UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K

(Mark One)

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2018

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission file number 001-13831

Quanta Services, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**74-2851603**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

2800 Post Oak Boulevard, Suite 2600
Houston, Texas 77056
(Address of principal executive offices, including zip code)

(713) 629-7600
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Exchange on Which Registered
Common Stock, $0.00001 par value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:
Title of Each Class
None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ☐ No ☑

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑	Accelerated filer ☐
Non-accelerated filer ☐	Smaller reporting company ☐
	Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☑

As of June 29, 2018 (the last business day of the Registrant's most recently completed second fiscal quarter), the aggregate market value of the Common Stock of the Registrant held by non-affiliates of the Registrant, based on the last sale price of the Common Stock reported by the New York Stock Exchange on such date, was $4.9 billion.

As of February 21, 2019, the number of outstanding shares of Common Stock of the Registrant was 141,356,413. As of the same date, 36,183 exchangeable shares of a Canadian subsidiary of the Registrant were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement for the 2019 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K.

QUANTA SERVICES, INC.
ANNUAL REPORT ON FORM 10-K
For the Year Ended December 31, 2018
INDEX

		Page Number
	PART I	
ITEM 1.	Business	2
ITEM 1A.	Risk Factors	8
ITEM 1B.	Unresolved Staff Comments	28
ITEM 2.	Properties	28
ITEM 3.	Legal Proceedings	28
ITEM 4.	Mine Safety Disclosures	28
	PART II	
ITEM 5.	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	29
ITEM 6.	Selected Financial Data	32
ITEM 7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	34
ITEM 7A.	Quantitative and Qualitative Disclosures About Market Risk	64
ITEM 8.	Financial Statements and Supplementary Data	66
ITEM 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	118
ITEM 9A.	Controls and Procedures	118
ITEM 9B.	Other Information	119
	PART III	
ITEM 10.	Directors, Executive Officers and Corporate Governance	120
ITEM 11.	Executive Compensation	120
ITEM 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	120
ITEM 13.	Certain Relationships and Related Transactions, and Director Independence	120
ITEM 14.	Principal Accounting Fees and Services	120
	PART IV	
ITEM 15.	Exhibits and Financial Statement Schedules	121
ITEM 16.	Form 10-K Summary	127
SIGNATURES		128

PART I

ITEM 1. *Business*

General

Quanta Services, Inc. (Quanta) is a leading provider of specialty contracting services, delivering comprehensive infrastructure solutions for the electric power, energy and communications industries in the United States, Canada, Australia, Latin America and select other international markets. The services we provide include the design, installation, upgrade, repair and maintenance of infrastructure within each of the industries we serve, such as electric power transmission and distribution networks; substation facilities; pipeline transmission and distribution systems and facilities; refinery, petrochemical and industrial facilities; and telecommunications and cable multi-system operator networks. We have a workforce of approximately 39,200 employees as of December 31, 2018 and serve a diverse customer base. We believe our reputation for responsiveness and performance, geographic reach, comprehensive service offerings, safety leadership and financial strength have resulted in strong relationships with numerous customers, which include many of the leading companies in the industries we serve, and have positioned us to continue to take advantage of other opportunities. Our services are typically provided pursuant to master service agreements, repair and maintenance contracts and fixed price and non-fixed price installation contracts. Quanta is organized as a corporation under the laws of the State of Delaware and was formed in 1997.

We report our results under two reportable segments: (1) Electric Power Infrastructure Services and (2) Pipeline and Industrial Infrastructure Services. This structure is generally focused on broad end-user markets for our services. As of December 31, 2018, we changed the name of our Oil and Gas Infrastructure Services segment to the Pipeline and Industrial Infrastructure Services segment. There was no change to the composition of the segment, and the name change was made to better reflect the work performed within the segment and the diversity of its service offerings. Our consolidated revenues for the year ended December 31, 2018 were $11.17 billion, of which 57% was attributable to the Electric Power Infrastructure Services segment and 43% was attributable to the Pipeline and Industrial Infrastructure Services segment.

We believe that our business strategies, along with our safety culture and financial strength, differentiate us from our competition and position us to capitalize on future capital spending by our customers. We offer comprehensive and diverse solutions on a broad geographic scale and have a solid base of long-standing customer relationships in each of the industries we serve. We also have an experienced management team, both at the executive level and within our operating units, and various proprietary technologies that enhance our service offerings. Our strategies of expanding our portfolio of service offerings for existing and potential customers, increasing our geographic and technological capabilities, promoting best practices and cross-selling services to our existing customers, as well as continuing to maintain our financial strength, place us in the position to capitalize on opportunities and trends in the industries we serve and expand our operations to select international markets. We continue to evaluate potential strategic acquisitions and investments to broaden our customer base, expand our geographic area of operations, grow our portfolio of services and increase opportunities across our operations.

Reportable Segments

The following is an overview of the types of services provided by each of our reportable segments.

Electric Power Infrastructure Services Segment

The Electric Power Infrastructure Services segment provides comprehensive network solutions to customers in the electric power industry. Services performed by the Electric Power Infrastructure Services segment generally include the design, installation, upgrade, repair and maintenance of electric power transmission and distribution infrastructure and substation facilities along with other engineering and technical services. This segment also provides emergency restoration services, including the repair of infrastructure damaged by inclement weather, the energized installation, maintenance and upgrade of electric power infrastructure utilizing unique bare hand and hot stick methods and our proprietary robotic arm technologies, and the installation of "smart grid" technologies on electric power networks. In addition, this segment provides services that support the development of renewable energy generation, including solar, wind and certain types of natural gas generation facilities, and related switchyards and transmission infrastructure. This segment also provides comprehensive communications infrastructure services to wireline and wireless telecommunications companies, cable multi-system operators and other customers within the communications industry; services in connection with the construction of electric power generation facilities; and the design, installation, maintenance and repair of commercial and industrial wiring. This segment also includes our postsecondary educational institution, which specializes in pre-apprenticeship training, apprenticeship training and specialized utility task training for electric workers, and has been recently expanded to include curriculum for the gas distribution and communications industries.

Pipeline and Industrial Infrastructure Services Segment

The Pipeline and Industrial Infrastructure Services segment provides comprehensive infrastructure solutions to customers involved in the development, transportation, storage and processing of natural gas, oil and other products. Services performed by the Pipeline and Industrial Infrastructure Services segment generally include the design, installation, repair and maintenance of pipeline transmission and distribution systems, gathering systems, production systems, storage systems and compressor and pump stations, as well as related trenching, directional boring and mechanized welding services. In addition, this segment's services include pipeline protection, integrity testing, rehabilitation and replacement, and the fabrication of pipeline support systems and related structures and facilities for natural gas utilities and midstream companies. We also provide high-pressure and critical-path turnaround services to the downstream and midstream energy markets and instrumentation and electrical services, piping, fabrication and storage tank services. To a lesser extent, this segment serves the offshore and inland water energy markets and designs, installs and maintains fueling systems and water and sewer infrastructure.

Financial Information and Geographic Areas

We operate primarily in the United States; however, we derived $2.60 billion, $2.48 billion and $1.59 billion of our revenues from foreign operations during the years ended December 31, 2018, 2017 and 2016, respectively. Of our foreign revenues, 76%, 79% and 75% were earned in Canada during the years ended December 31, 2018, 2017 and 2016, respectively. In addition, we held property and equipment of $304.0 million and $330.4 million in foreign countries, primarily Canada, as of December 31, 2018 and 2017.

Customers, Strategic Alliances and Preferred Provider Relationships

Our customers include electric power, energy and communications companies, as well as commercial, industrial and governmental entities. We have a large and diverse customer base, including many of the leading companies in the industries we serve. Our 10 largest customers accounted for 37% of our consolidated revenues during the year ended December 31, 2018. Our largest customer accounted for 7% of our consolidated revenues for the year ended December 31, 2018. Representative customers include:

- American Electric Power Company, Inc.
- ATCO Electric
- CenterPoint Energy, Inc.
- Dominion Energy, Inc.
- Duke Energy Corporation
- Enbridge Inc.
- Entergy Corporation
- Enterprise Products Partners L.P.
- EQT Midstream
- Exelon Corporation
- Eversource Energy
- FirstEnergy Corp.
- Fortis Inc.
- NextEra Energy, Inc.
- NiSource Inc.
- PG&E Corporation
- Puget Sound Energy, Inc.
- Sempra Energy
- Southern California Edison Company
- TransCanada Corporation
- Valero Energy Corporation
- Xcel Energy Inc.

Although we have a centralized marketing and business development strategy, management at each of our operating units is responsible for developing and maintaining successful long-term relationships with customers. Our operating unit management teams build upon existing customer relationships to secure additional projects and increase revenues. Many of these customer relationships are long-standing and are maintained through a partnering approach with centralized account management, which includes project evaluation and consulting, quality performance, performance measurement and direct customer contact. Additionally, operating unit management focuses on pursuing growth opportunities with prospective customers. We also encourage operating unit management to cross-sell services of our other operating units to their customers and coordinate with our other operating units to pursue projects, especially those that are larger and more complex. We believe our ability to provide services that cover a broad spectrum of our customers' requirements is a significant differentiator. Our corporate-level business development group supports these activities by promoting and marketing our services for existing and prospective large national accounts, as well as projects that are capable of utilizing services from multiple operating units.

We are a preferred service provider for many of our customers, which means we have met minimum standards for a specific category of service, maintained a high level of performance and agreed to certain payment terms and negotiated rates. We strive to maintain preferred status as we believe it provides us an advantage in the award of future work for the applicable customer. Furthermore, many of our strategic relationships with customers take the form of strategic alliance or long-term maintenance agreements, which typically extend for an initial term of approximately two to five years and may include renewal options to

extend the initial term. Strategic alliance agreements also generally state an intention to work together over a period of time and/ or on specific types of projects, and many provide us with preferential bidding procedures.

Remaining Performance Obligations and Backlog

As discussed in Note 3 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data*, effective January 1, 2018, we adopted the new revenue recognition guidance issued by the FASB. Pursuant to the new guidance, we are required to disclose, as of the end of each interim and annual period, the aggregate amount of remaining performance obligations under our contracts with customers. A performance obligation is a promise in a contract with a customer to transfer a distinct good or service. As of December 31, 2018, our remaining performance obligations were $4.68 billion, 66.2% of which was expected to be recognized in the subsequent twelve months. Our remaining performance obligations represent management's estimate of consolidated revenues that are expected to be realized from the remaining portion of firm orders under fixed price contracts not yet completed or for which work has not yet begun. For purposes of calculating remaining performance obligations, we include all estimated revenues attributable to consolidated joint ventures and variable interest entities (VIEs), revenues from funded and unfunded portions of government contracts to the extent they are reasonably expected to be realized, and revenues from change orders and claims to the extent management believes additional contract revenues will be earned and are deemed probable of collection.

We have also historically disclosed our backlog, and while backlog is not a term recognized under generally accepted accounting principles in the United States (GAAP), it is a common measurement used in our industry. We also believe this non-GAAP measure enables us to more effectively forecast our future results and better identify future operating trends that may not otherwise be apparent. Our remaining performance obligations, as described above, are a component of our backlog calculation, which also includes estimated orders under master service agreements (MSAs), including estimated renewals, and non-fixed price contracts expected to be completed within one year. Our methodology for determining backlog may not be comparable to the methodologies used by other companies.

Generally, our customers are not contractually committed to specific volumes of services under our MSAs, and most of our contracts may be terminated, typically upon 30 to 90 days' notice, even if we are not in default under the contract. We determine the estimated amount of backlog for work under MSAs by using recurring historical trends for current MSAs, factoring in seasonal demand and projected customer needs based upon ongoing communications with the customer. In addition, many of our MSAs are subject to renewal, and these potential renewals are considered in determining the estimated amount of backlog. As of December 31, 2018 and 2017, MSAs accounted for 53% and 44% of our estimated 12-month backlog and 60% and 52% of total backlog. There can be no assurance as to our customers' actual requirements or that our estimates are accurate.

Revenue estimates included in our remaining performance obligations and backlog can be subject to change as a result of, among other things: project acceleration; cancellations or delays due to various factors, including but not limited to commercial issues, regulatory requirements and adverse weather conditions; and final acceptance of change orders by our customers. These factors can also cause revenue amounts to be realized in periods and at levels different than originally projected.

The following table reconciles total remaining performance obligations to our backlog (a non-GAAP measure) by reportable segment as of December 31, 2018, along with estimates of amounts expected to be realized within 12 months of December 31, 2018 (in thousands):

	December 31, 2018	
	12 Month	Total
Electric Power Infrastructure Services		
Remaining performance obligations	$ 2,093,461	$ 3,045,553
Estimated orders under MSAs and short-term, non-fixed price contracts	2,467,654	5,499,887
Backlog	4,561,115	8,545,440
Pipeline and Industrial Infrastructure Services		
Remaining performance obligations	1,003,543	1,635,918
Estimated orders under MSAs and short-term, non-fixed price contracts	1,411,329	2,161,275
Backlog	2,414,872	3,797,193
Total		
Remaining performance obligations	3,097,004	4,681,471
Estimated orders under MSAs and short-term, non-fixed price contracts	3,878,983	7,661,162
Backlog	$ 6,975,987	$ 12,342,633

The following table presents our total backlog (a non-GAAP measure) by reportable segment as of December 31, 2018 and 2017, along with an estimate of the backlog amounts expected to be realized within 12 months of each balance sheet date (in thousands):

	Backlog as of December 31, 2018		Backlog as of December 31, 2017	
	12 Month	Total	12 Month	Total
Electric Power Infrastructure Services	$ 4,561,115	$ 8,545,440	$ 4,032,379	$ 7,359,237
Pipeline and Industrial Infrastructure Services	2,414,872	3,797,193	2,413,817	3,818,470
Total	$ 6,975,987	$ 12,342,633	$ 6,446,196	$ 11,177,707

Competition

The markets in which we operate are highly competitive. We compete with other contractors in most of the geographic markets in which we operate, and several of our competitors are large companies that have significant financial, technical and marketing resources. In addition, there are relatively few barriers to entry into some of the industries in which we operate and, as a result, any organization that has adequate financial resources and access to technical expertise may become a competitor. A significant portion of our revenues is currently derived from unit price or fixed price agreements, and price is often an important factor in the award of such agreements. Accordingly, we could be underbid by our competitors in an effort by them to procure such business. We believe that as demand for our services increases, customers often consider other factors in choosing a service provider, including technical expertise and experience, safety ratings, financial and operational resources, geographic presence, industry reputation and dependability, which we expect to benefit larger contractors such as us. In addition, competition may lessen as industry resources, such as labor supplies, approach capacity. There can be no assurance, however, that our competitors will not develop the expertise, experience and resources to provide services that are superior in both price and quality to our services, or that we will be able to maintain or enhance our competitive position. We also face competition from the in-house service organizations of our existing or prospective customers, including electric power, energy and engineering companies, which employ personnel who perform some of the same types of services we provide. Although these companies currently outsource a significant portion of these services, in particular services relating to larger energy transmission infrastructure projects, there can be no assurance that they will continue to do so in the future or that they will not acquire additional in-house capabilities.

Employees

As of December 31, 2018, we had approximately 39,200 employees, consisting of approximately 8,400 salaried employees, including executive officers, professional and administrative staff, project managers and engineers, job superintendents and field

personnel, and approximately 30,800 hourly employees, the number of which fluctuates depending upon the number and size of the projects that are ongoing and planned at any particular time. Approximately 38% of our employees at December 31, 2018 were covered by collective bargaining agreements, which require the payment of specified wages, the observance of certain workplace rules and the payment of certain amounts to multiemployer pension plans and employee benefit trusts. These collective bargaining agreements have varying terms and expiration dates, and the majority contain provisions that prohibit work stoppages or strikes, even during specified negotiation periods relating to agreement renewals, and provide for binding arbitration dispute resolution in the event of prolonged disagreement.

We provide health, welfare and benefit plans for employees who are not covered by collective bargaining agreements. We also have a 401(k) plan pursuant to which eligible U.S. employees who are not provided retirement benefits through a collective bargaining agreement may make contributions through a payroll deduction. We make matching cash contributions of 100% of each employee's contribution up to 3% of that employee's salary and 50% of each employee's contribution between 3% and 6% of such employee's salary, up to the maximum amount permitted by law.

Our industry is experiencing a shortage of journeyman linemen and specialty craft labor in certain geographic areas. In response to the shortage and to attract qualified employees, we support and utilize various training and educational programs and have developed additional company-wide and project-specific employee training and educational programs, as described in further detail below.

Training, Quality Assurance and Safety

Performance of our services requires the use of equipment and exposure to hazardous conditions. Although we are committed to a policy of operating safely and prudently, we have been and will continue to be subject to claims by employees, customers and third parties for property damage and personal injury. In response to these inherent hazards and as part of our commitment to employee safety, our operating units have established safety programs, policies and procedures and training requirements for our employees both before they begin work and on an ongoing basis. Additionally, we have implemented an enterprise-wide Automated External Defibrillator (AED) program, which provides AEDs to all of our crews and training to enhance life safety response measures. We have also continued to invest in our internal education and training capabilities, including the expansion of our training facility to add training for beginning linemen, lead and cable splicing and directional drilling to our existing energized electric power and pipeline integrity training. This facility provides classroom and on-the-job training programs and allows us to train employees in a controlled environment without the challenges of limited structure access and utility constraints. Additionally, during 2018, we acquired Northwest Lineman College, which specializes in pre-apprenticeship training, apprenticeship training and specialized utility task training for electric workers, and has been recently expanded to include curriculum for the gas distribution and communications industries.

Our operating units performing more sophisticated and technical jobs utilize, when applicable, training programs provided by the International Brotherhood of Electrical Workers/National Electrical Contractors Associations (IBEW/NECA) Apprenticeship Program, training programs sponsored by the four trade unions administered by the Pipe Line Contractors Association (PLCA), apprenticeship training programs sponsored by the Canadian Union of Skilled Workers (CUSW) or our equivalent programs. Under the IBEW/NECA Apprenticeship Program, all journeyman linemen are required to complete classroom education and on-the-job training, as well as extensive testing and certification. Certain of our operating units have established apprenticeship training programs approved by the U.S. Department of Labor that prescribe equivalent training requirements for employees who are not otherwise subject to the requirements of the IBEW/NECA Apprenticeship Program. Similarly, the CUSW offers apprenticeship training for construction and maintenance electricians and powerline technicians that requires classroom education and on-the-job training. In addition, the Laborers International Union of North America, the International Brotherhood of Teamsters, the United Association of Plumbers and Pipefitters and the International Union of Operating Engineers have training programs specifically designed for developing and improving the skills of their members who work in the pipeline construction industry. Our operating units also share best practices for training and educational programs and safety policies.

Materials

Our customers typically supply most or all of the materials required for each job. However, for some of our contracts, we may procure all or part of the materials required. As we continue to expand our comprehensive engineering, procurement and construction offerings, the cost of materials may become a proportionately larger component of our consolidated cost of services. We do not anticipate experiencing any significant procurement difficulties, as we purchase our required materials from a variety of sources; however, tariffs or other changes in U.S. trade relations could result in increased costs for these materials.

Regulation

Our operations are subject to various federal, state, local and international laws and regulations including:

- licensing, permitting and inspection requirements applicable to contractors, electricians and engineers;

- regulations relating to worker safety and environmental protection;
- permitting and inspection requirements applicable to construction projects;
- wage and hour regulations;
- regulations relating to transportation of equipment and materials, including licensing and permitting requirements;
- building and electrical codes; and
- special bidding, procurement and other requirements on government projects.

We believe that we are in compliance with all material licensing and regulatory requirements that are necessary to conduct our operations. Our failure to comply with applicable regulations could result in substantial fines or revocation of our operating licenses, as well as give rise to termination or cancellation rights under our contracts or disqualify us from future bidding opportunities.

Environmental Matters and Climate Change Impacts

We are committed to the protection of the environment and train our employees to perform their duties accordingly. We are subject to numerous federal, state, local and international environmental laws and regulations governing our operations, including the handling, transportation and disposal of non-hazardous and hazardous substances and wastes, as well as emissions and discharges into the environment, including discharges to air, surface water, groundwater and soil. We also are subject to laws and regulations that impose liability and cleanup responsibility for releases of hazardous substances into the environment. Under certain of these laws and regulations, liability can be imposed for cleanup of previously owned or operated properties or currently owned properties at which hazardous substances or wastes were discharged or disposed of by a former owner or operator, regardless of whether we directly caused the contamination or violated any law at the time of discharge or disposal. The presence of contamination from such substances or wastes could also interfere with ongoing operations or adversely affect our ability to sell or lease the property or use it as collateral for financing. In addition, we could be held liable for significant penalties and damages under certain environmental laws and regulations or be subject to revocation of certain licenses or permits, which could materially and adversely affect our business, results of operations and cash flows. Our contracts with customers may also impose liability on us for environmental issues that arise through the performance of our services.

From time to time, we may incur costs and obligations for correcting environmental noncompliance matters and for remediation at or relating to certain of our properties. We believe that we are in substantial compliance with our environmental obligations and that any such obligations will not have a material adverse effect on our business or financial performance.

The potential impact of climate change on our operations is uncertain. Climate change may result in, among other things, changes in rainfall and storm patterns and intensity and increased temperature and sea levels. As discussed elsewhere in this Annual Report on Form 10-K (Annual Report), including in Item 1A. *Risk Factors*, our operating results are significantly influenced by weather, and significant changes in historical weather patterns could significantly impact our future operating results. For example, if climate change results in drier weather and more accommodating temperatures over a greater period of time, we may be able to increase our productivity, which could positively impact our revenues and gross margins. Conversely, if climate change results in a greater amount of rainfall, snow, ice or other less accommodating weather conditions, we could experience reduced productivity, which could negatively impact our revenues and gross margins. Further, while an increase in severe weather events, such as hurricanes, tropical storms, blizzards and ice storms, can create a greater amount of emergency restoration service work, it often also can result in delays or other negative consequences for our existing projects, which could negatively impact our financial results. Climate change may also affect the conditions in which we operate, and in some cases, expose us to potentially increased liabilities associated with those environmental conditions. For example, severe drought in the western United States has increased the risk of wildfires, which in turn has potentially exposed electrical operators and contractors to increased risk of liability.

Concerns about climate change could also result in potential new regulations, regulatory actions or requirements to fund energy efficiency activities, any of which could negatively affect our customers and decrease demand for our services, in particular our pipeline construction services, or result in increased costs associated with our operations. For example, any decrease in demand for fossil fuels could negatively impact demand for certain of our pipeline and industrial services. We also maintain a large fleet and a significant amount of construction machinery, all of which could be impacted by new regulations related to greenhouse gas emissions from such sources.

Risk Management and Insurance

We are insured for employer's liability, workers' compensation, auto liability and general liability claims. Under these programs, the deductible for employer's liability is $1.0 million per occurrence, the deductible for workers' compensation is $5.0 million per occurrence, and the deductibles for auto liability and general liability are $10.0 million per occurrence. We manage and maintain a portion of our casualty risk through our wholly-owned captive insurance company, which insures all claims up to the amount of the applicable deductible of our third-party insurance programs. In connection with our casualty insurance programs, we are required to issue letters of credit to secure our obligations. We also have employee health care benefit plans for most employees not subject to collective bargaining agreements, of which the primary plan is subject to a deductible of $0.5 million per claimant per year.

Losses under all of these insurance programs are accrued based upon our estimate of the ultimate liability for claims reported and an estimate of claims incurred but not reported, with assistance from third-party actuaries. These insurance liabilities are difficult to assess and estimate due to unknown factors, including the severity of an injury, the extent of damage, the determination of our liability in proportion to other parties and the number of incidents not reported. The accruals are based upon known facts and historical trends, and management believes such accruals are adequate.

We renew our insurance policies on an annual basis, and therefore deductibles and levels of insurance coverage may change in future periods. In addition, insurers may cancel our coverage or determine to exclude certain items from coverage, or we may elect not to obtain certain types or incremental levels of insurance based on the potential benefits considered relative to the cost of such insurance. In any such event, our overall risk exposure would increase, which could negatively affect our results of operations, financial condition and cash flows.

Seasonality and Cyclicality

Our revenues and results of operations can be subject to seasonal and other variations. These variations are influenced by weather, customer spending patterns, bidding seasons, receipt of required regulatory approvals, permits and rights of way, project timing and schedules, and holidays. Please read the section entitled *Seasonality; Fluctuations of Results; Economic Conditions* included in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations*.

Website Access and Other Information

Our website address is *www.quantaservices.com*. Interested parties may obtain free electronic copies of our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to these reports through our website under the heading *Investors & Media/Financial Info/SEC Filings* or through the website of the Securities and Exchange Commission (the SEC) at *www.sec.gov*. These reports are available on our website as soon as reasonably practicable after we electronically file them with, or furnish them to, the SEC. We will also make available to any stockholder, without charge, copies of our Annual Report on Form 10-K as filed with the SEC. For copies of this or any other Quanta publication, stockholders may submit a request in writing to Quanta Services, Inc., Attn: Corporate Secretary, 2800 Post Oak Blvd., Suite 2600, Houston, TX 77056, or by phone at 713-629-7600.

Investors and others should note that we announce material financial information and make other public disclosures of information regarding Quanta through SEC filings, press releases, public conference calls, and our website. We also utilize social media to communicate this information, and it is possible that the information we post on social media could be deemed material. Accordingly, we encourage investors, the media and others interested in our company to follow Quanta, and review the information we post, on the social media channels listed on our website in the *Investors & Media/Social Media* section.

This Annual Report, our website and our social media channels contain information provided by other sources that we believe is reliable. We cannot provide assurance that the information obtained from other sources is accurate or complete. No information on our website or our social media channels is incorporated by reference herein.

ITEM 1A. *Risk Factors*

Our business is subject to a variety of risks and uncertainties, including, but not limited to, the risks and uncertainties described below. The matters described below are not the only risks and uncertainties facing our company. Additional risks and uncertainties not known to us or not described below also may impair our business operations. If any of the following risks actually occur, our business, financial condition, results of operations and cash flows could be negatively affected, and we may not be able to achieve our goals or expectations. This Annual Report also includes statements reflecting assumptions, expectations, projections, intentions or beliefs about future events that are intended as "forward-looking statements" under the Private Securities Litigation Reform Act of 1995 and should be read in conjunction with the section entitled *Uncertainty of Forward-Looking Statements and Information* included in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations.*

Our operating results may vary significantly from quarter to quarter.

Our business can be highly cyclical and subject to seasonal and other variations that can result in significant differences in operating results from quarter to quarter. For example, we typically experience lower gross and operating margins during winter months due to lower demand for our services and more difficult operating conditions in the Northern Hemisphere. Additionally, our quarterly results may be materially and/or adversely affected by:

- the timing and volume of work we perform and our performance with respect to ongoing projects;
- project delays, reductions in scope or cancellations, including as a result of permitting, regulatory or environmental processes, project performance, customer capital constraints, claimed force majeure events, protests or other political activity, or legal challenges;
- adverse weather conditions and significant weather events;
- variations in the size, scope and margins of projects we perform and the mix of our customers, contracts and business during any particular quarter;
- increases in construction, design, engineering or procurement costs;
- fluctuations in regional, national or global economic, political and market conditions, including as a result of tariffs or changes in U.S. trade relationships with other countries, which could result in decreased demand for our services;
- pricing pressures resulting from competition;
- the budgetary spending patterns of customers and federal, state and local governments;
- disruptions in our customers' strategic plans, which could occur as a result of, among other things, emerging technologies, financial difficulties of our customers or changing environmental conditions;
- the magnitude of work performed under change orders and the timing of their recognition;
- liabilities and costs experienced in our operations that are not covered by, or that are in excess of, our third-party insurance, including significant liabilities that may arise from the inherently hazardous conditions of our operations (e.g., explosions, fires) and which could be exacerbated by the geographies in which we operate;
- disputes with customers or delays relating to billing and payment under our contracts and change orders, and our ability to successfully negotiate and obtain payment or reimbursement under our contracts and change orders;
- the resolution of, or unexpected or increased costs associated with, pending or threatened litigation, indemnity obligations or other claims asserted against us;
- liabilities associated with multiemployer pension plans in which our employees participate, including with respect to any withdrawal therefrom;
- significant fluctuations in foreign currency exchange rates;
- changes in accounting pronouncements that require us to account for items differently;
- payment risk associated with the financial condition of our customers, including those customers affected by the volatility of natural gas and oil prices or that have filed for bankruptcy protection;
- the termination or expiration of existing customer agreements;
- changes in bonding and lien requirements applicable to existing and new customer agreements;
- implementation of various information technology systems, which could temporarily disrupt day-to-day operations;

- the decision by our Board of Directors to pay a dividend and market expectations with respect to the payment and amount of any dividends;

- the recognition of tax impacts related to changes in tax laws or uncertain tax positions;

- the timing and magnitude of costs we incur to support growth internally or through acquisitions or otherwise;

- the timing and integration of acquisitions and the magnitude of the related acquisition and integration costs; and

- estimates and assumptions in determining our financial results, remaining performance obligations and backlog, including the timing and significance of impairments of long-lived assets, equity or other investments, receivables, goodwill or other intangible assets.

Accordingly, our operating results in any particular quarter may not be indicative of the results that can be expected for any other quarter or for the entire year.

Negative economic and market conditions, including low oil and natural gas prices, may adversely impact our customers' future spending as well as payment for our services and, as a result, our operations and growth.

Stagnant or declining economic conditions can adversely impact the demand for our services and result in the delay, reduction or cancellation of certain projects. In addition, economic and market conditions specifically affecting the industries we serve could adversely affect our business, financial condition, results of operations and cash flows. A number of factors, including financing conditions and potential bankruptcies in the industries we serve or a prolonged economic downturn or recession, could adversely affect our customers and their ability or willingness to fund capital expenditures in the future or pay for past services. Consolidation, competition, capital constraints or negative economic conditions in the electric power, energy or communications industries may also result in reduced spending by, or the loss of, one or more of our customers.

Our Pipeline and Industrial Infrastructure Services segment is exposed to risks associated with the oil and gas industry. These risks, which are not subject to our control, include the volatility and cyclical nature of natural gas and oil prices and the resulting effect on demand for the services we provide, and a slowdown in the development or discovery of natural gas and/or oil reserves. Specifically, lower natural gas and oil prices can result in decreased spending by our customers in our Pipeline and Industrial Infrastructure Services segment. Declines in prices, or perceived risk thereof, may result in our customers reducing or delaying capital spending on larger pipeline projects, gas gathering and compressor systems and related infrastructure, resulting in less demand for our services. If the profitability of our Pipeline and Industrial Infrastructure Services segment were to decline, our overall financial position, results of operations and cash flows could also be adversely affected. Additionally, declines in natural gas and oil prices, and a resulting decline in the development of resource plays and oil and natural gas production, could negatively impact our Electric Power Infrastructure Services segment. For example, the low price of oil has had an adverse impact on the Canadian economy, which has impacted demand for some of our electric power services in Canada.

Further, many of our customers finance their projects through the incurrence of debt or the issuance of equity. During depressed markets, our customers may be unable to access capital markets or otherwise obtain financing for budgeted capital expenditures. A reduction in cash flow or the lack of availability of debt or equity financing for our customers could result in a reduction in our customers' spending for our services and may also impact the ability of our customers to pay amounts owed to us, which could have a material adverse effect on our business, financial condition, results of operations, cash flows and our ability to grow.

A variety of issues outside of our control could affect the timing of and our performance on projects, which may result in additional costs to us, reductions or delays in revenues or the payment of liquidated damages.

Our business is dependent in part upon projects that can be cyclical in nature and are subject to risks of delay or cancellation. The timing of or failure to obtain contracts, delays in awards of, start dates for or completion of projects and the cancellations of projects could result in significant periodic fluctuations in our business, financial condition, results of operations and cash flows.

Many projects involve challenging engineering, permitting, procurement and construction phases that may occur over extended time periods, sometimes several years. We may also encounter difficulties as a result of delays in design, engineering information or materials to be completed or procured by us, the customer or a third party; delays or difficulties in equipment and material delivery; schedule changes; delays due to our or our customers' failure to timely obtain permits or rights of way or meet other regulatory requirements or permitting conditions; weather-related delays; protests, legal challenges or other political activity; and other factors. Furthermore, regulatory requirements for a project may change during the course of our work, which can result in the suspension of work as permits are reissued or updated. Projects where we provide engineering, procurement and construction services present additional performance risks due to the amount of work and complexity involved. The bidding processes for these

projects can also be longer, often taking six to nine months, and regulatory and permitting delays on these projects tend to be more challenging and cause more timing uncertainty.

In addition, we contract with third-party suppliers and subcontractors to assist us with the completion of contracts. Any delay or failure by suppliers or by subcontractors in the completion of their portion of the project may result in delays in the overall progress of the project or cause us to incur additional costs. A failure by us to properly manage and invest in our equipment fleet could also negatively impact project performance and our financial condition, results of operations and cash flows. We also may encounter project delays due to local opposition to a project, which may include injunctive actions or other legal proceedings or public protests or other political activity.

Many of these difficulties and delays are beyond our control and could negatively impact our ability to complete the project in accordance with the original delivery schedule or achieve our anticipated margin on the project. Delays and additional costs may be substantial and not recoverable from third parties, and in some cases, we may be required to compensate the customer for such delays. In certain circumstances, we guarantee project completion or performance by a scheduled date. Failure to meet any of our schedules or performance requirements could also result in additional costs or penalties, including liquidated damages, and such amounts could exceed expected project profit. In extreme cases, the above-mentioned factors could cause project cancellations, and we may not be able to replace such projects with similar projects or at all. Such delays or cancellations may impact our reputation or relationships with customers, adversely affecting our ability to secure new contracts, and could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Our business is labor intensive, and we may be unable to attract and retain qualified employees, or incur significant costs in the event we are unable to efficiently manage our workforce.

Our ability to maintain our productivity and profitability is limited by our ability to employ, train and retain the necessary skilled personnel. We may not be able to maintain an adequately skilled labor force necessary to operate efficiently and to support our growth strategy. For instance, we may experience shortages of qualified journeyman linemen, who are integral to the provision of transmission and distribution services under our Electric Power Infrastructure Services segment. The commencement of new, large-scale infrastructure projects or increased demand for infrastructure improvements, as well as the aging electric utility workforce, may also further reduce the pool of skilled workers available to us. In addition, in our Pipeline and Industrial Infrastructure Services segment, there is limited availability of experienced supervisors and foremen that can oversee larger diameter pipeline projects. A shortage in the supply of these skilled personnel, as well as equipment operators and welders, creates competitive hiring markets and may result in increased labor expenses. Additionally, if we are unable to hire employees with the requisite skills, we may also be forced to incur significant education and training expenses. Labor shortages or increased labor costs could impair our ability to maintain our business or grow our revenues or profitability.

Furthermore, the uncertainty of contract award timing and project delays can also present difficulties in managing our workforce size. Inability to efficiently manage our workforce may require us to incur costs resulting from excess staff, reductions in staff, or redundancies that could have a material adverse impact on our business, financial condition, results of operations and cash flows.

The loss of one or a few customers could have a material adverse effect on us.

A few customers have in the past and may in the future account for a significant portion of our revenues in any one year or over a period of several consecutive years. Although we have long-standing relationships with many of our significant customers, a significant customer may unilaterally reduce or discontinue business with us at any time or merge or be acquired by a company that decides to reduce or discontinue business with us. A significant customer could also file for bankruptcy protection or cease operations, which could result in reduced or discontinued business with us. The loss of business from a significant customer could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Our failure to adequately recover on contract change orders or claims brought by us against customers related to payment terms and costs could materially and adversely affect our financial position, results of operations and cash flows.

We have in the past brought, and may in the future bring, claims against our customers related to, among other things, the payment terms of our contracts and change orders relating to our contracts. These types of claims occur due to, among other things, customer- or third party-caused delays or changes in project scope, which may result in additional costs, which may or may not be recovered until the claim is resolved. Under these circumstances, we generally negotiate with the customer for additional compensation; however, we are subject to the risk that we may be unable to obtain, through negotiation, arbitration, litigation or otherwise, adequate amounts to compensate us for the additional work or expenses incurred. Litigation or arbitration with respect to payment terms under contracts and change orders is generally lengthy and costly and may adversely affect our relationship with existing or potential customers, and it is often difficult to predict the timing or amount of any claim resolution. A failure to obtain adequate and prompt compensation for these matters could require us to record a reduction to revenues and gross profit recognized

in prior periods under the percentage-of-completion accounting method. Any such adjustments could be substantial. We may also be required to invest significant working capital to fund cost overruns while the resolution of a claim is pending, which could adversely affect our business, financial condition, results of operations and cash flows.

Regulatory requirements affecting any of the industries we serve may result in delays or cancellations of projects or less demand for our services.

Because the vast majority of our revenue is derived from a few industries, the federal, state and local regulations affecting those industries, including, among other things, environmental, safety, and permitting requirements, have a material effect on our business, and increased regulatory requirements could adversely affect our business, financial condition, results of operations and cash flows. In recent years, our customers have faced heightened regulatory requirements and increased regulatory enforcement, which have resulted in delays and reductions in scope and cancellations of projects. Increased regulatory requirements have also decreased demand for our services in the past, and may do so in the future, potentially impacting our business, financial condition, results of operations, cash flows and our ability to grow. Additionally, certain regulatory requirements applicable to our customers are also required of us when we contract with such customers, and our inability to meet those requirements could also result in decreased demand for our services.

Our failure to accurately estimate project costs or successfully execute a project could result in reduced profits or losses that could adversely affect our business, financial condition, results of operations and cash flows.

We currently generate some of our revenues under fixed price contracts, including contracts for projects where we provide engineering, procurement and construction (EPC) services, and we expect to continue generating varying amounts of revenues under these types of contracts on various projects, such as electric power transmission line and mainline pipeline projects. Under these contracts, we assume risks related to project estimates and execution, and project revenues, profitability and costs can vary, sometimes substantially, from our original projections due to a variety of factors, including:

- unforeseen circumstances or project modifications not included in our cost estimates or covered by our contract for which we cannot obtain adequate compensation, including concealed or unknown environmental, geological or geographical conditions;
- failure to accurately estimate project costs or accurately establish the scope of our services covered by the project contract;
- unanticipated technical problems, including design or engineering issues;
- inability to achieve guaranteed performance or quality standards with regard to engineering, construction or project management obligations;
- failure to properly make judgments in accordance with applicable professional standards, including engineering standards;
- changes in the cost of equipment, commodities, materials or labor;
- unanticipated costs or claims due to delays or failure to perform by customers, partners, subcontractors, suppliers or other third parties;
- contract termination or suspension and our inability to obtain reimbursement;
- delays or productivity issues caused by weather conditions or severe weather events;
- delays and additional costs associated with obtaining required permits or approvals;
- changes in laws or regulations;
- delays and additional costs attributable to legal challenges and protests and other political activity; and
- quality issues, including those requiring rework or replacement.

Additionally, we may be required to pay liquidated damages under certain of our contracts if we fail to meet schedule or performance requirements. These factors and events may result in reputational harm or cause actual revenues and gross profits for a project to differ from what we originally estimated, resulting in reduced profitability or losses on projects. Such differences could be material and could have a significant impact on our business, financial condition, results of operations and cash flows.

Changes in estimates related to revenues and costs associated with our contracts with customers could result in a reduction or an elimination of previously reported revenues and reduction of profits or the recognition of losses.

For fixed price contracts and certain unit-based contracts, we recognize revenue as performance obligations are satisfied over time and earnings or losses recognized on individual contracts are based on estimates of contract revenues, costs and profitability, as discussed in further detail in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies* and Note 2 of the Notes to Consolidated Financial Statements included in Item 8. *Financial Statements and Supplementary Data*. Changes in contract estimates are recognized on a cumulative catch-up basis in the period in which the revisions to the estimates are made, and such changes can result in the recognition of revenue and profit in a current period for performance obligations satisfied in prior periods or the reversal of previously recognized revenue and the recognition of a loss. The impacts of a change in estimate are measured as the differences between the revenue and gross profit recognized in the prior period and the revenue and gross profit which would have been recognized had the revised estimate been used as the basis of recognition in the prior period. Contract losses are recognized in full when losses are determined to be probable and can be reasonably estimated.

Variable consideration amounts, including performance incentives, early pay discounts and penalties, may also cause changes in contract estimates. Contract consideration is adjusted for variable consideration when it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur once the uncertainty related to the variable consideration is resolved. The timing for recognition of these variable consideration amounts is uncertain, and therefore could have a significant impact on our financial condition, results of operations and cash flows.

In addition, we recognize amounts associated with change orders and/or claims as revenue when it is probable that the contract price will be adjusted and the amount of any such adjustment can be reasonably estimated. As a result, costs incurred related to change orders and/or claims may be recognized in periods prior to the recognition of the related revenue. Actual collection of claims could differ from estimated amounts and could result in a reduction or elimination of previously recognized revenues and earnings. In certain circumstances, it is possible that such adjustments could be significant and could result in a reduction or an elimination of previously reported revenues and a reduction in profits or recognition of losses on the associated contract.

Our revenues and profitability may be exposed to potential risk if a contract is terminated or canceled, our customers encounter financial difficulties or file bankruptcy or disputes arise with our customers.

Our contracts often require us to satisfy or achieve certain milestones in order to receive payment for the work performed, or in the case of cost-reimbursable contracts, provide support for billings in advance of receiving payment. As a result, we may incur significant costs or perform significant amounts of work prior to receipt of payment. If any of our customers do not proceed with the completion of projects, terminate or cancel a contract with us or default on their payment obligations, or if disputes arise with our customers with respect to the adequacy of billing support, we may face difficulties in collecting payment of amounts due to us for costs previously incurred. We have in the past brought, and may in the future bring, claims against our customers related to the payment terms of our contracts. A failure to promptly recover on these types of claims could have a negative impact on our financial condition, results of operations and cash flows. Additionally, any such claims may harm our future relationships with our customers.

Slowing economic conditions in the industries we serve, economic downturns or bankruptcies could also impair the financial condition of one or more of our customers and hinder their ability to pay us on a timely basis. Further, to the extent a customer files bankruptcy, certain payments made to us prior to the filing of the bankruptcy petition may be avoided and returned to the customer's bankruptcy estate. For example, on January 29, 2019, PG&E Corporation and Pacific Gas and Electric Company (collectively PG&E), filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code, as amended, which could negatively impact, and is expected to delay, the collection of receivables owed to Quanta as of the filing date. See Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Concentrations of Credit Risk* for additional information. Additionally, many of our customers for larger projects are project-specific entities that do not have significant assets other than their interests in the project and may be more likely to encounter financial difficulties relating to their businesses. It may be difficult to collect amounts owed to us by customers experiencing financial difficulties or in bankruptcy, and accounts receivable from such customers may become uncollectible and ultimately have to be written off, which could have an adverse effect on our future financial condition, results of operations and cash flows.

Our operating results could be negatively affected by weather conditions and the nature of our work environment.

We perform substantially all of our services outdoors. Extraordinary or force majeure events, such as natural or man-made disasters, or other factors beyond our control could negatively impact our and our customers' ability to operate or increase our costs to operate. As an example, adverse weather conditions or events, such as extreme heat or cold, rainfall, snowfall, wind, an early thaw in Canada and the northern parts of the U.S., and hurricanes or other storms, may affect our productivity or may temporarily prevent us from performing services. The effect of weather delays on projects that are under fixed price arrangements may be greater if we are unable to adjust the project schedule for such delays, as the additional costs incurred as a result of the delays may not be reimbursed by our customers. Furthermore, our work is performed under a variety of conditions, including but not limited to, difficult terrain and difficult site conditions where delivery of materials and availability of labor are impacted or where there is exposure to harsh and hazardous conditions. A reduction in our productivity and efficiency in any given period or our inability to meet guaranteed schedules may adversely affect our financial condition, results of operations and cash flows.

Our business is subject to operational hazards, and we may not be insured against all potential liabilities.

Our business is subject to significant operational hazards due to the nature of services we provide and the conditions in which we operate. These hazards include electricity, fires, explosions, leaks, collisions, mechanical failures, offshore operation risks, and damage from severe weather conditions. Furthermore, certain of our customers operate energy-related infrastructure assets in locations and environments that increase the likelihood and/or severity of these operational hazards. In particular, we perform a significant amount of services for customers that operate electrical power and natural gas infrastructure assets in California and other locations that have recently experienced, and have a higher risk of, wildfires, some of which have exposed operators to significant additional costs and expenses and potentially significant additional liabilities. We also often operate in densely populated urban areas, which could increase the impact of any of these hazards or other accidents we experience.

As a result of these and other hazards, our operations could expose us to or result in liabilities, and because our services in certain instances may be integral to the operation and performance of our customers' infrastructure, such liabilities could arise even if our operations are not the cause of the harm. These liabilities could include, among other things, claims associated with personal injury, including severe injury or loss of life, and significant damage to property, equipment and the environment, and could lead to suspension of operations and/or material legal costs and liabilities. Insurance coverage may not be available to us or may be insufficient to cover the cost of these liabilities. If we are not fully insured or indemnified against such liabilities or a counterparty fails to meet its indemnification obligations to us, it could materially and adversely affect our business, financial condition, results of operations and cash flows. Further, any such liabilities or accidents could adversely affect our reputation or safety record, which could impact demand for our services or our ability to bid for certain work.

During the ordinary course of our business, we may become subject to lawsuits or indemnity claims, which could materially and adversely affect our business and results of operations.

We have in the past been, and may in the future be, named as a defendant in lawsuits, claims and other legal proceedings that arise in the ordinary course of our business. These actions may seek, among other things, compensation for alleged personal injury (including claims for loss of life), workers' compensation, employment discrimination, sexual harassment, workplace misconduct and other employment-related damages, compensation for breach of contract or property damage, environmental liabilities, multiemployer pension plan withdrawal liabilities, punitive damages, consequential damages, and civil penalties or other losses or injunctive or declaratory relief. In addition, we generally indemnify our customers for claims related to the services we provide and actions we take under our contracts, and, in some instances, we may be allocated risk through our contract terms for actions by our customers, subcontractors or other third parties. Because our services in certain instances may be integral to the operation and performance of our customers' infrastructure, we have been and may become subject to lawsuits or claims for any failure of the systems that we work on, even if our services are not the cause of such failures, and we could be subject to civil and criminal liabilities, which could be material. Insurance coverage may not be available or may be insufficient for these lawsuits, claims or legal proceedings. The outcome of any allegations, lawsuits, claims or legal proceedings, as well as any public reaction thereto, could result in significant costs and diversion of management's attention from our business. Payments of significant amounts, even if reserved, could materially and adversely affect our business, reputation, financial condition, results of operations and cash flows. For details on our existing litigation, claims and other legal proceedings, refer to Note 14 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.*

Unavailability or cancellation of third-party insurance coverage would increase our overall risk exposure, as well as disrupt our operations, and estimates of losses covered by our insurance policies could prove incorrect.

We maintain insurance coverage from third-party insurers as part of our overall risk management strategy and because some of our contracts require us to maintain specific insurance coverage limits. We are insured for employer's liability, workers' compensation, auto liability and general liability claims, but such insurance is subject to deductibles and limits and may be canceled or may not cover all of our losses. We manage and maintain a portion of our casualty risk through our wholly-owned captive

insurance company, which insures all claims up to the amount of the applicable deductible of our third-party insurance programs. In connection with our casualty insurance programs, we are required to issue letters of credit to secure our obligations. We also have employee health care benefit plans for most employees not subject to collective bargaining agreements. For additional information on our current deductibles, see Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Contractual Obligations — Insurance*. Our insurance policies include various coverage requirements, including the requirement to give appropriate notice. If we fail to comply with these requirements, our coverage could be denied.

Additionally, there can be no assurance that our insurance coverages will be sufficient or effective under all circumstances or against all claims and liabilities asserted against us. We also renew our insurance policies on an annual basis, and therefore deductibles and levels of coverage offered by third parties may change in future periods. There can be no assurance that any of our existing third party insurance coverage will be renewed upon the expiration of the coverage period or that future coverage will be affordable at the required limits. In addition, our third-party insurers could fail, suddenly cancel our coverage or otherwise be unable to provide us with adequate insurance coverage. For example, should our insurers determine to exclude coverage for wildfires in the future, due to the increased risk of such events in certain geographies or otherwise, we could be exposed to significant liabilities and a potential disruption of our operations. If our risk exposure increases as a result of adverse changes in our insurance coverage, we could be subject to increased claims and liabilities that could negatively affect our business, financial condition, results of operations and cash flows.

Losses under all of our insurance programs are accrued based upon our estimate of the ultimate liability for claims reported and an estimate of claims incurred but not reported, with assistance from third-party actuaries. These insurance liabilities are difficult to assess and estimate due to unknown factors, including the severity of an injury, the extent of damage, the determination of our liability in proportion to other parties and the number of incidents not reported. The accruals are based upon known facts and historical trends, and management believes such accruals are adequate. If we were to experience insurance claims or costs significantly above our estimates, our business, financial condition, results of operations and cash flows could be materially and adversely affected.

We may be unsuccessful at generating internal growth, which could adversely affect our financial condition, results of operations and cash flows.

Our ability to generate internal growth will be affected by, among other factors, our ability to:

- expand the range of services we offer to customers to address their evolving infrastructure needs;
- attract new customers;
- increase the number of projects performed for existing customers;
- hire and retain qualified employees;
- expand geographically, including internationally; and
- address the challenges presented by stringent regulatory, environmental and permitting requirements and difficult economic or market conditions that may affect us or our customers.

In addition, our customers may cancel, delay or reduce the number or size of projects available to us for a variety of reasons, including capital constraints or inability to meet regulatory requirements. Many of the factors affecting our ability to generate internal growth are beyond our control, and we cannot be certain that our strategies for achieving internal growth will be successful. Inability to successfully generate internal growth may adversely affect our financial condition, results of operations and cash flows.

Our business is highly competitive, and competitive pressures could affect our business, financial condition, results of operations and cash flows.

The specialty contracting business is served by numerous small, owner-operated private companies, some public companies and several large regional companies. Relatively few barriers prevent entry into some areas of our business, and as a result, any organization that has adequate financial resources and access to technical expertise may become one of our competitors.

In addition, some of our competitors have significant financial, technical and marketing resources. We cannot be certain that our competitors do not have or will not develop the expertise, experience and resources to provide services that are superior in both price and quality to our services. Similarly, we cannot be certain that we will be able to maintain or enhance our competitive position within the specialty contracting business or maintain our current customer base. Certain of our competitors may have lower overhead cost structures, and therefore may be able to provide the required services at lower rates than us. We also face

competition from in-house service organizations of our existing or prospective customers. Service providers in the industries we serve are capable of performing, or acquiring businesses that perform, some of the same types of services we provide, and we cannot be certain that our existing or prospective customers will continue to outsource these services in the future.

Furthermore, a substantial portion of our revenues is directly or indirectly dependent upon obtaining new contracts. The timing of project awards is unpredictable and often involves complex and lengthy negotiations and bidding processes. These processes could be impacted by a wide variety of factors, including price, governmental approvals, financing contingencies, commodity prices, environmental conditions and overall market and economic conditions. The competitive environment we operate in could also affect the timing of contract awards and the commencement or progress of work under awarded contracts. For example, based on rapidly changing competition dynamics, we have experienced, and may in the future experience, more competitive pricing in certain markets, such as the smaller scale transmission and distribution electric power market. Our bids also may not be successful due to, among other things, a potential customer's perception of our ability to perform the work or the technological advantages held by our competitors. Additionally, changing competitive pressures could present difficulties in matching workforce size with available contract awards. As a result, the competitive environment we operate in could have a material adverse effect on our business, financial condition, results of operations and cash flows and could cause our results of operations and cash flows to fluctuate significantly from quarter to quarter.

Technological advancements that compete with our customers' businesses or alter the services our customers require may also result in reduced demand for our services. For example, changes in technology, particularly with respect to efficient battery storage or the emergence of new, developing or alternative sources of power generation, may result in less demand for existing sources of power generation and for natural gas and oil, which could result in less demand for the services we provide.

Many of our contracts may be canceled or suspended on short notice or may not be renewed upon completion or expiration, and we may be unsuccessful in replacing our contracts in such events, which may adversely affect our financial condition, results of operations and cash flows.

We could experience a decrease in our revenues, net income and liquidity if any of the following occur:

- our customers cancel or suspend a significant number of contracts or contracts having significant value;
- we fail to renew a significant number of our existing contracts;
- we complete a significant number of non-recurring projects and cannot replace them with similar projects; or
- we fail to reduce operating and overhead expenses consistent with any decrease in our revenues.

Many of our customers may cancel or suspend our contracts on short notice, typically 30 to 90 days, even if we are not in default under the contract. Certain of our customers assign work to us on a project-by-project basis under master service agreements. Under these agreements, our customers generally have no obligation to assign a specific amount of work to us. Our operations could decline significantly if the anticipated volume of work is not assigned to us, which will be more likely if customer spending decreases due to, for example, unfavorable economic conditions. Many of our contracts, including our master service agreements, are opened to public bid at the expiration of their terms. There can be no assurance that we will be the successful bidder on our existing contracts that are subject to re-bid in the future.

The nature of our business exposes us to potential liability for warranty, engineering and other claims, which could materially and adversely affect our business and results of operations.

Under our contracts with customers, we typically provide warranties for the services and materials we provide, guaranteeing the work performed against, among other things, defects in workmanship, and may agree to indemnify our customers for losses related to our services. The length of the warranty periods we agree to vary and may extend for several years. As much of the work we perform is inspected by our customers for any defects in construction prior to acceptance of the project, the warranty claims that we have historically received have not been substantial. Additionally, materials used in construction are often provided by the customer or are warranted against defects by the supplier. However, certain projects may have longer warranty periods and include facility performance warranties that may be broader than the warranties we generally provide. In these circumstances, if warranty claims occur, we are generally required to re-perform the services and/or repair or replace the warranted item and any other facilities impacted thereby, at our sole expense, and we could also be responsible for other damages if we are not able to adequately satisfy our warranty obligations. In addition, we may be required under contractual arrangements with our customers to warrant any defects or failures in materials we provide. While we generally require the materials suppliers to provide us warranties that are consistent with those we provide to our customers, if any of these suppliers default on their warranty obligations to us, we may incur costs to repair or replace the defective materials. Costs incurred as a result of warranty claims could adversely affect our business, financial condition, results of operations and cash flows.

Furthermore, our business involves professional judgments regarding the planning, design, development, construction, operations and management of electric power transmission, communications and pipeline infrastructure. Because our projects are often technically complex, our failure to make judgments and recommendations in accordance with applicable professional standards, including engineering standards, could result in damages. A significantly adverse or catastrophic event at a project site or completed project resulting from the services we performed could result in significant professional or product liability, personal injury (including claims for loss of life) or property damage claims or other claims against us, as well as reputational harm. These liabilities could exceed our insurance limits or could impact our ability to obtain third-party insurance in the future. In addition, customers, subcontractors or suppliers who have agreed to indemnify us against any such liabilities or losses might refuse or be unable to pay us. An uninsured claim, either in part or in whole, if successful and of a material magnitude, could have a substantial impact on our business, financial condition, results of operations and cash flows.

Our failure to adequately protect critical data, sensitive information and technology systems could materially affect our business, financial condition, results of operations and cash flows or result in harm to our reputation.

We rely on computer, information, and communications technology and systems to manage our operations and other business processes and to protect sensitive company information. We also collect and retain information about our customers, stockholders, vendors and employees, all of which expect that we will adequately protect such information.

Breaches of our data security systems, which could result from cyber-attacks, the accidental release of sensitive information by an employee, or acts of terrorism against us, our customers and/or our vendors, could cause service disruption or, in extreme circumstances, infiltration into, damage to or loss of control of our customers' energy infrastructure systems. Strategic targets, such as the energy-related assets on which we may work, may be at greater risk of cyber-attacks or acts of terrorism than other targets. Any such breach could subject us to significant liabilities, cause damage to our reputation or customer relationships, or result in regulatory investigations or other actions by governmental authorities. Additionally, cyber-attacks and other disruptions to our data security systems and processes may occur and could result from, for example, theft, storms or other natural phenomena, information technology solution failures, network disruptions, and phishing and similar cyber-frauds. These could result in compromises of our payment systems, monetary losses, delays in the processing of transactions or the reporting of financial results, the unintentional disclosure or misappropriation of confidential or proprietary company information (including for the purpose of transacting in our stock), or the inadvertent release of customer, stockholder, vendor or employee data. Network security and internal control measures have been implemented to address such attacks and disruptions. However, there can be no assurance that such attacks or disruptions will not occur, and any such attack or disruption could go unnoticed for some period of time.

Furthermore, the continuing and evolving threat of cyber-attacks has resulted in increased legislative and regulatory focus on these issues. For example, new legislation and regulatory requirements, as well as contractual commitments, may affect how we must store, use, transfer and process the confidential information of our employees, customers, vendors and stockholders. To the extent we face new or changing legislative, regulatory or contractual requirements concerning cyber-security or data privacy and protection, we may be required to expend significant additional resources to meet such requirements.

Changes in government spending and legislative actions and initiatives relating to renewable energy and electric power may adversely affect demand for our services.

Demand for our services may not result from renewable energy initiatives. While many states currently have mandates in place that require specified percentages of power to be generated from renewable sources, those mandates could be reduced or made optional, thereby reducing, delaying or eliminating renewable energy development. Additionally, renewable energy is generally more expensive to produce than energy from traditional sources and may require additional power generation sources as backup. The locations of renewable energy projects are often remote and are not viable unless new or expanded transmission infrastructure to transport the power to demand centers is economically feasible. Furthermore, funding for renewable energy initiatives is uncertain and in the past has been constrained by the availability of credit. These factors could result in fewer renewable energy projects than anticipated and a delay in the construction of these projects and related infrastructure, which could negatively impact our business.

Other current and potential legislative or regulatory initiatives may not result in increased demand for our services. Examples include legislation or regulations that require utilities to meet reliability standards, ease siting and right-of-way issues for the construction of transmission lines, and encourage installation of new electric power transmission and renewable energy generation facilities. It is not certain whether existing legislation will create sufficient incentives for new projects, when or if proposed legislative initiatives will be enacted or whether any potentially beneficial provisions will be included in the final legislation.

There are also a number of legislative and regulatory proposals and global, non-binding agreements that address greenhouse gas emissions, which are in various phases of discussion or implementation. The outcome of these pending federal and state proposals and possible future proposals could negatively affect the operations of our customers through costs of compliance or restraints on projects, which could reduce their demand for our services.

Remaining performance obligations and backlog may not be realized or may not result in profits.

Our remaining performance obligations and backlog are difficult to determine with certainty. Customers often have no obligation under our contracts to assign or release work to us, and many contracts may be terminated on short notice. Reductions in remaining performance obligations and backlog due to cancellation or reduction in scope of one or more contracts or projects by a customer or for other reasons could significantly reduce the revenues and profit we actually receive from contracts. In the event of a project cancellation or reduction in scope, we may be reimbursed for certain costs but would not have a contractual right to the total revenues reflected in our remaining performance obligations and backlog. The remaining performance obligations and backlog we obtain in connection with companies we acquire may not be as large as we believed and may not result in the revenues or profits we expected at the time of acquisition. In addition, projects that are delayed may remain in remaining performance obligations and backlog for extended periods of time. All of these uncertainties are heightened by negative economic conditions and their impact on our customers' spending, as well as the effects of regulatory requirements and weather conditions. Consequently, our estimates of remaining performance obligations and backlog may not be accurate, and we may not be able to realize our estimated remaining performance obligations and backlog.

Furthermore, backlog is not a term recognized under GAAP, and our methodology for determining backlog may not be comparable to the methodologies used by other companies. For a discussion of how we calculate backlog for our business, please see *Backlog* in Item 1. *Business*.

Our financial results are based upon estimates and assumptions that may differ from actual results.

In preparing our consolidated financial statements in conformity with GAAP, several estimates and assumptions are used by management to report the assets, liabilities, revenues and expenses recognized during the periods presented and to determine the contingent assets and liabilities known to exist as of the date of the financial statements. These estimates and assumptions are necessary because certain information used in the preparation of our financial statements is dependent on future events, cannot be calculated with a high degree of precision from available data or cannot be readily calculated based on generally accepted methodologies. In some cases, these estimates are particularly difficult to determine, and we must exercise significant judgment. Estimates are used primarily in our assessment of the allowance for doubtful accounts, valuation of inventory, useful lives of assets, fair value assumptions in analyzing goodwill, other intangibles and long-lived asset impairments, equity and other investments, loan receivables, purchase price allocations, acquisition-related contingent consideration liabilities, liabilities for insurance and other claims and guarantees, multiemployer pension plan withdrawal liabilities, revenue recognition for construction contracts inclusive of contractual change orders and claims, share-based compensation, operating results of reportable segments, provision (benefit) for income taxes and the calculation of uncertain tax positions. Actual results for all estimates could differ materially from the estimates and assumptions that we use, which could have a material adverse effect on our financial condition, results of operations and cash flows.

Our inability to successfully execute our acquisition strategy may have an adverse impact on our growth strategy.

Our business strategy includes expanding our presence in the industries we serve through strategic acquisitions of companies that complement or enhance our business. The number of acquisition targets that meet our criteria may be limited. We may also face competition for acquisition opportunities, and other potential acquirers may offer more favorable terms or have greater financial resources available for potential acquisitions. This competition may further limit our acquisition opportunities and our ability to grow through acquisitions or could raise the prices of acquisitions and make them less accretive, or possibly not accretive, to us. Failure to consummate future acquisitions could negatively affect our growth strategies. Additionally, the acquisitions we complete may involve significant cash expenditures, the incurrence or assumption of debt or burdensome regulatory requirements, and any acquisition may ultimately have a negative impact on our business, financial condition, results of operations and cash flows.

We may be unsuccessful at integrating businesses that either we have acquired or that we may acquire in the future, which may reduce the anticipated benefit from acquired businesses.

As a part of our business strategy, we have acquired, and may seek to acquire in the future, companies that complement or enhance our business. The success of this strategy will depend on our ability to realize the anticipated benefits from the acquired businesses, such as the expansion of our existing operations, elimination of redundant costs and capitalizing on cross-selling opportunities. To realize these benefits, however, we must successfully integrate the operations of the acquired businesses with our existing operations. Integrating our acquired businesses involves a number of special risks, including:

- failure of an acquired business to achieve the results we expect;
- diversion of our management's attention from operational and other matters;

- difficulties integrating the operations and personnel of an acquired business;
- additional financial reporting and accounting challenges associated with integrating an acquired business;
- inability to retain key personnel of an acquired business;
- risks associated with unanticipated events or liabilities associated with the operations of an acquired business;
- loss of business due to customer overlap or other factors;
- risks and liabilities arising from the prior operations of an acquired business, such as performance, operational, safety, workforce or other compliance or tax issues, some of which we may not have discovered during our due diligence and may not be covered by indemnification obligations; and
- potential disruptions of our business.

We cannot be sure that we will be able to successfully complete the integration process without substantial costs, delays, disruptions or other operational or financial problems. If we do not implement proper overall business controls, our decentralized operating strategy could result in inconsistent operating and financial practices at the companies we acquire. Additionally, failure to successfully integrate acquired businesses could adversely impact our business, financial condition, results of operations and cash flows.

Our investments expose us to risks and may result in conflicts of interest that could adversely impact our business or result in reputational harm.

We have entered into strategic relationships and investment arrangements with various partners, including customers and infrastructure investors, through which we have invested and intend to invest in infrastructure assets. We expect this activity to continue in the future, both through direct investments by us and investments through the partnership structure we formed with select infrastructure investors. For additional information on our recent investments, see Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Recent Acquisitions, Investments and Divestitures*.

These types of investments may expose us to increased risks, including poor performance by the infrastructure projects in which we have invested due to, among other things, difficult market or economic conditions or slowdowns (which may occur across one or more industries, sectors or geographies) or changes to the supply or demand and fluctuations in the price of commodities. That negative performance could result in lower investment returns for us and our customers and infrastructure investors, as well as a decline in value or total loss of our investments and the possible sale of our investments at values below our initial projections, including at a loss, all of which could adversely affect our business, financial condition, results of operations and cash flows. Additionally, poor performance by our investments, in particular investments through our capital partnership structure, could result in reputational harm to Quanta that impairs our ability to raise or participate in raising new funds for future investment opportunities, which in turn could adversely affect our ability to secure certain future projects. Further, our relationship with a customer that partners with us in a poorly performing investment could become impaired, which may negatively impact our ability to continue providing services to that customer.

Conflicts of interest may also exist or arise for us in relation to our investment partners as a result of our capital partnership structure or the structure of our other investment arrangements. For example, in these structures, Quanta may be the contractor for a project as well as an equity investor and the manager of investments in that project. In those instances, conflicts of interest may exist for such things as contractor pricing and the handling of contractor change orders and other claims. While we have taken certain actions that we believe minimize or address these and other anticipated conflicts of interest, including through internal management practices and the terms of our agreements with investment partners, our failure to properly manage such conflicts of interest could expose us to liability or harm our relationships with investment partners, which could impact our business, financial condition, results of operations and cash flows or cause reputational harm to Quanta.

Our results of operations could be adversely affected as a result of asset impairments.

Our results of operations and financial condition could be adversely affected by impairments to goodwill, other intangible assets, receivables, long-lived assets or investments. For example, when we acquire a business, we record goodwill in an amount equal to the amount we paid for the business minus the fair value of the net tangible assets and other intangible assets of the acquired business. Goodwill and other intangible assets that have indefinite useful lives cannot be amortized, but instead must be tested at least annually for impairment. For additional description on this impairment testing, please read Item 7. *Management's*

Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies. We have recorded impairments in the past, and any future impairments, including impairments of goodwill, intangible assets, long-lived assets or investments, could have a material adverse effect on our financial condition and results of operations for the period in which the impairment is recognized. For example, during the fourth quarter of 2018, we recorded a $49.4 million asset impairment charge related to the winding down of certain oil-influenced operations and assets.

In addition, we enter into various types of investment arrangements in the normal course of business, each having unique terms and conditions. These investments may include equity interests we hold in business entities, including general or limited partnerships, contractual joint ventures or other forms of equity or profit participation. These investments may also include our participation in different finance structures such as the extension of loans to project specific entities, the acquisition of convertible notes issued by project specific entities or other strategic financing arrangements. Our equity method investments are carried at original cost and are included in "Other assets, net" in our consolidated balance sheet and are adjusted for our proportionate share of the investees' net income (loss) and distributions. Equity investments are reviewed for impairment by assessing whether there has been a decline in the fair value of the investment below the carrying amount and whether that decline is considered to be other than temporary. In making this determination, factors such as the ability to recover the carrying amount of the investment and the inability of the investee to sustain future earnings capacity are evaluated in determining whether an impairment has occurred and should be recognized.

We extend credit to customers for purchases of our services and may enter into longer-term deferred payment arrangements or provide other financing or investment arrangements with certain of our customers, which subjects us to potential credit or investment risk that could, if realized, adversely affect our financial condition, results of operations and cash flows.

We grant credit, generally without collateral, to our customers, which include electric power utilities, energy companies, communications providers, governmental entities, general contractors, and builders, owners and managers of renewable energy facilities and commercial and industrial properties located primarily in the United States, Canada, Australia and Latin America. We may also agree to allow our customers to defer payment on projects until certain milestones have been met or until the projects are substantially completed, and customers typically withhold some portion of amounts due to us as retainage. In addition, we may provide other forms of financing to our customers or make investments in our customers' projects, typically in situations where we also provide services in connection with the projects. Our payment arrangements subject us to potential credit risk related to changes in business and economic factors affecting our customers, including material changes in our customers' revenues or cash flows. These changes may also reduce the value of any financing or equity investment arrangements we have with our customers. Many of our customers have been negatively impacted by uncertain economic conditions in recent years, and certain customers have experienced financial difficulties (including bankruptcy), which could impact our ability to collect amounts owed to us, delay the collection of receivables from them or impair the value of our investments in them. Further, to the extent a customer files bankruptcy, certain payments made to us prior to the filing of the bankruptcy petition may be avoided and returned to the customer's bankruptcy estate.

If we are unable to collect amounts owed to us, or retain amounts paid to us, our cash flows would be reduced, and we could experience losses if those amounts exceed current allowances. We would also recognize losses with respect to any investments that are impaired as a result of our customers' financial difficulties or bankruptcies. The risk of loss may increase for projects where we provide services and make a financing or equity investment. Losses experienced could materially and adversely affect our financial condition, results of operations and cash flows.

The loss of key personnel could disrupt our business.

We depend on the continued efforts of our executive officers and senior management, including the management at each of our operating units. Although we typically enter into employment agreements with our executive officers and other key employees for initial terms of one to three years and subsequent one-year renewal options, we cannot be certain that any individual will continue in such capacity for any particular period of time. The loss of key management personnel, as well as our inability to attract, develop and retain qualified employees that can succeed key personnel, could negatively impact our ability to manage our business.

Our business growth could outpace the capability of our decentralized management infrastructure.

We cannot be certain that our management infrastructure will be adequate to support our operations as they expand. For example, the ability to internally communicate, coordinate and execute business strategies, plans and tactics may be negatively impacted by our increasing size and complexity. A decentralized structure places significant control and decision-making powers in the hands of our operating unit management. This contributes to the risk that we may be slower or less able to identify or react to problems affecting key business matters than we would in a more centralized environment. The lack of timely access to information may impact the quality of decision making by management. Our decentralized organization creates the possibility that our operating subsidiaries assume excessive risk without appropriate guidance from our centralized legal, accounting, tax,

treasury and insurance functions as to the potential overall impact. Future growth could also impose significant additional responsibilities on members of our senior management, including the need to recruit and integrate new senior level managers and executives. We cannot be certain that we will be able to recruit and retain such additional managers and executives. To the extent that we are unable to manage our growth effectively, or are unable to attract and retain additional qualified management, we may not be able to expand our operations or execute our business plan.

We may be required to contribute cash to meet our underfunded obligations in certain multiemployer pension plans.

Our collective bargaining agreements generally require us to participate with other companies in multiemployer pension plans. To the extent those plans are underfunded, the Employee Retirement Income Security Act of 1974, as amended by the Multiemployer Pension Plan Amendments Act of 1980, may subject us to substantial liabilities under those plans if we withdraw from them or they are terminated or experience a mass withdrawal. For example, we have been involved in several litigation matters associated with our withdrawal from the Central States, Southeast and Southwest Areas Pension Plan, certain of which were settled in 2017.

In addition, the Pension Protection Act of 2006 added special funding and operational rules generally applicable to plan years beginning after 2007 for multiemployer plans that are classified as "endangered," "seriously endangered" or "critical" status based on multiple factors (including, for example, the plan's funded percentage, cash flow position and whether it is projected to experience a minimum funding deficiency). Plans in these classifications must adopt measures to improve their funded status through a funding improvement or rehabilitation plan, as applicable, which may require additional contributions from employers (which may take the form of a surcharge on benefit contributions) and/or modifications to retiree benefits. Certain plans to which we contribute or may contribute in the future are in "endangered," "seriously endangered" or "critical" status. The amount of additional funds, if any, that we may be obligated to contribute to these plans in the future cannot be estimated due to uncertainty of the future levels of work that require the specific use of union employees covered by these plans, as well as the future contribution levels and possible surcharges on contributions applicable to these plans.

Our unionized workforce and related obligations could adversely affect our operations.

As of December 31, 2018, approximately 38% of our employees were covered by collective bargaining agreements. Although the majority of the collective bargaining agreements prohibit strikes and work stoppages, certain of our unionized employees have participated in strikes and work stoppages in the past, and we cannot be certain that strikes or work stoppages will not occur in the future. Strikes or work stoppages could adversely impact relationships with our customers and could cause us to lose business and experience a decline in revenues. Our ability to complete future acquisitions also could be adversely affected because of our union status for a variety of reasons. For instance, our union agreements may be incompatible with the union agreements of a business we want to acquire, and some businesses may not want to become affiliated with a union-based company. Additionally, we may increase our exposure to withdrawal liabilities for underfunded multiemployer pension plans to which an acquired company historically contributed or presently contributes.

Approximately 62% of our employees are not unionized. Certain of our customers require or prefer a non-union workforce, and they may reduce the amount of work assigned to us if our non-union labor crews become unionized, which could negatively affect our business, financial condition, results of operations and cash flows.

We may incur liabilities or suffer negative financial or reputational impacts relating to occupational health and safety matters.

Our operations are inherently dangerous and subject to extensive laws and regulations relating to the maintenance of safe conditions in the workplace. While we have invested, and will continue to invest, substantial resources in our occupational health and safety programs, our industry involves a high degree of operational risk, and there can be no assurance that we will avoid significant liability exposure. Although we have taken what we believe are appropriate precautions, we have suffered fatalities in the past and may suffer additional fatalities in the future. Serious accidents, including fatalities, may subject us to substantial penalties, civil litigation or criminal prosecution. Claims for damages to persons, including claims for bodily injury or loss of life, could result in substantial costs and liabilities. In addition, if our safety record were to substantially deteriorate over time or we were to suffer substantial penalties or criminal prosecution for violation of health and safety regulations, our customers could cancel our contracts and elect to procure future services from other providers. Unsafe work sites also have the potential to increase employee turnover, increase the costs of projects for our clients, and raise our operating costs. Any of the foregoing could result in financial loss, which could have a material adverse impact on our business, financial condition, results of operations and cash flows.

Risks associated with operating in international markets could restrict our ability to expand globally and harm our business and prospects.

Our overall business, financial condition, results of operations and cash flows could be negatively impacted by our activities and operations outside the United States. Although our international operations are presently conducted primarily in Canada, Australia and Latin America, we also perform work in other foreign countries. It is possible the number of countries in which we operate and the amount of work we perform in foreign countries could increase over the next few years. Changes in economic conditions, including those resulting from wars, civil unrest, acts of terrorism and other conflicts, or volatility in global markets, may adversely affect demand for our services and our customers' ability to pay for our services. In addition, at times we are paid for work outside the United States in currencies other than the U.S. dollar. Such payments may exceed our local currency needs, and, in certain instances, those amounts may be subject to temporary blocking or taxes or tariffs, and we may experience difficulties if we attempt to convert such amounts to U.S. dollars.

There are also numerous other risks inherent in conducting business internationally and with respect to international markets, including, but not limited to, changes in applicable regulatory requirements, foreign currency exchange fluctuations, instability of political, economic and social conditions in foreign countries, expropriation or nationalization of our assets, unfamiliar foreign legal systems and cultural practices, and complex U.S. and foreign tax regulations and other laws and international treaties. Additionally, uncertain or changing economic and political conditions may make it difficult for our clients, our vendors, and us to accurately forecast and plan future business activities. For example, recent changes to U.S. policies related to global trade and tariffs, as well as retaliatory trade measures implemented by other countries, have resulted in uncertainty surrounding the future of the global economy. Increases in the cost of steel, aluminum or other materials as a result of tariffs or trade policies may impact customer spending. We cannot predict the outcome of these changing trade policies or other unanticipated political conditions, nor can we predict the timing, strength or duration of any economic recovery or downturn worldwide or in our customers' markets. These risks could restrict our ability to provide services to international customers, operate our international business profitably or fund our strategic objectives, which could negatively impact our overall business, financial condition, results of operations and cash flows.

We could be adversely affected by our failure to comply with the laws applicable to our foreign activities, including the U.S. Foreign Corrupt Practices Act and other similar worldwide anti-bribery laws.

Applicable U.S. and non-U.S. anti-corruption laws, including but not limited to the U.S. Foreign Corrupt Practices Act (FCPA), prohibit us from, among other things, corruptly making payments to non-U.S. officials for the purpose of obtaining or retaining business. We pursue opportunities in certain parts of the world that experience government corruption, and in certain circumstances, compliance with these laws may conflict with longstanding local customs and practices. Our policies mandate compliance with all applicable anti-corruption laws. We have policies and procedures designed to ensure that our employees and intermediaries who work for us outside the United States comply with these laws, and we otherwise require such employees and intermediaries to comply with these laws. However, there can be no assurance that such policies, procedures and other requirements will protect us from liability under the FCPA or other similar laws for actions or inadvertences taken by our employees or intermediaries. Liability for such actions or inadvertences could result in severe criminal or civil fines, penalties, forfeitures, disgorgements or other sanctions. This in turn could have a material adverse effect on our reputation, business, financial condition, results of operations, and cash flows. In addition, detecting, investigating and resolving actual or alleged violations of such laws is expensive and could consume significant time and attention of our senior management, in-country management, and other personnel.

Fluctuating foreign currency exchange rates may have a greater impact on our financial results as we expand into international markets.

For the year ended December 31, 2018, we derived $2.60 billion, or 23.2%, of our consolidated revenues from foreign operations, the substantial majority of which was earned in Canada, Australia and Latin America. The functional currencies for our foreign operations are typically the currency of the country in which the foreign operating unit is located. Accordingly, our financial performance is subject to fluctuation due to changes in foreign currency exchange rates relative to the U.S. dollar. As the U.S. dollar strengthens against foreign currencies, our translation of foreign currency denominated revenues or expenses will result in lower U.S. dollar denominated revenues and expenses. Conversely, if the U.S. dollar weakens against foreign currencies, the translation of these foreign currency denominated revenues or expenses will result in increased U.S. dollar denominated revenues and expenses. For example, during the year ended December 31, 2018, foreign revenues decreased by approximately $18 million in comparison with the year ended December 31, 2017 as a result of less favorable foreign currency exchange rates due primarily to the U.S. dollar strengthening against the Canadian and Australian dollars. Also, during the year ended December 31, 2017, foreign revenues increased by approximately $53 million in comparison with the year ended December 31, 2016 as a result of more favorable foreign currency exchange rates due primarily to the U.S. dollar weakening against the Canadian and Australian dollars.

We intend to expand the volume of services that we provide internationally. As a result, our reported financial condition, results of operations and cash flows may be further exposed to the effects that fluctuating exchange rates have on the process of translating the financial statements of our international operations and the remeasurement of transactions which are not denominated in the reporting units' functional currencies.

Compliance with and changes in tax laws could adversely affect our performance.

We are subject to extensive tax liabilities imposed by multiple jurisdictions, including income taxes, indirect taxes (excise/duty, sales/use, gross receipts, and value-added taxes), payroll taxes, franchise taxes, withholding taxes, and ad valorem taxes. New tax laws, treaties and regulations and changes in existing tax laws, treaties and regulations are continuously being enacted or proposed and could result in significant changes to the tax rate on our earnings, which could have a material impact on our earnings and cash flows from operations. For example, the Tax Cuts and Jobs Act of 2017 (the Tax Act), enacted in December 2017, made numerous changes to U.S. federal corporate tax laws that are anticipated to impact our effective tax rate in future periods. In addition, significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities, and our tax estimates and tax positions could be materially affected by many factors, including the final outcome of tax audits and related litigation, the introduction of new tax accounting standards, legislation, regulations and related interpretations, our global mix of earnings, our ability to realize deferred tax assets and changes in uncertain tax positions. A significant increase in our tax rate could have a material adverse effect on our profitability and liquidity.

Our participation in joint ventures exposes us to liability and/or harm to our reputation for failures of our partners.

As part of our business, we have entered into joint venture arrangements and likely will continue to do so. The purpose of these joint ventures is typically to combine skills and resources to allow for the bidding and performance of particular projects. Success on these jointly performed projects can be adversely affected by the performance of our joint venture partners, over whom we may have little or no control. Differences in opinions or views between us and our joint venture partners could result in delayed decision-making or failure to agree on material issues that could adversely affect the business and operations of our joint ventures. Additionally, the failure by a joint venture partner to comply with applicable laws, regulations or client requirements could negatively impact our business.

We and our joint venture partners are generally jointly and severally liable for all liabilities and obligations of our joint ventures. If a joint venture partner fails to perform or is financially unable to bear its portion of required capital contributions or other obligations, including liabilities stemming from claims or lawsuits, we could be required to make additional investments, provide additional services or pay more than our proportionate share of a liability to make up for our partner's shortfall. Further, if our partners experience cost overruns or project performance issues that we are unable to adequately address, the customer may terminate the project, which could result in legal liability to us, harm our reputation and reduce our profit or increase our loss on a project.

Any deterioration in the quality or reputation of our brand could have an adverse impact on our reputation, business, financial condition or results of operations.

Our brand and our reputation are among our most important assets. The success of our business and our ability to attract and retain customers depends on brand recognition and reputation. Such dependence makes our business susceptible to reputational damage and to competition from other companies. Changes in management practices, or acts or omissions that adversely affect our business, including any crime, scandal, litigation, negative publicity, catastrophic fires or similar events or accidents and injuries can have a substantial negative impact on the operations of our business, and can cause a loss of consumer confidence. The considerable expansion in the use of social media over recent years has compounded the potential scope of the negative publicity that could be generated by such incidents. We could also face legal claims and adverse publicity from a variety of events or conditions, many of which are beyond our control. If the reputation or perceived quality of our brand declines, our reputation, business, financial condition or results of operations could be adversely affected.

We are in the process of implementing information technology (IT) solutions, which could temporarily disrupt day-to-day operations at certain operating units.

We continue to implement comprehensive IT solutions that we believe will allow for the interface between functions such as accounting and finance, human resources, operations, and fleet management. Continued development and implementation of the IT solutions will require substantial financial and personnel resources. While the IT solutions are intended to improve and enhance our information systems, implementation of new information systems at each operating unit exposes us to the risks of start-up of the new system and integration of that system with our existing systems and processes, including possible disruption of our financial reporting. There is no guarantee that we will realize economic or other intended benefits from continued development

and implementation of the IT solutions. Additionally, the IT solutions may not be developed or implemented as timely or as accurately as planned. Failure to properly implement the IT solutions could result in substantial disruptions to our business, including coordinating and processing our normal business activities, testing and recording of certain data necessary to provide oversight over our disclosure controls and procedures and effective internal controls over our financial reporting, and other unforeseen problems.

Our dependence on suppliers, subcontractors and equipment manufacturers could expose us to risk of loss in our operations.

On certain projects, we rely on suppliers to obtain the necessary materials and subcontractors to perform portions of our services. We also rely on equipment manufacturers to provide us with the equipment required to conduct our operations. Limitations on the availability of suppliers, subcontractors or equipment manufacturers could negatively impact our operations, particularly in the event we rely on a single or small number of providers. The risk of a lack of available suppliers, subcontractors or equipment manufacturers may be heightened as a result of market and economic conditions. To the extent we cannot engage subcontractors or acquire equipment or materials, our operations could be negatively impacted. Additionally, successful completion of our contracts may depend on whether our subcontractors successfully fulfill their contractual obligations. If our subcontractors fail to perform their contractual obligations as a result of financial or other difficulties, or if our subcontractors fail to meet the expected completion dates or quality standards or fail to comply with applicable laws, we may be required to incur additional costs or provide additional services in order to make up such shortfall.

An increase in the prices of certain materials used in our business could adversely affect our business.

For certain contracts, including where we have assumed responsibility for procuring materials for a project, we are exposed to market risk of increases in certain commodity prices of materials, such as copper and steel, which are used as components of supplies or materials utilized in all of our operations. In addition, our customers' capital budgets may be impacted by the prices of certain materials. These prices could be materially impacted by general market conditions and other factors, including U.S. trade relationships with other countries or the imposition of tariffs. We are also exposed to increases in energy prices, including as they relate to gasoline prices for our rolling-stock fleet of approximately 45,000 units. While we believe we can increase our prices to adjust for some price increases in commodities, there can be no assurance that price increases of commodities, if they were to occur, would be recoverable. Additionally, some of our fixed price contracts do not allow us to adjust our prices and, as a result, increases in material or fuel costs could reduce our profitability with respect to such projects.

We may not have access in the future to sufficient funding to finance desired growth and operations.

If we cannot secure future funds or financing on acceptable terms, we may be unable to support our future operations or growth strategy. We use cash for acquisitions, investments and internal growth projects, and the timing and size of these efforts cannot be readily predicted and may be substantial. The use of cash on hand, cash from operations and cash from our senior secured credit facility to fund these efforts limits our financial flexibility and may increase our need to seek capital through additional debt or equity financings. We also rely on financing companies to fund the leasing of certain of our trucks and trailers, support vehicles and specialty construction equipment. Credit market conditions may cause certain of these financing companies to restrict or withhold access to capital for us to fund the leasing of additional equipment. A widespread lack of available capital to fund the leasing of equipment could negatively impact our future operations.

The credit agreement for our senior secured credit facility contains significant restrictions, including financial covenants and other restrictions on our ability to borrow amounts under the agreement and limitations on our ability to incur additional debt or conduct certain types of preferred equity financings. Our ability to increase the current commitments under our senior secured credit facility is also dependent upon additional commitments from our lenders. Furthermore, if we are permitted to seek additional debt or equity financings, we cannot be certain they will be available to us on acceptable terms or at all, as banks are often restrictive in their lending practices, and additional debt financing may include covenants that further limit our operational and financial flexibility. If we are unable to borrow under our senior secured credit facility or secure other financing or if our lenders become unable or unwilling to fund their commitments to us, we may not be able to access the capital needed to fund our growth and operations. For additional information on the terms of our senior secured credit facility, please read Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Debt Instruments — Credit Facility.*

Additionally, the market price of our common stock has fluctuated, and may continue to fluctuate, significantly in response to various factors, including events beyond our control, which could impact our ability to utilize capital markets to obtain funds. A variety of events may cause the market price of our common stock to fluctuate significantly, including overall market conditions or volatility, a shortfall in our operating results from those anticipated, negative financial results or other unfavorable information relating to our market peers or the other risks described in this Annual Report.

Our variable rate indebtedness subjects us to interest rate risk, which could cause our debt service obligations to increase significantly.

Borrowings under our credit facility are at variable rates of interest and expose us to interest rate risk. If interest rates increase, our debt service obligations on the variable rate indebtedness will increase even if the amount borrowed remains the same, and our net income and cash flows, including cash available for servicing our indebtedness, will correspondingly decrease. Our weighted average interest rate on our variable rate debt for the year ended December 31, 2018 was 3.6%. The annual effect on our pretax earnings of a hypothetical 50 basis point increase or decrease in variable interest rates would be approximately $5.4 million based on our December 31, 2018 balance of variable rate debt.

Additionally, to address the transition in the financial markets away from the London Interest Bank Offered Rate (LIBOR) by the end of 2021, our senior secured credit facility agreement includes provisions related to the replacement of LIBOR with a LIBOR Successor Rate (as defined in the credit agreement for such facility). Changing to an alternative interest rate may lead to additional volatility in interest rates and could cause our debt service obligations to increase significantly. If no LIBOR Successor Rate has been determined at the time certain circumstances are present, the lenders' obligation to make or maintain loans based on a Eurocurrency rate could be suspended, and loans in U.S. dollars would default to the Base Rate (as described in Note 8 to our Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data*) rather than a rate using the Eurocurrency Rate. If this were to occur, our available liquidity and cash flows could be negatively impacted.

We may be unable to compete for or work on certain projects if we are not able to obtain surety bonds, letters of credit or bank guarantees.

A portion of our business depends on our ability to provide surety bonds, letters of credit, bank guarantees or other financial assurances. Current or future market conditions, including losses incurred in the construction industry or as a result of large corporate bankruptcies, as well as changes in our sureties' assessment of our operating and financial risk, could cause our surety providers and lenders to decline to issue or renew, or substantially reduce the amount of, bid or performance bonds for our work and could increase our costs associated with collateral. These actions could be taken on short notice. If our surety providers or lenders were to limit or eliminate our access to bonding, letters of credit or guarantees, our alternatives would include seeking capacity from other sureties and lenders or finding more business that does not require bonds or that allows for other forms of collateral for project performance, such as cash. We may be unable to secure these alternatives in a timely manner, on acceptable terms, or at all, which could affect our ability to bid for or work on future projects requiring financial assurances.

We have also granted security interests in certain assets to collateralize our obligations to our sureties and lenders. Furthermore, under standard terms in the surety market, sureties issue or continue bonds on a project-by-project basis and can decline to issue bonds at any time or require the posting of additional collateral as a condition to issuing or renewing bonds. If we were to experience an interruption or reduction in the availability of bonding capacity as a result of these or other reasons, we may be unable to compete for or work on certain projects that require bonding.

Our failure to comply with environmental laws could result in significant liabilities and increased environmental regulations could result in increased costs.

Our operations are subject to various environmental laws and regulations, including those dealing with the handling and disposal of waste products, PCBs, fuel storage, water quality and air quality. We perform work in many different types of underground environments. If the field location maps supplied to us are not accurate, or if objects are present in the soil that are not indicated on the field location maps, our underground work could strike objects in the soil, some of which may contain pollutants. These objects may also rupture, resulting in the discharge of pollutants. In such circumstances, we may be liable for fines and damages, and we may be unable to obtain reimbursement from the parties providing the incorrect information. We perform work in and around environmentally sensitive areas such as rivers, lakes and wetlands. In addition, we perform directional drilling operations below certain environmentally sensitive terrains and water bodies. Due to the inconsistent nature of the terrain and water bodies, it is possible that such directional drilling may cause a surface fracture, resulting in the release of subsurface materials. These subsurface materials may contain contaminants in excess of amounts permitted by law, potentially exposing us to remediation costs and fines. We also own and lease several facilities at which we store our equipment. Some of these facilities contain fuel storage tanks that are above or below ground. If these tanks were to leak, we could be responsible for the cost of remediation as well as potential fines.

Moreover, new laws and regulations, stricter enforcement of existing laws and regulations, the discovery of previously unknown contamination or leaks, or the imposition of new clean-up requirements could require us to incur significant costs or become the basis for new or increased liabilities that could negatively impact our business, financial condition, results of operations and cash flows. In certain instances, we have obtained indemnification or covenants from third parties (including predecessors or lessors) for such clean-up and other obligations and liabilities. However, such third-party indemnities or covenants may not cover all of our costs and the indemnitors may not pay amounts owed to us, and such unanticipated obligations or liabilities, or future

obligations and liabilities, may have a material adverse effect on our business, financial condition, results of operations and cash flows. Further, we cannot be certain that we will be able to identify or be indemnified for all potential environmental liabilities relating to any acquired business.

Concerns about climate change could also potentially result in new regulations, regulatory actions or requirements to fund energy efficiency activities, any of which could negatively affect our customers and decrease demand for their services, result in increased costs associated with our operations, or impact the prices we charge our customers. For example, if new regulations are adopted regulating greenhouse gas emissions from mobile sources such as cars and trucks, we could experience a significant increase in environmental compliance costs in light of our large rolling-stock fleet. In addition, if our operations are perceived to result in high greenhouse gas emissions, our reputation could suffer.

Certain regulatory requirements applicable to us and our subsidiaries could result in significant compliance costs and liabilities.

We are subject to various regulatory regimes and requirements that could result in significant compliance costs and liabilities. As a public company, we are subject to the corporate governance and financial reporting requirements of The Sarbanes-Oxley Act of 2002, including requirements for management to report on our internal controls over financial reporting and for our independent registered public accounting firm to express an opinion on the operating effectiveness of our internal control over financial reporting. Our internal control over financial reporting was effective as of December 31, 2018; however, there can be no assurance that our internal control over financial reporting will be determined to be effective in future years. Failure to maintain effective internal controls or to identify significant internal control deficiencies in acquired businesses (both prior acquisitions and future acquisitions) could result in a decrease in the market value of our publicly traded securities, a reduced ability to obtain debt and equity financing, a loss of customers, fines or penalties, and/or additional expenditures to meet the requirements or remedy any deficiencies.

One of our subsidiaries has registered as an investment adviser with the SEC under the U.S. Investment Advisers Act of 1940, as amended (the Advisers Act). The Advisers Act and the rules promulgated thereunder impose substantive and material restrictions and requirements on the operations of this subsidiary, including certain fiduciary duties that apply to its relationships with its advisory clients. The SEC has broad administrative powers to institute proceedings and impose sanctions for violations of the Advisers Act, ranging from fines and censures to termination of an adviser's registration. This subsidiary is also subject to periodic SEC examinations and other requirements, including, among other things, maintaining an effective compliance program, recordkeeping and reporting requirements, disclosure requirements and complying with anti-fraud prohibitions. The failure of our subsidiary to comply with the requirements of the Advisers Act could result in fines, suspensions of individual employees or other sanctions against our subsidiary that could have a material adverse effect on us. Even if an investigation or proceeding does not result in a fine or sanction or if a fine or sanction imposed against our subsidiary or its employees were small in monetary amount, the adverse publicity relating to an investigation, proceeding or imposition of these fines or sanctions could harm our reputation and have a material adverse effect on us.

Our wholly-owned captive insurance company is a registered insurance broker with the Texas Department of Insurance, and therefore is subject to various rules and regulations and required to meet certain capital requirements, which can result in additional use of our resources.

We own and operate a postsecondary educational institution that provides pre-apprenticeship training as well as programs for experienced lineman. In order to operate, each of the institution's campuses must be authorized by the state education agency where the campus is located, and the level of regulatory oversight varies substantially by state and can be extensive. If any of our campuses fail to comply with state licensing requirements, they may be unable to offer their programs and forced to close, which could result in harm to our reputation or negatively impact our ability to train skilled personnel that can be utilized to support our industry. Additionally, because our institution operates in a highly regulated industry, it is subject to compliance reviews and lawsuits or claims by government agencies and third parties. If the results of these reviews or proceedings are unfavorable to us, we may be required to pay significant monetary damages or be subject to fines, limitations on the operations of the institution, injunctions or other penalties. The postsecondary educational institution is also accredited by the Accrediting Commission of Career Schools and Colleges. Accreditation is a non-governmental process through which a commission examines the academic quality of the instructional programs and is generally viewed as confirmation that the programs meet generally accepted academic standards and practices. If an institution fails to comply with accrediting commission requirements, the institution and/or its campuses are subject to loss of accreditation or may be placed on probation or a special monitoring or reporting status, which could ultimately result in loss of accreditation. Campus closure or loss of accreditation could result in reputational harm or student-initiated litigation or negatively impact our ability to train skilled personnel that can be utilized to support our business.

If our intellectual property rights are unenforceable or become obsolete, or if new intellectual property rights held by a third party become the only or preferred way to perform services we offer, our competitive position could be adversely impacted.

We utilize a variety of intellectual property rights while performing our services. We view our portfolio of proprietary energized services tools and techniques and other process and design technologies as our competitive strengths, which we believe differentiate our service offerings. We may not be able to successfully preserve these intellectual property rights in the future, and these rights could be invalidated, circumvented or challenged. In addition, the laws of some foreign countries in which our services may be sold do not protect intellectual property rights to the same extent as the laws of the United States. If we are unable to protect and maintain our intellectual property rights, or if intellectual property challenges or infringement proceedings succeed against us, our ability to differentiate our service offerings could be reduced. Further, if our intellectual property rights or work processes become obsolete, we may not be able to differentiate our service offerings and some of our competitors may be able to offer more attractive services to our customers, which could materially and adversely affect our business, financial condition, results of operations and cash flows. We may also license certain technologies from third parties, and there is a risk that our relationships with such licensors may terminate or expire or may be interrupted or harmed.

We may incur additional healthcare costs arising from federal healthcare reform legislation.

In March 2010, the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act of 2010 (collectively ACA) were signed into law in the United States. The status of the ACA and any repeal or replacement thereof, is currently uncertain. Changes to laws governing health insurance could have a substantial impact on our financial results. We continue to monitor developments under ACA, including any potential repeal or replacement thereof, and assess the extent to which any such change could result in long-term material cost increases for us.

Opportunities within the government arena could subject us to increased governmental regulation and costs.

Most government contracts are awarded through a regulated competitive bidding process, which can often be more time consuming than the bidding process for non-governmental projects. Additionally, involvement with government contracts could require a significant amount of costs to be incurred before any revenues are realized. As a government contractor, we are also subject to a number of procurement rules and other public sector regulations, any deemed violation of which could lead to fines or penalties or a loss of business. Government agencies routinely audit and investigate government contractors. Government agencies may review a contractor's performance under its contracts, cost structure and compliance with applicable laws, regulations and standards. If a government agency determines that costs were improperly allocated to specific contracts, such costs will not be reimbursed or a refund of previously reimbursed costs may be required. If a government agency alleges or proves improper activity, civil and criminal penalties could be imposed and serious reputational harm could result. Many government contracts must be appropriated each year. If appropriations are not made in subsequent years, we would not realize all of the potential revenues from any awarded contracts.

Our sale or issuance of additional common stock or other equity-related securities could dilute each stockholder's ownership interest or adversely affect the market price of our common stock.

We grow our business organically as well as through acquisitions. We often fund a significant portion of the consideration paid in connection with our acquisitions with the issuance of additional equity securities, including shares of our common stock and securities that are convertible into shares of our common stock.

We may issue additional equity securities in the future, including in connection with future acquisitions or other issuances of our common stock or convertible securities or otherwise. Our Restated Certificate of Incorporation provides that we may issue up to 600,000,000 shares of common stock, of which 141,103,900 shares were outstanding as of December 31, 2018. Additionally, former owners of certain acquired businesses own exchangeable shares, 486,112 of which were outstanding as of December 31, 2018 and included in the calculation of basic and diluted weighted average shares outstanding. These shares are exchangeable for shares of Quanta common stock on a one-for-one basis. Any additional issuances of common stock or exchangeable shares could have the effect of diluting our earnings per share and our existing stockholders' individual ownership percentages and could lead to volatility in the market price of our common stock. We cannot predict the effect that future issuances of our common stock or other equity-related securities would have on the market price of our common stock.

There can be no assurance that we will declare or pay future dividends on our common stock.

Our Board of Directors declared an initial dividend on December 6, 2018, which was paid on January 16, 2019. The declaration, amount and timing of future dividends are subject to capital availability and determinations by our Board of Directors that cash dividends are in the best interest of our stockholders and are in compliance with all respective laws and applicable agreements. Our ability to declare and pay dividends will depend upon, among other factors, our financial condition, results of operations, cash flows, current and anticipated expansion plans, requirements under Delaware law and other factors that our Board

of Directors may deem relevant. A reduction in or elimination of our dividend payments could have a material negative effect on our stock price.

Certain provisions of our corporate governing documents could make an acquisition of our company more difficult.

The following provisions of our charter documents, as currently in effect, and Delaware law could discourage potential proposals to acquire us, delay or prevent a change in control of us or limit the price that investors may be willing to pay in the future for shares of our common stock:

- our certificate of incorporation permits our Board of Directors to issue “blank check” preferred stock and to adopt amendments to our bylaws;
- our bylaws contain restrictions regarding the right of stockholders to nominate directors and to submit proposals to be considered at stockholder meetings;
- our certificate of incorporation and bylaws restrict the right of stockholders to call a special meeting of stockholders and to act by written consent; and
- we are subject to provisions of Delaware law which restrict us from engaging in any of a broad range of business transactions with an “interested stockholder” for a period of three years following the date such stockholder became classified as an interested stockholder.

ITEM 1B. *Unresolved Staff Comments*

None.

ITEM 2. *Properties*

Facilities

We lease our corporate headquarters in Houston, Texas and own and lease other facilities throughout the United States, Canada and other foreign locations where we conduct business. Our facilities are utilized for operations in both of our reportable segments and include offices, equipment yards, warehouses, storage, maintenance shops and training and educational facilities. As of December 31, 2018, we owned 60 of our facilities and leased the remainder. We believe that our existing facilities are sufficient for our current needs.

Equipment

We operate a fleet of owned and leased trucks and trailers, support vehicles and specialty construction equipment, such as backhoes, excavators, trenchers, generators, boring machines, cranes, robotic arms, wire pullers, tensioners, marine vessels and helicopters. Our owned equipment and the leasehold interests in our leased equipment are encumbered by a security interest granted under our credit agreement. As of December 31, 2018, the total size of the rolling-stock fleet was approximately 45,000 units. Most of our fleet is serviced by our own mechanics who work at various maintenance sites and facilities. We believe that our equipment is generally well maintained and adequate for our present operations.

ITEM 3. *Legal Proceedings*

We are from time to time party to various lawsuits, claims and other legal proceedings that arise in the ordinary course of business. These actions typically seek, among other things, compensation for alleged personal injury, breach of contract and/or property damages, employment-related damages, punitive damages, civil penalties or other losses, or injunctive or declaratory relief. With respect to all such lawsuits, claims and proceedings, we record a reserve when it is probable that a loss has been incurred and the amount of loss can be reasonably estimated. In addition, we disclose matters for which management believes a material loss is at least reasonably possible. See Note 14 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data,* which are incorporated by reference in this Item 3, for additional information regarding litigation, claims and other legal proceedings.

ITEM 4. *Mine Safety Disclosures*

Not applicable.

PART II

ITEM 5. ***Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities***

Our common stock is listed on the New York Stock Exchange (NYSE) under the symbol "PWR."

On February 21, 2019, there were 650 holders of record of our common stock and three holders of record of exchangeable shares of Canadian subsidiaries of Quanta. There is no established trading market for the exchangeable shares; however, the exchangeable shares may be exchanged at the option of the holder for Quanta common stock on a one-for-one basis. See Note 10 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for additional discussion of our equity securities.

Unregistered Sales of Securities During the Fourth Quarter of 2018

None. However, subsequent to December 31, 2018, we issued 449,929 shares of our common stock to the former owner of an acquired business in exchange, on a one-for-one basis, for exchangeable shares in a Canadian subsidiary of Quanta that were held by the former owner. The former owner originally received the exchangeable shares as partial consideration for the sale of the acquired business. The shares of common stock issued in this transaction were issued in reliance upon the exemption from registration provided by Section 4(a)(2) of the Securities Act of 1933, as amended, as the shares were issued to the owner of business acquired in a privately negotiated transaction not involving any public offering or solicitation.

In connection with the aforementioned acquisition, the former owner also received one share of Quanta Series G Preferred Stock, which provided the former owner voting rights in Quanta common stock equivalent to the number of outstanding exchangeable shares held by the former owner. Upon completion of the exchange described above, no exchangeable shares associated with the preferred share remained outstanding. Accordingly, the share of Quanta Series G preferred stock was redeemed, deemed retired and canceled and may not be reissued.

Issuer Purchases of Equity Securities During the Fourth Quarter of 2018

The following table contains information about our purchases of equity securities during the three months ended December 31, 2018.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares That May Yet be Purchased Under the Plans or Programs[1]
October 1 - 31, 2018				
Open Market Stock Repurchases [1]	2,706,951	$ 31.86	2,706,951	$ 446,088,029
Tax Withholdings [2]	10,098	$ 33.61	—	
November 1 - 30, 2018				
Open Market Stock Repurchases [1]	—	$ —	—	$ 446,088,029
Tax Withholdings [2]	6,868	$ 34.71	—	
December 1 - 31, 2018				
Open Market Stock Repurchases [1]	4,945,214	$ 29.80	4,945,214	$ 298,709,474
Tax Withholdings [2]	—	$ —	—	
Total	7,669,131		7,652,165	$ 298,709,474

(1) Includes shares repurchased as of the trade date of such repurchases. On May 25, 2017, we issued a press release announcing that our Board of Directors approved a stock repurchase program that authorized us to purchase, from time to time through June 30, 2020, up to $300.0 million of our outstanding common stock (the 2017 Repurchase Program). Additionally, on September 4, 2018, we issued a press release announcing that our Board of Directors approved a stock repurchase program that authorizes us to purchase, from time to time through June 30, 2021, up to $500.0 million of our outstanding common stock (the 2018 Repurchase Program). Repurchases under these programs can be made in open market and privately negotiated transactions, at our discretion, based on market and business conditions, applicable contractual and legal requirements and other factors. These programs do not obligate us to acquire any specific amount of common stock and may be modified or terminated by our Board of Directors at any time at its sole discretion and without notice. As of December 31, 2018, we had repurchased 8.6 million shares of our common stock under the 2017 Repurchase Program at a cost of $300.0 million and 6.7 million shares of our common stock under the 2018 Repurchase Program at a cost of $201.3 million. As a result, the 2017 Repurchase Program was completed and $298.7 million remained available under the 2018 Repurchase Program as of December 31, 2018.

(2) Includes shares purchased from employees to satisfy tax withholding obligations in connection with the vesting of restricted stock unit and performance unit awards or the settlement of previously vested and deferred restricted stock unit and performance unit awards.

Dividends

We did not declare any cash dividends on our common stock during the year ended December 31, 2017. During the fourth quarter of 2018, we declared a cash dividend of $0.04 per share of our common stock, which was paid on January 16, 2019 to stockholders of record as of January 2, 2019. The declaration, payment and amount of future cash dividends, if any, will be at the discretion of our Board of Directors after taking into account various factors, including our financial condition, results of operations, cash flows from operations, current and anticipated capital requirements and expansion plans, the income tax laws then in effect and the requirements of Delaware law. In addition, as discussed in *Liquidity and Capital Resources — Debt Instruments — Senior Secured Credit Facility* in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations*, the credit agreement for our senior secured credit facility restricts the payment of cash dividends unless certain conditions are met.

Performance Graph

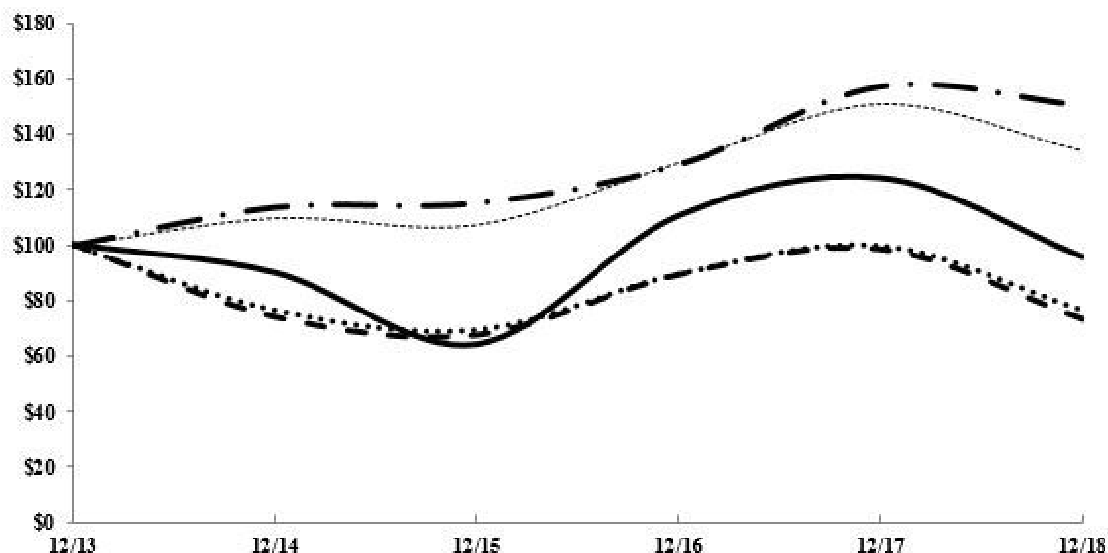
The following Performance Graph and related information shall not be deemed "soliciting material" or to be "filed" with the Securities and Exchange Commission, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that we specifically incorporate it by reference into such filing.

The following graph compares, for the period from December 31, 2013 to December 31, 2018, the cumulative stockholder return on our common stock with the cumulative total return of the S&P 500 Index (the S&P 500), the S&P MidCap 400 Index (the S&P 400) and two peer groups selected by our management that include public companies within our industries. The companies in the peer groups were selected to represent a broad group of publicly held corporations with operations similar to ours. The current peer group (the 2018 Peer Group) includes AECOM, EMCOR Group Inc., Fluor Corporation, Jacobs Engineering Group Inc., KBR, Inc., MasTec, Inc., McDermott International, Inc.; MYR Group Inc. and Primoris Services Corporation. The peer group used in the prior year (the 2017 Peer Group) was the same, except that McDermott International, Inc. replaced Chicago Bridge & Iron Company N.V. as a result of the combination of the two companies.

The graph below assumes an investment of $100 (with reinvestment of all dividends) in our common stock, the 2018 Peer Group, the 2017 Peer Group, the S&P 500 and the S&P MidCap 400 on December 31, 2013 and tracks their relative performance through December 31, 2018. The returns of each company in the Peer Group are weighted based on the market capitalization of that company at the beginning of the measurement period. The stock price performance reflected in the following graph is not necessarily indicative of future stock price performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN

Among Quanta Services, Inc., the 2018 Peer Group, the 2017 Peer Group, the S&P 500, and the S&P MidCap 400



	December 31,					
	2013	2014	2015	2016	2017	2018
Quanta Services, Inc.	$ 100.00	$ 89.96	$ 64.16	$ 110.42	$ 123.92	$ 95.50
2018 Peer Group	$ 100.00	$ 74.06	$ 67.55	$ 89.16	$ 98.27	$ 73.20
2017 Peer Group	$ 100.00	$ 76.57	$ 69.40	$ 89.62	$ 99.85	$ 76.52
S&P 500	$ 100.00	$ 113.69	$ 115.26	$ 129.05	$ 157.22	$ 150.33
S&P MidCap 400	$ 100.00	$ 109.77	$ 107.38	$ 129.65	$ 150.71	$ 134.01

ITEM 6. *Selected Financial Data*

The following historical selected financial data has been derived from our consolidated financial statements. See Note 4 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for information regarding certain acquisitions and the related impact on our results of operations as these acquisitions may affect the comparability of such results. Additionally, on August 4, 2015, we sold our fiber optic licensing operations. We have presented the results of operations, financial position and cash flows of such fiber optic licensing subsidiaries as discontinued operations for all applicable periods presented in this Annual Report. The historical selected financial data should be read in conjunction with our consolidated financial statements and related notes thereto included in Item 8. *Financial Statements and Supplementary Data* and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.*

	Year Ended December 31,					
	2018	2017	2016	2015	2014	
	(In thousands, except per share information)					
Consolidated Statements of Operations Data:						
Revenues	$11,171,423	$ 9,466,478	$ 7,651,319	$ 7,572,436	$ 7,747,229	
Cost of services (including depreciation)	9,691,459	8,224,618	6,637,519	6,648,771	6,578,435	
Gross profit	1,479,964	1,241,860	1,013,800	923,665	1,168,794	
Selling, general and administrative expenses	857,574	777,920	653,338	592,863	705,477	(c)
Amortization of intangible assets	43,994	32,205	31,685	34,848	34,257	
Asset impairment charges (a)	49,375	58,057	7,964	58,451	—	
Change in fair value of contingent consideration liabilities	(11,248)	(5,171)	—	—	—	
Operating income	540,269	378,849	320,813	237,503	429,060	
Interest expense	(36,945)	(20,946)	(14,887)	(8,024)	(4,765)	
Interest income	1,555	832	2,423	1,493	3,736	
Other expense, net	(47,213)	(4,978)	(663)	(2,297)	(1,432)	
Income from continuing operations before income taxes	457,666	353,757	307,686	228,675	426,599	
Provision for income taxes (b)	161,659	35,532	107,246	97,472	139,007	
Net income from continuing operations	296,007	318,225	200,440	131,203	287,592	
Net income (loss) from discontinued operations	—	—	(342)	190,621	27,490	
Net income	296,007	318,225	200,098	321,824	315,082	
Less: Net income attributable to non-controlling interests	2,661	3,247	1,715	10,917	18,368	
Net income attributable to common stock	$ 293,346	$ 314,978	$ 198,383	$ 310,907	$ 296,714	
Amounts attributable to common stock:						
Net income from continuing operations	$ 293,346	$ 314,978	$ 198,725	$ 120,286	$ 269,224	
Net income (loss) from discontinued operations	—	—	(342)	190,621	27,490	
Net income attributable to common stock	$ 293,346	$ 314,978	$ 198,383	$ 310,907	$ 296,714	
Basic earnings per share attributable to common stock from continuing operations	$ 1.92	$ 2.02	$ 1.26	$ 0.62	$ 1.22	
Diluted earnings per share attributable to common stock from continuing operations	$ 1.90	$ 2.00	$ 1.26	$ 0.62	$ 1.22	

(a) In 2018, 2017, 2016 and 2015, we recorded asset impairment charges of $49.4 million ($36.5 million net of tax), $58.1 million ($36.6 million net of tax), $8.0 million ($7.1 million net of tax) and $58.5 million ($44.6 million net of tax).The charges recorded in 2018 related to the winding down of certain oil-influenced operations and assets. The charges recorded in 2017 related to goodwill and intangible assets, including a $57.0 million goodwill impairment and a $1.1 million impairment of a customer relationship intangible asset. The goodwill impairment was associated with two reporting units within our Pipeline and Industrial Infrastructure Services Division. The charges recorded in 2016 primarily related to a pending disposition of certain international renewable energy services operations, which was completed in 2017. The charges recorded in 2015 related to goodwill, intangible assets and property and equipment, including a $39.8 million goodwill impairment and a $12.1 million impairment to customer relationship, trade name and non-compete agreement intangible assets. For further discussion of these charges in 2018, 2017 and 2016, refer to *Results of Operations — Consolidated Results — Asset impairment charges* included in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations*.

(b) The effective tax rates in 2018 and 2017 were impacted by the enactment of the Tax Cuts and Jobs Act of 2017 (Tax Act), which, among other things, lowered the U.S. federal corporate tax rate from 35% to 21% as of January 1, 2018. The lower effective tax rate in 2017 was primarily due to $70.1 million of tax benefits related to the enactment of the Tax Act. For more information regarding the Tax Act, refer to Note 9 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.* As a result of the tax reform regulations issued during 2018, the 2018 effective tax rate includes a $37.2 million provision to record a valuation allowance against tax benefits recognized during 2017 associated with the Tax Act and other entity restructuring and recapitalization efforts. For more information on other items that impacted the effective tax rates in 2018, 2017 and 2016, refer to *Results of Operations — Consolidated Results — Provision for income taxes* included in Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations*. The effective tax rate in 2015 did not include a significant decrease in reserves for uncertain tax positions. The effective tax rate in 2014 was impacted by $8.1 million in tax benefits primarily due to decreases in reserves for uncertain tax positions that resulted from the expiration of federal and state statute of limitations periods.

(c) In 2014, selling, general and administrative expenses included a $102.5 million charge to provision for long-term contract receivable associated with an electric power infrastructure services project and a $38.8 million expense resulting from an arbitration decision associated with a contract dispute on a directional drilling project.

	December 31,				
	2018	2017	2016	2015	2014
			(In thousands)		
Balance Sheet Data:					
Working capital	$ 1,519,977	$ 1,377,840	$ 1,083,517	$ 1,073,775	$ 1,389,393
Goodwill	$ 1,899,879	$ 1,868,600	$ 1,603,169	$ 1,552,658	$ 1,596,695
Total assets	$ 7,075,787	$ 6,480,154	$ 5,354,059	$ 5,213,543	$ 6,253,583
Long-term debt, net of current maturities	$ 1,040,532	$ 670,721	$ 353,562	$ 475,364	$ 72,489
Total stockholders' equity	$ 3,604,159	$ 3,791,571	$ 3,339,427	$ 3,085,494	$ 4,514,473

ITEM 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations*

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our historical consolidated financial statements and related notes included elsewhere in Item 8. *Financial Statements and Supplementary Data*. The discussion below contains forward-looking statements that are based upon our current expectations and are subject to uncertainty and changes in circumstances. Actual results may differ materially from these expectations due to inaccurate assumptions and known or unknown risks and uncertainties, including those identified in *Uncertainty of Forward-Looking Statements and Information* below and Item 1A. *Risk Factors*.

Introduction

We are a leading provider of specialty contracting services, delivering comprehensive infrastructure solutions for the electric power, energy and communications industries in the United States, Canada, Australia, Latin America and select other international markets. The services we provide include the design, installation, upgrade, repair and maintenance of infrastructure within each of the industries we serve, such as electric power transmission and distribution networks; substation facilities; pipeline transmission and distribution systems and facilities; refinery, petrochemical and industrial facilities; and telecommunications and cable multi-system operator networks.

Our customers include many of the leading companies in the industries we serve. We have developed strong strategic alliances with numerous customers and strive to develop and maintain our status as a preferred service provider to our customers. Our services are typically provided pursuant to master service agreements, repair and maintenance contracts and fixed price and non-fixed price installation contracts.

We report our results under two reportable segments: (1) Electric Power Infrastructure Services and (2) Pipeline and Industrial Infrastructure Services. This structure is generally focused on broad end-user markets for our services. As of December 31, 2018, we changed the name of our Oil and Gas Infrastructure Services segment to the Pipeline and Industrial Infrastructure Services segment. There was no change to the composition of the segment, and the name change was made to better reflect the work performed within the segment and the diversity of its service offerings. Our consolidated revenues for the year ended December 31, 2018 were $11.17 billion, of which 57% was attributable to the Electric Power Infrastructure Services segment and 43% was attributable to the Pipeline and Industrial Infrastructure Services segment.

The Electric Power Infrastructure Services segment provides comprehensive network solutions to customers in the electric power industry. Services performed by the Electric Power Infrastructure Services segment generally include the design, installation, upgrade, repair and maintenance of electric power transmission and distribution infrastructure and substation facilities along with other engineering and technical services. This segment also provides emergency restoration services, including the repair of infrastructure damaged by inclement weather, the energized installation, maintenance and upgrade of electric power infrastructure utilizing unique bare hand and hot stick methods and our proprietary robotic arm technologies, and the installation of "smart grid" technologies on electric power networks. In addition, this segment provides services that support the development of renewable energy generation, including solar, wind and certain types of natural gas generation facilities, and related switchyards and transmission infrastructure. This segment also provides comprehensive communications infrastructure services to wireline and wireless telecommunications companies, cable multi-system operators and other customers within the communications industry; services in connection with the construction of electric power generation facilities; and the design, installation, maintenance and repair of commercial and industrial wiring. This segment also includes our postsecondary educational institution, which specializes in pre-apprenticeship training, apprenticeship training and specialized utility task training for electric workers, and has been recently expanded to include curriculum for the gas distribution and communications industries.

The Pipeline and Industrial Infrastructure Services segment provides comprehensive infrastructure solutions to customers involved in the development, transportation, storage and processing of natural gas, oil and other products. Services performed by the Pipeline and Industrial Infrastructure Services segment generally include the design, installation, repair and maintenance of pipeline transmission and distribution systems, gathering systems, production systems, storage systems and compressor and pump stations, as well as related trenching, directional boring and mechanized welding services. In addition, this segment's services include pipeline protection, integrity testing, rehabilitation and replacement, and the fabrication of pipeline support systems and related structures and facilities for natural gas utilities and midstream companies. We also provide high-pressure and critical-path turnaround services to the downstream and midstream energy markets and instrumentation and electrical services, piping, fabrication and storage tank services. To a lesser extent, this segment serves the offshore and inland water energy markets and designs, installs and maintains fueling systems and water and sewer infrastructure.

For internal management purposes, we are also organized into two internal divisions: the Electric Power Infrastructure Services Division and the Pipeline and Industrial Infrastructure Services Division. These internal divisions are closely aligned with the reportable segments and are based on the predominant type of work provided by the operating units within each division.

Reportable segment information, including revenues and operating income by type of work, is gathered from each operating unit for the purpose of evaluating segment performance in support of our market strategies. These classifications of our operating unit revenues by type of work for segment reporting purposes can at times require judgment on the part of management. Our operating units may perform joint projects for customers in multiple industries, deliver multiple types of services under a single customer contract or provide service offerings to various industries. For example, we perform joint trenching projects to install distribution lines for electric power and natural gas customers. Our integrated operations and common administrative support for our operating units requires that certain allocations be made to determine segment profitability, including allocations of shared and indirect costs, such as facility costs, indirect operating expenses (e.g., depreciation), and general and administrative costs. Certain corporate costs are not allocated, including payroll and benefits, employee travel expenses, facility costs, professional fees, acquisition costs, non-cash stock-based compensation and amortization related to intangible assets.

We operate primarily in the United States; however, we derived $2.60 billion, $2.48 billion and $1.59 billion of our revenues from foreign operations during the years ended December 31, 2018, 2017 and 2016, respectively. Of our foreign revenues, 76%, 79% and 75% were earned in Canada during the years ended December 31, 2018, 2017 and 2016, respectively. In addition, we held property and equipment of $304.0 million and $330.4 million in foreign countries, primarily Canada, as of December 31, 2018 and 2017. See Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for a further disaggregation of revenues by geographic location.

Recent Acquisitions, Investments and Divestitures

Acquisitions

On January 24, 2019, we acquired an electric power specialty contracting business located in the United States. The purchase price for this acquisition was approximately $47.0 million, which included the repayment of certain indebtedness of the acquired business. The results of the acquired business will generally be included in our Electrical Power Infrastructure Services segment and consolidated financial statements beginning on the acquisition date.

During the year ended December 31, 2018, we acquired an electrical infrastructure services business specializing in substation construction and relay services, a postsecondary educational institution that provides pre-apprenticeship training and programs for experienced linemen and two communications infrastructure services businesses, all of which are located in the United States. The aggregate consideration for these acquisitions was $106.8 million paid or payable in cash, subject to certain adjustments, and 679,668 shares of Quanta common stock, which had a fair value of approximately $22.9 million as of the respective acquisition dates. Additionally, the acquisitions of the postsecondary educational institution and one of the communications infrastructure services businesses include the potential payment of up to $18.0 million of contingent consideration, payable if the acquired businesses achieve certain performance objectives over three-year and five-year post-acquisition periods. Based on the estimated fair value of this contingent consideration, we recorded $16.5 million of liabilities as of the respective acquisition dates. The results of the acquired businesses have generally been included in our Electric Power Infrastructure Services segment and have been included in our consolidated financial statements beginning on the respective acquisition dates.

On July 20, 2017, we acquired Stronghold, Ltd. and Stronghold Specialty, Ltd. (collectively Stronghold), a specialized services business located in the United States that provides high-pressure and critical-path solutions to the downstream and midstream energy markets. The aggregate consideration included $351.0 million in cash, subject to certain adjustments, and 2,693,680 shares of Quanta common stock, which had a fair value of $81.3 million as of the acquisition date. Additionally, the acquisition includes the potential payment of up to $100.0 million of contingent consideration, payable if the acquired business achieves certain performance objectives over a three-year post-acquisition period. Based on the estimated fair value of this contingent consideration, we recorded a $51.1 million liability as of the acquisition date. The results of the acquired business have generally been included in our Pipeline and Industrial Infrastructure Services segment and have been included in our consolidated financial statements since the acquisition date.

During the year ended December 31, 2017, we also acquired a communications infrastructure services business and an electrical and communications business, both of which are located in the United States. The aggregate consideration for these acquisitions consisted of $12.0 million paid or payable in cash, subject to certain adjustments, and 288,666 shares of Quanta common stock, which had a fair value of $8.3 million as of the acquisition date of the applicable acquired business. The results of the acquired businesses have generally been included in our Electric Power Infrastructure Services segment and have been included in our consolidated financial statements since the respective acquisition dates.

During 2016, we completed five acquisitions. The results of four of the acquired businesses have been generally included in our Electric Power Infrastructure Services segment and have been included in our consolidated financial statements since their respective acquisition dates. These businesses included an electrical infrastructure services business located in Australia, a utility contracting business located in Canada, a full service medium- and high-voltage powerline contracting business located in the United States and a communications services business located in Canada. We also acquired a pipeline services contractor located in the United States, the results of which have generally been included in our Pipeline and Industrial Infrastructure Services segment

since the acquisition date. The aggregate consideration for these acquisitions consisted of $75.9 million paid or payable in cash, subject to certain adjustments, 70,840 shares of Quanta common stock, which had a fair value of $1.5 million as of the settlement date of the applicable acquisition, and contingent consideration payments of up to $39.5 million, payable if certain of the acquired businesses achieve performance objectives over a four to five-year post-acquisition period. Based on the estimated fair value of this contingent consideration, we recorded a total of $18.7 million in liabilities as of the applicable acquisition dates.

Investments

During the year ended December 31, 2018, we acquired a 30% equity interest in a water and gas pipeline infrastructure contractor located in Australia for $22.2 million. This investment includes an option through 2020 to acquire the remaining equity of the company and provides for certain additional earnings and distribution participation rights during a designated 25-month post-investment period, as well as preferential liquidation rights. This investment has been recorded at cost and will be adjusted for impairment, if any, plus or minus observable changes in the value of the company's equity. Earnings on this investment are recognized as dividends are received and are reported in "Other expense, net" in the accompanying consolidated statements of operations. We received and recognized $3.9 million of cash dividends from this investment during 2018. Additionally, during the year ended December 31, 2018, we acquired a 49% equity interest in an electric power infrastructure services company together with certain related customer relationship and other intangible assets for $12.3 million in total.

We also enter into strategic partnerships and investment arrangements with customers and infrastructure investors to provide fully integrated infrastructure services on certain projects, including planning and feasibility analysis, engineering, design, procurement, construction and project operation and maintenance. These projects include public-private partnerships and concessions, along with private infrastructure projects such as build, own, operate (and in some cases transfer) and build-to-suit arrangements. As part of this strategy, we formed a partnership with select investors that provides up to $1.0 billion of capital, including approximately $80.0 million from us, available to invest in certain of these infrastructure projects through August 2024. Wholly owned subsidiaries of Quanta serve as the general partner of this partnership and as a separately operated registered investment adviser that manages the invested capital. Through February 2019, we had contributed $15.1 million to this partnership in connection with certain investments and the payment of management fees.

Seasonality; Fluctuations of Results; Economic Conditions

Our revenues and results of operations can be subject to seasonal and other variations. These variations are influenced by weather, customer spending patterns, bidding seasons, receipt of required regulatory approvals, permits and rights of way, project timing and schedules, and holidays. Typically, our revenues are lowest in the first quarter of the year because cold, snowy or wet conditions can cause delays on projects. In addition, many of our customers develop their annual capital budgets during the first quarter, and therefore do not begin infrastructure projects in a meaningful way until their capital budgets are finalized. Second quarter revenues are typically higher than those in the first quarter, as some projects begin, but continued cold and wet weather can often impact second quarter productivity. Third quarter revenues are typically the highest of the year, as a greater number of projects are underway, and weather is normally more accommodating. Generally, revenues during the fourth quarter of the year are lower than the third quarter but higher than the second quarter. Many projects are completed in the fourth quarter, and revenues are often impacted positively by customers seeking to spend their capital budgets before the end of the year. However, the holiday season and inclement weather can sometimes cause delays during the fourth quarter, reducing revenues and increasing costs. Productivity and operating activity in any quarter may be positively or negatively affected by atypical weather patterns in the areas we serve, such as severe weather, excessive rainfall or unusual winter weather. The timing of project awards and unanticipated changes in project schedules as a result of delays or accelerations can also create variations in the level of operating activity from quarter to quarter.

These seasonal impacts are typical for our U.S. operations, but as our foreign operations grow, this pattern may have a lesser impact on our quarterly revenues. For example, revenues in Canada are typically higher in the first quarter because projects are often accelerated in order to complete work while the ground is frozen and prior to the break up, or seasonal thaw, as productivity is adversely affected by wet ground conditions during the warmer spring and summer months. Also, although revenues from Australia and other international operations have not been significant relative to our overall revenues to date, their seasonal patterns may differ from those in North America and may impact our seasonality more in the future.

Additionally, our industry can be highly cyclical. Our volume of business may be adversely affected by declines or delays in new projects due to cyclicality, which may vary by geographic region. Project schedules, particularly in connection with larger, longer-term projects, can also create fluctuations in the amount of work performed in a given period. For example, in connection with larger and more complicated projects, the timing of obtaining permits and other approvals may be delayed, and we may need to maintain a portion of our workforce and equipment in an underutilized capacity to ensure we are strategically positioned to deliver on such projects when they move forward. Examples of other items that may cause our results or demand for our services

to fluctuate materially from quarter to quarter include: the financial condition of our customers and their access to capital; margins of ongoing projects; economic and political conditions on a regional, national or global scale, including changes in U.S. trade relationships with other countries; our customers' capital spending, including on larger pipeline and electrical infrastructure projects; oil, natural gas and natural gas liquids prices; liabilities and costs that are not covered by, or that are in excess of, third party insurance coverage; the timing of and costs associated with acquisitions; changes in the fair value of acquisition-related contingent consideration liabilities; dispositions; equity in earnings (losses) of unconsolidated affiliates; impairments of goodwill, intangible assets, long-lived assets or investments; effective tax rates; and interest rates. Accordingly, our operating results in any particular period may not be indicative of the results that can be expected for any other period. Please read *Outlook* and *Understanding Margins* for additional discussion of trends and challenges that may affect our financial condition, results of operations and cash flows.

Understanding Margins

Our gross margin is gross profit expressed as a percentage of revenues, and our operating margin is operating income expressed as a percentage of revenues. Cost of services, which is subtracted from revenues to obtain gross profit, consists primarily of salaries, wages and benefits to employees; depreciation; fuel and other equipment expenses; equipment rental expense; and costs related to subcontracted services, insurance, facilities, materials, parts and supplies. Selling, general and administrative expenses, amortization of intangible assets and change in fair value of contingent consideration liabilities are then subtracted from gross profit to obtain operating income. Various factors, only some of which are within our control, can impact our margins on a quarterly or annual basis.

Seasonal and geographical. Seasonal weather patterns can have a significant impact on margins. Generally, business is slower in the colder months versus the warmer months of the year, resulting in lower productivity and consequently reducing our ability to cover fixed costs. This can be offset somewhat by increased demand for electrical service and repair work resulting from infrastructure damaged by severe weather during the colder months, and increased demand in certain northern climates during the winter months due to the adverse operating conditions during the spring seasonal thaw. Additionally, project schedules, including when projects begin and are completed, may impact margins. The mix of business conducted in the areas we serve will also affect margins, as some areas offer the opportunity for higher margins due to their geographic characteristics. For example, margins may be negatively impacted by unexpected difficulties that can arise in challenging operating conditions such as urban settings or mountainous and other difficult terrain. Site conditions, including unforeseen underground conditions, can also impact margins.

Weather. Adverse or favorable weather conditions can impact gross margins in a given period. For example, snowfall, rainfall or other severe weather may negatively impact our revenues and margins due to reduced productivity, as projects may be terminated, deferred or delayed until weather conditions improve or an affected area recovers from a severe weather event. Conversely, in periods when weather remains dry and temperatures are accommodating, more work can be done, sometimes at a lower cost. In some cases, severe weather, such as hurricanes, ice storms and wildfires, can provide us with emergency restoration service work, which typically yields higher margins due in part to better equipment utilization rates and absorption of fixed costs.

Revenue mix. The mix of revenues derived from the industries we serve and the types of services we provide within an industry will impact margins, as certain industries and services provide higher margin opportunities. Additionally, changes in our customers' spending patterns can cause an imbalance in supply and demand and, therefore, affect margins and the mix of revenues.

Service and maintenance versus installation. Installation work is often performed on a fixed price basis, while maintenance work is often performed under pre-established or negotiated prices or cost-plus pricing arrangements. Margins for installation work may vary from project to project, and may be higher than maintenance work, as work obtained on a fixed price basis has higher risk than other types of pricing arrangements. We typically derive approximately 30% of our annual revenues from maintenance work, but a higher portion of installation work in any given period may affect our gross margins for that period.

Subcontract work. Work that is subcontracted to other service providers generally yields lower margins. An increase in subcontract work in a given period may contribute to a decrease in margins. In recent years, we have subcontracted approximately 15% to 20% of our work to other service providers.

Materials versus labor. Typically our customers are responsible for supplying the materials for their projects; however, for some of our contracts we may agree to procure all or part of the required materials. Margins may be lower on projects where we furnish a significant amount of materials, including projects where we provide engineering, procurement and construction (EPC) services, as our markup on materials is generally lower than our markup on labor costs. Furthermore, fluctuations in the price of materials we are required to procure, including as a result of changes in U.S. trade relationships with other countries or other economic or political conditions, may impact our margins. In a given period, an increase in the percentage of work with higher materials procurement requirements may decrease our overall margins.

Size, scope and complexity of projects. We may experience a decrease or fluctuations in margins when larger, more complex electric transmission and pipeline projects experience significant delays or other difficulties impacting performance. Larger projects

with higher voltage capacities, larger diameter throughput capacities, increased engineering, design or construction complexities, more difficult terrain requirements or longer distance requirements typically yield opportunities for higher margins as we assume a greater degree of performance risk and there is greater utilization of our resources for longer construction timeframes. Conversely, smaller or less complex electric transmission and pipeline projects typically provide lower margin opportunities as there are a greater number of competitors capable of performing in this market, and competitors at times may more aggressively pursue available volumes of work to absorb fixed costs. A greater percentage of smaller scale or less complex electric transmission and pipeline work also could negatively impact margins due to the inefficiency of transitioning between a greater number of smaller projects versus continuous production on fewer larger projects. Our margins may be further impacted by delays in the timing of larger projects, extended bidding procedures for more complex EPC projects or temporary decreases in capital spending by our customers. Also, during these periods we may choose to maintain a portion of our workforce and equipment in an underutilized capacity to ensure we are strategically positioned to deliver on larger, more complicated electric transmission or pipeline projects when they move forward.

Depreciation. We include depreciation in cost of services, which is common practice in our industry. However, this can make comparability of our margins to those of other companies difficult and must be taken into consideration when comparing us to other companies.

Insurance. As discussed in *Contractual Obligations — Insurance*, we are insured for employer's liability, workers' compensation, auto liability and general liability claims. We also have employee health care benefit plans for most employees not subject to collective bargaining agreements. Margins could be impacted by fluctuations in insurance accruals as additional claims arise and as circumstances and conditions of existing claims change.

Project Variability and Performance. Margins for a single project may fluctuate quarter to quarter due to changes in the volume or type of work performed, the pricing structure under the project contract or job productivity. Productivity can be influenced by many factors, including unexpected project difficulties or site conditions; project locations, including locations with challenging operating conditions; whether the work is on an open or encumbered right of way; inclement weather or severe weather events; environmental restrictions or regulatory delays; protests, other political activity or legal challenges related to a project; and the performance of third parties. These types of factors are not practicable to quantify through accounting data but may individually or in the aggregate have a direct impact on the gross margin of a specific project.

Foreign currency risk. Our financial performance is reported on a U.S. dollar-denominated basis but is partially subject to fluctuations in foreign currency exchange rates. Fluctuations in exchange rates relative to the U.S. dollar, primarily the Canadian and Australian dollars, could cause material fluctuations in comparisons of our results of operations between periods.

Change in fair value of contingent consideration liabilities. We anticipate fluctuations in operating income margins as a result of changes in the fair value of contingent consideration liabilities associated with prior acquisitions, which occur as we obtain additional information on the likelihood that the acquired businesses will achieve their post-acquisition performance objectives. See Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for more information about the valuation methodologies and assumptions related to the determination of the fair value of these liabilities.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist primarily of compensation and related benefits, marketing and communication costs, office rent and utilities, professional fees, bad debt expense, acquisition costs, gains and losses on the sale of property and equipment, letter of credit fees and maintenance, training and conversion costs related to information technology systems.

Results of Operations

As previously discussed, the results of acquired businesses have been included in the following results of operations beginning on their respective acquisition dates. The following table sets forth selected statements of operations data and such data as a percentage of revenues for the years indicated (dollars in thousands):

Consolidated Results

	Year Ended December 31,					
	2018		2017		2016	
Revenues	$ 11,171,423	100.0%	$ 9,466,478	100.0%	$ 7,651,319	100.0%
Cost of services (including depreciation)	9,691,459	86.8	8,224,618	86.9	6,637,519	86.7
Gross profit	1,479,964	13.2	1,241,860	13.1	1,013,800	13.3
Selling, general and administrative expenses	857,574	7.7	777,920	8.2	653,338	8.5
Amortization of intangible assets	43,994	0.4	32,205	0.4	31,685	0.5
Asset impairment charges	49,375	0.4	58,057	0.6	7,964	0.1
Change in fair value of contingent consideration liabilities	(11,248)	(0.1)	(5,171)	(0.1)	—	—
Operating income	540,269	4.8	378,849	4.0	320,813	4.2
Interest expense	(36,945)	(0.3)	(20,946)	(0.2)	(14,887)	(0.2)
Interest income	1,555	—	832	—	2,423	—
Other expense, net	(47,213)	(0.4)	(4,978)	(0.1)	(663)	—
Income from continuing operations before income taxes	457,666	4.1	353,757	3.7	307,686	4.0
Provision for income taxes	161,659	1.5	35,532	0.3	107,246	1.4
Net income from continuing operations	296,007	2.6	318,225	3.4	200,440	2.6
Net loss from discontinued operations	—	—	—	—	(342)	—
Net income	296,007	2.6	318,225	3.4	200,098	2.6
Less: Net income attributable to non-controlling interests	2,661	—	3,247	0.1	1,715	—
Net income attributable to common stock	$ 293,346	2.6%	$ 314,978	3.3%	$ 198,383	2.6%
Amounts attributable to common stock:						
Net income from continuing operations	$ 293,346	2.6%	$ 314,978	3.3%	$ 198,725	2.6%
Net loss from discontinued operations	—	—	—	—	(342)	—
Net income attributable to common stock	$ 293,346	2.6%	$ 314,978	3.3%	$ 198,383	2.6%

2018 compared to 2017

Revenues. Revenues increased $1.70 billion, or 18.0%, to $11.17 billion for the year ended December 31, 2018. Contributing to the overall increase were an $889.2 million increase in revenues from our Pipeline and Industrial Infrastructure Services segment and an $815.7 million increase in revenues from our Electric Power Infrastructure Services segment. The increase in Pipeline and Industrial Infrastructure Services segment revenues was primarily due to an increase in revenues from gas distribution and smaller diameter pipeline transmission services work and approximately $385 million of increased revenues from Stronghold during 2018, which was acquired in late July 2017. The increase in Electric Power Infrastructure Services segment revenues was primarily the result of increased spending by our customers associated with transmission and distribution services and to a lesser extent an increase in customer spending associated with larger electric transmission projects, including progress on a large transmission project in Canada.

Gross profit. Gross profit increased $238.1 million, or 19.2%, to $1.48 billion for the year ended December 31, 2018. Gross profit as a percentage of revenues increased slightly to 13.2% for the year ended December 31, 2018 from 13.1% for the year ended December 31, 2017. The increased gross profit was primarily due to the increased revenues described above, including the impact of continued favorable progress on a large transmission project in Canada. Partially offsetting the increases were project losses associated with two projects within the Pipeline and Industrial Infrastructure Services segment and one project within the Electric Power Infrastructure Services segment. Additionally, gross profit during 2017 was negatively impacted by work disruptions,

project suspensions or deferrals, and employee support costs due to Hurricanes Harvey and Irma. See *Segment Results* below for additional information and discussion related to segment revenues and operating income (loss).

Selling, general and administrative expenses. Selling, general and administrative expenses increased $79.7 million, or 10.2%, to $857.6 million for the year ended December 31, 2018. The increase was primarily due to a $56.7 million increase in expenses associated with acquired businesses, including incremental acquisition and integration costs of $6.7 million; and a $25.3 million increase in compensation expenses, largely associated with higher salaries due to increased personnel to support business growth, annual and incentive compensation increases and increased stock-based compensation expense related to improved forecasted achievement of multi-year performance metrics. Also contributing to the increase were a $7.9 million increase in travel and entertainment expenses; a $6.8 million increase in bad debt expense; and $1.3 million of severance and restructuring costs incurred during 2018, which were associated with the closure of certain operations within the Pipeline and Industrial Infrastructure Services segment. These increases were partially offset by a $12.5 million decrease in legal costs, partially due to certain legal costs incurred in 2017 that were related to a matter involving our prior disposition of certain communications operations, and a $6.0 million decrease in liabilities associated with deferred compensation plans. Selling, general and administrative expenses as a percentage of revenues decreased to 7.7% for the year ended December 31, 2018 from 8.2% for the year ended December 31, 2017, primarily due to the increase in revenues described above.

Amortization of intangible assets. Amortization of intangible assets increased $11.8 million to $44.0 million for the year ended December 31, 2018. This increase was primarily due to increased amortization of intangible assets associated with recently acquired businesses, partially offset by reduced amortization expense from previously acquired intangible assets as certain of these assets became fully amortized.

Asset impairment charges. Asset impairment charges were $49.4 million for the year ended December 31, 2018 compared to $58.1 million for the year ended December 31, 2017. During the fourth quarter of 2018, we recorded a $49.4 million asset impairment charge related to the winding down of certain oil-influenced operations and assets. During the fourth quarter of 2017, we recorded a $57.0 million goodwill impairment and a $1.1 million impairment related to a customer relationship intangible asset.

Change in fair value of contingent consideration liabilities. An $11.2 million decrease in the fair value of contingent consideration liabilities was recognized for the year ended December 31, 2018, which resulted in a corresponding increase in operating income, as compared to a $5.2 million decrease in fair value of contingent consideration liabilities recognized for the year ended December 31, 2017. The decreases in fair value were primarily due to changes in forecasted performance for certain acquired businesses, and we anticipate that additional changes in fair value will be recorded periodically until the contingent consideration liabilities are settled. See *Contractual Obligations — Contingent Consideration Liabilities* for more information.

Interest expense. Interest expense increased $16.0 million to $36.9 million for the year ended December 31, 2018, as compared to the year ended December 31, 2017, due to increased borrowing activity, primarily related to outstanding amounts borrowed in connection with the acquisition of Stronghold and common stock repurchases, as well as a higher weighted average interest rate.

*Other expense, ne*t. Other expense, net was $47.2 million for the year ended December 31, 2018, as compared to $5.0 million for the year ended December 31, 2017. The increase was primarily due to an increase in construction activity on a large electric transmission project in Canada for an entity in which we have an equity investment. Due to such equity investment, a portion of our construction earnings for the project are deferred, which is recognized by a decrease to the recorded value of the equity investment and a charge to equity in earnings (losses) of unconsolidated affiliates within "Other expense, net." As of December 31, 2018, the project was approximately 88% complete, and additional profit deferrals are anticipated through the first half of 2019 as the project progresses toward completion. Upon completion of the project and transfer of the constructed asset to the customer, the amount of profit deferral will be recognized in equity in earnings (losses) of unconsolidated affiliates. The positive net impact of this equity investment on equity in earnings (losses) of unconsolidated affiliates is expected to be approximately $60 million for 2019. Also included for the year ended December 31, 2018 were $3.9 million in dividends received from our 30% equity interest in a water and gas pipeline infrastructure contractor located in Australia.

Provision for income taxes. The provision for income taxes was $161.7 million for the year ended December 31, 2018, with an effective tax rate of 35.3%. The provision for income taxes was $35.5 million for the year ended December 31, 2017, with an effective tax rate of 10.0%. Our effective tax rates for 2018 and 2017 were impacted by the enactment of the Tax Act on December 22, 2017, which, lowered the U.S. federal corporate tax rate from 35% to 21% as of January 1, 2018 and resulted in the recognition of a $70.1 million provisional benefit during 2017 associated with the enactment of the Tax Act and an additional benefit of $6.3 million recognized during 2018 as an adjustment to the provisional amount. Also during 2017, $26.7 million of tax benefits were recognized associated with entity restructuring and recapitalization efforts. As a result of the tax reform regulations issued during 2018, the 2018 effective tax rate was impacted by a $37.2 million provision to record a valuation allowance against certain tax benefits recognized during 2017 associated with the Tax Act and other entity restructuring and recapitalization efforts. Additionally,

the effective tax rates in 2018 and 2017 were impacted by tax benefits of $8.0 million and $7.2 million related to decreases in reserves for uncertain tax positions, which resulted from the expiration of certain federal and state statute of limitations periods, and $1.4 million and $5.1 million related to vesting of stock-based compensation awards, which were primarily impacted by changes in the weighted average vesting date stock prices. As described above, the Tax Act significantly revised the U.S. corporate tax regime and is anticipated to significantly impact our future effective tax rate, which we expect to be approximately 29.5% to 30.0% for 2019. For additional information regarding the Tax Act, refer to Note 9 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.*

Other comprehensive income. Other comprehensive income (loss), net of taxes, was a loss of $82.7 million in the year ended December 31, 2018 compared to a gain of $68.3 million in the year ended December 31, 2017. The loss in the year ended December 31, 2018 was due to the strengthening of the U.S. dollar against foreign currencies associated with our international operations, primarily the Canadian and Australian dollars, as of December 31, 2018 when compared to December 31, 2017. The gain in year ended December 31, 2017 was due to the strengthening of foreign currencies associated with our international operations, primarily the Canadian and Australian dollars, against the U.S. dollar as of December 31, 2017 when compared to December 31, 2016.

2017 compared to 2016

Revenues. Revenues increased $1.82 billion, or 23.7%, to $9.47 billion for the year ended December 31, 2017. Contributing to the overall increase were a $1.07 billion increase in revenues from pipeline and industrial infrastructure services and a $749.3 million increase in revenues from electric power infrastructure services. The increase in revenues from pipeline and industrial infrastructure services was primarily the result of increased capital spending by our customers on larger gas pipeline transmission projects and approximately $190 million of incremental revenues during 2017 from the acquisition of Stronghold. The increase in revenues from electric power infrastructure services was primarily due to increased customer spending associated with larger electric transmission projects and an increase in emergency restoration services revenues.

Gross profit. Gross profit increased $228.1 million, or 22.5%, to $1.24 billion for the year ended December 31, 2017. Gross profit as a percentage of revenues decreased slightly to 13.1% for the year ended December 31, 2017 from 13.3% for the year ended December 31, 2016. Gross profit and gross profit as a percentage of revenues for the year ended December 31, 2017 were positively impacted by greater contributions from emergency restoration services and midstream gas pipeline transmission projects, which typically yield higher margins. However, these increases were partially offset by the negative impact of work disruptions, deferrals, cancellations and employee support costs due to Hurricanes Harvey and Irma. Gross profit and gross profit as a percentage of revenues for the year ended December 31, 2016 were negatively impacted by project losses related to a power plant project in Alaska, which was substantially completed in the fourth quarter of 2016. See *Segment Results* below for additional information and discussion related to segment revenues and operating income (loss).

Selling, general and administrative expenses. Selling, general and administrative expenses increased $124.6 million, or 19.1%, to $777.9 million for the year ended December 31, 2017. This increase was primarily due to a $62.8 million increase in compensation costs, largely associated with higher incentive compensation based on increased profitability, increased annual compensation and increased personnel to support business growth; a $38.3 million increase in expenses associated with acquired businesses, including acquisition and integration costs; and a $6.9 million increase in legal costs, $4.2 million of which was associated with a matter involving our prior disposition of certain communications operations. These increases were partially offset by $6.3 million of incremental costs incurred during 2016 that were related to severance costs for our former president and chief executive officer and severance and restructuring costs primarily associated with certain operations within the Pipeline and Industrial Infrastructure Services segment. Selling, general and administrative expenses as a percentage of revenues decreased to 8.2% for the year ended December 31, 2017 from 8.5% for the year ended December 31, 2016, primarily due to the increase in revenues described above.

Amortization of intangible assets. Amortization of intangible assets increased $0.5 million to $32.2 million for the year ended December 31, 2017. This increase was primarily due to increased amortization of intangible assets associated with recently acquired companies, partially offset by reduced amortization expense from previously acquired intangible assets as certain of these assets became fully amortized.

Asset impairment charges. Asset impairment charges were $58.1 million for the year ended December 31, 2017 compared to $8.0 million for the year ended December 31, 2016. During the fourth quarter of 2017, we recorded a $57.0 million goodwill impairment and a $1.1 million impairment related to a customer relationship intangible asset, as a result of an extended low commodity price environment that significantly impacted certain reporting units within our Pipeline and Industrial Infrastructure Services Division. Specifically, a reporting unit that provides material handling services experienced lower operating margins and was expected to continue to face a highly competitive environment in its select markets and a reporting unit that provides marine and offshore services experienced prolonged periods of reduced revenues and operating margins and was expected to continue to experience lower levels of activity in the U.S. Gulf of Mexico and other offshore markets. During the fourth quarter of 2016, we

also recorded an asset impairment of $8.0 million related to certain international renewable energy services operations as a result of a pending disposition of these operations, which was completed in 2017.

Change in fair value of contingent consideration liabilities. A $5.2 million decrease in fair value of contingent consideration liabilities was recognized for the year ended December 31, 2017, which resulted in a corresponding increase in operating income during 2017, as compared to no change in fair value for the year ended December 31, 2016. The decrease in fair value was primarily due to changes in the timing and amounts of forecasted operating results of certain acquired businesses.

Interest expense. Interest expense increased $6.1 million to $20.9 million for the year ended December 31, 2017 as compared to the year ended December 31, 2016 due to increased borrowing activity, primarily related to the acquisition of Stronghold, as well as a higher weighted average interest rate.

Provision for income taxes. The provision for income taxes was $35.5 million for the year ended December 31, 2017, with an effective tax rate of 10.0%. The provision for income taxes was $107.2 million for the year ended December 31, 2016, with an effective tax rate of 34.9%. Our effective tax rate for 2017 was impacted by a $70.1 million provisional benefit related to the enactment of the Tax Act; $26.7 million of tax benefits recognized associated with entity restructuring and recapitalization efforts; and a $5.1 million discrete income tax benefit associated with the adoption of an accounting update addressing share-based payments. Also impacting the 2017 effective tax rate were an increased proportion of income before taxes from international jurisdictions, which are generally taxed at lower statutory rates, and an $8.5 million decrease of the production activity related tax benefit due to the acceleration of certain temporary deductions and the loss of a permanent deduction. For additional information regarding the Tax Act and income before taxes from international versus domestic jurisdictions, refer to Note 9 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.* Additionally, the effective tax rates in 2017 and 2016 were impacted by tax benefits of $7.2 million and $20.5 million related to decreases in reserves for uncertain tax positions, which resulted from the expiration of certain federal and state statute of limitations periods.

Other comprehensive income. Other comprehensive income, net of taxes was a gain of $68.3 million in the year ended December 31, 2017 compared to a gain of $23.0 million in the year ended December 31, 2016. These gains were due to a strengthening of foreign currencies associated with our international operations, primarily the Canadian and Australian dollars, against the U.S. dollar as of December 31, 2017 when compared to December 31, 2016 and as of December 31, 2016 when compared to December 31, 2015.

Segment Results

The following table sets forth segment revenues and segment operating income (loss) for the years indicated (dollars in thousands):

	Year Ended December 31,					
	2018		2017		2016	
Revenues:						
Electric Power Infrastructure Services	$ 6,415,562	57.4%	$ 5,599,836	59.2%	$ 4,850,495	63.4%
Pipeline and Industrial Infrastructure Services	4,755,861	42.6	3,866,642	40.8	2,800,824	36.6
Consolidated revenues from external customers	$11,171,423	100.0%	$ 9,466,478	100.0%	$ 7,651,319	100.0%
Operating income (loss):						
Electric Power Infrastructure Services	$ 628,286	9.8%	$ 518,130	9.3%	$ 395,745	8.2%
Pipeline and Industrial Infrastructure Services	204,178	4.3	184,083	4.8	149,502	5.3
Corporate and non-allocated costs	(292,195)	N/A	(323,364)	N/A	(224,434)	N/A
Consolidated operating income	$ 540,269	4.8%	$ 378,849	4.0%	$ 320,813	4.2%

2018 compared to 2017

Electric Power Infrastructure Services Segment Results

Revenues for this segment increased $815.7 million, or 14.6%, to $6.42 billion for the year ended December 31, 2018. This change in revenues was primarily due to increased spending by our customers associated with transmission and distribution services and to a lesser extent an increase in customer spending associated with larger electric transmission projects, including favorable progress on a large transmission project in Canada during 2018, an approximate $85 million increase in revenues from acquired

businesses, and an approximate $58 million increase in communications infrastructure services revenues. These increases were partially offset by an approximate $24 million decrease in emergency restoration services, primarily attributable to the significant impact of Hurricanes Harvey and Irma during 2017.

Operating income increased $110.2 million, or 21.3%, to $628.3 million for the year ended December 31, 2018. Operating income as a percentage of segment revenues increased to 9.8% for the year ended December 31, 2018 from 9.3% for the year ended December 31, 2017. These increases were primarily due to the increase in revenues described above, including favorable progress on a large transmission project in Canada that successfully executed through project procurement, winter schedule and productivity risks resulting in a decrease in cost contingencies. Operating income for 2017 included the impact of a $17.3 million project loss on an electric transmission project that experienced road access, subcontractor and labor issues and which was completed during 2018. Operating income for 2018 was negatively impacted by a $21.8 million project loss on an electric power project that was approximately 86% complete as of December 31, 2018 and that experienced unexpected site conditions, adverse weather conditions and material delivery delays, as well as reduced operating income from emergency restoration services, which typically yield higher margins due in part to higher equipment utilization and absorption of fixed costs.

Pipeline and Industrial Infrastructure Services Segment Results

Revenues for this segment increased $889.2 million, or 23.0%, to $4.76 billion for the year ended December 31, 2018. This increase was primarily due to an increase in revenues from gas distribution and pipeline transmission services and an approximate $385 million increase in revenues from Stronghold, which was acquired in late July 2017. These increases were partially offset by a decrease in revenues from larger pipeline transmission projects during 2018, the timing of construction of which is highly variable due to potential permitting delays, worksite access limitations related to environmental regulations and seasonal weather patterns. Also contributing to the year over year increase was the negative impact during 2017 related to the temporary suspension or deferral of several projects as a result of Hurricane Harvey.

Operating income increased $20.1 million, or 10.9%, to $204.2 million for the year ended December 31, 2018. Operating income as a percentage of segment revenues decreased to 4.3% for the year ended December 31, 2018 from 4.8% for the year ended December 31, 2017. The overall increase in operating income was primarily due to the increase in revenues as described above from gas distribution and pipeline transmission services; partially offset by the decrease in revenues from larger pipeline transmission projects and the negative impact in 2017 related to the temporary suspension or deferral of projects as a result of Hurricane Harvey. The decrease in operating income as a percentage of segment revenues in 2018 was primarily due to the recognition of $52.7 million of asset impairment and other charges related to the winding down of certain oil-influenced operations and assets, including a write-down of certain long-lived assets held for sale, and a loss on the disposition of a long-lived asset. Additionally, operating income during 2018 was negatively impacted by $49.8 million of project losses associated with two projects, including engineering and production delays on a processing facility construction project in Texas that was 88% complete at December 31, 2018 and production issues and the impact of severe weather conditions on a large gas transmission project in West Virginia that was 99% complete at December 31, 2018. Operating income during 2017 was negatively impacted by lower margins on two distribution MSAs that resulted from unexpected delays in the release of work after crews were mobilized and also by increased costs associated with certain Canadian pipeline transmission projects resulting from adverse weather conditions, delays and other production issues.

Corporate and Non-allocated Costs

Certain selling, general and administrative expenses and amortization of intangible assets are not allocated to segments. Corporate and non-allocated costs for the year ended December 31, 2018 decreased $31.2 million to $292.2 million compared to the year ended December 31, 2017. This decrease was primarily due to a $58.1 million decrease in goodwill and intangible asset impairment charges and a $6.0 million decrease in liabilities associated with deferred compensation plans. These decreases were partially offset by a $21.8 million increase in compensation expenses, largely associated with increased personnel to support business growth, annual and incentive compensation increases and increased stock-based compensation expense related to improved forecasted achievement of multi-year performance metrics; an $11.8 million increase in intangible amortization, primarily related to the Stronghold acquisition; and a $6.7 million increase in acquisition-related costs.

2017 compared to 2016

Electric Power Infrastructure Services Segment Results

Revenues for this segment increased $749.3 million, or 15.4%, to $5.60 billion for the year ended December 31, 2017. This increase was primarily due to increased customer spending associated with larger electric transmission projects, which primarily resulted from interconnections with new generation facilities and modernization of the North American electric power grid; a $143.8 million increase in emergency restoration services revenues, which primarily resulted from Hurricanes Harvey and Irma and winter storms across the United States and Canada; an approximate $40 million increase in revenues from acquired companies; and an approximate $27 million increase in revenues due to favorable foreign currency exchange rates, primarily attributable to

the relationship between the U.S. dollar and the Canadian and Australian dollars. These items were partially offset by delays on certain projects during 2017, including as a result of work disruptions, deferrals and cancellations related to Hurricanes Harvey and Irma; a decrease in renewable energy services revenues; and a decrease in revenues associated with a power plant project in Alaska, as the project was substantially completed in the fourth quarter of 2016.

Operating income increased $122.4 million, or 30.9%, to $518.1 million for the year ended December 31, 2017. Operating income as a percentage of segment revenues increased to 9.3% for the year ended December 31, 2017 from 8.2% for the year ended December 31, 2016. These increases were primarily due to $54.8 million of project losses on a power plant project in Alaska that were recognized during 2016 and an increase in emergency restoration services revenues, which typically yield higher margins due in part to higher equipment utilization and absorption of fixed costs. These items were partially offset by $17.3 million of project losses on an electric transmission project that were recognized during 2017 due to road access, subcontractor and labor production issues; delays on certain projects during 2017, including as a result of work disruptions, deferrals, cancellations and employee support costs due to Hurricanes Harvey and Irma; and an increase in expenses incurred to support the growth of our communications services operations.

Pipeline and Industrial Infrastructure Services Segment Results

Revenues for this segment increased $1.07 billion, or 38.1%, to $3.87 billion for the year ended December 31, 2017. This increase was primarily due to an increase in capital spending by our customers on larger gas pipeline transmission projects, the timing of which is highly variable due to delays associated with obtaining permits, worksite access limitations related to environmental regulations and seasonality of weather patterns; an approximate $190 million increase in revenues from acquired businesses; an approximate $26 million increase in revenues due to favorable foreign currency exchange rates, primarily attributable to the relationship between the U.S. dollar and the Canadian dollar; and project delays due to forest fires in Alberta, Canada during 2016.

Operating income increased $34.6 million, or 23.1%, to $184.1 million for the year ended December 31, 2017. Operating income as a percentage of segment revenues decreased to 4.8% for the year ended December 31, 2017 from 5.3% for the year ended December 31, 2016. These changes were positively impacted by an increase in the proportion of larger gas pipeline transmission projects, which typically yield higher margins. In addition, overall higher revenues in the segment allowed for better coverage of fixed and overhead costs. These increases were offset by higher costs associated with adverse weather conditions, including delays and other production issues on certain Canadian pipeline transmission projects during 2017, and the temporary suspension or deferral of several projects as a result of Hurricane Harvey during 2017.

Corporate and Non-allocated Costs

Certain selling, general and administrative expenses and amortization of intangible assets are not allocated to segments. Corporate and non-allocated costs for the year ended December 31, 2017 increased $98.9 million to $323.4 million compared to the year ended December 31, 2016. The increase was primarily due to $58.1 million of goodwill and intangible asset impairment charges recognized in 2017; an increase in compensation costs, which were largely associated with higher incentive compensation based on profitability; an increase in acquisition and integration costs; an increase in costs associated with ongoing technology and business development initiatives; $4.2 million of legal costs during 2017 that were associated with our prior disposition of certain communications operations; and a $2.4 million charitable contribution during 2017 that was associated with the formation of a non-profit line training school. These items were partially offset by a $5.2 million decrease in the fair value of certain contingent consideration liabilities that was recognized during 2017 and $4.0 million associated with the departure of our former president and chief executive officer that was recognized during 2016.

Liquidity and Capital Resources

Cash Requirements

Amounts related to our cash and cash equivalents based on geographic location of the bank accounts were as follows (in thousands):

	December 31,	
	2018	2017
Cash and cash equivalents held in domestic bank accounts	$ 62,495	$ 83,074
Cash and cash equivalents held in foreign bank accounts	16,192	55,211
Total cash and cash equivalents	$ 78,687	$ 138,285

Cash and cash equivalents held by joint ventures, which are either consolidated or proportionately consolidated, are available to support joint venture operations, but we cannot utilize those assets to support our other operations. We generally have no right to the joint ventures' cash and cash equivalents other than participating in distributions and in the event of dissolution. Amounts related to cash and cash equivalents held by joint ventures, which are included in our total cash and cash equivalents balances, were as follows (in thousands):

	December 31,	
	2018	2017
Cash and cash equivalents held by domestic joint ventures	$ 8,544	$ 10,042
Cash and cash equivalents held by foreign joint ventures	441	6,615
Total cash and cash equivalents held by joint ventures	8,985	16,657
Cash and cash equivalents not held by joint ventures	69,702	121,628
Total cash and cash equivalents	$ 78,687	$ 138,285

At December 31, 2018, we were in compliance with the covenants under the credit agreement for our senior secured credit facility. We anticipate that our cash and cash equivalents on hand, existing borrowing capacity under our senior secured credit facility, and future cash flows from operations will provide sufficient funds to enable us to meet our debt repayment obligations, future operating needs and planned capital expenditures during 2019, as well as facilitate our ability to grow through acquisitions or otherwise in the foreseeable future.

Our industry is capital intensive, and we expect the need for substantial capital expenditures to continue into the foreseeable future to meet the anticipated demand for our services, all of which may require cash. Total capital expenditures are expected to be approximately $260 million to $275 million for 2019.

We also evaluate opportunities for strategic acquisitions, stock repurchases under our authorized stock repurchase programs and opportunities to invest in strategic partnerships with customers and infrastructure investors. These investment opportunities exist in the markets and industries we serve and may require the use of cash to purchase debt or equity investments.

Management monitors financial markets and national and global economic conditions for factors that may affect our liquidity and capital resources. We consider our investment policies related to cash and cash equivalents to be conservative in that we maintain a diverse portfolio of what we believe to be high-quality cash and cash equivalent investments with short-term maturities. Accordingly, we do not anticipate that any weakness in the capital markets will have a material impact on the principal amounts of our cash and cash equivalents or our ability to rely upon our senior secured credit facility for funds. To date, we have not experienced a loss of or lack of access to our cash or cash equivalents or funds under our senior secured credit facility; however, our access to invested cash and cash equivalents or availability under our senior secured credit facility could be impacted in the future by adverse conditions in financial markets.

We generally do not provide for taxes related to undistributed earnings of our foreign subsidiaries because such earnings either would not be taxable when remitted or they are considered to be indefinitely reinvested. We could also be subject to additional foreign withholding taxes if we were to repatriate cash that is indefinitely reinvested outside the United States, but we do not expect such amounts to be material.

Sources and Uses of Cash

As of December 31, 2018, we had cash and cash equivalents of $78.7 million and working capital of $1.52 billion. We had $1.07 billion of outstanding loans under our senior secured credit facility, which included $592.5 million outstanding under the term loan facility and $477.8 million of outstanding revolving loans. Of the total outstanding borrowings, $883.8 million were denominated in U.S. dollars, $102.6 million were denominated in Canadian dollars and $83.9 million were denominated in Australian dollars. We also had $412.9 million of outstanding letters of credit and bank guarantees under our senior secured credit facility, $242.2 million of which were denominated in U.S. dollars and $170.7 million of which were denominated in currencies other than the U.S. dollar, primarily Australian or Canadian dollars. As of December 31, 2018, our senior secured credit facility had $1.09 billion available for loans or issuing new letters of credit or bank guarantees.

In summary, our cash flows for each period were as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Net cash provided by operating activities of continuing operations	$ 358,789	$ 371,891	$ 390,749
Net cash used in investing activities of continuing operations	(402,670)	(572,084)	(264,379)
Net cash provided by (used in) financing activities of continuing operations	(16,570)	227,764	(133,836)

Operating Activities

Cash flow from operations is primarily influenced by demand for our services and operating margins but can also be influenced by working capital needs associated with the various types of services that we provide. In particular, working capital needs may increase when we commence large volumes of work under circumstances where project costs, primarily labor, equipment and subcontractors, are required to be paid before the associated receivables are billed and collected. Accordingly, changes within working capital in accounts receivable, contract assets and contract liabilities are normally related and are typically affected on a collective basis by changes in revenue due to the timing and volume of work performed and variability in the timing of customer billings and payments. Additionally, working capital needs are generally higher during the summer and fall months due to increased demand for our services when favorable weather conditions exist in many of our operating regions. Conversely, working capital assets are typically converted to cash during the winter months. These seasonal trends can be offset by changes in project timing due to delays or accelerations and other economic factors that may affect customer spending.

Net cash provided by operating activities during 2018 and 2017 were favorably impacted by increases in earnings from continuing operations. However, we had higher working capital requirements during 2018 driven by the increase in 2018 revenues, particularly the increased activity in the fourth quarter of 2018 when compared to the fourth quarter of 2017, and higher working capital requirements during 2017 primarily related to variability in billing and payment terms across various projects and an increase in accounts receivable associated with emergency restoration services work performed late in 2017. Also impacting cash provided by operating activities during 2017 was a $25.5 million payment related to the settlement of certain multiemployer pension plan withdrawal liabilities associated with the Central States, Southeast and Southwest Areas Pension Plan and a reduction in cash tax payments due to the acceleration of certain tax deductions.

Days sales outstanding (DSO) as of December 31, 2018 was 74 days, as compared to 76 days as of December 31, 2017. DSO is calculated by using the sum of current accounts receivable, net of allowance (which includes retainage and unbilled balances), plus contract assets less contract liabilities, divided by average revenues per day during the quarter.

Investing Activities

Net cash used in investing activities of continuing operations during 2018 included $293.6 million used for capital expenditures; $94.9 million used for acquisitions; $36.9 million of cash paid for investments in unconsolidated affiliates and other entities, including $18.5 million for our acquisition of a 30% interest in a water and gas pipeline infrastructure contractor located in Australia and $14.9 million related to a limited partnership that is involved in an engineering, procurement and construction electric transmission project in Canada; and $14.4 million of cash paid for intangible assets. These items were partially offset by $31.8 million of proceeds from the sale of property and equipment.

Net cash used in investing activities of continuing operations during 2017 included $361.2 million used for acquisitions, $347.5 million of which was associated with the Stronghold acquisition; $244.7 million used for capital expenditures; and $56.5 million of cash paid related to investments in unconsolidated affiliates and other entities, primarily associated with the limited partnership mentioned above. These items were partially offset by $65.8 million of cash distributions from investments in unconsolidated affiliates and other entities, primarily from the limited partnership mentioned above and $23.3 million of proceeds from the sale of property and equipment.

Net cash used in investing activities of continuing operations during 2016 included $212.6 million used for capital expenditures and $68.8 million used for acquisitions. These items were partially offset by $22.0 million of proceeds from the sale of property and equipment.

Our industry is capital intensive, and we expect the need for substantial capital expenditures to continue into the foreseeable future to meet the anticipated demand for our services. We also have various contractual obligations related to investments in unconsolidated affiliates and other capital commitments that are detailed in *Contractual Obligations* below. In addition, we expect to continue to pursue strategic acquisitions and investments, although we cannot predict the timing or magnitude of the potential cash outlays for these initiatives.

Additionally, certain of our acquisitions included the potential payment of contingent consideration, payable in the event certain performance objectives are achieved by the acquired businesses. The majority of these contingent consideration liabilities are subject to a maximum payment amount, which totaled $157.2 million as of December 31, 2018. Included within this maximum amount is approximately $18.0 million related to certain 2018 acquisitions, payable if the acquired businesses achieve certain performance objectives over three-year and five-year post-acquisition periods, and approximately $100.0 million related to the 2017 acquisition of Stronghold, payable at the end of a three-year post-acquisition period if the acquired business achieves certain performance objectives. The significant majority of these liabilities would be paid at least 70% to 85% in cash, and the aggregate fair value of all of our contingent consideration liabilities was $70.8 million as of December 31, 2018.

Financing Activities

Net cash used in financing activities of continuing operations during 2018 included $443.2 million of common stock repurchases under our stock repurchase programs and $15.2 million of payments to satisfy tax withholding obligations associated with share-based compensation. These items were mostly offset by $415.3 million of net borrowings under our senior secured credit facility and $33.8 million of net short-term debt borrowings.

Net cash provided by financing activities of continuing operations during 2017 included $307.9 million of net borrowings under our senior secured credit facility. This cash provided was partially offset by $50.0 million of common stock repurchases under our stock repurchase programs and $18.5 million of payments to satisfy tax withholding obligations associated with share-based compensation. Net borrowings during 2017 were primarily utilized to fund the cash portion of the consideration paid at closing for the Stronghold acquisition and additional working capital requirements associated with increases in emergency restoration services projects and the number and size of ongoing pipeline and industrial infrastructure projects.

Net cash used in financing activities of continuing operations during 2016 included $116.2 million of net repayments under our senior secured credit facility and $8.3 million of payments to satisfy tax withholding obligations associated with share-based compensation.

Stock Repurchases

During the years ended December 31, 2018 and 2017, we repurchased 13.9 million and 1.4 million shares of our common stock in the open market at a cost of $451.3 million and $50.0 million, respectively. Our policy is to record a stock repurchase as of the trade date; however, the payment of cash related to a repurchase is made on the settlement date of the trade. During the years ended December 31, 2018 and 2017, cash payments related to stock repurchases were $443.2 million and $50.0 million. At December 31, 2018, $298.7 million remained under our current repurchase program. In January and February 2019, we have repurchased an additional 0.3 million shares of our common stock in the open market at a cost of $8.0 million. For additional detail about our stock repurchases, refer to Note 10 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.*

Dividends

On December 6, 2018, we declared a cash dividend of $0.04 per share of our common stock, which was paid on January 16, 2019 to stockholders of record as of January 2, 2019. Holders of restricted stock units on the record date received a cash dividend equivalent payment on the payment date, and holders of unearned and unvested performance units are entitled to cash dividend equivalent payments to the extent such performance units become earned and vest. Cash dividend equivalents related to certain vested and unvested equity awards that have been deferred pursuant to the terms of a deferred compensation plan maintained by Quanta are recorded as liabilities in such plans until the deferred awards are distributed. Additionally, holders of exchangeable shares of certain of our Canadian subsidiaries on the record date were paid a cash dividend of $0.04 per exchangeable share as of the payment date. At December 31, 2018, we accrued $5.8 million for cash dividends and cash dividend equivalents, and in January 2019, we paid the substantial majority of this amount.

The declaration, payment and amount of future cash dividends, if any, will be at the discretion of our Board of Directors after taking into account various factors, including our financial condition, results of operations, cash flows from operations, current and anticipated capital requirements and expansion plans, the income tax laws then in effect and the requirements of Delaware law. In addition, as discussed below, our credit agreement restricts the payment of cash dividends unless certain conditions are met.

Debt Instruments

Senior Secured Credit Facility

We have a credit agreement with various lenders that, as amended on October 10, 2018, provides for (i) a $1.99 billion revolving credit facility and (ii) a term loan facility with total term loan commitments of $600.0 million. In addition, subject to the conditions specified in the credit agreement, we have the option to increase the capacity of the credit facility, in the form of

an increase in the revolving credit facility, incremental term loans or a combination thereof, by up to an additional $400.0 million, from time to time, upon receipt of additional commitments from new or existing lenders. Borrowings under the credit agreement are to be used to refinance existing indebtedness and for working capital, capital expenditures and other general corporate purposes. The maturity date for both the revolving credit facility and the term loan facility is October 31, 2022, and we are required to make quarterly principal payments on the term loan facility as described below.

With respect to the revolving credit facility, the entire amount available may be used by us for revolving loans and letters of credit in U.S. dollars and certain alternative currencies. Up to $600.0 million may be used by certain of our subsidiaries for revolving loans and letters of credit in certain alternative currencies, up to $100.0 million may be used for swing line loans in U.S. dollars, up to $50.0 million may be used for swing line loans in Canadian dollars and up to $50.0 million may be used for swing line loans in Australian dollars.

On October 10, 2018, we borrowed the full amount of the term loan facility and used all of such proceeds to repay outstanding revolving loans. As of December 31, 2018, we had $1.07 billion of outstanding borrowings under the credit agreement, which included $592.5 million borrowed under the term loan facility and $477.8 million of outstanding revolving loans. Of the total outstanding borrowings, $883.8 million were denominated in U.S. dollars, $102.6 million were denominated in Canadian dollars and $83.9 million were denominated in Australian dollars. We also had $412.9 million of letters of credit and bank guarantees issued under our revolving credit facility, of which $242.2 million were denominated in U.S. dollars and $170.7 million were denominated in currencies other than the U.S. dollar, primarily Canadian and Australian dollars. The remaining $1.09 billion of available commitments under the credit facility was available for loans or issuing new letters of credit and bank guarantees.

Subsequent to November 19, 2017, revolving loans borrowed in U.S. dollars bear interest, at our option, at a rate equal to either (i) the Eurocurrency Rate (as defined in the credit agreement) plus 1.125% to 2.000%, as determined based on our Consolidated Leverage Ratio (as described below), or (ii) the Base Rate (as described below) plus 0.125% to 1.000%, as determined based on our Consolidated Leverage Ratio. Revolving loans borrowed in any currency other than U.S. dollars bear interest at a rate equal to the Eurocurrency Rate plus 1.125% to 2.000%, as determined based on our Consolidated Leverage Ratio. Additionally, standby or commercial letters of credit issued under the credit agreement are subject to a letter of credit fee of 1.125% to 2.000%, based on our Consolidated Leverage Ratio, and Performance Letters of Credit (as defined in the credit agreement) issued under the credit agreement in support of certain contractual obligations are subject to a letter of credit fee of 0.675% to 1.150%, based on our Consolidated Leverage Ratio. From December 18, 2015 through November 19, 2017, interest rates for revolving loans and letter of credit fees were generally consistent with those set forth above, other than the maximum additional interest rates and fee percentages were 0.125% higher.

Term loans bear interest at rates generally consistent with the revolving loans borrowed in U.S. dollars, except that the additional amount over the Eurocurrency Rate is 1.125% to1.875%, based on our Consolidated Leverage Ratio. We are also required to make quarterly principal payments of $7.5 million on the last business day of each March, June, September and December, which began in December 2018. The aggregate outstanding principal amount of all outstanding term loans must be paid on the maturity date; however, we may voluntarily prepay that amount from time to time, in whole or in part, without premium or penalty.

We are also subject to a commitment fee of 0.20% to 0.40%, based on our Consolidated Leverage Ratio, on any unused availability under the revolving credit facility.

Consolidated Leverage Ratio is the ratio of our Consolidated Funded Indebtedness to Consolidated EBITDA (as those terms are defined in the credit agreement). For purposes of calculating our Consolidated Leverage Ratio, Consolidated Funded Indebtedness is reduced by available cash and cash equivalents (as defined in the credit agreement) in excess of $25.0 million. The Base Rate equals the highest of (i) the Federal Funds Rate (as defined in the credit agreement) plus 0.5%, (ii) the prime rate publicly announced by Bank of America, N.A. and (iii) the Eurocurrency Rate plus 1.00%. Consolidated Interest Coverage Ratio is the ratio of (i) Consolidated EBIT (as defined in the credit agreement) for the four fiscal quarters most recently ended to (ii) Consolidated Interest Expense (as defined in the credit agreement) for such period (excluding all interest expense attributable to capitalized loan costs and the amount of fees paid in connection with the issuance of letters of credit on our behalf during such period).

The credit agreement contains certain covenants, including (i) a maximum Consolidated Leverage Ratio of 3.0 to 1.0 (except that in connection with certain permitted acquisitions in excess of $200.0 million, such ratio is 3.5 to 1.0 for the fiscal quarter in which the acquisition is completed and the two subsequent fiscal quarters) and (ii) a minimum Consolidated Interest Coverage Ratio of 3.0 to 1.0. As of December 31, 2018, we were in compliance with all of the covenants under the credit agreement.

Subject to certain exceptions, (i) all borrowings under the credit agreement are secured by substantially all of our assets and the assets of our wholly owned U.S. subsidiaries and by a pledge of all of the capital stock of our wholly owned U.S. subsidiaries and 65% of the capital stock of direct foreign subsidiaries of our wholly owned U.S. subsidiaries and (ii) our wholly owned U.S. subsidiaries guarantee the repayment of all amounts due under the credit agreement. Subject to certain conditions, all collateral will automatically be released from the liens at any time we maintain an Investment Grade Rating (defined in the credit agreement

as two of the following three conditions being met: (i) a corporate credit rating that is BBB- or higher by Standard & Poor's Rating Services, (ii) a corporate family rating that is Baa3 or higher by Moody's Investors Services, Inc. or (iii) a corporate credit rating that is BBB- or higher by Fitch Ratings, Inc.).

The credit agreement also limits certain acquisitions, mergers and consolidations, indebtedness, asset sales and prepayments of indebtedness and, subject to certain exceptions, prohibits liens on our assets. The credit agreement allows cash payments for dividends and stock repurchases subject to compliance with the following requirements (after giving effect to the dividend or stock repurchase): (i) no default or event of default under the credit agreement; (ii) continued compliance with the financial covenants in the credit agreement; and (iii) at least $100.0 million of availability under the revolving credit facility and/or cash and cash equivalents on hand.

The credit agreement provides for customary events of default and contains cross-default provisions with our underwriting, continuing indemnity and security agreement with our sureties and certain other debt instruments exceeding $150.0 million in borrowings or availability. If an Event of Default (as defined in the credit agreement) occurs and is continuing, on the terms and subject to the conditions set forth in the credit agreement, the lenders may declare all amounts outstanding and accrued and unpaid interest immediately due and payable, require that we provide cash collateral for all outstanding letter of credit obligations, terminate the commitments under the credit agreement, and foreclose on the collateral.

Off-Balance Sheet Transactions

As is common in our industry, we have entered into certain off-balance sheet arrangements in the ordinary course of business that result in risks not directly reflected in our balance sheets. Our significant off-balance sheet transactions include certain obligations relating to our investments and joint venture arrangements, liabilities associated with non-cancelable operating leases, letters of credit obligations, surety guarantees related to performance bonds, committed expenditures to purchase equipment and certain multiemployer pension plan liabilities. See *Contractual Obligations* below and Note 14 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for a description of these arrangements.

Contractual Obligations

The following table summarizes our future contractual obligations as of December 31, 2018, excluding amounts discussed below related to unrecognized tax benefits, multiemployer pension plan obligations, interest associated with letters of credit and bank guarantees, commitment fees under our senior secured credit facility, commitments associated with our insurance liabilities and acquisition-related contingent consideration liabilities (in thousands):

	Total	2019	2020	2021	2022	2023	Thereafter
Long-term debt - principal [(1)]	$ 1,071,822	$ 31,522	$ 30,000	$ 30,000	$ 980,300	$ —	$ —
Long-term debt - cash interest [(2)]	6	6	—	—	—	—	—
Short-term debt [(3)]	33,422	33,422	—	—	—	—	—
Operating lease obligations	354,550	124,530	81,189	55,827	34,337	21,450	37,217
Capital lease obligations[(4)]	934	702	112	112	8	—	—
Equipment purchase commitments [(5)]	7,824	7,824	—	—	—	—	—
Capital commitment related to investments in unconsolidated affiliates [(6)]	36,345	36,345	—	—	—	—	—
Total	$ 1,504,903	$ 234,351	$ 111,301	$ 85,939	$ 1,014,645	$ 21,450	$ 37,217

(1) Amounts were recorded in our December 31, 2018 consolidated balance sheet. We had $1.07 billion of outstanding borrowings under the credit agreement, which included $592.5 million borrowed under the term loan facility and $477.8 million of outstanding revolving loans, both of which bear interest at variable market rates. Assuming the principal amount outstanding at December 31, 2018 remained outstanding and the interest rate in effect at December 31, 2018 remained the same, the annual cash interest expense with respect to our senior secured credit facility would be approximately $42.6 million, payable until October 31, 2022, the maturity date of the facility. In addition, we are required to make quarterly principal payments of $7.5 million on the term borrowings, which are due on the last business day of each March, June, September and December, and pay the remaining balance of the term borrowings at the maturity date for the facility.

(2) Amount represents cash interest expense on our fixed-rate long-term debt, which excludes our senior secured credit facility.

(3) Amount was recorded in our December 31, 2018 consolidated balance sheet.

(4) Principal amounts of capital lease obligations were recorded in our December 31, 2018 consolidated balance sheet.

(5) Amount represents capital committed for the expansion of our vehicle fleet in order to accommodate manufacturer lead times on certain types of vehicles. Although we have committed to the purchase of these vehicles at the time of their delivery, we expect that these orders will be assigned to third party leasing companies and be made available to us under certain of our master equipment lease agreements, which will release us from our capital commitment.

(6) Amount represents outstanding capital commitments associated with investments in unconsolidated affiliates. An additional capital commitment of $0.7 million is anticipated to be paid by May 31, 2022; however we have excluded this capital commitment from the Contractual Obligations table because we are unable to determine the timing of this payment. Additionally, during the year ended December 31, 2017, we formed a partnership with select investors that provides up to $1.0 billion of capital, including approximately $80.0 million from us, available to invest in certain specified types of infrastructure projects through August 2024. Because we are not obligated to invest this amount and are unable to determine the timing of any such investments, we have excluded this capital commitment from the Contractual Obligations table other than $13.7 million that was contributed in February 2019.

Unrecognized Tax Benefits

Quanta and certain subsidiaries remain under examination by various U.S. state, Canadian and other foreign tax authorities for multiple periods. We believe it is reasonably possible that within the next 12 months unrecognized tax benefits may decrease by up to $9.5 million as a result of settlement of these examinations or the expiration of certain statute of limitations periods. Because we are unable to accurately predict the timing and amounts of any obligations related to unrecognized tax benefits, we have excluded unrecognized tax benefits from the Contractual Obligations table.

Multiemployer Pension Plans

The previously presented table of estimated contractual obligations does not reflect the obligations under the multiemployer pension plans in which our union employees participate. Some of our operating units are parties to various collective bargaining agreements with unions that represent certain of their employees. The agreements require the operating units to pay specified wages, provide certain benefits to their union employees and contribute certain amounts to multiemployer pension plans and employee benefit trusts. Our multiemployer pension plan contribution rates generally are specified in the collective bargaining agreements (usually on an annual basis), and contributions are made to the plans on a “pay-as-you-go” basis based on our union employee payrolls. The location and number of union employees that we employ at any given time and the plans in which they may participate vary depending on the projects we have ongoing at any time and the need for union resources in connection with those projects. Therefore, we are unable to accurately predict our union employee payroll and the amount of the resulting multiemployer pension plan contribution obligations for future periods.

We may also be required to make additional contributions to our multiemployer pension plans if they become underfunded, and these additional contributions will be determined based on our union employee payrolls. The Pension Protection Act of 2006 added special funding and operational rules generally applicable to plan years beginning after 2007 for multiemployer plans that are classified as “endangered,” “seriously endangered” or “critical” status based on multiple factors (including, for example, the plan’s funded percentage, cash flow position and whether it is projected to experience a minimum funding deficiency). Plans in these classifications must adopt measures to improve their funded status through a funding improvement or rehabilitation plan, as applicable, which may require additional contributions from employers (which may take the form of a surcharge on benefit contributions) and/or modifications to retiree benefits. Certain multiemployer plans to which our operating units contribute or may contribute in the future are in “endangered,” “seriously endangered” or “critical” status. The amount of additional funds, if any, that we may be obligated to contribute to these plans in the future cannot be reasonably estimated and are not included in the above table due to uncertainty of the future levels of work that require the specific use of the union employees covered by these plans, as well as the future contribution levels and possible surcharges on contributions applicable to these plans.

We may be subject to additional liabilities imposed by law as a result of our participation in multiemployer defined benefit pension plans. The Employee Retirement Income Security Act of 1974, as amended by the Multiemployer Pension Plan Amendments Act of 1980, imposes certain liabilities upon an employer who is a contributor to a multiemployer plan if the employer withdraws from the plan or the plan is terminated or experiences a mass withdrawal. These liabilities include an allocable share of the unfunded vested benefits in the plan for all plan participants, not merely the benefits payable to a contributing employer’s own retirees. As a result, participating employers may bear a higher proportion of liability for unfunded vested benefits if other participating employers cease to contribute or withdraw, with the reallocation of liability being more acute in cases when a withdrawn employer is insolvent or otherwise fails to pay its withdrawal liability. We are not aware of any material amounts of withdrawal liability that have been incurred or asserted and that remain outstanding as a result of our withdrawal from a multiemployer defined benefit pension plan.

Letters of Credit and Bank Guarantee Fees and Commitment Fees

We have excluded from the Contractual Obligations table interest associated with letters of credit and bank guarantees and commitment fees under our senior secured credit facility because the outstanding letters of credit and bank guarantees, availability and applicable interest rates and fees are variable. Assuming that the amount of letters of credit and bank guarantees outstanding and the interest rate as of December 31, 2018 remained the same, the annual cash interest expense for our letters of credit and bank guarantees would be approximately $4.7 million. For additional information regarding our letters of credit and bank guarantees and the interest rates and fees associated with these items and our borrowings under our senior secured credit facility, see *Liquidity and Capital Resources — Debt Instruments* above.

Insurance

We are insured for employer's liability, workers' compensation, auto liability and general liability claims. Under these programs, the deductible for employer's liability is $1.0 million per occurrence, the deductible for workers' compensation is $5.0 million per occurrence, and the deductibles for auto liability and general liability are $10.0 million per occurrence. We manage and maintain a portion of our casualty risk through our wholly-owned captive insurance company, which insures all claims up to the amount of the applicable deductible of our third-party insurance programs. In connection with our casualty insurance programs, we are required to issue letters of credit to secure our obligations. We also have employee health care benefit plans for most employees not subject to collective bargaining agreements, of which the primary plan is subject to a deductible of $0.5 million per claimant per year.

Losses under all of these insurance programs are accrued based upon our estimate of the ultimate liability for claims reported and an estimate of claims incurred but not reported, with assistance from third-party actuaries. These insurance liabilities are difficult to assess and estimate due to unknown factors, including the severity of an injury, the extent of damage, the determination of our liability in proportion to other parties and the number of incidents not reported. The accruals are based upon known facts and historical trends, and management believes such accruals are adequate. As of December 31, 2018 and 2017, the gross amount accrued for insurance claims totaled $272.9 million and $254.7 million, with $210.1 million and $200.0 million considered to be long-term and included in "Insurance and other non-current liabilities." Related insurance recoveries/receivables as of December 31, 2018 and 2017 were $56.5 million and $50.4 million, of which $0.3 million and $0.4 million were included in "Prepaid expenses and other current assets" and $56.2 million and $50.0 million were included in "Other assets, net."

We renew our insurance policies on an annual basis, and therefore deductibles and levels of insurance coverage may change in future periods. In addition, insurers may cancel our coverage or determine to exclude certain items from coverage, or we may elect not to obtain certain types or incremental levels of insurance based on the potential benefits considered relative to the cost of such insurance. In any such event, our overall risk exposure would increase, which could negatively affect our results of operations, financial condition and cash flows. The Contractual Obligations table excludes commitments associated with our insurance liabilities, as we are unable to determine the timing of payments related to these obligations.

Contingent Consideration Liabilities

We have excluded from the Contractual Obligations table acquisition-related contingent consideration liabilities, which represent the estimated fair value of future amounts payable to the former owners of certain acquired businesses, because the amounts have not been earned and we are unable to determine the portion of the liabilities that will be settled in cash and the exact timing of any such payments as of December 31, 2018. Payment of such consideration is contingent upon achievement of certain performance objectives by the acquired businesses, and the fair value of such consideration is estimated by management based on entity-specific assumptions that are evaluated on an ongoing basis. As of December 31, 2018 and 2017, the aggregate fair value of these outstanding and unearned contingent consideration liabilities totaled $70.8 million and $65.7 million, all of which was included in "Insurance and other non-current liabilities" on our consolidated balance sheets. Because acquisition-related contingent consideration liabilities are contingent upon future events, we include these liabilities in the Contractual Obligations table when the contingencies are resolved. We expect a significant portion of these liabilities to be settled by late 2020 or early 2021.

The fair values of the contingent consideration liabilities as of December 31, 2018 were primarily determined using a Monte Carlo simulation valuation methodology based on probability-weighted performance projections and other inputs, including a discount rate and an expected volatility factor for each acquisition. The expected volatility factors ranged from 22.2% to 30.0% based on historical asset volatility of selected guideline public companies. Depending on contingent consideration payment terms, the present values of the estimated payments are discounted based on a risk-free rate and/or our cost of debt, ranging from 2.1% to 3.8%. The fair value determinations incorporate significant inputs not observable in the market. Accordingly, the level of inputs used for these fair value measurements is the lowest level (Level 3), as further described in Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data*. Significant changes in any of these assumptions could result in a significantly higher or lower potential liability.

The majority of our contingent consideration liabilities are subject to a maximum payment amount, which totaled $157.2 million as of December 31, 2018. One contingent consideration liability is not subject to a maximum payout amount, and that liability had a fair value of $1.0 million as of December 31, 2018.

Our aggregate contingent consideration liabilities can change due to additional business acquisitions, payments to settle outstanding liabilities, changes in the fair value of amounts owed based on actual or forecasted performance, and foreign currency translation gains or losses. During the years ended December 31, 2018, 2017 and 2016, acquisitions increased our aggregate contingent consideration liabilities by $16.5 million, $51.1 million and $18.7 million. During the years ended December 31, 2018 and 2017, we recognized net decreases in the fair value of contingent consideration liabilities of $11.2 million and $5.2 million, which were reflected in "Change in fair value of contingent consideration liabilities" on our consolidated statements of operations.

Concentrations of Credit Risk

We are subject to concentrations of credit risk related primarily to our cash and cash equivalents and our net receivable position with customers, which includes amounts related to billed and unbilled accounts receivable and contract assets net of advanced billings with the same customer. Substantially all of our cash and cash equivalents are managed by what we believe to be high credit quality financial institutions. In accordance with our investment policies, these institutions are authorized to invest cash and cash equivalents in a diversified portfolio of what we believe to be high quality cash and cash equivalent investments, which consist primarily of interest-bearing demand deposits, money market investments and money market mutual funds. Although we do not currently believe the principal amount of these cash and cash equivalents is subject to any material risk of loss, changes in economic conditions could impact the interest income we receive from these investments. In addition, we grant credit under normal payment terms, generally without collateral, to our customers, which include electric power and energy companies, governmental entities, general contractors, and builders, owners and managers of commercial and industrial properties located primarily in the United States, Canada, Australia and Latin America. Consequently, we are subject to potential credit risk related to changes in business and economic factors throughout these locations, which may be heightened as a result of uncertain economic and financial market conditions. However, we generally have certain statutory lien rights with respect to services provided. Some of our customers have experienced significant financial difficulties (including bankruptcy), and customers may experience financial difficulties in the future. These difficulties expose us to increased risk related to collectability of billed and unbilled receivables and contract assets for services we have performed.

PG&E Bankruptcy. On January 29, 2019, one of our largest customers, PG&E, filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code, as amended. We are monitoring the bankruptcy proceeding and evaluating the treatment of, and potential claims related to, our pre-petition receivables, which we currently estimate total approximately $150 million as of the bankruptcy filing date. We currently believe we will ultimately collect the amounts owed, whether through assumption of certain executory contracts or through amounts approved by the bankruptcy court for payment to certain of PG&E's safety and reliability suppliers. As with any bankruptcy, that belief is based on a number of assumptions that are potentially subject to change as the bankruptcy proceeding progresses. Should any of those assumptions change, the amount collected could be materially less than the amount of our pre-petition receivables. Additionally, we are continuing to perform services for PG&E while the bankruptcy matter is ongoing and believe that amounts billed for post-petition services will be collected in the ordinary course.

At December 31, 2018 and 2017, no customer represented 10% or more of our consolidated net receivable position. No customer represented 10% or more of our consolidated revenues for the years ended December 31, 2018, 2017 and 2016.

Project Insurance Claim

In June 2018, while performing a horizontal directional drill and installing an underground gas pipeline, one of our subsidiaries experienced a partial collapse of a borehole. Subsequent to the incident, we have been working with our customer to mitigate the impact of the incident and to complete the project, and have encountered additional challenges similar to those experienced previously. As required by the contract, the customer procured certain insurance coverage for the project, with our subsidiary as an additional insured. We believe the incident is covered under such insurance and are working collaboratively with the customer to pursue insurance claims with the customer's insurance carriers. To the extent such claims are not successful, we could pursue contractual relief from the customer or seek partial recovery under our own insurance policies.

As of December 31, 2018, we recorded an insurance receivable of $26.7 million, which represents a portion of the insurance claims being pursued as of such date and management's estimate of the amount of costs incurred through such date that are probable of recovery. We expect the insurance claims and the amount of insurance receivable to increase in future periods as additional mitigation costs are incurred, which could be significant. The plan and related work to mitigate the incident are not complete, may change and will be subject to inherent risks associated with underground pipeline installation, which could cause the costs to mitigate the incident to increase materially. To the extent we are unsuccessful in realizing insurance or contractual recoveries, additional charges to operating results, which could be material, would be required.

Legal Proceedings

We are from time to time party to various lawsuits, claims and other legal proceedings that arise in the ordinary course of business. These actions typically seek, among other things, compensation for alleged personal injury, breach of contract and/or property damages, employment-related damages, punitive damages, civil penalties or other losses, or injunctive or declaratory relief. With respect to all such lawsuits, claims and proceedings, we record a reserve when it is probable that a loss has been incurred and the amount of loss can be reasonably estimated. In addition, we disclose matters for which management believes a material loss is at least reasonably possible. See Note 14 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for additional information regarding litigation, claims and other legal proceedings.

Related Party Transactions

In the normal course of business, we enter into transactions from time to time with related parties. Our significant related party transactions typically involve real property and facility leases with prior owners of certain acquired companies.

Inflation

Due to relatively low levels of inflation experienced during the years ended December 31, 2018, 2017 and 2016, inflation did not have a significant effect on our results of operations, financial condition or cash flows.

Critical Accounting Policies

The discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with GAAP. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosures of contingent assets and liabilities known to exist as of the date the consolidated financial statements are published and the reported amounts of revenues and expenses recognized during the periods presented. We review all significant estimates affecting our consolidated financial statements on a recurring basis and record the effect of any necessary adjustments prior to their publication. Judgments and estimates are based on our beliefs and assumptions derived from information available at the time such judgments and estimates are made. Uncertainties with respect to such estimates and assumptions are inherent in the preparation of financial statements. There can be no assurance that actual results will not differ from those estimates. Management has reviewed its development and selection of critical accounting estimates with the audit committee of our Board of Directors. Our accounting policies are more fully described in Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data*. We believe the following accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements:

Revenue Recognition

As discussed in Note 3 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data*, effective January 1, 2018, we adopted new revenue recognition guidance using the modified retrospective transition method, applying the guidance to contracts with customers that were not substantially complete as of such date. Our financial results for reporting periods after January 1, 2018 are presented under the new guidance, while financial results for prior periods will continue to be reported in accordance with the prior guidance and our historical accounting policy. The net cumulative adjustment due to adoption of the new guidance was a $1.3 million reduction to retained earnings as of January 1, 2018, which represented a $1.8 million decrease to revenue recognized prior to adoption, net of $0.5 million in taxes. This adjustment primarily related to certain contracts that are now accounted for as a single performance obligation but were previously accounted for separately for revenue recognition purposes. We do not anticipate significant changes to the pattern of revenue recognition for contracts with customers and do not believe that the guidance surrounding the identification of contracts and performance obligations or the measurement of variable consideration will have a material impact on revenue recognition under our customary contractual arrangements.

Contracts

We design, install, upgrade, repair and maintain infrastructure for customers in the electric power, energy and communications industries. These services may be provided pursuant to master service agreements (MSAs), repair and maintenance contracts and fixed price and non-fixed price installation contracts. These contracts are classified into three categories based on how transaction prices are determined and revenue is recognized: unit-based contracts, cost-plus contracts and fixed price contracts. Transaction prices for unit-based contracts are determined on a per unit basis, transaction prices for cost-plus contracts are determined by applying a profit margin to costs incurred on the contracts and transaction prices for fixed price contracts are determined on a lump-sum basis. Among other considerations, revenue is not recognized unless collectability under the contract is considered

probable. This determination requires the use of judgment based on our beliefs and assumptions derived from information available at the time such judgments and estimates are made. These estimates may be adjusted as additional information is received.

Performance Obligations

A performance obligation is a promise in a contract with a customer to transfer a distinct good or service. Most of our contracts are considered to have a single performance obligation whereby we are required to integrate complex activities and equipment into a deliverable for the customer. For contracts with multiple performance obligations, we allocate the transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract. The standalone selling price is estimated using the expected costs plus a margin approach for each performance obligation.

At December 31, 2018, the aggregate transaction price allocated to unsatisfied or partially satisfied performance obligations was estimated to be approximately $4.68 billion, of which 66.2% was expected to be recognized in the subsequent twelve months. This amount represents management's estimate of the consolidated revenues that are expected to be realized from the remaining portion of firm orders under fixed price contracts not yet completed or for which work has not yet begun. For purposes of calculating remaining performance obligations, we include all estimated revenues attributable to consolidated joint ventures and VIEs, revenues from funded and unfunded portions of government contracts to the extent they are reasonably expected to be realized and revenues from change orders and claims to the extent management believes additional contract revenues will be earned and are deemed probable of collection. Excluded from remaining performance obligations were potential orders under MSAs and non-fixed price contracts expected to be completed within one year.

Recognition of Revenue Upon Satisfaction of Performance Obligations

A transaction price is determined for each contract, and that amount is allocated to each performance obligation within the contract and recognized as revenue when, or as, the performance obligation is satisfied. We generally recognize revenue over time as we perform our obligations because there is a continuous transfer of control of the deliverable to the customer. Under unit-based contracts with an insignificant amount of partially completed units, we recognize revenue as units are completed based on contractual pricing amounts. Under unit-based contracts with more than an insignificant amount of partially completed units and fixed price contracts, we recognize revenues as performance obligations are satisfied over time, with the percentage completion generally measured as the percentage of costs incurred to total estimated costs for such performance obligation. Under cost-plus contracts, we recognize revenue on an input basis, as labor hours are incurred, materials are utilized and services are performed.

Contract costs include all direct materials, labor and subcontract costs and indirect costs related to contract performance, such as indirect labor, supplies, tools, repairs and depreciation costs. The majority of the materials associated with our work are owner-furnished, and therefore not included in contract revenues and costs.

Contract Estimates

Actual revenues and project costs can vary, sometimes substantially, from previous estimates due to changes in a variety of factors, including unforeseen or changed circumstances not included in our cost estimates or covered by our contracts. The estimating process is based on the professional knowledge and experience of our engineers, project managers and financial professionals. Some of the factors that may lead to changes in estimates include concealed or unknown environmental conditions; changes in the cost of equipment, commodities, materials or labor; unanticipated costs or claims due to delays caused by customers or third parties; customer failure to provide required materials or equipment; errors in engineering, specifications or designs; project modifications or contract termination; weather conditions; changes in estimates related to the length of time to complete a performance obligation; and performance and quality issues requiring rework or replacement. These factors, along with other risks inherent in performing services under fixed price contracts, are routinely evaluated by management. Any changes in estimates could result in changes in profitability or losses associated with the related performance obligations. For example, estimated costs for a performance obligation may increase from the original estimate and contractual provisions may not allow for adequate compensation or reimbursement for such additional costs. Changes in estimated revenues, costs and profit are recorded in the period they are determined to be probable and can be reasonably estimated.

Changes in cost estimates on certain contracts may result in the issuance of change orders and/or claims, which may be approved or unapproved by the customer. We determine the probability that such costs will be recovered based on, among other things, contractual entitlement, past practices with the customer, specific discussions or preliminary negotiations with the customer or verbal approvals by the customer. We recognize amounts associated with change orders and claims as revenue if it is probable that the contract price will be adjusted and the amount of any such adjustment can be reliably estimated. Most of our change orders are for services that are not distinct from an existing contract and are accounted for as part of an existing contract on a cumulative catch-up basis. We account for a change order as a separate contract if the additional goods or services are distinct from and increase the scope of the contract, and the price of the contract increases by an amount commensurate to our standalone selling price for the additional goods or services.

As of December 31, 2018 and 2017, we had recognized revenues of $121.8 million and $144.0 million related to change orders and claims included as contract price adjustments and that were in the process of being negotiated in the normal course of business. These aggregate amounts, which were included in "Contract assets" in the accompanying consolidated balance sheets, represent management's estimates of additional contract revenues that were earned and probable of collection. However, our estimates could be incorrect and the amount ultimately realized could be significantly higher or lower than the estimated amount.

Variable consideration amounts, including performance incentives, early pay discounts and penalties, may also cause changes in contract estimates. The amount of variable consideration is estimated based on the most likely amount that is deemed probable of realization. Contract consideration is adjusted for variable consideration when it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur once the uncertainty related to the variable consideration is resolved.

Changes in contract estimates are recognized on a cumulative catch-up basis in the period in which the revisions to the estimates are made. Such changes in estimates can result in the recognition of revenue in a current period for performance obligations that were satisfied or partially satisfied in prior periods. Such changes in estimates may also result in the reversal of previously recognized revenue if the current estimate differs from the previous estimate. The impact of a change in estimate is measured as the difference between the revenue or gross profit recognized in the prior period as compared to the revenue or gross profit which would have been recognized had the revised estimate been used as the basis of recognition in the prior period. See Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* for information relating to our changes in estimates.

Current and Long-Term Accounts Receivable, Notes Receivable and Allowance for Doubtful Accounts

We provide an allowance for doubtful accounts when collection of an account or note receivable is considered doubtful, and receivables are written off against the allowance when deemed uncollectible. Inherent in the assessment of the allowance for doubtful accounts are certain judgments and estimates regarding, among other factors, our customer's access to capital, our customer's willingness or ability to pay, general economic and market conditions, the ongoing relationship with the customer and uncertainties related to the resolution of disputed matters. We consider accounts receivable delinquent after 30 days but do not generally include delinquent accounts in our analysis of the allowance for doubtful accounts unless the accounts receivable have been outstanding for at least 90 days. We also include accounts receivable balances that relate to customers in bankruptcy or with other known difficulties in our analysis of the allowance for doubtful accounts. Material changes to a customer's business, cash flows or financial condition, which may be impacted by negative economic and market conditions, could affect our ability to collect amounts due. Should anticipated recoveries relating to receivables fail to materialize (including anticipated recoveries relating to existing bankruptcies or other workout situations), we could experience reduced cash flows and losses in excess of current allowances provided. Long-term accounts receivable are included within "Other assets, net" in our consolidated balance sheets.

Insurance

As discussed in *Contractual Obligations — Insurance*, we are insured for employer's liability, workers' compensation, auto liability, general liability, and group health claims, and have recognized certain liabilities and related recoveries associated with these insurance coverages. Losses under all of these insurance programs are accrued based upon our estimate of the ultimate liability for claims reported and an estimate of claims incurred but not reported, with assistance from third-party actuaries. These insurance liabilities are difficult to assess and estimate due to unknown factors, including the severity of an injury, the extent of damage, the determination of our liability in proportion to other parties and the number of incidents not reported. The accruals are based upon known facts and historical trends, and management believes such accruals are adequate. However, our assumptions may be incorrect and our actual liabilities may differ materially from our accruals. Any adjustments to our accrued amounts will be recorded in the period that the experience becomes known.

Valuation of Goodwill

Goodwill, net of accumulated impairment losses, which represents the excess of cost over the fair market value of net tangible and identifiable intangible assets of acquired businesses, is stated at cost. Goodwill is not amortized but instead is annually tested for impairment, or more frequently if events or circumstances indicate that the carrying amount of goodwill may be impaired. We have recorded goodwill in connection with our historical acquisitions of businesses. Upon acquisition, these businesses were either combined into one of our existing operating units or managed on a stand-alone basis as an individual operating unit. Our operating units are organized into one of two internal divisions: the Electric Power Infrastructure Services Division and the Pipeline and Industrial Infrastructure Services Division. As most of the companies acquired by us provide multiple types of services for multiple types of customers, these divisional designations are based on the predominant type of work performed by an operating unit at the point in time the divisional designation is made. Goodwill is required to be measured for impairment at the reporting unit level, which represents the operating segment level or one level below the operating segment level for which discrete financial information is available. We have determined that our individual operating units represent our reporting units for the purpose of assessing goodwill impairment. An annual assessment for impairment is performed for each reporting unit that carries a balance of goodwill.

Our goodwill impairment assessment is performed during the fourth quarter of our fiscal year, or more frequently if events or circumstances arise which indicate that goodwill may be impaired. An assessment can be performed by first completing a qualitative assessment on none, some or all of our reporting units. We can also bypass the qualitative assessment for any reporting unit in any period and proceed directly to the quantitative impairment test, and then resume the qualitative assessment in any subsequent period. Qualitative indicators that may trigger the need for annual or interim quantitative impairment testing include, among other things, deterioration in macroeconomic conditions, declining financial performance, deterioration in the operational environment, or an expectation of selling or disposing of a portion of a reporting unit. Additionally, a significant change in business climate, a loss of a significant customer, increased competition, a sustained decrease in share price, or a decrease in our market capitalization below book value may trigger the need for interim impairment testing of goodwill associated with one or more of our reporting units.

If we believe that, as a result of our qualitative assessment, it is more likely than not that the fair value of a reporting unit is less than its carrying amount, the quantitative impairment test is required. The quantitative test involves comparing the fair value of each of our reporting units with its carrying amount, including goodwill. We determine the fair value of our reporting units using a weighted combination of the income approach (discounted cash flow method) and market multiples valuation techniques (market guideline transaction method and market guideline public company method), with heavier weighting on the discounted cash flow method because management believes this method results in the most appropriate calculation of fair value and reflects an expectation of market value as determined by a "held and used" model.

Under the discounted cash flow method, we determine fair value based on the estimated future cash flows for each reporting unit, discounted to present value using a risk-adjusted industry weighted average cost of capital, which reflects the overall level of inherent risk for each reporting unit and the rate of return an outside investor would expect to earn. Cash flow projections are derived from budgeted amounts (typically a one-year model) and subsequent period cash flows are developed for each reporting unit using growth rates that management believes are reasonably likely to occur. All cash flow projections by reporting unit are evaluated by management. A terminal value is derived from a multiple of the reporting unit's earnings before interest, taxes, depreciation and amortization (EBITDA). The EBITDA multiples for each reporting unit are based on observed purchase transactions for similar businesses adjusted for size, volatility and risk.

Under the market guideline transaction and market guideline public company methods, we determine the estimated fair value of each of our reporting units by applying transaction multiples and public company multiples, respectively, to each reporting unit's projected EBITDA and then averaging that estimate with similar historical calculations using either a one, two or three year average. The transaction multiples are based on observed purchase transactions for similar businesses adjusted for size, volatility and risk. The public company multiples are based on peer group multiples adjusted for size, volatility and risk. For the market guideline public company method, we add a reasonable control premium, which is estimated as the premium that would be appropriate to convert the reporting unit value to a controlling interest basis.

The following table presents the significant estimates used by management in determining the fair values of our reporting units for which a quantitative assessment was performed at December 31, 2018, 2017 and 2016:

	2018	2017	2016
Years of cash flows before terminal value	5 years	5 years	5 years
Weighted average cost of capital	12.0% to 15.0%	12.0% to 14.0%	12.5% to 14.5%
Transaction multiples applied to EBITDA	6.5 to 9.0	5.5 to 7.0	5.5 to 7.0
Guideline public company multiples applied to EBITDA	6.5 to 9.5	6.5 to 8.0	5.5 to 7.0
Five-year revenue compounded annual growth rates	-14% to 8%	-14% to 17%	-2% to 24%
Weighting of three methods:			
Discounted cash flows	70%	70%	70%
Market guideline transaction method	15%	15%	15%
Market guideline public company method	15%	15%	15%

Although no goodwill impairment charges were recorded during the year ended December 31, 2018, the determination of a reporting unit's fair value requires judgment and the use of significant estimates and assumptions. We believe the estimates and assumptions used in our impairment assessments are reasonable and based on available market information obtained from relevant industry sources; however, variations in any of the assumptions could result in materially different calculations of fair value and impairment determinations. Accordingly, management considered the sensitivity of its fair value estimates to changes in certain valuation assumptions. After taking into account a 10% decrease in the fair value of the reporting units for which a quantitative impairment test was performed, two reporting units within our Pipeline and Industrial Infrastructure Services Division would have fair values below their carrying amounts. One of the reporting units is the material handling services business for which a goodwill

impairment was recorded in 2017 as described in Note 2 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data* and the other reporting unit operates within the midstream and smaller-scale pipeline market. Goodwill and intangible assets associated with these two reporting units were $48.0 million and $11.1 million at December 31, 2018.

If an operating unit experiences prolonged periods of declining revenues, operating margins or both, it may be at risk of failing the quantitative goodwill impairment test. The reporting units referenced above have experienced declines over the short-term due to challenging macroeconomic conditions in certain geographic areas and low oil and natural gas prices, which have negatively impacted customer spending and resulted in project cancellations and delays. Additionally, customer capital spending has been constrained as a result of an increasingly complex regulatory and permitting environment. We monitor these conditions and others to determine if it is necessary to perform the quantitative fair-value based impairment test for one or more operating units prior to the annual impairment assessment.

Due to the cyclical nature of our business, and the other factors described above and in Item 1A. *Risk Factors*, the profitability of our individual reporting units may suffer from decreases in customer demand and other factors. These factors may have a disproportionate impact on the individual reporting units as compared to Quanta as a whole and might adversely affect the fair value of individual reporting units. If material adverse conditions occur that impact our reporting units, our future estimates of fair value may not support the carrying amount of one or more of our reporting units, and the related goodwill would need to be written down to an amount considered recoverable.

Valuation of Other Intangible Assets

Our intangible assets include customer relationships, backlog, trade names, non-compete agreements, patented rights and developed technology and curriculum, all of which are subject to amortization, as well as an engineering license, which is not subject to amortization. The value of customer relationships is estimated as of the date a business is acquired based on the value-in-use concept utilizing the income approach, specifically the multi-period excess earnings method. This analysis discounts to present value the projected cash flows attributable to the customer relationships, with consideration given to customer contract renewals and estimated customer attrition rates. The following table presents the significant estimates used by management in determining the fair values of customer relationships associated with acquisitions in the years ended December 31, 2018, 2017 and 2016:

	2018	2017	2016
Discount rates	20% to 27%	17% to 25%	20% to 23%
Customer attrition rates	20% to 33%	15% to 78%	10% to 70%

We value backlog for acquired businesses as of the acquisition date based upon the contractual nature of the backlog within each service line, discounted to present value. The value of trade names and curriculum are estimated using the relief-from-royalty method of the income approach, which is based on the assumption that in lieu of ownership, a company would be willing to pay a royalty for use of the trade name and curriculum. The value of a non-compete agreement is estimated based on the difference between the present value of the prospective cash flows with the agreement in place and the present value of the prospective cash flows without the agreement in place. The value of the engineering license is based on cash paid to acquire the asset.

We amortize the intangible assets that are subject to amortization based upon the estimated consumption of their economic benefits, or on a straight-line basis if the pattern of economic benefit cannot otherwise be reliably estimated. Intangible assets are reviewed for impairment and tested for recoverability whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. For instance, a significant change in business climate or a loss of a significant customer, among other things, may trigger the need for interim impairment testing of intangible assets. An impairment loss is recognized if the carrying amount of an intangible asset is not recoverable and its carrying amount exceeds its fair value. Intangible asset impairments are included within “Asset impairment charges” on our consolidated statements of operations.

Valuation of Long-Lived Assets

We review long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount may not be realizable. If an evaluation is required, the estimated future undiscounted cash flows associated with the asset group are compared to the asset group’s carrying amount to determine if an impairment is necessary. This requires us to make long-term forecasts of the future revenues and costs related to the asset group. Forecasts require assumptions about demand for our products and future market conditions. Estimating future cash flows requires significant judgment, and our projections may vary from the cash flows eventually realized. When an impairment exists, the difference between the fair value of the asset group and its carrying amount is expensed and reflected in operating income (loss) in our consolidated statements of operations. In addition, we estimate the useful lives of our long-lived assets and periodically review these estimates to determine whether they are appropriate. Depreciation expense related to property and equipment is recognized on a straight-line basis over the estimated useful lives of the long-lived assets.

Contingent Consideration Liabilities

As more fully described in *Contractual Obligations — Contingent Consideration Liabilities* above, we have recorded liabilities related to contingent consideration associated with certain acquisitions, the payment of which is contingent upon the achievement of certain performance objectives by the acquired businesses during post-acquisition periods and, if earned, would be payable to the former owners of the acquired businesses. The liabilities recorded represent the estimated fair values of future amounts payable to the former owners and are estimated by management based on entity-specific assumptions that are evaluated on an ongoing basis.

The fair value of contingent consideration liabilities as of December 31, 2018 was primarily determined using a Monte Carlo simulation valuation methodology based on probability-weighted performance projections and other inputs, including a discount rate and an expected volatility factor for each acquisition. The expected volatility factors ranged from 22.2% to 30.0% based on historical asset volatility of selected guideline public companies. Depending on contingent consideration payment terms, the present value of the estimated payments are discounted based on a risk free rate and/or our cost of debt, ranging from 2.1% to 3.8%. The fair value determinations incorporate significant inputs not observable in the market. Accordingly, the level of inputs used for these fair value measurements is the lowest level (Level 3). Significant changes in any of these assumptions could result in a significantly higher or lower potential liability.

Income Taxes

We follow the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recorded based on future tax consequences of temporary differences between the financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates and laws that are expected to be in effect when the underlying assets or liabilities are recovered or settled.

We regularly evaluate valuation allowances established for deferred tax assets for which future realization is uncertain, including in connection with changes in tax laws. The estimation of required valuation allowances includes estimates of future taxable income. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. We consider projected future taxable income and tax planning strategies in making this assessment. If actual future taxable income differs from our estimates, we may not realize deferred tax assets to the extent estimated.

We record reserves for income taxes related to certain tax positions in those instances where we consider it more likely than not that additional taxes may be due in excess of amounts reflected on income tax returns filed. When recording these reserves, we assume that taxing authorities have full knowledge of the position and all relevant facts. We continually review exposure to additional tax obligations, and as further information is known or events occur, changes in tax reserves may be recorded. To the extent interest and penalties may be assessed by taxing authorities on any underpayment of income tax, such amounts have been accrued and included in the provision for income taxes.

U.S. federal and state and foreign income tax laws and regulations are voluminous and are often ambiguous. As such, we are required to make many subjective assumptions and judgments regarding our tax positions that could materially affect amounts recognized in our future consolidated balance sheets, consolidated statements of operations and consolidated statements of comprehensive income. For example, the Tax Act significantly revised the U.S. corporate tax regime, which, among other things, resulted in a reduction of our current and estimated future effective tax rate and a remeasurement of our deferred tax assets and liabilities. For additional information on the Tax Act, refer to *Results of Operations* above and Note 9 of the Notes to Consolidated Financial Statements in Item 8. *Financial Statements and Supplementary Data.*

Outlook

We believe there are growth opportunities across the industries we serve and continue to have a positive long-term outlook. Overall, favorable end-market drivers have spurred demand for infrastructure services in both our Electric Power Infrastructure Services and Pipeline and Industrial Infrastructure Services segments, and we believe both segments are generally in a multi-year up-cycle. Additionally, the traditional electric utility model has evolved since our inception, with many long-standing customers shifting their focus from fossil fuel-based electric power generation to an advanced integrated utility model that is primarily focused on electric transmission and distribution investment, and increasing their focus on gas distribution and ownership of pipeline infrastructure. We have strategically adapted our business over time to respond to these changes, which allows us to collaborate with our customers and create unique solutions that benefit end users. We are focused on long-term profitable growth and continuing to distinguish ourselves through safe execution and best-in-class field leadership. Although not without risks and challenges, including those discussed below and referenced in Item 1A. *Risk Factors* of Part I of this Annual Report and *Uncertainty of Forward-Looking Statements and Information* below, we believe we are well-positioned to capitalize on opportunities and trends in the industries we serve with our full-service operations, broad geographic reach, financial position and technical expertise.

Electric Power Infrastructure Services Segment

We expect demand for electricity in North America to grow over the long term and believe that certain segments of the North American electric power grid are not adequate to efficiently serve the power needs of the future. These factors have affected and will continue to affect reliability, requiring utilities to upgrade, modernize and expand their existing transmission and distribution systems. Furthermore, current federal legislation also requires the power industry to meet federal reliability standards for its transmission and distribution systems. In response to these dynamics, over the past several years, many utilities across North America have begun to implement plans to upgrade their transmission and distribution systems in order to improve reliability and reduce congestion.

As demand for power increases, we expect the need for new power generation facilities to also increase. The development of such facilities, expected to be powered by certain types of traditional energy sources and renewable energy sources such as solar and wind, would necessitate new or expanded transmission infrastructure to transport power to demand centers. Furthermore, we anticipate that the access to low cost natural gas resources from unconventional shale formations in the United States and Canada will continue to increase the amount of electricity generated by natural gas-powered plants. To the extent this dynamic continues, transmission and substation infrastructure will be needed to interconnect new natural gas-fired generation facilities. We also anticipate that modification and reengineering of existing transmission and substation infrastructure will be required as existing coal and nuclear generation facilities are retired or shut down.

With respect to distribution systems, a number of utilities are implementing system upgrades or hardening programs in response to severe weather events that have occurred over the past several years, which is increasing distribution investment in some regions of the United States. We also anticipate that utilities will continue to integrate smart grid technologies into their distribution systems over time to improve grid management and create efficiencies. Further, to the extent adoption of electrical vehicle technology increases, we believe upgrades to distribution and other electrical infrastructure will be required to accommodate increased load demand.

We believe that several existing, pending or proposed legislative or regulatory actions may also positively impact long-term demand for the services we provide, particularly in connection with electric power infrastructure and renewable energy spending. For example, legislative or regulatory action that alleviates some of the siting and right-of-way challenges that impact transmission projects would potentially accelerate future construction, and federal reliability standards for transmission and distribution systems could create incentives for system investment and maintenance. We also consider renewable energy, including solar and wind generation facilities, to be an ongoing opportunity for our engineering, project management and installation services; however, the economic feasibility of these projects may depend on the availability of tax incentive programs and there is no assurance that existing incentive programs will be extended or that new incentive programs will be implemented.

Despite these positive trends, the regulatory and environmental permitting processes remain a hurdle for some proposed transmission and renewable energy projects, and these factors continue to create uncertainty as to timing of projects and customer spending. In the near term, margins for our electric power infrastructure services operations have been impacted by regulatory and permitting delays and unfavorable economic and market conditions, particularly for larger transmission projects. We anticipate many of these issues to be resolved over the long term, as a number of these projects are currently underway, and we expect this segment's backlog to remain strong during 2019.

Our customers are also seeking additional specialized labor resources to address an aging utility workforce and labor availability issues, increasing pressure to reduce costs and improve reliability, and increasing duration and complexity of customer capital programs. We believe these trends will continue, possibly to the point where customer demand for labor resources will outpace the supply of industry resources. Our ability to take advantage of available opportunities is limited by our ability to employ, train and retain the necessary skilled personnel. We are taking proactive steps to develop our workforce, including through strategic relationships with universities, the military and unions; the expansion and development of our training facility, which provides classroom and on-the-job training programs; and the acquisition and development of our postsecondary educational institution, which specializes in pre-apprenticeship training, apprenticeship training and specialized utility task training for electric workers, and has been recently expanded to include curriculum for the gas distribution and communications industries. Although we believe these initiatives will help address workforce needs, meeting our customers' demand for labor resources could remain challenging.

With respect to our communications service offerings, consumer and commercial demand in North America and Latin America for communication and data-intensive, high-bandwidth wireline and wireless services and applications is driving significant investment in infrastructure and the deployment of new technologies. In particular, we believe there is increasing demand to upgrade or build fiber optic networks that are closer or connected to the end user. In North America, communications providers are in the early stages of developing new fifth generation wireless services (5G), which are intended to facilitate bandwidth-intensive services at high speeds for consumers and a wide range of commercial applications. These 5G networks

require significant fiber network development and the deployment of new small cells to provide 5G services. As a result of these near- and longer-term industry trends, we believe there will be meaningful demand for our services.

Pipeline and Industrial Infrastructure Services Segment

We continue to see growth opportunities in our Pipeline and Industrial Infrastructure Services segment, primarily with respect to services related to natural gas distribution, pipeline integrity, downstream industrial services, the installation and maintenance of larger pipeline systems and associated facilities and horizontal directional drilling.

We have experienced an increase in demand for our natural gas distribution services as a result of improved economic conditions, lower natural gas prices and a significant need to upgrade and replace aging infrastructure. We believe there are also growth opportunities for our pipeline integrity, rehabilitation and replacement services. Regulatory measures have increased and could continue to increase the frequency or stringency of pipeline integrity testing requirements, which we expect to result in increased capital expenditures by our customers.

We have also expanded our industrial services offerings, including high-pressure and critical-path turnaround services to the downstream and midstream energy markets, and enhanced our capabilities with respect to instrumentation and electrical services, piping, fabrication and storage tank services. While these services can be negatively impacted by severe weather events along the U.S. Gulf Coast region, we believe, looking at trends and estimates for process facility utilization rates and overall refining capacity, North America will be the largest downstream maintenance market in the world over the next several years. Furthermore, we believe processing facilities located along the U.S. Gulf Coast region should have certain strategic advantages due to their access and proximity to affordable hydrocarbon resources.

A number of larger pipeline projects from the North American shale formations and Canadian oil sands to power plants, refineries and other demand centers are in various stages of development. While there is risk the projects will not move forward or could be delayed, we believe many of our customers remain committed to them given the cost and time required to move from conception to construction.

Due to its abundant supply and current low price, we believe demand for North American natural gas will continue to increase in the future and that natural gas will remain a fuel of choice for both primary power generation and backup power generation for renewable-driven power plants. In certain areas of North America, the existing pipeline system infrastructure is insufficient to support this expected future development. Furthermore, the abundance of affordable natural gas in the United States, Canada and Australia has also resulted in efforts to develop liquefied natural gas (LNG) export facilities to serve higher-price international markets, which could provide pipeline and related facilities development opportunities for us. Although fluctuating commodity prices, regulatory issues and changing economic conditions may impact the number of projects that ultimately move forward, we believe our comprehensive service offerings and broad geographic presence enable us to competitively pursue opportunities that become available.

Despite these positive trends, a challenging regulatory and permitting environment has caused the delay of some larger pipeline projects during the past several years. These dynamics negatively impacted our segment margins, in part as a result of our inability to adequately cover certain fixed costs. Margins for larger pipeline projects are also subject to significant performance risk, which can arise from adverse weather conditions, challenging geography, customer decisions and crew productivity. Specific opportunities for larger pipeline projects are also sometimes difficult to predict because of the seasonality of bidding and construction cycles.

Although much of this segment’s services are influenced by hydrocarbon production volume rather than shorter-term changes in commodity prices, the broader oil and gas industry is highly cyclical and subject to volatility as a result of fluctuations in natural gas, natural gas liquids and oil prices. Certain of our end markets remain challenged as the broader energy market has not fully recovered from the significant decline in oil prices that began in mid-2014. Exploration and production companies and midstream companies significantly reduced capital spending in response to the price decline, and demand in certain areas where the price of oil is influential, such as Australia, the Canadian Oil Sands, certain oil-driven U.S. shale formations and the Gulf of Mexico, has been adversely impacted by low oil prices. If oil and natural gas prices decline or remain at lower levels over the long term, our outlook may change and demand for our services could be materially impacted.

Overall, we remain optimistic about this segment’s operations. Over several years we have taken steps to diversify and expand our operations in this segment through services such as pipeline integrity, natural gas distribution, and downstream industrial services, to better withstand various end-market cyclicality. Additionally, from a near- and medium-term perspective, we continue to believe that larger pipeline opportunities can provide significant profitability, although these projects are often subject to more cyclicality and execution risk than our other service offerings.

Strategic Acquisitions and Investments

We continue to evaluate potential strategic acquisitions and investments to broaden our customer base, expand our geographic area of operations, grow our portfolio of services and increase opportunities across our operations. We believe that attractive growth opportunities exist primarily due to the highly fragmented and evolving nature of the industries in which we operate and adjacent industries, along with the inability of many companies to expand and modernize due to capital or liquidity constraints. We will pursue opportunities designed to enhance our core business and leadership position in the industries we serve and provide innovative solutions to our customers. We also believe our unique operating model and entrepreneurial mindset will continue to be attractive to acquisition candidates.

Uncertainty of Forward-Looking Statements and Information

This Annual Report includes "forward-looking statements" reflecting assumptions, expectations, projections, intentions or beliefs about future events that are intended to qualify for the "safe harbor" from liability established by the Private Securities Litigation Reform Act of 1995. You can identify these statements by the fact that they do not relate strictly to historical or current facts. They use words such as "anticipate," "estimate," "project," "forecast," "may," "will," "should," "could," "expect," "believe," "plan," "intend" and other words of similar meaning. In particular, these include, but are not limited to, statements relating to the following:

- Projected revenues, net income, earnings per share, margins, weighted average shares outstanding, capital expenditures, tax rates and other projections of operating or financial results;
- Expectations regarding our business or financial outlook, growth, trends or opportunities in particular markets;
- The expected value of contracts or intended contracts with customers;
- Future capital allocation initiatives;
- The scope, services, term and results of any projects awarded or expected to be awarded for services to be provided by us;
- The development of larger electric transmission and pipeline projects, as well as the level of oil, natural gas and natural gas liquids prices and their impact on our business or demand for our services;
- Future capital allocation initiatives, including the amount, timing and strategies with respect to any future stock repurchases, and expectations regarding the declaration, amount and timing of any future cash dividends;
- The impact of existing or potential legislation or regulation;
- Potential opportunities that may be indicated by bidding activity or similar discussions with customers;
- The future demand for and availability of labor resources in the industries we serve;
- The expected realization of remaining performance obligations or backlog;
- The potential benefits from investments or acquisitions;
- The expected outcome of pending or threatened litigation;
- Beliefs and assumptions about the collectability of receivables;
- The business plans or financial condition of our customers;
- Our plans and strategies;
- Possible recovery of pending or contemplated insurance claims or change orders or claims against customers or third parties; and
- The current economic and regulatory conditions and trends in the industries we serve.

These forward-looking statements are not guarantees of future performance, involve or rely on a number of risks, uncertainties, and assumptions that are difficult to predict or beyond our control, and reflect management's beliefs and assumptions based on information available at the time the statements are made. We caution you that actual outcomes and results may differ materially from what is expressed, implied or forecasted by our forward-looking statements and that any or all of our forward-looking statements may turn out to be inaccurate or incorrect. Those statements can be affected by inaccurate assumptions and by known or unknown risks and uncertainties, including the following:

- Market conditions;
- The effects of industry, economic, financial or political conditions outside our control, including weakness in the capital markets or any actual or potential shutdown, sequester, default or similar event or occurrence involving the U.S. federal government;
- Quarterly variations in our operating and financial results, liquidity, financial condition, capital requirements, and reinvestment opportunities;
- Trends and growth opportunities in relevant markets;
- Delays, reductions in scope or cancellations of anticipated, pending or existing projects, including as a result of weather, regulatory or permitting issues, environmental processes, project performance issues, claimed force majeure events, protests or other political activity, legal challenges or customer capital constraints;
- The successful negotiation, execution, performance and completion of anticipated, pending and existing contracts, including the ability to obtain future project awards;
- Our dependence on suppliers, subcontractors, equipment manufacturers and other third-party contractors;
- Our ability to attract and the potential shortage of skilled employees and our ability to retain key personnel and qualified employees;
- Our dependence on fixed price contracts and the potential to incur losses with respect to these contracts;
- Estimates relating to revenue recognition and costs associated with contracts;
- Adverse weather conditions or significant weather events, including hurricanes, tropical storms and floods;
- Risks associated with operational hazards that arise due to the nature of the services we provide and the conditions in which we operate;
- Our ability to generate internal growth;
- Competition in our business, including our ability to effectively compete for new projects and market share;
- The effect of natural gas, natural gas liquids and oil prices on our operations and growth opportunities and on our customers' capital programs and demand for our services;
- The future development of natural resources;
- The failure of existing or potential legislative actions and initiatives to result in demand for our services;
- Fluctuations of prices of certain materials used in our business, including as a result of the imposition of tariffs or changes in U.S. trade relationships with other countries;
- Unexpected costs or liabilities that may arise from pending or threatened litigation, indemnity obligations or other claims or actions asserted against us, including liabilities, costs, fines or penalties for which we are not covered by, or are in excess of, our third-party insurance;
- The outcome of pending or threatened litigation;

- Risks relating to the potential unavailability or cancellation of third-party insurance, the exclusion of coverage for certain losses, and potential increases in premiums for coverage deemed beneficial to us;
- Damage to our brand or reputation arising as a result of cyber-security or data privacy breaches, environmental and occupational health and safety matters, or other negative corporate incidents;
- Cancellation provisions within our contracts and the risk that contracts expire and are not renewed or are replaced on less favorable terms;
- Loss of customers with whom we have long-standing or significant relationships;
- The potential that participation in joint ventures or similar structures exposes us to liability and/or harm to our reputation for acts or omissions by our partners;
- Our inability or failure to comply with the terms of our contracts, which may result in additional costs, unexcused delays, warranty claims, failure to meet performance guarantees, damages or contract terminations;
- The inability or refusal of our customers to pay for services, including failure to collect our outstanding receivables;
- The failure to recover on payment claims against project owners or third-party contractors or to obtain adequate compensation for customer-requested change orders;
- The failure of our customers to comply with regulatory requirements applicable to their projects, which may result in project delays and cancellations;
- Budgetary or other constraints that may reduce or eliminate tax incentives or government funding for projects, which may result in project delays or cancellations;
- Estimates and assumptions in determining our financial results, remaining performance obligations and backlog;
- Our ability to successfully complete our remaining performance obligations or realize our backlog;
- Risks associated with operating in international markets, including instability of foreign governments, currency exchange fluctuations, and compliance with unfamiliar foreign legal systems and cultural practices, the U.S. Foreign Corrupt Practices Act and other applicable anti-bribery and anti-corruption laws, and complex U.S. and foreign tax regulations and international treaties;
- Our ability to successfully identify, complete, integrate and realize synergies from acquisitions;
- The potential adverse impact resulting from uncertainty surrounding acquisitions and investments, including the ability to retain key personnel from acquired businesses, the potential increase in risks already existing in our operations and poor performance or decline in value of our investments;
- The adverse impact of impairments of goodwill, other intangible assets, receivables, long-lived assets or investments;
- Our growth outpacing our decentralized management and infrastructure;
- Requirements relating to governmental regulation and changes thereto;
- Inability to enforce our intellectual property rights or the obsolescence of such rights;
- Risks related to the implementation of new information technology solutions;
- The impact of our unionized workforce on our operations, including labor stoppages or interruptions due to strikes or lockouts;
- The cost of borrowing, availability of cash and credit, fluctuations in the price and volume of our common stock, debt covenant compliance, interest rate fluctuations and other factors affecting our financing and investing activities;

- The ability to access sufficient funding to finance desired growth and operations;
- Our ability to obtain performance bonds;
- Our ability to meet the regulatory requirements applicable to us and our subsidiaries, including the Sarbanes-Oxley Act of 2002;
- Rapid technological and other structural changes that could reduce the demand for our services;
- New or changed tax laws, treaties or regulations;
- Legislative or regulatory changes that result in increased costs, including with respect of labor and healthcare costs;
- Significant fluctuations in foreign currency exchange rates; and
- The other risks and uncertainties described elsewhere herein and in Item 1A. *Risk Factors* in this Annual Report and as may be detailed from time to time in our other public filings with the SEC.

All of our forward-looking statements, whether written or oral, are expressly qualified by these cautionary statements and any other cautionary statements that may accompany such forward-looking statements or that are otherwise included in this report. In addition, we do not undertake and expressly disclaim any obligation to update or revise any forward-looking statements to reflect events or circumstances after the date of this report or otherwise.

ITEM 7A. ***Quantitative and Qualitative Disclosures about Market Risk***

Our primary exposure to market risk relates to unfavorable changes in concentration of credit risk, interest rates and currency exchange rates.

Credit Risk. We are subject to concentrations of credit risk related to our cash and cash equivalents and net receivable position with customers, which includes amounts related to billed and unbilled accounts receivable and contract assets net of advanced billings with the same customer. Substantially all of our cash and cash equivalents are managed by what we believe to be high credit quality financial institutions. In accordance with our investment policies, these institutions are authorized to invest cash and cash equivalents in a diversified portfolio of what we believe to be high-quality investments, which primarily include interest-bearing demand deposits, money market investments and money market mutual funds. Although we do not currently believe the principal amounts of these cash and cash equivalents are subject to any material risk of loss, changes in economic conditions could impact the interest income we receive from these investments.

In addition, we grant credit under normal payment terms, generally without collateral; and therefore, are subject to potential credit risk related to our customers' inability to pay for services provided. For example, in January 2019 one of our customers, PG&E, filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code, as amended. See Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations — Concentration of Credit Risk* for additional information regarding our pre-petition receivables and this bankruptcy matter. Furthermore, the risk of nonpayment may be heightened as a result of depressed economic and financial market conditions. We believe the concentration of credit risk related to billed and unbilled receivables and contract assets is limited because of the diversity of our customers, and we perform ongoing credit risk assessments of our customers and financial institutions and in some cases obtain collateral or other security from our customers.

Interest Rate Risk. As of December 31, 2018, we had no derivative financial instruments to manage interest rate risk. As such, we were exposed to earnings and fair value risk due to changes in interest rates with respect to our long-term obligations. As of December 31, 2018, the fair value of our variable rate debt of $1.07 billion approximated book value. Our weighted average interest rate on our variable rate debt for the year ended December 31, 2018 was 3.6%. The annual effect on our pretax earnings of a hypothetical 50 basis point increase or decrease in variable interest rates would be approximately $5.4 million based on our December 31, 2018 balance of variable rate debt.

Foreign Currency Risk. The U.S. dollar is the functional currency for the majority of our operations, which are primarily located within the United States. The functional currency for our foreign operations, which are primarily located in Canada, Australia and Latin America, is typically the currency of the country in which the foreign operating unit is located. Accordingly, our financial performance is subject to fluctuation due to changes in foreign currency exchange rates relative to the U.S. dollar. During 2018, revenues from our foreign operations accounted for 23.2% of our consolidated revenues. Fluctuations in foreign exchange rates during the year ended December 31, 2018 caused a decrease of approximately $18 million in foreign revenues

compared to the year ended December 31, 2017. Fluctuations in foreign exchange rates during the year ended December 31, 2017 caused an increase of approximately $53 million in foreign revenues compared to the year ended December 31, 2016.

We are also subject to foreign currency risk with respect to sales, purchases and borrowings that are denominated in a currency other than the respective functional currencies of our operating units. To minimize the risk from changes in foreign currency exchange rates, we may enter into foreign currency derivative contracts to hedge our foreign currency risk on a cash flow basis. There were no outstanding foreign currency derivative contracts at December 31, 2018.

We also have foreign exchange risk related to cash and cash equivalents in foreign banks. Based on the balance of cash and cash equivalents in foreign banks of $16.2 million as of December 31, 2018, an assumed 5% adverse change to foreign exchange rates would result in a fair value decline of $0.7 million. Fluctuations in fair value are recorded in "Accumulated other comprehensive income (loss)," a separate component of stockholders' equity.

ITEM 8. ***Financial Statements and Supplementary Data***

INDEX TO QUANTA SERVICES, INC.'S CONSOLIDATED FINANCIAL STATEMENTS

	Page
Report of Management	67
Report of Independent Registered Public Accounting Firm	68
Consolidated Balance Sheets	70
Consolidated Statements of Operations	71
Consolidated Statements of Comprehensive Income	72
Consolidated Statements of Cash Flows	73
Consolidated Statements of Equity	74
Notes to Consolidated Financial Statements	75

REPORT OF MANAGEMENT

Management's Report on Financial Information and Procedures

The accompanying financial statements of Quanta Services, Inc. and its subsidiaries were prepared by management. These financial statements were prepared in accordance with accounting principles generally accepted in the United States, applying certain estimates and judgments as required.

Our management, including our Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls or our internal control over financial reporting will prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. The design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Further, because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of simple errors or mistakes. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with U.S. generally accepted accounting principles. Internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the company's assets that could have a material effect on the financial statements.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we have conducted an evaluation of the effectiveness of our internal control over financial reporting based upon the criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management has concluded that our internal control over financial reporting was effective as of December 31, 2018 to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurances and may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies and procedures may deteriorate.

The effectiveness of Quanta Services, Inc.'s internal control over financial reporting as of December 31, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in its report which appears herein.

Management's assessment of the effectiveness of our internal control over financial reporting as of December 31, 2018 excluded the four acquisitions we completed in 2018. Such exclusion was in accordance with SEC guidance that an assessment of recently acquired businesses may be omitted in management's report on internal control over financial reporting, provided the acquisition took place within twelve months of management's evaluation. These acquisitions comprised approximately 0.9% and 0.6% of our consolidated assets and revenues as of and for the year ended December 31, 2018.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Quanta Services, Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Quanta Services, Inc. and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income, cash flows and equity for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

As described in Management's Report on Internal Control over Financial Reporting, management has excluded its 2018 acquisitions from its assessment of internal control over financial reporting as of December 31, 2018 because they were acquired by the Company in purchase business combinations during 2018. We have also excluded the 2018 acquisitions from our audit of internal control over financial reporting. The 2018 acquisitions of the Company and its related subsidiaries are wholly-owned subsidiaries whose total assets and total revenues excluded from management's assessment and our audit of internal control over financial reporting represent 0.9% and 0.6%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2018.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are

being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

Houston, Texas
February 28, 2019

We have served as the Company's auditor since 2002.

QUANTA SERVICES, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

	December 31, 2018	December 31, 2017
	(In thousands, except share information)	
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 78,687	$ 138,285
Accounts receivable, net of allowances of $5,839 and $4,465	2,354,737	1,985,077
Contract assets	576,891	497,292
Inventories	107,732	80,890
Prepaid expenses and other current assets	208,057	168,363
Total current assets	3,326,104	2,869,907
Property and equipment, net of accumulated depreciation of $1,092,440 and $981,275	1,276,032	1,288,602
Other assets, net	293,592	189,866
Other intangible assets, net of accumulated amortization of $372,081 and $335,507	280,180	263,179
Goodwill	1,899,879	1,868,600
Total assets	$ 7,075,787	$ 6,480,154
LIABILITIES AND EQUITY		
Current Liabilities:		
Current maturities of long-term debt and short-term debt	$ 65,646	$ 1,220
Accounts payable and accrued expenses	1,314,520	1,057,460
Contract liabilities	425,961	433,387
Total current liabilities	1,806,127	1,492,067
Long-term debt and notes payable, net of current maturities	1,040,532	670,721
Deferred income taxes	219,115	179,381
Insurance and other non-current liabilities	404,560	342,356
Total liabilities	3,470,334	2,684,525
Commitments and Contingencies		
Equity:		
Common stock, $.00001 par value, 600,000,000 shares authorized, 157,333,046 and 155,219,154 shares issued, and 141,103,900 and 153,342,326 shares outstanding	2	2
Exchangeable Shares, no par value, 486,112 shares issued and outstanding	—	—
Series G Preferred Stock, $.00001 par value, 1 share authorized, issued and outstanding	—	—
Additional paid-in capital	1,967,354	1,889,356
Retained earnings	2,477,291	2,191,059
Accumulated other comprehensive loss	(286,048)	(203,395)
Treasury stock, 16,229,146 and 1,876,828 common shares	(554,440)	(85,451)
Total stockholders' equity	3,604,159	3,791,571
Non-controlling interests	1,294	4,058
Total equity	3,605,453	3,795,629
Total liabilities and equity	$ 7,075,787	$ 6,480,154

The accompanying notes are an integral part of these consolidated financial statements.

QUANTA SERVICES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,		
	2018	2017	2016
	(In thousands, except per share information)		
Revenues	$ 11,171,423	$ 9,466,478	$ 7,651,319
Cost of services (including depreciation)	9,691,459	8,224,618	6,637,519
Gross profit	1,479,964	1,241,860	1,013,800
Selling, general and administrative expenses	857,574	777,920	653,338
Amortization of intangible assets	43,994	32,205	31,685
Asset impairment charges	49,375	58,057	7,964
Change in fair value of contingent consideration liabilities	(11,248)	(5,171)	—
Operating income	540,269	378,849	320,813
Interest expense	(36,945)	(20,946)	(14,887)
Interest income	1,555	832	2,423
Other expense, net	(47,213)	(4,978)	(663)
Income from continuing operations before income taxes	457,666	353,757	307,686
Provision for income taxes	161,659	35,532	107,246
Net income from continuing operations	296,007	318,225	200,440
Net loss from discontinued operations	—	—	(342)
Net income	296,007	318,225	200,098
Less: Net income attributable to non-controlling interests	2,661	3,247	1,715
Net income attributable to common stock	$ 293,346	$ 314,978	$ 198,383
Amounts attributable to common stock:			
Net income from continuing operations	$ 293,346	$ 314,978	$ 198,725
Net loss from discontinued operations	—	—	(342)
Net income attributable to common stock	$ 293,346	$ 314,978	$ 198,383
Basic earnings per share attributable to common stock:			
Continuing operations	$ 1.92	$ 2.02	$ 1.26
Discontinued operations	—	—	—
Net income attributable to common stock	$ 1.92	$ 2.02	$ 1.26
Weighted average basic shares outstanding	152,963	156,124	157,287
Diluted earnings per share attributable to common stock:			
Continuing operations	$ 1.90	$ 2.00	$ 1.26
Discontinued operations	—	—	—
Net income attributable to common stock	$ 1.90	$ 2.00	$ 1.26
Weighted average diluted shares outstanding	154,226	157,155	157,288

The accompanying notes are an integral part of these consolidated financial statements.

QUANTA SERVICES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Year Ended December 31,		
	2018	**2017**	**2016**
		(In thousands)	
Net income	$ 296,007	$ 318,225	$ 200,098
Other comprehensive income (loss), net of tax provision:			
Foreign currency translation adjustment, net of tax of $0, $0 and $0	(84,484)	67,404	23,137
Other, net of tax of $(677), $(347) and $46	1,831	874	(121)
Other comprehensive income (loss)	(82,653)	68,278	23,016
Comprehensive income	213,354	386,503	223,114
Less: Comprehensive income attributable to non-controlling interests	2,661	3,247	1,715
Total comprehensive income attributable to Quanta stockholders	$ 210,693	$ 383,256	$ 221,399

The accompanying notes are an integral part of these consolidated financial statements.

QUANTA SERVICES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2018	2017	2016
		(In thousands)	
Cash Flows from Operating Activities of Continuing Operations:			
Net income	$ 296,007	$ 318,225	$ 200,098
Adjustments to reconcile net income to net cash provided by operating activities of continuing operations —			
Net loss from discontinued operations	—	—	342
Depreciation	202,519	183,808	170,240
Amortization of intangible assets	43,994	32,205	31,685
Asset impairment charges	49,375	58,057	7,964
Change in fair value of contingent consideration liabilities	(11,248)	(5,171)	—
Equity in losses of unconsolidated affiliates	52,867	10,945	979
Amortization of debt issuance costs	1,270	1,321	1,356
(Gain) loss on sale of property and equipment	3,296	(549)	(734)
Foreign currency (gain) loss	(385)	409	880
Provision for (recovery of) doubtful accounts	7,169	87	(543)
Deferred income tax expense (benefit)	61,974	(32,130)	(15,695)
Non-cash stock-based compensation	52,484	46,448	42,843
Changes in operating assets and liabilities, net of non-cash transactions	(400,533)	(241,764)	(48,666)
Net cash provided by operating activities of continuing operations	358,789	371,891	390,749
Cash Flows from Investing Activities of Continuing Operations:			
Capital expenditures	(293,595)	(244,651)	(212,555)
Proceeds from sale of property and equipment	31,780	23,348	21,975
Proceeds from insurance settlements related to property and equipment	714	1,175	546
Cash paid for acquisitions, net of cash, cash equivalents and restricted cash acquired	(94,917)	(361,217)	(68,788)
Investments in unconsolidated affiliates and other entities	(36,909)	(56,528)	(13,150)
Cash received from investments in unconsolidated affiliates and other entities	4,705	65,789	7,593
Cash paid for intangible assets	(14,448)	—	—
Net cash used in investing activities of continuing operations	(402,670)	(572,084)	(264,379)
Cash Flows from Financing Activities of Continuing Operations:			
Borrowings under credit facility	4,491,782	2,932,338	2,744,453
Payments under credit facility	(4,076,460)	(2,624,404)	(2,860,673)
Payments on other long-term debt	(1,298)	(5,361)	(6,959)
Net borrowings (repayments) of short-term debt	33,790	(2,783)	(1,957)
Debt issuance and amendment costs	(1,976)	(1,507)	—
Distributions to non-controlling interests, net of contributions received	(4,038)	(2,001)	(761)
Payments related to tax withholding for share-based compensation	(15,218)	(18,543)	(8,340)
Exercise of stock options	—	25	401
Repurchase of common stock	(443,152)	(50,000)	—
Net cash provided by (used in) financing activities of continuing operations	(16,570)	227,764	(133,836)
Discontinued operations:			
Net cash used in operating activities	—	—	(1,035)
Net cash used in investing activities	—	—	(6,080)
Net cash used in discontinued operations	—	—	(7,115)
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	(68)	1,794	220
Net increase (decrease) in cash, cash equivalents and restricted cash	(60,519)	29,365	(14,361)
Cash, cash equivalents and restricted cash, beginning of year	143,775	114,410	128,771
Cash, cash equivalents and restricted cash, end of year	$ 83,256	$ 143,775	$ 114,410

The accompanying notes are an integral part of these consolidated financial statements.

QUANTA SERVICES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF EQUITY

(In thousands, except share information)

	Common Stock		Exchangeable Shares		Series F Preferred Stock		Series G Preferred Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity	Non-controlling Interests	Total Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount							
Balance, December 31, 2015	152,907,166	$ 2	6,876,042	$ —	1	$ —	1	$ —	$ 3,497,740	$ 1,677,698	$ (294,689)	$ (1,795,257)	$ 3,085,494	$ 2,321	$ 3,087,815
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	23,016	—	23,016	—	23,016
Acquisitions	70,840	—	—	—	—	—	—	—	1,508	—	—	—	1,508	—	1,508
Restricted stock and restricted stock unit activity	760,395	—	—	—	—	—	—	—	49,665	—	—	(15,160)	34,505	—	34,505
Stock options exercised	25,423	—	—	—	—	—	—	—	425	—	—	—	425	—	425
Exchange of exchangeable shares	360,589	—	(360,589)	—	—	—	—	—	—	—	—	—	—	—	—
Income tax impact from long-term incentive plans	—	—	—	—	—	—	—	—	(3,904)	—	—	—	(3,904)	—	(3,904)
Settlement of accelerated stock repurchase program	(9,413,640)	—	—	—	—	—	—	—	150,000	—	—	(150,000)	—	—	—
Retirement of treasury stock	—	(1)	—	—	—	—	—	—	(1,946,128)	—	—	1,946,129	—	—	—
Distributions to non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	(761)	(761)
Net income	—	—	—	—	—	—	—	—	—	198,383	—	—	198,383	1,715	200,098
Balance, December 31, 2016	144,710,773	1	6,515,453	—	1	—	1	—	1,749,306	1,876,081	(271,673)	(14,288)	3,339,427	3,275	3,342,702
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	68,278	—	68,278	—	68,278
Acquisitions	2,982,346	—	—	—	—	—	—	—	89,604	—	—	—	89,604	—	89,604
Restricted stock unit activity	1,000,935	1	—	—	—	—	—	—	50,421	—	—	(21,163)	29,259	—	29,259
Stock options exercised	1,223	—	—	—	—	—	—	—	25	—	—	—	25	—	25
Exchange of exchangeable shares	6,029,341	—	(6,029,341)	—	—	—	—	—	—	—	—	—	—	—	—
Common stock repurchases	(1,382,292)	—	—	—	—	—	—	—	—	—	—	(50,000)	(50,000)	—	(50,000)
Retirement of preferred stock	—	—	—	—	(1)	—	—	—	—	—	—	—	—	—	—
Distributions to non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	(2,001)	(2,001)
Buyout of a non-controlling interest	—	—	—	—	—	—	—	—	—	—	—	—	—	(463)	(463)
Net income	—	—	—	—	—	—	—	—	—	314,978	—	—	314,978	3,247	318,225
Balance, December 31, 2017	153,342,326	2	486,112	—	—	—	1	—	1,889,356	2,191,059	(203,395)	(85,451)	3,791,571	4,058	3,795,629
Revenue recognition cumulative effect adjustment	—	—	—	—	—	—	—	—	—	(1,276)	—	—	(1,276)	—	(1,276)
Other comprehensive loss	—	—	—	—	—	—	—	—	—	—	(82,653)	—	(82,653)	—	(82,653)
Acquisitions	679,668	—	—	—	—	—	—	—	22,882	—	—	—	22,882	—	22,882
Restricted stock unit activity	998,631	—	—	—	—	—	—	—	55,116	—	—	(17,699)	37,417	—	37,417
Common stock repurchases	(13,916,725)	—	—	—	—	—	—	—	—	—	—	(451,290)	(451,290)	—	(451,290)
Dividends declared	—	—	—	—	—	—	—	—	—	(5,838)	—	—	(5,838)	—	(5,838)
Distributions to non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	(4,038)	(4,038)
Buyout of a non-controlling interest	—	—	—	—	—	—	—	—	—	—	—	—	—	(1,387)	(1,387)
Net income	—	—	—	—	—	—	—	—	—	293,346	—	—	293,346	2,661	296,007
Balance, December 31, 2018	141,103,900	$ 2	486,112	$ —	—	$ —	1	$ —	$ 1,967,354	$ 2,477,291	$ (286,048)	$ (554,440)	$ 3,604,159	$ 1,294	$ 3,605,453

The accompanying notes are an integral part of these consolidated financial statements.

QUANTA SERVICES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. BUSINESS AND ORGANIZATION:

Quanta Services, Inc. (Quanta) is a leading provider of specialty contracting services, delivering comprehensive infrastructure solutions for the electric power, energy and communications industries in the United States, Canada, Australia, Latin America and select other international markets. Quanta reports its results under two reportable segments: (1) Electric Power Infrastructure Services and (2) Pipeline and Industrial Infrastructure Services. As of December 31, 2018, Quanta changed the name of its Oil and Gas Infrastructure Services segment to the Pipeline and Industrial Infrastructure Services segment. There was no change to the composition of the segment, and the name change was made to better reflect the work performed within the segment and the diversity of its service offerings.

Electric Power Infrastructure Services Segment

The Electric Power Infrastructure Services segment provides comprehensive network solutions to customers in the electric power industry. Services performed by the Electric Power Infrastructure Services segment generally include the design, installation, upgrade, repair and maintenance of electric power transmission and distribution infrastructure and substation facilities along with other engineering and technical services. This segment also provides emergency restoration services, including the repair of infrastructure damaged by inclement weather, the energized installation, maintenance and upgrade of electric power infrastructure utilizing unique bare hand and hot stick methods and Quanta's proprietary robotic arm technologies, and the installation of "smart grid" technologies on electric power networks. In addition, this segment provides services that support the development of renewable energy generation, including solar, wind and certain types of natural gas generation facilities, and related switchyards and transmission infrastructure. This segment also provides comprehensive communications infrastructure services to wireline and wireless telecommunications companies, cable multi-system operators and other customers within the communications industry; services in connection with the construction of electric power generation facilities; and the design, installation, maintenance and repair of commercial and industrial wiring. This segment also includes Quanta's postsecondary educational institution, which specializes in pre-apprenticeship training, apprenticeship training and specialized utility task training for electric workers, and has been recently expanded to include curriculum for the gas distribution and communications industries.

Pipeline and Industrial Infrastructure Services Segment

The Pipeline and Industrial Infrastructure Services segment provides comprehensive infrastructure solutions to customers involved in the development, transportation, storage and processing of natural gas, oil and other products. Services performed by the Pipeline and Industrial Infrastructure Services segment generally include the design, installation, repair and maintenance of pipeline transmission and distribution systems, gathering systems, production systems, storage systems and compressor and pump stations, as well as related trenching, directional boring and mechanized welding services. In addition, this segment's services include pipeline protection, integrity testing, rehabilitation and replacement, and the fabrication of pipeline support systems and related structures and facilities for natural gas utilities and midstream companies. Quanta also provides high-pressure and critical-path turnaround services to the downstream and midstream energy markets and instrumentation and electrical services, piping, fabrication and storage tank services. To a lesser extent, this segment serves the offshore and inland water energy markets and designs, installs and maintains fueling systems and water and sewer infrastructure.

Acquisitions

During the year ended December 31, 2018, Quanta acquired an electrical infrastructure services business specializing in substation construction and relay services, a postsecondary educational institution that provides pre-apprenticeship training and programs for experienced linemen and two communications infrastructure services businesses, all of which are located in the United States. The results of the acquired businesses have generally been included in Quanta's Electric Power Infrastructure Services segment and have been included in Quanta's consolidated financial statements beginning on the respective acquisition dates.

On July 20, 2017, Quanta acquired Stronghold, Ltd. and Stronghold Specialty, Ltd. (collectively Stronghold), a specialized services business located in the United States that provides high-pressure and critical-path solutions to the downstream and midstream energy markets. The results of the acquired business are generally included in Quanta's Pipeline and Industrial Infrastructure Services segment and have been included in Quanta's consolidated financial statements beginning on the acquisition date.

During the year ended December 31, 2017, Quanta also acquired a communications infrastructure services contractor and an electrical and communications contractor, both of which are located in the United States. The results of these acquired businesses

are generally included in Quanta's Electric Power Infrastructure Services segment and have been included in Quanta's consolidated financial statements beginning on the respective acquisition dates.

During 2016, Quanta completed five acquisitions. The results have been included in Quanta's consolidated financial statements beginning on the respective acquisition dates. See further discussion regarding these acquisitions in Note 4.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

Principles of Consolidation

The consolidated financial statements of Quanta include the accounts of Quanta Services, Inc. and its wholly owned subsidiaries, which are also referred to as its operating units. The consolidated financial statements also include the accounts of certain of Quanta's investments in joint ventures, which are either consolidated or proportionately consolidated, as discussed in the following summary of significant accounting policies. Investments in affiliated entities in which Quanta does not have a controlling financial interest, but over which Quanta has significant influence, usually because Quanta holds a voting interest of between 20% and 50%, are accounted for using the equity method. All significant intercompany accounts and transactions have been eliminated in consolidation. Unless the context requires otherwise, references to Quanta include Quanta Services, Inc. and its consolidated subsidiaries.

Reclassifications

Quanta reclassified certain prior period amounts related to restricted cash and proceeds from the settlement of insurance claims related to property and equipment in the accompanying consolidated statements of cash flows to conform to the current period presentation under recently adopted accounting updates. See Note 3 for further details regarding these updates. Quanta also reclassified certain amounts related to cash paid for investments in unconsolidated affiliates and other entities and cash received from investments in unconsolidated affiliates and other entities on the accompanying statements of cash flows to conform to the current period presentation. Additionally, the amounts previously reported as "Costs and estimated earnings in excess of billings on uncompleted contracts" and "Billings in excess of costs and estimated earnings on uncompleted contracts" on Quanta's consolidated balance sheets prior to 2018 have been included in the newly titled "Contract assets" and "Contract liabilities" in accordance with the newly adopted revenue recognition guidance discussed below and in Note 3.

Use of Estimates and Assumptions

The preparation of financial statements in conformity with generally accepted accounting principles in the United States requires the use of estimates and assumptions by management in determining the reported amounts of assets and liabilities, disclosures of contingent assets and liabilities known to exist as of the date the financial statements are published, and the reported amounts of revenues and expenses recognized during the periods presented. Quanta reviews all significant estimates affecting its consolidated financial statements on a recurring basis and records the effect of any necessary adjustments prior to their publication. Judgments and estimates are based on Quanta's beliefs and assumptions derived from information available at the time such judgments and estimates are made. Uncertainties with respect to such estimates and assumptions are inherent in the preparation of financial statements. Estimates are primarily used in Quanta's assessment of the allowance for doubtful accounts, valuation of inventory, useful lives of assets, fair value assumptions in analyzing goodwill, other intangibles and long-lived asset impairments, equity and other investments, purchase price allocations, acquisition-related contingent consideration liabilities, liabilities for insurance and other claims and guarantees, multiemployer pension plan withdrawal liabilities, contingent liabilities, revenue recognition for construction contracts inclusive of contractual change orders and claims, share-based compensation, operating results of reportable segments, as well as the provision for income taxes and the calculation of uncertain tax positions.

Revenue Recognition

As discussed in Note 3, effective January 1, 2018, Quanta adopted new revenue recognition guidance using the modified retrospective transition method, applying the guidance to contracts with customers that were not substantially complete as of such date. Quanta's financial results for reporting periods after January 1, 2018 are presented under the new guidance, while financial results for prior periods will continue to be reported in accordance with the prior guidance and Quanta's historical accounting policy. The net cumulative adjustment due to adoption of the new guidance was a $1.3 million reduction to retained earnings as of January 1, 2018, which represented a $1.8 million decrease to revenue recognized prior to adoption, net of $0.5 million in taxes. The adjustment primarily related to certain contracts that are now accounted for as a single performance obligation but were previously accounted for separately for revenue recognition purposes. Quanta does not anticipate significant changes to the pattern of revenue recognition for contracts with customers and does not believe that the guidance surrounding the identification of contracts and performance obligations or the measurement of variable consideration will have a material impact on revenue

recognition under its customary contractual arrangements. If Quanta had not adopted the new revenue recognition guidance effective January 1, 2018, it would have recognized $2.0 million of additional revenues during the year ended December 31, 2018.

Contracts

Quanta designs, installs, upgrades, repairs and maintains infrastructure for customers in the electric power, energy and communications industries. These services may be provided pursuant to master service agreements (MSAs), repair and maintenance contracts and fixed price and non-fixed price installation contracts. These contracts are classified into three categories based on how transaction prices are determined and revenue is recognized: unit-based contracts, cost-plus contracts and fixed price contracts. Transaction prices for unit-based contracts are determined on a per unit basis, transaction prices for cost-plus contracts are determined by applying a profit margin to costs incurred on the contracts and transaction prices for fixed price contracts are determined on a lump-sum basis. All of Quanta's revenues are recognized from contracts with its customers. In addition to the considerations described below, revenue is not recognized unless collectability under the contract is considered probable, the contract has commercial substance and the contract has been approved. Additionally, the contract must contain payment terms, as well as the rights and commitments of both parties.

Performance Obligations

A performance obligation is a promise in a contract with a customer to transfer a distinct good or service. Most of Quanta's contracts are considered to have a single performance obligation whereby Quanta is required to integrate complex activities and equipment into a deliverable for the customer. For contracts with multiple performance obligations, Quanta allocates the transaction price to each performance obligation using its best estimate of the standalone selling price of each distinct good or service in the contract. The standalone selling price is estimated using the expected costs plus a margin approach for each performance obligation.

At December 31, 2018, the aggregate transaction price allocated to unsatisfied or partially satisfied performance obligations was estimated to be approximately $4.68 billion, of which 66.2% was expected to be recognized in the subsequent twelve months. This amount represents management's estimate of the consolidated revenues that are expected to be realized from the remaining portion of firm orders under fixed price contracts not yet completed or for which work has not yet begun. For purposes of calculating remaining performance obligations, Quanta includes all estimated revenues attributable to consolidated joint ventures and variable interest entities, revenues from funded and unfunded portions of government contracts to the extent they are reasonably expected to be realized and revenues from change orders and claims to the extent management believes additional contract revenues will be earned and are deemed probable of collection. Excluded from remaining performance obligations were potential orders under MSAs and non-fixed price contracts expected to be completed within one year.

Recognition of Revenue Upon Satisfaction of Performance Obligations

A transaction price is determined for each contract, and that amount is allocated to each performance obligation within the contract and recognized as revenue when, or as, the performance obligation is satisfied. Quanta generally recognizes revenue over time as it performs its obligations because there is a continuous transfer of control of the deliverable to the customer. Under unit-based contracts with an insignificant amount of partially completed units, Quanta recognizes revenue as units are completed based on contractual pricing amounts. Under unit-based contracts with more than an insignificant amount of partially completed units and fixed price contracts, Quanta recognizes revenues as performance obligations are satisfied over time, with the percentage completion generally measured as the percentage of costs incurred to total estimated costs for such performance obligation. Under cost-plus contracts, Quanta recognizes revenue on an input basis, as labor hours are incurred, materials are utilized and services are performed.

Contract costs include all direct materials, labor and subcontract costs and indirect costs related to contract performance, such as indirect labor, supplies, tools, repairs and depreciation costs. The majority of the materials associated with Quanta's work are owner-furnished, and therefore not included in contract revenues and costs.

Additionally, Quanta may incur incremental costs to obtain certain contracts, such as selling and marketing costs, bid and proposal costs, sales commissions, and legal fees or initial set-up or mobilization costs, certain of which can be capitalized under the newly adopted revenue recognition guidance. Such costs were not material during the year ended December 31, 2018.

Contract Estimates

Actual revenues and project costs can vary, sometimes substantially, from previous estimates due to changes in a variety of factors, including unforeseen or changed circumstances not included in Quanta's cost estimates or covered by its contracts. The estimating process is based on the professional knowledge and experience of Quanta's engineers, project managers and financial professionals. Some of the factors that may lead to changes in estimates include concealed or unknown environmental conditions; changes in the cost of equipment, commodities, materials or labor; unanticipated costs or claims due to delays caused by customers or third parties; customer failure to provide required materials or equipment; errors in engineering, specifications or designs; project modifications or contract termination; weather conditions; changes in estimates related to the length of time to complete

a performance obligation; and performance and quality issues requiring rework or replacement. These factors, along with other risks inherent in performing services under fixed price contracts, are routinely evaluated by management. Any changes in estimates could result in changes in profitability or losses associated with the related performance obligations. For example, estimated costs for a performance obligation may increase from the original estimate and contractual provisions may not allow for adequate compensation or reimbursement for such additional costs. Changes in estimated revenues, costs and profit are recorded in the period they are determined to be probable and can be reasonably estimated. Contract losses are recognized in full when losses are determined to be probable and can be reasonably estimated.

Changes in cost estimates on certain contracts may result in the issuance of change orders and/or claims, which may be approved or unapproved by the customer. Quanta determines the probability that such costs will be recovered based on, among other things, contractual entitlement, past practices with the customer, specific discussions or preliminary negotiations with the customer or verbal approvals by the customer. Quanta recognizes amounts associated with change orders and claims as revenue if it is probable that the contract price will be adjusted and the amount of any such adjustment can be reliably estimated. Most of Quanta's change orders are for services that are not distinct from an existing contract and are accounted for as part of an existing contract on a cumulative catch-up basis. Quanta accounts for a change order as a separate contract if the additional goods or services are distinct from and increase the scope of the contract, and the price of the contract increases by an amount commensurate to Quanta's standalone selling price for the additional goods or services.

As of December 31, 2018 and 2017, Quanta had recognized revenues of $121.8 million and $144.0 million related to change orders and claims included as contract price adjustments and that were in the process of being negotiated in the normal course of business. These aggregate amounts, which were included in "Contract assets" in the accompanying consolidated balance sheets, represent management's estimates of additional contract revenues that were earned and probable of collection. However, Quanta's estimates could be incorrect and the amount ultimately realized could be significantly higher or lower than the estimated amount.

Variable consideration amounts, including performance incentives, early pay discounts and penalties, may also cause changes in contract estimates. The amount of variable consideration is estimated based on the most likely amount that is deemed probable of realization. Contract consideration is adjusted for variable consideration when it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur once the uncertainty related to the variable consideration is resolved.

Changes in contract estimates are recognized on a cumulative catch-up basis in the period in which the revisions to the estimates are made. Such changes in estimates can result in the recognition of revenue in a current period for performance obligations that were satisfied or partially satisfied in prior periods. Such changes in estimates may also result in the reversal of previously recognized revenue if the current estimate differs from the previous estimate. The impact of a change in estimate is measured as the difference between the revenue or gross profit recognized in the prior period as compared to the revenue or gross profit which would have been recognized had the revised estimate been used as the basis of recognition in the prior period. Quanta's operating results for the years ended December 31, 2018 and 2017 were impacted by less than 5% as a result of aggregate changes in contract estimates related to projects that were in progress at December 31, 2017 and 2016, respectively. However, certain projects were materially impacted by changes to total estimated contract revenues and/or costs during the year ended December 31, 2018. Quanta experienced engineering and production delays on an ongoing processing facility construction project in Texas, which resulted in additional estimated construction costs. These changes in estimates negatively impacted gross profit related to work performed in prior periods by $34.2 million during the year ended December 31, 2018. At December 31, 2018, this project had a contract value of approximately $150 million, was approximately 88% complete and is expected to be completed in 2019. Quanta also experienced unexpected site conditions, adverse weather conditions and material delivery delays on a renewable energy power project in Australia that negatively impacted gross profit related to work performed in prior periods by $22.3 million during the year ended December 31, 2018. At December 31, 2018, this project had a contract value of approximately $75 million and was approximately 86% complete. Additionally, a natural gas pipeline construction project in the northeast United States experienced weather delays and project performance issues resulting in additional estimated construction costs that negatively impacted gross profit related to work performed in prior periods by $17.3 million during the year ended December 31, 2018. At December 31, 2018, this project had a contract value of approximately $50 million and was approximately 99% complete. Quanta also successfully executed through project procurement, winter schedule challenges and productivity risks on an electrical transmission project in Canada, resulting in reductions to the estimated total costs necessary to complete the project. These changes positively impacted gross profit related to work performed in prior periods by $52.2 million during the year ended December 31, 2018.

Revenues by Category

The following tables present Quanta's revenue disaggregated by geographic location and contract type for the year ended December 31, 2018 (in thousands):

	Year Ended December 31, 2018	
By primary geographic location:		
United States	$ 8,575,341	76.7%
Canada	1,984,214	17.8%
Australia	377,453	3.4%
Latin America and Other	234,415	2.1%
Total revenues	$ 11,171,423	100.0%

	Year Ended December 31, 2018	
By contract type:		
Unit-price contracts	$ 3,828,997	34.3%
Fixed price contracts	4,835,401	43.3%
Cost-plus contracts	2,507,025	22.4%
Total revenues	$ 11,171,423	100.0%

As described above, under unit-based contracts with more than an insignificant amount of partially completed units and fixed price contracts, revenue is recognized as performance obligations are satisfied over time, with the percentage completion generally measured as the percentage of costs incurred to total estimated costs for such performance obligation. Approximately 57.7% of Quanta's revenues recognized during the year ended December 31, 2018 were associated with this revenue recognition method.

Contract Assets and Liabilities

With respect to Quanta's contracts, interim payments are typically received as work progresses in accordance with agreed-upon contractual terms, either at periodic intervals or upon achievement of contractual milestones. As a result, under fixed price contracts the timing of revenue recognition and contract billings results in contract assets and contract liabilities. Contract assets represent revenues recognized in excess of amounts billed for fixed price contracts and are current assets that are transferred to accounts receivable when billed or the billing rights become unconditional. Contract assets are not considered a significant financing component as the intent is to protect the customer in the event Quanta does not perform on its obligations under the contract.

Conversely, contract liabilities represent billings in excess of revenues recognized for fixed price contracts. These arise under certain contracts that allow for upfront payments from the customer or contain contractual billing milestones, which result in billings that exceed the amount of revenues recognized for certain periods. Contract liabilities are current liabilities and are not considered a significant financing component, as they are used to meet working capital requirements that are generally higher in the early stages of a contract and protect Quanta from the other party failing to meet its obligations under the contract. Contract assets and liabilities are recorded on a performance obligation basis at the end of each reporting period.

Contract assets and liabilities consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Contract assets	$ 576,891	$ 497,292
Contract liabilities	$ 425,961	$ 433,387

The increase in contract assets as of December 31, 2018 was primarily due to an increase in the volume of fixed price contracts in process. During the year ended December 31, 2018, Quanta recognized revenue of approximately $400.0 million related to contract liabilities outstanding at December 31, 2017. Additionally, during the year ended December 31, 2018, revenues were favorably impacted by $71.9 million as a result of changes in estimates associated with performance obligations on fixed price contracts partially satisfied prior to December 31, 2017.

Impairment losses recognized on contract assets were not material for the year ended December 31, 2018.

Current and Long-Term Accounts Receivable, Notes Receivable and Allowance for Doubtful Accounts

Quanta provides an allowance for doubtful accounts when collection of an account or note receivable is considered doubtful, and receivables are written off against the allowance when deemed uncollectible. Inherent in the assessment of the allowance for doubtful accounts are certain judgments and estimates regarding, among other factors, the customer's access to capital, the customer's willingness or ability to pay, general economic and market conditions, the ongoing relationship with the customer and uncertainties related to the resolution of disputed matters. Quanta considers accounts receivable delinquent after 30 days but does not generally include delinquent accounts in its analysis of the allowance for doubtful accounts unless the accounts receivable have been outstanding for at least 90 days. Quanta also includes accounts receivable balances that relate to customers in bankruptcy or with other known difficulties in its analysis of the allowance for doubtful accounts. Material changes to a customer's business, cash flows or financial condition, which may be impacted by negative economic and market conditions, could affect Quanta's ability to collect amounts due. Should anticipated recoveries relating to receivables fail to materialize (including anticipated recoveries relating to existing bankruptcies or other workout situations), Quanta could experience reduced cash flows and losses in excess of current allowances provided. As of December 31, 2018 and 2017, Quanta had allowances for doubtful accounts on current receivables of $5.8 million and $4.5 million. See Note 18 for additional information related to the bankruptcy matter involving PG&E Corporation and its primary operating subsidiary, Pacific Gas and Electric Company (collectively PG&E), a significant customer of Quanta, which was filed on January 29, 2019.

Long-term accounts receivable are included within "Other assets, net" in the accompanying consolidated balance sheets.

Some contracts allow customers to withhold a small percentage of billings pursuant to retainage provisions, and such amounts are generally due upon completion of the contracts and acceptance by the customer. Based on Quanta's experience with similar contracts in recent years, the majority of the retainage balances at each balance sheet date are expected to be collected within the next twelve months. Current retainage balances as of December 31, 2018 and 2017 were $337.1 million and $300.5 million and were included in "Accounts receivable." Retainage balances with settlement dates beyond the next twelve months were included in "Other assets, net," and as of December 31, 2018 and 2017 were $99.6 million and $41.9 million.

Quanta recognizes unbilled receivables for non-fixed price contracts within "Accounts receivable" in certain circumstances, such as when revenues have been earned and recorded but the amount cannot be billed under the terms of the contract until a later date or amounts arise from routine lags in billing (for example, work completed one month but not billed until the next month). These balances do not include revenues recognized for work performed under fixed-price contracts as these amounts are recorded as "Contract assets." At December 31, 2018 and 2017, the balances of unbilled receivables included in "Accounts receivable" were $434.9 million and $303.9 million. Quanta also recognizes unearned revenues for non-fixed price contracts when cash is received prior to recognizing revenues for the related performance obligation. Unearned revenues, which are included in "Accounts payable and accrued expenses," were $40.1 million and $16.0 million at December 31, 2018 and 2017.

Practical Expedients and Exemptions

Quanta utilizes certain practical expedients and exemptions associated with the new revenue recognition guidance. For example, Quanta elected the modified retrospective transition method, which allowed the guidance to be applied only to contracts that were not considered substantially complete as of January 1, 2018. Additionally, in cases where Quanta has a right to consideration from a customer in an amount that corresponds directly with the value of Quanta's performance completed to date, Quanta recognizes revenue in the amount to which it has a right to invoice and does not disclose such performance as a remaining performance obligation. Also, contract consideration is not adjusted for the effects of a significant financing component if payment is expected to be collected less than one year from when the services are performed.

Cash and Cash Equivalents

Amounts related to Quanta's cash and cash equivalents based on geographic location of the bank accounts were as follows (in thousands):

	December 31,	
	2018	2017
Cash and cash equivalents held in domestic bank accounts	$ 62,495	$ 83,074
Cash and cash equivalents held in foreign bank accounts	16,192	55,211
Total cash and cash equivalents	$ 78,687	$ 138,285

Cash consisting of interest-bearing demand deposits is carried at cost, which approximates fair value. Quanta considers all highly liquid investments with an original maturity of three months or less at the time of purchase to be cash equivalents, which are carried at fair value. At December 31, 2018 and 2017, cash equivalents were $37.2 million and $7.1 million and consisted

primarily of money market investments and money market mutual funds and are discussed further in *Fair Value Measurements* below.

Cash and cash equivalents held by joint ventures, which are either consolidated or proportionately consolidated, are available to support joint venture operations, but Quanta cannot utilize those assets to support its other operations. Quanta generally has no right to the joint ventures' cash and cash equivalents other than participating in distributions and in the event of dissolution. Amounts related to cash and cash equivalents held by joint ventures, which are included in Quanta's total cash and cash equivalents balances, were as follows (in thousands):

	December 31,	
	2018	2017
Cash and cash equivalents held by domestic joint ventures	$ 8,544	$ 10,042
Cash and cash equivalents held by foreign joint ventures	441	6,615
Total cash and cash equivalents held by joint ventures	8,985	16,657
Cash and cash equivalents not held by joint ventures	69,702	121,628
Total cash and cash equivalents	$ 78,687	$ 138,285

Inventories

Inventories consist primarily of parts and supplies held for use in the ordinary course of business, which are valued by Quanta at the lower of cost or net realizable value. Cost is determined by using either the first-in, first-out (FIFO) method or the average costing method. Inventories also include certain job specific materials not yet installed, which are valued using the specific identification method.

Property and Equipment

Property and equipment are stated at cost, and depreciation is computed using the straight-line method, net of estimated salvage values, over the estimated useful lives of the assets. Leasehold improvements are capitalized and amortized over the lesser of the life of the lease or the estimated useful life of the asset. Depreciation expense related to property and equipment is recognized on a straight-line basis over the estimated useful lives of the assets and was $202.5 million, $183.8 million and $170.2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Accrued capital expenditures were $2.7 million and $9.6 million as of December 31, 2018 and 2017. The impact of these items has been excluded from Quanta's capital expenditures in the accompanying consolidated statements of cash flows due to their non-cash nature.

Expenditures for repairs and maintenance are charged to expense when incurred. Expenditures for major renewals and betterments, which extend the useful lives of existing equipment, are capitalized and depreciated over the adjusted remaining useful lives of the assets. Upon retirement or disposition of property and equipment, the cost and related accumulated depreciation are removed from the accounts and any resulting gain or loss is reflected in selling, general and administrative expenses.

Management reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount may not be realizable. When an evaluation is required, the estimated future undiscounted cash flows associated with the asset group are compared to the asset group's carrying amount to determine if an impairment is necessary. The effect of any impairment involves expensing the difference between the fair value of the asset group and its carrying amount in the period incurred.

Quanta recorded asset impairments of $49.4 million during the year ended December 31, 2018 related to the winding down of certain oil-influenced operations and assets. The related long-lived assets have been written down to their estimated fair value of $14.0 million and have been classified as assets held for sale and recorded in "Prepaid expenses and other current assets" in the accompanying December 31, 2018 consolidated balance sheet. These assets are associated with Quanta's Pipeline and Industrial Infrastructure Services segment. Additionally, Quanta recorded asset impairments of $8.0 million in 2016 primarily related to certain international renewable energy services operations. The 2016 impairment was primarily due to a pending disposition of certain international renewable energy services operations that was completed in 2017.

Other Assets, Net

Other assets, net consists primarily of long-term receivables, long-term retainage, deferred tax assets, debt issuance costs, equity and other investments, refundable security deposits for leased properties and insurance claims in excess of deductibles that are due from Quanta's insurers.

Debt Issuance and Amendment Costs

Capitalized debt issuance and amendment costs related to Quanta's senior secured credit facility are included in "Other assets, net" in the accompanying consolidated balance sheets and are amortized into interest expense on a straight-line basis over the terms of the respective agreements giving rise to the costs, which Quanta believes approximates the effective interest rate method. During 2018 and 2017, Quanta incurred $2.0 million and $1.5 million of debt issuance and amendment costs related to amendments and a restatement of its credit agreement. In 2017, Quanta recorded a nominal charge to interest expense for the write-off of a portion of the debt issuance and amendment costs related to the prior facility. As of December 31, 2018 and 2017, capitalized debt issuance costs were $14.9 million and $12.9 million, with accumulated amortization of $8.6 million and $7.4 million. For the years ended December 31, 2018, 2017 and 2016, amortization expense related to capitalized debt issuance and amendment costs was $1.3 million, $1.3 million and $1.4 million, respectively.

Goodwill

Goodwill, net of accumulated impairment losses, which represents the excess of cost over the fair market value of net tangible and identifiable intangible assets of acquired businesses, is stated at cost. Goodwill is not amortized but instead is annually tested for impairment, or more frequently if events or circumstances indicate that the carrying amount of goodwill may be impaired. Quanta has recorded goodwill in connection with its historical acquisitions of businesses. Upon acquisition, these businesses were either combined into one of Quanta's existing operating units or managed on a stand-alone basis as an individual operating unit. Quanta's operating units are organized into one of two internal divisions. The two internal divisions are: the Electric Power Infrastructure Services Division and the Pipeline and Industrial Infrastructure Services Division. As most of the companies acquired by Quanta provide multiple types of services for multiple types of customers, these divisional designations are based on the predominant type of work performed by an operating unit at the point in time the divisional designation is made. Goodwill is required to be measured for impairment at the reporting unit level, which represents the operating segment level or one level below the operating segment level for which discrete financial information is available. Quanta has determined that its individual operating units represent its reporting units for the purpose of assessing goodwill impairment. An annual assessment for impairment is performed for each reporting unit that carries a balance of goodwill.

Quanta's goodwill impairment assessment is performed during the fourth quarter of its fiscal year, or more frequently if events or circumstances arise which indicate that goodwill may be impaired. An assessment can be performed by first completing a qualitative assessment on none, some or all of its reporting units. Quanta can also bypass the qualitative assessment for any reporting unit in any period and proceed directly to the quantitative impairment test, and then resume the qualitative assessment in any subsequent period. Qualitative indicators that may trigger the need for annual or interim quantitative impairment testing include, among other things, deterioration in macroeconomic conditions, declining financial performance, deterioration in the operational environment, or an expectation of selling or disposing of a portion of a reporting unit. Additionally, a significant change in business climate, a loss of a significant customer, increased competition, a sustained decrease in share price, or a decrease in Quanta's market capitalization below book value may trigger the need for interim impairment testing of goodwill associated with one or more of Quanta's reporting units.

If Quanta believes that, as a result of its qualitative assessment, it is more likely than not that the fair value of a reporting unit is less than its carrying amount, the quantitative impairment test is required. The quantitative test involves comparing the fair value of each of Quanta's reporting units with its carrying amount, including goodwill. If the carrying amount of a reporting unit exceeds its fair value, an impairment loss is recorded as a reduction to goodwill with a corresponding charge to "Asset impairment charges" in the consolidated statements of operations. The income tax effect associated with an impairment of tax deductible goodwill is also considered in the measurement of the goodwill impairment. Any goodwill impairment is limited to the total amount of goodwill allocated to that reporting unit.

Quanta determines the fair value of its reporting units using a weighted combination of the income approach (discounted cash flow method) and market multiples valuation techniques (market guideline transaction method and market guideline public company method), with heavier weighting on the discounted cash flow method because management believes this method results in the most appropriate calculation of fair value and reflects an expectation of market value as determined by a "held and used" model.

Under the discounted cash flow method, Quanta determines fair value based on the estimated future cash flows for each reporting unit, discounted to present value using a risk-adjusted industry weighted average cost of capital, which reflects the overall level of inherent risk for each reporting unit and the rate of return an outside investor would expect to earn. Cash flow projections are derived from budgeted amounts (typically a one-year model) and subsequent period cash flows are developed for each reporting unit using growth rates that management believes are reasonably likely to occur. All cash flow projections by reporting unit are evaluated by management. A terminal value is derived from a multiple of the reporting unit's earnings before interest, taxes, depreciation and amortization (EBITDA). The EBITDA multiples for each reporting unit are based on observed purchase transactions for similar businesses adjusted for size, volatility and risk.

Under the market guideline transaction and market guideline public company methods, Quanta determines the estimated fair value for each of its reporting units by applying transaction multiples and public company multiples, respectively, to each reporting unit's projected EBITDA and then averaging that estimate with similar historical calculations using either a one, two or three year average. The transaction multiples are based on observed purchase transactions for similar businesses adjusted for size, volatility and risk. The public company multiples are based on peer group multiples adjusted for size, volatility and risk. For the market guideline public company method, Quanta adds a reasonable control premium, which is estimated as the premium that would be appropriate to convert the reporting unit value to a controlling interest basis.

The following table presents the significant estimates used by management in determining the fair values of Quanta's reporting units for which a quantitative assessment was performed at December 31, 2018, 2017 and 2016:

	2018	2017	2016
Years of cash flows before terminal value	5 years	5 years	5 years
Weighted average cost of capital	12.0% to 15.0%	12.0% to 14.0%	12.5% to 14.5%
Transaction multiples applied to EBITDA	6.5 to 9.0	5.5 to 7.0	5.5 to 7.0
Guideline public company multiples applied to EBITDA	6.5 to 9.5	6.5 to 8.0	5.5 to 7.0
Five-year revenue compounded annual growth rates	-14% to 8%	-14% to 17%	-2% to 24%
Weighting of three methods:			
Discounted cash flows	70%	70%	70%
Market multiple	15%	15%	15%
Market capitalization	15%	15%	15%

For Quanta's annual goodwill impairment assessment performed during the fourth quarter of 2018, Quanta concluded to first assess qualitative factors to determine whether it was necessary to perform a quantitative fair value impairment analysis. As a result of the qualitative assessment, Quanta identified certain reporting units for which a quantitative goodwill impairment assessment was determined appropriate based on either changes in market conditions or specific performance indicators. Ultimately, the quantitative analyses indicated that the fair value of each of the selected reporting units was in excess of its carrying amount. Accordingly, Quanta did not record any impairment charges related to goodwill during the fourth quarter of 2018. In connection with the 2017 annual goodwill assessment, Quanta recorded a $57.0 million impairment associated with two reporting units. Specifically, a reporting unit that provides material handling services had experienced lower operating margins and was expected to continue to face a highly competitive environment in its select markets, and a reporting unit that provides marine and offshore services had experienced prolonged periods of reduced revenues and operating margins and was expected to continue to experience lower levels of activity in the U.S. Gulf of Mexico and other offshore markets.

Although, no goodwill impairment charges were recorded during the year ended December 31, 2018, the determination of a reporting unit's fair value requires judgment and the use of significant estimates and assumptions. Quanta believes the estimates and assumptions used in its impairment assessments are reasonable and based on available market information obtained from relevant industry sources; however, variations in any of the assumptions could result in materially different calculations of fair value and impairment determinations. Accordingly, management considered the sensitivity of its fair value estimates to changes in certain valuation assumptions. After taking into account a 10% decrease in the fair value of the reporting units for which a quantitative impairment test was performed, two reporting units within Quanta's Pipeline and Industrial Infrastructure Services Division would have fair values below their carrying amounts. One of the reporting units is the material handling services business for which a goodwill impairment was recorded in 2017 as described above and the other reporting unit operates within the midstream and smaller-scale pipeline market. Goodwill and intangible assets associated with these two reporting units were $48.0 million and $11.1 million at December 31, 2018.

If an operating unit experiences prolonged periods of declining revenues, operating margins or both, it may be at risk of failing the quantitative goodwill impairment test. The reporting units referenced above have experienced declines over the short-term due to challenging macroeconomic conditions in certain geographic areas and low oil and natural gas prices, which have

negatively impacted customer spending and resulted in project cancellations and delays. Additionally, customer capital spending has been constrained as a result of an increasingly complex regulatory and permitting environment. Quanta monitors these conditions and others to determine if it is necessary to perform the quantitative fair value impairment test for one or more operating units prior to the annual impairment assessment.

Due to the cyclical nature of Quanta's business, and the other factors described above, the profitability of its individual reporting units may suffer from decreases in customer demand and other factors. These factors may have a disproportionate impact on the individual reporting units as compared to Quanta as a whole and might adversely affect the fair value of individual reporting units. If material adverse conditions occur that impact Quanta's reporting units, its future estimates of fair value may not support the carrying amount of one or more of its reporting units, and the related goodwill would need to be written down to an amount considered recoverable.

Other Intangible Assets

Quanta's intangible assets include customer relationships, backlog, trade names, non-compete agreements, patented rights and developed technology and curriculum, all of which are subject to amortization, as well as an engineering license, which is not subject to amortization. The value of customer relationships is estimated as of the date a business is acquired based on the value-in-use concept utilizing the income approach, specifically the multi-period excess earnings method. This analysis discounts to present value the projected cash flows attributable to the customer relationships, with consideration given to customer contract renewals and estimated customer attrition rates. The following table presents the significant estimates used by management in determining the fair values of customer relationships associated with acquisitions in the years ended December 31, 2018, 2017 and 2016:

	2018	2017	2016
Discount rates	20% to 27%	17% to 25%	20% to 23%
Customer attrition rates	20% to 33%	15% to 78%	10% to 70%

Quanta values backlog for acquired businesses as of the acquisition date based upon the contractual nature of the backlog within each service line, discounted to present value. The values of trade names and curriculum are estimated using the relief-from-royalty method of the income approach, which is based on the assumption that in lieu of ownership, a company would be willing to pay a royalty for use of the trade name and curriculum. The value of a non-compete agreement is estimated based on the difference between the present value of the prospective cash flows with the agreement in place and the present value of the prospective cash flows without the agreement in place. The value of the engineering license is based on cash paid to acquire the asset.

Quanta amortizes the intangible assets that are subject to amortization based upon the estimated consumption of their economic benefits, or on a straight-line basis if the pattern of economic benefit cannot otherwise be reliably estimated. Intangible assets are reviewed for impairment and tested for recoverability whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. For instance, a significant change in business climate or a loss of a significant customer, among other things, may trigger the need for interim impairment testing of intangible assets. An impairment loss is recognized if the carrying amount of an intangible asset is not recoverable and its carrying amount exceeds its fair value. Intangible asset impairments are included within "Asset impairment charges" in the consolidated statements of operations.

During 2017, Quanta recorded an impairment charge of $1.1 million related to a customer relationship intangible asset, which primarily resulted from a strategic decision to restructure a business within a reporting unit in the Pipeline and Industrial Infrastructure Services Division.

Investments in Affiliates and Other Entities

In the normal course of business, Quanta enters into various types of investment arrangements, each having unique terms and conditions. These investments may include equity interests held by Quanta in business entities, including general or limited partnerships, contractual joint ventures, or other forms of equity or profit participation. These investments may also include Quanta's participation in different financing structures, such as the extension of loans to project specific entities, the acquisition of convertible notes issued by project specific entities, or other strategic financing arrangements. Quanta also enters into strategic partnerships with customers and infrastructure investors to provide fully integrated infrastructure services on certain projects, including planning and feasibility analyses, engineering, design, procurement, construction and project operation and maintenance. These projects include public-private partnerships and concessions, along with private infrastructure projects such as build, own, operate (and in some cases transfer) and build-to-suit arrangements. As part of this strategy, Quanta formed a partnership with select investors that provides up to $1.0 billion of capital, including approximately $80.0 million from Quanta, available to invest

in certain of these infrastructure projects through August 2024. Wholly owned subsidiaries of Quanta serve as the general partner of this partnership and as a separately operated registered investment adviser that manages the invested capital.

Quanta determines whether investments involve a variable interest entity (VIE) based on the characteristics of the subject entity. If the entity is determined to be a VIE, then management determines if Quanta is the primary beneficiary of the entity and whether or not consolidation of the VIE is required. The primary beneficiary consolidating the VIE must normally have both (i) the power to direct the activities that most significantly affect the VIE's economic performance and (ii) the obligation to absorb significant losses of or the right to receive significant benefits from the VIE. When Quanta is deemed to be the primary beneficiary, the VIE is consolidated and the other party's equity interest in the VIE is accounted for as a non-controlling interest. In cases where Quanta determines that it has an undivided interest in the assets, liabilities, revenues and profits of an unincorporated VIE (e.g., a general partnership interest), such amounts are consolidated on a basis proportional to Quanta's ownership interest in the unincorporated entity.

Investments in entities of which Quanta is not the primary beneficiary, but over which Quanta has the ability to exercise significant influence, are accounted for using the equity method of accounting. Quanta's share of net income or losses from unconsolidated equity investments is reported as equity in earnings (losses) of unconsolidated affiliates, which is included in "Other expense, net" in the accompanying consolidated statements of operations. Equity investments are reviewed for impairment by assessing whether any decline in the fair value of the investment below the carrying amount is other than temporary. In making this determination, factors such as the ability to recover the carrying amount of the investment and the inability of the investee to sustain an earnings capacity are evaluated in determining whether a loss in value should be recognized. Any impairment losses related to investments would be recognized in equity in earnings (losses) of unconsolidated affiliates. Equity method investments are carried at original cost adjusted for Quanta's proportionate share of the investees' income, losses and distributions and are included in "Other assets, net" in Quanta's accompanying consolidated balance sheets.

Quanta has a minority ownership interest in a limited partnership that was selected during 2014 to build, own and operate a new electric transmission line and two substations in Alberta, Canada and has accounted for this interest as an equity-method investment. The limited partnership contracted with a Quanta subsidiary to perform the engineering, procurement and construction (EPC) services for the project, and the Quanta subsidiary recognizes revenue and related cost of services as performance progresses on the project. However, due to Quanta's ownership interest, a proportional amount of the EPC profit is deferred until the electric transmission line and related substations are constructed and ownership of the assets is deemed to be transferred to the third party customer, which is expected to occur in 2019. The profit deferral has been recorded as a decrease to the equity method investment and as a component of equity in earnings (losses) of unconsolidated affiliates, which is included in "Other expense, net" in the accompanying consolidated statements of operations. Because the profit deferral is greater than the amount invested, the net amount has been included in "Insurance and other non-current liabilities" in the accompanying consolidated balance sheets.

Investments in entities which Quanta is not the primary beneficiary, and over which Quanta does not have the ability to exercise significant influence, are accounted for using the cost method of accounting. These investments are required to be measured at fair value with changes in fair value recognized in net income unless the investments do not have readily determinable fair values, in which case the investments are measured at cost minus impairment, if any, plus or minus observable price changes in orderly transactions for an identical or a similar investment of the same company.

During the year ended December 31, 2018, Quanta acquired a 30% equity interest in a water and gas pipeline infrastructure contractor located in Australia for $22.2 million. This investment includes an option to acquire the remaining equity of the company through 2020 and provides for certain additional earnings and distribution participation rights during a designated 25-month post-investment period, as well as preferential liquidation rights. Quanta's equity interest has been recorded at cost and will be adjusted for impairment, if any, plus or minus observable changes in the value of the company's equity. Earnings on this investment are recognized as dividends are received and are reported in "Other expense, net" in the accompanying consolidated statements of operations. Quanta received and recognized $3.9 million in cash dividends from this investment during 2018. Additionally, during the year ended December 31, 2018, Quanta acquired a 49% equity interest in an electric power infrastructure services company together with certain related customer relationship and other intangible assets for $12.3 million in total. See Notes 10 and 14 for additional disclosures related to investments.

Income Taxes

Quanta follows the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recorded based on future tax consequences of temporary differences between the financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates and laws that are expected to be in effect when the underlying assets or liabilities are recovered or settled.

Quanta regularly evaluates valuation allowances established for deferred tax assets for which future realization is uncertain, including in connection with changes in tax laws. The estimation of required valuation allowances includes estimates of future taxable income. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Quanta considers projected future taxable income and tax planning strategies in making this assessment. If actual future taxable income differs from these estimates, Quanta may not realize deferred tax assets to the extent estimated.

Quanta records reserves for income taxes related to certain tax positions in those instances where Quanta considers it more likely than not that additional taxes may be due in excess of amounts reflected on income tax returns filed. When recording these reserves, Quanta assumes that taxing authorities have full knowledge of the position and all relevant facts. Quanta continually reviews exposure to additional tax obligations, and as further information is known or events occur, changes in tax reserves may be recorded. To the extent interest and penalties may be assessed by taxing authorities on any underpayment of income tax, such amounts have been accrued and included in the provision for income taxes.

As of December 31, 2018, the total amount of unrecognized tax benefits relating to uncertain tax positions was $41.1 million, an increase from December 31, 2017 of $4.9 million. This increase resulted primarily from a $6.2 million increase in reserves for uncertain tax positions to be taken for 2018 and a $6.5 million net increase for uncertain tax positions related to prior years, partially offset by an $7.9 million decrease in reserves for uncertain tax positions resulting from the expiration of the statute of limitations for the 2014 tax year. Quanta and certain subsidiaries remain under examination by various U.S. state and Canadian and other foreign tax authorities for multiple periods. Quanta believes it is reasonably possible that within the next 12 months unrecognized tax benefits may decrease by up to $9.5 million as a result of settlement of these examinations or as a result of the expiration of certain statute of limitations periods.

U.S. federal and state and foreign income tax laws and regulations are voluminous and are often ambiguous. As such, Quanta is required to make many subjective assumptions and judgments regarding its tax positions that could materially affect amounts recognized in its future consolidated balance sheets, consolidated statements of operations and consolidated statements of comprehensive income. For example, the Tax Cuts and Jobs Act of 2017 (the Tax Act) significantly revised the U.S. corporate tax regime which, among other things, resulted in a reduction of Quanta's current and estimated future effective tax rate and a remeasurement of its deferred tax assets and liabilities. For additional information on the Tax Act, refer to Note 9.

Earnings Per Share

Basic and diluted earnings per share attributable to common stock are computed using the weighted average number of shares of common stock outstanding during the applicable period. Exchangeable shares that were issued pursuant to certain of Quanta's historical acquisitions (as further discussed in Note 10), which are exchangeable on a one-for-one basis with shares of Quanta common stock, have been included in the calculation of weighted average shares outstanding for basic and diluted earnings per share attributable to common stock for the portion of the periods that they were outstanding. Additionally, unvested stock-based awards that contain non-forfeitable rights to dividends or dividend equivalents (participating securities) have been included in the calculation of basic and diluted earnings per share attributable to common stock for the portion of the periods that the awards were outstanding. Weighted average shares outstanding for basic and diluted earnings per share attributable to common stock for the years ended December 31, 2018, 2017 and 2016 included 2.6 million, 2.3 million and 2.6 million weighted average participating securities. Diluted earnings per share attributable to common stock is computed using the weighted average number of shares of common stock outstanding during the period adjusted for all potentially dilutive common stock equivalents, except in cases where the effect of the common stock equivalents would be antidilutive.

Insurance

Quanta is insured for employer's liability, workers' compensation, auto liability and general liability claims. Under these programs, the deductible for employer's liability is $1.0 million per occurrence, the deductible for workers' compensation is $5.0 million per occurrence, and the deductibles for auto liability and general liability are $10.0 million per occurrence. Quanta manages and maintains a portion of its casualty risk through its wholly-owned captive insurance company, which insures all claims up to the amount of the applicable deductible of its third-party insurance programs. Quanta also has employee health care benefit plans for most employees not subject to collective bargaining agreements, of which the primary plan is subject to a deductible of $0.5 million per claimant per year.

Losses under all of these insurance programs are accrued based upon Quanta's estimate of the ultimate liability for claims reported and an estimate of claims incurred but not reported, with assistance from third-party actuaries. These insurance liabilities are difficult to assess and estimate due to unknown factors, including the severity of an injury, the extent of damage, the determination of Quanta's liability in proportion to other parties and the number of incidents not reported. The accruals are based upon known facts and historical trends, and management believes such accruals are adequate.

Collective Bargaining Agreements

Some of Quanta's operating units are parties to various collective bargaining agreements with unions that represent certain of their employees. The collective bargaining agreements expire at various times and have typically been renegotiated and renewed on terms similar to those in the expiring agreements. The agreements require the operating units to pay specified wages, provide certain benefits to their union employees and contribute certain amounts to multiemployer pension plans and employee benefit trusts. Quanta's multiemployer pension plan contribution rates generally are specified in the collective bargaining agreements (usually on an annual basis), and contributions are made to the plans on a "pay-as-you-go" basis based on its union employee payrolls. The location and number of union employees that Quanta employs at any given time and the plans in which they may participate vary depending on the projects Quanta has ongoing at that time and the need for union resources in connection with those projects. Therefore, Quanta is unable to accurately predict the union employee payroll and the amount of the resulting multiemployer pension plan contribution obligations for future periods.

Stock-Based Compensation

Quanta recognizes compensation expense for restricted stock, restricted stock units (RSUs) and performance units to be settled in common stock based on the fair value of the awards, net of estimated forfeitures. The fair value of these awards is generally determined based on the number of shares or units granted and the closing price of Quanta's common stock on the date of grant, with the exception of performance units with market-based metrics, the fair value of which is determined using a Monte Carlo simulation valuation methodology. An estimate of future forfeitures, based on historical data, is utilized to determine the period expense. Such estimates are subject to change and may impact the value that will ultimately be recognized as compensation expense. The resulting compensation expense for performance unit and time-based RSU awards is recognized on a straight-line basis over the requisite service period, which is generally the vesting period, and the resulting compensation expense for performance-based RSU awards is recognized using the graded vesting method over the requisite service period. The compensation expense related to outstanding performance units can also vary from period to period based on changes in the total number of shares of common stock that Quanta anticipates will be issued upon vesting of such performance units. Payments made by Quanta to satisfy employee tax withholding obligations associated with awards settled in common stock are classified as financing cash flows.

Compensation expense associated with liability-based awards, such as RSUs that are expected to or may settle in cash, is recognized based on a remeasurement of the fair value of the award at the end of each reporting period. Upon settlement, the holders receive for each RSU an amount in cash equal to the fair market value on the settlement date of one share of Quanta common stock, as specified in the applicable award agreement. For additional information on Quanta's restricted stock, RSU, and performance unit awards, see Note 11.

Functional Currency and Translation of Financial Statements

The U.S. dollar is the functional currency for the majority of Quanta's operations, which are primarily located within the United States. The functional currency for Quanta's foreign operations, which are primarily located in Canada, Australia and Latin America, is typically the currency of the country where the foreign operating unit is located and transacts the majority of its activities, including billings, financing, payroll and other expenditures. The treatment of foreign currency translation gains or losses is dependent upon management's determination of the functional currency, and when preparing its consolidated financial statements, Quanta translates the financial statements of its foreign operating units from their functional currency into U.S. dollars. Statements of operations, comprehensive income and cash flows are translated at average monthly rates, while balance sheets are translated at month-end exchange rates. The translation of the balance sheet results in translation gains or losses, which are included as a separate component of equity under "Accumulated other comprehensive income (loss)." Gains and losses arising from transactions not denominated in functional currencies are included within "Other expense, net" in the accompanying consolidated statements of operations.

Comprehensive Income

Components of comprehensive income include all changes in equity during a period, except those resulting from changes in Quanta's capital related accounts. Quanta records other comprehensive income (loss) for foreign currency translation adjustments related to its foreign operations and for other revenues, expenses, gains and losses that are included in comprehensive income but excluded from net income.

Litigation Costs and Reserves

Quanta records reserves when the likelihood of incurring a loss is probable and the amount of loss can be reasonably estimated. Costs incurred for litigation are expensed as incurred. Further details are presented in Note 14.

Fair Value Measurements

For disclosure purposes, qualifying assets and liabilities are categorized into three broad levels based on the priority of the inputs used to determine their fair values. The fair value hierarchy gives the highest priority to quoted prices (unadjusted) in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). Certain assumptions and other information as they relate to these qualifying assets and liabilities are described below.

Contingent Consideration Liabilities. As of December 31, 2018 and 2017, financial instruments required to be measured at fair value on a recurring basis consisted primarily of Quanta's liabilities related to contingent consideration associated with certain acquisitions, the payment of which is contingent upon the achievement of certain performance objectives by the acquired businesses during post-acquisition periods and, if earned, would be payable to the former owners of the acquired businesses. The liabilities recorded represent the estimated fair values of future amounts payable to the former owners of the acquired businesses and are estimated by management based on entity-specific assumptions that are evaluated on an ongoing basis. As of December 31, 2018 and 2017, the aggregate fair value of these outstanding and unearned contingent consideration liabilities totaled $70.8 million and $65.7 million, all of which was included in "Insurance and other non-current liabilities" in the accompanying consolidated balance sheets. Quanta expects a significant portion of these liabilities to be settled by late 2020 or early 2021. The fair values of contingent consideration liabilities as of December 31, 2018 were primarily determined using a Monte Carlo simulation valuation methodology based on probability-weighted performance projections and other inputs, including a discount rate and an expected volatility factor for each acquisition. The expected volatility factors ranged from 22.2% to 30.0% based on historical asset volatility of selected guideline public companies. Depending on contingent consideration payment terms, the present values of the estimated payments are discounted based on a risk-free rate and/or Quanta's cost of debt, ranging from 2.1% to 3.8%. The fair value determinations incorporate significant inputs not observable in the market. Accordingly, the level of inputs used for these fair value measurements is the lowest level (Level 3). Significant changes in any of these assumptions could result in a significantly higher or lower potential liability.

The majority of Quanta's contingent consideration liabilities are subject to a maximum payment amount, which totaled $157.2 million as of December 31, 2018. One contingent consideration liability is not subject to a maximum payout amount, and that liability had a fair value of $1.0 million as of December 31, 2018.

Quanta's aggregate contingent consideration liabilities can change due to additional business acquisitions, payments to settle outstanding liabilities, changes in the fair value of amounts owed based on actual or forecasted performance, and foreign currency translation gains or losses. During the years ended December 31, 2018 and 2017, Quanta recognized net decreases in the fair value of contingent consideration liabilities of $11.2 million and $5.2 million, which were reflected in "Change in fair value of contingent consideration liabilities" in the accompanying consolidated statements of operations.

Goodwill and Other Intangible Assets. As discussed in the *Goodwill* and *Other Intangible Assets* sections within this Note 2 above, Quanta has recorded goodwill and identifiable intangible assets in connection with certain of its historical business acquisitions. Quanta utilizes the fair value premise as the primary basis for its impairment valuation procedures. The *Goodwill* and *Other Intangible Assets* sections provide information regarding valuation methods, including the income approach, market approach and cost approach, and assumptions used to determine fair values of these assets based on the appropriateness of each method in relation to the type of asset being valued. Quanta believes that these valuation methods appropriately represent the methods that would be used by other market participants in determining fair value, and periodically engages the services of an independent valuation firm when a new business is acquired to assist management with this valuation process, including assistance with the selection of appropriate valuation methodologies and the development of market-based valuation assumptions. The level of inputs used for these fair value measurements is the lowest level (Level 3).

Investments and Financial Instruments. Quanta also uses fair value measurements in connection with the valuation of its investments in private company equity interests and financial instruments. These valuations require significant management judgment due to the absence of quoted market prices, the inherent lack of liquidity and the long-term nature of such assets. Typically, the initial costs of these investments are considered to represent fair market value, as such amounts are negotiated between willing market participants. On a quarterly basis, Quanta performs an evaluation of its investments to determine if an other-than-temporary decline in the value of each investment has occurred and whether the recorded amount of each investment will be recoverable. If an other-than-temporary decline in the value of an investment occurs, a fair value analysis would be performed to determine the degree to which the investment was impaired and a corresponding charge to earnings would be recorded during the period. These types of fair market value assessments are similar to other nonrecurring fair value measures used by Quanta, which include the use of significant judgment and available relevant market data. Such market data may include observations of the valuation of comparable companies, risk adjusted discount rates and an evaluation of the expected performance of the underlying portfolio asset, including historical and projected levels of profitability or cash flows. In addition, a variety of additional factors may be reviewed by management, including, but not limited to, contemporaneous financing and sales transactions with third parties, changes in market outlook and the third-party financing environment. The level of inputs used for these fair value measurements is the lowest level (Level 3).

Other: The carrying amounts of cash equivalents, accounts receivable and accounts payable and accrued expenses approximate fair value due to the short-term nature of these instruments. The carrying amount of variable rate debt also approximates fair value. All of Quanta's cash equivalents were categorized as Level 1 assets at December 31, 2018 and 2017, as all values were based on unadjusted quoted prices for identical assets in an active market that Quanta has the ability to access.

3. NEW ACCOUNTING PRONOUNCEMENTS:

Adoption of New Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued an update that superseded most revenue recognition guidance, as well as certain cost recognition guidance. The update, together with other clarifying updates, requires that the recognition of revenue related to the transfer of goods or services to customers reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The update also requires additional qualitative and quantitative disclosures about the nature, amount, timing and uncertainty of revenues and cash flows arising from customer contracts, including significant judgments and changes in judgments, and information about contract balances and performance obligations.

Quanta adopted the new revenue recognition guidance using the modified retrospective transition method effective January 1, 2018, applying the guidance to contracts that were not substantially complete as of such date. Quanta's financial results for reporting periods after January 1, 2018 have been and will be presented under the new guidance, while financial results for prior periods will continue to be reported in accordance with the prior guidance and Quanta's historical accounting policy. The net cumulative adjustment resulting from adoption was a $1.3 million reduction to retained earnings as of January 1, 2018, which represented a $1.8 million decrease to revenue recognized prior to adoption, net of $0.5 million in taxes. This adjustment primarily related to certain contracts that are now accounted for as a single performance obligation but were previously accounted for separately for revenue recognition purposes. Quanta has not experienced significant changes to the pattern of revenue recognition for its contracts, the identification of contracts and performance obligations or the measurement of variable consideration. For the year ended December 31, 2018, the impact related to the adoption of the new revenue recognition guidance on revenues, contract assets and contract liabilities was immaterial. If Quanta had not adopted the new revenue recognition guidance effective January 1, 2018, it would have recognized $2.0 million of additional revenues during the year ended December 31, 2018. Quanta has also expanded its discussion in Note 2 above to address the quantitative and qualitative disclosure requirements of the new revenue recognition standard.

In January 2016, the FASB issued an update that addresses certain aspects of recognition, measurement, presentation, and disclosure of financial instruments to provide users of financial statements with more decision-useful information. This update requires equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income. However, an entity may choose to measure equity investments that do not have readily determinable fair values at cost minus impairment, if any, plus or minus observable price changes in orderly transactions for an identical or a similar investment of the same company. Quanta adopted the new standard effective January 1, 2018. Quanta's equity investments that are within the scope of this update do not have readily determinable fair values. Accordingly, Quanta continues to measure these investments at cost less any impairments and also considers changes resulting from any observable price changes as described above. The new standard is not expected to have a material impact on Quanta's consolidated financial statements in the near-term based on the number and amount of equity investments held at the time of adoption.

In August 2016, the FASB issued an update intended to standardize the classification of certain transactions on the statements of cash flows. These transactions include contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies and distributions received from equity method investments. The new standard requires application using a retrospective transition method. Quanta adopted this guidance effective January 1, 2018, and the changes did not have a material impact on its consolidated financial statements.

In October 2016, the FASB issued an update that requires a reporting entity to recognize the tax expense from the sale of an asset in the seller's tax jurisdiction when the transfer occurs, even though the pre-tax effects of that transaction are eliminated in consolidation. Any deferred tax asset that arises in the buyer's jurisdiction should be recognized at the time of the transfer. The new guidance does not apply to intra-entity transfers of inventory. The income tax consequences from the sale of inventory from one member of a consolidated entity to another will continue to be deferred until the inventory is sold to a third party. Quanta adopted this guidance effective January 1, 2018 utilizing the modified retrospective method, and the changes did not have a material impact on its consolidated financial statements.

In November 2016, the FASB issued an update intended to standardize the classification of restricted cash and cash equivalents transactions on the statement of cash flows. The new guidance requires net cash withdrawn from (deposited to) restricted cash to be removed from investing activities. Additionally, restricted cash balances for each period are included with “Cash and cash equivalents” in order to obtain beginning and ending balances for consolidated statement of cash flow purposes, and any activity between “Cash and cash equivalents” and restricted cash is no longer reported on Quanta’s consolidated statements of cash flows. Quanta adopted this guidance effective January 1, 2018 utilizing the retrospective transition method, and the changes did not have a material impact on its consolidated financial statements. See Note 15 for reconciliations of “Cash and cash equivalents” and restricted cash.

In January 2017, the FASB issued an update intended to clarify whether transactions should be accounted for as acquisitions or disposals of assets or businesses. When substantially all of the fair value of the gross assets acquired or disposed of is concentrated in a single identifiable asset or group of similar identifiable assets, the asset or group is not a business. The update requires, among other things, that to be considered a business, a set of assets and activities must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output. Additionally, the update removes the evaluation of whether a market participant could replace missing elements in order to consider the set of assets and activities a business, provides more stringent criteria for sets without outputs and narrows the definition of output. Quanta adopted this guidance effective January 1, 2018 utilizing the prospective transition method, and the changes did not materially impact its consolidated financial statements.

In May 2017, the FASB issued an update providing guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. A modification should be accounted for unless the following characteristics of the award are unchanged: the fair value, the vesting conditions and the classification as an equity instrument or a liability instrument. Quanta adopted this guidance effective January 1, 2018 using the prospective transition method, and the changes did not materially impact its consolidated financial statements.

In June 2018, the FASB issued an update that expands the scope of share-based payment accounting to include share-based payment transactions for acquiring goods and services from non-employees. Quanta adopted this guidance in 2018, which did not materially impact Quanta’s consolidated financial statements.

In August 2018, the FASB issued an update that aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). Quanta adopted this guidance in 2018, which did not materially impact Quanta’s consolidated financial statements. Quanta will apply the new guidance prospectively.

Accounting Standards Not Yet Adopted

In February 2016, the FASB issued an update that requires the recognition of operating lease right-of-use assets and the corresponding lease liabilities on the balance sheet. The new standard is effective for interim and annual periods beginning after December 15, 2018. In July 2018, the FASB issued an update that provides entities a choice between the previously required modified retrospective transition method and another transition method that allows entities to initially apply the new standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. Quanta established a cross-functional team to implement this standard and evaluated arrangements that would be subject to the standard, implemented software to meet the reporting and disclosure requirements of the standard and assessed the impact of the standard on its processes and internal controls. Quanta plans to elect the practical expedients that permit it to retain the identification and classification of leases under the previous accounting guidance, as well as an expedient where leases with terms of twelve months or less are not recorded on the balance sheet. Quanta will adopt this guidance effective January 1, 2019. Quanta anticipates recording lease right-of-use assets and lease liabilities in similar amounts of between approximately $280 million and $320 million on its consolidated balance sheet as of January 1, 2019, with any difference between the right-of-use assets and lease liabilities being recorded as a cumulative effect adjustment as of such date. The update is not anticipated to have a material effect on Quanta’s consolidated statement of operations and is not expected to have a material impact on Quanta’s compliance with the financial covenants under its senior secured credit facility.

In June 2016, the FASB issued an update that will change the way companies measure credit losses for most financial assets and certain other instruments that are not measured at fair value through net income. The update will require companies to use an “expected loss” model for instruments measured at amortized cost and to record allowances for available-for-sale debt securities rather than reduce the carrying amounts. The update will also require disclosure of information regarding how a company developed its allowance, including changes in the factors that influenced management’s estimate of expected credit losses and the reasons

for those changes. Companies will apply this standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective. The new standard is effective for interim and annual reporting periods beginning after December 15, 2019. Quanta is currently evaluating the potential impact of this authoritative guidance on its consolidated financial statements and will adopt this guidance effective January 1, 2020.

In August 2017, the FASB issued an update that amends and simplifies existing guidance for presenting the economic effects of risk management activities in the financial statements. The update is effective for interim and annual periods beginning after December 15, 2018. The amended presentation and disclosure guidance is required only prospectively, but certain amendments, if applicable, could require a cumulative-effect adjustment. Quanta is evaluating the impact of this new standard on its consolidated financial statements and will adopt the new standard effective January 1, 2019; however, as of December 31, 2018, Quanta had no hedging relationships outstanding.

In August 2018, the FASB issued an update that amends certain disclosure requirements related to fair value measurements. Certain disclosure requirements will be removed, such as the valuation processes for Level 3 fair value measurements, and other disclosure requirements will be modified or added, including a new requirement to disclose the range and weighted average (or a more reasonable and rational method to reflect the distribution) of significant unobservable inputs used to develop Level 3 fair value measurements. This update is effective for interim and annual periods beginning after December 15, 2019. Certain amendments, including the disclosure of the range and weighted average of significant observable inputs used to develop Level 3 fair value measurements, should be applied prospectively, while other amendments should be applied retrospectively. Quanta is evaluating the impact of this new standard on its consolidated financial statements and will adopt the new standard effective January 1, 2020.

4. ACQUISITIONS:

2018 Acquisitions

During the year ended December 31, 2018, Quanta acquired an electrical infrastructure services business specializing in substation construction and relay services, a postsecondary educational institution that provides pre-apprenticeship training and programs for experienced linemen and two communications infrastructure services businesses, all of which are located in the United States. The aggregate consideration for these acquisitions was $106.8 million paid or payable in cash, subject to certain adjustments, and 679,668 shares of Quanta common stock, which had a fair value of approximately $22.9 million as of the respective acquisition dates. Additionally, the acquisitions of the postsecondary educational institution and one of the communications infrastructure services businesses include the potential payment of up to $18.0 million of contingent consideration, payable if the acquired businesses achieve certain performance objectives over five-year and three-year post-acquisition periods. Based on the estimated fair value of the contingent consideration, Quanta recorded $16.5 million of liabilities as of the respective acquisition dates. The results of the acquired businesses have generally been included in Quanta's Electric Power Infrastructure Services segment and have been included in Quanta's consolidated financial statements beginning on the respective acquisition dates.

Quanta is in the process of finalizing its assessments of the fair values of the acquired assets and assumed liabilities related to businesses acquired during 2018, and further adjustments to the purchase price allocations may occur. As of December 31, 2018, the estimated fair values of the net assets acquired were preliminary, with possible updates primarily related to certain tax estimates. The aggregate purchase consideration of the businesses acquired during 2018 was allocated to acquired assets and assumed liabilities, which resulted in an allocation of $37.5 million to net tangible assets, $52.4 million to identifiable intangible assets and $56.3 million to goodwill.

2017 Acquisitions

On July 20, 2017, Quanta acquired Stronghold, a specialized services business located in the United States that provides high-pressure and critical-path solutions to the downstream and midstream energy markets. The aggregate consideration included $351.0 million in cash, subject to certain adjustments, and 2,693,680 shares of Quanta common stock, which had a fair value of $81.3 million as of the acquisition date. Additionally, the acquisition includes the potential payment of up to $100.0 million of contingent consideration, payable if the acquired business achieves certain performance objectives over a three-year post-acquisition period. Based on the estimated fair value of the contingent consideration, Quanta recorded a $51.1 million liability as of the acquisition date. The results of the acquired business have generally been included in Quanta's Pipeline and Industrial Infrastructure Services segment and have been included in Quanta's consolidated financial statements since the acquisition date.

During the year ended December 31, 2017, Quanta also acquired a communications infrastructure services business and an electrical and communications business, both of which are located in the United States. The aggregate consideration for these acquisitions consisted of $12.0 million paid or payable in cash, subject to certain adjustments, and 288,666 shares of Quanta common stock, which had a fair value of $8.3 million on the acquisition date of the applicable acquired business. The results of

the acquired businesses have generally been included in Quanta's Electric Power Infrastructure Services segment and consolidated financial statements since the respective acquisition dates.

2016 Acquisitions

During 2016, Quanta completed five acquisitions. The results of four of the acquired businesses have been generally included in Quanta's Electric Power Infrastructure Services segment and have been included in Quanta's consolidated financial statements since their respective acquisition dates. These businesses included an electrical infrastructure services business located in Australia, a utility contracting business located in Canada, a full service medium- and high-voltage powerline contracting business located in the United States and a communications services business located in Canada. Quanta also acquired a pipeline services contractor located in the United States, the results of the acquired businesses have generally been included in Quanta's Pipeline and Industrial Infrastructure Services segment since the acquisition date. The aggregate consideration for these acquisitions consisted of $75.9 million paid or payable in cash, subject to certain adjustments, 70,840 shares of Quanta common stock, which had a fair value of $1.5 million as of the settlement date of the applicable acquisition, and contingent consideration payments of up to $39.5 million, payable if certain of the acquired businesses achieve performance objectives over four- or five-year post-acquisition periods. Based on the estimated fair value of the contingent consideration, Quanta recorded a total of $18.7 million in liabilities as of the applicable acquisition dates.

2018, 2017 and 2016 Acquisitions

The following table summarizes the aggregate consideration paid or payable as of December 31, 2018 for the 2018 acquisitions and 2017 acquisitions and presents the allocation of these amounts to net tangible and identifiable intangible assets based on their estimated fair values as of the respective acquisition dates, inclusive of any purchase price adjustments. These allocations require significant use of estimates and are based on information that was available to management at the time these consolidated financial statements were prepared. Quanta uses a variety of information to estimate fair values, including quoted market prices, carrying amounts and valuation techniques such as discounted cash flows. When deemed appropriate, third-party appraisal firms are engaged to assist in fair value determination of fixed assets, intangible assets and certain other assets and liabilities (in thousands).

	2018	2017	
	All Acquisitions	Stronghold	Other Acquisitions
Consideration:			
Cash paid or payable	$ 106,804	$ 351,014	$ 11,955
Value of Quanta common stock issued	22,882	81,337	8,267
Contingent consideration	16,471	51,084	—
Fair value of total consideration transferred or estimated to be transferred	$ 146,157	$ 483,435	$ 20,222
Accounts receivable	$ 18,405	$ 77,478	$ 7,157
Contract assets	1,905	11,913	193
Other current assets	8,484	20,914	170
Property and equipment	23,674	51,258	1,480
Other assets	576	1,513	12
Identifiable intangible assets	52,364	95,700	8,091
Contract liabilities	(175)	(13,489)	(93)
Other current liabilities	(11,205)	(58,346)	(2,705)
Deferred tax liabilities, net	(4,208)	—	—
Other long-term liabilities	—	(48)	—
Total identifiable net assets	89,820	186,893	14,305
Goodwill	56,337	296,542	5,917
	$ 146,157	$ 483,435	$ 20,222

Goodwill represents the amount by which the purchase price for an acquired business exceeds the net fair value of the assets acquired and liabilities assumed. The 2018, 2017 and 2016 acquisitions strategically expanded Quanta's Canadian, Australian and domestic electric power, energy and communications service offerings, which Quanta believes contributes to the recognition of the goodwill. Goodwill of $20.1 million and $251.4 million is expected to be deductible for income tax purposes related to the 2018 and 2017 acquisitions.

The following table summarizes the estimated fair values of identifiable intangible assets for the 2018 acquisitions as of the acquisition dates and the related weighted average amortization periods by type (in thousands, except for weighted average amortization periods, which are in years).

	Estimated Fair Value	Weighted Average Amortization Period in Years
Customer relationships	$ 30,767	5.3
Backlog	2,158	1.0
Trade names	7,689	15.0
Non-compete agreements	2,750	5.0
Curriculum	$ 9,000	10.0
Total intangible assets subject to amortization acquired in 2018 acquisitions	$ 52,364	7.4

The following unaudited supplemental pro forma results of operations have been provided for illustrative purposes only and do not purport to be indicative of the actual results that would have been achieved by the combined companies for the periods presented or that may be achieved by the combined companies in the future. Future results may vary significantly from the results reflected in the following pro forma financial information because of future events and transactions, as well as other factors (in thousands, except per share amounts):

	Year Ended December 31,		
	2018	2017	2016
Revenues	$ 11,238,475	$ 9,848,386	$ 8,183,104
Gross profit	$ 1,506,125	$ 1,356,515	$ 1,129,661
Selling, general and administrative expenses	$ 865,452	$ 842,996	$ 734,900
Amortization of intangible assets	$ 49,262	$ 49,918	$ 46,579
Net income from continuing operations	$ 304,565	$ 333,386	$ 207,956
Net income from continuing operations attributable to common stock	$ 301,904	$ 330,139	$ 206,241
Earnings per share from continuing operations:			
Basic	$ 1.97	$ 2.08	$ 1.29
Diluted	$ 1.95	$ 2.07	$ 1.29

The pro forma combined results of operations for the years ended December 31, 2018 and 2017 were prepared by adjusting the historical results of Quanta to include the historical results of the 2018 acquisitions as if they occurred January 1, 2017. The pro forma combined results of operations for the year ended December 31, 2017 have also been prepared by adjusting the historical results of Quanta to include the historical results of the 2017 acquisitions as if they occurred January 1, 2016. The pro forma combined results of operations for the year ended December 31, 2016 have been prepared by adjusting the historical results of Quanta to include the historical results of the 2017 acquisitions as if they occurred January 1, 2016 and the historical results of the 2016 acquisitions as if they occurred January 1, 2015. These pro forma combined historical results were adjusted for the following: a reduction of interest expense as a result of the repayment of outstanding indebtedness of the acquired businesses; an increase in interest expense as a result of the cash consideration paid; an increase in amortization expense due to the incremental intangible assets recorded; changes in depreciation expense to adjust acquired property and equipment to the acquisition date fair value and to conform with Quanta's accounting policies; an increase in the number of outstanding shares of Quanta common stock; and reclassifications to conform the acquired businesses' presentation to Quanta's accounting policies. The pro forma results of operations do not include any adjustments to eliminate the impact of acquisition-related costs or any cost savings or other synergies that resulted or may result from the acquisitions. As noted above, the pro forma results of operations do not purport to be indicative of the actual results that would have been achieved by the combined company for the periods presented or that may be achieved by the combined company in the future.

Revenues of approximately $71.1 million and a loss from continuing operations before income taxes of approximately $8.9 million, which included $11.0 million of acquisition-related costs, were included in Quanta's consolidated results of operations for the year ended December 31, 2018 related to the 2018 acquisitions. Revenues of approximately $207.4 million and a loss from continuing operations before income taxes of approximately $8.1 million, which included $5.4 million of acquisition-related costs, were included in Quanta's consolidated results of operations for the year ended December 31, 2017 related to the 2017 acquisitions.

Additionally, revenues of approximately $68.5 million and a loss from continuing operations before income taxes of approximately $5.6 million, which included $0.3 million of acquisition-related costs, were included in Quanta's consolidated results of operations for the year ended December 31, 2016 related to the 2016 acquisitions.

5. GOODWILL AND OTHER INTANGIBLE ASSETS:

As described in Note 2, Quanta's operating units are organized into one of Quanta's two internal divisions, and accordingly, the goodwill associated with the operating units has been aggregated on a divisional basis in the table below. These divisions are closely aligned with Quanta's reportable segments, and operating units are assigned to a division based on the predominant type of work performed. From time to time, an operating unit may be reorganized between divisions if warranted due to changes in its predominant business.

A summary of changes in Quanta's goodwill is as follows (in thousands):

	Electric Power Infrastructure Services Division	Pipeline and Industrial Infrastructure Services Division	Total
Balance at December 31, 2015:			
Goodwill	$ 1,226,245	$ 366,306	$ 1,592,551
Accumulated impairment	—	(39,893)	(39,893)
	$ 1,226,245	$ 326,413	1,552,658
Goodwill recorded related to 2016 acquisitions	24,168	21,018	45,186
Purchase price allocation adjustments	229	(214)	15
Foreign currency translation adjustments	3,337	1,973	5,310
Balance at December 31, 2016:			
Goodwill	1,253,979	388,923	1,642,902
Accumulated impairment	—	(39,733)	(39,733)
	1,253,979	349,190	1,603,169
Goodwill recorded related to 2017 acquisitions	5,866	296,542	302,408
Purchase price allocation adjustments	(619)	(659)	(1,278)
Goodwill impaired during 2017	—	(57,011)	(57,011)
Foreign currency translation adjustments	13,301	8,011	21,312
Balance at December 31, 2017:			
Goodwill	1,272,527	693,905	1,966,432
Accumulated impairment	—	(97,832)	(97,832)
	1,272,527	596,073	1,868,600
Goodwill recorded related to 2018 acquisitions	56,337	—	56,337
Purchase price allocation adjustments	51	—	51
Foreign currency translation adjustments	(15,837)	(9,272)	(25,109)
Balance at December 31, 2018:			
Goodwill	1,313,078	683,284	1,996,362
Accumulated impairment	—	(96,483)	(96,483)
	$ 1,313,078	$ 586,801	$ 1,899,879

Adjustments primarily represent changes in deferred tax liability estimates and would not have had a material impact on Quanta's consolidated financial statements in prior periods had these adjustments been booked at the respective acquisition dates. The goodwill impairment in the year ended December 31, 2017 was associated with two reporting units within the Pipeline and Industrial Infrastructure Services Division. Specifically, a reporting unit that provides material handling services had experienced lower operating margins and was expected to continue to face a highly competitive environment in its select markets, and a reporting unit that provides marine and offshore services had experienced prolonged periods of reduced revenues and operating margins and was expected to continue to experience lower levels of activity in the U.S. Gulf of Mexico and other offshore markets.

Quanta's intangible assets and the remaining weighted average amortization periods related to its intangible assets subject to amortization were as follows (in thousands except for weighted average amortization periods, which are in years):

	As of December 31, 2018			As of December 31, 2017			As of December 31, 2018
	Intangible Assets	Accumulated Amortization	Intangible Assets, Net	Intangible Assets	Accumulated Amortization	Intangible Assets, Net	Remaining Weighted Average Amortization Period in Years
Customer relationships	$ 359,967	$ (165,715)	$ 194,252	$ 327,334	$ (137,333)	$ 190,001	6.2
Backlog	135,578	(134,592)	986	136,266	(135,847)	419	0.7
Trade names	81,058	(21,559)	59,499	74,797	(17,057)	57,740	15.4
Non-compete agreements	40,728	(30,168)	10,560	37,760	(27,659)	10,101	3.6
Patented rights and developed technology	22,482	(19,175)	3,307	22,529	(17,611)	4,918	2.7
Curriculum	9,448	(872)	8,576	—	—	—	9.1
Total intangible assets subject to amortization	649,261	(372,081)	277,180	598,686	(335,507)	263,179	8.0
Engineering license	3,000	—	3,000	—	—	—	
Total intangible assets	$ 652,261	$ (372,081)	$ 280,180	$ 598,686	$ (335,507)	$ 263,179	

Amortization expense for intangible assets was $44.0 million, $32.2 million and $31.7 million for the years ended December 31, 2018, 2017 and 2016, respectively. During the year ended December 31, 2017, Quanta recorded an impairment charge of $1.1 million related to a customer relationships intangible asset, which primarily resulted from a strategic decision to restructure a business within a reporting unit in Quanta's Pipeline and Industrial Infrastructure Services Division. The impairment charge recognized in 2017 is reflected in the accumulated amortization balances above.

The estimated future aggregate amortization expense of intangible assets subject to amortization as of December 31, 2018 is set forth below (in thousands):

Year Ending December 31:	
2019	$ 47,135
2020	44,980
2021	42,657
2022	39,129
2023	31,323
Thereafter	71,956
Total	$ 277,180

6. PER SHARE INFORMATION:

The amounts used to compute basic and diluted earnings per share attributable to common stock for the years ended December 31, 2018, 2017 and 2016 consisted of the following (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Amounts attributable to common stock:			
Net income from continuing operations	$ 293,346	$ 314,978	$ 198,725
Net loss from discontinued operations	—	—	(342)
Net income attributable to common stock	$ 293,346	$ 314,978	$ 198,383
Weighted average shares:			
Weighted average shares outstanding for basic earnings per share attributable to common stock	152,963	156,124	157,287
Effect of dilutive unvested non-participating stock-based awards	1,263	1,031	1
Weighted average shares outstanding for diluted earnings per share attributable to common stock	154,226	157,155	157,288

Basic and diluted earnings per share attributable to common stock are computed using the weighted average number of shares of common stock outstanding during the applicable period. Exchangeable shares that were issued pursuant to certain of Quanta's historical acquisitions (as further discussed in Note 10), which are exchangeable on a one-for-one basis with shares of Quanta common stock, have been included in the calculation of weighted average shares outstanding for basic and diluted earnings per share attributable to common stock for the portion of the periods that they were outstanding. Additionally, unvested stock-based awards that contain non-forfeitable rights to dividends or dividend equivalents (participating securities) have been included in the calculation of basic and diluted earnings per share attributable to common stock for the portion of the periods that the awards were outstanding. Weighted average shares outstanding for basic and diluted earnings per share attributable to common stock for the years ended December 31, 2018, 2017 and 2016 included 2.6 million, 2.3 million and 2.6 million weighted average participating securities.

For purposes of calculating diluted earnings per share attributable to common stock, there were no adjustments required to derive Quanta's net income attributable to common stock. Diluted earnings per share attributable to common stock is computed using the weighted average number of shares of common stock outstanding during the period adjusted for all potentially dilutive common stock equivalents, except in cases where the effect of the common stock equivalents would be antidilutive.

7. DETAIL OF CERTAIN BALANCE SHEET ACCOUNTS:

Activity in Quanta's allowance for doubtful accounts consisted of the following (in thousands):

	December 31,	
	2018	2017
Balance at beginning of year	$ 4,465	$ 2,752
Charged to bad debt expense (recoveries of bad debt expense)	7,169	87
Deductions for uncollectible receivables written off (recoveries of uncollectible receivables)	(5,795)	1,626
Balance at end of year	$ 5,839	$ 4,465

Property and equipment consisted of the following (in thousands):

	Estimated Useful Lives in Years	December 31, 2018	December 31, 2017
Land	N/A	$ 61,305	$ 48,832
Buildings and leasehold improvements	5-30	208,974	155,628
Operating equipment and vehicles	1-25	1,865,917	1,834,715
Office equipment, furniture and fixtures and information technology systems	3-10	212,769	170,115
Construction work in progress	N/A	19,507	60,587
		2,368,472	2,269,877
Less — Accumulated depreciation and amortization		(1,092,440)	(981,275)
Property and equipment, net		$ 1,276,032	$ 1,288,602

Accounts payable and accrued expenses consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Accounts payable, trade	$ 786,546	$ 632,931
Accrued compensation and related expenses	279,107	225,193
Accrued insurance, current portion	56,552	64,112
Deferred revenues, current portion	40,083	15,967
Income and franchise taxes payable	13,094	19,635
Other accrued expenses	139,138	99,622
	$ 1,314,520	$ 1,057,460

8. DEBT OBLIGATIONS:

Quanta's long-term debt obligations consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Borrowings under senior secured credit facility	$ 1,070,299	$ 668,427
Other long-term debt, interest rate of 2.4%	1,523	1,810
Capital leases, interest rates ranging from 2.5% to 3.8%	934	1,704
Total long-term debt obligations	1,072,756	671,941
Less — Current maturities of long-term debt	32,224	1,220
Total long-term debt obligations, net of current maturities	$ 1,040,532	$ 670,721

Quanta's current maturities of long-term debt and short-term debt consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Short-term debt	$ 33,422	$ —
Current maturities of long-term debt	32,224	1,220
Current maturities of long-term debt and short-term debt	$ 65,646	$ 1,220

Senior Secured Credit Facility

Quanta has a credit agreement with various lenders that, as amended on October 10, 2018, provides for (i) a $1.99 billion revolving credit facility and (ii) a term loan facility with total term loan commitments of $600.0 million. In addition, subject to the conditions specified in the credit agreement, Quanta has the option to increase the capacity of the credit facility, in the form of an increase in the revolving credit facility, incremental term loans or a combination thereof, by up to an additional $400.0

million, from time to time, upon receipt of additional commitments from new or existing lenders. Borrowings under the credit agreement are to be used to refinance existing indebtedness and for working capital, capital expenditures and other general corporate purposes. The maturity date for both the revolving credit facility and the term loan facility is October 31, 2022, and Quanta is required to make quarterly payments on the term loan facility as described below.

With respect to the revolving credit facility, the entire amount available may be used by Quanta for revolving loans and letters of credit in U.S. dollars and certain alternative currencies. Up to $600.0 million may be used by certain subsidiaries of Quanta for revolving loans and letters of credit in certain alternative currencies, up to $100.0 million may be used for swing line loans in U.S. dollars, up to $50.0 million may be used for swing line loans in Canadian dollars and up to $50.0 million may be used for swing line loans in Australian dollars.

On October 10, 2018, Quanta borrowed the full amount of the term loan facility and used all of such proceeds to repay outstanding revolving loans. As of December 31, 2018, Quanta had $1.07 billion of outstanding borrowings under the credit agreement, which included $592.5 million borrowed under the term loan facility and $477.8 million of outstanding revolving loans. Of the total outstanding borrowings, $883.8 million were denominated in U.S. dollars, $102.6 million were denominated in Canadian dollars and $83.9 million were denominated in Australian dollars. Quanta also had $412.9 million of letters of credit and bank guarantees issued under the revolving credit facility, of which $242.2 million were denominated in U.S. dollars and $170.7 million were denominated in currencies other than the U.S. dollar, primarily Canadian and Australian dollars. The remaining $1.09 billion of available commitments under the credit facility was available for loans or issuing new letters of credit and bank guarantees. Borrowings under the credit facility and the applicable interest rates during the years ended December 31, 2018, 2017 and 2016 were as follows (dollars in thousands):

	Year Ended December 31,		
	2018	2017	2016
Maximum amount outstanding under the credit facility during the period	$ 1,300,401	$ 917,895	$ 518,607
Average daily amount outstanding under the credit facility	$ 914,012	$ 613,130	$ 458,908
Weighted-average interest rate	3.6%	2.7%	2.1%

Subsequent to November 19, 2017, revolving loans borrowed in U.S. dollars bear interest, at Quanta's option, at a rate equal to either (i) the Eurocurrency Rate (as defined in the credit agreement) plus 1.125% to 2.000%, as determined based on Quanta's Consolidated Leverage Ratio (as described below), or (ii) the Base Rate (as described below) plus 0.125% to 1.000%, as determined based on Quanta's Consolidated Leverage Ratio. Revolving loans borrowed in any currency other than U.S. dollars bear interest at a rate equal to the Eurocurrency Rate plus 1.125% to 2.000%, as determined based on Quanta's Consolidated Leverage Ratio. Additionally, standby or commercial letters of credit issued under the credit agreement are subject to a letter of credit fee of 1.125% to 2.000%, based on Quanta's Consolidated Leverage Ratio, and Performance Letters of Credit (as defined in the credit agreement) issued under the credit agreement in support of certain contractual obligations are subject to a letter of credit fee of 0.675% to 1.150%, based on Quanta's Consolidated Leverage Ratio. From December 18, 2015 through November 19, 2017, interest rates for revolving loans and letter of credit fees were generally consistent with those set forth above, other than the maximum additional interest rates and fee percentages were 0.125% higher.

Term loans bear interest at rates generally consistent with the revolving loans borrowed in U.S. dollars, except that the additional amount over the Eurocurrency Rate is 1.125% to1.875%, based on Quanta's Consolidated Leverage Ratio. Quanta is also required to make quarterly principal payments of $7.5 million on the last business day of each March, June, September and December, which began in December 2018. The aggregate outstanding principal amount of all outstanding term loans must be paid on the maturity date; however, we may voluntarily prepay that amount from time to time, in whole or in part, without premium or penalty.

Quanta is also subject to a commitment fee of 0.20% to 0.40%, based on its Consolidated Leverage Ratio, on any unused availability under the revolving credit facility.

Consolidated Leverage Ratio is the ratio of Quanta's Consolidated Funded Indebtedness to Consolidated EBITDA (as those terms are defined in the credit agreement). For purposes of calculating Quanta's Consolidated Leverage Ratio, Consolidated Funded Indebtedness is reduced by available cash and cash equivalents (as defined in the credit agreement) in excess of $25.0 million. The Base Rate equals the highest of (i) the Federal Funds Rate (as defined in the credit agreement) plus 0.5%, (ii) the prime rate publicly announced by Bank of America, N.A. and (iii) the Eurocurrency Rate plus 1.00%. Consolidated Interest Coverage Ratio is the ratio of (i) Consolidated EBIT (as defined in the credit agreement) for the four fiscal quarters most recently ended to (ii) Consolidated Interest Expense (as defined in the credit agreement) for such period (excluding all interest expense attributable to capitalized loan costs and the amount of fees paid in connection with the issuance of letters of credit on behalf of Quanta during such period).

The credit agreement contains certain covenants, including (i) a maximum Consolidated Leverage Ratio of 3.0 to 1.0 (except that in connection with certain permitted acquisitions in excess of $200.0 million, such ratio is 3.5 to 1.0 for the fiscal quarter in which the acquisition is completed and the two subsequent fiscal quarters) and (ii) a minimum Consolidated Interest Coverage Ratio of 3.0 to 1.0. As of December 31, 2018, Quanta was in compliance with all of the covenants under the credit agreement.

Subject to certain exceptions, (i) all borrowings under the credit agreement are secured by substantially all the assets of Quanta and Quanta's wholly owned U.S. subsidiaries and by a pledge of all of the capital stock of Quanta's wholly owned U.S. subsidiaries and 65% of the capital stock of direct foreign subsidiaries of Quanta's wholly owned U.S. subsidiaries and (ii) Quanta's wholly owned U.S. subsidiaries guarantee the repayment of all amounts due under the credit agreement. Subject to certain conditions, all collateral will automatically be released from the liens at any time Quanta maintains an Investment Grade Rating (defined in the credit agreement as two of the following three conditions being met: (i) a corporate credit rating that is BBB- or higher by Standard & Poor's Rating Services, (ii) a corporate family rating that is Baa3 or higher by Moody's Investors Services, Inc. or (iii) a corporate credit rating that is BBB- or higher by Fitch Ratings, Inc.).

The credit agreement also limits certain acquisitions, mergers and consolidations, indebtedness, asset sales and prepayments of indebtedness and, subject to certain exceptions, prohibits liens on Quanta's assets. The credit agreement allows cash payments for dividends and stock repurchases subject to compliance with the following requirements (after giving effect to the dividend or stock repurchase): (i) no default or event of default under the credit agreement; (ii) continued compliance with the financial covenants in the credit agreement; and (iii) at least $100.0 million of availability under the revolving credit facility and/or cash and cash equivalents on hand.

The credit agreement provides for customary events of default and contains cross-default provisions with Quanta's underwriting, continuing indemnity and security agreement with its sureties and certain other debt instruments exceeding $150.0 million in borrowings or availability. If an Event of Default (as defined in the credit agreement) occurs and is continuing, on the terms and subject to the conditions set forth in the credit agreement, the lenders may declare all amounts outstanding and accrued and unpaid interest immediately due and payable, require that Quanta provide cash collateral for all outstanding letter of credit obligations, terminate the commitments under the credit agreement, and foreclose on the collateral.

9. INCOME TAXES:

U.S. federal and state and foreign income tax laws and regulations are voluminous and are often ambiguous. As such, Quanta is required to make many subjective assumptions and judgments regarding its tax positions that could materially affect amounts recognized in its future consolidated balance sheets, consolidated statements of operations and consolidated statements of comprehensive income. For example, the Tax Act significantly revised the U.S. corporate tax regime, which, among other things, resulted in a reduction of Quanta's future effective tax rate and a remeasurement of its deferred tax assets and liabilities. Quanta completed its analysis of the Tax Act within the prescribed one-year measurement period, and adjustments during the measurement period were included within "Net income" as an adjustment to "Provision for income taxes" on Quanta's consolidated statement of operations. The measurement period adjustments are described in further detail below.

The Tax Act lowered the U.S. federal corporate income tax rate from 35% to 21% effective January 1, 2018, required companies to pay a one-time transition tax on earnings of certain foreign subsidiaries, limited and eliminated certain tax deductions and created new taxes on certain foreign-sourced earnings. Consequently, for the year ended December 31, 2017, Quanta recorded one-time net tax benefits of $70.1 million, including $85.3 million of tax benefits associated with the remeasurement of U.S. federal deferred tax assets and liabilities based on expected future rates (generally 21%), partially offset by an estimated $15.2 million transition tax on post-1986 earnings and profits of certain foreign subsidiaries. This net tax benefit was Quanta's provisional estimate, utilizing the information that was available at the time. As permitted by and in accordance with the guidance issued by the SEC and codified by the FASB, during the year ended December 31, 2018, Quanta recorded $6.3 million of additional benefit related to the remeasurement of U.S. federal deferred tax assets and liabilities, as the estimate of such amount was revised in connection with the preparation and filing of Quanta's 2017 income tax returns. Additionally, as a result of the tax reform regulations issued during 2018, Quanta recorded a valuation allowance of $43.5 million against foreign tax credits. As of December 31, 2018, Quanta has completed its accounting for the tax effects of the enactment of the Tax Act; however, we continue to expect additional regulations that could have a material impact on Quanta's effective tax rate in future periods. Further, to the extent there are settlements of certain foreign unrecognized tax benefits in future periods, changes to the estimates associated with the transition tax may be required.

The Tax Act also imposed a tax on global intangible low-taxed income (GILTI). Quanta analyzed the impacts of GILTI and made an accounting policy election in the fourth quarter of 2018 whereby it determined that such income will be recognized in the period earned and will not recognize deferred taxes for basis differences that may reverse as GILTI in future years.

For the year ended December 31, 2017, an additional one-time tax benefit of $26.7 million was recorded in connection with entity restructuring and recapitalization transactions completed by Quanta, which was partially offset by an $8.5 million decrease in

the production activity-related tax benefit that resulted from acceleration of certain deductions into 2017. During the year ended December 31, 2018, the estimated benefit associated with entity restructuring and recapitalization transactions was decreased by $1.8 million based on actual 2017 earnings and profit balances.

The components of income (loss) from continuing operations before income taxes were as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Income (loss) from continuing operations before income taxes:			
Domestic	$ 318,635	$ 291,031	$ 349,959
Foreign	139,031	62,726	(42,273)
Total	$ 457,666	$ 353,757	$ 307,686

The components of the provision for income taxes for continuing operations were as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Current:			
Federal	$ 50,306	$ 44,695	$ 106,316
State	26,170	301	11,549
Foreign	23,209	22,666	5,076
Total current tax provision	99,685	67,662	122,941
Deferred:			
Federal	62,482	(36,915)	(264)
State	(4,152)	14,951	(923)
Foreign	3,644	(10,166)	(14,508)
Total deferred tax provision (benefit)	61,974	(32,130)	(15,695)
Total provision for income taxes from continuing operations	$ 161,659	$ 35,532	$ 107,246

The actual income tax provision differed from the income tax provision computed by applying the U.S. federal statutory corporate rate to income from continuing operations before provision for income taxes as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Provision at the statutory rate	$ 96,110	$ 123,815	$ 107,690
Increases (decreases) resulting from —			
Tax Cuts and Jobs Act	(6,295)	(70,129)	—
State taxes	18,504	17,920	6,479
Foreign taxes	2,734	(16,958)	1,860
Contingency reserves, net	(2,619)	3,651	(13,540)
Production activity deduction	—	(1,504)	(8,586)
Employee per diems, meals and entertainment	11,949	13,605	8,764
Taxes on unincorporated joint ventures	(578)	(1,354)	(656)
Asset impairments	—	—	1,909
Entity restructuring and recapitalization efforts	(4,424)	(26,668)	—
Equity compensation	(1,449)	(5,095)	—
Valuation allowance - Foreign Tax Credits	43,507	—	—
Other	4,220	(1,751)	3,326
Total provision for income taxes from continuing operations	$ 161,659	$ 35,532	$ 107,246

Deferred income taxes result from temporary differences in the recognition of income and expenses for financial reporting purposes and tax purposes. The tax effects of these temporary differences, representing deferred tax assets and liabilities, result principally from the following (in thousands):

	December 31,	
	2018	2017
Deferred income tax liabilities:		
Property and equipment	$ (178,090)	$ (161,491)
Goodwill	(60,305)	(49,407)
Other intangibles	(21,034)	(26,676)
Customer holdbacks	(44,173)	(36,218)
Other book/tax accounting method differences	(7,247)	(17,967)
Total deferred income tax liabilities	(310,849)	(291,759)
Deferred income tax assets:		
Accruals and reserves	28,594	21,419
Stock and incentive compensation	20,627	17,676
Net operating loss carryforwards	52,406	62,925
Tax credits	43,572	48,516
Deferred profit on investment in unconsolidated affiliates	16,021	2,813
Other	15,054	4,747
Subtotal	176,274	158,096
Valuation allowance	(67,601)	(19,328)
Total deferred income tax assets	108,673	138,768
Total net deferred income tax liabilities	$ (202,176)	$ (152,991)

The net deferred income tax assets and liabilities were comprised of the following in the accompanying consolidated balance sheets (in thousands):

	December 31,	
	2018	2017
Deferred income taxes:		
Assets	$ 16,939	$ 26,390
Liabilities	(219,115)	(179,381)
Total net deferred income tax liabilities	$ (202,176)	$ (152,991)

The valuation allowance for deferred income tax assets at December 31, 2018, 2017 and 2016 was $67.6 million, $19.3 million and $15.0 million, respectively. These valuation allowances relate to state and foreign net operating loss carryforwards and foreign tax credits. The net change in the total valuation allowance for each of the years ended December 31, 2018, 2017 and 2016 was an increase of $48.3 million, an increase of $4.3 million and a decrease of $1.1 million, respectively. The valuation allowance was established primarily as a result of uncertainty in Quanta's outlook as to the amount and character of future taxable income in particular tax jurisdictions. Quanta believes it is more likely than not that it will realize the benefit of its deferred tax assets net of existing valuation allowances.

At December 31, 2018, Quanta had state and foreign net operating loss carryforwards, the tax effect of which was $57.1 million. These carryforwards will expire as follows: 2019, $0.2 million; 2020, $1.7 million; 2021, $0.5 million; 2022, $0.2 million; 2023, $1.3 million and $53.2 million thereafter. A valuation allowance of $21.9 million has been recorded against certain foreign and state net operating loss carryforwards.

Quanta generally does not provide for taxes related to undistributed earnings of its foreign subsidiaries because such earnings either would not be taxable when remitted or they are considered to be indefinitely reinvested. Quanta could also be subject to additional foreign withholding taxes if it were to repatriate cash that is indefinitely reinvested outside the United States, but it does not expect such amount to be material.

A reconciliation of unrecognized tax benefit balances is as follows (in thousands):

	December 31,		
	2018	2017	2016
Balance at beginning of year	$ 36,229	$ 35,240	$ 54,541
Additions based on tax positions related to the current year	6,231	7,040	4,227
Additions for tax positions of prior years	9,377	3,372	2,048
Reductions for tax positions of prior years	(2,870)	(1,171)	(1,948)
Reductions for audit settlements	—	—	(180)
Reductions resulting from a lapse of the applicable statute of limitations periods	(7,857)	(8,252)	(23,448)
Balance at end of year	$ 41,110	$ 36,229	$ 35,240

For the year ended December 31, 2018, the $7.9 million reduction was primarily due to the expiration of certain federal and state statute of limitations periods for the 2014 tax year. For the year ended December 31, 2017, the $8.3 million reduction was primarily due to the expiration of certain federal and state statute of limitations periods for the 2010 through 2012 tax years. For the year ended December 31, 2016, the $23.4 million reduction was primarily due to the expiration of certain federal and state statute of limitations periods for the 2004 tax year.

The balances of unrecognized tax benefits, the amount of related interest and penalties and what Quanta believes to be the range of reasonably possible changes in the next 12 months are as follows (in thousands):

	December 31,		
	2018	2017	2016
Unrecognized tax benefits	$ 41,110	$ 36,229	$ 35,240
Portion that, if recognized, would reduce tax expense and effective tax rate	40,977	35,561	33,128
Accrued interest on unrecognized tax benefits	5,459	5,368	5,539
Accrued penalties on unrecognized tax benefits	631	631	650
Reasonably possible reduction to the balance of unrecognized tax benefits in succeeding 12 months	$0 to $9,541	$0 to $13,655	$0 to $12,332
Portion that, if recognized, would reduce tax expense and effective tax rate	$0 to $8,224	$0 to $12,483	$0 to $10,983

Quanta classifies interest and penalties within the provision for income taxes. Quanta recognized interest expense of $0.1 million, interest income of $0.2 million and interest income of $3.2 million in the provision for income taxes for the years ended December 31, 2018, 2017 and 2016, respectively.

Quanta and certain subsidiaries remain under examination by various U.S. state and Canadian and other foreign tax authorities for multiple periods. Quanta does not consider any state in which it does business to be a major tax jurisdiction.

10. EQUITY:

Exchangeable Shares and Preferred Stock

In connection with certain prior acquisitions of Canadian businesses, the former owners of the acquired businesses received exchangeable shares of certain Canadian subsidiaries of Quanta, which may be exchanged at the option of the holders for Quanta common stock on a one-for-one basis. The holders of exchangeable shares can make an exchange only once in any calendar quarter and must exchange a minimum of either 50,000 shares or, if less, the total number of remaining exchangeable shares registered in the name of the holder making the request. Additionally, in connection with two of such acquisitions, Quanta issued one share of Quanta Series F preferred stock and one share of Quanta Series G preferred stock to voting trusts on behalf of the respective holders of the exchangeable shares issued in such acquisitions, which provided such holders with voting rights in Quanta common stock equivalent to the number of exchangeable shares outstanding. The share of Series F preferred stock was redeemed and retired effective October 6, 2017. All holders of exchangeable shares have rights equivalent to Quanta common stockholders with respect to dividends and other economic rights.

During 2017 and 2016, 6.0 million and 0.4 million exchangeable shares were exchanged for Quanta common stock. As of December 31, 2018, the Quanta Series G preferred stock remained outstanding and 0.5 million exchangeable shares remained outstanding, of which 0.4 million were associated with the Quanta Series G preferred stock. On January 1, 2019, 0.4 million exchangeable shares were exchanged for Quanta common stock, and the share of Series G preferred stock was redeemed and retired.

Treasury Stock

General

Treasury stock is recorded at cost. Under Delaware corporate law, treasury stock is not counted for quorum purposes or entitled to vote.

Shares withheld for tax withholding obligations

The tax withholding obligations of employees upon vesting of restricted stock, RSUs and performance units settled in common stock are typically satisfied by Quanta making such tax payments and withholding the number of vested shares having a value on the date of vesting equal to the tax withholding obligation. For the settlement of these employee tax liabilities, Quanta withheld 0.4 million shares of Quanta common stock during the year ended December 31, 2018, which had a total market value of $15.2 million, 0.5 million shares of Quanta common stock during the year ended December 31, 2017, which had a total market value of $18.6 million, and 0.4 million shares of Quanta common stock during the year ended December 31, 2016, which had a total market value of $8.3 million. These shares and the related costs to acquire them were accounted for as adjustments to the balance of treasury stock.

Notional amounts recorded related to deferred compensation plans

For RSUs and performance units that vest but the settlement of which is deferred under Quanta's deferred compensation plans, Quanta records a notional amount to "Treasury stock" and an offsetting amount to "Additional paid-in capital" (APIC). However, the only shares added to outstanding treasury stock at vesting are shares withheld for tax liabilities other than income taxes, as the shares of Quanta common stock associated with deferred equity awards are not issued. Upon settlement of the deferred equity awards and issuance of the associated Quanta common stock, the original accounting entry is reversed. The amounts recorded to treasury stock related to the deferred compensation plans during the years ended December 31, 2018, 2017 and 2016 were $2.5 million, $2.6 million and $6.8 million, respectively.

Retirement of Treasury Stock

Effective December 1, 2016, Quanta retired 84.8 million shares of treasury stock. These retired shares were restored to the status of authorized and unissued shares as permitted by Delaware law. The retired stock had a carrying amount of $1.95 billion. In accordance with Quanta's policy, Quanta recorded the formal retirement of treasury stock by deducting the par value from common stock and the excess of cost over par value from APIC.

Stock repurchases

During the second quarter of 2017, Quanta's Board of Directors approved a stock repurchase program that authorized Quanta to purchase, from time to time through June 30, 2020, up to $300.0 million of its outstanding common stock (the 2017 Repurchase Program). During the third quarter of 2018, Quanta's Board of Directors approved an additional stock repurchase program that authorizes Quanta to purchase, from time to time through June 30, 2021, up to $500.0 million of its outstanding common stock (the 2018 Repurchase Program). Repurchases under these programs can be made in open market and privately negotiated transactions. During the years ended December 31, 2018 and 2017, Quanta repurchased 13.9 million shares of its common stock in the open market at a cost of $451.3 million and 1.4 million shares of its common stock in the open market at a cost of $50.0 million. Quanta's policy is to record a stock repurchase as of the trade date; however, the payment of cash related to the repurchase is made on the settlement date of the trade. As a result of this policy, during the years ended December 31, 2018 and 2017, cash payments related to stock repurchases were $443.2 million and $50.0 million. At December 31, 2018, $298.7 million remained under the 2018 Repurchase Program.

During the second quarter of 2016, Quanta received 9.4 million shares of its common stock upon completion of an accelerated share repurchase arrangement that was executed under a prior repurchase program. The cash for such shares was paid in 2015.

Non-controlling Interests

Quanta holds interests in various entities through both joint venture entities that provide infrastructure services under specific customer contracts, either directly or through subcontracting relationships, and other equity investments in partially owned entities

that own and operate certain infrastructure assets, including investments that may be entered into through the partnership structure Quanta has formed with certain infrastructure investors. Quanta has determined that certain of these joint ventures where Quanta provides the majority of the infrastructure services, which management believes most significantly influences the economic performance of such joint ventures, are VIEs. Management has concluded that Quanta is the primary beneficiary of these joint ventures and has accounted for each on a consolidated basis. The other parties' equity interests in these joint ventures have been accounted for as "Non-controlling interests" in Quanta's consolidated balance sheets. Net income attributable to the other participants in the amounts of $2.7 million, $3.2 million and $1.7 million for the years ended December 31, 2018, 2017 and 2016, respectively, has been accounted for as a reduction of net income in deriving "Net income attributable to common stock" in Quanta's consolidated statements of operations.

The carrying amount of the investments held by Quanta in all of its VIEs was $9.6 million and $7.8 million at December 31, 2018 and 2017. The carrying amount of investments held by the non-controlling interests in these VIEs at December 31, 2018 and 2017 was $1.3 million and $4.1 million. During the years ended December 31, 2018, 2017 and 2016, net distributions to non-controlling interests were $4.0 million, $2.0 million and $0.8 million. There were also discharges of notes receivable from a joint venture partner of $1.4 million and $0.5 million, which were accounted for as a "Buyout of a non-controlling interest" in the accompanying consolidated statements of equity for the years ended December 31, 2018 and 2017. There were no other changes in equity as a result of transfers to/from the non-controlling interests during the years ended December 31, 2018, 2017 and 2016. See Note 14 for further disclosures related to Quanta's joint venture arrangements.

Dividends

On December 6, 2018, Quanta's Board of Directors declared an initial cash dividend of $0.04 per share of its common stock, payable in the first quarter of 2019 to stockholders of record as of January 2, 2019. The declaration, payment and amount of future cash dividends will be at the discretion of Quanta's Board of Directors after taking into account various factors, including Quanta's financial condition, results of operations, cash flows from operations, current and anticipated capital requirements and expansion plans, the income tax laws then in effect and the requirements of Delaware law. In addition, as discussed in Note 8, Quanta's credit agreement restricts the payment of cash dividends unless certain conditions are met.

11. EQUITY-BASED COMPENSATION:

Stock Incentive Plans

On May 19, 2011, Quanta's stockholders approved the 2011 Omnibus Equity Incentive Plan (the 2011 Plan). The 2011 Plan provides for the award of non-qualified stock options, incentive (qualified) stock options, stock appreciation rights, restricted stock, RSUs, stock bonus awards, performance compensation awards (including performance units and cash bonus awards) or any combination of the foregoing. The purpose of the 2011 Plan is to attract and retain key personnel and provide participants with additional performance incentives by increasing their proprietary interest in Quanta. Employees, directors, officers, consultants or advisors of Quanta or its affiliates are eligible to participate in the 2011 Plan, as are prospective employees, directors, officers, consultants or advisors of Quanta who have agreed to serve Quanta in those capacities. An aggregate of 13,300,000 shares of Quanta common stock may be issued pursuant to awards granted under the 2011 Plan.

The 2011 Plan is administered by the Compensation Committee of the Board of Directors of Quanta. The Compensation Committee has, subject to applicable regulation and the terms of the 2011 Plan, the authority to grant awards under the 2011 Plan, to construe and interpret the 2011 Plan and to make all other determinations and take any and all actions necessary or advisable for the administration of the 2011 Plan. The Board also delegated to the Equity Grant Committee, a committee of the Board consisting of one or more directors, the authority to grant limited awards to eligible persons who are not executive officers or non-employee directors.

Restricted Stock and RSUs to be Settled in Common Stock

During the years ended December 31, 2018, 2017 and 2016, Quanta granted 1.6 million, 1.5 million and 1.8 million shares of RSUs to be settled in common stock under the 2011 Plan with weighted average grant date fair values of $34.37, $37.06 and $22.22 per share, respectively. The grant date fair value for RSUs to be settled in common stock is based on the market value of Quanta common stock on the date of grant. RSU awards to be settled in common stock are subject to forfeiture, restrictions on transfer and certain other conditions until vesting, which generally occurs in equal installments over a two-year, three-year or five-year period following the date of grant. Holders of RSUs to be settled in common stock are entitled to receive a cash dividend equivalent payment equal to any cash dividend payable on account of common shares.

During the years ended December 31, 2018, 2017 and 2016, vesting activity consisted of 1.4 million, 1.5 million and 1.4 million shares of restricted stock and RSUs settled in common stock with an approximate fair value at the time of vesting of $48.6 million, $55.6 million and $28.9 million, respectively.

A summary of the activity for RSUs to be settled in common stock for the year ended December 31, 2018 is as follows (shares in thousands):

	Shares	Weighted Average Grant Date Fair Value (Per share)
Unvested at December 31, 2017	2,600	$30.42
Granted	1,625	$34.37
Vested	(1,370)	$28.88
Forfeited	(221)	$32.27
Unvested at December 31, 2018	2,634	$33.50

During the years ended December 31, 2018, 2017 and 2016, Quanta recognized $43.9 million, $41.0 million and $39.6 million of non-cash stock compensation expense related to restricted stock and RSUs to be settled in common stock. Such expense is recorded in "Selling, general and administrative expenses." As of December 31, 2018, there was $45.5 million of total unrecognized compensation expense related to unvested RSUs to be settled in common stock granted to both employees and non-employees. This cost is expected to be recognized over a weighted average period of 2.24 years.

Performance Units to be Settled in Common Stock

Performance units awarded pursuant to the 2011 Plan provide for the issuance of shares of common stock upon vesting. These performance units cliff-vest at the end of a three-year performance period based on achievement of certain performance metrics established by Quanta's compensation committee, including company performance goals and, with respect to certain awards, Quanta's total shareholder return as compared to a predetermined group of peer companies. The final number of shares of common stock issuable upon vesting of performance units can range from 0% to 200% of the number of performance units initially granted, depending on the level of achievement, as determined by Quanta's compensation committee.

During each of the years ended December 31, 2018, 2017 and 2016, Quanta granted 0.3 million of performance units to be settled in common stock under the 2011 Plan with a weighted average grant date fair value of $12.24, $17.63 and $22.86 per unit. The grant date fair values for awards of performance units with market-based metrics, which were granted in the years ended December 31, 2018 and 2017, were determined using a Monte Carlo simulation valuation methodology using the following key inputs:

	2018	2017
Valuation date stock price based on the February 28, 2018 and March 22, 2017 closing stock prices	$34.44	$36.31
Expected volatility	34%	36%
Risk-free interest rate	2.39%	1.46%
Term in years	2.84	2.78

Quanta recognizes expense related to performance units with market-based metrics based on the probability of achievement of the underlying performance metrics, multiplied by the portion of the three-year period that has expired and the fair value of the total number of shares of common stock that Quanta anticipates will be issued based on such achievement. Quanta recognizes expense related to performance units without market-based metrics based on the portion of the three-year period that has expired multiplied by the fair value of the total number of shares of common stock that Quanta anticipates will be issued. During the years ended December 31, 2018, 2017 and 2016, Quanta recognized $8.6 million, $5.4 million and $3.2 million in compensation expense associated with performance units. Such expense is recorded in "Selling, general and administrative expenses." During the years ended December 31, 2018 and 2017, 0.1 million performance units vested, and 0.1 million shares of common stock were issued in connection with performance units. During the year ended December 31, 2016, no performance units vested, and no shares of common stock were issued in connection with performance units.

RSUs to be Settled in Cash

Certain RSUs granted by Quanta under the 2011 Plan are settled solely in cash. These cash-settled RSUs are intended to provide plan participants with cash performance incentives that are substantially equivalent to the risks and rewards of equity ownership in Quanta, typically vest in equal installments over a two-year or three-year period following the date of grant, and are subject to forfeiture under certain conditions, primarily termination of service. Additionally, subject to certain restrictions, Quanta's non-employee directors may elect to settle a portion of their RSU awards in cash. For RSUs settled in cash, the holders receive for each vested RSU an amount in cash equal to the fair market value of one share of Quanta common stock on the settlement date, as specified in the applicable award agreement.

Compensation expense related to RSUs to be settled in cash was $5.0 million, $8.1 million and $7.0 million for the years ended December 31, 2018, 2017 and 2016. Such expense is recorded in "Selling, general and administrative expenses." RSUs that are anticipated to be settled in cash are not included in the calculation of earnings per share, and the estimated earned value of such RSUs is classified as a liability. Quanta paid $5.9 million, $8.6 million and $4.6 million to settle liabilities related to cash-settled RSUs in the years ended December 31, 2018, 2017 and 2016, respectively. Accrued liabilities for the estimated earned value of outstanding RSUs to be settled in cash were $3.4 million and $4.6 million at December 31, 2018 and 2017.

12. EMPLOYEE BENEFIT PLANS:

Unions' Multiemployer Pension Plans

Quanta contributes to a number of multiemployer defined benefit pension plans under the terms of collective bargaining agreements with various unions that represent certain of Quanta's employees. Quanta's multiemployer pension plan contribution rates generally are specified in the collective bargaining agreements (usually on an annual basis), and contributions are made to the plans on a "pay-as-you-go" basis based on its union employee payrolls. Quanta may also have additional liabilities imposed by law as a result of its participation in multiemployer defined benefit pension plans. The Employee Retirement Income Security Act of 1974, as amended by the Multiemployer Pension Plan Amendments Act of 1980, imposes certain liabilities upon an employer who is a contributor to a multiemployer pension plan if the employer withdraws from the plan or the plan is terminated or experiences a mass withdrawal.

The Pension Protection Act of 2006 (PPA) also added special funding and operational rules generally applicable to plan years beginning after 2007 for multiemployer plans in the United States that are classified as "endangered," "seriously endangered" or "critical" status based on multiple factors (including, for example, the plan's funded percentage, cash flow position and whether it is projected to experience a minimum funding deficiency). Plans in these classifications must adopt measures to improve their funded status through a funding improvement or rehabilitation plan, as applicable, which may require additional contributions from employers (which may take the form of a surcharge on benefit contributions) and/or modifications to retiree benefits. Certain plans to which Quanta contributes or may contribute in the future are in "endangered," "seriously endangered" or "critical" status. The amount of additional funds, if any, that Quanta may be obligated to contribute to these plans in the future cannot be estimated due to uncertainty of the future levels of work that require the specific use of union employees covered by these plans, as well as the future contribution levels and possible surcharges on contributions applicable to these plans.

The following table summarizes plan information relating to Quanta's participation in multiemployer defined benefit pension plans, including company contributions for the last three years, the status under the PPA of the plans and whether the plans are subject to a funding improvement or rehabilitation plan or contribution surcharges. The most recent PPA zone status available in 2018 and 2017 relates to the plan's fiscal year-end in 2017 and 2016. Forms 5500 were not yet available for the plan years ending in 2018. The PPA zone status is based on information that Quanta received from the respective plans, as well as publicly available information on the U.S. Department of Labor website, and is certified by the plan's actuary. Although multiple factors or tests may result in red zone or yellow zone status, plans in the red zone generally are less than 65 percent funded, plans in the yellow zone generally are less than 80 percent funded, and plans in the green zone generally are at least 80 percent funded. Under the PPA, red zone plans are classified as "critical" status, yellow zone plans are classified as "endangered" status and green zone plans are classified as neither "endangered" nor "critical" status. The "Subject to Financial Improvement/ Rehabilitation Plan" column indicates plans for which a financial improvement plan or a rehabilitation plan is either pending or has been implemented. The last column lists the expiration dates of Quanta's collective-bargaining agreements to which the plans are subject. Total contributions to these plans correspond to the number of union employees employed at any given time and the plans in which they participate and vary depending upon the location and number of ongoing projects at a given time and the need for union resources in connection with such projects. Information has been presented separately for individually significant plans, based on PPA funding status classification, and in the aggregate for all other plans.

Fund	Employee Identification Number/ Pension Plan Number	PPA Zone Status		Subject to Financial Improvement/ Rehabilitation Plan	Contributions (in thousands)			Surcharge Imposed	Expiration Date of Collective Bargaining Agreement
		2018	2017		2018	2017	2016		
National Electrical Benefit Fund	53-0181657-001	Green	Green	No	$ 35,399	$ 29,161	$22,912	No	Varies through May 2022
Pipeline Industry Pension Fund	73-6146433-001	Green	Green	No	10,132	13,585	6,954	No	Varies through May 2020
Central Pension Fund of the IUOE & Participating Employers	36-6052390-001	Green	Green	No	9,246	12,176	5,668	No	Varies through December 2020
Laborers Pension Trust Fund for Northern California	94-6277608-001	Yellow	Yellow	Yes	3,652	3,387	3,805	Yes	Varies through May 2020
International Union of Operating Engineers Local 132 Pension Fund	55-6015364-001	Green	Green	No	3,367	222	42	No	May 2020
Eighth District Electrical Pension Fund	84-6100393-001	Green	Green	No	3,332	3,208	3,089	No	Varies through December 2020
West Virginia Laborers Pension Trust Fund	55-6026775-001	Green	Green	No	3,321	509	129	No	May 2020
Teamsters National Pipe Line Pension Plan	46-1102851-001	Green	Green	No	3,318	3,602	1,661	No	Varies through December 2020
Plumbers and Pipefitters National Pension Fund	52-6152779-001	Yellow	Yellow	No	2,734	1,273	1,666	No	Varies through March 2021
Locals 302 & 612 of the IUOE-Employers Construction Industry Retirement Plan	91-6028571-001	Green	Green	No	2,620	2,194	2,269	No	May 2021
Operating Engineers Local 324 Pension Fund	38-1900637-001	Red	Red	Yes	2,310	1,969	1,291	Yes	Varies through December 2020
Alaska Electrical Pension Plan	92-6005171-001	Green	Green	No	2,287	2,143	2,701	No	Varies through December 2019
Laborers National Pension Fund	75-1280827-001	Red	Green	Yes	2,051	3,049	1,358	Yes	Varies through December 2020
OE Pension Trust Fund	94-6090764-001	Red	Red	Yes	1,922	1,703	1,508	Yes	Varies through June 2020
Employer-Teamsters Local Nos 175 & 505 Pension Trust Fund	55-6021850-001	Red	Red	Yes	1,209	50	—	Yes	May 2020
Laborers District Council of W PA Pension Fund	25-6135576-001	Red	Red	Yes	1,029	418	876	Yes	May 2020
Alaska Laborers - Employers Retirement Fund	91-6028298-001	Yellow	Yellow	Yes	411	536	1,216	No	December 2018
Alaska Teamster Employer Pension Plan	92-6003463-024	Red	Red	Yes	197	255	659	No	December 2018
All other plans - U.S.					29,136	21,365	26,869		
All other plans - Canada [(1)]					8,518	9,277	562		
Total					$126,191	$110,082	$85,235		

(1) Multiemployer defined benefit pension plans in Canada are not subject to the reporting requirements under the PPA. Accordingly, certain information was not publicly available.

Quanta's contributions to the following individually significant plans were five percent or more of the total contributions to these plans for the periods indicated based on the Forms 5500 for these plans for the years ended December 31, 2017 and 2016. Forms 5500 were not yet available for these plans for the year ended December 31, 2018.

Pension Fund	Plan Years in which Quanta Contributions Were Five Percent or More of Total Plan Contributions
Pipeline Industry Pension Fund	2017 and 2016
Eighth District Electrical Pension Fund	2017 and 2016
Teamsters National Pipe Line Pension Plan	2017 and 2016
Local 697 IBEW and Electrical Industry Pension Fund	2017 and 2016
IBEW Local 456 Pension Plan	2017 and 2016
National Electrical Benefit Fund	2017
Local Union 400 IBEW Pension Plan	2017
IBEW 648 Pension Plan	2017
Laborers Local 57 Industrial Pension Plan	2017
Local Union No. 9 IBEW and Outside Contractors Pension Fund	2016
Alaska Plumbing and Pipefitting Industry Pension Fund	2016
Alaska Electrical Pension Plan	2016
Michigan Electrical Employees' Pension Plan	2016

In addition to the contributions made to multiemployer defined benefit pension plans noted above, Quanta also contributed to multiemployer defined contribution or other benefit plans on behalf of certain union employees. Contributions to union multiemployer defined contribution or other benefit plans by Quanta were $174.7 million, $171.4 million and $139.3 million for the years ended December 31, 2018, 2017 and 2016. Total contributions made to all of these multiemployer plans for the years ended December 31, 2018, 2017 and 2016 correspond to the number of union employees employed at any given time and the plans in which they participate and vary depending upon the location and number of ongoing projects at a given time and the need for union resources in connection with such projects.

Quanta 401(k) Plan

Quanta maintains a 401(k) plan pursuant to which employees who are not provided retirement benefits through a collective bargaining agreement may make contributions through a payroll deduction. Quanta makes matching cash contributions of 100% of each employee's contribution up to 3% of that employee's salary and 50% of each employee's contribution between 3% and 6% of such employee's salary, up to the maximum amount permitted by law. Contributions to the 401(k) plan by Quanta were $33.4 million, $26.3 million and $21.9 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Deferred Compensation Plans

Quanta maintains nonqualified deferred compensation plans pursuant to which non-employee directors and certain key employees, independent contractors and consultants may defer receipt of some or all of their cash compensation and/or settlement of their equity-based awards, subject to certain limitations. These plans are unfunded and unsecured compensation arrangements. Individuals participating in these plans may allocate deferred cash amounts among a group of notional accounts that mirror the gains and losses of various investment alternatives. Generally, participants receive distributions of deferred balances based on predetermined payout schedules or other events.

The plan covering key employees provides for employer matching contributions for certain officers and employees whose benefits under the 401(k) plan are limited by federal tax law. Quanta may also make discretionary employer contributions to that plan. Matching contributions vest immediately and discretionary employer contributions are subject to a vesting schedule determined at the time of the contribution, provided that vesting accelerates upon a change in control and the participant's death or retirement. All matching and discretionary employer contributions, whether vested or not, are forfeited upon a participant's termination of employment for cause or upon the participant engaging in competition with Quanta or any of its affiliates.

Quanta made contributions to the eligible participants' accounts under the deferred compensation plans of $1.1 million, $1.1 million and $1.0 million during the years ended December 31, 2018, 2017 and 2016, respectively. At December 31, 2018 and 2017, obligations under these plans, including amounts contributed by Quanta, were $33.4 million and $30.1 million and were

included in "Insurance and other non-current liabilities" in the accompanying consolidated balance sheets. Quanta maintains investments to provide for future obligations related to these deferred compensation plans. At December 31, 2018 and 2017, these investments were primarily comprised of company-owned life insurance policies, had fair market values of $33.5 million and $28.7 million and were included in "Other assets, net" in the accompanying consolidated balance sheets.

13. RELATED PARTY TRANSACTIONS:

Certain of Quanta's operating units have entered into related party lease arrangements for operational facilities, typically with prior owners of certain acquired businesses. These lease agreements generally have terms of up to approximately 5 years and include renewal options. Related party lease expense for the years ended December 31, 2018, 2017 and 2016 was $14.0 million, $12.3 million and $8.7 million, respectively.

14. COMMITMENTS AND CONTINGENCIES:

Investments in Affiliates and Other Entities

As described in Note 10, Quanta holds investments in various entities, including joint venture entities that provide infrastructure services under specific customer contracts and partially owned entities that own and operate certain infrastructure assets constructed by Quanta. Losses incurred by these entities are generally shared ratably based on the percentage ownership of the participants in these structures. However, in Quanta's joint venture structures that provide infrastructure services, each participant is typically jointly and severally liable for all of the obligations of the joint venture entity pursuant to the contract with the customer, as a general partner or through a parent guarantee and, therefore, can be liable for full performance of the contract with the customer. In circumstances where Quanta's participation in a joint venture qualifies as a general partnership, the joint venture partners are jointly and severally liable for all of the obligations of the joint venture, including obligations owed to the customer or any other person or entity. Quanta is not aware of circumstances that would lead to future claims against it for material amounts in connection with these joint and several liabilities.

Additionally, in the joint venture structures entered into by Quanta, typically each party indemnifies the other party for any liabilities incurred in excess of the liabilities such other party is obligated to bear under the respective joint venture agreement or in accordance with the scope of work subcontracted to each party. It is possible, however, that Quanta could be required to pay or perform obligations in excess of its share if the other party is unable or refuses to pay or perform its share of the obligations. Quanta is not aware of circumstances that would lead to future claims against it for material amounts that would not be indemnified.

As described in Note 2, Quanta has also formed a partnership with select infrastructure investors that provides up to $1.0 billion of capital, including approximately $80.0 million from Quanta, available to invest in certain specified infrastructure projects through August 2024. Additionally, as of December 31, 2018, Quanta had outstanding capital commitments associated with investments in unconsolidated affiliates related to planned oil and gas infrastructure projects of $14.8 million, of which $14.1 million is expected to be paid in 2019. The remaining $0.7 million of these capital commitments is anticipated to be paid by May 31, 2022.

During 2014, a limited partnership in which Quanta is a partner was selected for an engineering, procurement and construction (EPC) electric transmission project in Canada to construct approximately 500 kilometers of transmission line and two 500 kV substations. A subsidiary of Quanta, engaged by the limited partnership, is contracted to provide turnkey EPC services for the entire project. As of December 31, 2018, Quanta made aggregate contributions to this unconsolidated affiliate of $76.2 million, received $59.3 million as a return of capital and had outstanding additional capital commitments associated with this project of $8.6 million, which are anticipated to be paid in 2019.

Leases

Quanta leases certain land, buildings and equipment under non-cancelable lease agreements, including related party leases as discussed in Note 13. The terms of these agreements vary from lease to lease, and certain leases include renewal options and escalation clauses. Quanta may decide to cancel or terminate a lease before the end of its term, in which case it is typically liable to the lessor for the remaining lease payments under the term of the lease. The following schedule shows the future minimum lease payments under these operating leases as of December 31, 2018 (in thousands):

Year Ending December 31:	
2019	$ 124,530
2020	81,189
2021	55,827
2022	34,337
2023	21,450
Thereafter	37,217
Total minimum lease payments	$ 354,550

Rent expense related to operating leases was $309.7 million, $276.2 million and $242.3 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Quanta has guaranteed the residual value on certain of its equipment operating leases, agreeing to pay any difference between this residual value and the fair market value of the underlying asset at the date of termination of such leases. At December 31, 2018, the maximum guaranteed residual value was $665.9 million. Quanta believes that no significant payments will be made as a result of the difference between the fair market value of the leased equipment and the guaranteed residual value; however, there can be no assurance that significant payments will not be required in the future.

Contingent Consideration Liabilities

As discussed in further detail in Note 2, Quanta is obligated to pay contingent consideration amounts to the former owners of certain acquired businesses in the event that such acquired businesses achieve specified performance objectives. As of December 31, 2018 and 2017, the estimated fair value of Quanta's contingent consideration liabilities totaled $70.8 million and $65.7 million.

Committed Expenditures

Quanta has capital commitments for the expansion of its vehicle fleet in order to accommodate manufacturer lead times on certain types of vehicles. As of December 31, 2018, Quanta had issued $7.8 million of production orders with expected delivery dates in 2019. Although Quanta has committed to purchase these vehicles at the time of their delivery, Quanta anticipates that the majority of these orders will be assigned to third party leasing companies and made available to Quanta under certain of its master equipment lease agreements, thereby releasing Quanta from its capital commitments.

Legal Proceedings

Quanta is from time to time party to various lawsuits, claims and other legal proceedings that arise in the ordinary course of business. These actions typically seek, among other things, compensation for alleged personal injury, breach of contract and/or property damages, employment-related damages, punitive damages, civil penalties or other losses, or injunctive or declaratory relief. With respect to all such lawsuits, claims and proceedings, Quanta records a reserve when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. In addition, Quanta discloses matters for which management believes a material loss is at least reasonably possible. Except as otherwise stated below, none of these proceedings are expected to have a material adverse effect on Quanta's consolidated financial position, results of operations or cash flows. In all instances, management has assessed the matter based on current information and made a judgment concerning its potential outcome, giving due consideration to the nature of the claim, the amount and nature of damages sought and the probability of success. Management's judgment may prove materially inaccurate, and such judgment is made subject to the known uncertainties of litigation.

Maurepas Project Dispute. During the third quarter of 2017, Maurepas Pipeline, LLC (Maurepas) notified QPS Engineering, LLC (QPS), a subsidiary of Quanta, of Maurepas' assertion of a claim for liquidated damages allegedly arising from delay in mechanical completion of a project in Louisiana. Quanta disputes the claim and believes that QPS is not responsible for liquidated damages under the contract terms. The matter remains subject to contractual dispute resolution measures; however, either party

may choose to institute a formal legal proceeding upon completion of such measures. If, upon final resolution of this matter, Quanta is unsuccessful, any such liquidated damages would be recorded as additional costs on the project. As of December 31, 2018, Quanta had recorded an accrual with respect to this matter based on the current estimated amount of probable loss and believes that the range of any additional reasonably possible loss would be the difference between the accrued amount and $22.0 million, which is the maximum liability for liquidated damages pursuant to the contract terms. In July and August 2018, Quanta also received notice from Maurepas claiming certain warranty defects on the project. Quanta is evaluating the claimed defects, and based on information currently available, no estimate of reasonably possible loss related to the warranty claim can be determined.

Lorenzo Benton v. Telecom Network Specialists, Inc., et al. In June 2006, plaintiff Lorenzo Benton filed a class action complaint in the Superior Court of California, County of Los Angeles, alleging various wage and hour violations against Telecom Network Specialists (TNS), a former subsidiary of Quanta. Quanta retained liability associated with this matter pursuant to the terms of Quanta's sale of TNS in December 2012. Benton represents a class of workers that includes all persons who worked on certain TNS projects, including individuals that TNS retained through numerous staffing agencies. The plaintiff class in this matter is seeking damages for unpaid wages, penalties associated with the failure to provide meal and rest periods and overtime wages, interest and attorneys' fees. In January 2017, the trial court granted a summary judgment motion filed by the plaintiff class and found that TNS was a joint employer of the class members and that it failed to provide adequate meal and rest breaks and failed to pay overtime wages. In February 2019, the court granted, in part, the plaintiff class's final motion for summary judgment on damages, awarding the class approximately $7.5 million for its meal/rest break and overtime claims, and denied the motion as to penalties. Quanta believes the court's decisions on liability and damages are not supported by controlling law and continues to contest its liability and the damage calculation asserted by the plaintiff class in this matter.

Additionally, in November 2007, TNS filed cross complaints for indemnity and breach of contract against the staffing agencies, which employed many of the individuals in question. In December 2012, the trial court heard cross-motions for summary judgment filed by TNS and the staffing agencies pertaining to TNS's demand for indemnity. The court denied TNS's motion and granted the motions filed by the staffing agencies; however, the California Appellate Court reversed the trial court's decision in part and instructed the trial court to reconsider its ruling. In February 2017, the court denied a new motion for summary judgment filed by the staffing companies and has since stated that the staffing companies would be liable to TNS for any damages owed to the class members that the staffing companies employed.

The final amount of liability, if any, payable in connection with this matter remains the subject of pending litigation and will ultimately depend on various factors, including the outcome of Quanta's appeal of the trial court's rulings on liability and damages, the final determination with respect to any additional damages owed by Quanta, and the solvency of the staffing agencies. Based on review and analysis of the trial court's rulings on liability, Quanta does not believe, at this time, that it is probable this matter will result in a material loss. However, if Quanta is unsuccessful in this litigation and the staffing agencies are unable to fund damages owed to class members, Quanta believes the range of reasonably possible loss to Quanta upon final resolution of this matter could be up to approximately $11.0 million, plus attorneys' fees and expenses of the plaintiff class.

Concentrations of Credit Risk

Quanta is subject to concentrations of credit risk related primarily to its cash and cash equivalents and its net receivable position with customers, which includes amounts related to billed and unbilled accounts receivable and contract assets net of advanced billings with the same customer. Substantially all of Quanta's cash and cash equivalents are managed by what it believes to be high credit quality financial institutions. In accordance with Quanta's investment policies, these institutions are authorized to invest cash and cash equivalents in a diversified portfolio of what Quanta believes to be high quality cash and cash equivalent investments, which consist primarily of interest-bearing demand deposits, money market investments and money market mutual funds. Although Quanta does not currently believe the principal amount of these cash and cash equivalents is subject to any material risk of loss, changes in economic conditions could impact the interest income Quanta receives from these investments. In addition, Quanta grants credit under normal payment terms, generally without collateral, to its customers, which include electric power and energy companies, governmental entities, general contractors, and builders, owners and managers of commercial and industrial properties located primarily in the United States, Canada, Australia and Latin America. Consequently, Quanta is subject to potential credit risk related to changes in business and economic factors throughout these locations, which may be heightened as a result of uncertain economic and financial market conditions that have existed in recent years. However, Quanta generally has certain statutory lien rights with respect to services provided. Some of Quanta's customers have experienced significant financial difficulties (including bankruptcy), and customers may experience financial difficulties in the future. These difficulties expose Quanta to increased risk related to collectability of billed and unbilled receivables and contract assets for services Quanta has performed.

In January 2019, PG&E Corporation and Pacific Gas and Electric Company (collectively PG&E), one of Quanta's largest customers, filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code, as amended. See Note 18 for information related to the PG&E bankruptcy.

At December 31, 2018 or 2017, no customer represented 10% or more of Quanta's consolidated net receivable position. No customer represented 10% or more of Quanta's consolidated revenues for the years ended December 31, 2018, 2017 or 2016.

Insurance

As discussed in Note 2, Quanta is insured for employer's liability, workers' compensation, auto liability, general liability and group health claims. As of December 31, 2018 and 2017, the gross amount accrued for insurance claims totaled $272.9 million and $254.7 million, with $210.1 million and $200.0 million considered to be long term and included in "Insurance and other non-current liabilities." Related insurance recoveries/receivables as of December 31, 2018 and 2017 were $56.5 million and $50.4 million, of which $0.3 million and $0.4 million were included in "Prepaid expenses and other current assets" and $56.2 million and $50.0 million were included in "Other assets, net."

Project Insurance Claim. In June 2018, while performing a horizontal directional drill and installing an underground gas pipeline, one of Quanta's subsidiaries experienced a partial collapse of a borehole. Subsequent to the incident, Quanta has been working with its customer to mitigate the impact of the incident and to complete the project, and has encountered additional challenges similar to those experienced previously. As required by the contract, the customer procured certain insurance coverage for the project, with the Quanta subsidiary as an additional insured. Quanta believes the incident is covered under such insurance and is working collaboratively with the customer to pursue insurance claims with the customer's insurance carriers. To the extent such claims are not successful, Quanta could pursue contractual relief from the customer or seek partial recovery under its own insurance policies.

As of December 31, 2018, Quanta had recorded an insurance receivable of $26.7 million, which represents a portion of the insurance claims being pursued as of such date and management's estimate of the amount of costs incurred through such date that are probable of recovery. Quanta expects the insurance claims and the amount of insurance receivable to increase in future periods as additional mitigation costs are incurred, which could be significant. The plan and related work to mitigate the incident are not complete, may change and will be subject to inherent risks associated with underground pipeline installation, which could cause the costs to mitigate the incident to increase materially. To the extent Quanta is unsuccessful in realizing insurance or contractual recoveries, additional charges to operating results, which could be material, would be required.

Letters of Credit

Certain of Quanta's vendors require letters of credit to ensure reimbursement for amounts they are disbursing on Quanta's behalf, such as to beneficiaries under its insurance programs. In addition, from time to time, certain customers require Quanta to post letters of credit to ensure payment of subcontractors and vendors and guarantee performance under contracts. Such letters of credit are generally issued by a bank or similar financial institution, typically pursuant to Quanta's senior secured credit facility. Each letter of credit commits the issuer to pay specified amounts to the holder of the letter of credit if the holder claims that Quanta has failed to perform specified actions. If this were to occur, Quanta would be required to reimburse the issuer of the letter of credit. Depending on the circumstances of such a reimbursement, Quanta may also be required to record a charge to earnings for the reimbursement. Quanta does not believe it is likely that any material claims will be made under a letter of credit in the foreseeable future.

As of December 31, 2018, Quanta had $412.9 million in outstanding letters of credit and bank guarantees under its senior secured credit facility securing its casualty insurance program and various contractual commitments. These are irrevocable stand-by letters of credit with maturities generally expiring at various times throughout 2019. Quanta expects to renew the majority of the letters of credit related to the casualty insurance program for subsequent one-year periods upon maturity.

Performance Bonds and Parent Guarantees

Many customers, particularly in connection with new construction, require Quanta to post performance and payment bonds issued by a financial institution known as a surety. These bonds provide a guarantee to the customer that Quanta will perform under the terms of a contract and pay its subcontractors and vendors. If Quanta fails to perform, the customer may demand that the surety make payments or provide services under the bond. Quanta must reimburse the surety for any expenses or outlays it incurs. Under Quanta's underwriting, continuing indemnity and security agreement with its sureties and with the consent of the lenders that are party to Quanta's credit agreement, Quanta has granted security interests in certain of our assets as collateral for its obligations to the sureties. Subject to certain conditions and consistent with terms of Quanta's credit agreement, these security interests will be automatically released if Quanta maintains a credit rating that meets two of the following three conditions: (i) a corporate credit rating that is BBB- or higher by Standard & Poor's Rating Services, (ii) a corporate family rating that is Baa3 or higher by Moody's Investors Services, Inc. or (iii) a corporate credit rating that is BBB- or higher by Fitch Ratings, Inc. Quanta may be required to post letters of credit or other collateral in favor of the sureties or Quanta's customers in the future, which would reduce the borrowing availability under its senior secured credit facility. To date, Quanta has not been required to make any

reimbursements to our sureties for bond-related costs. While Quanta believes that it is unlikely that it will have to fund significant claims under its surety arrangements in the foreseeable future, to the extent a reimbursement is required, the amount could be material.

These performance bonds expire at various times ranging from mechanical completion of the related projects to a period extending beyond contract completion in certain circumstances, and as such a determination of maximum potential amounts outstanding requires the use of certain estimates and assumptions. Such amounts can also fluctuate from period to period based upon the mix and level of Quanta's bonded operating activity. As of December 31, 2018, the total amount of the outstanding performance bonds was estimated to be approximately $2.6 billion. Quanta's estimated maximum exposure as it relates to the value of the performance bonds outstanding is lowered on each bonded project as the cost to complete is reduced, and each of its commitments under the performance bonds generally extinguishes concurrently with the expiration of its related contractual obligation. The estimated cost to complete these bonded projects was approximately $733 million as of December 31, 2018.

Additionally, from time to time, Quanta guarantees certain obligations and liabilities of its subsidiaries that may arise in connection with, among other things, contracts with customers, equipment lease obligations, joint venture arrangements and contractors' licenses. These guarantees may cover all of the subsidiary's unperformed, un-discharged and un-released obligations and liabilities under or in connection with the relevant agreement. For example, with respect to customer contracts, a guarantee may cover a variety of obligations and liabilities arising during the ordinary course of the subsidiary's business or operations, including, among other things, warranty and breach of contract claims, third party and environmental liabilities arising from the subsidiary's work and for which it is responsible, liquidated damages amounts, or indemnity claims. Quanta is not aware of any obligations or liabilities currently asserted under any of these guarantees that are material, individually or in the aggregate. However, to the extent a subsidiary incurs a material obligation or liability and Quanta has guaranteed the performance or payment of such liability, the recovery by a customer or other counterparty or a third party will not be limited to the assets of the subsidiary. As a result, responsibility under the guarantee could exceed the amount recoverable from the subsidiary alone and could materially and adversely affect Quanta's consolidated business, financial condition, results of operations and cash flows.

Employment Agreements

Quanta has various employment agreements with certain executives and other employees, which provide for compensation, other benefits and, under certain circumstances, severance payments and post-termination equity-related benefits. Certain employment agreements also contain clauses that become effective upon a change in control of Quanta, and Quanta may be obligated to pay certain amounts to such employees upon the occurrence of any of the defined change in control events.

Collective Bargaining Agreements

Some of Quanta's operating units are parties to various collective bargaining agreements with unions that represent certain of their employees. The collective bargaining agreements expire at various times and have typically been renegotiated and renewed on terms similar to those in the expiring agreements. From time to time, Quanta is a party to grievance actions based on claims arising out of the collective bargaining agreements. The agreements require the operating units to pay specified wages, provide certain benefits to their union employees and contribute certain amounts to multiemployer pension plans and employee benefit trusts. Quanta's multiemployer pension plan contribution rates generally are specified in the collective bargaining agreements (usually on an annual basis), and contributions are made to the plans on a "pay-as-you-go" basis based on its union employee payrolls. The location and number of union employees that Quanta employs at any given time and the plans in which they may participate vary depending on the projects Quanta has ongoing at any time and the need for union resources in connection with those projects. Therefore, Quanta is unable to accurately predict its union employee payroll and the amount of the resulting multiemployer pension plan contribution obligations for future periods.

The PPA also added special funding and operational rules generally applicable to plan years beginning after 2007 for multiemployer plans that are classified as "endangered," "seriously endangered" or "critical" status based on multiple factors (including, for example, the plan's funded percentage, cash flow position and whether it is projected to experience a minimum funding deficiency). Plans in these classifications must adopt measures to improve their funded status through a funding improvement or rehabilitation plan, as applicable, which may require additional contributions from employers (which may take the form of a surcharge on benefit contributions) and/or modifications to retiree benefits. Certain plans to which Quanta contributes or may contribute in the future are in "endangered," "seriously endangered" or "critical" status. The amount of additional funds, if any, that Quanta may be obligated to contribute to these plans in the future cannot be reasonably estimated due to uncertainty of the future levels of work that require the specific use of union employees covered by these plans, as well as the future contribution levels and possible surcharges on contributions applicable to these plans.

Quanta may be subject to additional liabilities imposed by law as a result of its participation in multiemployer defined benefit pension plans. For example, the Employee Retirement Income Security Act of 1974, as amended by the Multiemployer Pension

Plan Amendments Act of 1980, imposes certain liabilities upon an employer who is a contributor to a multiemployer pension plan if the employer withdraws from the plan or the plan is terminated or experiences a mass withdrawal. These liabilities include an allocable share of the unfunded vested benefits in the plan for all plan participants, not merely the benefits payable to a contributing employer's own retirees. As a result, participating employers may bear a higher proportion of liability for unfunded vested benefits if other participating employers cease to contribute or withdraw, with the reallocation of liability being more acute in cases when a withdrawn employer is insolvent or otherwise fails to pay its withdrawal liability. Quanta is not aware of any material amounts of withdrawal liability that have been incurred or asserted and that remain outstanding as a result of a withdrawal by Quanta from a multiemployer defined benefit pension plan.

Indemnities

Quanta generally indemnifies its customers for the services it provides under its contracts, as well as other specified liabilities, which may subject Quanta to indemnity claims and liabilities and related litigation. Additionally, in connection with certain acquisitions and dispositions, Quanta has indemnified various parties against specified liabilities that those parties might incur in the future. The indemnities under acquisition or disposition agreements are usually contingent upon the other party incurring liabilities that reach specified thresholds. As of December 31, 2018, except as otherwise set forth above in *Legal Proceedings*, Quanta does not believe any material liabilities for claims exist against it in connection with any of these indemnity obligations.

In the normal course of Quanta's acquisition transactions, Quanta obtains rights to indemnification from the sellers or former owners of acquired businesses for certain risks, liabilities and obligations arising from their prior operations, such as performance, operational, safety, workforce or tax issues, some of which Quanta may not have discovered during due diligence. However, the indemnities may not cover all of Quanta's exposure for such pre-acquisition matters, and the indemnitors may be unwilling or unable to pay the amounts owed to Quanta. Accordingly, Quanta may incur expenses for which it is not reimbursed. Quanta is currently in the process of negotiating certain pre-acquisition obligations associated with non-U.S. payroll taxes that may be due from a business acquired by Quanta in 2013. As of December 31, 2018, Quanta had recorded $11.4 million as its estimate of the pre-acquisition tax obligations and a corresponding indemnification asset, as management expects to recover from the indemnity counterparties any amounts that Quanta may be required to pay in connection with any such obligations.

15. SEGMENT INFORMATION:

Quanta presents its operations under two reportable segments: (1) Electric Power Infrastructure Services and (2) Pipeline and Industrial Infrastructure Services. This structure is generally based on the broad end-user markets for Quanta's services. See Note 1 for additional information regarding Quanta's reportable segments.

Quanta's segment results are derived from the types of services provided across its operating units in each of its end user markets. Quanta's entrepreneurial business model allows each of its operating units to serve the same or similar customers and to provide a range of services across end user markets. Quanta's operating units are organized into one of two internal divisions, namely, the Electric Power Infrastructure Services Division and the Pipeline and Industrial Infrastructure Services Division. These internal divisions are closely aligned with the reportable segments and are based on their operating units' predominant type of work.

Reportable segment information, including revenues and operating income by type of work, is gathered from each operating unit for the purpose of evaluating segment performance in support of Quanta's market strategies. These classifications of Quanta's operating unit revenues by type of work for segment reporting purposes can at times require judgment on the part of management. Quanta's operating units may perform joint projects for customers in multiple industries, deliver multiple types of services under a single customer contract or provide service offerings to various industries. For example, Quanta performs joint trenching projects to install distribution lines for electric power and natural gas customers.

In addition, Quanta's integrated operations and common administrative support for its operating units require that certain allocations be made to determine segment profitability, including allocations of shared and indirect costs (e.g., facility costs), indirect operating expenses (e.g., depreciation), and general and administrative costs. Certain corporate costs are not allocated and include payroll and benefits, employee travel expenses, facility costs, professional fees, acquisition costs and amortization related to intangible assets.

Summarized financial information for Quanta's reportable segments is presented in the following table (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Revenues:			
Electric Power Infrastructure Services	$ 6,415,562	$ 5,599,836	$ 4,850,495
Pipeline and Industrial Infrastructure Services	4,755,861	3,866,642	2,800,824
Consolidated	$ 11,171,423	$ 9,466,478	$ 7,651,319
Operating income (loss):			
Electric Power Infrastructure Services	$ 628,286	$ 518,130	$ 395,745
Pipeline and Industrial Infrastructure Services	204,178	184,083	149,502
Corporate and non-allocated costs	(292,195)	(323,364)	(224,434)
Consolidated	$ 540,269	$ 378,849	$ 320,813
Depreciation:			
Electric Power Infrastructure Services	$ 96,300	$ 91,708	$ 91,269
Pipeline and Industrial Infrastructure Services	89,046	76,355	67,374
Corporate and non-allocated costs	17,173	15,745	11,597
Consolidated	$ 202,519	$ 183,808	$ 170,240

Separate measures of Quanta's assets and cash flows by reportable segment, including capital expenditures, are not produced or utilized by management to evaluate segment performance. Quanta's fixed assets, which are held at the operating unit level, include operating machinery, equipment and vehicles, as well as office equipment, buildings and leasehold improvements, and are used on an interchangeable basis across its reportable segments. As such, for reporting purposes, total depreciation expense is allocated each quarter among Quanta's reportable segments based on the ratio of each reportable segment's revenue contribution to consolidated revenues.

Foreign Operations

During 2018, 2017, and 2016, Quanta derived $2.60 billion, $2.48 billion and $1.59 billion, respectively, of its revenues from foreign operations. Of Quanta's foreign revenues, 76%, 79% and 75% were earned in Canada during the years ended December 31, 2018, 2017 and 2016, respectively. In addition, Quanta held property and equipment of $304.0 million and $330.4 million in foreign countries, primarily Canada, as of December 31, 2018 and 2017.

16. SUPPLEMENTAL CASH FLOW INFORMATION:

The net effects of changes in operating assets and liabilities, net of non-cash transactions, on cash flows from operating activities of continuing operations are as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Accounts and notes receivable	$ (475,919)	$ (425,313)	$ 144,877
Contract assets	(92,838)	15,999	(152,702)
Inventories	(28,131)	14,110	(9,905)
Prepaid expenses and other current assets	(40,187)	(32,079)	25,133
Accounts payable and accrued expenses and other non-current liabilities	247,897	28,547	81,246
Contract liabilities	(23)	139,114	(124,680)
Other, net	(11,332)	17,858	(12,635)
Net change in operating assets and liabilities, net of non-cash transactions	$ (400,533)	$ (241,764)	$ (48,666)

A reconciliation of cash, cash equivalents, and restricted cash reported within the consolidated balance sheets that sum to the total of such amounts shown in the statements of cash flows are as follows (in thousands).

	December 31,			
	2018	2017	2016	2015
Cash and cash equivalents	78,687	138,285	$ 112,183	$ 128,771
Restricted cash included in "Prepaid expenses and other current assets"	3,286	5,106	1,709	—
Restricted cash included in "Other assets, net"	1,283	384	518	—
Total cash, cash equivalents, and restricted cash reported in the statements of cash flows	$ 83,256	$ 143,775	$ 114,410	$ 128,771

Restricted cash includes any cash that is legally restricted as to withdrawal or usage.

Additional supplemental cash flow information is as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Cash (paid) received during the period for -			
Interest paid related to continuing operations	$ (34,935)	$ (19,373)	$ (12,828)
Income taxes paid related to continuing operations	$ (112,895)	$ (112,335)	$ (121,662)
Income taxes paid related to discontinued operations	$ —	$ —	$ (7,260)
Income tax refunds related to continuing operations	$ 5,209	$ 9,845	$ 7,548

During the year ended December 31, 2018, Quanta entered into non-cash transactions whereby Quanta accepted title to a marine industrial property appraised at $6.4 million in exchange for a construction barge and received certain equipment in exchange for other equipment and the discharge of a receivable with an aggregate value of $3.8 million. During the year ended December 31, 2017, Quanta entered into a non-cash transaction whereby Quanta accepted title to a construction barge in satisfaction and discharge of a $7.1 million note receivable.

17. QUARTERLY FINANCIAL DATA (UNAUDITED):

The table below sets forth the unaudited consolidated operating results by quarter for the years ended December 31, 2018 and 2017 (in thousands, except per share information).

	For the Three Months Ended			
	March 31,	June 30,	September 30,	December 31,
2018:				
Revenues	$ 2,417,576	$ 2,656,348	$ 2,985,281	$ 3,112,218
Gross profit	301,048	333,371	425,830	419,715
Net income	38,611	74,706	124,899	57,791
Net income from continuing operations attributable to common stock	37,614	74,365	124,551	56,816
Basic earnings per share from continuing operations attributable to common stock	$ 0.24	$ 0.49	$ 0.82	$ 0.38
Diluted earnings per share from continuing operations attributable to common stock	$ 0.24	$ 0.48	$ 0.81	$ 0.38
2017:				
Revenues	$ 2,178,170	$ 2,200,374	$ 2,609,307	$ 2,478,627
Gross profit	266,188	302,165	350,631	322,876
Net income	48,440	64,360	89,849	115,576
Net income from continuing operations attributable to common stock	48,267	63,837	89,313	113,561
Basic earnings per share from continuing operations attributable to common stock	$ 0.31	$ 0.41	$ 0.57	$ 0.72
Diluted earnings per share from continuing operations attributable to common stock	$ 0.31	$ 0.41	$ 0.56	$ 0.72

During the fourth quarter of 2018, Quanta recorded asset impairment charges of $49.4 million ($36.5 million net of tax) related to the winding down of certain oil-influenced operations and assets and net tax charges of $36.0 million, as further described in Note 9 and primarily related to Quanta's final assessment of the Tax Act enacted on December 22, 2017 and for which regulations have been issued during 2018. During the fourth quarter of 2017, Quanta recorded one-time tax benefits as further described in Note 9 and asset impairment charges of $58.1 million ($36.6 million net of tax), which were primarily associated with two reporting units within its Pipeline and Industrial Infrastructure Services Division. Specifically, a reporting unit that provides material handling services experienced lower operating margins and was expected to continue to face a highly competitive environment in its select markets, and a reporting unit that provides marine and offshore services experienced prolonged periods of reduced revenues and operating margins and was expected to continue to experience lower levels of activity in the U.S. Gulf of Mexico and other offshore markets.

The sum of the individual quarterly earnings per share amounts may not equal year-to-date earnings per share as each period's computation is based on the weighted average number of shares outstanding during the period.

18. SUBSEQUENT EVENTS:

PG&E Bankruptcy

On January 29, 2019, one of Quanta's largest customers, PG&E, filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code, as amended. Quanta is monitoring the bankruptcy proceeding and evaluating the treatment of, and potential claims related to, its pre-petition receivables. As of December 31, 2018, Quanta had $102.4 million of receivables from PG&E, of which $79.9 million was unpaid and outstanding on the bankruptcy filing date. Quanta currently believes it will ultimately collect the amounts owed, whether through assumption of certain executory contracts or through amounts approved by the bankruptcy court for payment to certain of PG&E's safety and reliability suppliers. As with any bankruptcy, that belief is based on a number of assumptions that are potentially subject to change as the bankruptcy matter progresses. Should any of those assumptions change, the amount collected could be materially less than the amount of Quanta's pre-petition receivables. Additionally, Quanta is continuing to perform services for PG&E while the bankruptcy case is ongoing and believes that amounts billed for post-petition services will be collected in the ordinary course.

Acquisition

On January 24, 2019, Quanta acquired an electric power specialty contracting business located in the United States. The purchase price for this acquisition was approximately $47.0 million, which included the repayment of certain indebtedness of the acquired business. The results of the acquired business will generally be included in Quanta's Electrical Power Infrastructure Services segment and consolidated financial statements beginning on the acquisition date.

ITEM 9. *Changes in and Disagreements with Accountants on Accounting and Financial Disclosure*

There have been no changes in or disagreements with accountants on accounting and financial disclosure within the parameters of Item 304(b) of Regulation S-K.

ITEM 9A. *Controls and Procedures*

Attached as exhibits to this Annual Report on Form 10-K are certifications of Quanta's Chief Executive Officer and Chief Financial Officer that are required in accordance with Rule 13a-14 of the Securities Exchange Act of 1934, as amended (the Exchange Act). This Item 9A. section includes information concerning the controls and controls evaluation referred to in the certifications, and it should be read in conjunction with the certifications for a more complete understanding of the topics presented.

Evaluation of Disclosure Controls and Procedures

Our management has established and maintains a system of disclosure controls and procedures that are designed to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act, such as this Annual Report on Form 10-K, is recorded, processed, summarized and reported within the time periods specified in the SEC rules and forms. The disclosure controls and procedures are also designed to provide reasonable assurance that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

As of the end of the period covered by this Annual Report, we evaluated the effectiveness of the design and operation of our disclosure controls and procedures pursuant to Rule 13a-15(b) of the Exchange Act. This evaluation was carried out under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer. Based on this evaluation, these officers have concluded that, as of December 31, 2018, our disclosure controls and procedures were effective to provide reasonable assurance of achieving their objectives.

Evaluation of Internal Control over Financial Reporting

Management's report on internal control over financial reporting can be found in Item 8. *Financial Statements and Supplementary Data* under the heading *Report of Management* and is incorporated herein by reference. The report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, on the financial statements, and its opinion on the effectiveness of internal control over financial reporting, can also be found in Item 8. *Financial Statements and Supplementary Data* under the heading *Report of Independent Registered Public Accounting Firm* and is incorporated herein by reference.

There has been no change in our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Design and Operation of Control Systems

Our management, including the Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. The design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Further, because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty and breakdowns can occur because of simple errors or mistakes. Controls can be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

ITEM 9B. *Other Information*

None.

PART III

ITEM 10. ***Directors, Executive Officers and Corporate Governance***

The information required by this Item 10 is incorporated by reference to our definitive proxy statement, which is to be filed with the SEC pursuant to the Exchange Act within 120 days following the end of our 2018 fiscal year.

ITEM 11. ***Executive Compensation***

The information required by this Item 11 is incorporated by reference to our definitive proxy statement, which is to be filed with the SEC pursuant to the Exchange Act within 120 days following the end of our 2018 fiscal year.

ITEM 12. ***Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters***

The information required by this Item 12 is incorporated by reference to our definitive proxy statement, which is to be filed with the SEC pursuant to the Exchange Act within 120 days following the end of our 2018 fiscal year.

ITEM 13. ***Certain Relationships and Related Transactions, and Director Independence***

The information required by this Item 13 is incorporated by reference to our definitive proxy statement, which is to be filed with the SEC pursuant to the Exchange Act within 120 days following the end of our 2018 fiscal year.

ITEM 14. ***Principal Accounting Fees and Services***

The information required by this Item 14 is incorporated by reference to our definitive proxy statement, which is to be filed with the SEC pursuant to the Exchange Act within 120 days following the end of our 2018 fiscal year.

PART IV

ITEM 15. ***Exhibits and Financial Statement Schedules***

The following financial statements, schedules and exhibits are filed as part of this Annual Report on Form 10-K:

(1) *Consolidated financial statements.* The consolidated financial statements are included in Item 8. *Financial Statements and Supplementary Data* of this Annual Report on Form 10-K.

(2) *Financial statement schedules.* All financial statement schedules are omitted because they are not applicable or the required information is shown in the consolidated financial statements or the notes to the consolidated financial statements in Item 8. *Financial Statements and Supplementary Data* of this Annual Report on Form 10-K.

(3) *Exhibits.*

EXHIBIT INDEX

Exhibit No.		Description
2.1	—	Securities Purchase Agreement, dated as of July 20, 2017, by and among Quanta Services, Inc., certain subsidiaries of Quanta Services, Inc., as purchasers, and the General Partners and Limited Partners of Stronghold, Ltd. and Stronghold Specialty, Ltd. (previously filed as Exhibit 2.1 to the Company's Form 10-Q for the quarter ended September 30, 2017 (No. 001-13831) filed November 9, 2017 and incorporated herein by reference)
3.1	—	Restated Certificate of Incorporation of Quanta Services, Inc. (previously filed as Exhibit 3.3 to the Company's Form 8-K (No. 001-13831) filed May 25, 2011 and incorporated herein by reference)
3.2	—	Bylaws of Quanta Services, Inc., as amended and restated December 6, 2018 (previously filed as Exhibit 3.1 to the Company's Form 8-K (No. 001-13831) filed December 11, 2018 and incorporated herein by reference)
4.1	—	Form of Common Stock Certificate (previously filed as Exhibit 4.1 to the Company's Registration Statement on Form S-1/Amendment No. 2 (No. 333-42957) filed February 9, 1998 and incorporated herein by reference)
10.1*	—	Quanta Services, Inc. 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 4.5 to the Company's Form S-8 (No. 333-174374) filed May 20, 2011 and incorporated herein by reference)
10.2*	—	Amendment No. 1 to the Quanta Services, Inc. 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.4 to the Company's Form 10-Q for the quarter ended June 30, 2013 (No. 001-13831) filed August 9, 2013 and incorporated herein by reference)
10.3*	—	Amendment No. 2 to the Quanta Services, Inc. 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended June 30, 2016 (No. 001-13831) filed August 8, 2016 and incorporated herein by reference)
10.4*	—	Amendment No. 3 to the Quanta Services, Inc. 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.4 to the Company's Form 8-K (No. 001-13831) filed May 30, 2018 and incorporated herein by reference)
10.5*	—	Form of Restricted Stock Agreement for awards to employees/consultants pursuant to the 2011 Omnibus Equity Incentive Plan accommodating electronic acceptance (previously filed as Exhibit 10.12 to the Company's Form 10-K (No. 001-13831) filed February 29, 2012 and incorporated herein by reference)
10.6*	—	Form of Restricted Stock Agreement for awards to non-employee directors pursuant to the 2011 Omnibus Equity Incentive Plan accommodating electronic acceptance (previously filed as Exhibit 10.13 to the Company's Form 10-K (No. 001-13831) filed February 29, 2012 and incorporated herein by reference)
10.7*	—	Form of Restricted Stock Unit Agreement for awards to employees/consultants pursuant to the 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.2 to the Company's Form 8-K (No. 001-13831) filed March 8, 2013 and incorporated herein by reference)
10.8*	—	Form of Restricted Stock Unit Agreement for awards to non-employee directors pursuant to the 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.3 to the Company's Form 10-Q for the quarter ended March 31, 2013 (No. 001-13831) filed May 8, 2013 and incorporated herein by reference)
10.9*	—	Form of Restricted Stock Unit Award Agreement for awards to non-employee directors pursuant to the 2011 Omnibus Equity Incentive Plan (Settled in Stock Unless Cash Settlement Elected) (previously filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended June 30, 2015 (No. 001-13831) filed August 10, 2015 and incorporated herein by reference)
10.10*	—	Form of Performance Unit Award Agreement for awards to employees/consultants pursuant to the 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.2 to the Company's Form 8-K (No. 001-13831) filed March 7, 2014 and incorporated herein by reference)
10.11*	—	Form of Restricted Stock Unit Award Agreement for awards with performance condition(s) to employee/ consultant pursuant to the 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.2 to the Company's Form 10-Q for the quarter ended March 31, 2016 (No. 001-13831) filed May 10, 2016 and incorporated herein by reference
10.12*	—	Employment Agreement dated September 1, 2016, effective as of March 14, 2016, by and between Quanta Services, Inc. and Earl C. Austin, Jr. (previously filed as Exhibit 10.1 to the Company's Form 8-K (No. 001-13831) filed September 8, 2016 and incorporated herein by reference)

Exhibit No.		Description
10.13*	—	Employment Agreement dated March 29, 2012, effective as of May 17, 2012, by and between Quanta Services, Inc. and Derrick A. Jensen (previously filed as Exhibit 10.2 to the Company's Form 8-K (No. 001-13831) filed April 2, 2012 and incorporated herein by reference)
10.14*	—	Employment Agreement dated March 4, 2014, effective as of January 6, 2014, by and between Quanta Services, Inc. and Jesse E. Morris (previously filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended March 31, 2014 (No. 001-13831) filed May 8, 2014 and incorporated herein by reference)
10.15*		Employment Agreement dated September 12, 2017, effective as of January 1, 2017, by and between Quanta Services, Inc. and Paul C. Gregory (previously filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended September 30, 2017 (No. 001-13831) filed November 9, 2017 and incorporated herein by reference)
10.16*		Employment Agreement dated September 12, 2017, effective as of May 15, 2017, by and between Quanta Services, Inc. and Donald C. Wayne (previously filed as Exhibit 10.2 to the Company's Form 10-Q for the quarter ended September 30, 2017 (No. 001-13831) filed November 9, 2017 and incorporated herein by reference)
10.17*	—	Quanta Services, Inc. 2017 Annual Incentive Plan – Corporate Employees, Quanta Services, Inc. 2017 Senior Leadership Long-Term Incentive Plan and Quanta Services, Inc. 2017 Discretionary Plan – All Employees (previously filed as Exhibit 10.1 to the Company's Form 8-K (No. 001-13831) filed May 26, 2017 and incorporated herein by reference)
10.18*		Quanta Services, Inc. Term Sheet for 2018 Annual Incentive Plan - Corporate Employees, Quanta Services, Inc. Terms Sheet for 2018 Senior Leadership Long-Term Incentive Plan and Quanta Services, Inc. Term Sheet for 2018 Discretionary Plan - All Employees (previously filed as Exhibit 10.1 to the Company's Form 8-K (No. 001-13831) filed March 2, 2018 and incorporated herein by reference)
10.19*	—	Director Compensation Summary effective as of the 2017 Annual Meeting of the Board of Directors (previously filed as Exhibit 10.24 to the Company's Form 10-K for the year ended December 31, 2016 (No. 001-13831) filed March 1, 2017 and incorporated herein by reference)
10.20*	—	Quanta Services, Inc. Non-Employee Director Deferred Compensation Plan dated effective January 1, 2017 (previously filed as Exhibit 10.25 to the Company's Form 10-K for the year ended December 31, 2016 (No. 001-13831) filed March 1, 2017 and incorporated herein by reference)
10.21*	—	Restricted Stock Unit Deferral Election Form, pursuant to the Quanta Services, Inc. 2011 Omnibus Equity Incentive Plan (previously filed as Exhibit 10.5 to the Company's Form 10-Q for the quarter ended March 31, 2013 (No. 001-13831) filed May 8, 2013 and incorporated herein by reference)
10.22*	—	Quanta Services, Inc. Nonqualified Deferred Compensation Plan, as restated effective January 1, 2017, including the Nonqualified Deferred Compensation Plan Adoption Agreement (previously filed as Exhibit 10.27 to the Company's Form 10-K for the year ended December 31, 2016 (No. 001-13831) filed March 1, 2017 and incorporated herein by reference)
10.23*	—	Form of Amended and Restated Indemnity Agreement (previously filed as Exhibit 10.1 to the Company's Form 8-K (No. 001-13831) filed December 11, 2018 and incorporated herein by reference)
10.24	—	Fourth Amended and Restated Credit Agreement, dated as of December 18, 2015, among Quanta Services, Inc. and certain subsidiaries of Quanta Services, Inc., as Borrowers, certain subsidiaries of Quanta Services, Inc. identified therein as Guarantors, Bank of America, N.A., as Administrative Agent, Domestic Swing Line Lender and an L/C Issuer, and the other Lenders party thereto (previously filed as Exhibit 99.1 to the Company's Form 8-K (No. 001-13831) filed December 23, 2015 and incorporated herein by reference)
10.25	—	First Amendment to Fourth Amended and Restated Credit Agreement dated as of June 27, 2016, among Quanta Services, Inc. and certain subsidiaries of Quanta Services, Inc., as Borrowers, certain subsidiaries of Quanta Services, Inc. identified therein as Guarantors, Bank of America, N.A., as Administrative Agent, Domestic Swing Line Lender and an L/C Issuer, and the other Lenders party thereto (previously filed as Exhibit 10.2 to the Company's Form 10-Q (No. 001-13831) filed August 8, 2016 and incorporated herein by reference)
10.26	—	Second Amendment to Fourth Amended and Restated Credit Agreement, dated as of October 31, 2017, among Quanta Services, Inc. and certain subsidiaries of Quanta Services, Inc., as Borrowers, certain subsidiaries of Quanta Services, Inc. identified therein as Guarantors, the lenders party thereto, Bank of America, N.A., as Administrative Agent, and the Swing Line Lenders and L/C Issuers party thereto (previously filed as Exhibit 10.1 to the Company's Form 8-K filed November 6, 2017 and incorporated herein by reference)

Exhibit No.		Description
10.27	—	Third Amendment to Fourth Amended and Restated Credit Agreement, dated as of August 24, 2018, among Quanta Services, Inc. and certain subsidiaries of Quanta Services, Inc., as Borrowers, certain subsidiaries of Quanta Services, Inc. identified therein as Guarantors, the lenders party thereto, Bank of America, N.A., as Administrative Agent, and the Swing Line Lenders and L/C Issuers party thereto (previously filed as Exhibit 10.1 to the Company's Form 8-K filed October 15, 2018 and incorporated herein by reference)
10.28	—	Fourth Amendment to Fourth Amended and Restated Credit Agreement, dated as of October 10, 2018, among Quanta Services, Inc. and certain subsidiaries of Quanta Services, Inc., as Borrowers, certain subsidiaries of Quanta Services, Inc. identified therein as Guarantors, the lenders party thereto, Bank of America, N.A., as Administrative Agent, and the Swing Line Lenders and L/C Issuers party thereto (previously filed as Exhibit 10.2 to the Company's Form 8-K filed October 15, 2018 and incorporated herein by reference)
10.29	—	Fourth Amended and Restated Security Agreement, dated as of December 18, 2015, among Quanta Services, Inc., the other Debtors identified therein, and Bank of America, N.A., as Administrative Agent for the ratable benefit of the Secured Parties (previously filed as Exhibit 99.2 to the Company's Form 8-K (No. 001-13831) filed December 23, 2015 and incorporated herein by reference)
10.30	—	Fourth Amended and Restated Pledge Agreement, dated as of December 18, 2015, among Quanta Services, Inc., the other Pledgors identified therein, and Bank of America, N.A., as Administrative Agent for the ratable benefit of the Secured Parties (previously filed as Exhibit 99.3 to the Company's Form 8-K (No. 001-13831) filed December 23, 2015 and incorporated herein by reference)
10.31	—	Assignment and Assumption Agreement dated as of August 30, 2007, by and between InfraSource Services, Inc. and Quanta Services, Inc. (previously filed as Exhibit 10.3 to Quanta's Form 8-K (001-13831) filed September 6, 2007 and incorporated herein by reference)
10.32	—	Underwriting, Continuing Indemnity and Security Agreement dated as of March 14, 2005 by Quanta Services, Inc. and the subsidiaries and affiliates of Quanta Services, Inc. identified therein, in favor of Federal Insurance Company (previously filed as Exhibit 10.1 to the Company's Form 8-K (No. 001-13831) filed March 16, 2005 and incorporated herein by reference)
10.33	—	Intercreditor Agreement dated March 14, 2005 by and between Federal Insurance Company and Bank of America, N.A., as Lender Agent on behalf of the other Lender Parties (under the Company's Credit Agreement, as amended) and agreed to by Quanta Services, Inc. and the subsidiaries and affiliates of Quanta Services, Inc. identified therein (previously filed as Exhibit 10.2 to the Company's Form 8-K (No. 001-13831) filed March 16, 2005 and incorporated herein by reference)
10.34	—	First Amendment to Intercreditor Agreement dated December 3, 2012 by and between Federal Insurance Company and Bank of America, N.A., as Lender Agent on behalf of the other Lender Parties (under the Company's Credit Agreement, as amended) and agreed to by Quanta Services, Inc. and the subsidiaries and affiliates of Quanta Services, Inc. identified therein (previously filed as Exhibit 10.7 to the Company's Form 10-Q for the quarter ended June 30, 2013 (No. 001-13831) filed August 9, 2013 and incorporated herein by reference)
10.35	—	Second Amendment to Intercreditor Agreement dated August 4, 2015 by and between Federal Insurance Company; American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, PA and The Insurance Company of the State of Pennsylvania; Liberty Mutual Insurance Company, Liberty Mutual Fire Insurance Company and Safeco Insurance Company of America, and Bank of America, N.A., as Lender Agent on behalf of the other Lender Parties (under the Company's Credit Agreement, as amended), and agreed to by Quanta Services, Inc. and the subsidiaries and affiliates of Quanta Services, Inc. identified therein (previously filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended June 30, 2018 (No. 001-13831) filed August 7, 2018 and incorporated herein by reference)
10.36	—	Joinder Agreement and Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of November 28, 2006, among American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, Pa., The Insurance Company of the State of Pennsylvania, Federal Insurance Company, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 99.1 to the Company's Form 8-K (No. 001-13831) filed December 4, 2006 and incorporated herein by reference)

Exhibit No.		Description
10.37	—	Second Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of January 9, 2008, among American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, Pa., The Insurance Company of the State of Pennsylvania, Federal Insurance Company, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 10.34 to the Company's Form 10-K for the year ended December 31, 2007 (No. 001-13831) filed February 29, 2008 and incorporated herein by reference)
10.38	—	Joinder Agreement and Third Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of December 19, 2008, among American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, Pa., The Insurance Company of the State of Pennsylvania, Federal Insurance Company, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 10.30 to the Company's Form 10-K for the year ended December 31, 2011 (No. 001-13831) filed February 29, 2012 and incorporated herein by reference)
10.39	—	Joinder Agreement and Fourth Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of March 31, 2009, among American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, Pa., The Insurance Company of the State of Pennsylvania, Liberty Mutual Insurance Company, Liberty Mutual Fire Insurance Company, Safeco Insurance Company of America, Federal Insurance Company, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 99.1 to the Company's Form 8-K (No. 001-13831) filed April 1, 2009 and incorporated herein by reference)
10.40	—	Joinder Agreement and Fifth Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of May 17, 2012, among Federal Insurance Company, Liberty Mutual Insurance Company, Liberty Mutual Fire Insurance Company, Safeco Insurance Company of America, American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, PA, The Insurance Company of the State of Pennsylvania, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 10.2 to the Company's Form 10-Q for the quarter ended June 30, 2012 (No. 001-13831) filed August 8, 2012 and incorporated herein by reference)
10.41	—	Sixth Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of December 3, 2012, among Federal Insurance Company, American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, PA, The Insurance Company of the State of Pennsylvania, Liberty Mutual Insurance Company, Liberty Mutual Fire Insurance Company, Safeco Insurance Company of America, Quanta Services, Inc., and the other Indemnitors identified therein (previously filed as Exhibit 10.32 to the Company's Form 10-K for the year ended December 31, 2012 (No. 001-13831) filed March 1, 2013 and incorporated herein by reference)
10.42	—	Seventh Amendment to Underwriting, Continuing Indemnity and Security Agreement dated as of August 4, 2015, among Federal Insurance Company; American Home Assurance Company, National Union Fire Insurance Company of Pittsburgh, PA and The Insurance Company of the State of Pennsylvania; Liberty Mutual Insurance Company, Liberty Mutual Fire Insurance Company and Safeco Insurance Company of America; Quanta Services, Inc., the other Indemnitors identified therein; and the Stallone Companies (previously filed as Exhibit 10.2 to the Company's Form 10-Q for the quarter ended June 30, 2018 (No. 001-13831) filed August 7, 2018 and incorporated herein by reference)
21.1^	—	Subsidiaries
23.1^	—	Consent of PricewaterhouseCoopers LLP
31.1^	—	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) of the Exchange Act, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2^	—	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) of the Exchange Act, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1†	—	Certification of Chief Executive Officer and Chief Financial Officer pursuant to Rule 13a-14(b) of the Exchange Act and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS^	—	XBRL Instance Document - The instance document does not appear in the Interactive Data File because its XBRL tabs are embedded within the Inline XBRL document
101.SCH^	—	XBRL Taxonomy Extension Schema Document
101.CAL^	—	XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB^	—	XBRL Taxonomy Extension Label Linkbase Document
101.PRE^	—	XBRL Taxonomy Extension Presentation Linkbase Document

Exhibit No.		Description
101.DEFˆ	—	XBRL Taxonomy Extension Definition Linkbase Document

____

* Management contracts or compensatory plans or arrangements
ˆ Filed with this Annual Report on Form 10-K
† Furnished with this Annual Report on Form 10-K

ITEM 16. ***Form 10-K Summary.***

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Quanta Services, Inc. has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Houston, State of Texas, on February 28, 2019.

QUANTA SERVICES, INC.

By: /s/ EARL C. AUSTIN, JR.

Earl C. Austin, Jr.
President, Chief Executive Officer and Chief Operating Officer

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Earl C. Austin, Jr. and Derrick A. Jensen, each of whom may act without joinder of the other, as their true and lawful attorneys-in-fact and agents, each with full power of substitution and resubstitution, for such person and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Report has been signed by the following persons in the capacities indicated on February 28, 2019.

Signature	Title
/s/ EARL C. AUSTIN, JR. Earl C. Austin, Jr.	President, Chief Executive Officer, Chief Operating Officer and Director (Principal Executive Officer)
/s/ DERRICK A. JENSEN Derrick A. Jensen	Chief Financial Officer (Principal Financial Officer)
/s/ JERRY K. LEMON Jerry K. Lemon	Chief Accounting Officer (Principal Accounting Officer)
/s/ DOYLE N. BENEBY Doyle N. Beneby	Director
/s/ J. MICHAL CONAWAY J. Michal Conaway	Director
/s/ VINCENT D. FOSTER Vincent D. Foster	Director
/s/ BERNARD FRIED Bernard Fried	Director
/s/ WORTHING F. JACKMAN Worthing F. Jackman	Director
/s/ DAVID M. McCLANAHAN David M. McClanahan	Chairman of the Board of Directors
/s/ MARGARET B. SHANNON Margaret B. Shannon	Director
/s/ PAT WOOD, III Pat Wood, III	Director