FUEL TECH, INC.
Form 10-K
March 12, 2018
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SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K
(Mark One)
ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended: December 31, 2017
OR

¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission File Number 001-33059

Fuel Tech, Inc.
(Exact name of registrant as specified in its charter)

Delaware	20-5657551
(State of Incorporation)	(I.R.S. ID)

Fuel Tech, Inc.
27601 Bella Vista Parkway
Warrenville, IL 60555-1617
(630) 845-4500
www.ftek.com
Securities registered pursuant to Section 12(b) of the Act:

COMMON STOCK, $0.01 par value per share	NASDAQ

Securities registered pursuant to Section 12(g) of the Act: 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 ý
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 ý
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 ý No ¨
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ý 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, or a smaller reporting company. See the definitions of "large" accelerated filer, "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer ¨ Accelerated Filer ¨

Non-accelerated Filer ¨ (Do not check if a smaller reporting company) Smaller reporting company ý

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

As of June 30, 2017, the aggregate market value of the registrant's common stock held by non-affiliates of the registrant was approximately $17,045,910 based on the closing sale price as reported on the NASDAQ National Market System.

As of February 28, 2018, there were 24,132,910 shares of common stock outstanding.

Documents incorporated by reference:

Portions of the definitive Proxy Statement to be delivered to shareholders in connection with the Annual Meeting of Shareholders to be held on May 16, 2018 are incorporated by reference into Part III.

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TABLE OF DEFINED TERMS

Term	Definition
AIG	Ammonia Injection Grid
ASCR™	A trademark used to describe our Advanced Selective Catalytic Reduction process
CAIR	Clean Air Interstate Rule
CAVR	Clean Air Visibility Rule
CSAPR	Cross-State Air Pollution Rule
CFD	Computational Fluid Dynamics
EPA	The U.S. Environmental Protection Agency
ESP	Electrostatic Precipitator
FGC	Flue Gas Conditioning
FUEL CHEM®	A trademark used to describe our fuel and flue gas treatment processes, including its TIFI® Targeted In-Furnace Injection™ technology to control slagging, fouling, corrosion and a variety of sulfur trioxide-related issues
GSG™	Graduated Straightening Grid
HERT™ High Energy Reagent Technology™	A trademark used to describe one of our SNCR processes for the reduction of NOx
I-NOx®	Systems can include LNB, OFA, and SNCR components, along with SCR technology, Ammonia Injection Grid (AIG), and Graduated Straightening Grid (GSG™) system
NO_x	Oxides of nitrogen
NO_xOUT®	A trademark used to describe one of our SNCR processes for the reduction of NOx
NO_xOUT-SCR®	A trademark used to describe our direct injection of urea as a catalyst reagent
NO_xOUT-CASCADE®	A trademark used to describe our process for the combination of SNCR and SCR technologies
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction

TIFI® Targeted In-Furnace Injection™	A trademark used to describe our proprietary technology that enables the precise injection of a chemical reagent into a boiler or furnace as part of a FUEL CHEM program
UDI™	Urea Direct Injection as the process to provide urea reagent directly into a duct for SCR applications
ULTRA®	A trademark used to describe our process for generating ammonia for use as a Selective Catalytic Reduction reagent

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PART I

Forward-Looking Statements

This Annual Report on Form 10-K contains "forward-looking statements," as defined in Section 21E of the Securities Exchange Act of 1934, as amended, that are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and reflect our current expectations regarding our future growth, results of operations, cash flows, performance and business prospects, and opportunities, as well as assumptions made by, and information currently available to, our management. We have tried to identify forward-looking statements by using words such as "anticipate," "believe," "plan," "expect," "intend," "will," and similar expressions, but these words are not the exclusive means identifying forward-looking statements. These statements are based on information currently available to us and are subject to various risks, uncertainties, and other factors, including, but not limited to, those discussed herein under the caption "Risk Factors" that could cause our actual growth, results of operations, financial condition, cash flows, performance and business prospects and opportunities to differ materially from those expressed in, or implied by, these statements. Except as expressly required by the federal securities laws, we undertake no obligation to update such factors or to publicly announce the results of any of the forward-looking statements contained herein to reflect future events, developments, or changed circumstances or for any other reason. Investors are cautioned that all forward-looking statements involve risks and uncertainties, including those detailed in our filings with the Securities and Exchange Commission. See "Risk Factors" in Item 1A.

ITEM 1 - BUSINESS

As used in this Annual Report on Form 10-K, the terms "we," "us," or "our," refer to Fuel Tech, Inc. and our wholly-owned subsidiaries.

GENERAL

We are a leading technology company engaged in the worldwide development, commercialization and application of state-of-the-art proprietary technologies for air pollution control, process optimization, combustion efficiency and advanced engineering services. These technologies enable our customers to operate efficiently in a cost-effective and environmentally sustainable manner. We operate as a fully integrated company to apply our extensive knowledge of carbonaceous fuel and combustion engineering to serve a variety of end markets. Our Air Pollution Control (APC) and FUEL CHEM® business processes rely heavily on our unique ability to inject chemical slurries into combustion units, in precise concentrations and locations, to achieve a desired outcome.

Our APC technologies include advanced combustion modification techniques including low NO_x burners and over fire air systems, along with post-combustion nitrogen oxide (NO_x) control approaches, including NO_xOUT® and HERT™ Selective Non-Catalytic Reduction (SNCR) and Rich Reagent Injection (RRI) systems. Our Advanced Selective Catalytic Reduction (ASCR) system utilizes the combination of combustion systems and SNCR to provide a cost effective alternative to high capital cost, standalone conventional SCR systems while providing similar NO_x reduction levels. The ULTRA®

system generates ammonia on-site for SCR systems using safe urea reagent. Our SCR group provides process design optimization, performance testing and improvement, and catalyst selection services for SCR systems on coal-fired boilers. These technologies have established us as a leader in NO_x reduction, with installations on over 1,000 units worldwide, where coal, fuel oil, natural gas, municipal waste, biomass, and other fuels are utilized.

Our FUEL CHEM technologies revolve around the unique application of chemical injection programs which improve the efficiency, reliability, fuel flexibility and environmental status of combustion units by controlling slagging, fouling, corrosion, opacity and acid plume, as well as the formation of sulfur trioxide, ammonium bisulfate, particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), and carbon dioxide (CO_2). We use our patented TIFI® Targeted In-Furnace Injection™ processes to apply specialty chemical programs to units burning a wide variety of fuels including coal, heavy oil, biomass, and municipal waste. These TIFI programs incorporate design, modeling, equipment, reagent, and service to provide complete customized on-site programs designed to improve plant operations and provide a return on investment in addition to helping meet emission regulatory requirements.

Many of our products and services rely heavily on our computational fluid dynamics and chemical kinetics modeling capabilities, which are enhanced by internally developed, high-end visualization software. These capabilities, coupled with our innovative technologies and multi-disciplined team approach, enable us to provide practical solutions to some of our customers' most challenging issues.

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AIR POLLUTION CONTROL

Regulations and Markets: Domestic

The continued growth of our APC technology segment is dependent upon the adoption and enforcement of environmental regulations in the U.S. and globally. In the U.S., federal and state laws regulating the emission of NO_x are the primary driver in our APC technology segment. The principal regulatory drivers currently in effect are as follows:

Clean Air Act: The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to establish national ambient air quality standards (NAAQS) at levels that are protective of public health with an adequate margin of safety. The six pollutants specified include: Ozone (O_3), Particulate Matter (PM), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Lead, and Carbon Monoxide (CO). The NAAQS provisions require that states comply with ozone and particulate emissions standards. NO_x emissions are a precursor to ozone formation and also contribute to fine particulate emissions ($PM_{2.5}$), which has been the recent regulatory driver through the Cross-State Air Pollution Rule (CSAPR). NO_x emissions were targeted as contributors to fine particulate emissions and ozone emissions. Since 1990, programs have been established by the EPA at the regional and federal level to help states in their mission to define and meet their State Implementation Plans (SIPs) for attainment. NAAQS PM standards were issued in 1997, with more stringent standards issued in 2006 and 2012. The NAAQS ozone standards issued in 1997 were made more stringent in 2008. On October 1, 2015, the EPA strengthened the NAAQS for ground-level ozone by reducing the minimum acceptable level from 75 to 70 parts per billion (ppb). Implementation of the 2015 NAAQS standards will begin in 2018 with finalization of the area designations.

Cross-State Air Pollution Rule (CSAPR): On July 7, 2011, the Environmental Protection Agency passed the Cross-State Air Pollution Rule (CSAPR) under the “good neighbor” provision of the Clean Air Act to reduce emissions of SO_2 and NO_x from power plants in the eastern half of the United States. This rule replaces the Clean Air Transport Rule (CATR) and focuses on reducing air emissions contributing to fine particle ($PM_{2.5}$) and ozone nonattainment that often travel across state lines; including SO_2 and NO_x which contribute to $PM_{2.5}$ transport. CSAPR affected 27 states, with compliance for the first phase in 2012, with additional reductions required in the second phase by 2014. Under CSAPR, state emission caps were designated to mitigate the emission impact on downwind states by controlling emissions from upwind states. If sources within a state caused the state to exceed its assurance limit, severe penalties including a two-for-one reduction based on each source’s contribution percentage of the state overage would be applied. The timing of CSAPR's implementation has been affected by a number of court actions. In December 2011, CSAPR was stayed prior to implementation due to lawsuits filed by various states and combustion sources, and in August 2012 the U.S. Circuit Court of Appeals, D.C. Circuit, vacated CSAPR and remanded it to the EPA. The U.S. Supreme Court reversed that decision in April 2014. Following the remand of the case to the D.C. Circuit, the EPA requested that the court lift the CSAPR stay and toll the CSAPR compliance deadlines by three years. In October 2014, the D.C. Circuit granted the EPA's request and, accordingly, CSAPR Phase 1 implementation commenced in 2015, with Phase 2 implementation starting in 2018 for the May to September ozone season, one year later than originally planned.

Industrial Boiler MACT: In December 2011, the EPA re-proposed its new emissions rule for industrial, commercial and institutional boilers and process heaters, known as the Industrial Boiler Maximum Achievable Control Technology (MACT) standard. The EPA implemented the final rule on January 31, 2013, with compliance starting in January 2016 for most units. Emissions regulated include acid gas emissions including hydrochloric acid (HCl), carbon monoxide (CO), mercury, PM, and dioxins. Due to on-going litigation, final resolution has not been determined for all the boiler types and categories, although many sources have installed controls to meet the requirements.

Clean Air Visibility Rule (CAVR): The Clean Air Visibility Rule (CAVR), also known as the Regional Haze rule, is part of the Clean Air Act and was finalized in 2005. Under CAVR, certain States are required to submit implementation plans to the EPA to comply with the Regional Haze requirements, and updates are required every five years. A new CAVR was issued in January 2017 which requires states to implement new air pollution controls by 2021. The overall obligation of CAVR is to return the US scenic areas to “active” visibility by 2064.

Consent Decrees: Consent decree activity through the US Department of Justice or EPA may require emission sources to meet individual requirements. Sources may also agree to specific air pollution requirements with states or environmental groups.

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Regulations and Markets: International

We also sell NO_x control systems outside the United States, specifically in Europe, Latin America, India (under a license agreement) and in the Pacific Rim, including the People's Republic of China (China). The European Union published the BREF (Best Available Reference Technology) emission guidelines in mid 2017 that further lower emission targets over a span of the next four years. The implementation of the ultra-low emission rules in China is close to completion on large utility boilers but the focus is now shifting to the industrial sector. The Indian government's initial compliance deadline of December 2017 has been delayed but adoption of emission control technologies has started and it is expected to progress at a faster pace in 2018. We expect these developments to further present opportunities to implement our technologies in the international markets.

China continues to represent an attractive opportunity for us as the government continues its policy of pollution control, energy conservation and efficiency improvements as top priorities, as part of tightened standards addressed by the super clean emission regulation officially released in December, 2015. However, the focus is starting to shift to the industrial sector. China's Ministry of Environmental Protection issued super clean emission regulations to be fully implemented by 2020, in support of reducing harmful pollutants and further defining the technologies recommended to achieve the reductions. Super clean emission requires NOx emission under 50 mg/Nm3, SO2 emission under 35 mg/Nm3 and particulate emission under 10 mg/Nm3. The regulations apply to all public utility units of 300MW or larger and private power generation units of 100MW or larger, and were planned to be progressively implemented in the eastern region by 2017, the central region by 2018, and the western region by 2020. The pace of implementation has been faster than anticipated and is expected to be completed in 2018 with few projects remaining for 2019. These emission limits are now being more diligently enforced on industrial emitters. This prompts a shift for suppliers of emission control technologies to become more active in the industrial market space. We anticipate that Fuel Tech's technologies will be in demand in this sector, particularly with clients in critical process industries such as petro-chemical, who value high performance over low cost.

In Europe, new standards on emissions will lower the environmental impact of more than 3000 large combustion plants throughout the European Union. Moreover, European countries not current EU members are expected to adopt these new standards as part of their approach to gain EU membership. In August 2017, the Large Combusion Plant (LCP) BREF was published with new emission limits being phased in over the next four years for multiple pollutants including NOx and particulate matter. In addition, for the first time, limits for Mercury and Hydrogen Chloride have been established for the EU. Despite the significant expansion of renewable energy throughout Europe, the EU and neighboring states still rely heavily on coal generation to provide a stable base load to their power and heating demands. The BREF guidelines reduce NOx limit values by up to 25% which will require an upgrade of first generation NOx abatement systems, and that is expected to present new opportunities for Fuel Tech. However, the pace of implementation will still be dependent on each country's internal processes.

In India, stricter emission targets were announced by the government in December 2015 and phased implementation has begun. Several companies are actively doing engineering studies and preparing technical specifications for their clients to enable them to implement control technologies for NOx and particulate matter in the next couple of years. Trials of SCR and SNCR technologies by NTPC are expected to begin in Q1, 2018. The results are expected to speed up the adoption of these technologies by both government owned plants and IPPs, which is expected to result in a higher demand of Fuel Tech's SNCR and flue gas conditioning technologies, implemented through our collaboration with our local partner ISGEC.

Products

Our NO_x reduction and particulate control technologies are installed worldwide on over 1000 combustion units, including utility, industrial and municipal solid waste applications. Our products include customized NO_x control systems and our patented ULTRA®technology, which converts urea-to-ammonia on site and provides safe reagent for use in Selective Catalytic Reduction (SCR) systems.

- SNCR Systems: Our NO_xOUT® and HERT™ SNCR processes use non-hazardous urea as the reagent rather than ammonia. Both the NO_xOUT® and HERT™ processes on their own are capable of reducing NO_x by up to 25% - 50% for utilities and by potentially significantly greater amounts for industrial units in many types of plants with capital costs ranging from $5 - $20/kW for utility boilers and with total annualized operating costs ranging from $1,000 -

$2,000/ton of NO_x removed.

I-NOx® Systems: Our I-NOx® systems can include LNB, OFA, and SNCR components, along with SCR technology, Ammonia Injection Grid (AIG), and Graduated Straightening Grid (GSG™) system. Together, these systems provide up to 90% NO_x reduction at significantly lower capital and operating costs than conventional SCR systems while providing greater operational flexibility to plant operators. The capital costs for I-NOx® systems can range from $30 - $150/kW depending on boiler size and configuration, which is significantly less than that of conventional SCRs, which can cost $300/kW or more, while operating costs are competitive with those experienced by SCR systems. Our SCR systems utilize urea or ammonia as the SCR catalyst reagent to achieve NO_x reductions of up to 85% from industrial combustion sources.

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- ULTRA Technology: Our ULTRA® process is designed to convert urea to ammonia safely and economically for use as a reagent in the SCR process for NO_x reduction. Recent local objections in the ammonia permitting process have raised concerns regarding the safety of ammonia shipment and storage in quantities sufficient to supply SCR. In addition, the Department of Homeland Security has characterized anhydrous ammonia as a Toxic Inhalation Hazard commodity. Our ULTRA® process is believed to be a market leader for the safe conversion of urea to ammonia just prior to injection into the flue gas duct, which is particularly important near densely populated cities, major waterways, harbors or islands, or where the transport of anhydrous or aqueous ammonia is a safety concern. Ammonia feed systems provide reagent flexibility for SCR reagent feed system, while our UDI™ Urea Direct Injection systems utilize direct injection of reagent without the need for an ammonia injection grid.
- SCR Processes and Services: Our SCR group provides process design optimization, performance testing and improvement, and catalyst selection services for SCR systems on coal-fired boilers. In addition, other related services, including start-ups, maintenance support and general consulting services for SCR systems, Ammonia Injection Grid design and tuning to help optimize catalyst performance, and catalyst management services to help optimize catalyst life, are now offered to customers around the world. We also specialize in computational fluid dynamics models, which simulate fluid flow by generating a virtual replication of real-world geometry and operating inputs. We design flow corrective devices, such as turning vanes, ash screens, static mixers and our patented GSG® Graduated Straightening Grid. Our models help clients optimize performance in flow critical equipment, such as selective catalytic reactors in SCR systems, where the effectiveness and longevity of catalysts are of utmost concern. The Company's modeling capabilities are also applied to other power plant systems where proper flow distribution and mixing are important for performance, such as flue gas desulfurization scrubbers, electrostatic precipitators, air heaters, exhaust stacks and carbon injection systems for mercury removal.
- ESP Processes and Services: ESP technologies for particulate control include Electrostatic Precipitator (ESP) products and services including ESP Inspection Services, Performance Modeling, and Performance and Efficiency Upgrades, along with complete turnkey capability for ESP retrofits. Flue gas conditioning (FGC) systems include treatment using sulfur trioxide (SO_3) and ammonia (NH_3) based systems to improve the performance of ESPs by modifying the properties of the fly ash particle. Our ULTRA technology can provide the ammonia system feed requirements for FGC applications as a safe alternative to ammonia reagent based systems. FGC systems offer a lower capital cost approach to improving ash particulate capture versus the alternative of installing larger ESPs or utilizing fabric filter technology to meet targeted emissions and opacity limits. Fuel Tech's particulate control technologies have been installed on more than 125 units worldwide.
- Burner Systems: Low NO_x Burners and Ultra Low NO_x Burners (LNB and ULNB) are available for coal-, oil-, and gas-fired industrial and utility units. Each system application is specifically designed to maximize NO_x reduction. Computational fluid dynamics combustion modeling is used to validate the design prior to fabrication of equipment. NO_x reductions can range from 40%-60% depending on the fuel type. Over-Fire Air (OFA) systems stage combustion for enhanced NO_x reduction. Additional NO_x reductions, beyond Low NO_x Burners, of 35% - 50% are possible on different boiler configurations on a range of fuel types. Combined overall reductions range from 50% - 70%, with overall capital costs ranging from $10 - $20/kW and total costs ranging from $300 - $1,500/ton of NO_x removed, depending on the scope.

The key market dynamic for the APC product line is the continued use of coal as the principal fuel source for global electricity production. Coal currently accounts for approximately 30% of all U.S. electricity generation and roughly 69% of Chinese electricity generation. Major coal consumers include China, the United States and India. The growth of natural gas in the U.S. for industrial applications has increased the need for SCR technology since it often meets the definition of Best Available Control Technology and is required on new industrial units.

Sales of APC products were $27.8 million, $34.1 million, and $43.5 million for the years ended December 31, 2017, 2016 and 2015, respectively.

NO_x Reduction Competition

Competition with our NO_x reduction suite of products may be expected from companies supplying urea SNCR systems, combustion modification products, SCR systems and ammonia SNCR systems. In addition, we experience competition in the urea-to-ammonia conversion market.

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Combustion modifications, including Low NO_x Burners and Over-Fire Air systems, can be fitted to most types of boilers with cost and effectiveness varying with specific boilers. Combustion modifications may yield up to 20% - 60% NO_x reduction economically with capital costs ranging from $10 - $20/kW and total costs ranging from $300 - $1,500/ton of NO_x removed. The modifications are designed to reduce the formation of NO_x and are typically the first NO_x reduction efforts employed. Companies such as GE, and Babcock & Wilcox Company, are active competitors in the Low NO_x Burner business. Once NO_x is formed, then the SCR process is an effective and proven method of control for removal of NO_x up to 90%. SCR systems have a high capital cost of $300+/kW on retrofit coal applications. Such companies as GE, Babcock Power, Babcock & Wilcox Company, CECO Environmental and Mitsubishi Hitachi, are active SCR system and reagent feed system providers.

The use of ammonia as the reagent for the SNCR process can reduce NO_x by 30% - 70% on incinerators but has limited applicability in the utility industry. Ammonia system capital costs range from $5 - $20/kW, with annualized operating costs ranging from $1,000 - $3,000/ton of NO_x removed. These systems require the use of either anhydrous or aqueous ammonia, both of which are hazardous substances.

In addition to or in lieu of using the foregoing processes, certain customers may elect to close or de-rate plants, purchase electricity from third-party sources, switch from higher to lower NO_x-emitting fuels or purchase NO_x emission allowances.

Lastly, with respect to urea-to-ammonia conversion technologies, a competitive approach to our controlled urea decomposition system competes with Wahlco, Inc., which manufactures a system that hydrolyzes urea under high temperature and pressure.

APC Backlog

Consolidated APC segment backlog at December 31, 2017 was $22.1 million versus backlog at December 31, 2016 of $8.0 million. A substantial portion of the backlog as of December 31, 2017 should be recognized as revenue in fiscal 2018, although the timing of such revenue recognition in 2018 is subject to the timing of the expenses incurred on existing projects.

FUEL CHEM

Product and Markets

The FUEL CHEM® technology segment revolves around the unique application of specialty chemicals to improve the efficiency, reliability and environmental status of plants operating in the electric utility, industrial, pulp and paper, waste-to-energy, and university and district heating markets. FUEL CHEM programs are currently in place on combustion units in North America, Mexico and Europe, treating a wide variety of solid and liquid fuels, including coal, heavy oil, black liquor, biomass and municipal waste.

Central to the FUEL CHEM approach is the introduction of chemical reagents, such as magnesium hydroxide, to combustion units via in-body fuel application (pre-combustion) or via direct injection (post-combustion) utilizing our proprietary TIFI® technology. By attacking performance-hindering problems, such as slagging, fouling and corrosion, as well as the formation of sulfur trioxide (SO_3), and ammonium bisulfate (ABS), our programs offer numerous operational, financial and environmental benefits to owners of boilers, furnaces and other combustion units.

The key market dynamic for this product line is the continued use of coal as the principal fuel source for global electricity production. Coal currently accounts for approximately 30% of all U.S. electricity generation and roughly 69% of Chinese electricity generation. Major coal consumers include the United States, China and India. Additional market dynamics include a growing, worldwide utilization of biomass for both steam and electrical production, as well as the strengthening of the pulp and paper industry worldwide, resulting in black liquor recovery boilers needing to maximize throughput.

The principal markets for this product line are electric power plants burning coals with slag-forming constituents such as sodium, iron and high levels of sulfur. Sodium is typically found in the Powder River Basin coals of Wyoming and Montana. Iron is typically found in coals produced in the Illinois Basin region. High sulfur content is typical of Illinois Basin coals and certain Appalachian coals. High sulfur content can give rise to unacceptable levels of SO_3 formation especially in plants with SCR systems and flue gas desulphurization units (scrubbers).

The combination of slagging coals and SO_3-related issues, such as “blue plume” formation, air pre-heater fouling and corrosion, SCR fouling and the proclivity to suppress certain mercury removal processes, represents an attractive market potential for Fuel Tech.

Sales of the FUEL CHEM products were $17.4 million, $21.1 million, and $30.2 million for the years ended December 31, 2017, 2016 and 2015, respectively.

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Competition

Competition for our FUEL CHEM product line includes chemicals sold by specialty chemical and combustion engineering companies, such as Ashland Inc., Environmental Energy Services, Inc., and GE Infrastructure. No technologically comparable substantive competition currently exists for our TIFI technology, which is designed primarily for slag control and SO_3 abatement, but there can be no assurance that such lack of substantive competition will continue.

INTELLECTUAL PROPERTY

The majority of our products are protected by U.S. and non-U.S. patents. We own 128 granted patents worldwide and 13 allowed utility model patents in China. We have 68 patent applications pending; including 12 in the United States and 56 in non-U.S. Jurisdictions. These patents and applications cover some 32 inventions, 16 associated with our NO_x reduction business, 14 associated with the FUEL CHEM business, and two associated with the Fuel Conversion business. Our granted patents have expiration dates ranging from October of 2018 to May of 2037.

Management believes that the protection provided by the numerous claims in the above referenced patents or patent applications is substantial, and afford us a significant competitive advantage in our business. Accordingly, any significant reduction in the protection afforded by these patents or any significant development in competing technologies could have a material adverse effect on our business.

EMPLOYEES

At December 31, 2017, we had 122 employees, 82 in North America, 32 in China and eight in Europe. We enjoy good relations with our employees and are not a party to any labor management agreement.

RELATED PARTIES

Douglas G. Bailey, a member of our Board, is a stockholder of American Bailey Corporation (ABC), which is a related party. Please refer to Note 11 to the consolidated financial statements in this Form 10-K for information about our transactions with ABC. Additionally, see the more detailed information relating to this subject under the caption “Certain Relationships and Related Transactions” in our definitive Proxy Statement to be distributed in connection with our 2018 Annual Meeting of Stockholders, which information is incorporated by reference.

AVAILABLE INFORMATION

We are a fully integrated company using a suite of advanced technologies to provide boiler optimization, efficiency improvement and air pollution reduction and control solutions to utility and industrial customers worldwide. Originally incorporated in 1987 under the laws of the Netherlands Antilles as Fuel-Tech N.V., we were domesticated in the United States on September 30, 2006, and continue as a Delaware corporation with our corporate headquarters at 27601 Bella Vista Parkway, Warrenville, Illinois, 60555-1617. Fuel Tech maintains an Internet website at www.ftek.com. Our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports filed or furnished pursuant to Section 13(a) of the Exchange Act are made available through our website as soon as reasonably practical after we electronically file or furnish the reports to the Securities and Exchange Commission. Our website also contains our Corporate Governance Guidelines and Code of Ethics and Business Conduct, as well as the charters of the Audit, Compensation, and Nominating and Corporate Governance committees of the Board of Directors. All of these documents are available in print without charge to stockholders who request them. Information on our website is not incorporated into this report.

ITEM 1A - RISK FACTORS

Investors in our Common Shares should be mindful of the following risk factors relative to our business.

Our Product Portfolio Lacks Diversification

We have two broad technology segments that provide advanced engineering solutions to meet the pollution control, efficiency improvement, and operational optimization needs of coal-fired energy-related facilities worldwide. They

are as follows:

The Air Pollution Control technology segment includes technologies to reduce NO_x emissions in flue gas from boilers, incinerators, furnaces and other stationary combustion sources. These include Low and Ultra Low NO_x Burners (LNB and ULNB), Over-Fire Air (OFA) systems, NO_xOUT® and HERT™ Selective Non-Catalytic Reduction (SNCR) systems, and Advanced Selective Catalytic Reduction (ASCR™) systems. The ASCR system includes ULNB, OFA, and SNCR components, along with a downsized SCR catalyst, Ammonia Injection Grid (AIG), and Graduated Straightening Grid (GSG™) systems to provide high NO_x reductions at significantly lower capital and operating costs than conventional

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SCR systems. The NO_xOUT CASCADE® and NO_xOUT-SCR® processes are basic types of ASCR systems, using just SNCR and SCR catalyst components. ULTRA® technology creates ammonia at a plant site using safe urea for use with any SCR application. ESP technologies make use of electrostatic precipitator products and services to reduce particulate matter. Flue Gas Conditioning systems are chemical injection systems offered in markets outside the U.S. and Canada to enhance electrostatic precipitator and fabric filter performance in controlling particulate emissions.

- The FUEL CHEM® technology segment which uses chemical processes in combination with advanced Computational Fluid Dynamics (CFD) and Chemical Kinetics Modeling (CKM) boiler modeling for the control of slagging, fouling, corrosion, opacity and other sulfur trioxide-related issues in furnaces and boilers through the addition of chemicals into the furnace using TIFI® Targeted In-Furnace Injection™ technology.

An adverse development in our advanced engineering solution business as a result of competition, technological change, government regulation, customers converting to use natural gas or other fuels, or any other factor could have a significantly greater impact than if we maintained more diverse operations.

We Face Substantial Competition

Competition in the Air Pollution Control market comes from competitors utilizing their own NO_x reduction processes, including SNCR systems, Low NO_x Burners, Over-Fire Air systems, flue gas recirculation, ammonia SNCR and SCR, which do not infringe our patented technologies. Indirect competition will also arise from business practices such as the purchase rather than the generation of electricity, fuel switching, closure or de-rating of units, and sale or trade of pollution credits and emission allowances. Utilization by customers of such processes or business practices or combinations thereof may adversely affect our pricing and participation in the NO_x control market if customers elect to comply with regulations by methods other than the purchase of our Air Pollution Control products. See Item 1 “Products” and “NO_x Reduction Competition” in the Air Pollution Control segment overview.

Competition in the FUEL CHEM markets includes chemicals sold by specialty chemical and combustion engineering companies, such as NALCO (Ecolab), GE Infrastructure, and Environmental Energy Services, Inc.

Demand for Our APC and FUEL CHEM Products is Affected by External Market Factors

Reduced coal-fired electricity demand across the United States has led to coal-fired electricity production declines. Contributing to this decline in coal-fired generations were 1) lower natural gas prices which allowed utility operators to increase the amount of power generated from natural gas plants, 2) increased cost of environmental compliance with current environmental regulations, 3) constrained funding for capital projects, and 4) the uncertainty of regulation resulted in electricity generating unit operators delaying investment in NO_x emission remediation plans until such time as the United States Environmental Protection Agency further clarifies the regulations.

Our Business Is Dependent on Continuing Air Pollution Control Regulations and Enforcement

Our business is significantly impacted by and dependent upon the regulatory environment surrounding the electricity generation market. Our business will be adversely impacted to the extent that regulations are repealed or amended to significantly reduce the level of required NO_x reduction, or to the extent that regulatory authorities delay or otherwise minimize enforcement of existing laws. Additionally, long-term changes in environmental regulation that threaten or preclude the use of coal or other fossil fuels as a primary fuel source for electricity production which result in the reduction or closure of a significant number of fossil fuel-fired power plants may adversely affect our business, financial condition and results of operations. See Item 1 above under the caption “Regulations and Markets” in the Air Pollution Control segment overview.

We May Not Be Able to Successfully Protect our Patents and Proprietary Rights

We hold licenses to or own a number of patents for our products and processes. In addition, we also have numerous patent applications pending both in the U.S. and abroad. There can be no assurance that any of our pending patent applications will be granted or that our outstanding patents will not be challenged, overturned or otherwise circumvented by competitors. In foreign markets, the absence of harmonized patent laws makes it more difficult to

ensure consistent respect for our patent rights in emerging markets. In addition, certain critical technical information relating to our products which is not patented is held as trade secret, and protected by trade secret laws and restrictions on disclosure contained in our confidentiality and licensing agreements. There can be no assurance that such protections will prove adequate or that we will have adequate remedies against contractual counterparties for disclosure of our trade secrets or other violations of our intellectual property rights. See Item 1 above under the caption “Intellectual Property.”

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Our Results May Be Affected By Foreign Operations

In 2007, we expanded our operations in China by establishing a wholly-owned subsidiary in Beijing. Our management believes that the Asia-Pacific region, particularly China, offers significant market opportunities as nations in this region look to establish and implement regulatory policies for improving their environment and utilizing fossil fuels, especially coal, efficiently and effectively. In 2012, we expanded our operations in Latin and South America by establishing a wholly-owned subsidiary in Chile. The future business opportunities in these markets are dependent on the continued implementation and enforcement of regulatory policies that will benefit our technologies, the acceptance of our engineering solutions in such markets, the ability of potential customers to utilize our technologies on a competitive, cost-effective basis, and our ability to protect and enforce our intellectual property rights.

Our Operating Results May Be Adversely Affected by Product Pricing

The onset of significant competition for either of the technology segments might require us to lower our product prices in order to remain competitive and have a corresponding adverse impact on our realized gross margins and operating profitability. See the risk factor entitled “We Face Substantial Competition” above.

We May Not Be Able to Purchase Raw Materials on Commercially Advantageous Terms

Our FUEL CHEM technology segment is dependent, in part, upon a supply of magnesium hydroxide. Any adverse changes in the availability of this chemical will likely have an adverse impact on ongoing operation of our FUEL CHEM programs. On March 4, 2009, we entered into a Restated Product Supply Agreement (“PSA”) with Martin Marietta Magnesia Specialties, LLC (MMMS) in order to assure the continuance of a stable supply from MMMS of magnesium hydroxide products for our requirements in the United States and Canada. The term of the PSA expires on December 31, 2019. Pursuant to the PSA, MMMS supplies us with magnesium hydroxide products manufactured pursuant to our specifications and we have agreed to purchase from MMMS, and MMMS has agreed to supply, 100% of our requirements for such magnesium hydroxide products for our customers who purchase such products for delivery in the United States and Canada. There can be no assurance that we will be able to obtain a stable source of magnesium hydroxide in markets outside the United States.

Our Customer Base Is Highly Concentrated

A small number of customers have historically accounted for a significant portion of our revenues. There can be no assurance that our current customers will continue to place orders, that orders by existing customers will continue at the levels of previous periods, or that we will be able to obtain orders from new customers. The loss of one or more of our customers could have a material adverse effect on our sales and operating results.

We May Not Be Able to Borrow Funds Pursuant to our Credit Facilities

We are party to a $5.0 million domestic revolving credit agreement with JPMorgan Chase Bank, N.A. As of December 31, 2017, there were no outstanding borrowings on this facility, and we had advanced $3.0 million of Letters of Credit. The Facility is secured by cash held by the Company in a separate restricted use designated JPM Chase deposit account, which is not readily available for our operating needs. The balance in this restricted cash account is $6,020 as of December 31, 2017. In addition, our Chinese subsidiary, Beijing Fuel Tech Environmental Technologies Company, Ltd., has a RMB 6.5 million (approximately $999) revolving credit facility with JPMorgan Chase Bank (China) Company Limited. As of December 31, 2017, there were no outstanding borrowings under this facility, and we had outstanding bank guarantees of approximately $0.2 million. In the event of any default on our part under either of these agreements, the lender is entitled to accelerate payment of any amounts outstanding and may, under certain circumstances, cancel the facilities. If we were unable to obtain a waiver for a breach of covenant and the lender accelerated the payment of any outstanding amounts, such acceleration may cause our cash position to significantly deteriorate or, if cash on hand were insufficient to satisfy the payment due, may require us to obtain alternate financing.

We may not be able to recover a significant portion of our carrying value of our assets held for sale associated with our Fuel Conversion business segment

Effective June 28, 2017, the Company has suspended all operations associated with the Fuel Conversion business segment. We may not be able to realize as much value from the sale of the assets as we expect and we may incur higher than expected, or unforeseen, costs associated with the disposal related activities. Any of the foregoing could have a material adverse effect on our business, financial position and results of operations.

ITEM 1B - UNRESOLVED STAFF COMMENTS

None

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ITEM 2 - PROPERTIES

We own an office building in Warrenville, Illinois, which has served as our corporate headquarters since June 23, 2008. This facility, with approximately 40,000 square feet of office space, is sufficient to meet our requirements for the foreseeable future.

We also operate from leased office facilities and we do not segregate any of these leased facilities by operating business segment. The terms of the Company's eight primary lease arrangements are as follows:

- The Stamford, Connecticut building lease, for approximately 6,440 square feet, runs from February 1, 2010 to December 31, 2019. The facility houses certain administrative functions.
- The Beijing, China building lease, for approximately 9,000 square feet, runs from June 1, 2017 to May 31, 2020. This facility serves as the operating headquarters for our Beijing Fuel Tech operation.
- The Durham, North Carolina building lease, for approximately 2,590 square feet, runs from July 1, 2016 to July 31, 2019. This facility houses engineering operations.
- The Gallarate, Italy building lease, for approximately 1,636 square feet, runs from May 1, 2013 to April 30, 2019. This facility serves as the operating headquarters for our European operations.
- The Westlake, Ohio building lease, for approximately 3,000 square feet, runs from May 1, 2017 to April 30, 2020. This facility houses engineering operations.
- The Aurora, IL warehouse lease, for approximately 11,000 square feet, runs from September 1, 2013 to December 31, 2020. This facility serves as an outside warehouse facility.
- The Overland Park, KS lease, for approximately 600 square feet, runs from October 16, 2015 to October 15, 2018. This facility serves primarily as a sales office.

ITEM 3 - LEGAL PROCEEDINGS

We are from time to time involved in litigation incidental to our business. We are not currently involved in any litigation in which we believe an adverse outcome would have a material effect on our business, financial condition, results of operations, or prospects.

ITEM 4 – MINE SAFETY DISCLOSURES

Not Applicable

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PART II

ITEM 5 - MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASE OF EQUITY SECURITIES

Market

Our Common Shares have been traded since September 1993 on The NASDAQ Stock Market, Inc, where it trades under the symbol FTEK.

Prices

The table below sets forth the high and low sales prices during each calendar quarter since January 2016.

2017	High	Low
Fourth Quarter	$1.17	$0.91
Third Quarter	1.14	0.79
Second Quarter	0.99	0.76
First Quarter	1.28	1.02

2016	High	Low
Fourth Quarter	$1.51	$1.13
Third Quarter	1.80	1.31
Second Quarter	1.86	1.41
First Quarter	2.05	1.50

Dividends

We have never paid cash dividends on the Common Shares and have no current plan to do so in the foreseeable future. The declaration and payment of dividends on the Common Shares are subject to the discretion of our Board of Directors. The decision of the Board of Directors to pay future dividends will depend on general business conditions, the effect of a dividend payment on our financial condition, and other factors the Board of Directors may consider relevant. The current policy of the Board of Directors is to reinvest earnings in operations to promote future growth.

Holders

As of February 28, 2018, there were 111 holders of record of our common stock, which does not include the number of beneficial owners whose common stock was held in street name or through fiduciaries.

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Performance Graph

The following line graph compares our total return to stockholders per common share for the five years ended December 31, 2017 to that of the NASDAQ Composite Index and the WilderHill Progressive Energy Index for the period December 31, 2012 through December 31, 2017. The graph tracks the performance of a $100 investment in the Company's common stock and in each of the indexes (with the reinvestment of all dividends) on December 31, 2012.

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ITEM 6 - SELECTED FINANCIAL DATA

Selected financial data are presented below as of the end of and for each of the fiscal years in the five-year period ended December 31, 2017. The selected financial data should be read in conjunction with the audited consolidated financial statements as of and for the year ended December 31, 2017, and "Management's Discussion and Analysis of Financial Condition and Results of Operations" included elsewhere in this report and the schedules thereto.

	For the years ended December 31				
CONSOLIDATED STATEMENT OF OPERATIONS DATA (in thousands of dollars, except for share and per-share data)	2017	2016	2015	2014	2013
Revenues	$45,166	$55,161	$73,664	$79,017	$109,338
Cost of sales	27,144	36,367	45,107	43,889	62,521
Selling, general and administrative	20,933	25,564	30,897	35,432	36,375
Restructuring charge	119	1,428	219	—	—
Research and development	1,070	1,752	1,447	1,459	2,442
Building, goodwill and intangible assets impairment	2,965	2,074	1,425	23,400	—
Operating (loss) income from continuing operations	(7,065)	(12,024)	(5,431)	(25,163)	8,000
Net (loss) income from continuing operations	(7,069)	(14,588)	(9,554)	(17,448)	5,101
Loss from discontinued operations	(3,914)	(2,800)	(2,826)	(277)	—
Net (loss) income	$(10,983)	$(17,388)	$(12,380)	$(17,725)	$5,101
Net (loss) income per common share:					
Basic					
Continuing operations	$(0.30)	$(0.62)	$(0.41)	$(0.77)	$0.23
Discontinued operations	(0.16)	(0.12)	(0.13)	(0.01)	—
Basic net (loss) income per common share	$(0.46)	$(0.74)	$(0.54)	$(0.78)	$0.23
Diluted					
Continuing operations	$(0.30)	$(0.62)	$(0.41)	$(0.77)	$0.23
Discontinued operations	(0.16)	(0.12)	(0.13)	(0.01)	—
Diluted net (loss) income per common share	$(0.46)	$(0.74)	$(0.54)	$(0.78)	$0.23
Weighted-average basic shares outstanding	23,872,000	23,365,000	23,101,000	22,782,000	22,286,000
Weighted-average diluted shares outstanding	23,872,000	23,365,000	23,101,000	22,782,000	22,579,000

	December 31				
CONSOLIDATED BALANCE SHEET DATA (in thousands of dollars)	2017	2016	2015	2014	2013
Working capital	$18,025	$26,585	$35,865	$39,688	$48,619
Total assets	50,484	57,788	76,011	91,471	110,058
Long-term obligations	420	346	501	520	789
Total liabilities	16,143	14,396	17,037	19,170	21,435
Stockholders' equity (1)	34,341	43,392	58,974	72,301	88,623

Notes:

(1) Stockholders' equity includes the principal amount of nil coupon non-redeemable perpetual loan notes. See Note 7 to the consolidated financial statements.

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ITEM 7 - MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (amounts in thousands of dollars)

Background

We have two broad technology segments that provide advanced engineered solutions to meet the pollution control, efficiency improvement and operational optimization needs of energy-related facilities worldwide. They are as follows:

Air Pollution Control Technologies

The Air Pollution Control technology segment includes technologies to reduce NO_x emissions in flue gas from boilers, incinerators, furnaces and other stationary combustion sources. These include Low and Ultra Low NO_x Burners (LNB and ULNB), OFA systems, NO_xOUT and HERT SNCR systems, and ASCR systems. The ASCR system includes ULNB, OFA, and SNCR components, along with a downsized SCR catalyst, AIG, and GSG systems to provide high NO_x reductions at significantly lower capital and operating costs than conventional SCR systems. The NO_xOUT CASCADE and NO_xOUT-SCR processes are basic types of ASCR systems, using just SNCR and SCR catalyst components. ULTRA technology creates ammonia at a plant site using safe urea for use with any SCR application. Our ESP products and services include complete turnkey ESP retrofits and related services. Flue Gas Conditioning systems are chemical injection systems offered in markets outside the U.S. and Canada to enhance electrostatic precipitator and fabric filter performance in controlling particulate emissions. We distribute our products through our direct sales force and third-party sales agents.

FUEL CHEM Technologies

The FUEL CHEM technology segment, which uses chemical processes in combination with advanced CFD and CKM boiler modeling, for the control of slagging, fouling, corrosion, opacity and other sulfur trioxide-related issues in furnaces and boilers through the addition of chemicals into the furnace using TIFI Targeted In-Furnace Injection technology. Fuel Tech sells its FUEL CHEM program through its direct sales force and agents to industrial and utility power-generation facilities. FUEL CHEM programs have been installed on combustion units in North America, Europe, China, and India, treating a wide variety of solid and liquid fuels, including coal, heavy oil, biomass and municipal waste. The FUEL CHEM program improves the efficiency, reliability and environmental status of plants operating in the electric utility, industrial, pulp and paper, waste-to-energy, university and district heating markets and offers numerous operational, financial and environmental benefits to owners of boilers, furnaces and other combustion units.

The key market dynamic for both technology segments is the continued use of fossil fuels, especially coal, as the principal fuel source for global electricity production. Coal currently accounts for approximately 30% of all U.S. electricity generation and roughly 69% of Chinese electricity generation. Major coal consumers include China, the United States and India.

Critical Accounting Policies and Estimates

The consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America, which require us to make estimates and assumptions. We believe that of our accounting policies (see Note 1 to the consolidated financial statements), the following involve a higher degree of judgment and complexity and are deemed critical. We routinely discuss our critical accounting policies with the Audit Committee of the Board of Directors.

Revenue Recognition

Revenues from the sales of chemical products are recorded when title transfers, either at the point of shipment or at the point of destination, depending on the contract with the customer. We use the percentage of completion method of accounting for equipment construction, equipment supply and license contracts that are sold within the Air Pollution Control technology segment. Under the percentage of completion method, revenues are recognized as work is performed based on the relationship between actual construction costs incurred and total estimated costs at completion. Construction costs include all direct costs such as materials, labor, and subcontracting costs, and indirect costs allocable to the particular contract such as indirect labor, tools and equipment, and supplies. Revisions in completion estimates and contract values are made in the period in which the facts giving rise to the revisions become known and can influence the timing of when revenues are recognized under the percentage of completion method of accounting. Such revisions have historically not had a material effect on the amount of revenue recognized. Provisions are made for estimated losses on uncompleted contracts in the period in which such losses are determined. As of December 31, 2017, we had four construction contracts in progress that were identified as loss contracts and a provision for losses in the amount of $117 was recorded in other accrued liabilities on the consolidated balance sheet. As of December 31, 2016, we had two construction contract in progress that was identified as a loss contract and a provision for losses in the amount of $41 was recorded in other accrued liabilities on the consolidated balance sheet.

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Typically, our APC contracts are eight to sixteen months in length. A typical contract will have three or four critical operational measurements that, when achieved, serve as the basis for us to invoice the customer via progress billings. At a minimum, these measurements will include the generation of engineering drawings, the shipment of equipment and the completion of a system performance test.

As part of most of our contractual APC project agreements, we contractually commit to customer-specific acceptance criteria that relate to the operational performance of the system that is being sold. These criteria are determined based on mathematical modeling that is performed by our personnel, which is in turn based on operational inputs that are provided by the customer. Our customer is solely responsible for the accuracy of the operating condition information; all performance guarantees and equipment warranties granted by us are void if the operating condition information is inaccurate or is not met.

Accounts receivable includes unbilled receivables, representing revenues recognized in excess of billings on uncompleted contracts under the percentage of completion method of accounting. At December 31, 2017 and December 31, 2016, unbilled receivables were approximately $7,894 and $6,755, respectively, and are included in accounts receivable on the consolidated balance sheet. Billings in excess of costs and estimated earnings on uncompleted contracts were $2,403 and $1,730 at December 31, 2017 and December 31, 2016, respectively, and are included in other accrued liabilities on the consolidated balance sheet.

We have installed over 1,000 units with APC technology and normally provide performance guarantees to our customers based on the operating conditions for the project. As part of the project implementation process, we perform system start-up and optimization services that effectively serve as a test of actual project performance. We believe that this test, combined with the accuracy of the modeling that is performed, enables revenue to be recognized prior to the receipt of formal customer acceptance.

Allowance for Doubtful Accounts

The allowance for doubtful accounts is management’s best estimate of the amount of credit losses in accounts receivable. In order to control and monitor the credit risk associated with our customer base, we review the credit worthiness of customers on a recurring basis. Factors influencing the level of scrutiny include the level of business the customer has with us, the customer’s payment history and the customer’s financial stability. Receivables are considered past due if payment is not received by the date agreed upon with the customer, which is normally 30 days. Representatives of our management team review all past due accounts on a weekly basis to assess collectability. At the end of each reporting period, the allowance for doubtful accounts balance is reviewed relative to management’s collectability assessment and is adjusted if deemed necessary through a corresponding charge or credit to bad debts expense, which is included in selling, general, and administrative expenses in the consolidated statements of operations. Bad debt write-offs are made when management believes it is probable a receivable will not be recovered.

Inventories

Inventories consist primarily of spare parts and are stated at the lower of cost or net realizable value using the first-in, first-out method. Usage is recorded in cost of sales in the period that parts were issued to a project or used to service equipment. Inventories are periodically evaluated to identify obsolete or otherwise impaired parts and are written off when management determines usage is not probable. On June 30, 2017, the Company established an additional excess and obsolete inventory reserve of $228 which is included in inventory on the consolidated balance sheet. On December 31, 2016, the Company established an excess and obsolete inventory reserve of $825 of which $175 is included in inventories and $650 is included in other assets on the consolidated balance sheet. The Company estimates the balance of excess and obsolete inventory by analyzing inventory by age using last used and original purchase date

and existing sales pipeline for which the inventory could be used.

Assessment of Potential Impairments of Goodwill and Intangible Assets

Goodwill is not amortized, but rather is reviewed annually (in the fourth quarter) or more frequently if indicators arise, for impairment. We do not have any indefinite-lived intangible assets other than goodwill. Such indicators include a decline in expected cash flows, a significant adverse change in legal factors or in the business climate, unanticipated competition, a decrease in our market capitalization to an amount less than the carrying value of our assets, or slower growth rates, among others.

Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. We have two reporting units: the FUEL CHEM segment and the APC technology segment.

Our evaluation of goodwill impairment involves first assessing qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. We may bypass this qualitative assessment, or determine that based on our qualitative assessment considering the totality of events and circumstances including macroeconomic factors,

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industry and market considerations, current and projected financial performance, a sustained decrease in our share price, or other factors, that additional impairment analysis is necessary. This additional analysis involves comparing the current fair value of a reporting unit to its carrying value. Fuel Tech uses a discounted cash flow (DCF) model to determine the current fair value of its two reporting units as this methodology was deemed to best quantify the present values of our expected future cash flows and yield a fair value that should be in line with the aggregate market value placed on the outstanding number of Common Shares as reflected by the current stock price multiplied by the outstanding common shares. A number of significant assumptions and estimates are involved in the application of the DCF model to forecast operating cash flows, including markets and market share, sales volumes and prices, costs to produce and working capital changes. Events outside our control, specifically market conditions that impact revenue growth assumptions, could significantly impact the fair value calculated. Management considers historical experience and all available information at the time the fair values of its reporting units are estimated. However, actual fair values that could be realized in an actual transaction may differ from those used to evaluate the impairment of goodwill.

The application of our DCF model in estimating the fair value of each reporting segment is based on the ‘net asset’ approach to business valuation. In using this approach for each reportable segment, we forecast segment revenues and expenses out to perpetuity and then discount the resulting cash flows to their present value using an appropriate discount rate. The forecast considers, among other items, the current and expected business environment, expected changes in the fixed and variable cost structure as the business grows, and a revenue growth rate that we feel is both achievable and sustainable. The discount rate used is composed of a number of identifiable risk factors, including equity risk, company size, and certain company specific risk factors such as our debt-to-equity ratio, among other factors, that when added together, results in a total return that a prudent investor would demand for an investment in our company.

In the event the estimated fair value of a reporting unit per the DCF model is less than the carrying value, additional analysis would be required. The additional analysis would compare the carrying amount of the reporting unit’s goodwill with the implied fair value of that goodwill. The implied fair value of goodwill is the excess of the fair value of the reporting unit over the fair values assigned to all of the assets and liabilities of that unit as if the reporting unit was acquired in a business combination and the fair value of the reporting unit represented the purchase price. If the carrying value of goodwill exceeds its implied fair value, an impairment loss equal to such excess would be recognized.

Fuel Tech performed its annual goodwill impairment analysis for each of its reporting units as of October 1, 2017 and determined that no impairment of goodwill existed within the FUEL CHEM technology segment.

Building Impairment

During the second quarter of 2017, we experienced a decrease in our stock price that caused our market capitalization to fall below the equity value on our consolidated balance sheet, which resulted in an indicator of impairment. This, along with an overall slowdown in APC technology and corresponding downward adjustments to our financial forecasts, was considered during a detailed evaluation of the fair value of our reporting units. As a result of these triggering events, Fuel Tech performed a long-lived asset impairment analysis for each of the reporting units as of April 1, 2017. Based on this evaluation, we determined that our APC segment failed the first step of our impairment analysis because the estimated gross cash flows and fair value of the reporting unit was less than its carrying value, thus requiring additional analysis of the segment. However, no impairment resulted as the fair values of the underlying patents and equipment equaled or exceeded their carrying values. We evaluated the corporate asset group, which contains our corporate headquarters office building and land in Warrenville, Illinois, using the residual method and management determined that there was not adequate gross cash flows to support the carrying value. After obtaining an appraisal from a third-party appraiser, management determined that the carrying value of the office building and land exceeded the fair value and recorded an impairment charge of $2,965 for the year ended December 31, 2017.

Impairment of Long-Lived Assets and Amortizable Intangible Assets

Long-lived assets, including property, plant and equipment (PP&E) and intangible assets, are reviewed for impairment when events and circumstances indicate that the carrying amount of the assets (or asset group) may not be recoverable. If impairment indicators exist, we perform a more detailed analysis and an impairment loss is recognized when estimated future undiscounted cash flows expected to result from the use of the asset (or asset group) and its eventual disposition are less than the carrying amount. This process of analyzing impairment involves examining the operating condition of individual assets (or asset group) and estimating a fair value based upon current condition, relevant market factors and remaining estimated operational life compared to the asset's remaining depreciable life. Quoted market prices and other valuation techniques are used to determine expected cash flows. Due to the existence of impairment indicators as more fully described in Note 1 to our consolidated financial statements, we performed a more detailed analysis of potential long-lived and intangible asset impairment in the APC technology asset group during the fourth quarter of 2017 using the aforementioned undiscounted cash flows analysis.

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In the fourth quarter of 2016, the Company performed an impairment test of the carrying value of our intangible assets to determine whether any impairment existed. The Company determined that the sum of the expected undiscounted cash flows attributable to certain intangible assets was less than its carrying value and that an impairment write-down was required. The impairment loss primarily related to the developed technology, customer relationships and trademarks acquired in the 2014 acquisition of PECO and FGC. The Company calculated the estimated fair value of the intangible asset by summing the present value of the expected cash flows over its life. The impairment was calculated by deducting the present value of the expected cash flows from the carrying value. This assessment resulted in an impairment charge of $2,074, which was included in “Goodwill and intangible assets impairment” line in the accompanying Consolidated Statements of Operations for the year ended December 31, 2016.
In the fourth quarter of 2015, the Company performed an impairment test of the carrying value of our intangible assets to determine whether any impairment existed. The Company determined that the sum of the expected undiscounted cash flows attributable to certain intangible assets was less than its carrying value and that an impairment write-down was required. The impairment loss primarily related to the customer lists acquired in the 2009 acquisition of Advanced Combustion Technology and the 2014 acquisition of PECO. The Company calculated the estimated fair value of the intangible asset by summing the present value of the expected cash flows over its life. The impairment was calculated by deducting the present value of the expected cash flows from the carrying value. This assessment resulted in an impairment write-down of $1,425, which was included in “Goodwill and intangible assets impairment” line in the accompanying Consolidated Statements of Operations for the year ended December 31, 2015.
A significant portion of our property and equipment is comprised of assets deployed at customer locations relating to our FUEL CHEM technology asset group, and due to the shorter-term duration over which this equipment is depreciated, the likelihood of impairment is mitigated. The discontinuation of a FUEL CHEM program at a customer site would most likely result in the re-deployment of all or most of the affected assets to another customer location rather than an impairment.

Valuation Allowance for Deferred Income Taxes

Deferred tax assets represent deductible temporary differences and net operating loss and tax credit carryforwards. A valuation allowance is recognized if it is more likely than not that some portion of the deferred tax asset will not be realized. At the end of each reporting period, management reviews the realizability of the deferred tax assets. As part of this review, we consider if there are taxable temporary differences that could generate taxable income in the future, if there is the ability to carry back the net operating losses or credits, if there is a projection of future taxable income, and if there are any tax planning strategies that can be readily implemented.

Stock-Based Compensation

We recognize compensation expense for employee equity awards ratably over the requisite service period of the award, adjusted for estimated forfeitures.

We utilize the Black-Scholes option-pricing model to estimate the fair value of stock option awards. Determining the fair value of stock options using the Black-Scholes model requires judgment, including estimates for (1) risk-free interest rate - an estimate based on the yield of zero-coupon treasury securities with a maturity equal to the expected life of the option; (2) expected volatility - an estimate based on the historical volatility of our Common Shares for a period equal to the expected life of the option; and (3) expected life of the option - an estimate based on historical experience including the effect of employee terminations.

In addition, we utilize a Monte Carlo valuation pricing model to determine the fair value of certain restricted stock units (RSUs) that contain market conditions. Determining the fair value of these RSUs requires judgment and involves simulating potential future stock prices based on estimates for the risk-free interest rate, stock volatility, and correlations between our stock price and the stock prices of a peer group of companies. If any of these assumptions

differ significantly from actual results, stock-based compensation expense could be impacted.

Recently Adopted Accounting Standards

In March 2016, the FASB issued ASU 2016-09, Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting. The amendments in this Update simplify the income tax effects, minimum statutory tax withholding requirements and impact of forfeitures related to how share-based payments are accounted for and presented in the financial statements. ASU 2016-09 is effective for the Company beginning on January 1, 2017. The adoption of ASU 2016-09 did not have a material effect on our earnings, cash flows, or financial position. See Note 8, Stock-Based Compensation, for further discussion.

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In July 2015, the FASB issued ASU 2015-11, Inventory (Topic 330): Simplifying the Measurement of Inventory. This new accounting guidance more clearly articulates the requirements for the measurement and disclosure of inventory. Topic 330, Inventory, currently requires an entity to measure inventory at the lower of cost or market. Market could be replacement cost, net realizable value, or net realizable value less an approximately normal profit margin. This new accounting guidance requires the measurement of inventory at lower of cost and net realizable value. The adoption of ASU 2015-11 is effective for the Company beginning on January 1, 2017 and the adoption did not have a material impact on the Company’s consolidated financial statements.

Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued ASU 2014-09 "Revenue from Contracts with Customers" (Topic 606). These changes created a comprehensive framework for all entities in all industries to apply in the determination of when to recognize revenue, and, therefore, supersede virtually all existing revenue recognition requirements and guidance. This framework is expected to result in less complex guidance in application while providing a consistent and comparable methodology for revenue recognition. The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this principle, an entity should apply the following steps: (i) identify the contract(s) with a customer, (ii) identify the performance obligations in the contract(s), (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations in the contract(s), and (v) recognize revenue when, or as, the entity satisfies a performance obligation. The new standard also requires additional financial statement disclosures that will enable users to understand the nature, amount, timing and uncertainty of revenue and cash flows relating to customer contracts. In August 2015, the FASB approved a one-year deferral to January 1, 2018. The standard may be applied retrospectively to each prior period presented or retrospectively with the cumulative effect recognized as of the date of adoption. The Company has completed a detailed review of the terms and provisions of its customer contracts in light of these changes. The project team is in the process of finalizing the evaluation of these contracts under the new guidance, as well as assessing the need for any potential changes to the Company’s accounting policies and internal control structure. That said, the Company recognizes revenue when title, ownership, and risk of loss pass to the customer, all of which occurs utilizing a percentage of completion (cost-to-cost input), or shipment or delivery of the product based on the applicable shipping terms. Fuel Tech’s sales of its products to customers represent single performance obligations, which are not expected to be impacted by these changes. As a result, management does not expect the adoption of these changes to have a material impact on the Consolidated Financial Statements. The Company adopted the standard on January 1, 2018 using the modified retrospective method and the cumulative impact, which the Company expects will be immaterial to the Consolidated Financial Statements, will be recognized in beginning retained earnings.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842). The amendments in this Update increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. ASU 2016-02 will be effective for the Company beginning on January 1, 2019. The Company is in the initial stages of evaluating the impact of the new standard on the accounting policies, processes, and system requirements. While the Company continues to assess the potential impacts of the new standard and anticipate this standard could have a material impact on the consolidated financial statements, the Company does not know or cannot reasonably estimate quantitative information related to the impact of the new standard on the financial statements at this time.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash (a consensus of the FASB Emerging Issues Task Force). The amendments in this Update require that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Accordingly, restricted cash will be included with cash and cash

equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the Consolidated Statement of Cash Flows. ASU 2016-18 will be effective for the Company beginning on January 1, 2018 and will be applied using a retrospective approach. Other than this change in presentation within the Consolidated Statement of Cash Flows, ASU 2016-18 will not have an impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU 2017-04, Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The amendments in this Update simplify how an entity is required to test goodwill for impairment by eliminating Step 2 from the goodwill impairment test. Step 2 measures a goodwill impairment loss by comparing the implied fair value of a reporting unit’s goodwill with the carrying amount of that goodwill. ASU 2017-04 will be effective for the Company beginning on January 1, 2020. The Company is in the initial stages of evaluating the impact of the new standard on the accounting policies, processes, and system requirements. While the Company continues to assess the potential impacts of the new standard and anticipate this standard could have a material impact on the consolidated financial statements, the Company does not know or cannot reasonably estimate quantitative information related to the impact of the new standard on the financial statements at this time.

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2017 versus 2016

Revenues for the years ended December 31, 2017 and 2016 were $45,166 and $55,161, respectively. The year-over-year decrease of $9,995, or 18%, was driven by decreased revenue in both APC and FUEL CHEM technology segments in both our United States (U.S.) and foreign operations. Our U.S. revenues decreased by $13,035 or 31% from $42,545 to $29,510, and our international revenues increased by $3,040 or 24% from $12,616 to $15,656.

Revenues for the APC technology segment were $27,808 for the year ended December 31, 2017, a decrease of $6,244, or 18%, versus fiscal 2016. First, the U.S. regulatory environment, while remaining favorable for our prospects, has not spurred capital investment in our products by electric power producers. Second, while general economic conditions in the U.S. have improved, energy demand for coal fired power plants has declined as utilities have switched to lower cost natural gas sources. At the same time, these sources have generally allowed utilities to meet their regulatory objectives with existing emissions investments. Sales in foreign locations have not been robust enough to offset reduced demand in the U.S. While we expect to see improved order flow in our U.S. APC segment in 2018, any future orders will be dependent on our customers' capital investment decisions to install emissions control technologies in order to meet state or federal regulations. We continue to actively bid projects in our foreign markets during 2018 and will continue to look for growth opportunities within our chosen markets. Backlog for the years ended December 31, 2017 and 2016 was $22.1 million and $8.0 million, respectively.

Revenues for the FUEL CHEM technology segment for the year ended December 31, 2017 were $17,358, a decrease of $3,751, or 18% versus fiscal 2016. This decrease is principally associated with reduced product demand from some of our largest Fuel Chem customers. These customers' decision to reduce spending was based on a number of factors including cost of coal fire powered generation, energy demand and overall economic conditions affecting the plant. We remain focused on attracting new customers in our FUEL CHEM business, for both coal and non-coal applications, but our ability to attract new coal customers continues to be affected by the soft electric demand market and fuel switching as a result of low natural gas prices.

Consolidated cost of sales for the years ended December 31, 2017 and 2016 were $27,144 and $36,367, respectively. Consolidated gross margin percentages for the years ended December 31, 2017 and 2016 were 40% and 34%, respectively. The gross margins for the APC technology segment increased to 34% in 2017 from 25% in 2016. Gross margin for the APC technology segment in 2016 included charges totaling $0.8 million consisting of a subcontractor dispute of $0.6 million and a non-cash excess and obsolete inventory reserve of $0.2 million; exclusive of these charges, gross margin would have been $9.5 million, or 28%. The overall increase in gross margin in the APC technology segment from 2016 to 2017 is due to product and technology mix. Gross margin percentage for the FUEL CHEM technology segment increased slightly in 2017 to 50% from 48% in 2016. Gross margin for the FUEL CHEM technology segment in 2016 included the impact of the above-referenced non-cash excess and obsolete inventory reserve of $0.6 million; excluding this impact, gross margin would have been $10.7 million or 51%.

During the second quarter of 2017, we experienced a decrease in our stock price that caused our market capitalization to fall below the equity value on our consolidated balance sheet, which resulted in an indicator of impairment. This, along with an overall slowdown in APC technology and corresponding downward adjustments to our financial forecasts, was considered during a detailed evaluation of the fair value of our reporting units. As a result of these triggering events, Fuel Tech performed a long-lived asset impairment analysis for each of the reporting units as of April 1, 2017. We evaluated the corporate asset group, which contains our corporate headquarters office building and land in Warrenville, Illinois, using the residual method and management determined that there was not adequate gross cash flows to support the carrying value. After obtaining an appraisal from a third-party appraiser, management determined that the carrying value of the office building and land exceeded the fair value and recorded an impairment charge of $2,965 for the year ended December 31, 2017.

Selling, general and administrative (SG&A) expenses for the years ended December 31, 2017 and 2016 were $20,933 and $25,564, respectively. The decrease of $4,631 or 18%, is primarily attributed to the following:

- A decrease in employee related costs, totaling $2,060, including an overall reduction in travel and entertainment costs of $437
- A decrease in stock compensation expense of $602
- A decrease in depreciation and amortization of $436
- A decrease in professional fees and consulting services of $452
- A decrease in office and administrative costs relating to our foreign subsidiaries of $377
- A decrease in other administrative costs of $730

Restructuring costs were $119 and $1,428 in connection with the workforce reduction for the years ended December 31, 2017 and 2016. See Note 15, Restructuring Activities, for further discussion.

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Research and development ("R&D") expenses were $1,070 and $1,752 for the years ended December 31, 2017 and 2016, respectively. The decrease in research and development expenses for the year ended December 31, 2017 in comparison to the same period prior year amounts was related to organizational workforce actions taken in both 2017 and 2016. The remaining expenditures in our research and development expenses were focused on new product development for our APC and Fuel Chem businesses. We plan to continue focusing on increased research and development efforts in the pursuit of commercial applications for technologies outside of our traditional markets, and in the development and analysis of new technologies that could represent incremental market opportunities.

Interest income for the year ended December 31, 2017 decreased by $15 to $10 versus $25 in 2016. Interest expense was $0 in both 2017 and 2016. Finally, the decrease in net other expenses to $28 from $925 in the prior year is due primarily to the impact of foreign exchange rates as it relates to settlement of balances denominated in foreign currencies, and certain other bank fees related to Letter of Credits.

For the year ended December 31, 2017, we recorded an income tax benefit of $46 on pre-tax loss of $7,115. Our effective tax rates were 0.4% and 12.9% for the years ended December 31, 2017 and 2016, respectively. The effective tax rate for the year-ended December 31, 2017 differed from the federal statutory rate of 34% as a result of net operating losses generated in the United States, China, and Italy, which were offset by establishment of full valuation allowances. For the year ended December 31, 2016, we recorded an income tax expense of $1,664 on pre-tax loss of $12,924. Our income tax expense of 1,664 in 2016 resulted from the establishment of a full valuation allowance for the China deferred tax assets.

On December 22, 2017, the United States ("U.S.") enacted significant changes to the U.S. tax law following the passage and signing of H.R.1, "An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018" (the "Tax Act") (previously known as "The Tax Cuts and Jobs Act"). Information regarding the impact on the Company is included in Note 4. Income Taxes to the consolidated financial statements included herein.

2016 versus 2015

Revenues for the years ended December 31, 2016 and 2015 were $55,161 and $73,664, respectively. The year-over-year decrease of $18,503, or 25%, was driven by decreased revenue in both APC and FUEL CHEM technology segments in both our United States (U.S.) and foreign operations. Our U.S. revenues decreased by $8,940 or 17% from $51,485 to $42,545, and our international revenues declined by $9,563 or 43% from $22,179 to $12,616.

Revenues for the APC technology segment were $34,052 for the year ended December 31, 2016, a decrease of $9,433, or 22%, versus fiscal 2015. Revenues in our APC technology segment, which had been growing into 2013 largely through international sales, were adversely affected by a number of factors in 2016. First, the U.S. regulatory environment, while remaining favorable for our prospects, has not spurred capital investment in our products by electric power producers. Second, while general economic conditions in the U.S. have improved, energy demand for coal fired power plants has declined as utilities have switched to lower cost natural gas sources. At the same time, these sources have generally allowed utilities to meet their regulatory objectives with existing emissions investments. Sales in foreign locations have not been robust enough to offset reduced demand in the U.S. While we expect to see improved order flow in our U.S. APC segment in 2017, any future orders will be dependent on our customers' capital investment decisions to install emissions control technologies in order to meet state or federal regulations. We continue to actively bid projects in our foreign markets during 2017 and will continue to look for growth opportunities within our chosen markets. Backlog for the years ended December 31, 2016 and 2015 was $8.0 million and $22.2 million, respectively.

Revenues for the FUEL CHEM technology segment for the year ended December 31, 2016 were $21,109, a decrease of $9,070, or 30% versus fiscal 2015. This decrease is principally associated with reduced product demand from some of our largest Fuel Chem customers. These customers' decision to reduce spending was based on a number of factors including cost of coal fire powered generation, energy demand and overall economic conditions affecting the plant. We remain focused on attracting new customers in our FUEL CHEM business, for both coal and non-coal applications, but our ability to attract new coal customers continues to be affected by the soft electric demand market and fuel switching as a result of low natural gas prices.

Consolidated cost of sales for the years ended December 31, 2016 and 2015 were $36,367 and $45,107, respectively. Consolidated gross margin percentage for the years ended December 31, 2016 and 2015 were 34% and 39%, respectively. The gross margins for the APC technology segment decreased to 25% in 2016 from 30% in 2015. Gross margin for the APC technology segment included charges totaling $0.8 million consisting of a subcontractor dispute of $0.6 million and a non-cash excess and obsolete inventory reserve of $0.2 million; exclusive of these charges, gross margin would have been $9.5 million, or 28%. Gross margin percentage for the FUEL CHEM technology segment decreased slightly in 2016 to 48% from 52% in 2015. Gross margin for the FUEL CHEM technology segment included the impact of the above-referenced non-cash excess and obsolete inventory reserve of $0.6 million; excluding this impact, gross margin would have been $10.7 million or 51%.

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During 2016 we recognized an impairment charge of $2.1 million for finite-lived APC segment intangible assets. All of the impairment charge recognized in 2016 related to the acquisition of PECO and FGC which was completed on April 30, 2014.

Selling, general and administrative (SG&A) expenses for the years ended December 31, 2016 and 2015 were $25,564 and $31,116, respectively. The decrease of $5,333 or 17%, is primarily attributed to the following:

- A decrease in employee related costs, totaling $3,506
- An increase in stock compensation expense of $208
- A decrease in depreciation and amortization of $194
- A decrease in professional fees and consulting services of $917
- A decrease in office and administrative costs relating to our foreign subsidiaries of $140
- A decrease in other administrative costs of $784

Restructuring costs were $1,428 and $219 in connection with the workforce reduction for the years ended December 31, 2016 and 2015. See Note 15, Restructuring Activities, for further discussion.

Research and development (“R&D”) expenses were $1,752 and $1,447 for the years ended December 31, 2016 and 2015, respectively. We plan to continue focusing on increased R&D efforts in the pursuit of commercial applications for our technologies outside of our traditional markets, and in the development and analysis of new technologies that could represent incremental market opportunities.

Interest income for the year ended December 31, 2016 increased by $4 to $25 versus $21 in 2015. Interest expense of $0 was recorded in 2016, compared to $27 in the prior year. Finally, the increase in net other expenses to $925 from $360 in the prior year is due primarily to the impact of foreign exchange rates as it relates to settlement of balances denominated in foreign currencies, and certain other bank fees related to Letter of Credits.

For the year ended December 31, 2016, we recorded an income tax expense of $1,664 on pre-tax loss of $12,924. Our effective tax rates were 12.9% and 43.6% for the years ended December 31, 2016 and 2015, respectively. The effective tax rate for the year-ended December 31, 2016 differed from the federal statutory rate of 34% as a result of establishing a full valuation allowance on our China deferred tax assets and net operating losses generated in the United States, which were offset by establishment of full valuation allowance. For the year ended December 31, 2015, we recorded an income tax expense of $3,757 on pre-tax loss of $8,623. Our income tax expense of $3,757 in 2015 resulted from the establishment of a full valuation allowance for the United States deferred tax assets and income from our Italian subsidiary for which we reversed a portion of our deferred income tax valuation allowances as a result of the entity’s previously recorded net operating losses.

Liquidity and Sources of Capital

At December 31, 2017, we had cash and cash equivalents of $8,366 (excluding restricted cash of $6,020) and working capital of $18,025 versus cash and cash equivalents of $11,826 (excluding restricted cash of $6,020) and working capital of $26,585 at December 31, 2016.

Operating activities used $3,568 of cash for the year ended December 31, 2017, primarily due to the add back of non-cash items from our net loss from continuing operations of $7,069 including stock compensation expense of $1,389, depreciation and amortization of 1,503, building impairment charge of $2,965, excess and obsolete inventory reserve of $228, and a loss on sale of equipment of $304, as well as a decrease in our accounts receivable balance of

$113, an increase in our inventory balance of $134, and an increase in prepaid expenses and other current and non-current assets of $1,084, and an decrease in our accrued liabilities and other non-current liabilities of $2,439. Partially offsetting these items was subtraction from our net loss related to an increase in our accounts payable balance of $2,500. Cash used by operating activities also included cash used of $1,868 associated with the activity of the Fuel Conversion discontinued operations.

Operating activities used $2,738 of cash for the year ended December 31, 2016, primarily due to the add back of non-cash items from our net loss of $17,388 including stock compensation expense of $1,991, depreciation and amortization of 3,500, a decrease in deferred income taxes of $1,196, intangibles assets impairment charge of $2,074, excess and obsolete inventory reserve of $825, a reduction in bad debt expense of $111, and a loss on sale of equipment of $60, as well as a decrease in our accounts receivable balance of $3,522, a decrease in inventory of $446, and a decrease in prepaid expenses and other current and non-current assets of $2,893, and an increase in our accrued liabilities and other non-current liabilities of $699. Partially offsetting these items was subtraction of a non-cash item from our net loss related to a decrease in our accounts payable balance of $2,445.

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Investing activities used cash of $490 and $938 for the years ended December 31, 2017 and 2016, respectively. Investment activities for the year ended December 31, 2017 consisted of purchases of equipment, patents, and other intangibles of $492 and proceeds from sale of equipment of $2. Investment activities for the year ended December 31, 2016 consisted of purchases of equipment, patents, and other intangibles of $940 and proceeds from sale of equipment of $2.

Financing activities used $258 of cash for the year ended December 31, 2017 as a result of $258 in cash used for the acquisition of common shares held in treasury that were withheld for taxes due by employees upon lapsing of restricted stock units. Financing activities used $6,192 of cash for the year ended December 31, 2016 as a result of $6,020 increase in restricted cash, and $172 in cash used for the acquisition of common shares held in treasury that were withheld for taxes due by employees upon lapsing of restricted stock units.

On June 30, 2015, Fuel Tech amended its existing revolving credit facility (the Facility) with JPMorgan Chase Bank, N.A. (JPM Chase) to extend the maturity date through June 30, 2017. The total availability under the facility was $15,000 and contained a provision to increase the facility up to a total principal amount of $25,000 upon approval from JPM Chase. The Facility was unsecured, bears interest at a rate of LIBOR plus 300 basis points, and has the Company’s Italian subsidiary, Fuel Tech S.r.l., as a guarantor. Fuel Tech can use this Facility for cash advances and standby letters of credit. As of December 31, 2016 and December 31, 2015, there were no outstanding borrowings on the credit facility.

The Facility contained several debt covenants with which the Company must comply on a quarterly or annual basis. The Facility required a minimum trailing-twelve month EBITDA of $500 for the quarters ending March 31, 2016 and June 30, 2016; Beginning with the fiscal quarter ended September 30, 2016, the Facility required a minimum EBITDA for the trailing twelve-month period then ended of not less than $1,000. EBITDA includes after tax earnings with add backs for interest expense, income taxes, depreciation and amortization, stock-based compensation expense, and other non-cash items. This covenant was waived by our bank through the period ending December 31, 2015. In addition, the Facility required a minimum working capital requirement of $35,000, starting as of December 31, 2015. Finally, the Facility had an annual capital expenditure limit of $5,000.

On May 9, 2016, the Company amended its existing U.S. Domestic credit facility with JPM Chase such that the financial covenants as set forth in the credit agreement would not be measured for the period ending as of March 31, 2016, and were removed in their entirety from the Facility. The credit availability under the Facility has been reduced from $15,000 to $7,000 with this amendment, and further, JPM Chase's then current Revolving Commitment under the Facility is now secured by cash held by the Company in a separate restricted use designated JPM Chase deposit account. The amount of credit available to the Company under the Facility was $7,000 from the date of the effective date of the amended facility through May 31, 2016, at which time the credit available to the Company under the Facility was reduced to $6,000 from June 1, 2016 through July 31, 2016, at which time the credit available to the Company under the Facility was reduced to $5,000 and will remain as such until the Maturity Date of the Facility on June 30, 2017.

On June 16, 2017, the Company amended its existing U.S. Domestic credit facility with JPM Chase to extend the maturity date to June 28, 2019. There are no financial covenants set forth in this amendment to the Facility. The credit availability under the Facility remains at $5,000 with this amendment, and further, JPM Chase's current Revolving Commitment under the Facility remains secured by cash held by the Company in a separate restricted use designated JPM Chase deposit account. The amount of credit available to the Company under the Facility is $5,000 and will remain as such until the Maturity Date of the Facility on June 28, 2019. The Company intends to renew the U.S. Domestic credit facility at its maturity. During the entire period of the Facility the Company must maintain sufficient cash balances in a segregated deposit account equal to the amount of the Facility and has fully pledged such cash as collateral to the bank to support the credit available to the Company under the Facility. As of December 31, 2017 and

2016, there were no outstanding borrowings on the credit facility.

On January 10, 2018, the Company amended its existing U.S. Domestic credit facility with JPM Chase to increase the credit available under the Facility by $500 to $5,500 from the effective date of the amendment to August 31, 2018. After August 31, 2018, the amount of credit available under the facility will be reduced to $5,000 through the maturity date of June 28, 2019. There were no other modifications to the terms of the Facility from the amendment of the facility on June 16, 2017.

At December 31, 2017 and 2016, we had outstanding standby letters of credit and bank guarantees totaling approximately $3,004 and $3,292, respectively, on our domestic credit facility in connection with contracts in process. We are committed to reimbursing the issuing bank for any payments made by the bank under these instruments. At December 31, 2017 and 2016, there were no cash borrowings under the domestic revolving credit facility and approximately $1,996 and $1,708, respectively, was available for future borrowings. We pay a commitment fee of 0.25% per year on the unused portion of the revolving credit facility.

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On June 16, 2017, Beijing Fuel Tech Environmental Technologies Company, Ltd. (Beijing Fuel Tech), a wholly-owned subsidiary of Fuel Tech, entered into a new revolving credit facility (the China Facility) agreement with JPM Chase for RMB 6.5 million (approximately $999), which expires on June 29, 2018. The current facility for Beijing Fuel Tech is also secured by cash held by the Company of $1,020 in a separate restricted use designated JPM Chase deposit account. The Company intends to renew the China Facility at its maturity. This new credit facility replaced the previous RMB 6.5 million facility that expired on June 23, 2017. The facility is unsecured, bears interest at a rate of 125% of the People's Bank of China (PBOC) Base Rate, and is guaranteed by Fuel Tech. Beijing Fuel Tech can use this facility for cash advances and bank guarantees. As of December 31, 2017 and 2016, Beijing Fuel Tech had no cash borrowings under the China Facility.

At December 31, 2017 and 2016, we had outstanding standby letters of credit and bank guarantees totaling approximately $246 and $22, respectively, on its Beijing Fuel Tech revolving credit facility in connection with contracts in process. At December 31, 2017 and 2016, approximately $753 and $914 was available for future borrowings.

In the event of default on either the domestic facility or the China facility, the cross default feature in each allows the lending bank to accelerate the payments of any amounts outstanding and may, under certain circumstances, allow the bank to cancel the facility. If we were unable to obtain a waiver for a breach of covenant and the bank accelerated the payment of any outstanding amounts, such acceleration may cause our cash position to deteriorate or, if cash on hand were insufficient to satisfy the payment due, may require us to obtain alternate financing to satisfy the accelerated payment.

We continue to monitor our liquidity needs and in response to our continued losses have taken measures to reduce expenses and restructure operations which we feel are necessary to ensure we maintain sufficient working capital and liquidity to operate the business and invest in our future.

For the year ended December 31, 2017, we have sustained losses before discontinued operations totaling $7,069. Our cash used in continuing operations for this same period totaled $1,700. We have taken measures to reduce our expense infrastructure, and over the past three years have eliminated approximately $19 million in aggregate expense through headcount and other operating expense cutbacks.

Our cash balance as of December 31, 2017 totaled $14.4 million (inclusive of our restricted cash balance), and our working capital totaled $18.0 million. We do not have any outstanding debt obligations other than our letters of credit, and our current credit agreement does not have any financial covenants as we have moved to a cash collateralized line of credit with our lender.

We have evaluated our ongoing business needs, and considered the cash requirements of our base business of Air Pollution Control and Fuel Chem businesses. This evaluation included consideration of the following: a) customer and revenue trends in our APC and Fuel Chem business segments, b) current operating structure and expenditure levels, c) contingent payouts as described in the notes to our financial statements, and d) support for our research and development initiatives.

We currently have a $5 million domestic U.S. credit facility which we use to issue letters of credit to our customers, which is a fully cash collateralized line of credit requiring us to deposit funds in a restricted cash account to support that credit line. We expect to continue operating under this arrangement for the foreseeable future. Our liquidity may be adversely affected to the extent we are required to collateralize further letters of credit by additional cash deposits.

Based on this analysis, management believes that currently we have sufficient cash and working capital to operate our base APC and Fuel Chem businesses.

Contractual Obligations and Commitments

In our normal course of business, we enter into agreements obligating us to make future payments. The contractual cash obligations noted below are primarily related to supporting the ongoing operations of the business.

Payments due by period in thousands of dollars

Contractual Cash Obligations	Total	2018	2019-2020	2021-2022	Thereafter
Operating lease obligations	$1,664	$749	$ 713	$ 202	$ —
Total	$1,664	$749	$ 713	$ 202	$ —

Interest payments in the amount of $0, $0, and $27 were made during the years ended December 31, 2017, 2016 and 2015, respectively.

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In the normal course of our business, we use bank performance guarantees and letters of credit in support of construction contracts with customers as follows:

- in support of the warranty period defined in the contract; or
- in support of the system performance criteria that are defined in the contract.

In addition, we use bank performance guarantees with standby letters of credit and performance surety bonds as security for contract performance and other obligations as needed in the normal course of business. As of December 31, 2017, we had outstanding bank performance obligations that may or may not result in cash obligations as follows:

Commitment expiration by period in thousands of dollars

Commercial Commitments	Total	2018	2019	2020	Thereafter
Standby letters of credit and bank guarantees	$3,250	$2,970	$216	$ 64	$ —
Total	$3,250	$2,970	$216	$ 64	$ —

Off-Balance-Sheet Transactions

There were no other off-balance-sheet transactions other than the obligations and commitments listed above during the three-year period ended December 31, 2017.

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ITEM 7A - QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Our earnings and cash flow are subject to fluctuations due to changes in foreign currency exchange rates. We do not enter into foreign currency forward contracts or into foreign currency option contracts to manage this risk due to the nature of the transactions involved.

We are also exposed to changes in interest rates primarily due to our debt arrangement (refer to Note 10 to the consolidated financial statements). A hypothetical 100 basis point adverse move in interest rates along the entire interest rate yield curve would not have a materially adverse effect on interest expense during the upcoming year ended December 31, 2017.

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ITEM 8 - FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Fuel Tech, Inc.

Opinion on the Financial Statements
We have audited the accompanying consolidated balance sheets of Fuel Tech, Inc. (the Company) as of December 31, 2017 and 2016, the related consolidated statements of operations, comprehensive (loss) income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2017, and the related notes to the consolidated financial statements (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2017, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion
These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statements 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 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ RSM US LLP

We have served as the Company's auditor since 2010.

Chicago, Illinois
March 12, 2018

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Fuel Tech, Inc.
Consolidated Balance Sheets
(in thousands of dollars, except share and per-share data)

	December 31,	
	2017	2016
ASSETS		
Current assets:		
Cash and cash equivalents	$8,366	$11,826
Restricted cash	1,020	6,020
Marketable securities	6	9
Accounts receivable, net	19,690	18,790
Inventories, net	945	1,012
Prepaid expenses and other current assets	3,592	2,891
Income taxes receivable	129	87
Total current assets	33,748	40,635
Property and equipment, net	6,272	10,517
Goodwill	2,116	2,116
Other intangible assets, net	1,671	1,796
Restricted cash	5,000	—
Assets held for sale	485	2,058
Other assets	1,192	666
Total assets	$50,484	$57,788
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$9,065	$6,303
Accrued liabilities:		
Employee compensation	1,487	1,390
Income taxes payable	73	—
Other accrued liabilities	5,098	6,357
Total current liabilities	15,723	14,050
Other liabilities	420	346
Total liabilities	16,143	14,396
COMMITMENTS AND CONTINGENCIES (Note 9)		
Stockholders' equity:		
Common stock, $.01 par value, 40,000,000 shares authorized, 24,777,001 and 23,800,924 shares issued, and 24,132,910 and 23,446,035 outstanding in 2017 and 2016, respectively	248	238
Additional paid-in capital	138,760	137,380
Accumulated deficit	(102,503)	(91,520)
Accumulated other comprehensive loss	(768)	(1,568)
Nil coupon perpetual loan notes	76	76
Treasury stock, 644,091 and 354,889 shares in 2017 and 2016, respectively, at cost	(1,472)	(1,214)
Total stockholders' equity	34,341	43,392
Total liabilities and stockholders' equity	$50,484	$57,788

See notes to consolidated financial statements.

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Fuel Tech, Inc.
Consolidated Statements of Operations
(in thousands of dollars, except share and per-share data)

	For the years ended December 31,		
	2017	2016	2015
Revenues	$45,166	$55,161	$73,664
Costs and expenses:			
Cost of sales	27,144	36,367	45,107
Selling, general and administrative	20,933	25,564	30,897
Restructuring charge	119	1,428	219
Research and development	1,070	1,752	1,447
Building and intangible assets impairment	2,965	2,074	1,425
Total Costs and Expenses	52,231	67,185	79,095
Operating loss from continuing operations	(7,065)	(12,024)	(5,431)
Interest expense	—	—	(27)
Interest income	10	25	21
Other expense	(60)	(925)	(360)
Loss from continuing operations before income taxes	(7,115)	(12,924)	(5,797)
Income tax benefit (expense)	46	(1,664)	(3,757)
Net loss from continuing operations	(7,069)	(14,588)	(9,554)
Loss from discontinued operations (net of income tax benefit of $0 in 2017, 2016 and 2015)	(3,914)	(2,800)	(2,826)
Net loss	$(10,983)	$(17,388)	$(12,380)
Net loss per common share:			
Basic			
Continuing operations	$(0.30)	$(0.62)	$(0.42)
Discontinued operations	(0.16)	(0.12)	(0.12)
Basic net loss per common share	(0.46)	(0.74)	(0.54)
Diluted			
Continuing operations	(0.30)	(0.62)	$(0.42)
Discontinued operations	(0.16)	(0.12)	(0.12)
Diluted net loss per common share	(0.46)	(0.74)	(0.54)
Weighted-average number of common shares outstanding:			
Basic	23,872,000	23,365,000	23,101,000
Diluted	23,872,000	23,365,000	23,101,000

See notes to consolidated financial statements.

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Fuel Tech, Inc.
Consolidated Statements of Comprehensive (Loss) Income
(in thousands of dollars)

	For the years ended December 31,		
	2017	2016	2015
Net (loss)	$(10,983)	$(17,388)	$(12,380)
Other comprehensive (loss):			
Foreign currency translation adjustments	802	(6)	(1,097)
Unrealized (losses)/gains from marketable securities, net of tax	(2)	(6)	(11)
Total other comprehensive income (loss)	800	(12)	(1,108)
Comprehensive (loss)	$(10,183)	$(17,400)	$(13,488)

See notes to consolidated financial statements.

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Fuel Tech, Inc.
Consolidated Statements of Stockholders' Equity
(in thousands of dollars or shares, as appropriate)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Nil Coupon Perpetual Loan Notes	Treasury Stock	Total
	Shares	Amount						
Balance at December 31, 2014	22,860	$ 230	$134,985	$(61,752)	$ (448)	$ 76	$(790)	$72,301
Net loss				(12,380)				(12,380)
Foreign currency translation adjustments					(1,097)			(1,097)
Unrealized loss on marketable securities, net of tax					(11)			(11)
Stock compensation expense			1,809					1,809
Issuance of Deferred Director's shares	39	1	(71)					(70)
Tax effect of expired vested options			(908)			`		(908)
Common shares issued upon vesting of restricted stock units	352	3	(421)					(418)
Treasury shares withheld	(84)						(252)	(252)
Balance at December 31, 2015	23,167	$ 234	$135,394	$(74,132)	$ (1,556)	$ 76	$(1,042)	$58,974
Net loss				(17,388)				(17,388)
Foreign currency translation adjustments					(6)			(6)
Unrealized loss on marketable securities, net of tax					(6)			(6)
Stock compensation expense			1,991					1,991
Common shares issued upon vesting of restricted stock units	382	4	(5)					(1)
Treasury shares withheld	(103)						(172)	(172)
Balance at December 31, 2016	23,446	$ 238	$137,380	$(91,520)	$ (1,568)	$ 76	$(1,214)	$43,392
Net loss				(10,983)				(10,983)
Foreign currency translation adjustments					802			802
Unrealized loss on marketable securities, net of tax					(2)			(2)
Stock compensation expense			1,389					1,389
Common shares issued upon vesting of restricted stock units	976	10	(9)					1
Treasury shares withheld	(289)						(258)	(258)
Balance at December 31, 2017	24,133	$ 248	$138,760	$(102,503)	$ (768)	$ 76	$(1,472)	$34,341

See notes to consolidated financial statements.

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Fuel Tech, Inc.
Consolidated Statements of Cash Flows
(in thousands of dollars)

	For the years ended December 31,		
	2017	2016	2015
OPERATING ACTIVITIES			
Net loss	$(10,983)	$(17,388)	$(12,380)
Loss from discontinued operations	3,914	2,800	2,826
Net loss from continuing operations	(7,069)	(14,588)	(9,554)
Adjustments to reconcile net loss to net cash used in (provided by) operating activities:			
Depreciation	1,312	1,780	2,067
Amortization	215	1,118	1,536
Loss (gain) on disposal of equipment	304	60	(26)
Provision for doubtful accounts, net	—	(111)	—
Deferred income taxes	—	1,196	4,916
Stock compensation expense, net of forfeitures	1,389	1,991	1,809
Building and intangible assets impairment	2,965	2,074	1,425
Excess and obsolete inventory provision	228	825	—
Changes in operating assets and liabilities, net of acquisitions:			
Accounts receivable	113	3,522	7,880
Inventories	(134)	446	(560)
Prepaid expenses, other current assets and other noncurrent assets	(1,084)	2,893	(1,245)
Accounts payable	2,500	(2,445)	1,817
Accrued liabilities and other noncurrent liabilities	(2,439)	699	(913)
Net cash (used in) provided by operating activities - continuing operations	(1,700)	(540)	9,152
Net cash used in operating activities - discontinued operations	(1,868)	(2,198)	(2,224)
Net cash (used in) provided by operating activities	(3,568)	(2,738)	6,928
INVESTING ACTIVITIES			
Purchases of property, equipment and patents	(492)	(940)	(802)
Proceeds from the sale of equipment	2	2	26
Net cash used in investing activities	(490)	(938)	(776)
FINANCING ACTIVITIES			
Payments on short-term borrowings	—	—	(1,623)
Change in restricted cash	—	(6,020)	—
Treasury shares withheld	(258)	(172)	(252)
Net cash used in financing activities	(258)	(6,192)	(1,875)
Effect of exchange rate fluctuations on cash	856	10	(1,230)
Net (decrease) increase in cash and cash equivalents	(3,460)	(9,858)	3,047
Cash and cash equivalents at beginning of year	11,826	21,684	18,637
Cash and cash equivalents at end of year	$8,366	$11,826	$21,684
Supplemental Cash Flow Information:			
Cash paid for:			
Interest	$—	$—	$27

Income taxes paid	$31	$368	$—

See notes to consolidated financial statements.

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Notes to Consolidated Financial Statements
(in thousands of dollars, except share and per-share data)

1. ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES

Organization

Fuel Tech, Inc. and subsidiaries ("Fuel Tech", the "Company", "we", "us" or "our") provides advanced engineered solutions for the optimization of combustion systems in utility and industrial applications. Our primary focus is on the worldwide marketing and sale of NOx reduction technologies as well as our FUEL CHEM program. The Company's NOx reduction technologies reduce nitrogen oxide emissions from boilers, furnaces and other stationary combustion sources.

Our FUEL CHEM program is based on proprietary TIFI® Targeted In-Furnace™ Injection technology, in combination with advanced Computational Fluid Dynamics (CFD) and Chemical Kinetics Modeling (CKM) boiler modeling, in the unique application of specialty chemicals to improve the efficiency, reliability and environmental status of combustion units by controlling slagging, fouling, corrosion, opacity and other sulfur trioxide-related issues in the boiler.

Our business is materially dependent on the continued existence and enforcement of air quality regulations, particularly in the United States. We have expended significant resources in the research and development of new technologies in building our proprietary portfolio of air pollution control, fuel and boiler treatment chemicals, computer modeling and advanced visualization technologies.

International revenues were $15,656, $12,616, and $22,179 for the years ended December 31, 2017, 2016 and 2015, respectively. These amounts represented 35%, 23%, and 30% of Fuel Tech's total revenues for the respective periods of time. Foreign currency changes did not have a material impact on the calculation of these percentages. We have foreign offices in Beijing, China and Gallarate, Italy.

Basis of Presentation

The consolidated financial statements include the accounts of Fuel Tech and its wholly-owned subsidiaries. All intercompany transactions have been eliminated.

Reclassifications

Certain reclassifications to prior year amounts have been made in the consolidated financial statements to conform to the current period presentation. In the second quarter of 2017, the Company suspended all operations associated with the Fuel Conversion business segment. All amounts for the periods presented in the Consolidated Balance Sheets have been reclassified to Assets Held for Sale and all amounts in the Consolidated Statements of Operations have been reclassified to Discontinued Operations; Refer to footnote 2 for further detail.

Use of Estimates

The preparation of the financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. The Company uses estimates in accounting for, among other items, revenue recognition, allowance for doubtful accounts, income tax provisions, excess and obsolete inventory reserve, impairment of long-lived assets, and warranty expenses. Actual results could differ from those estimates.

Fair Value of Financial Instruments

The carrying values of cash and cash equivalents, accounts receivable, and accounts payable are reasonable estimates of their fair value due to their short-term nature. Our marketable securities are carried at fair value based on quoted market prices in an active market.

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Cash and Cash Equivalents

We include cash and investments having an original maturity of three months or less at the time of acquisition in cash and cash equivalents. We have never incurred realized or unrealized holdings gains or losses on securities classified as cash equivalents. Income resulting from short-term investments is recorded as interest income. At December 31, 2017, we had cash on hand of approximately $1,260 at our Beijing, China subsidiary that is subject to certain local regulations that may limit the immediate availability of these funds outside of China. Cash on hand at our Italy subsidiary totaled approximately $1,132 at December 31, 2017.

Restricted Cash

Restricted cash represents funds that are restricted to satisfy any amount borrowed against the Company's existing revolving credit facility (the Facility) with JPMorgan Chase Bank, N.A. The remaining balance of restricted cash totaling $6,020 will remain through the Maturity Date of the Facility. Refer to Note 10 Debt Financing for further information on the Facility.

Foreign Currency Risk Management

Our earnings and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. We do not enter into foreign currency forward contracts or into foreign currency option contracts to manage this risk due to the nature of the transactions involved.

Accounts Receivable

Accounts receivable consist of amounts due to us in the normal course of our business, are not collateralized, and normally do not bear interest. Accounts receivable includes unbilled receivables, representing costs and estimated earnings in excess of billings on uncompleted contracts under the percentage of completion method. At December 31, 2017 and 2016, unbilled receivables were approximately $7,894 and $6,755, respectively.

Allowance for Doubtful Accounts

The allowance for doubtful accounts is our management's best estimate of the amount of credit losses in accounts receivable. In order to control and monitor the credit risk associated with our customer base, we review the credit worthiness of customers on a recurring basis. Factors influencing the level of scrutiny include the level of business the customer has with Fuel Tech, the customer’s payment history, and the customer’s financial stability. Receivables are considered past due if payment is not received by the date agreed upon with the customer, which is normally 30 days. Representatives of our management team review all past due accounts on a weekly basis to assess collectability. At the end of each reporting period, the allowance for doubtful accounts balance is reviewed relative to management’s collectability assessment and is adjusted if deemed necessary through a corresponding charge or credit to bad debts expense, which is included in selling, general, and administrative expenses in the consolidated statements of operations. Bad debt write-offs are made when management believes it is probable a receivable will not be recovered. The table below sets forth the components of the Allowance for Doubtful Accounts for the years ended December 31.

Year	Balance at January 1	Provision charged to expense	Write-offs / Recoveries	Balance at December 31
2015	$ 1,922	$ —	$ (150)	$ 1,772
2016	$ 1,772	$ 172	$ (375)	$ 1,569
2017	$ 1,569	$ —	$ (24)	$ 1,545

Prepaid expenses and other current assets

Prepaid expenses and other current assets includes Chinese banker acceptances of $613 and $838 as of December 31, 2017 and 2016. These are short-term commitments of typically 30 to 60 days for future payments and can be redeemed at a discount or applied to future vendor payments.

Inventories

Inventories consist primarily of spare parts and are stated at the lower of cost or net realizable value using the first-in, first-out method. Usage is recorded in cost of sales in the period that parts were issued to a project or used to service equipment. Inventories are periodically evaluated to identify obsolete or otherwise impaired parts and are written off when management determines usage is not probable. The Company estimates the balance of excess and obsolete inventory by analyzing inventory by age using last used and original purchase date and existing sales pipeline for

which the inventory could be used. The table below sets forth the components of the Excess and Obsolete Inventory Reserve for the years ended December 31.

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Year	Balance at January 1	Provision charged to expense	Write-offs / Recoveries	Balance at December 31
2016	$ —	$ 825	$ —	$ 825
2017	$ 825	$ 228		$ 1,053

Foreign Currency Translation and Transactions

Assets and liabilities of consolidated foreign subsidiaries are translated into U.S. dollars at exchange rates in effect at year end. Revenues and expenses are translated at average exchange rates prevailing during the year. Gains or losses on foreign currency transactions and the related tax effects are reflected in net income. The resulting translation adjustments are included in stockholders' equity as part of accumulated other comprehensive income.

Accumulated Other Comprehensive (Loss)

The changes in accumulated other comprehensive (loss) by component were as follows:

	December 31, 2017	2016
Foreign currency translation		
Balance at beginning of period	$(1,574)	$(1,568)
Other comprehensive (loss):		
Foreign currency translation adjustments (1)	802	(6)
Balance at end of period	$(772)	$(1,574)
Available-for-sale marketable securities		
Balance at beginning of period	$6	$12
Other comprehensive (loss):		
Net unrealized holding (loss) (2)	(2)	(6)
Balance at end of period	$4	$6
Total accumulated other comprehensive (loss)	$(768)	$(1,568)

(1) In all periods presented, there were no tax impacts related to rate changes and no amounts were reclassified to earnings.

(2) In all periods presented, there were no realized holding gains or losses and therefore no amounts were reclassified to earnings.

Research and Development

Research and development costs are expensed as incurred. Research and development projects funded by customer contracts are reported as part of cost of goods sold. Internally funded research and development expenses are reported as operating expenses.

Product/System Warranty

We typically warrant our air pollution control products and systems against defects in design, materials and workmanship for one to two years. A provision for estimated future costs relating to warranty expense is recorded when the products/systems become commercially operational.

Goodwill

Goodwill is not amortized, but is reviewed annually or more frequently if indicators arise, for impairment. Our evaluation of goodwill impairment involves first assessing qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. We may bypass this qualitative assessment, or determine that based on our qualitative assessment considering the totality of events and circumstances including macroeconomic factors, industry and market considerations, current and projected financial performance, a sustained decrease in our share price, or other factors, that additional impairment analysis is necessary. This additional analysis involves comparing the current fair value of our reporting units to their carrying values. We use a discounted cash flow (DCF) model to determine the current fair value of our two reporting units. A number of significant assumptions and estimates are involved in the application of the DCF model to forecast operating cash flows,

including markets and market share, sales volumes and prices, costs to produce and working capital changes. Management considers

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historical experience and all available information at the time the fair values of its reporting units are estimated. However, actual fair values that could be realized in an actual transaction may differ from those used to evaluate the impairment of goodwill.

Goodwill is allocated to each of our reporting units, which is defined as an operating segment or one level below an operating segment, upon acquisition after considering the nature of the net assets giving rise to the goodwill and how each reporting unit would enjoy the benefits and synergies of the net assets acquired. Goodwill is also evaluated for impairment at the reporting unit level. We have two reporting units for goodwill evaluation purposes: the FUEL CHEM technology segment and the APC technology segment. There is no goodwill associated with our APC business technology segment.

The entire goodwill balance of $2,116 was allocated to the FUEL CHEM technology segment as of December 31, 2017 and 2016. The Company did not recognize a charge for goodwill impairment for the periods ended December 31, 2017, 2016 and 2015.

Other Intangible Assets

Management reviews other finite-lived intangible assets, which include customer lists and relationships, covenants not to compete, patent assets, trade names, and acquired technologies, for impairment when events or changes in circumstances indicate the carrying amount of an asset or asset group may not be recoverable. In the event that impairment indicators exist, a further analysis is performed and if the sum of the expected undiscounted future cash flows resulting from the use of the asset or asset group is less than the carrying amount of the asset or asset group, an impairment loss equal to the excess of the asset or asset group's carrying value over its fair value is recorded. Management considers historical experience and all available information at the time the estimates of future cash flows are made, however, the actual cash values that could be realized may differ from those that are estimated. In the fourth quarter of 2016, the Company performed an impairment test of the carrying value of our intangible assets to determine whether any impairment existed given the decline in our stock price and sustained operating losses in our APC segment. The Company determined that the sum of the expected undiscounted cash flows attributable to certain intangible assets was less than its carrying value and that an impairment charge was required. The impairment loss primarily related to the developed technology, customer relationships and trademarks acquired in the 2014 acquisition of PECO and FGC. The Company calculated the estimated fair value of the intangible asset by summing the present value of the expected cash flows over its life. The impairment was calculated by deducting the present value of the expected cash flows from the carrying value. This assessment resulted in an impairment charge of $2,074, which was included in “Intangible assets impairment” in the accompanying Consolidated Statements of Operations for the year ended December 31, 2016.

In the fourth quarter of 2015, the Company performed an impairment test of the carrying value of our intangible assets to determine whether any impairment existed. The Company determined that the sum of the expected undiscounted cash flows attributable to certain intangible assets was less than its carrying value and that an impairment write-down was required. The impairment loss primarily related to the customer lists acquired in the 2009 acquisition of Advanced Combustion Technology and the 2014 acquisition of PECO. The Company calculated the estimated fair value of the intangible asset by summing the present value of the expected cash flows over its life. The impairment was calculated by deducting the present value of the expected cash flows from the carrying value. This assessment resulted in an impairment write-down of $1,425, which was included in “Intangible assets impairment” in the accompanying Consolidated Statements of Operations for the year ended December 31, 2015.

Third-party costs related to the development of patents are included within other intangible assets on the consolidated balance sheets. As of December 31, 2017 and 2016, the net patent asset balance, excluding patents acquired in business acquisitions, was $1,611 and $1,656, respectively. The third-party costs capitalized as patent costs during the years ended December 31, 2017 and 2016 were $135 and $166, respectively. Third-party costs are comprised of legal fees that relate to the review and preparation of patent disclosures and filing fees incurred to present the patents to the required governing body.

Our intellectual property portfolio has been a significant building block for the Air Pollution Control and FUEL CHEM technology segments. The patents are essential to the generation of revenue for our businesses and are essential to protect us from competition in the markets in which we serve. These costs are being amortized on the

straight-line method over the period beginning with the patent issuance date and ending on the patent expiration date. Patent maintenance fees are charged to operations as incurred.

Amortization expense from continuing operations for intangible assets was $215, $1,118 and $1,536 for the years ended December 31, 2017, 2016 and 2015, respectively. The table below shows the amortization period and other intangible asset cost by intangible asset as of December 31, 2017 and 2016, and the accumulated amortization and net intangible asset value in total for all other intangible assets.

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Description of Other Intangibles	Amortization Period	2017 Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	2016 Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Customer relationships	11-15 years	$1,198	$ (1,138)	$ 60	$3,119	$ (2,979)	$ 140
Patent assets	1- 20 years	2,412	(801)	1,611	3,100	(1,444)	1,656
Total		$3,610	$ (1,939)	$ 1,671	$6,219	$ (4,423)	$ 1,796

The table below shows the estimated future amortization expense for intangible assets:

Year	Estimated Amortization Expense
2018	$ 198
2019	138
2020	138
2021	138
2022	138
Thereafter	921
Total	$ 1,671

Property and Equipment

Property and equipment is stated at historical cost. Provisions for depreciation are computed by the straight-line method, using estimated useful lives that range based on the nature of the asset. Leasehold improvements are depreciated over the shorter of the associated lease term or the estimated useful life of the asset. Depreciation expense from continuing operations was $1,312, $1,780, and $2,067 for the years ended December 31, 2017, 2016 and 2015, respectively. The table below shows the depreciable life and cost by asset class as of December 31, 2017 and 2016, and the accumulated depreciation and net book value in total for all classes of assets.

Description of Property and Equipment	Depreciable Life	2017	2016
Land		$1,050	$1,440
Building	39 years	3,950	4,535
Building and leasehold improvements	3-39 years	3,264	5,087
Field equipment	3-4 years	19,251	19,467
Computer equipment and software	2-3 years	3,124	2,973
Furniture and fixtures	3-10 years	1,539	1,521
Vehicles	5 years	32	36
Total cost		32,210	35,059
Less accumulated depreciation		(25,938)	(24,542)
Total net book value		$6,272	$10,517

Property and equipment is reviewed for impairment when events and circumstances indicate that the carrying amount of the assets (or asset group) may not be recoverable. If impairment indicators exists, we perform a more detailed analysis and an impairment loss is recognized when estimated future undiscounted cash flows expected to result from the use of the asset (or asset group) and its eventual disposition are less than the carrying amount. This process of analyzing impairment involves examining the operating condition of individual assets (or asset group) and estimating a fair value based upon current condition, relevant market factors and remaining estimated operational life compared to the asset’s remaining depreciable life. Quoted market prices and other valuation techniques are used to determine expected cash flows. A significant portion of our property and equipment is comprised of assets deployed at customer locations relating to our FUEL CHEM technology asset group, and due to the shorter-term duration over which this equipment is depreciated, the likelihood of impairment is mitigated. The discontinuation of a FUEL CHEM program at a customer site would most likely result in the re-deployment of all or most of the affected assets to another

customer location rather than an impairment.

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During the second quarter of 2017, we experienced a decrease in our stock price that caused our market capitalization to fall below the equity value on our consolidated balance sheet, which resulted in an indicator of impairment. This, along with an overall slowdown in APC technology and corresponding downward adjustments to our financial forecasts, was considered during a detailed evaluation of the fair value of our reporting units. As a result of these triggering events, Fuel Tech performed a long-lived asset impairment analysis for each of the reporting units as of April 1, 2017. Based on this evaluation, we determined that our APC segment failed the first step of our impairment analysis because the estimated gross cash flows and fair value of the reporting unit was less than its carrying value, thus requiring additional analysis of the segment. However, no impairment resulted as the fair values of the underlying patents and equipment equaled or exceeded their carrying values. We evaluated the corporate asset group, which contains our corporate headquarters office building and land in Warrenville, Illinois, using the residual method and management determined that there was not adequate gross cash flows to support the carrying value. After obtaining an appraisal from a third-party appraiser, management determined that the carrying value of the office building and land exceeded the fair value and recorded an impairment charge of $2,965 for the year ended December 31, 2017.

Revenue Recognition

Revenues from the sales of chemical products are recorded when title transfers, either at the point of shipment or at the point of destination, depending on the contract with the customer.

We utilize the percentage of completion method of accounting for equipment construction and license contracts that are sold within the Air Pollution Control technology segment. Under the percentage of completion method, revenues are recognized as work is performed based on the relationship between actual construction costs incurred and total estimated costs at completion. Construction costs include all direct costs such as materials, labor, subcontracting costs, and indirect costs allocable to the particular contract such as indirect labor, tools and equipment, and supplies. Revisions in completion estimates and contract values are made in the period in which the facts giving rise to the revisions become known and can influence the timing of when revenues are recognized under the percentage of completion method of accounting. Such revisions have historically not had a material effect on the amount of revenue recognized. Provisions are made for estimated losses on uncompleted contracts in the period in which such losses are determined. The completed contract method is used for certain contracts when reasonably dependable estimates of the percentage of completion cannot be made. When the completed contract method is used, revenue and costs are deferred until the contract is substantially complete, which usually occurs upon customer acceptance of the installed product.

Cost of Sales

Cost of sales includes all internal and external engineering costs, equipment and chemical charges, inbound and outbound freight expenses, internal and site transfer costs, installation charges, purchasing and receiving costs, inspection costs, warehousing costs, project personnel travel expenses and other direct and indirect expenses specifically identified as project- or product line-related, as appropriate (e.g., test equipment depreciation and certain insurance expenses). Certain depreciation and amortization expenses related to tangible and intangible assets, respectively, are allocated to cost of sales. We classify shipping and handling costs in cost of sales in the consolidated statements of operations.

Selling, General and Administrative Expenses

Selling, general and administrative expenses primarily include the following categories except where an allocation to the cost of sales line item is warranted due to the project- or product-line nature of a portion of the expense category: salaries and wages, employee benefits, non-project travel, insurance, legal, rent, accounting and auditing, recruiting, telephony, employee training, Board of Directors' fees, auto rental, office supplies, dues and subscriptions, utilities, real estate taxes, commissions and bonuses, marketing materials, postage and business taxes. Departments comprising the selling, general and administrative line item primarily include the functions of executive management, finance and accounting, investor relations, regulatory affairs, marketing, business development, information technology, human resources, sales, legal and general administration.

Income Taxes

The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, the provision for income taxes represents income taxes paid or payable (or received or

receivable) for the current year plus the change in deferred taxes during the year. Deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid, and result from differences between the financial and tax bases of our assets and liabilities and are adjusted for changes in tax rates and tax laws when enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management considers all potential sources of taxable income, including income available in carryback periods, future reversals of taxable temporary differences, projections of taxable income, and income from tax planning strategies, as well as all available positive and negative evidence. Positive evidence includes factors such as a history of profitable operations,

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projections of future profitability within the carryforward period, including from tax planning strategies, and our experience with similar operations. Negative evidence includes items such as cumulative losses, projections of future losses, or carryforward periods that are not long enough to allow for the utilization of a deferred tax asset based on existing projections of income. Deferred tax assets for which no valuation allowance is recorded may not be realized upon changes in facts and circumstances.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more likely than not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitation has expired or the appropriate taxing authority has completed their examination even though the statute of limitations remains open. Interest and penalties related to uncertain tax positions are recognized as part of the provision for income taxes and are accrued beginning in the period that such interest and penalties would be applicable under relevant tax law until such time that the related tax benefits are recognized.

Stock-Based Compensation

Our stock-based employee compensation plan, referred to as the Fuel Tech, Inc. 2014 Long-Term Incentive Plan (Incentive Plan), was adopted in May 2014 and allows for awards to be granted to participants in the form of non-qualified stock options, incentive stock options, stock appreciation rights, restricted stock, restricted stock units, performance awards, and bonuses or other forms of share-based or non-share-based awards or combinations thereof. Participants in the Incentive Plan may be our directors, officers, employees, consultants or advisors (except consultants or advisors in capital-raising transactions) as the directors determine are key to the success of our business. There are a maximum of 4,400,676 shares that may be issued or reserved for awards to participants under the Incentive Plan as of December 31, 2017. Based on the existing issued or reserved awards in Incentive Plan, there are 404,941 shares available to be used for future awards to participants in the Incentive Plan as of December 31, 2017.

Basic and Diluted Earnings per Common Share

Basic earnings per share excludes the antidilutive effects of stock options, restricted stock units (RSUs) and the nil coupon non-redeemable convertible unsecured loan notes (see Note 7). Diluted earnings per share includes the dilutive effect of the nil coupon non-redeemable convertible unsecured loan notes, RSUs, and unexercised in-the-money stock options, except in periods of net loss where the effect of these instruments is antidilutive. Out-of-the-money stock options are excluded from diluted earnings per share because they are anti-dilutive. At December 31, 2017, 2016 and 2015, we had outstanding equity awards of 2,210,000, 1,800,000 and 2,068,000, respectively, which were antidilutive for the purpose of inclusion in the diluted earnings per share calculation because the exercise prices of the options were greater than the average market price of our common stock. As of December 31, 2017 and 2016, respectively, we had an additional 168,000 and 184,000 equity awards that were antidilutive because of the net loss in the year then ended. These equity awards could potentially dilute basic EPS in future years.

The table below sets forth the weighted-average shares used at December 31 in calculating earnings (loss) per share:

	2017	2016	2015
Basic weighted-average shares	23,872,000	23,365,000	23,101,000
Conversion of unsecured loan notes	—	—	—
Unexercised options and unvested restricted stock units	—	—	—
Diluted weighted-average shares	23,872,000	23,365,000	23,101,000

Risk Concentrations

Financial instruments that potentially subject the Company to a significant concentration of credit risk consist primarily of cash and cash equivalents and accounts receivable. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. However, management believes the Company is not exposed to significant credit risk due to the financial position of its primary depository institution where a significant portion of its deposits are held.

For the year ended December 31, 2017, we had one customer which individually represented greater than 10% of revenues. The customer contributed primarily to our FUEL CHEM technology segment and represented 10% of consolidated revenues. We had no customers that accounted for greater than 10% of our current assets as of December 31, 2017.

For the year ended December 31, 2016, we had one customer which individually represented greater than 10% of revenues. This customer contributed primarily to our APC technology segment and represented 19% of consolidated revenues. We had no customers that accounted for greater than 10% of our current assets as of December 31, 2016.

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For the year ended December 31, 2015, we had one customer which individually represented greater than 10% of revenues. This customer contributed primarily to our FUEL CHEM technology segment and represented 12% of consolidated revenues. We had no customers that accounted for greater than 10% of our current assets as of December 31, 2015.

We control credit risk through requiring milestone payments on long-term contracts, performing ongoing credit evaluations of its customers, and in some cases obtaining security for payment through bank guarantees and letters of credit.

Treasury Stock

We use the cost method to account for its common stock repurchases. During the years ended December 31, 2017 and 2016, we withheld 289,202 and 103,097 shares of our Common Shares, valued at approximately $258 and $172, respectively, to settle personal tax withholding obligations that arose as a result of restricted stock units that vested. Refer to Note 6, “Treasury Stock,” for further discussion.

Recently Adopted Accounting Standards

In March 2016, the FASB issued ASU 2016-09, Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting. The amendments in this Update simplify the income tax effects, minimum statutory tax withholding requirements and impact of forfeitures related to how share-based payments are accounted for and presented in the financial statements. ASU 2016-09 is effective for the Company beginning on January 1, 2017. The adoption of ASU 2016-09 did not have a material effect on our earnings, cash flows, or financial position. See Note 8, Stock-Based Compensation, for further discussion.

In July 2015, the FASB issued ASU 2015-11, Inventory (Topic 330): Simplifying the Measurement of Inventory. This new accounting guidance more clearly articulates the requirements for the measurement and disclosure of inventory. Topic 330, Inventory, currently requires an entity to measure inventory at the lower of cost or market. Market could be replacement cost, net realizable value, or net realizable value less an approximately normal profit margin. This new accounting guidance requires the measurement of inventory at lower of cost and net realizable value. The adoption of ASU 2015-11 is effective for the Company beginning on January 1, 2017 and the adoption did not have a material impact on the Company’s consolidated financial statements.

Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued ASU 2014-09 "Revenue from Contracts with Customers" (Topic 606). These changes created a comprehensive framework for all entities in all industries to apply in the determination of when to recognize revenue, and, therefore, supersede virtually all existing revenue recognition requirements and guidance. This framework is expected to result in less complex guidance in application while providing a consistent and comparable methodology for revenue recognition. The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this principle, an entity should apply the following steps: (i) identify the contract(s) with a customer, (ii) identify the performance obligations in the contract(s), (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations in the contract(s), and (v) recognize revenue when, or as, the entity satisfies a performance obligation. The new standard also requires additional financial statement disclosures that will enable users to understand the nature, amount, timing and uncertainty of revenue and cash flows relating to customer contracts. In August 2015, the FASB approved a one-year deferral to January 1, 2018. The standard may be applied retrospectively to each prior period presented or retrospectively with the cumulative effect recognized as of the date of adoption. The Company has completed a detailed review of the terms and provisions of its customer contracts in light of these changes. The project team is in the process of finalizing the evaluation of these contracts under the new guidance, as well as assessing the need for any potential changes to the Company’s accounting policies and internal control structure. That said, the Company recognizes revenue when title, ownership, and risk of loss pass to the customer, all of which occurs utilizing a percentage of completion (cost-to-cost input), or shipment or delivery of the product based

on the applicable shipping terms. Fuel Tech's sales of its products to customers represent single performance obligations, which are not expected to be impacted by these changes. As a result, management does not expect the adoption of these changes to have a material impact on the Consolidated Financial Statements. The Company adopted the standard on January 1, 2018 using the modified retrospective method and the cumulative impact, which the Company expects will be immaterial to the Consolidated Financial Statements, will be recognized in beginning retained earnings.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842). The amendments in this Update increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. ASU 2016-02 will be effective for the Company beginning on January 1, 2019. The Company is in the initial stages of evaluating the impact of the new standard on the accounting policies, processes, and system

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requirements. While the Company continues to assess the potential impacts of the new standard and anticipate this standard could have a material impact on the consolidated financial statements, the Company does not know or cannot reasonably estimate quantitative information related to the impact of the new standard on the financial statements at this time.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash (a consensus of the FASB Emerging Issues Task Force). The amendments in this Update require that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Accordingly, restricted cash will be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the Consolidated Statement of Cash Flows. ASU 2016-18 will be effective for the Company beginning on January 1, 2018 and will be applied using a retrospective approach. Other than this change in presentation within the Consolidated Statement of Cash Flows, ASU 2016-18 will not have an impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU 2017-04, Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The amendments in this Update simplify how an entity is required to test goodwill for impairment by eliminating Step 2 from the goodwill impairment test. Step 2 measures a goodwill impairment loss by comparing the implied fair value of a reporting unit’s goodwill with the carrying amount of that goodwill. ASU 2017-04 will be effective for the Company beginning on January 1, 2020. The Company is in the initial stages of evaluating the impact of the new standard on the accounting policies, processes, and system requirements. While the Company continues to assess the potential impacts of the new standard and anticipate this standard could have a material impact on the consolidated financial statements, the Company does not know or cannot reasonably estimate quantitative information related to the impact of the new standard on the financial statements at this time.

2. DISCONTINUED OPERATIONS

During 2017, the Company has suspended all operations associated with the Fuel Conversion business segment. The components of the net assets of the Fuel Conversion discontinued operations as of December 31, 2017 are included in Assets held for sale on the Consolidated Balance Sheets totaling $485 which consists primarily of certain equipment. The components of the net assets of the Fuel Conversion discontinued operations as of December 31, 2016 are included in Assets held for sale on the Consolidated Balance Sheets totaling $2,058 which consisted of certain equipment of $402 and the Carbonite intangible asset of $1,656. The resulting amount in assets held for sale was determined using management's assumptions based on a plan of sale and we may not be able to realize as much value from the sale of the assets as we expect. In addition, accrued severance of $376 is included in the other accrued liabilities line of the Consolidated Balance Sheets as of December 31, 2017. The Fuel Conversion business segment had no other assets or liabilities associated with it.

The activity of the Fuel Conversion discontinued operations consisted of Research and Development, severance, an impairment charge and other costs for the years ended December 31, 2017, 2016, and 2015 of $3,914, $2,800 and $2,826, respectively. The loss from discontinued operations in the Consolidated Statement of Operations for the year ended December 31, 2017 includes the severance charges associated with suspension of the Fuel Conversion business segment of $581. The loss from discontinued operations in the Consolidated Statement of Operations for the year ended December 31, 2017 includes an impairment charge related to the Carbonite intangible asset of $1,354 as a result of not being able to reach an agreement with a third-party to acquire or license the Carbonite technology. Absent a third-party agreement, management determined there was not adequate gross cash flows to support the carrying value of the asset and recorded the impairment charge during the fourth quarter of 2017. The Fuel Conversion business segment had no revenues associated with it.

The Company expects to incur $581 of severance costs relating to the suspension of the Fuel Conversion business segment, of which $205 was paid in 2017, $311 will be paid in 2018 and $65 will be paid in 2019. The Company expects to incur storage fees and other disposal costs associated with certain property, plant and equipment and

contractual termination payments or other miscellaneous expenses but an estimated amount or range of amounts has not yet been determined.

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3. CONSTRUCTION CONTRACTS IN PROGRESS

The status of contracts in progress as of December 31, 2017 and 2016 is as follows:

	2017	2016
Costs incurred on uncompleted contracts	$101,600	$111,925
Estimated earnings	49,561	55,527
Earned revenue	151,161	167,452
Less billings to date	(145,670)	(162,427)
Total	$5,491	$5,025
Classified as follows:		
Costs and estimated earnings in excess of billings on uncompleted contracts	$7,894	$6,755
Billings in excess of costs and estimated earnings on uncompleted contracts	(2,403)	(1,730)
Total	$5,491	$5,025

Costs and estimated earnings in excess of billings on uncompleted contracts are included in accounts receivable on the consolidated balance sheet, while billings in excess of costs and estimated earnings on uncompleted contracts are included in other accrued liabilities on the consolidated balance sheet.

As of December 31, 2017 we had four construction contracts in progress that were identified as loss contracts and a provision for losses of $117 was recorded in other accrued liabilities on the consolidated balance sheet. As of December 31, 2016, we had 2 construction contracts in progress that was identified as a loss contract and a provision for losses of $41 was recorded in other accrued liabilities on the consolidated balance sheet.

4. INCOME TAXES

On December 22, 2017, the United States (“U.S.”) enacted significant changes to the U.S. tax law following the passage and signing of H.R.1, “An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018” (the “Tax Act”) (previously known as “The Tax Cuts and Jobs Act”). The Tax Act included significant changes to existing tax law, including a permanent reduction to the U.S. federal corporate income tax rate from 35% to 21%, a one-time repatriation tax on deferred foreign income (“Transition Tax”), deductions, credits and business-related exclusions.

On December 22, 2017, the SEC issued guidance under Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (“SAB 118”) directing taxpayers to consider the impact of the U.S. legislation as “provisional” when it does not have the necessary information available, prepared or analyzed (including computations) in reasonable detail to complete its accounting for the change in tax law. The Company did not record additional provisional income tax given the Company has full valuation allowances on its deferred tax assets and liabilities and the net operating loss generated in 2017. This represents our best estimate based on interpretation of the U.S. legislation as we are still accumulating data to finalize the underlying calculations, or in certain cases, the U.S. Treasury is expected to issue further guidance on the application of certain provisions of the U.S. legislation. Future adjustments to the provisional numbers will be recorded as discrete adjustments to income tax expense in the period in which those adjustments become estimable and/or are finalized.

Accordingly, the Company’s income tax provision as of December 31, 2017 reflects (i) the current year impacts of the U.S. Tax Act on the estimated annual effective tax rate and (ii) the following discrete items resulting directly from the enactment of the Tax Act based on the information available, prepared, or analyzed (including computations) in reasonable detail:

(a) The Tax Act reduced the U.S. federal corporate tax rate from 35% to 21%. The impact from the permanent reduction to the U.S. federal corporate income tax rate from 35% to 21% is effective January 1, 2018. The Company adjusted the deferred tax asset and liabilities and the corresponding valuation reserve as a result of the reduction in the U.S. federal corporate tax rate.

The Tax Act imposes a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign-sourced earnings. The one-time transition tax is based on our total post-1986 foreign earnings and profits ("E&P") for which we have previously deferred from U.S. income taxes. The Company determined there to be no provisional amount for its one-time transition tax liability for its foreign subsidiaries given the cumulative net operating losses in its foreign jurisdictions. We have not yet completed our calculation of the total post-1986 foreign E&P for these foreign subsidiaries. Further, the transition tax is based in part on the amount of those earnings held in cash and other specified assets which may change

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when we finalize these amounts and the calculation of post-1986 foreign E&P previously deferred from U.S. federal taxation. No additional income taxes have been provided for any remaining undistributed foreign earnings not subject to the transition tax and any additional outside basis difference (i.e., basis difference in excess of that subject to the one-time transition tax) inherent in these entities as these amounts continue to be indefinitely reinvested in foreign operations. It is not practicable to determine the amount of unrecognized withholding taxes and deferred tax liability related to any remaining undistributed foreign earnings not subject to the transition tax and additional outside basis difference in these entities. The position to indefinitely reinvest foreign earnings will be reassessed as part of the analysis related to the one-time repatriation tax.

Within the calculation of the Company's annual effective tax rate the Company has used assumptions and estimates that may change as a result of future guidance, interpretation, and rule-making from the Internal Revenue Service, the SEC, and the FASB and/or various other taxing jurisdictions. For example, the Company anticipates that the state jurisdictions will continue to determine and announce their conformity to the Tax Act which could have an impact on the annual effective tax rate.

The components of (loss) income before taxes for the years ended December 31 are as follows:

Origin of income before taxes	2017	2016	2015
United States	$(9,821)	$(13,016)	$(9,763)
Foreign	(1,208)	(2,708)	1,140
(Loss) before income taxes	$(11,029)	$(15,724)	$(8,623)

Significant components of income tax benefit (expense) for the years ended December 31 are as follows:

	2017	2016	2015
Current:			
Federal	$111	$(357)	$1,155
State	—	—	(14)
Foreign	(65)	(105)	(120)
Total current	46	(462)	1,021
Deferred:			
Federal	—	—	(4,143)
State	—	—	(548)
Foreign	—	(1,202)	(87)
Total deferred	—	(1,202)	(4,778)
Income tax benefit (expense)	$46	$(1,664)	$(3,757)

A reconciliation between the provision for income taxes calculated at the U.S. federal statutory income tax rate and the consolidated income tax expense in the consolidated statements of operations for the years ended December 31 is as follows:

	2017	2016	2015
Provision at the U.S. federal statutory rate	34.0 %	34.0 %	34.0 %
State taxes, net of federal benefit	— %	2.4 %	5.2 %
Foreign tax rate differential	(0.2)%	— %	0.6 %
Valuation allowance	10.2 %	(42.7)%	(72.3)%
Federal tax rate change	(43.9)%	— %	— %
Other true up	— %	(0.6)%	(7.8)%
Intangible assets impairment and other non-deductibles	(1.8)%	— %	(2.2)%
Other	2.1 %	(4.1)%	(1.1)%
Income tax benefit (expense) effective rate	0.4 %	(11.0)%	(43.6)%

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The deferred tax assets and liabilities at December 31 are as follows:

	2017	2016
Deferred tax assets:		
Stock compensation expense	$1,814	$2,624
Goodwill	2,366	2,235
Royalty accruals	443	353
Intangible assets	—	967
Bad debt allowance	360	389
Inter-company interest expense accrual	496	629
Net operating loss carryforwards	5,253	5,485
Credit carry-forwards	694	584
Inventory reserve	254	318
Depreciation	555	—
Other	362	399
Total deferred tax assets	12,597	13,983
Deferred tax liabilities:		
Depreciation	—	(460)
Intangible assets	(386)	—
Other	(146)	(344)
Total deferred tax liabilities	(532)	(804)
Net deferred tax asset before valuation allowance	12,065	13,179
Valuation allowances for deferred tax assets	(12,065)	(13,179)
Net deferred tax asset	$—	$—