FUEL TECH, INC.
Form 10-K
March 14, 2017
Table of Contents

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, 2016
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, 2016, the aggregate market value of the registrant's common stock held by non-affiliates of the registrant was approximately $31,097,000 based on the closing sale price as reported on the NASDAQ National Market System.

As of February 28, 2017, there were 23,459,265 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 18, 2017 are incorporated by reference into Part III.

Table of Contents

TABLE OF CONTENTS

Table of Contents

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
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
ULTRA™	

A trademark used to describe our process for generating ammonia for use as a Selective Catalytic Reduction reagent

Table of Contents

1

Table of Contents

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 Fuel Conversion business is a development stage opportunity focused on creating and manufacturing value-added engineered carbon feedstock products for carbon feedstock customer markets.

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.

Table of Contents

The Fuel Conversion business represents the continuing evolution of a new research and business development initiative we first commenced in 2014 following our acquisition of intellectual property rights and know-how related to the CARBONITE® fuel conversion process and technology. The goal of our Fuel Conversion technology is to convert coals of various grades into value-added engineered carbon feedstock products that are designed to be high in energy content and manufactured to contain other customizable carbon feedstock characteristics desirable in a variety of carbon feedstock use applications. Our Fuel Conversion technology has a number of potential applications including certain coal replacement, electric arc furnace reductant, ferro-alloy feedstock, and mercury reduced carbon feedstock. Since 2014, we have been testing and developing certain engineered carbon feedstock products for specific market applications. We are in the process of evaluating the commercialization of these product offerings with prospective customers.

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.

AIR POLLUTION CONTROL

Regulations and Markets: Domestic

The continued growth of our APC technology segment is dependent upon the adoption and enforcement of increasingly stringent 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).

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 beginning in 2017.

Most recently, in October 2016, the EPA finalized an update to CSAPR for the 2008 ozone NAAQS. The rule requires a number of sources to reduce NOx during the ozone season, which is from May through the end of September, starting in 2017. There are NOx credits available from prior years that may allow sources to trade banked allowances and delay emission reductions from current levels until the 2018 ozone season.

Table of Contents

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 deadlines still have 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.

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). Under European Union Directives, existing coal fired power plants will need to meet tighter emission regulations, and come into compliance by 2019 or 2020 (country specific). The Latin American countries will also present some opportunities for SNCR systems with plants that have inter-company directives for curbing emissions, in the absence of national regulations. However, these opportunities will not be time sensitive, and will greatly depend on allocation of capital budgets from the parent companies.

China continues to represent an attractive opportunity for us as the government sets 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. We have viable technologies to help achieve these objectives. China’s dominant reliance on coal as an energy resource is not expected to change in the foreseeable future. China alone is forecasted to account for 76% of the projected increase in world coal use through 2035. Clean air will continue to be a pressing issue and has become a political issue, especially given China’s growing awareness of air pollution and increasingly expanded role in international events and organizations.

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 will be progressively implemented in the eastern region by 2017, the central region by 2018, and the western region by 2020. These limits are also expected to be enforced on industrial emitters once the utility boilers are in compliance. Newly constructed units and existing units must meet the same stringent emission standard. The existing units which cannot be retrofitted will be closed, particularly for units under 300MW as part of Thirteenth Five Year Plan-improving overall energy efficiency and clean emission from 2015-2020. In addition, Chinese government promotes the use of waste incineration plants to replace landfills with focus on major cities. New construction of MSW’s units which are equipped with SNCR or SCR has been growing.

The European Industrial Emissions Directive (IED) sets the target for NOx emissions to be at or below 200 mg/Nm3 from 1st January 2016. 15 member states have applied for temporary derogation primarily due to aging coal-fired fleets and compliance time frames vary between 2016 and 2020. The implementation is country specific and each member country sets its own limits based on this guideline. Turkey, while not a member state, is also looking to meet this guideline as part of their bid to join the European Union. Other European countries that rely heavily on coal generation, and are impacted by the IED include Spain, Poland and Czech Republic. A number of Polish and Czech utilities have first generation NOx abatement systems which cannot comply with BREF limits, and will need to be upgraded. Turkey will also see modernization of its fleet of coal-based power generation with upgrade projects

covering all aspects of the power plant. However, the pace of implementation will be dependent on the degree of political stability in the country.

The Latin American governments in general have not enacted NOx specific emission regulations (with the exception of Chile). However, certain companies have set internal targets for pollution control and these will present a few opportunities for Fuel Tech in the next 2 - 3 years. Current Chilean NOx emission limits for existing units are being met with retrofitting of Low NOx burners and OFA systems, while the new units are being fitted with SCRs. Further tightening of NOx limits may require the addition of SCRs to existing plants for compliance.

Table of Contents

In India, stricter emission targets were announced by the government in December 2015 and phased implementation is expected. The government has prioritized PM, SOx, and NOx abatement in order of precedence for retrofit of existing power plants but emission control equipment is being designed in on new power plant projects. The power producers are looking to the government to set up policies to help pay for the cost of plant retrofits. This will impact the pace of upgrade projects.

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.
- Combined Systems: Our Advanced Selective Catalytic Reduction (ASCR™) systems include LNB, OFA, and SNCR components, along with a downsized SCR catalyst, 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 ASCR 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. The NO_xOUT CASCADE® and NO_xOUT-SCR® processes are basic types of ASCR systems which use just SNCR and SCR catalyst components. The NO_xOUT CASCADE® systems can achieve 60% - 70% NO_x reduction, with capital costs being a portion of the ASCR values defined above. Our NO_xOUT-SCR® process utilizes urea as the SCR catalyst reagent to achieve NO_x reductions of up to 85% from smaller stationary combustion sources with capital and operating costs competitive with equivalently sized, standard SCR systems.
- 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. Overseas, new coal-fired power plants incorporating SCR systems are expected to be constructed at a rapid rate in China, and 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.
- 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 both physical experimental models, which involve construction of scale models through which fluids are tested, and 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 patent pending Graduated Straightening Grid (GSG™). 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 desulphurization 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 conditioning 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.

Table of Contents

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 33% of all U.S. electricity generation and roughly 74% of Chinese electricity generation. Major coal consumers include China, the United States and India.

Sales of APC products were $34.1 million, $43.5 million, and $42.0 million for the years ended December 31, 2016, 2015 and 2014, 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.

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 Alstom, Babcock Power, Inc., The Babcock & Wilcox Burner Business, Combustion Components Associates, Inc., Foster Wheeler Corporation, and Siemens 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 Alstom, Babcock Power, The Babcock & Wilcox Company, Foster Wheeler Corporation, Peerless Manufacturing Company, and Hitachi, are active SCR system providers, or providers of the catalyst itself.

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, 2016 was $8.0 million versus backlog at December 31, 2015 of $22.2 million. A substantial portion of the backlog as of December 31, 2016 should be recognized as revenue in fiscal 2017, although the timing of such revenue recognition in 2017 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.

Table of Contents

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 33% of all U.S. electricity generation and roughly 74% 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 $21.1 million, $30.2 million, and $37.0 million for the years ended December 31, 2016, 2015 and 2014, respectively.

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.

FUEL CONVERSION

The Fuel Conversion business represents a new business initiative we commenced in 2014. As described in Note 1 to the consolidated financial statements included in this Form 10-K, we acquired intellectual property rights and know-how related to the CARBONITE® Fuel Conversion process and technology. This process can convert coals of various grades into value-added products that are high in energy content, carbon-rich and contain less pollutants. Our Fuel Conversion technology has a number of potential applications including certain coal replacement, electric arc furnace reductant, ferro-alloy feedstock, and mercury reduced carbon feedstock. Since 2014, we have been testing and developing the engineered carbon products for specific markets. We are in the process of evaluating the commercialization of these product offerings with prospective customers and considering alternatives. Refer to Item 1A. RISK FACTORS for further detail regarding the risk factors associated with this segment. We have not yet earned revenue from prospective customers.

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 84 patent applications pending; including 12 in the United States and 72 in non-U.S. Jurisdictions. These patents and applications cover some 31 inventions, 16 associated with our NO_x reduction business, 13 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 June of 2035.

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, 2016, we had 146 employees, 103 in North America, 34 in China, seven in Europe and two in Chile. We enjoy good relations with our employees and are not a party to any labor management agreement.

Table of Contents

RELATED PARTIES

Douglas G. Bailey, a member of our executive team, 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 2017 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 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.

Table of Contents

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."

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.

Table of Contents

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, 2017. 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, 2016, there were no outstanding borrowings on this facility, and we had advanced $3.3 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, 2016. In addition, our Chinese subsidiary, Beijing Fuel Tech Environmental Technologies Company, Ltd., has a RMB 6.5 million (approximately $936) revolving credit facility with JPMorgan Chase Bank (China) Company Limited. As of December 31, 2016, there were no outstanding borrowings under this facility, and we had outstanding bank guarantees of less than $0.1 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.

Our Fuel Conversion Business is in its Early Stages of Development

Our Fuel Conversion business is in the research and development stage and has not commenced commercial operations as of December 31, 2016. Traditionally, we have financed our research and product development activities from cash generated from operations. We spent $2.8 million in research and development and other related costs for both the years ended December 31, 2016 and 2015. We have been testing and developing engineered carbon feedstock products for specific markets which are not yet commercially viable. While we remain optimistic of our ability to develop and commercialize these products in the future, there can be no assurance that we will be able to further develop these products to the extent required for use within the markets and customer bases we have identified.

Further, we will be required to find outside financial resources to support the full development of our Fuel Conversion business for the longer term. The ability of the Company to fund its potential future Fuel Conversion operations, including constructing new manufacturing facilities and/or acquiring and re-purposing existing manufacturing facilities to meet our specifications for our Fuel Conversion business, is dependent upon our ability to obtain additional financing when and as needed. Due to the current state of the coal-fired electricity generating market, we believe we do not currently have the ability to access commercial debt markets for that financing. In addition, the volatility in the energy industry combined with recent bankruptcies and additional perceived credit risk of companies with coal exposure has resulted in traditional bank lenders seeking to reduce or eliminate their lending exposure to these companies. Accordingly, we may be required to seek financing from other sources at unfavorable pricing or with

unfavorable terms to continue to run our traditional APC and Chemical Technologies contemporaneously with the development of the Fuel Conversion business segment. If such funding is not attainable, the development of the Fuel Conversion business may be significantly delayed or stopped altogether.

Table of Contents

We may be unable to obtain, maintain or renew permits or leases necessary for future operations of our Fuel Conversion business, which could hinder our ability to commence future operations

Future operations for our Fuel Conversion business will require us to obtain a number of permits that impose strict regulations on various environmental and operational matters. These, as well as our anticipated Fuel Conversion facilities and operations, would include permits issued by various federal, state and local agencies and regulatory bodies. The permitting rules, and the interpretations of these rules, are complex, change frequently and are often subject to discretionary interpretations by applicable regulators, all of which might make compliance more difficult or impractical, and might possibly preclude the continuance of commencing future operations in the Fuel Conversion business. Non-governmental organizations, environmental groups and individuals have certain statutory rights to engage in the permitting process and might comment upon, or object to, our anticipated requested permits. Such persons also have the right to bring citizen's lawsuits to challenge the issuance of permits, or the validity of environmental impact statements related thereto. If any permits or leases would not be issued or renewed in a timely fashion or at all, or if permits issued or renewed would be conditioned in a manner that restricts our ability to efficiently and economically conduct our future Fuel Conversion operations, our cash flows or profitability could be materially or adversely affected.

ITEM 1B - UNRESOLVED STAFF COMMENTS

None

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 8,000 square feet, runs from September 1, 2014 to August 31, 2017. 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 1,300 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 5,000 square feet, runs from May 1, 2014 to April 30, 2017. This facility houses engineering operations. Upon expiration of the existing lease on April 30, 2017, the Company will move to a smaller location with 3,000 square feet of space, and with the lease term commencing on May 1, 2017 and ending on April 30, 2020.
- 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.
- The Aberdeen Corners, GA lease, for an office suite, runs from June 1, 2015 to May 31, 2017. This facility primarily serves 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

Table of Contents

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 2015.

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

2015	High	Low
Fourth Quarter	$2.54	$1.77
Third Quarter	2.42	1.76
Second Quarter	3.16	2.18
First Quarter	3.86	3.00

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 March 7, 2017, there were 119 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.

Performance Graph

The following line graph compares our total return to stockholders per common share for the five years ended December 31, 2016 to that of the NASDAQ Composite Index and the WilderHill Progressive Energy Index for the period December 31, 2011 through December 31, 2016.

Table of Contents

13

Table of Contents

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, 2016. The selected financial data should be read in conjunction with the audited consolidated financial statements as of and for the year ended December 31, 2016, 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)	2016	2015	2014	2013	2012
Revenues	$55,161	$ 73,664	$ 79,017	$ 109,338	$ 97,644
Cost of sales	36,367	45,107	43,889	62,521	56,899
Selling, general and administrative	25,564	30,897	35,432	36,375	32,682
Restructuring charge	1,428	219	—	—	—
Research and development	4,552	4,273	1,459	2,442	2,863
Goodwill and intangible assets impairment	2,074	1,425	23,400	—	—
Operating (loss) income	(14,824)	(8,257)	(25,163)	8,000	5,200
Net (loss) income	(17,388)	(12,380)	(17,725)	5,101	2,776
Basic (loss) income per common share	$(0.74)	$ (0.54)	$ (0.78)	$ 0.23	$ 0.12
Diluted (loss) income per common share	$(0.74)	$ (0.54)	$ (0.78)	$ 0.23	$ 0.12
Weighted-average basic shares outstanding	23,365,000	23,101,000	22,782,000	22,286,000	22,709,000
Weighted-average diluted shares outstanding	23,365,000	23,101,000	22,782,000	22,579,000	23,535,000

	December 31				
CONSOLIDATED BALANCE SHEET DATA (in thousands of dollars)	2016	2015	2014	2013	2012
Working capital	$26,585	$35,865	$39,688	$48,619	$38,918
Total assets	57,788	76,011	91,471	110,058	105,897
Long-term obligations	346	501	520	789	715
Total liabilities	14,396	17,037	19,170	21,435	21,661
Stockholders' equity (1)	43,392	58,974	72,301	88,623	84,236

Notes:

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

Table of Contents

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

Background

We have three 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 33% of all U.S. electricity generation and roughly 74% of Chinese electricity generation. Major coal consumers include China, the United States and India.

Fuel Conversion

The Fuel Conversion business represents a new business initiative we commenced in 2014. As described in Note 1 to the consolidated financial statements included in this Form 10-K, we acquired intellectual property rights and know-how related to the CARBONITE® fuel conversion process and technology. This process can convert coals of various grades into value-added products that are high in energy content, carbon-rich and contain less pollutants. Our Fuel Conversion technology has a number of potential applications including certain coal replacement, electric arc furnace reductant, ferro-alloy feedstock, and mercury reduced carbon feedstock. During 2015 and 2016, we have been testing and developing the engineered carbon products for specific markets. We are in the process of evaluating the

commercialization of these product offerings with prospective customers and considering alternatives. Refer to Item 1A. RISK FACTORS for further detail regarding the risk factors associated with this segment. We have not yet earned revenue from prospective customers.

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.

Table of Contents

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, 2016, we had two construction contracts in progress that were identified as loss contracts and a provision for losses in the amount of $41 was recorded in other accrued liabilities on the consolidated balance sheet. As of December 31, 2015, we had two construction contract in progress that was identified as a loss contract and a provision for losses in the amount of $3 was recorded in other accrued liabilities on the consolidated balance sheet.

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, 2016 and December 31, 2015, unbilled receivables were approximately $6,755 and $7,312, respectively, and are included in accounts receivable on the consolidated balance sheet. Billings in excess of costs and estimated earnings on uncompleted contracts were $1,730 and $1,858 at December 31, 2016 and December 31, 2015, 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.

Table of Contents

Inventories

Inventories consist primarily of spare parts and are stated at the lower of cost or market 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 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 three reporting units: the FUEL CHEM segment, the APC technology segment and the Fuel Conversion 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, 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 ‘income’ 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.

Table of Contents

Fuel Tech performed its annual goodwill impairment analysis for each of its reporting units as of October 1, 2016 and determined that no impairment of goodwill existed within the FUEL CHEM technology segment. Goodwill related to APC technology reporting unit was fully impaired in the fourth quarter of 2014. APC technology segment failed the first step test because the estimated fair value of the reporting unit was less than its carrying value, a result significantly affected by Fuel Tech's market capitalization, and thus requiring additional analysis of the segment. Based on this additional analysis, Fuel Tech determined that the current fair value of the APC technology reporting unit was less than the fair value of the assets and liabilities of the unit, resulting in an implied fair value of goodwill of zero, and accordingly recorded a non-cash goodwill impairment charge of $23.4 million related to this segment.

The APC segment encompasses the integrated operations of the Company's acquisitions of Advanced Combustion Technology, Inc. (ACT) in 2009 and PECO in 2014. While goodwill impairment is tested for the segment as a whole, the changes in estimates that led to the goodwill impairment charge were most significantly related to the ACT acquisition. The impairment primarily resulted from the lower estimates of revenues and margins in the segment in the assessment forecast period. These lower estimates derive from (1) lower natural gas prices that allow utility operators to switch to natural gas from coal and increase the amount of power generated from natural gas plants, (2) slower sales and smaller margins in the China market and (3) continued delays in investment in environmental remediation, particularly with respect to NOx technologies due to the regulatory environment.

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 2016 using the aforementioned undiscounted cash flows analysis.

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.

Table of Contents

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 November 2015, the FASB issued ASU 2015-17, Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes. The amendments in this Update require that deferred tax liabilities and assets be classified as non-current in a classified statement of financial position. Current accounting principles require an entity to separate deferred income tax liabilities and assets into current and non-current amounts in a classified statement of financial position. ASU 2015-17 is effective for interim and annual periods beginning after December 15, 2016. The Company elected to early adopt ASU 2015-17 prospectively for the interim period beginning in the second quarter of 2016; thus, the prior reporting period was not retrospectively adjusted. See Note 4, Income Taxes, for further discussion.

Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued ASU 2014-09 "Revenue from Contracts with Customers" (Topic 606). This new accounting guidance on revenue recognition provides for a single five-step model to be applied to all revenue contracts with customers. 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. Early adoption is permitted as of the original effective date. 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 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 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. ASU 2015-11 will be effective for the Company beginning on January 1, 2017. The adoption of this guidance in not expected to have a material impact on the Company’s consolidated financial statements.

Table of Contents

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 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 will be effective for the Company beginning on January 1, 2017. 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. ASU 2016-18 will be effective for the Company beginning on January 1, 2018. 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 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.

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.

Table of Contents

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%.

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 $4,552 and $4,273 for the years ended December 31, 2016 and 2015, respectively. Included in our 2016 and 2015 R&D expense was $2,800 and $2,826 expense pertaining to the development of our Fuel Conversion business, while the remaining expenditures were focused on new product development for our APC and Fuel Chem businesses. 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 $15,724. Our effective tax rates were 10.6% 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.

2015 versus 2014

Revenues for the years ended December 31, 2015 and 2014 were $73,664 and $79,017, respectively. The year-over-year decrease of $5,353, or 7%, was principally driven by decreased revenue in our FUEL CHEM technology segment in both our United States (U.S.) and foreign operations, while our APC technology segment revenues increased marginally. Our U.S. revenues increased by $584 or 1% from $50,901 to $51,485, while our international revenues declined by $5,937 or 21% from $28,116 to $22,179.

Table of Contents

Revenues for the APC technology segment were $43,485 for the year ended December 31, 2015, an increase of $1,454, or 3%, versus fiscal 2014. 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 2015. 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. Foreign sales declined year-over-year by approximately $6.0 million. This is due largely to the completion of several large contracts in China offset by a large contract starting in Italy in 2015. Backlog for the years ended December 31, 2015 and 2014 was $22.2 million and $18.0 million, respectively.

Revenues for the FUEL CHEM technology segment for the year ended December 31, 2015 were $30,179, a decrease of $6,807, or 18%versus fiscal 2014. This decrease is principally associated with reduced product demand from our largest Fuel Chem customer. This customer's 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. During 2015, our total revenue for this customer decreased from approximately $15 million in 2014 to $9 million in 2015 and we expect to see a further decline in 2016. 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, 2015 and 2014 were $45,107 and $43,889, respectively. Consolidated gross margin percentage for the years ended December 31, 2015 and 2014 were 39% and 44%, respectively. The gross margins for the APC technology segment decreased to 30% in 2015 from 37% in 2014. Gross margin percentage for the FUEL CHEM technology segment decreased slightly in 2015 to 52% from 53% in 2014.

During 2015 we recognized an impairment charge of $1.4 million for finite-lived APC segment intangible assets, and during 2014 we recognized an impairment charge of $23.4 million for our APC segment goodwill asset. A significant portion, $15.8 million, of our APC segment goodwill impairment recognized in 2014 and $1.1million of our APC segment intangible asset impairment recognized in 2015 related to the acquisition of Advanced Combustion Technology, Inc. (“ACT”) which was completed on January 1, 2009.

Selling, general and administrative expenses for the years ended December 31, 2015 and 2014 were $31,116 and $35,432, respectively. The decrease of $4,316 or 12%, is primarily attributed to the following:

- An decrease in employee costs, primarily commissions and bonuses, totaling $1,029
- An decrease in non-employee commissions of $215
- An decrease in stock compensation expense of $539
- An increase in depreciation and amortization of $140
- An decrease in professional fees and consulting services of $455
- An decrease related to cleanup fees for a legacy facility of $325
- An decrease in bad debt expense of $127
- An decrease in office and administrative costs relating to our foreign subsidiaries of $1,211

Research and development (“R&D”) expenses were $4,273 and $1,459 for the years ended December 31, 2015 and 2014, respectively. Included in our 2015 and 2014 R&D expense was $2,826 and $277 expense pertaining to the development of our Fuel Conversion business, while the remaining expenditures were focused on new product

development for our APC and Fuel Chem businesses. 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, 2015 decreased by $8 to $21versus $29 in 2014. Interest expense of $27 was recorded in 2015, compared to $125 in the prior year. Finally, the decrease in net other expenses to $360 from $544 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, particularly in Chile.

Table of Contents

For the year ended December 31, 2015, we recorded an income tax expense of $3,757 on pre-tax loss of $8,623. Our effective tax rates were 43.6% and (31.3%) for the years ended December 31, 2015 and 2014, respectively. The effective tax rate for the year-ended December 31, 2015 differed from the the federal statutory rate of 34% as a result of establishing a full valuation allowance on our 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. For the year ended December 31, 2014, we recorded an income tax benefit of $8,078 on pre-tax loss of $25,803.

Liquidity and Sources of Capital

At December 31, 2016, we had cash and cash equivalents of $11,826 (excluding restricted cash of $6,020) and working capital of $26,585 versus cash and cash equivalents of $21,684 and working capital of $35,865 at December 31, 2015.

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.

Operating activities provided $6,928 of cash for the year ended December 31, 2015, primarily due to the add back of non-cash items from our net loss of $12,380 including stock compensation expense of $1,809, depreciation and amortization of $4,205, and a decrease in deferred income taxes of $4,916, as well as a decrease in our accounts receivable balance of $7,880 and an increase in our accounts payable balance of $1,817. Partially offsetting these items were subtractions of non-cash items from our net loss including gain on sale of equipment of $26, as well an increase in inventory of $560, an increase in prepaid expenses and other current and non-current assets of $1,245, and a decrease in our accrued liabilities and other non-current liabilities of $913.

Investing activities used cash of $938 and $776 for the years ended December 31, 2016 and 2015, respectively. 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. Investment activities for the year ended December 31, 2015 consisted of purchases of equipment, patents, and other intangibles of $802 and proceeds from sale of equipment of $26.

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. Financing activities used $1,875 of cash for the year ended December 31, 2015 which included a payment of our short-term debt in the amount of $1,623 and payments to repurchase our common stock in the amount of $252 for shares withheld to pay employee payroll taxes upon vesting of equity awards.

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.

Table of Contents

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. 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 will fully pledge such cash as collateral to the bank to support the credit available to the Company under the Facility.

At December 31, 2016 and 2015, we had outstanding standby letters of credit and bank guarantees totaling approximately $3,292 and $7,803, 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, 2016 and 2015, there were no cash borrowings under the domestic revolving credit facility and approximately $1,708 and $7,197, 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.

On June 24, 2016, 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 $936), which expires on June 23, 2017. The Company intends to renew the China Facility at its maturity. This new credit facility replaced the previous RMB 35 million facility that expired on June 24, 2016. 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, 2016 and December 31, 2015, Beijing Fuel Tech had no cash borrowings under the China Facility.

At December 31, 2016 and 2015, we had outstanding standby letters of credit and bank guarantees totaling approximately $22 and $57, respectively, on its Beijing Fuel Tech revolving credit facility in connection with contracts in process. At December 31, 2016 and 2015, approximately $914 and $5,335 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, 2016, we have sustained losses totaling $17,388. Our cash used in operations for this same period totaled $2,738. We incur on an annualized basis approximately $5.5 million in non-cash expenses for depreciation, amortization and stock compensation. We have taken measures to reduce our expense infrastructure, and over the past two years have eliminated approximately $8 million in aggregate expense through headcount and other

operating expense cutbacks.

Our cash balance as of December 31, 2016 totaled $17.8 million (inclusive of our restricted cash balance), and our working capital totaled $26.6 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, as well as our efforts to support our Fuel Conversion business. 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 Fuel Conversion business and other research and development initiatives.

Table of Contents

We currently have a $5 million domestic U.S. credit facility which we use to issue letters of credit to our customers. During 2016 that credit facility was converted to 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. However, we do not have sufficient capital to support the full development of our Fuel Conversion business. We will need to identify outside funding sources to support this business effort. No assurances can be given as to whether such resources will be available, or on what terms. If such funding is not attainable, the development of the Fuel Conversion business may be significantly delayed or stopped altogether.

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	2017	2018-2019	2020-2021	Thereafter
Operating lease obligations	$1,781	$778	$ 915	$ 88	$ —
Total	$1,781	$778	$ 915	$ 88	$ —

Interest payments in the amount of $0, $27, and $125 were made during the years ended December 31, 2016, 2015 and 2014, respectively.

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, 2016, 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	2017	2018	2019	Thereafter
Standby letters of credit and bank guarantees	$3,314	$2,392	$890	$ 32	$ —
Performance Surety Bonds	$4,598	$4,598	$—	$ —	$ —
Total	$7,912	$6,990	$890	$ 32	$ —

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, 2016.

Table of Contents

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.

Table of Contents

ITEM 8 - FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

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

We have audited the accompanying consolidated balance sheets of Fuel Tech, Inc. (the Company) as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, 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. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Fuel Tech, Inc. as of December 31, 2016 and 2015, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles.

/s/ RSM US LLP

Chicago, Illinois
March 14, 2017

Table of Contents

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

	December 31,	
	2016	2015
ASSETS		
Current assets:		
Cash and cash equivalents	$11,826	$21,684
Restricted cash	6,020	—
Marketable securities	9	19
Accounts receivable, net	18,790	23,060
Inventories, net	1,012	1,653
Prepaid expenses and other current assets	2,891	3,889
Income taxes receivable	87	1,857
Deferred income taxes	—	239
Total current assets	40,635	52,401
Property and equipment, net	10,920	12,001
Goodwill	2,116	2,116
Other intangible assets, net	3,451	7,144
Deferred income taxes	—	992
Other assets	666	1,357
Total assets	$57,788	$76,011
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	6,303	8,942
Accrued liabilities:		
Employee compensation	1,390	1,645
Other accrued liabilities	6,357	5,949
Total current liabilities	14,050	16,536
Other liabilities	346	501
Total liabilities	14,396	17,037
COMMITMENTS AND CONTINGENCIES (Note 9)		
Stockholders' equity:		
Common stock, $.01 par value, 40,000,000 shares authorized, 23,800,924 and 23,419,008 shares issued, and 23,446,035 and 23,167,216 outstanding in 2016 and 2015, respectively	238	234
Additional paid-in capital	137,380	135,394
Accumulated deficit	(91,520)	(74,132)
Accumulated other comprehensive loss	(1,568)	(1,556)
Nil coupon perpetual loan notes	76	76
Treasury stock, 354,889 and 251,792 shares in 2016 and 2015, respectively, at cost	(1,214)	(1,042)
Total stockholders' equity	43,392	58,974
Total liabilities and stockholders' equity	$57,788	$76,011

See notes to consolidated financial statements.

Table of Contents

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

	For the years ended December 31,		
	2016	2015	2014
Revenues	$55,161	$73,664	$79,017
Costs and expenses:			
Cost of sales	36,367	45,107	43,889
Selling, general and administrative	25,564	30,897	35,432
Restructuring charge	1,428	219	—
Research and development	4,552	4,273	1,459
Goodwill and intangible assets impairment	2,074	1,425	23,400
Total Costs and Expenses	69,985	81,921	104,180
Operating (loss)	(14,824)	(8,257)	(25,163)
Interest expense	—	(27)	(125)
Interest income	25	21	29
Other expense	(925)	(360)	(544)
(Loss) before income taxes	(15,724)	(8,623)	(25,803)
Income tax (expense) benefit	(1,664)	(3,757)	8,078
Net (loss)	$(17,388)	$(12,380)	$(17,725)
Net (loss) per common share:			
Basic	$(0.74)	$(0.54)	$(0.78)
Diluted	$(0.74)	$(0.54)	$(0.78)
Weighted-average number of common shares outstanding:			
Basic	23,365,000	23,101,000	22,782,000
Diluted	23,365,000	23,101,000	22,782,000

See notes to consolidated financial statements.

Table of Contents

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

	For the years ended December 31,		
	2016	2015	2014
Net (loss)	$(17,388)	$(12,380)	$(17,725)
Other comprehensive (loss):			
Foreign currency translation adjustments	(6)	(1,097)	(489)
Unrealized (losses)/gains from marketable securities, net of tax	(6)	(11)	4
Total other comprehensive (loss)	(12)	(1,108)	(485)
Comprehensive (loss)	$(17,400)	$(13,488)	$(18,210)

See notes to consolidated financial statements.

Table of Contents

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, 2013	22,593	$ 227	$132,796	$ (44,027)	$ 37	$ 76	$ (486)	$88,623
Net loss				(17,725)				(17,725)
Foreign currency translation adjustments					(489)			(489)
Unrealized gain on marketable securities, net of tax					4			4
Exercise of stock options	60		297					297
Tax benefit from stock compensation expense			7					7
Stock compensation expense			2,322					2,322
Tax effect of expired vested options			(379)					(379)
Common shares issued upon vesting of restricted stock units	266	3	(58)					(55)
Treasury shares withheld	(59)						(304)	(304)
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								