

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

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

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: 001-34112



Energy Recovery, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware

*(State or Other Jurisdiction of
Incorporation or Organization)*

01-0616867

*(I.R.S. Employer
Identification No.)*

1717 Doolittle Drive, San Leandro, CA 94577

(Address of Principal Executive Offices)

Registrant's telephone number, including area code: (510) 483-7370

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934:

Title of Each Class
Common stock, \$0.001 par value

Name of Exchange on Which Registered
The NASDAQ Stock Market LLC

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted 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 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," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act:

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

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

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

The aggregate market value of the voting stock held by non-affiliates amounted to approximately \$287 million on June 30, 2018.

The number of shares of the registrant's common stock outstanding as of February 28, 2019 was 59,562,995 shares.

DOCUMENTS INCORPORATED BY REFERENCE

As noted herein, the information called for by Part III is incorporated by reference to specified portions of the registrant's definitive proxy statement to be filed in conjunction with the registrant's 2019 Annual Meeting of Stockholders, which is expected to be filed not later than 120 days after the registrant's fiscal year ended December 31, 2018.

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FORWARD-LOOKING INFORMATION

This Annual Report on Form 10-K for the year ended December 31, 2018, including “Item 7– Management’s Discussion and Analysis of Financial Condition and Results of Operations” and certain information incorporated by reference, contain forward-looking statements within the “safe harbor” provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements in this report include, but are not limited to, statements about our expectations, objectives, anticipations, plans, hopes, beliefs, intentions, or strategies regarding the future.

Forward-looking statements represent our current expectations about future events, are based on assumptions, and involve risks and uncertainties. If the risks or uncertainties occur or the assumptions prove incorrect, then our results may differ materially from those set forth or implied by the forward-looking statements. Our forward-looking statements are not guarantees of future performance or events.

Words such as “expects,” “anticipates,” “aims,” “projects,” “intends,” “plans,” “believes,” “estimates,” “seeks,” variations of such words, and similar expressions are also intended to identify such forward-looking statements. These forward-looking statements are subject to risks, uncertainties, and assumptions that are difficult to predict; therefore, actual results may differ materially and adversely from those expressed in any forward-looking statements. Readers are directed to risks and uncertainties identified under “Item 1A – Risk Factors” and elsewhere in this report for factors that may cause actual results to be different from those expressed in these forward-looking statements. Except as required by law, we undertake no obligation to revise or update publicly any forward-looking statements for any reason.

Forward-looking statements in this report include, without limitation, statements about the following:

- our belief that levels of gross profit margin are sustainable to the extent that volume grows, we experience a favorable product mix, pricing remains stable, and we continue to realize cost savings through production efficiencies and enhanced yields;*
- our plan to improve our existing energy recovery devices and to develop and manufacture new and enhanced versions of these devices;*
- our belief that our PX® energy recovery devices are the most cost-effective energy recovery devices over time and will result in low life-cycle costs;*
- our belief that our turbocharger devices have long operating lives;*
- our objective of finding new applications for our technology and developing new products for use outside of desalination, including oil & gas applications;*
- our expectation that our expenses for research and development and sales and marketing may increase as a result of diversification into markets outside of desalination;*
- our expectation that we will continue to rely on sales of our energy recovery devices in the desalination market for a substantial portion of our revenue and that new desalination markets, including the United States, will provide revenue opportunities to us;*
- our ability to meet projected new product development dates, anticipated cost reduction targets, or revenue growth objectives for new products;*
- our belief that we can commercialize the VorTeq™ hydraulic fracturing system;*
- our belief that the VorTeq enables oilfield service (“OFS”) companies to migrate to more efficient pumping technology;*
- our belief that we will be able to enter into a long-term licensing agreement to bring the MTeq solution to market;*
- our belief that customers will accept and adopt our new products;*
- our belief that our current facilities will be adequate for the foreseeable future;*
- our expectation that sales outside of the United States will remain a significant portion of our revenue;*
- the timing of our receipt of payment for products or services from our customers;*
- our belief that our existing cash balances and cash generated from our operations will be sufficient to meet our anticipated liquidity needs for the foreseeable future, with the exception of a decision to enter into an acquisition and/or fund investments in our latest technology arising from rapid market adoption that could require us to seek additional equity or debt financing;*
- our expectation that, as we expand our international sales, a portion of our revenue could be denominated in foreign currencies;*

- *our expectations of the impact of the Tax Cuts and Jobs Act of 2017;*
- *our belief that new markets will grow in the water desalination market;*
- *our expectation that we will be able to enforce our intellectual property rights;*
and
- *other factors disclosed under Item 1 – Business, Item 1A – Risk Factors, Item 2 – Properties, Item 7 – Management’s Discussion and Analysis of Financial Condition and Results of Operation, Item 7A – Quantitative and Qualitative Disclosures about Market Risks and elsewhere in this Form 10-K.*

You should not place undue reliance on these forward-looking statements, which reflect management’s opinions only as of the date of the filing of this Annual Report on Form 10-K. All forward-looking statements included in this document are subject to additional risks and uncertainties further discussed under “Item 1A – Risk Factors” and are based on information available to us as of March 7, 2019. We assume no obligation to update any such forward-looking statements. It is important to note that our actual results could differ materially from the results set forth or implied by our forward-looking statements. The factors that could cause our actual results to differ from those included in such forward-looking statements are set forth under the heading “Item 1A – Risk Factors” and our results disclosed from time to time in our reports on Forms 10-Q and 8-K and our Annual Reports to Stockholders.

PART I

ITEM 1 — BUSINESS

Overview

Energy Recovery, Inc. (the “Company”, “Energy Recovery”, “we”, “our” and “us”) (NASDAQ: ERII) is an engineering-driven technology company that engineers, designs, manufactures and supplies solutions for industrial fluid flow processes. The Company offers technologies which can drive meaningful, immediate cost savings and operational efficiencies for our customers. Currently, we operate in two markets - water and oil & gas, and our products are utilized in these markets to either recycle and convert wasted pressure energy into a usable asset or preserve pumps that are subject to hostile processing environments.

Energy Recovery was incorporated in Virginia in 1992 and reincorporated in Delaware in 2001. Our headquarters and principal research, development, and manufacturing facility is located in California. We are also constructing a new facility in Texas, which we hope to complete in 2019. We maintain direct sales offices and technical support centers in Europe, the Middle East and Asia.

Water

For more than 20 years, Energy Recovery has been developing innovative and efficient technologies and solutions for the reverse osmosis water desalination industry. Climate change, increasing water scarcity, as well as population and economic growth across the globe are driving water demand for human, agricultural, and industrial use. Apart from seasonal variations, the supply of fresh water generally remains fixed, and in some geographic areas is falling, and cannot keep pace with this growing demand. Desalination of seawater, brackish water and wastewater offers one solution to water scarcity needs around the world. In many parts of the world, desalination contributes significantly to the freshwater supply.

Solutions

We are the market leader in the engineering, design, manufacturing and supply of energy recovery devices (“ERDs”) to the global reverse osmosis desalination market. Our ERDs are categorized into two technology groups: positive displacement isobaric ERDs, namely our proprietary Pressure Exchanger (“PX Pressure Exchanger”), and centrifugal-type ERDs such as our hydraulic turbochargers (“Turbochargers”). We also manufacture high-performance and high-efficiency pumps that are utilized in the reverse osmosis desalination process.

Energy Recovery Devices

Prior to the introduction of ERDs, the expense of reverse osmosis desalination was often cost prohibitive due to the high energy needs required in the process. Generally speaking, energy intensive pumps are used to pressurize the feed water, whether seawater or brackish water, which is then forced through a membrane that removes the salts and minerals. The process results in potable water, suitable for human, agricultural and industrial use. In the case of seawater reverse osmosis (“SWRO”) desalination, for example, this process results in a highly concentrated and pressurized concentrate stream. Prior to the adoption of ERDs, this concentrate stream was often discharged back into the world’s oceans after dissipating the pressure through throttle valves, thereby wasting the pressure energy. The repeated pressurization of the feed water and subsequent dissipation of the pressure energy in the discharge water was inefficient and resulted in tremendous amounts of wasted energy that made SWRO desalination substantially more expensive than alternative water production options.

When introduced, ERDs fundamentally altered this paradigm by capturing and reusing this wasted pressure energy. Rather than dissipating the pressure energy from the discharge brine, ERDs such as our PX Pressure Exchanger can transfer the pressure energy from the discharge water directly to the unprocessed feed water, thereby reducing the amount of ongoing pressure energy required by the processes’ pumps. This results in a much more efficient process as the size of the high-pressure pumps and the corresponding energy usage are reduced. As a result, ERDs have made SWRO desalination a viable economic option in the production of potable water.

The brackish water reverse osmosis (“BWRO”) desalination process is identical to that of the SWRO desalination process. Brackish water typically has lower salt content than seawater, therefore fewer solids need to be removed and less energy is expended on pressurizing the feed water. The amount of salts in the feedwater will ultimately determine the system design and operating conditions which, in turn, will drive decisions related to the specification or type of energy recovery device to be employed, if any. Due to the lower cost involved, our Turbocharger devices generally have characteristics more applicable to BWRO, although this is not always the case.

The PX Pressure Exchanger, high efficiency positive-displacement isobaric energy recovery device. Our patented PX Pressure Exchanger technology consists of a ceramic rotor supported by a highly efficient hydrodynamic and hydrostatic bearing system. Our PX Pressure Exchangers compete largely in the SWRO industry, or in higher salination BWRO desalination applications, and enable desalination plant operators to recover otherwise wasted hydraulic pressure energy from a high-pressure fluid flow and transfer the energy to a low-pressure fluid flow.

Turbochargers, high efficiency centrifugal energy recovery device. Our Turbochargers are designed for low-pressure brackish and high-pressure seawater reverse osmosis systems, as well as various other water treatment applications. Our Turbochargers provide high efficiency with state-of-the-art engineering and configuration. Designed for maximum durability, reliability and optimum efficiency, our Turbochargers offer substantial savings, and the custom-designed hydraulics allow for optimum performance over a wide range of operating conditions. Our Turbochargers compete primarily in BWRO desalination applications, where the systems have characteristics more applicable to our Turbocharger technology. However, our Turbocharger technology is also implemented in SWRO desalination applications where initial cost, simplicity and / or low energy costs are key factors in the decision-making process.

Pumps

High efficiency pumps, high-pressure feed and high-pressure circulation pumps. In addition to ERDs, water reverse osmosis desalination requires specialized high-pressure feed and circulation pumps. These devices, in combination with ERDs, must efficiently pressurize and circulate feedwater to the membranes to purify water. Plant operators require specialized pumps with performance matched to the requirements of the membranes and energy recovery devices. To minimize plant costs these pumps must provide high energy efficiency and reliability with low maintenance requirements. Specifically designed for the reverse osmosis industry, our pumps utilize our material science and hydraulic design expertise. Designed for maximum durability, reliability, and optimum efficiency, our pumping systems offer users savings, while the investment cast components and optimized fluid pathways ensure maximum performance.

We manufacture and / or supply specialized high-pressure feed and circulation pumps for only a portion of the markets served by our ERD solutions, generally in small-to medium-sized desalination plants. Our high-pressure feed pumps are designed to pressurize the membrane feed flow and overcome the osmotic pressure requirements of the feed water resulting in the production of permeate water. Our high-pressure circulation pumps are designed to “circulate” and control the high-pressure flow rates through the PX Pressure Exchanger and to compensate for small pressure losses across the membrane, PX Pressure Exchanger and associated process piping.

Markets

Seawater, brackish, and wastewater reverse osmosis desalination have been our markets for revenue generation to date. The water market ranges from small desalination plants such as those used in cruise ships and resorts, to mega-project desalination plants deployments globally that process 50,000 cubic meters of water per day and above. Because of the geographical location of many significant water desalination projects, geopolitical and economic events can influence the timing of expected projects. We anticipate that markets traditionally not associated with desalination, including the United States (“U.S.”) will inevitably develop and provide further revenue growth opportunities.

Greenfield

The greenfield market represents newly constructed reverse osmosis desalination projects. These facilities vary in size, scope and geography. Large-scale greenfield projects are typically public in nature and involve a formal tendering process. Smaller greenfield projects may be private in nature, but typically still involve a formal tendering process. We work directly with the project bidders, generally large engineering, procurement and construction (“EPC”) firms, end-users and industry consultants to scope in our products prior to the project being awarded, where possible. Once the project is awarded to an EPC, our normal sales process ensues. The greenfield market has been the key market for our water business. This market is highly competitive, and the tendering process pays close attention to the cost to desalinate water (*i.e.*, dollars per cubic meter of water produced). Our PX Pressure Exchanger’s industry-leading efficiency for ERDs in the desalination industry has allowed us to remain competitive.

Retrofit

The retrofit market represents existing water facilities that are currently in operation utilizing legacy technologies. These facilities and their owners not only encounter issues with low-efficiency legacy technologies, but also encounter capital expenditure and “know-how” issues that may prevent them from retrofitting plants. Typical retrofits include improvements to existing operations, equipment upgrades and potential expansions of existing capacity. We leverage our best-in-class solutions and “know how” to unseat existing technology by implementing water production efficiency measures to reduce overall power consumed, repair and maintenance costs and avoid costly capital upgrades, as well as increase throughput and/or plant availability. These retrofit opportunities may or may not have a formal tendering process. We typically approach the plant operators, owners and/or end-users of these facilities to present our value-proposition.

Service & Aftermarket

The service & aftermarket market is comprised of existing water facilities that have our solutions installed or in operation. We provide spare and repaired components, field services and various commissioning activities to our customer base. We leverage our water expertise in supporting our existing installed base to ensure that our solutions are being operated effectively and efficiently. Readily available aftermarket products and services are required by our industry partners and customers in order maximize plant availability and profits.

Customers

We sell our energy recovery devices and pumps to (1) major international EPC firms that can design, build, own and operate large-scale desalination plants (mega projects); (2) original equipment manufacturers (“OEM”) which are companies that supply equipment and packaged solutions for small- to medium-sized desalination plants, and national, state and local municipalities worldwide; and (3) plant owners and/or operators who can utilize our technology to upgrade or keep their plant running, or retrofit their existing plant equipment with various efficiency measures to optimize operations by reducing overall power consumed and reduce other operating costs in the desalination process.

Large Engineering, Procurement and Construction Firms

A significant portion of our revenue has historically come from sales to large EPC firms worldwide which have the required desalination expertise to engineer, undertake procurement for, construct, and sometimes own and operate, large desalination plants or mega-projects. Due to the enormous volume of water processed by these mega-projects, ongoing operating costs rather than initial capital expenditures is the key factor in their selection of an ERD solution. As such, EPCs most often select our PX Pressure Exchangers, which offers the highest efficiency and total life-cycle-cost savings to the end client. We work with these EPC firms to specify our PX Pressure Exchanger solutions for their plant designs. The time between project tender and shipment can range from 16 to 36 months, or more. Each mega-project typically represents revenue opportunities ranging from \$1 million to \$10 million.

We estimate that the total capital investments in these mega-projects may fall between \$50 million to \$1 billion or more. Due to the large capital investments needed to fund these projects, which are typically provided by national or local governments, these projects are more susceptible to macroeconomic and regional risks, such as economic downturns, currency shocks, or political risks.

Original Equipment Manufacturers

We sell a broad set of our products to OEMs including our PX Pressure Exchangers, Turbochargers, high-pressure pumps, and circulation “booster” pumps. Our sale of solutions and services to OEM suppliers are for integration and use in small- to medium-sized desalination plants processing up to 50,000 cubic meters of water per day located in local municipalities, hotels and resorts, power plants, cruise ships, farm operations, among others. In addition, these OEMs purchase our solutions for “quick water” or emergency water solutions.

Unlike mega-projects, OEM projects are smaller in scope and, as such, the initial capital expenditure, rather than future ongoing operating costs, is often the key factor in selection of an ERD solution. Accordingly, we sell not only our PX Pressure Exchanger, but also our Turbochargers, which offer a lower cost alternative to the PX Pressure Exchanger. The typical time from project tender and shipment can range from one to 12 months. OEM projects typically represent revenue opportunities of up to \$1 million or more.

Capital investments in OEM projects can be as high as \$100 million, but typically range between \$10 - \$50 million. Due to the lower capital investment of these projects, such projects are more likely to be privately financed, or financed by local municipalities. Due to a more diverse customer base and source of financing, OEM projects tend to be less susceptible to economic and regional shocks, and to provide a more stable source of revenue to the company.

End-users and Service Providers

Our existing and expanding installed base of energy recovery and pump products in water plants has created a growing customer base comprised of plant operators and service providers. These customers purchase spare parts, replacement parts, and service contracts, as well as utilize our field service expertise to perform maintenance and repairs. Owners and operators of older plants without effective energy recovery devices, and newer plants with devices manufactured by our competitors, purchase our equipment to retrofit plants to realize operational expense reductions or expansions in plant capacity.

Competition

The market for ERDs and pumps in the water treatment market is competitive. As the demand for fresh water increases and the market expands, we expect competition to persist and intensify.

We have three main competitors for our ERDs: Flowserve Corporation (“Flowserve”), Fluid Equipment Development Company (“FEDCO”), and Danfoss Group (“Danfoss”). We believe our solutions offer a competitive advantage compared to our competitor’s solutions because our ERDs provide the lowest life-cycle cost and are therefore the most cost-effective ERD solutions for the reverse osmosis desalination industry over time.

In the market for large mega-projects, our PX Pressure Exchanger competes primarily with Flowserve’s DWEER product. We believe our PX Pressure Exchangers have a competitive advantage as compared to the DWEER product because our devices are made with highly durable and corrosion-resistant ceramic parts that are designed for a life of more than 25 years, are warranted for high efficiencies, cause minimal unplanned downtime, and offer lower lifecycle costs. Additionally, the PX Pressure Exchanger offers optimum scalability with a quick startup as well as no scheduled maintenance.

In the market for small-to-medium-sized desalination plants, our ERD solutions compete with FEDCO’s turbochargers and Danfoss’s iSave energy recovery device. We believe that our PX Pressure Exchangers have a distinct competitive advantage over these solutions because our devices provide up to 98% energy efficiency, have lower lifecycle maintenance costs, and are made of highly durable and corrosion-resistant ceramic parts. We also believe that our Turbochargers compete favorably with FEDCO’s turbochargers based on efficiency, price and because our turbochargers have design advantages that enhance efficiency, operational flexibility, and serviceability.

In the applicable market and flow ranges that we serve for high-pressure pumps and circulation pumps, our solutions compete with pumps manufactured by Clyde Union Ltd.; FEDCO; Flowserve; KSB Aktiengesellschaft; Torishima Pump Mfg. Co., Ltd.; Sulzer Pumps, Ltd.; and other companies. We believe that our pump solutions are competitive with these solutions because our pumps are developed specifically for reverse osmosis desalination, are highly efficient, feature product-lubricated bearings, and are often purchased with our ERDs in small- to medium-sized plants.

Sales and Marketing

Our strategically located direct salesforce offers our products through capital sale to our customers around the world. We have sales offices in the United States, Madrid, Shanghai, and Dubai, and we maintain a sales and service footprint in strategic territories allowing rapid response to our customers' needs. Our team is composed of individuals with many years of desalination and water expertise and deep references throughout the industry. Aligning to the geographic breadth of our current and potential future customers, our product marketing approach includes a strategic presence at water industry events across various regions. In addition, we leverage our industry and market intelligence to develop new solutions and services that can be adopted by our growing customer base.

A significant portion of our revenue is from outside of the U.S. Additional segment and geographical information regarding our product revenue is included in Note 13, "Geographical Information and Concentrations" of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

Operations

Our water products are manufactured at our facility located in San Leandro, California, where our PX Pressure Exchangers, Turbochargers and pumps are produced, assembled, and tested. Our 100,000 sq. ft manufacturing area includes an advanced ceramics manufacturing facility and testing laboratory, five hydraulic performance testing loops, CNC machines, assembly stations and warehouse. Ceramic components for the PX device are manufactured in-house from high-grade, raw alumina to the final product. Components for our other products also undergo final precision finishing in San Leandro to protect the proprietary nature of our manufacturing methods and product designs and to maintain premium quality standards. The availability of multiple test loops allows us to test every water product we manufacture to its full rated operating conditions.

We obtain raw, processed and certain pre-machined materials from various suppliers to support our manufacturing operations. A limited number of these suppliers are near sole-source to maintain material consistency and support new product development. A qualified redundant material source exists in all cases.

Our production facility operates under the principles of Lean Manufacturing and continuously seeks ways to improve product and process performance. Our manufacturing operations is certified to ISO9001:2015 standards.

Water field activities are conducted by our after-market and field service organization on-site at customer locations.

Seasonality

We often experience substantial fluctuations in product revenue from quarter-to-quarter and from year-to-year because a single order for our ERDs by a large EPC firm for a particular plant may represent a significant portion of our revenue. Prior to 2018, our EPC customers tended to order a significant amount of equipment for delivery in the fourth quarter, and as a consequence, a significant portion of our annual sales typically occurred during the fourth quarter. This trend did not repeat itself in 2018, however, and seasonality as experienced in prior years may not be the same in future years.

Oil & Gas

Across oil & gas markets, highly pressurized fluid flows are required to extract and process hydrocarbons. These pressurized fluid flows are a necessity but come at a high cost to the oil & gas industry. In the upstream sector, high rates of flow, high pressure differentials and hostile (*e.g.*, corrosive, erosive or abrasive) fluids lead to rapid degradation of expensive pressure pumping equipment. In the mid-stream and down-stream sectors, pressure energy becomes a waste product at various stages of oil and gas processing thereby driving excessive energy usage and cost. Oil & gas operators seek ways to reduce these costs and improve overall productivity.

Markets

Upstream Sector

Hydraulic fracturing is a well-stimulation technique in which pressurized liquid containing a highly abrasive, proppant-laden fluid is injected into a wellbore. Oilfield service (“OFS”) providers utilize high-pressure hydraulic fracturing pumps (commonly referred to as “frac-pumps”) to pressurize fracturing fluid (commonly referred to as “frac-fluid”) at treating pressures up to 15,000 pounds per square inch (“psi”). This frac-fluid is sent from the frac-pumps through traditional missile manifolds into the wellbore to create cracks in the deep-rock formations thereby permitting oil and gas extraction. These frac-pumps are routinely destroyed by the abrasive frac-fluids used during the hydraulic fracturing process causing significant OFS operator costs associated with excessive downtime, repairs, maintenance, and capital equipment redundancy.

During mud pumping in the drilling process, a drilling fluid (commonly referred to as “drilling mud”) is circulated from a mud pit through the wellbore utilizing high-pressure mud pumps, which pressurize the drilling mud at treating pressures up to 7,500 psi, to control formation pressures, lubricate the drill bit, and to remove cuttings. Although the existing mud pumping process removes most of the solids from the drilling mud, debris and sand often remain. The pumps circulating the drilling mud is therefore subjected to extreme wear, resulting in burdensome repair and maintenance costs. Components of these mud pumps are routinely destroyed by the hostile drilling mud used during the mud pumping process causing OFS operators significant costs associated with excessive downtime, repairs, maintenance, capital equipment redundancy, safety, and rig mobilization.

OFS operators have long sought ways to ruggedize or extend the life of pumps thereby reducing costs in both the hydraulic fracturing and drilling processes. We believe the most efficient method of extending the life of these pumps is to isolate the high-pressure pumps from the abrasive fluids completely, thereby enabling OFS operators to realize immediate and long-term savings in the form of reduced downtime, repairs and maintenance costs and capital equipment redundancy.

Midstream and Downstream Sectors

Today, natural gas is typically processed by removing acid gases such as carbon dioxide and hydrogen sulfide before it is ready for distribution and use. A common acid gas removal process uses an amine solvent to absorb acid gases in a high-pressure contactor column. Having absorbed the carbon dioxide and hydrogen sulfide, the pressurized (rich) amine is then depressurized and processed into regenerated (lean) amine for reuse. An ERD, such as a Turbocharger, can recover the energy wasted during this reduction in pressure of the amine. This recovered energy can then be converted to electricity, or hydraulic energy, which eliminates the need for a high-pressure pump. Fewer high-pressure pumps reduce capital expenditures, and energy and maintenance costs, positively impacting plant availability.

Within pipeline applications, crude oil or final hydrocarbon products must be pressurized to travel from upstream gathering facilities or refineries, to terminals and tank farms. Fluid pressure builds within the pipeline during transport, and this pressure must be reduced before storing the liquid. This required pressure-drop, typically managed through a control valve that simply dissipates the energy into the atmosphere, represents an opportunity to generate electricity from otherwise wasted pressure energy.

Solutions

Our technology solutions seek to preserve or eliminate pumping technology in hostile processing environments or convert wasted pressure energy into a reusable asset. Our core oil & gas solutions based upon PX Pressure Exchanger technology, the VorTeq and MTeq, isolate high cost pumping equipment from hostile processing fluids. Our centrifugal line of solutions based upon our Turbocharger technology, the IsoBoost and IsoGen, recycle otherwise lost pressure energy.

Upstream Sector

VorTeq, a PX solution for hydraulic fracturing applications: The VorTeq technology isolates and preserves costly frac-pumps by re-routing hostile frac-fluid away from the frac-pumps, and ultimately enables a more efficient pumping model. Using VorTeq, the frac-pumps will process only clean fluid, which leads to reduced repairs and maintenance costs, reduced capital costs by extending frac-pump life expectancy, and the elimination of redundant capital equipment. Our VorTeq technology is currently in the research and development (“R&D”) stage. We completed a substantial re-design of the VorTeq during 2017 and have progressed the technology significantly in 2018. Our focus remains on commercializing this technology.

MTEq, a PX solution for mud pumping applications: Our MTEq technology isolates and preserves costly mud pumps by re-routing hostile drilling mud from these critical pumps, and ultimately enables a more efficient pumping model. These mud pumps will process only clean fluid, which leads to reduced repairs and maintenance costs and reduced capital costs by extending pump life expectancy and eliminating redundant capital equipment. Our MTEq technology is currently in the R&D stage and we are actively working towards progressing this technology. We designed the MTEq during late 2016 and early 2017 and completed building the first prototype in December 2017.

Midstream and Downstream Sectors

IsoBoost & IsoGen, turbocharger solutions, for gas processing & pipeline applications: Within the gas processing and pipeline pressure down cycle, the IsoBoost and IsoGen technology enables the recovery of pressure energy in the fluid flows either through the exchange of pressure within the application or by converting it to electricity. Our technology enables gas processing plant and pipeline owners and operators to achieve immediate and long-term energy savings with little or no operational disruption. Our IsoBoost is comprised of hydraulic turbochargers and related controls and automation systems. The IsoBoost solution enables oil & gas operators to capture and use wasted hydraulic pressure energy within the acid gas removal process, acting like a pump that is powered by hydraulic pressure that would otherwise be discarded through a control valve. Our IsoGen is comprised of hydraulic turbines, generators, and related controls and automation systems. The IsoGen enables oil & gas operators to generate electricity from the hydraulic energy in high-pressure fluid flows, either within the acid gas removal process in gas processing or at pipeline choke stations.

Customers

We license, lease or sell our oil and gas products to oil field service companies, international oil companies (“IOC”), national oil companies (“NOC”), exploration and production companies (“E&P”), OEMs and EPC firms.

Oilfield Service Companies

OFS companies provide the infrastructure, equipment, intellectual property, and services needed by the oil & gas industry to explore for, extract, and transport crude oil and natural gas. OFS hydraulic fracturing and mud pumping operators face significant pressure to reduce costs as oil & gas companies curtail capital expenditures and seek operational efficiencies in response to lower commodity prices.

In 2014, we entered into a strategic partnership with Liberty Oil Field Services (“Liberty”) to pilot and conduct field trials with the VorTeq. Through this agreement, Liberty has the rights to lease up to twenty VorTeq missiles for a period of up to five years following commercialization. In 2015, we entered into a 15-year license agreement with Schlumberger Technology Corporation (the “VorTeq Licensee”) for the exclusive, worldwide right to use the VorTeq for hydraulic fracturing onshore operations. The license agreement provides a carve out for Liberty’s contractual rights to utilize the VorTeq. We are currently working with the VorTeq Licensee and Liberty to commercialize the VorTeq technology.

As the MTEq technology matures, the Company intends to evaluate the best potential distribution method for the technology, which may include long term licensing partnerships with OFS companies that specialize in drilling wells or OEMs that supply or lease equipment to market participants.

Gas Processing & Pipeline Operators

We have contracted and delivered oil & gas solutions to customers in North America, Asia, and the Middle East for use in gas processing applications. Our target market consists of gas processing plants, pipeline substations and ammonia plants worldwide. Our IsoGen solution has been installed in a major gas processing plant in the Middle East.

In 2016, we received our first major purchase order for multiple units of our IsoBoost solution for integration into a major gas processing plant under construction in the Middle East. We completed and shipped the initial units to the Middle East in fourth quarter of 2018. In April 2017, we entered into a 10-year licensing agreement with Alderley FZE for our IsoBoost & IsoGen technologies in gas processing and pipeline applications within the countries of the Gulf Cooperation Council (“GCC”), as well as Iraq and Iran to the extent international sanctions and laws permit.

Competition

The landscape for our technology within the oil & gas market is competitive as the industry is continuously seeking ways to reduce costs and extend the life of assets used in the production or transportation of hydrocarbons. As demand for our products increases, we expect competition to intensify.

We believe our VorTeq technology represents a competitive advantage over existing missile manifold technology because our solution re-routes abrasive proppant away from high-pressure pumps and will provide OFS operators the option to transition to more robust, longer lived, centrifugal pumps thereby further decreasing operating and capital costs. While our VorTeq replaces a traditional manifold, the competitors to our VorTeq are the high-pressure frac pump manufacturers. There are a multitude of these pump manufacturers, including Gardner Denver, Inc., FMC Technologies, the Weir Group, Stewart & Stevenson and Forum Energy Technologies.

Similar to the VorTeq, the MTeq enhances the useful life of mud pumps and consumable pump components used in land drilling by re-routing the hostile drilling mud away from the high-pressure pumps and OFS operators have the option to transition to more robust, longer life, centrifugal pumps thereby further decreasing operating and capital costs. The competition to the MTeq is a more robust mud pump or more durable mud pump components. The primary manufacturers of mud pumps are National Oilwell Varco, Inc., Gardner Denver, Inc. and Cameron International Corporation.

Several companies manufacture competitive technology to the IsoGen, which primarily consists of reverse running pumps (also called hydraulic power recovery turbines or HPRTs) and perform a basic form of energy recovery. Manufacturers of reverse running pumps include, but are not limited to, Flowserve, Sulzer Pumps, Ltd., and Shin Nippon Machinery. Several companies manufacture hydraulic turbochargers, which could eventually develop into competitive technology to the IsoBoost. However, none of these companies that manufacture turbochargers have significant experience within gas processing. In order to utilize a turbocharger in gas processing, expertise is required to validate the system level design and integration within a gas processing application.

Sales and Marketing

In the oil & gas market, we target OFSs, IOCs, NOCs, E&Ps, OEMs or EPCs on behalf of oil producers and chemical producers who have applications for our solutions and services. We endeavor to limit capital sales into the oil & gas market, thereby minimizing installation and distribution costs, as well as associated sales and marketing expenses. As a result, our primary go-to-market strategy in the oil & gas market is through technology licensing as outlined in the Customer section of this overview.

A significant portion of our revenue is from outside of the U.S. Additional segment and geographical information regarding our product revenue is included in Note 14, "Geographical Information and Concentrations" of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

Operations

Our oil & gas product manufacturing, assembly, and testing has been historically managed through our operations in Ireland. In October 2018, these functions were transitioned to the U.S. branch of our Ireland operating company, which is resident in Malta. To produce our oil & gas products, we utilize multiple supply chain partners, in addition to our San Leandro manufacturing facility. We complete critical machining, assembly, and testing operations in-house to protect the proprietary nature of our manufacturing methods and product designs and to maintain premium quality standards. Our Ireland operations has also historically been responsible for overseeing the commercialization of the VorTeq. Likewise, in October 2018, this responsibility was transitioned to the U.S. branch of our Ireland operating company, which is tax resident in Malta.

Oil & gas field activities are conducted by our field operations organization, which also provides support to R&D activities leading to VorTeq and MTeq commercialization.

In January 2019, we signed a long-term lease for a new facility near Houston, Texas. This facility will consolidate our Texas Oil & Gas operations and allow us to test our VorTeq and MTeq technologies at scale and in real world conditions on a regular, uninterrupted basis. The facility will also house equipment to manufacture, machine, inspect and test tungsten carbide components in support of R&D and eventual commercialization.

Seasonality

In our Oil & Gas segment, we do not currently have enough history to determine seasonal revenue patterns.

Research and Development

Energy Recovery's focus on R&D is a key driver of the company's future evolution. When developing products, we seek four distinct process criteria: (1) high rates of fluid flow; (2) large pressure differentials; (3) hostile fluids; and (4) high degrees of capital intensity, specifically in the form of pumping and/or compression assets. Using these criteria, our product development strategy is to identify fluid flow applications where equipment is being destroyed or adversely affected and/or where pressure energy is being wasted. We maintain a product development road map, which guides R&D resource allocation across all business units. Our R&D team guides products through defined development stages with structured toll-gate reviews throughout the process.

The Company has invested significantly in R&D to support our product development strategy and has grown its R&D headcount by 45 percent since 2013. We maintain advanced testing capabilities at our headquarters in San Leandro, California and are building new testing facilities for oil & gas applications in Texas.

Our engineers specialize in a range of technical fields spanning the Company's core engineering competencies of fluid mechanics and aerodynamics, solid mechanics with expertise in computational fluid dynamics and finite element analysis, bearings design (roller-element, hydrostatic, and hydrodynamic), multi-phase flow, dynamics and controls, acoustics and vibrations, tribology, material science and coatings, pumps and turbines, aircraft engines, turbomachines, and rotating machinery.

We have invested in advanced numerical modeling and analytical tools that allow for 3D, multi-phase, multi-physics, and multi-scale computational fluid dynamics and fluid structure interactions. Leading-edge modeling and analytical techniques coupled with extensive experimental capabilities allow us to further refine our existing water and oil and gas technologies, as well as develop new derivatives of the PX pressure exchanger for complex systems and applications.

We have advanced testing capabilities in our San Leandro facility to test our PX Pressure Exchanger, Turbocharger, and pump technologies. We are building new testing facilities in Texas that will allow us to test our oil & gas products at full scale. In 2018, we made a sizable investment in high pressure frac equipment such as frac pumps, blenders, and other equipment to bolster our testing capabilities in Texas to advance our VorTeq and MTeq solutions.

Today our R&D investments are focused on (1) commercialization of our VorTeq and MTeq solutions; (2) advances to our existing PX pressure exchanger, turbocharger, and pump technologies to better service our water end markets; (3) development of new pump technologies in support of our water business; and (4) fundamental research into new applications of our PX pressure exchanger technology in existing and new verticals.

Intellectual Property

We seek patent protection for new technologies, inventions, and improvements that are likely to be incorporated into our solutions. We rely on patents, trade secret laws, and contractual safeguards to protect the proprietary tooling, processing techniques, and other know-how used in the production of our solutions. We have a robust intellectual property portfolio consisting of U.S. and international issued patents as well as pending patent applications.

We have registered the following trademarks with the United States Patent and Trademark office: "ERI," "PX," "PX Pressure Exchanger," "Pressure Exchanger," the Energy Recovery logo, "Making Desalination Affordable," "IsoBoost," and "IsoGen." Applications are pending for "VorTeq" and "MTeq." We have also applied for and received registrations in international trademark offices.

Employees

As of December 31, 2018, we had 143 employees: 52 in manufacturing; 30 in engineering, research and development; 33 in corporate services and management; and 28 in sales, service, and marketing. Fourteen of these employees were located outside of the United States. We also engage a relatively small number of independent contractors, primarily as sales agents worldwide. We have not experienced any work stoppages, and our employees are not unionized. We consider our relations with our employees to be good.

Additional Information

The Energy Recovery website is www.energyrecovery.com. We use the Investor Relations section of our website as a routine channel for distribution of important information, including news releases, presentations, and financial statements. We intend to use the Investor Relations section of our website as a means of complying with our disclosure obligations under Regulation FD. Accordingly, investors should monitor our Investor Relations website in addition to press releases, Securities and Exchange Commission (“SEC”) filings, and public conference calls and webcasts. Our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, all amendments to those reports, and the Proxy Statement for our Annual Meeting of Stockholders are made available, free of charge, in the Investor Relations section of our website, as soon as reasonably practicable after the reports have been filed with or furnished to the SEC. The information contained on our website or any other website is not part of this report nor is it considered to be incorporated by reference herein or with any other filing we make with the SEC. Our headquarters and primary manufacturing center is located at 1717 Doolittle Drive, San Leandro, California 94577, and our main telephone number is (510) 483-7370. The SEC maintains an internet site that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC and the address of that site (<http://www.sec.gov>).

Item 1A — Risk Factors

The following discussion sets forth what management currently believes could be the most significant risks and uncertainties that could impact our businesses, results of operations, and financial condition. Other risks and uncertainties, including those not currently known to the Company or its management, could also negatively impact our businesses, results of operations, and financial conditions. Accordingly, the following should not be considered a complete discussion of all of the risks and uncertainties the Company may face. We may amend or supplement these risk factors from time to time in other reports we file with the SEC.

Risk Related to our Water Segment

Our Water Segment depends on the construction of new desalination plants for revenue, and as a result, our operating results have experienced, and may continue to experience, significant variability due to volatility in capital spending, availability of project financing, and other factors affecting the water desalination industry.

We currently derive the majority of our revenue from sales of products and services used in desalination plants for municipalities, hotels, mobile containerized desalination solutions, resorts, and agricultural operations in dry or drought-ridden regions of the world. The demand for our Water segment products may decrease if the construction of desalination plants declines for political, economic, or other factors, especially in these dry or drought-ridden regions. Other factors that could affect the number and capacity of desalination plants built or the timing of their completion, include the availability of required engineering and design resources; a weak global economy; shortage in the supply of credit and other forms of financing; changes in government regulation, permitting requirements, or priorities; and reduced capital spending for desalination. Each of these factors could result in reduced or uneven demand for our Water segment products. Pronounced variability or delays in the construction of desalination plants or reductions in spending for desalination, could negatively impact our Water segment sales and revenue, which in turn could have an adverse effect on our entire business, financial condition, or results of operations and make it difficult for us to accurately forecast our future sales and revenue.

Our Water segment faces competition from a number of companies that offer competing energy recovery and pump solutions. If any one of these companies produces superior technology or offers more cost-effective products, our competitive position in the market could be harmed and our profits may decline.

The market for ERD and pumps for desalination plants is competitive and evolving. We expect competition, especially competition on price, to persist and intensify as the desalination market grows and new competitors enter the market. Some of our current and potential competitors may have significantly greater financial, technical, marketing, and other resources; longer operating histories; or greater name recognition. They may also have more extensive products and product lines that would enable them to offer multi-product or packaged solutions as well as competing products at lower prices or with other more favorable terms and conditions. As a result, our ability to sustain our market share may be adversely impacted, which would affect our business, operating results, and financial condition. In addition, if one of our competitors were to merge or partner with another company, the change in the competitive landscape could adversely affect our continuing ability to compete effectively.

If we are unable to collect unbilled receivables, which are caused in part by holdback provisions, our operating results could be adversely affected.

Our contracts with large engineering, procurement, and construction firms generally contain holdback provisions that typically delay final installment payments for our products by up to 24 months, after the product has been shipped and revenue has been recognized. Generally, 10% or less of the revenue we recognize pursuant to our customer contracts is subject to such holdback provisions and is accounted for as contract assets. Such holdbacks may result in relatively high unbilled receivables. If we are unable to collect these performance holdbacks, our results of operations would be adversely affected.

We depend on a limited number of suppliers for some of our components. If our suppliers are not able to meet our demand and/or requirements, our business could be harmed.

We rely on a limited number of suppliers for vessel housings, stainless steel ports, alumina powder, and tungsten carbide for our portfolio of PX ERDs and stainless steel castings and components for our turbochargers and pumps. Our reliance on a limited number of manufacturers for these supplies involves several risks, including reduced control over delivery schedules, quality assurance, manufacturing yields, production costs, and lack of guaranteed production capacity or product supply. We do not have long-term supply agreements with these suppliers but secure these supplies on a purchase order basis. Our suppliers have no obligation to supply products to us for any specific period, in any specific quantity, or at any specific price, except as set forth in a particular purchase order. Our requirements may represent a small portion of the total production capacities of these suppliers, and our suppliers may reallocate capacity to other customers, even during periods of high demand for our products. We have in the past experienced, and may in the future experience, product quality issues and delivery delays with our suppliers due to factors such as high industry demand or the inability of our vendors to consistently meet our quality or delivery requirements. If our suppliers were to cancel or materially change their commitments to us or fail to meet quality or delivery requirements needed to satisfy customer orders for our products, we could lose time-sensitive customer orders, be unable to develop or sell our products cost-effectively or on a timely basis, if at all, and have significantly decreased revenue, which could harm our business, operating results, and financial condition. We may qualify additional suppliers in the future, which would require time and resources. If we do not qualify additional suppliers, we may be exposed to increased risk of capacity shortages due to our dependence on current suppliers.

Risk Related to our Oil & Gas Segment

We may not be able to successfully commercialize the VorTeq.

In October 2015, we entered into the VorTeq License Agreement with the VorTeq Licensee, which provides the VorTeq Licensee with exclusive worldwide rights to our VorTeq technology for hydraulic fracturing onshore applications. Once the VorTeq is commercialized, the VorTeq Licensee will begin paying ongoing recurring royalty fees to us for the VorTeq technology. In order to commercialize the VorTeq, the VorTeq License Agreement provides, among other things, that we successfully meet certain specified milestones against key performance indicators set forth in the license agreement. The VorTeq is a relatively new technology and the hydraulic fracturing process is extremely complex, which presents a wide range of technological challenges for us. If we are unable to successfully solve these challenges and, as a result, fail to meet the milestones, we may not be able to successfully commercialize the VorTeq. In that circumstance, we will not receive any royalty payments from the VorTeq Licensee, which could have an adverse effect on our entire business, financial condition, or results of operation.

If the VorTeq Licensee fails to adopt the VorTeq, for any reason, we may not receive royalty payments or be able to successfully commercialize the VorTeq.

The successful commercialization of the VorTeq depends heavily on the VorTeq Licensee's support and ultimate adoption of the technology. If the VorTeq Licensee fails to adopt the VorTeq, for any reason, we may not be able to successfully commercialize the VorTeq with the VorTeq Licensee and consequently, we may not receive any royalties under the VorTeq License Agreement. In addition, we may not be able to find a suitable replacement for the VorTeq Licensee or be able to negotiate royalties similar to those contained in the VorTeq License Agreement or to commercialize the VorTeq at all. Failure to commercialize the VorTeq could have an adverse effect on our entire business, financial condition, or results of operation.

We may not meet the key performance indicators necessary to meet the two milestones in the VorTeq License Agreement

The VorTeq License Agreement calls for certain milestone key performance indicators that if met will result in payments to the Company of \$25 million for each of two milestones. Achievement of these milestones is uncertain, and while we believe we can meet the milestones, if we are unable to do so, the milestone payments will be delayed until such time as the milestones are met or may not be earned and received at all. Failure to meet said milestones may also jeopardize commercialization and the rate of adoption of our VorTeq.

We may not be able to successfully complete early stage testing of the MTeq, enter into a long term licensing agreement for the MTeq or fail to commercialize the MTeq.

We introduced the MTeq in 2017 and entered into a strategic early stage testing agreement in the second quarter of 2017. Like the VorTeq, we intend to find a long-term licensing partner for the MTeq and to ultimately commercialize the MTeq. Even if early stage testing proves to be successful, we may not be able to identify a licensing partner for the technology to assist us in bringing the MTeq solution to the market. If we were able to enter into such a licensing agreement, we may still fail to produce a viable commercialized solution given the complex and extreme conditions found in mud pumping, which present a wide range of technological challenges for us. If we are unable to successfully complete early stage testing, fail to locate and successfully negotiate a licensing or similar agreement with a long-term partner, or fail to solve any of the technological challenges, we may not be able to successfully commercialize the MTeq, which could have an adverse effect on our entire business, financial condition, or results of operation.

Our Oil & Gas segment may be impacted by prolonged deflation in global oil prices which may cause delays or cancellations of projects by Oil & Gas segment customers, negatively affecting the rate of our market penetration and consequently our revenue and profitability.

A deflationary oil environment may delay and even stall adoption and deployment of our products within our Oil & Gas segment including but not limited to the VorTeq as licensed for onshore applications by the VorTeq Licensee. Emerging market economies, those dependent on commodity exports, and especially those for whom oil exports make up a significant percent of total exports, may be unable to retrofit or expand their oil exploration, production, and gas processing infrastructure thus negatively impacting our addressable market and future revenue. Additionally, oil price deflation may continue to lead to widespread liquidity and insolvency issues for exploration, production, and processing customers, which may negatively affect our addressable markets and therefore our financial performance.

Risk Related to our Entire Business

Our diversification into new fluid flow markets, such as oil & gas, may not be successful

We have made a substantial investment in research, development, and sales to execute on our diversification strategy into fluid flow markets such as oil & gas and chemical processing. While we see diversification as core to our growth strategy, there is no guarantee that we will be successful in our efforts. Our model for growth is based in part on our ability to initiate and embrace disruptive technology trends, to enter new markets, both in terms of geographies and product areas, and to drive broad adoption of the products and services that we develop and market. Any inability to execute this model for growth could damage our reputation, limit our growth, and negatively affect our operation results. For example, while we believe that our products will enable gas processing plant operators to operate at a high level of energy efficiency with minimal downtime, we may be subject to warranty claims if customers of these offerings experience significant downtimes or failures for which our warranty reserves may be inadequate given the lack of historical failure rates associated with new product introductions. We also could be subject to damage claims based on our products, which we may not be able to properly insure. In addition, profitability, if any, in new industrial verticals may be lower than in our Water Segment, and we may not be sufficiently successful in our diversification efforts to recoup investments.

Our operating results may fluctuate significantly, making our future operating results difficult to predict and causing our operating results to fall below expectations.

Our operating results may fluctuate due to a variety of factors, many of which are outside of our control.

We have experienced significant fluctuations in revenue from quarter-to-quarter and year-to-year, and we expect such fluctuations to continue. In addition, in the past, customer buying patterns led to a significant portion of our sales occurring in the fourth quarter. This presents the risk that delays, cancellations, or other adverse events in the fourth quarter could have a substantial negative impact on annual results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Since it is difficult for us to anticipate our future results, in the event our revenue or operating results fall below the expectations of investors or securities analysts, our stock price may decline.

Our sales cycles can be long and unpredictable, and our sales efforts require considerable time and expense. As a result, our sales are difficult to predict and may vary substantially from quarter to quarter, which may cause our operating results to fluctuate.

Our sales efforts involve substantial education of our current and prospective customers about the use and benefits of our energy recovery products. This education process can be time-consuming and typically involves a significant product evaluation process which is particularly pronounced when dealing with product introduction into new fluid flow industrial verticals. In our Water segment, the sales cycle for our OEM customers, which are involved with smaller desalination plants, averages one to 12 months. The Water segment sales cycle for our international engineering, procurement, and construction firm customers, which are involved with larger desalination plants, ranges from 16 to 36 months. These long sales cycles make quarter-by-quarter revenue predictions difficult and results in our expending significant resources well in advance of orders for our products.

Our business entails significant costs that are fixed or difficult to reduce in the short term while demand for our products is variable and subject to fluctuation, which may adversely affect our operating results.

Our business requires investments in facilities, equipment, research and development, and training that are either fixed or difficult to reduce or scale in the short term. At the same time, the market for our products is variable and has experienced downturns due to factors such as economic recessions, increased precipitation, uncertain global financial markets, and political changes, many of which are outside of our control. During periods of reduced product demand, we may experience higher relative costs and excess manufacturing capacity, resulting in high overhead and lower gross profit margins while causing cash flow and profitability to decline. Similarly, although we believe that our existing manufacturing facilities are capable of meeting current demand and demand for the foreseeable future, the continued success of our business depends on our ability to expand our manufacturing, research and development, and testing facilities to meet market needs. If we are unable to respond timely to an increase in demand, our revenue, gross profit margin, net income, and cash flow may be adversely affected.

Parts of our inventory may become excess or obsolete, which would increase our cost of revenues.

Inventory of raw materials, parts, components, work in-process, or finished products may accumulate, and we may encounter losses due to a variety of factors, including technological change in the water desalination and oil & gas industries that result in product changes; long delays in shipment of our products or order cancellations; our need to order raw materials that have long lead times and our inability to estimate exact amounts and types of items needed, especially with regard to the configuration of our high-efficiency pumps and IsoBoost and IsoGen systems; and cost reduction initiatives resulting in component changes within the products.

In addition, we may from time to time purchase more inventory than is immediately required in order to shorten our delivery time in case of an anticipated increase in demand for our products. If we are unable to forecast demand for our products with a reasonable degree of certainty and our actual orders from our customers are lower than these forecasts, we may accumulate excess inventory that we may be required to write off, and our business, financial condition, and results of operations could be adversely affected.

We may not generate positive returns on our research and development strategy

Developing our products is expensive and the investment in product development may involve a long payback cycle. For the years ended December 31, 2018, 2017 and 2016, our R&D expenses were \$17.0 million, or approximately 23% of our total revenue, \$13.4 million, or approximately 19% of our total revenue, and \$10.1 million, or approximately 18% of our total revenue, respectively. We believe one of our greatest strengths lies in our innovation and our product development efforts. By investing in R&D, we believe we are well positioned to continue to execute on our product strategy, take into consideration our customers' cost and efficiency sensitivities and take advantage of other market opportunities. We expect that our results of operations may be impacted by the timing and size of these investments. In addition, these investments may take several years to generate positive returns, if ever.

We are subject to risks related to product defects, which could lead to warranty claims in excess of our warranty provision or result in a significant or a large number of warranty or other claims in any given year.

We provide a warranty for certain products for a period of 18 to 30 months and provide up to a five-year warranty for the ceramic components of our PX-branded products. We test our products in our manufacturing facilities through a variety of means; however, there can be no assurance that our testing will reveal latent defects in our products, which may not become apparent until after the products have been sold into the market. The testing may not replicate the harsh, corrosive, and varied conditions of the desalination and other plants in which they are installed. It is also possible that components purchased from our suppliers could break down under those conditions. Certain components of our turbochargers and pumps are custom-made and may not scale or perform as required in production environments. Accordingly, there is a risk that we may have significant warranty claims or breach supply agreements due to product defects. We may incur additional cost of revenue if our warranty provisions are not sufficient to cover the actual cost of resolving issues related to defects in our products. If these additional expenses are significant, they could adversely affect our business, financial condition, and results of operations.

Business interruptions may damage our facilities or those of our suppliers.

Our operations and those of our suppliers may be vulnerable to interruption by fire, earthquake, flood, and other natural disasters, as well as power loss, telecommunications failure, and other events beyond our control. Our facilities in California are located near major earthquake faults and have experienced earthquakes in the past. If a natural disaster occurs, our ability to conduct our operations could be seriously impaired, which could harm our business, financial condition, results of operations, and cash flows. We cannot be sure that the insurance we maintain against general business interruptions will be adequate to cover all of our losses.

If we are unable to protect our technology or enforce our intellectual property rights, our competitive position could be harmed, and we could be required to incur significant expenses to enforce our rights.

Our competitive position depends on our ability to establish and maintain proprietary rights in our technology and to protect our technology from copying by others. We rely on trade secret, patent, copyright, and trademark laws, as well as confidentiality agreements with employees and third parties, all of which may offer only limited protection. We hold a number of U.S. and counterpart international patents, and when their terms expire, we could become more vulnerable to increased competition. The protection of our intellectual property in some countries may be limited. While we have expanded our portfolio of patent applications, we do not know whether any of our pending patent applications will result in the issuance of patents or whether the examination process will require us to narrow our claims, and even if patents are issued, they may be contested, circumvented, or invalidated. Moreover, while we believe our issued patents and patent pending applications are essential to the protection of our technology, the rights granted under any of our issued patents or patents that may be issued in the future may not provide us with proprietary protection or competitive advantages, and as with any technology, competitors may be able to develop similar or superior technologies now or in the future. In addition, our granted patents may not prevent misappropriation of our technology, particularly in foreign countries where intellectual property laws may not protect our proprietary rights as fully as those in the United States. This may render our patents impaired or useless and ultimately expose us to currently unanticipated competition. Protecting against the unauthorized use of our products, trademarks, and other proprietary rights is expensive, difficult, and in some cases, impossible. Litigation may be necessary in the future to enforce or defend our intellectual property rights or to determine the validity and scope of the proprietary rights of others. Intellectual property litigation could result in substantial costs and diversion of management resources, either of which could harm our business.

Claims by others that we infringe their proprietary rights could harm our business.

Third parties could claim that our technology infringes their intellectual property rights. In addition, we or our customers may be contacted by third parties suggesting that we obtain a license to certain of their intellectual property rights that they may believe we are infringing. We expect that infringement claims against us may increase as the number of products and competitors in our market increases and overlaps occur. In addition, to the extent that we gain greater visibility, we believe that we will face a higher risk of being the subject of intellectual property infringement claims. Any claim of infringement by a third party, even those without merit, could cause us to incur substantial costs defending against the claim and could distract management from our business. Furthermore, a party making such a claim, if successful, could secure a judgment that requires us to pay substantial damages. A judgment against us could also include an injunction or other court order that could prevent us from offering our products. In addition, we might be required to seek a license for the use of such intellectual property, which may not be available on commercially reasonable terms, or at all. Alternatively, we may be required to develop non-infringing technology, which could require significant effort and expense and may ultimately not be successful. Any of these events could seriously harm our business. Third parties may also assert infringement claims against our customers. Because we generally indemnify our customers if our products infringe the proprietary rights of third parties, any such claims would require us to initiate or defend protracted and costly litigation on their behalf in one or more jurisdictions, regardless of the merits of these claims. If any of these claims succeed, we may be forced to pay damages on behalf of our customers.

We are currently involved in legal proceedings, and may be subject to additional future legal proceedings, that may result in material adverse outcomes.

In addition to the intellectual property litigation risks discussed above, we are presently involved, and may become involved in the future, in various commercial and other disputes as well as related claims and legal proceedings that arise from time to time in the course of our business. See Note 16, "Litigation," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for information about certain legal proceedings in which we are involved. Our current legal proceedings and any future lawsuits to which we may become a party are and will likely be expensive and time consuming to investigate, defend and resolve, and will divert our management's attention. Any litigation to which we are a party may result in an onerous or unfavorable judgment that may not be reversed upon appeal or in payments of substantial monetary damages or fines, or we may decide to settle lawsuits on similarly unfavorable terms, which could have an adverse effect on our business, financial condition, or results of operations.

Our global operations expose us to risks and challenges associated with conducting business internationally, and our results of operations may be adversely affected by our efforts to comply with the laws of other countries, as well as U.S. laws which apply to international operations, such as the Foreign Corrupt Practices Act (FCPA) and U.S. export control laws.

We operate on a global basis with offices or activities in Europe, Africa, Asia, South America, and North America. We face risks inherent in conducting business internationally, including compliance with international and U.S. laws and regulations that apply to our international operations. These laws and regulations include tax laws, anti-competition regulations, import and trade restrictions, export control laws, and laws which prohibit corrupt payments to governmental officials or certain payments or remunerations to customers, including the U.S. Foreign Corrupt Practices Act ("FCPA") or other anti-corruption laws that have recently been the subject of a substantial increase in global enforcement. Many of our products are subject to U.S. export law restrictions that limit the destinations and types of customers to which our products may be sold, or require an export license in connection with sales outside the United States. Given the high level of complexity of these laws, there is a risk that some provisions may be inadvertently or intentionally breached, for example through fraudulent or negligent behavior of individual employees, our failure to comply with certain formal documentation requirements, or otherwise. Also, we may be held liable for actions taken by our local dealers and partners. Violations of these laws and regulations could result in fines, criminal sanctions against us, our officers or our employees, and prohibitions or conditions on the conduct of our business. Any such violations could include prohibitions or conditions on our ability to offer our products in one or more countries and could materially damage our reputation, our brand, our business, and our operating results. In addition, we operate in many parts of the world that have experienced significant governmental corruption to some degree and, in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. We may be subject to competitive disadvantages to the extent that our competitors are able to secure business, licenses, or other preferential treatment by making payments to government officials and others in positions of influence or through other methods that relevant law and regulations prohibit us from using. Our success depends, in part, on our ability to anticipate these risks and manage these difficulties. These factors or any combination of these factors may adversely affect our revenue or our overall financial performance.

Uncertainty in the global geopolitical landscape may impact our operations outside the United States.

There is uncertainty as to the position the United States will take with respect to world affairs. This uncertainty may include such issues as U.S. support for existing treaty and trade relationships with other countries, including, notably, China. This uncertainty, together with other recent key global events (such as recently enacted currency control regulations and tariff regimes in or against China, the continuing uncertainty arising from the Brexit referendum in the United Kingdom as well as ongoing terrorist activity, and potential hostilities in the Middle East) may adversely impact (i) the ability or willingness of non-U.S. companies to transact business in the United States, including with us, (ii) our ability to transact business in other countries, including the Middle East, where many of the water mega-projects are planned, (iii) regulation and trade agreements affecting U.S. companies, (iv) global stock markets (including The Nasdaq Global Market on which our common shares are traded), and (v) general global economic conditions. All of these factors are outside of our control, but may nonetheless cause us to adjust our strategy in order to compete effectively in global markets.

Acts of War or Terrorism

Threats or acts of war or terrorism can adversely affect our business. Terrorist attacks in the United States, Europe and in other countries and continuing hostilities in the Middle East and elsewhere have created significant instability and uncertainty in the world. These and future events may have a material adverse effect on world financial markets as well as the water industry, as many large existing and planned water desalination plants are located in the Middle East. In addition, threats or acts of war or terrorism can cause our customers to curtail their purchase of our products. These factors or any combination of these factors may adversely affect our revenue or our overall financial performance.

The U.S. Congress and Trump Administration may make substantial changes to fiscal, political, regulation and other federal policies that may adversely affect our business, financial condition, operating results and cash flows.

Changes in general economic or political conditions in the United States or other regions could adversely affect our business. There have been and may be significant changes in, and uncertainty with respect to, legislation, regulation and government policy. While it is not possible to predict whether and when any such changes will occur, changes at the local, state or federal level could impact our business. Specific legislative and regulatory proposals that could have a material impact on us include, but are not limited to, modifications to international trade policy; public company reporting requirements; and environmental regulation.

Additionally, on July 6, 2018, the Trump Administration imposed 25% tariffs on a variety of imports from China, including certain components imported into the U.S. for our manufacturing activities. The Administration subsequently imposed tariffs on two additional lists of products from China; the first of these additional lists involves 25% tariffs and the second list imposes 10% tariffs, which were originally scheduled to increase to 25% on January 1, 2019. On November 19, 2018, the U.S. Bureau of Industry and Security proposed export control rules on emerging technologies for public comment.

China responded to the multiple U.S. tariff lists by announcing several lists of products from the U.S. that are subject to additional tariffs upon import to China. The first round of Chinese retaliatory tariffs went into effect on July 6, 2018, and a second set was implemented on August 23, 2018. Our products are not impacted by these tariffs. A third group of items subject to 5 to 10% tariff went into effect on September 24, 2018, which includes our PX Pressure Exchanger, Turbocharger, and pump products. On December 2, 2018, the U.S. and China agreed to refrain from increasing tariffs or imposing new tariffs until March 1, 2019. On February 24, 2019, President Trump announced via Twitter that he will be delaying increases in tariffs due to recent progress in trade talks.

We cannot predict what actions may ultimately be taken with respect to tariffs or trade relations between the United States and other countries, what products may be subject to such actions, or what actions may be taken by the other countries in retaliation. Accordingly, it is difficult to predict how such actions may impact our business, or the business of our customers. Our business operations, as well as the businesses of our customers on which we are substantially dependent, are located in various countries at risk for escalating trade disputes, including the United States and China. Any resulting trade wars could have a significant adverse effect on world trade and could adversely impact our revenues, gross margins and business operations.

Regulations related to conflict minerals could adversely impact our business.

The Dodd-Frank Wall Street Reform and Consumer Protection Act contains provisions to improve transparency and accountability concerning the supply of certain minerals, known as conflict minerals, originating from the Democratic Republic of Congo (“DRC”) and adjoining countries. As a result, in August 2012, the SEC adopted annual disclosure and reporting requirements for those companies who use conflict minerals mined from the DRC and adjoining countries in their products. Based on our purchasing policy and supplier selection, it is considered unlikely that any conflict minerals are used in the manufacturing of our products. Nevertheless, we are continuing reasonable country of origin inquiry and have implemented a program of due diligence on the source and chain of custody for conflict minerals. There are costs associated with complying with these disclosure requirements, including loss of customers and potential changes to products, processes, or sources of supply. The implementation of these rules could adversely affect the sourcing, supply, and pricing of materials used in our products. As there may be only a limited number of suppliers offering “conflict free” minerals, we cannot be sure that we will be able to obtain necessary materials from such suppliers in sufficient quantities or at competitive prices. Also, we may face reputational challenges if we determine that certain of our products contain minerals not determined to be conflict-free or if we are unable to sufficiently verify the origins for all conflict minerals used in our products through the procedures we have implemented.

We may have risks associated with security of our information technology systems.

We make significant efforts to maintain the security and integrity of our information technology systems and data. Despite significant efforts to create security barriers to such systems, it is virtually impossible for us to entirely mitigate this risk. There is a risk of industrial espionage, cyber-attacks, misuse or theft of information or assets, or damage to assets by people who may gain unauthorized access to our facilities, systems, or information. Such cybersecurity breaches, misuse, or other disruptions could lead to the disclosure of confidential information, improper usage and distribution of our intellectual property, theft, manipulation and destruction of private and proprietary data, and production downtimes. Although we actively employ measures to prevent unauthorized access to our information systems, preventing unauthorized use or infringement of our rights is inherently difficult. These events could adversely affect our financial results and any legal action in connection with any such cybersecurity breach could be costly and time-consuming and may divert management’s attention and adversely affect the market’s perception of us and our products. In addition, we must frequently expand our internal information system to meet increasing demand in storage, computing and communication, which may result in increased costs. Our internal information system is expensive to expand and must be highly secure due to the sensitive nature of our customers’ information that we transmit. Building and managing the support necessary for our growth places significant demands on our management and resources. These demands may divert these resources from the continued growth of our business and implementation of our business strategy.

We may have risks associated with our international tax optimization structure

In 2015, we implemented an international tax optimization structure. While the Company continues to conclude that uncertain tax positions are unlikely, it is possible that the international tax structure could be examined by the Internal Revenue Service in the U.S. and/or the Tax Authorities in Ireland, and it is possible that such an examination could result in an unfavorable impact on us.

The enactment of legislation implementing changes in taxation of international business activities, the adoption of other corporate tax reform policies, or changes in tax legislation or policies could materially impact our financial position and results of operations.

Corporate tax reform, base-erosion efforts and tax transparency continue to be high priorities in many tax jurisdictions where we have business operations. As a result, policies regarding corporate income and other taxes in numerous jurisdictions are under heightened scrutiny and tax reform legislation is being proposed or enacted in a number of jurisdictions. For example, on December 22, 2017, President Trump signed into law “H.R.1”, known as the “Tax Cuts and Jobs Act”, (the “Tax Act”), which significantly changes existing U.S. tax laws.

In addition, many countries are beginning to implement legislation and other guidance to align their international tax rules with the Organisation for Economic Co-operation's Base Erosion and Profit Shifting recommendations and action plan that aim to standardize and modernize global corporate tax policy, including changes to cross-border tax, transfer-pricing documentation rules, and nexus-based tax incentive practices. As a result of the heightened scrutiny of corporate taxation policies, prior decisions by tax authorities regarding treatments and positions of corporate income taxes could be subject to enforcement activities, and legislative investigation and inquiry, which could also result in changes in tax policies or prior tax rulings. Any such changes in policies or rulings may also result in the taxes we previously paid being subject to change.

Due to the scale of our international business activities any substantial changes in international corporate tax policies, enforcement activities or legislative initiatives may materially and adversely affect our business, the amount of taxes we are required to pay and our financial condition and results of operations generally.

If we need additional capital to fund future growth, it may not be available on favorable terms, or at all.

Our primary source of cash historically has been customer payments for our products and services and proceeds from the issuance of common stock. This has funded our operations and capital expenditures. We may require additional capital from equity or debt financing in the future to fund our operations or respond to competitive pressures or strategic opportunities, such as a potential acquisition or the expansion of operations. We may not be able to secure such additional financing on favorable terms or at all. The terms of additional financing may place limits on our financial and operational flexibility. If we raise additional funds through further issuances of equity, convertible debt securities, or other securities convertible into equity, our existing stockholders could suffer significant dilution in their percentage ownership of our company, and any new securities that we issue could have rights, preferences, or privileges senior to those of existing or future holders of our common stock. If we are unable to obtain necessary financing on terms satisfactory to us, if and when we require it, our ability to grow or support our business and to respond to business challenges or opportunities could be significantly limited.

We may seek to expand through acquisitions of and investments in other businesses, technologies, and assets. These acquisition activities may be unsuccessful or divert management's attention.

We may consider strategic and complementary acquisitions of and investments in other businesses, technologies, and assets, and such acquisitions or investments are subject to risks that could affect our business, including risks related to:

- the necessity of coordinating geographically disparate organizations;
- implementing common systems and controls;
- integrating personnel with diverse business and cultural backgrounds;
- integrating acquired research and manufacturing facilities, technology and products;
- combining different corporate cultures and legal systems;
- unanticipated expenses related to integration, including technical and operational integration;
- increased costs and unanticipated liabilities, including with respect to registration, environmental, health and safety matters, that may affect sales and operating results;
- retaining key employees;
- obtaining required government and third-party approvals;
- legal limitations in new jurisdictions;
- installing effective internal controls and audit procedures;
- issuing common stock that could dilute the interests of our existing stockholders;
- spending cash and incurring debt;
- assuming contingent liabilities; and
- creating additional expenses.

We may not be able to identify opportunities or complete transactions on commercially reasonable terms, or at all, or actually realize any anticipated benefits from such acquisitions or investments. Similarly, we may not be able to obtain financing for acquisitions or investments on attractive terms. If we do complete acquisitions, we cannot ensure that they will ultimately strengthen our competitive or financial position or that they will not be viewed negatively by customers, financial markets, investors, or the media. In addition, the success of any acquisitions or investments also will depend, in part, on our ability to integrate the acquisition or investment with our existing operations.

The integration of businesses that we may acquire is likely to be a complex, time-consuming, and expensive process and we may not realize the anticipated revenues or other benefits associated with our acquisitions if we fail to successfully manage and operate the acquired business. If we fail in any acquisition integration efforts and are unable to efficiently operate as a combined organization utilizing common information and communication systems, operating procedures, financial controls, and human resources practices, our business, financial condition, and results of operations may be adversely affected.

In connection with certain acquisitions, we may agree to issue common stock or assume equity awards that dilute the ownership of our current stockholders, use a substantial portion of our cash resources, assume liabilities, record goodwill and amortizable intangible assets that will be subject to impairment testing on a regular basis and potential periodic impairment charges, incur amortization expenses related to certain intangible assets, and incur large and immediate write-offs and restructuring and other related expenses, all of which could harm our financial condition and results of operations.

Our actual operating results may differ significantly from our guidance

We release guidance in our quarterly earnings conference calls, quarterly earnings releases, or otherwise, regarding our future performance that represents our management's estimates as of the date of release. This guidance, which includes forward-looking statements, will be based on projections prepared by our management. These projections will not be prepared with a view toward compliance with published guidelines of the American Institute of Certified Public Accountants, and neither our registered public accountants nor any other independent expert or outside party compiles or examines the projections. Accordingly, no such person will express any opinion or any other form of assurance with respect to the projections.

Projections are based upon a number of assumptions and estimates that, while presented with numerical specificity, are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond our control and are based upon specific assumptions with respect to future business decisions, some of which will change. We will continue to state possible outcomes as high and low ranges which are intended to provide a sensitivity analysis as variables are changed but are not intended to imply that actual results could not fall outside of the suggested ranges. The principal reason that we release guidance is to provide a basis for our management to discuss our business outlook with analysts and investors. We do not accept any responsibility for any projections or reports published by any such third parties.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions underlying the guidance furnished by us will not materialize or will vary significantly from actual results. Accordingly, our guidance is only an estimate of what management believes is realizable as of the date of release. Actual results may vary from our guidance and the variations may be material. In light of the foregoing, investors are urged not to rely upon our guidance in making an investment decision regarding our common stock.

Any failure to successfully implement our operating strategy or the occurrence of any of the events or circumstances set forth in this "Risk Factors" section in this Annual Report on Form 10-K could result in the actual operating results being different from our guidance and the differences may be adverse and material.

Insiders and principal stockholders will likely have significant influence over matters requiring stockholder approval.

Our directors, executive officers, and other principal stockholders beneficially own, in the aggregate, a substantial amount of our outstanding common stock. These stockholders could likely have significant influence over all matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions such as a merger or other sale of our company or its assets.

The market price of our common stock may continue to be volatile.

The market price of our common stock has been, and is likely to continue to be, volatile and subject to fluctuations. Changes in the stock market generally, as it concerns our industry, as well as geopolitical, economic, and business factors unrelated to us, may also affect our stock price. Significant declines in the market price of our common stock or failure of the market price to increase could harm our ability to recruit and retain key employees, reduce our access to debt or equity capital, and otherwise harm our business or financial condition. In addition, we may not be able to use our common stock effectively as consideration in connection with any future acquisitions.

Anti-takeover provisions in our charter documents and under Delaware law could discourage, delay, or prevent a change in control of our company and may affect the trading price of our common stock.

Provisions in our amended and restated certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control or changes in our management. Our amended and restated certificate of incorporation and amended and restated bylaws include provisions that:

- authorize our Board of Directors to issue, without further action by the stockholders, up to 10,000,000 shares of undesignated preferred stock;
- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our Board of Directors, the chairman of the board, the chief executive officer, or the president;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our Board of Directors;
- establish that our Board of Directors is divided into three classes, Class I, Class II, and Class III, with each class serving staggered terms;
- provide that our directors may be removed only for cause;
- provide that vacancies on our Board of Directors may be filled only by a majority vote of directors then in office, even though less than a quorum;
- specify that no stockholder is permitted to cumulate votes at any election of directors; and
- require a super-majority of votes to amend certain of the above-mentioned provisions.

In addition, we are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. Section 203 generally prohibits us from engaging in a business combination with an interested stockholder subject to certain exceptions.

Changes in United States Generally Accepted Accounting Principles (“GAAP”) could adversely affect our financial results and may require significant changes to our internal accounting systems and processes.

We prepare our consolidated financial statements in conformity with GAAP. These principles are subject to interpretation by the Financial Accounting Standards Board (“FASB”), the SEC and various bodies formed to interpret and create appropriate accounting principles and guidance. The FASB periodically issues new accounting standards on a variety of topics. For information regarding new accounting standards, please refer to Note 2 of Notes to Consolidated Financial Statements under the heading “Note 2 - Recent Accounting Pronouncements.” These and other such standards generally result in different accounting principles, which may significantly impact our reported results or could result in variability of our financial results.

In preparing our financial statements we make certain assumptions, judgments and estimates that affect amounts reported in our consolidated financial statements, which, if not accurate, may significantly impact our financial results.

We make assumptions, judgments and estimates for a number of items, including the fair value of financial instruments, goodwill, long-lived assets and other intangible assets, the realizability of deferred tax assets, the recognition of revenue and the fair value of stock awards. We also make assumptions, judgments and estimates in determining the accruals for employee-related liabilities, including commissions and variable compensation, and in determining the accruals for uncertain tax positions, valuation allowances on deferred tax assets, allowances for doubtful accounts, and legal contingencies. These assumptions, judgments and estimates are drawn from historical experience and various other factors that we believe are reasonable under the circumstances as of the date of the consolidated financial statements. Actual results could differ materially from our estimates, and such differences could significantly impact our financial results.

Our business could be negatively affected as a result of actions of activist shareholders, and such activism could impact the trading value of our securities.

In recent years, shareholder activists have become involved in numerous public companies. Shareholder activists frequently propose to involve themselves in the governance, strategic direction and operations of the Company. Such proposals may disrupt our business and divert the attention of our Board of Directors and our management and employees, and any perceived uncertainties as to our future direction resulting from such a situation could result in the loss of potential business opportunities, interfere with our ability to execute our strategic plan be exploited by our competitors, cause concern to our current or potential customers, and make it more difficult to attract and retain qualified personnel and business partners, all of which could adversely affect our business. A proxy contest for the election of directors at our annual meeting could also require us to incur significant legal fees and proxy solicitation expenses. In addition, actions of activist shareholders may cause significant fluctuations in our stock price based on temporary or speculative market perceptions or other factors that do not necessarily reflect the underlying fundamentals and prospects of our business.

Item 1B — Unresolved Staff Comments

None

Item 2 — Properties

We lease approximately 171,000 square feet of space in San Leandro, California for product manufacturing, research and development, and executive headquarters under a lease that expires on January 1, 2029. We believe that this facility will be adequate for our purposes for the foreseeable future. Additionally, we lease offices in Dubai, United Arab Emirates; Shanghai, Peoples Republic of China; Houston, Texas and on January 10, 2019, we entered into an industrial lease agreement in Katy, Texas.

Item 3 — Legal Proceedings

See Note 16, "Litigation," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K, which is incorporated by reference into this Item 3, for a description of the lawsuits pending against us.

Item 4 — Mine Safety Disclosures

Not applicable.

PART II

Item 5 — Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Our common stock is quoted on the NASDAQ Stock Market under the symbol “ERII.”

Stockholders

As of December 31, 2018, there were approximately 38 stockholders of record of our common stock as reported by our transfer agent, one of which is Cede & Co., a nominee for Depository Trust Company (“DTC”). All of the shares of common stock held by brokerage firms, banks, and other financial institutions as nominees for beneficial owners are deposited into participant accounts at DTC and are therefore considered to be held of record by Cede & Co. as one stockholder.

Dividend Policy

We have never declared or paid any dividends on our common stock, and we do not currently intend to pay any dividends on our common stock for the foreseeable future. Any future determination to pay dividends on our common stock will be, subject to applicable law, at the discretion of our Board of Directors, and will depend upon, among other factors, our results of operations, financial condition, capital requirements, and contractual restrictions in loan or other agreements.

Stock Repurchase Program

On March 7, 2018, our Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, may repurchase up to \$10.0 million in aggregate cost of our outstanding common stock (“March 2018 Authorization”). Under the repurchase program, purchases of shares of common stock may be made from time to time in the open market, or in privately negotiated transactions, in compliance with applicable state and federal securities laws. The timing and amounts of any purchases will be based on market conditions and other factors including price, regulatory requirements, and capital availability. The share buyback program does not obligate us to acquire any specific number of shares in any period, and may be expanded, extended, modified or discontinued at any time without prior notice. Under the March 2018 Authorization, as of December 31, 2018, the Company repurchased 1,193,102 shares at an aggregate cost of \$10.0 million. The March 2018 Authorization expired in September 2018 and there was no repurchase authorization in place at December 31, 2018. The Company accounts for stock repurchases using the cost method. The aggregate cost includes fees charged in connection with acquiring the outstanding common stock.

In March 2017, our Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, could repurchase up to \$15.0 million in aggregate cost of our outstanding common stock through September 30, 2017 (the “March 2017 Authorization”). At December 31, 2017, 541,177 shares, at an aggregate cost of \$4.3 million, had been repurchased under the March 2017 Authorization.

Sales of Unregistered Securities

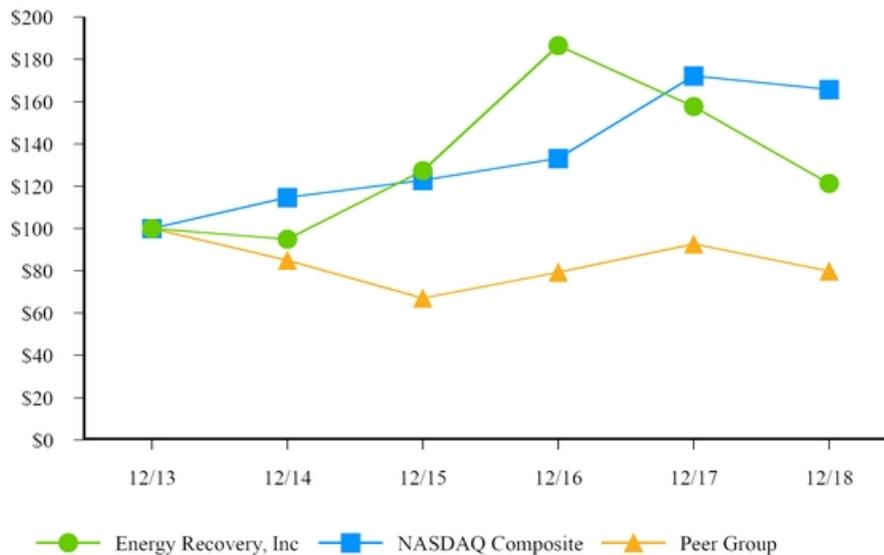
None

Stock Performance Graph

The following graph shows the cumulative total stockholder return of an investment of \$100 on December 31, 2013 in (i) our common stock, (ii) the NASDAQ Composite Index, and (iii) common stock of a selected group of peer issuers (“Peer Group”). Cumulative total return assumes the reinvestment of dividends, although dividends have never been declared on our stock, and is based on the returns of the component companies, weighted according to their capitalizations as of the end of each quarterly period. The NASDAQ Composite Index tracks the aggregate price performance of equity securities traded on the NASDAQ. The Peer Group tracks the weighted average price performance of equity securities of seven companies in our industry: Consolidated Water Co. Ltd.; Flowserve Corp.; Hyflux Ltd.; Kurita Water Industries Ltd.; Pentair PLC; Tetra Tech, Inc.; and The Gorman-Rupp Company. The return of each component issuer of the Peer Group is weighted according to the respective issuer’s stock market capitalization at the end of each period for which a return is indicated. Our stock price performance shown in the graph below is not indicative of future stock price performance.

The following graph and its related information is not “soliciting material,” is not deemed “filed” with the Securities and Exchange Commission, and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended or the Securities Exchange Act of 1934, as amended, whether made before or after the date hereof and irrespective of any general incorporation language contained in such filing.

COMPARISON OF FIVE-YEAR CUMULATIVE TOTAL RETURN *
Among Energy Recovery Inc., The NASDAQ Composite Index,
And A Peer Group



* Graph represents the value of \$100 invested on December 31, 2013 in stock or index, including reinvestment of dividends as of the year ending December 31.

	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018
Energy Recovery, Inc.	\$ 100.00	\$ 94.95	\$ 127.39	\$ 186.49	\$ 157.66	\$ 121.26
NASDAQ Composite Index	100.00	114.62	122.81	133.19	172.11	165.84
Peer Group	100.00	84.98	67.02	79.31	92.57	79.84

Item 6 — Selected Financial Data

The following selected financial data should be read in conjunction with Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and Part II, Item 8, “Financial Statements and Supplementary Data,” included in this Annual Report on Form 10-K.

	Years Ended December 31,				
	2018	2017 (1)	2016 (1)	2015 (2)	2014 (2)
<i>(In thousands, except per share amounts)</i>					
Consolidated Statements of Operations Data:					
Product revenue	\$ 61,025	\$ 58,023	\$ 49,715	\$ 43,671	\$ 30,426
Product cost of revenue	17,873	19,061	17,849	19,111	13,713
Product gross profit	43,152	38,962	31,866	24,560	16,713
License and development revenue	13,490	11,106	8,069	1,042	—
Operating expenses:					
General and administrative	21,476	17,354	16,626	19,773	14,139
Sales and marketing	7,546	9,391	9,116	9,326	10,525
Research and development	17,012	13,443	10,136	7,659	9,690
Amortization of intangible assets	630	631	631	635	842
Total operating expenses	46,664	40,819	36,509	37,393	35,196
Income (loss) from operations	9,978	9,249	3,426	(11,791)	(18,483)
Other income (expense), net	1,462	680	287	(181)	69
Income (loss) before income taxes	11,440	9,929	3,713	(11,972)	(18,414)
(Benefit from) provision for income taxes	(10,653)	(8,425)	(6)	(334)	291
Net income (loss)	\$ 22,093	\$ 18,354	\$ 3,719	\$ (11,638)	\$ (18,705)
Income (loss) per share:					
Basic	\$ 0.41	\$ 0.34	\$ 0.07	\$ (0.22)	\$ (0.36)
Diluted	\$ 0.40	\$ 0.33	\$ 0.07	\$ (0.22)	\$ (0.36)
Number of shares used in per share calculation:					
Basic	53,764	53,701	52,341	52,151	51,675
Diluted	55,338	55,612	55,451	52,151	51,675

(1) Due to the full retrospective adoption of Accounting Standards Update (“ASU”) No. 2014-09 (“ASU 2014-09”), *Revenue from Contracts with Customers (Topic 606)*, referred to as Accounting Standards Codification (“ASC”) 606 (“ASC 606”) the balances for the years ended 2017 and 2016 are recast. See Note 2, “Recent Accounting Pronouncements” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data” of this Annual Report on Form 10-K.

(2) The 2015 and the 2014 numbers in this financial data have not been recast for ASC 606 adoption. The impact of ASC 606 for periods prior to 2016 was included as a one-time adjustment to 2016 beginning balance retained earnings.

	As of December 31,				
	2018	2017 (1) (3)	2016 (2)	2015 (4)	2014 (4)
	<i>(In thousands)</i>				
Consolidated Balance Sheets Data:					
Cash and cash equivalents	\$ 21,955	\$ 27,780	\$ 61,364	\$ 99,931	\$ 15,501
Short-term investments	73,338	70,020	39,073	257	13,072
Long-term investments	1,269	—	—	—	267
Total assets	179,841	164,485	\$ 148,679	151,799	85,941
Long-term liabilities	39,331	42,231	57,307	72,116	4,501
Total liabilities	66,463	72,591	80,571	88,140	16,023
Total stockholders' equity	113,378	91,894	68,108	63,659	69,918

(1) Due to the full retrospective adoption of ASC 606 the balances for the year ended 2017 re recast. See Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K.

(2) Due to the full retrospective adoption of ASC 606 the balances for the year ended 2016 are recast.

(3) Due to the modified retrospective adoption of ASU No. 2016-02 ("ASU 2016-02"), Leases (Topic 842) the balances for the year ended 2017 are recast. See Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K.

(4) The 2015 and the 2014 numbers in this financial data have not been recast for ASC 606 adoption. The impact of ASC 606 for periods prior to 2016 was included as a one time adjustment to 2016 beginning balance retained earnings.

Item 7 — Management’s Discussion and Analysis of Financial Condition and Results of Operations

The following Management Discussion and Analysis of Financial Condition and Results of Operations is intended to help the reader understand our results of operations and financial condition. It should be read in conjunction with the Consolidated Financial Statements and related Notes included in Part II, Item 8, “Financial Statements and Supplementary Data,” in this Annual Report on Form 10-K.

Overview

Energy Recovery, Inc. (the “Company”, “Energy Recovery”, “we”, “our” and “us”) (NASDAQ: ERII) is an engineering-driven technology company that engineers, designs, manufactures and supplies solutions for industrial fluid flow processes. The Company offers technologies which can drive meaningful, immediate cost savings and operational efficiencies for our customers. Currently, we operate in two markets - water and oil & gas, and our products are utilized in these markets to either recycle and convert wasted pressure energy into a usable asset or preserve pumps that are subject to hostile processing environments.

Energy Recovery was incorporated in Virginia in 1992 and reincorporated in Delaware in 2001. Our headquarters and principal research, development, and manufacturing facility is located in California. We are also constructing a new facility in Texas, which we hope to complete in 2019. We maintain direct sales offices and technical support centers in Europe, the Middle East and Asia.

Results of Operations

2018 Compared to 2017

Total Revenue

On January 1, 2018, we adopted ASC 606. Adoption of ASC 606 did not have a material impact on the timing of revenue and expense recognition for product revenue for either the Water segment or the cost-to-total cost (“CTC”) revenue contract in the Oil & Gas segment.

The implementation of ASC 606 for license and development revenue resulted in a material difference in the timing of revenue recognition under the new standard, with an overall acceleration of the recognition of deferred revenue under the VorTeq license agreement (the “VorTeq License Agreement”) that the Company entered into with Vorteq licensee. The amounts below have been adjusted for adoption of ASC 606. See Note 2, “Recent Accounting Pronouncements,” and Note 3, “Revenues,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data” of this Annual Report on Form 10-K, for further discussion on the adoption of ASC 606 and a reconciliation between prior year “As Previously Reported” and “As Adjusted” amounts. Since the full retrospective method was adopted, the Company has fully comparable period to period results.

	For the Year Ended December 31,					
	2018		2017		\$ Change	% Change
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Product revenue	\$ 61,025	82%	\$ 58,023	84%	\$ 3,002	5%
License and development revenue	13,490	18%	11,106	16%	2,384	21%
Total revenue	<u>\$ 74,515</u>	<u>100%</u>	<u>\$ 69,129</u>	<u>100%</u>	<u>\$ 5,386</u>	<u>8%</u>

Product Revenue by Segment

	For the Year Ended December 31,			
	2018	2017	\$ Change	% Change
	<i>(In thousands, except for percentages)</i>			
Water	\$ 60,512	\$ 54,301	\$ 6,211	11%
Oil & Gas	513	3,722	(3,209)	(86%)
Total product revenue	\$ 61,025	\$ 58,023	\$ 3,002	5%

Water segment product revenue increased in 2018, compared to 2017, due primarily to higher mega-project (“MPD”) sales of \$6.1 million, and higher after-market shipments of \$1.4 million, partially offset by lower original equipment manufacturer (“OEM”) sales of \$1.3 million.

Oil & Gas segment product revenue, decreased in 2018, compared to 2017, due primarily to lower CTC revenue recognition associated with multiple IsoBoost systems.

A limited number of our customers account for a substantial portion of our product revenue. Revenue from customers representing 10% or more of product revenue varies from period to period. For the year ended December 31, 2018, two customers represented 15% and 11% of the Company’s product revenue. For the year ended December 31, 2017 no customer represented 10% or more of the Company’s product revenue, and for the year ended December 31, 2016, one customer, represented 11% of the Company’s product revenues. See Note 14, “*Geographical Information and Concentrations*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for further details on customer concentration.

Product revenue attributable to domestic and international sales as a percentage of total product revenue is presented in the following table.

	For the Year Ended December 31,	
	2018	2017
Domestic revenue	3%	3%
International revenue	97%	97%
Total product revenue	100%	100%

License and Development Revenue

	For the Year Ended December 31,			
	2018	2017	\$ Change	% Change
	<i>(In thousands, except for percentages)</i>			
License and development revenue	\$ 13,490	\$ 11,106	\$ 2,384	21%

In October 2015, through our subsidiary ERI Energy Recovery Ireland Ltd., we entered into the VorTeq License Agreement. License and development revenue increased \$2.4 million, or 21%, in the twelve months ended December 31, 2018, compared to the twelve months ended December 31, 2017, due primarily to higher costs incurred under the cost driver input measure based on revenue recognition methodology of ASC 606.

See Note 2, “*Recent Accounting Pronouncements*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data,” of this Annual Report on Form 10-K for further discussion on our license and development revenue recognition policy under ASC 606; and Note 15, “*VorTeq Partnership and License Agreement*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data,” of this Annual Report on Form 10-K for additional discussion on the VorTeq License agreement.

Product Gross Profit and Margin

	Year Ended December 31, 2018			Year Ended December 31, 2017		
	Water	Oil & Gas	Total	Water	Oil & Gas	Total
	<i>(In thousands, except for percentages)</i>					
Product gross profit	\$ 43,301	\$ (149)	\$ 43,152	\$ 38,269	\$ 693	\$ 38,962
Product gross margin	71.6%	(29.0%)	70.7%	70.5%	18.6%	67.1%

Product gross profit represents our product revenue less our product cost of revenue. Our product cost of revenue consists primarily of raw materials, personnel costs (including stock-based compensation), manufacturing overhead, warranty costs, depreciation expense, and manufactured components.

Product gross margin increased in 2018 compared to 2017, due primarily to increased Water segment channel and product mix, manufacturing efficiencies and higher production levels, partially offset by decline in contribution of Oil & Gas segment to the total product gross margin due to higher project costs.

Operating Expenses

	For the Year Ended December 31,					
	2018		2017		\$ Change	% Change
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Total revenue	\$ 74,515	100%	\$ 69,129	100%	\$ 5,386	8%
Operating expenses:						
General and administrative	\$ 21,476	29%	\$ 17,354	25%	\$ 4,122	24%
Sales and marketing	7,546	10%	9,391	14%	(1,845)	(20%)
Research and development	17,012	23%	13,443	19%	3,569	27%
Amortization of intangible assets	630	1%	631	1%	(1)	—%
Total operating expenses	\$ 46,664	63%	\$ 40,819	59%	\$ 5,845	14%

General and Administrative

General and administrative expense increased in 2018, compared to 2017, due primarily to higher employee-related compensation and benefits of \$2.7 million, facility costs of \$0.3 million and other costs of \$0.3 million, partially offset by lower professional and legal costs of \$0.8 million. Employee-related compensation and benefits included an increase in compensation of \$1.7 million and stock-based compensation of \$1.1 million, primarily due to a \$0.9 million equity award modification charge chiefly related to the modification of certain equity awards held by the Company's former President and Chief Executive Officer, who resigned on February 24, 2018, in consideration for his entering into a Settlement Agreement and Release.

Sales and Marketing

Sales and marketing expense decreased in 2018, compared to 2017, due primarily to lower employee-related compensation and benefits of \$1.8 million.

Research and Development

Research and development expense increased in 2018, compared to 2017, due primarily to increased occupancy and depreciation cost of \$1.3 million, higher employee-related compensation and benefits of \$1.1 million, direct research and development project costs of \$0.8 million and other costs of \$0.4 million. Employee-related compensation and benefits included an increase in compensation of \$0.7 million and stock-based compensation of \$0.3 million.

Amortization of Intangible Assets

Amortization of intangible assets is related to finite-lived intangible assets acquired as a result of our purchase of Pump Engineering, LLC in December 2009. There was no material change in our amortization amounts in 2018, compared to 2017.

Other Income (Expense), net

	For the Year Ended December 31,					
	2018		2017		\$ Change	% Change
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Total revenue	\$ 74,515	100%	\$ 69,129	100%	\$ 5,386	8%
Other income (expense):						
Interest income	\$ 1,543	2%	\$ 870	1%	\$ 673	77%
Interest expense	(1)	—%	(2)	—%	1	(50%)
Other non-operating expense, net	(80)	—%	(188)	—%	108	(57%)
Total other income, net	\$ 1,462	2%	\$ 680	1%	\$ 782	115%

Total other income (expense), net increased in 2018, compared to 2017, due primarily to interest income on higher investment balances and improvement in foreign currency exchange rates.

Income Taxes

Our income tax benefit was \$10.7 million for the year ended December 31, 2018 compared to a tax benefit of \$8.4 million for the year ended December 31, 2017. On December 22, 2017, President Trump signed into law, the U.S. Tax Cut and Jobs Act (“Tax Act”), which significantly changed existing U.S. tax laws which impacted in 2017, including, but not limited to, (1) requiring companies to pay a one-time deemed repatriation tax on certain un-repatriated earnings of foreign subsidiaries; (2) re-measurement of deferred tax assets and liabilities at the new 21% tax rate; and (3) bonus depreciation that will allow for full expensing of qualified property.

The tax benefit of \$10.7 million for the year ended December 31, 2018, included a \$12.3 million U.S. federal and state deferred tax benefit related to the income tax effects of a tax election related to a change to the Company’s international tax structure in Ireland that was effective for the quarter ended June 30, 2018. This election resulted in a deferred tax asset related to tax expense recorded on earnings and profits under the Tax Act on deferred revenue not yet recognized under US GAAP. In addition, the 2018 tax results reflect \$800,000 of tax benefit from stock-based compensation tax deductions in excess of the related book expense. The Company continues to evaluate the impact of the tax law changes to its overall structure and income tax planning. The Company continues to assert that the accumulated foreign earnings in Spain and Canada are permanently reinvested.

The tax benefit of \$8.4 million for the year ended December 31, 2017, consisted of a net \$10.1 million U.S. federal and state deferred tax benefit after taking into consideration a valuation allowance release on all but \$1.4 million of our U.S. federal and state deferred tax assets, less a valuation allowance for the Irish deferred tax assets of \$1.3 million less U.S. federal, state and foreign current tax expense of \$0.4 million. In addition, as a result of enactment of the legislation, during the fourth quarter of 2017, the Company incurred a one-time income tax expense of \$7.0 million related to the deemed repatriation tax on accumulated foreign earnings (of which \$0.3 million is a cash charge and the remaining \$6.7 million represents a non-cash discrete tax expense largely from the utilization of net operating loss carryovers). The Company also incurred a non-cash income tax expense of \$2.5 million related to the re-measurement of certain deferred tax assets and liabilities based on the tax rates from the Tax Act.

See Note 10, “Income Taxes,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K.

2017 Compared to 2016

Total Revenue

	For the Year Ended December 31,				\$ Change	% Change
	2017		2016			
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Product revenue	\$ 58,023	84%	\$ 49,715	86%	\$ 8,308	17%
License and development revenue	11,106	16%	8,069	14%	3,037	38%
Total revenue	\$ 69,129	100%	\$ 57,784	100%	\$ 11,345	20%

Product Revenue by Segment

	For the Year Ended December 31,				\$ Change	% Change
	2017		2016			
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Water	\$ 54,301		\$ 47,545		\$ 6,756	14%
Oil & Gas	3,722		2,170		1,552	72%
Total product revenue	\$ 58,023		\$ 49,715		\$ 8,308	17%

Water segment product revenue increased in 2017, compared to 2016, due primarily to higher mega-project (“MPD”) sales of \$5.6 million and original equipment manufacturer (“OEM”) sales of \$1.3 million, partially offset by lower after-market sales of \$0.1 million.

Oil & Gas segment product revenue, increased in 2017, compared to 2016, due primarily to the cost-to-total cost (“CTC”) revenue recognition associated with the sale of multiple IsoBoost systems, partially offset by revenue adjustments of \$0.3 million.

A limited number of our customers account for a substantial portion of our product revenue. Revenue from customers representing 10% or more of product revenue varies from period to period. For the year ended December 31, 2017 no customer represented 10% or more of the Company’s product revenue, and for the year ended December 31, 2016, one customer, represented 11% of the Company’s product revenues. See Note 14, “Geographical Information and Concentrations,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for further details on customer concentration.

Product revenue attributable to domestic and international sales as a percentage of total product revenue is presented in the following table.

	For the Year Ended December 31,	
	2017	2016
Domestic revenue	3%	2%
International revenue	97%	98%
Total product revenue	100%	100%

License and Development Revenue

	For the Year Ended December 31,			
	2017	2016	\$ Change	% Change
	<i>(In thousands, except for percentages)</i>			
License and development revenue	\$ 11,106	\$ 8,069	\$ 3,037	38%

In October 2015, through our subsidiary ERI Energy Recovery Ireland Ltd., we entered into the VorTeq Licensee (“VorTeq License Agreement”), an international customer. The VorTeq License Agreement has a term of 15-years for the exclusive, worldwide right to use our VorTeq technology for hydraulic fracturing onshore operations. License revenue was higher in 2017 as compared to 2016 due to higher costs incurred in 2017 under the input measure cost driver revenue recognition methodology of ASC 606. See Note 3, “Revenues,” and Note 15, “Vorteq Partnership and Licensing Agreement,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for further details.

Product Gross Profit and Margin

	Year Ended December 31, 2017			Year Ended December 31, 2016		
	Water	Oil & Gas	Total	Water	Oil & Gas	Total
	<i>(In thousands, except for percentages)</i>					
Product gross profit	\$ 38,269	\$ 693	\$ 38,962	\$ 31,192	\$ 674	\$ 31,866
Product gross margin	70.5%	18.6%	67.2%	65.6%	31.1%	64.1%

Product gross profit increased in 2017 compared to 2016, due primarily to increased Water segment sales volume and favorable price and mix and increased Oil & Gas segment sales volume.

Product gross margin increased in 2017 compared to 2016, due primarily to increased Water segment favorable price and mix, and operational efficiencies, partially offset by higher Oil & Gas segment project costs.

Operating Expenses

	For the Year Ended December 31,					
	2017		2016		\$ Change	% Change
	\$	% of Total Revenue	\$	% of Total Revenue		
	<i>(In thousands, except for percentages)</i>					
Total revenue	\$ 69,129	100%	\$ 57,784	100%	\$ 11,345	20%
Operating expenses:						
General and administrative	\$ 17,354	25%	\$ 16,626	29%	\$ 728	4%
Sales and marketing	9,391	14%	9,116	16%	275	3%
Research and development	13,443	19%	10,136	18%	3,307	33%
Amortization of intangible assets	631	1%	631	1%	—	—%
Total operating expenses	\$ 40,819	59%	\$ 36,509	64%	\$ 4,310	12%

General and Administrative

General and administrative expense increased in 2017, compared to 2016, due primarily to higher employee-related compensation and benefits of \$0.5 million, facility costs of \$0.4 million and other costs of \$0.3 million, partially offset by lower professional and legal costs of \$0.5 million. Employee-related compensation and benefits included an increase in compensation of \$0.3 million and stock-based compensation of \$0.2 million.

Sales and Marketing

Sales and marketing expense increased in 2017, compared to 2016, due primarily to higher employee-related compensation and benefits of \$0.4 million and higher professional services of \$0.1 million, partially offset by lower marketing and other costs of \$0.2 million. Employee-related compensation and benefits included an increase in commissions of \$0.3 million and stock-based compensation of \$0.3 million, partially offset by lower compensation and incentive compensation of \$0.2 million.

Research and Development

Research and development expense increased in 2017, compared to 2016, due primarily to higher employee-related compensation and benefits of \$1.6 million, direct research and development project costs of \$1.5 million and other costs of \$0.2 million. Employee-related compensation and benefits included an increase in compensation of \$1.4 million and stock-based compensation of \$0.3 million, partially offset by lower incentive compensation of \$0.1 million.

Amortization of Intangible Assets

Amortization of intangible assets is related to finite-lived intangible assets acquired as a result of our purchase of Pump Engineering, LLC in December 2009. There was no material change in our amortization amounts in 2017, compared to 2016.

Other Income (Expense), net

	For the Year Ended December 31,					
	2017		2016		\$ Change	% Change
\$	% of Total Revenue	\$	% of Total Revenue			
<i>(In thousands, except for percentages)</i>						
Total revenue	\$ 69,129	100%	\$ 57,784	100%	\$ 11,345	20%
Other income (expense):						
Interest income	\$ 870	1%	\$ 309	1%	\$ 561	182%
Interest expense	(2)	—%	(3)	—%	1	(33%)
Other non-operating expense, net	(188)	—%	(19)	—%	(169)	889%
Total other income (expense), net	\$ 680	1%	\$ 287	1%	\$ 393	137%

Total other income (expense), net increased in 2017, compared to 2016, due primarily to interest income on higher investment balances, partially offset by higher bank fees related to our higher investment balance in 2017 and unfavorable foreign currency exchange.

Income Taxes

Our income tax benefit was \$8.4 million for the year ended December 31, 2017 compared to a \$6 thousand tax benefit for the year ended December 31, 2016.

The tax benefit of \$8.4 million for the year ended December 31, 2017, consisted of a net \$10.1 million U.S. federal and state deferred tax benefit after taking into consideration a valuation allowance release on all but \$1.4 million of our U.S. federal and state deferred tax assets, less a valuation allowance for the Irish deferred tax assets of \$1.3 million less U.S. federal, state and foreign current tax expense of \$0.4 million. With respect to the 2017 year, as a result of enactment of the legislation, during the fourth quarter of 2017, the Company incurred a one-time income tax expense of \$7.0 million related to the deemed repatriation tax on accumulated foreign earnings (of which \$0.3 million is a cash charge and the remaining \$6.7 million represents a non-cash discrete tax expense largely from the utilization of net operating loss carryovers). The Company also incurred a non-cash income tax expense of \$2.5 million related to the re-measurement of certain deferred tax assets and liabilities based on the recently enacted rates from the Tax Act.

There was immaterial tax benefit for the year ended December 31, 2016 which consisted of \$0.3 million benefit related to losses in our Ireland subsidiary, which was partially offset by tax expense of \$0.3 million related to the deferred tax effects associated with the amortization of goodwill and other taxes.

See Note 10, "*Income Taxes*," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

Liquidity and Capital Resources

Overview

Historically, our primary source of cash to fund our operations and capital expenditures has been proceeds from customer payments for our products and services and the issuance of common stock. As of December 31, 2018, we have issued common stock for aggregate net proceeds of \$104.6 million, excluding common stock issued in exchange for promissory notes.

As of December 31, 2018, our principal sources of liquidity consisted of unrestricted cash and cash equivalents of \$22.0 million; short-term investments of \$73.3 million that are primarily invested in marketable debt securities; and accounts receivable, net of allowances of \$10.2 million. As of December 31, 2018, our unrestricted cash, cash equivalents and short-term investments held outside the U.S. was \$20.3 million. We invest cash not needed for current operations predominantly in high-quality, investment-grade, marketable debt instruments with the intent to make such funds available for operating purposes as needed.

At December 31, 2018 and 2017, we had \$4.1 million and \$6.3 million, respectively, of contract assets. In the Water segment, contract assets may be related to either contract terms which specify payment when the product arrives at a destination or to customer contractual holdback provisions. Under the holdback provisions we invoice the final retention payment(s) due under certain sales contracts in the next 12 months. The customer holdbacks represent amounts intended to provide a form of security for the customer. In the Oil & Gas segment, we had unbilled project costs, of \$1.3 million at December 31, 2018. See Note 3, "Revenues," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for additional information about contract assets.

Loan and Pledge Agreement

On January 27, 2017, we entered into a loan and pledge agreement (the "Loan and Pledge Agreement") with a financial institution. The Loan and Pledge Agreement provides for a committed revolving credit line of \$16.0 million and an uncommitted revolving credit line of \$4.0 million. Under the Loan and Pledge Agreement, we are allowed to borrow and request letters of credit against the eligible assets held from time to time in the pledged account maintained with the financial institution. Revolving loans incur interest per annum at a base rate equal to the London Interbank Offered Rate (also referred to as "LIBOR") plus 1.5%. Any default bears the aforementioned interest rate plus an additional 2%. The unused portion of the credit line is subject to a fee. We are subject to certain financial and administrative covenants under the Loan and Pledge Agreement. The Loan and Pledge Agreement was amended on March 30, 2018 to extend the termination date of the Loan and Pledge Agreement from March 31, 2018 to March 31, 2020, of which the Company paid closing fees of \$16 thousand. The Loan and Pledge Agreement was amended on March 17, 2017, to increase the permitted indebtedness under the agreement and to modify certain revolving loan credit options. No other provisions of the Loan and Pledge Agreement were amended. The Loan and Pledge Agreement was further amended on August 24, 2018 to permit the Company to incur indebtedness owed to a foreign subsidiary in an aggregate amount not to exceed \$66.0 million, which amount is subordinated to any amounts outstanding under the Loan and Pledge Agreement. As of December 31, 2018, no debt was outstanding under the Loan and Pledge Agreement, however, the standby letters of credit outstanding with this Financial Institution is deducted from the total revolving credit line. As of December 31, 2018, we were in compliance with loan covenants.

Stand-by Letters of Credit

At December 31, 2018, we have stand-by letters of credit with various financial institutions totaling \$8.8 million whereby we are required to maintain a restricted cash balance of \$0.1 million and a U.S. investment balance of \$8.7 million. Stand-by letters of credit are subject to fees based on the amount of the letter of credit, that are payable quarterly and are non-refundable. See Note 8, "Long-term Debt and Lines of Credit," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for additional information about our stand-by letters of credit arrangements.

Share Repurchases

On March 7, 2018, our Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, may repurchase up to \$10.0 million in aggregate cost of our outstanding common stock (“March 2018 Authorization”). Under the repurchase program, purchases of shares of common stock may be made from time to time in the open market, or in privately negotiated transactions, in compliance with applicable state and federal securities laws. The timing and amounts of any purchases will be based on market conditions and other factors including price, regulatory requirements, and capital availability. The share buyback program does not obligate us to acquire any specific number of shares in any period, and may be expanded, extended, modified or discontinued at any time without prior notice. Under the March 2018 Authorization, as of December 31, 2018, the Company repurchased 1,193,102 shares at an aggregate cost of \$10.0 million. The March 2018 Authorization expired in September 2018 and there was no repurchase authorization in place at December 31, 2018.

In March 2017, our Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, could repurchase up to \$15.0 million in aggregate cost of our outstanding common stock through September 30, 2017 (the “March 2017 Authorization”). At December 31, 2017, 541,177 shares, at an aggregate cost of \$4.3 million, had been repurchased under the March 2017 Authorization.

See Note 11, “Stockholder’s Equity,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for additional information about our share repurchase programs.

Cash Flows

Our cash flows are presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Net cash provided by operating activities	\$ 7,565	\$ 2,895	\$ 4,965
Net cash used in investing activities	(10,159)	(38,911)	(40,129)
Net cash (used in) provided by financing activities	(5,886)	951	(2,785)
Effect of exchange rate differences on cash and cash equivalents	(8)	(57)	(41)
Net change in cash and cash equivalents and restricted cash	<u>\$ (8,488)</u>	<u>\$ (35,122)</u>	<u>\$ (37,990)</u>

Cash Flows from Operating Activities

Cash provided by operating activities is generated by net income (loss) adjusted for certain non-cash items and changes in assets and liabilities.

Cash provided by operating activities was higher in 2018, compared to 2017, by \$4.7 million, primarily due to higher net income of \$3.7 million and increased stock-based compensation of \$1.2 million, partially offset by decrease in deferred income taxes of \$1.5 million.

Net changes of cash used for assets and liabilities of \$14.7 million in 2018 were primarily attributable to a \$13.6 million decrease in contract liabilities due to the recognition of revenue related to our exclusive license agreement, a \$2.3 million decrease in accounts payable and a \$1.9 million increase in inventories due to increased production, offset by a \$4.1 million decrease in accounts receivable and contract assets due to timing of invoices and payments.

Cash provided by operating activities was lower in 2017, compared to 2016, by \$2.1 million, due primarily to higher non-cash for deferred income tax adjustment of \$8.4 million and cash used for operating assets and liabilities of \$15.1 million, partially offset by higher net income of \$14.6 million.

Net changes of cash used for assets and liabilities of \$15.1 million in 2017 were primarily attributable to a \$11.9 million decrease in contract liabilities due to the recognition of revenue related to our exclusive license agreement, a \$5.0 million decrease in accounts receivable and contract assets due to timing of invoices and payments,

a \$1.3 million increase in inventories due to increased production, partially offset by a \$2.7 million increase in accounts payable and accrued expenses and other liabilities, and a \$0.4 million increase in taxes payable.

Net changes of cash used for assets and liabilities of \$5.0 million in 2016 were primarily attributable to a \$6.3 million decrease in contract liabilities due to the recognition of revenue related to our exclusive license agreement, a \$0.4 million decrease in accounts payable, partially offset by a \$2.3 million decrease in inventories due to decreased shipments, a \$0.4 million increase in accounts receivable and contract assets due to timing of invoices and payments.

Cash Flows from Investing Activities

Cash flows from investing activities primarily relate to maturities and purchases of marketable securities to preserve principal and liquidity while at the same time maximizing yields without significantly increasing risk, and capital expenditures to support our growth, and changes in our restricted cash used to collateralize our stand-by letters of credit and other contingent considerations.

Cash used in 2018 was primarily attributable to \$86.2 million used to purchase investments and \$5.2 million for capital expenditures. These were offset by \$81.3 million in maturities of marketable security investments.

Also, in 2018 and 2017 due to the adoption of ASC 842, the Company recorded a non-cash impact of \$10.4 million and \$3.3 million lease liability respectively, with a corresponding adjustment to the right-of-use asset.

Cash used in 2017 was primarily attributable to \$80.6 million used to purchase investments, and \$7.4 million for capital expenditures. These were offset by \$49.1 million in maturities of marketable security investments.

Cash used in 2016 was primarily attributable to \$46.6 million used to purchase investments, and \$1.1 million for capital expenditures. These were offset by \$7.5 million in maturities of marketable security investments.

Cash Flows from Financing Activities

Net cash used in 2018 was primarily due to the use of \$10.0 million to repurchase our common stock, partially offset by \$4.3 million received from the issuance of common stock related to stock option exercises.

Net cash provided in 2017 was primarily due to \$5.5 million received from the issuance of common stock related to option exercises partially offset by \$4.2 million to repurchase our common stock.

Net cash used in 2016 was primarily due to 9.4 million to repurchase our common stock, partially offset by \$6.6 million received from the issuance of common stock related to stock option exercises.

Liquidity and Capital Resource Requirements

We believe that our existing resources and cash generated from our operations will be sufficient to meet our anticipated capital requirements for at least the next 12 months. However, we may need to raise additional capital or incur additional indebtedness to continue to fund our operations or to support acquisitions in the future and/or fund investments in our latest technology arising from rapid market adoption that could require us to seek additional equity or debt financing. Our future capital requirements will depend on many factors, including the continuing market acceptance of our products, our rate of revenue growth, the timing of new product introductions, the expansion of our research and development, manufacturing, and sales and marketing activities, the timing and extent of our expansion into new geographic territories, and the amount and timing of cash used for stock repurchases. In addition, we may enter into potential material investments in, or acquisitions of, complementary businesses, services, or technologies in the future, which could also require us to seek additional equity or debt financing. Should we need additional liquidity or capital funds, these funds may not be available to us on favorable terms, or at all.

Contractual Obligations

We lease facilities and equipment under fixed non-cancellable operating leases that expire on various dates through 2028. Additionally, in the course of our normal operations, we have entered into cancellable purchase commitments with our suppliers for various key raw materials and component parts. The purchase commitments covered by these arrangements are subject to change based on our sales forecasts for future deliveries.

The following is a summary of our contractual obligations as of December 31, 2018.

	Payments Due by Period				
	1 Year	2-3 Years	4-5 Years	5+ Years	Total
	<i>(In thousands)</i>				
Operating leases	\$ 1,855	\$ 3,464	\$ 3,636	\$ 8,122	\$ 17,077
Purchase obligations ⁽¹⁾	7,983	—	—	—	7,983
	<u>\$ 9,838</u>	<u>\$ 3,464</u>	<u>\$ 3,636</u>	<u>\$ 8,122</u>	<u>\$ 25,060</u>

⁽¹⁾ Purchase obligations are related to open purchase orders for materials and supplies.

This table excludes agreements with guarantees or indemnity provisions that we have entered into with customers and others in the ordinary course of business. Based on our historical experience and information known to us as of December 31, 2018, we believe that our exposure related to these guarantees and indemnities as of December 31, 2018 was not material.

Off-Balance Sheet Arrangements

During the periods presented, we did not have any relationships with unconsolidated entities or financial partnerships such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Critical Accounting Policies and Estimates

Our Consolidated Financial Statements are prepared in accordance with generally accepted accounting principles (“GAAP”) in the United States. These accounting principles require us to make estimates and judgments that can affect the reported amounts of assets and liabilities as of the date of the Consolidated Financial Statements as well as the reported amounts of revenue and expense during the periods presented. We believe that the estimates and judgments upon which we rely are reasonable based upon information available to us at the time that we make these estimates and judgments. To the extent that there are material differences between these estimates and actual results, our consolidated financial results will be affected. The accounting policies that reflect our more significant estimates and judgments and which we believe are the most critical to aid in fully understanding and evaluating our reported financial results are revenue recognition, capitalization of research and development assets; valuation of stock options; valuation and impairment of goodwill and acquired intangible assets; valuation adjustments for excess and obsolete inventory; deferred taxes and valuation allowances on deferred tax assets; and evaluation and measurement of contingencies.

The following is not intended to be a comprehensive list of all of our accounting policies or estimates. Our accounting policies are more fully described in Note 1, “*Description of Business and Significant Accounting Policies*” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K.

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to the Company’s customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services. At the inception of each contract, performance obligations are identified and the total transaction price is allocated to the performance obligations.

The Company’s contracts with customers may include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative stand-alone selling price. The Company generally determines standalone selling prices based on the prices charged to customers.

With respect to termination, the Company does not have the ability to cancel a contract for convenience. In general, customers can cancel for convenience upon the payment of a termination fee that covers costs and profit. It is rare for customers to cancel contracts.

See Note 3, “*Revenues*” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for more detail on product and service revenue recognition - Water segment, cost-to-total cost (“CTC”) revenue recognition- Oil and Gas segment, license and development revenue recognition - Oil and Gas segment.

Capitalization of Research and Development Assets

The costs of materials that are acquired for research and development activities and have no alternative future uses (in research and development projects or otherwise) are expensed as incurred. With respect to tangible assets acquired or constructed for R&D activities, if the costs of materials that are acquired or constructed for a particular research and development project have alternative future uses (in other research and development projects or otherwise), they are capitalized as an asset and the cost of depreciation is charged to expense.

Stock-Based Compensation

We measure and recognize stock-based compensation expense based on the fair value measurement for all stock-based awards made to our employees and directors — including restricted stock units (“RSUs”), and employee stock options — over the requisite service period (typically the vesting period of the awards). The fair value of RSUs is based on our stock price on the date of grant. The fair value of stock options is calculated on the date of grant using the Black-Scholes option pricing model, which requires a number of complex assumptions including expected life, expected volatility, risk-free interest rate, and dividend yield. The estimation of awards that will ultimately vest requires judgment, and to the extent that actual results or updated estimates differ from our current estimates, such amounts are recorded as a cumulative adjustment in the period in which the estimates are revised. See Note 12, “*Stock-Based Compensation*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for further discussion of stock-based compensation.

Goodwill and Other Intangible Assets

The purchase price of an acquired company is allocated between intangible assets and the net tangible assets of the acquired business with the residual purchase price recorded as goodwill. The determination of the value of the intangible assets acquired involves certain judgments and estimates. These judgments can include, but are not limited to, the cash flows that an asset is expected to generate in the future and the appropriate weighted average cost of capital.

Acquired intangible assets with determinable useful lives are amortized on a straight-line or accelerated basis over the estimated periods benefited, ranging from one to 20 years. Acquired intangible assets with contractual terms are amortized over their respective legal or contractual lives. Customer relationships and other non-contractual intangible assets with determinable lives are amortized over periods ranging from five to 20 years.

We evaluate the recoverability of intangible assets by comparing the carrying amount of an asset to estimated future net undiscounted cash flows generated by the asset. If such assets are considered to be impaired, the impairment recognized is measured as the amount by which the carrying amount of the assets exceeds the fair value of the assets. The evaluation of recoverability involves estimates of future operating cash flows based upon certain forecasted assumptions, including, but not limited to, revenue growth rates, gross profit margins, and operating expenses over the expected remaining useful life of the related asset. A shortfall in these estimated operating cash flows could result in an impairment charge in the future.

Goodwill is not amortized, but is evaluated annually for impairment at the reporting unit level or when indicators of a potential impairment are present. We estimate the fair value of the reporting unit using the discounted cash flow and market approaches. Forecast of future cash flows are based on our best estimate of future net sales and operating expenses, based primarily on expected category expansion, pricing, market segment, and general economic conditions.

As of December 31, 2018 and December 31, 2017, acquired intangibles, including goodwill, relate to the acquisition of Pump Engineering, LLC during the fourth quarter of 2009. See Note 7, “*Goodwill and Intangible Assets*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for further discussion of intangible assets.

Inventories

Inventories are stated at the lower of cost (using the first-in, first-out “FIFO” method) or market. We calculate inventory valuation adjustments for excess and obsolete inventory based on current inventory levels, movement, expected useful lives, and estimated future demand of the products and spare parts.

Income Taxes

Current and non-current tax assets and liabilities are based upon an estimate of taxes refundable or payable for each of the jurisdictions in which the Company is subject to tax. In the ordinary course of business, there is inherent uncertainty in quantifying income tax positions. We assess income tax positions and record tax benefits for all years subject to examination based upon the Company's evaluation of the facts, circumstances, and information available at the reporting dates. For those tax positions where it is more likely than not that a tax benefit will be sustained, we record the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit is recognized in the financial statements. When applicable, associated interest and penalties are recognized as a component of income tax expense. Accrued interest and penalties are included within the related tax asset or liability on the Consolidated Balance Sheets.

Deferred income taxes are provided for temporary differences arising from differences in bases of assets and liabilities for tax and financial reporting purposes. Deferred income taxes are recorded on temporary differences using enacted tax rates in effect for the year in which the temporary differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Significant judgment is required in determining whether and to what extent any valuation allowance is needed on the Company's deferred tax assets. In making such a determination, we consider all available positive and negative evidence including recent results of operations, scheduled reversals of deferred tax liabilities, projected future income, and available tax planning strategies. See Note 10, "Income Taxes," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for further discussion of the tax valuation allowance.

On December 22, 2017, President Trump signed into law the Tax Act, which significantly changed existing U.S. tax laws. Following the enactment of the Tax Act, the SEC staff issued SAB 118, which provided guidance on accounting for the tax effects of the Tax Act. SAB 118 provided a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under ASC 740. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete but it is able to determine a reasonable estimate, it must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the provisions of the tax law that were in effect immediately before the enactment of the Tax Act. Our adjustments were final in 2017. See Note 10, "Income Taxes," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for a discussion of our income tax accounting related to the Tax Act.

Our operations are subject to income and transaction taxes in the U.S. and in foreign jurisdictions. Significant estimates and judgments are required in determining our worldwide provision for income taxes. Some of these estimates are based on interpretations of existing tax laws or regulations. The ultimate amount of tax liability may be uncertain as a result.

Recent Accounting Pronouncements

See Note 2, "Recent Accounting Pronouncements," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K regarding the impact of certain recent accounting pronouncements on our Consolidated Financial Statements.

Item 7A — Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Risk

Our exposures are to fluctuations in exchange rates for USD versus the British Pound, Saudi Riyal, United Arab Emirates Dirham, Euro, Chinese Yuan, Indian Rupee and Canadian Dollar. Changes in currency exchange rates could adversely affect our consolidated operating results or financial position.

Our revenue contracts have been denominated in U.S. Dollars (“USD”). At times our international customers may have difficulty in obtaining USD to pay our receivables, thus increasing collection risk and potential doubtful account expense. As we expand our international sales, a portion of our revenue could be denominated in foreign currencies. As a result, our cash and cash equivalents and operating results could be increasingly affected by changes in exchange rates.

In addition, we pay many vendors in foreign currency and therefore, are subject to changes in foreign currency exchange rates.

Our international sales and service operations incur expense that is denominated in foreign currencies. This expense could be materially affected by currency fluctuations. Our international sales and services operations also maintain cash balances denominated in foreign currencies. To decrease the inherent risk associated with translation of foreign cash balances into our reporting currency, we do not maintain excess cash balances in foreign currencies.

We have not hedged our exposure to changes in foreign currency exchange rates because expenses in foreign currencies have been insignificant to date, and exchange rate fluctuations have had little impact on our operating results and cash flows.

Interest Rate Risk and Credit Risk

We have an investment portfolio of fixed-income marketable debt securities, including amounts classified as cash equivalents and short-term investments. The primary objective of our investment activities is to preserve principal and liquidity while at the same time maximizing yields without significantly increasing risk. We invest primarily in investment-grade short-term debt instruments of high-quality corporate issuers and the U.S. government and its agencies. These investments are subject to counterparty credit risk. To minimize this risk, we invest pursuant to a Board-approved investment policy. The policy mandates high credit rating requirements and restricts our exposure to any single corporate issuer by imposing concentration limits.

At December 31, 2018, our investments with maturity dates less than 12 months, totaled approximately \$73.3 million and were classified as short-term investments. Those with maturity dates more than 12 months which totaled approximately \$1.3 million are classified as long-term investments. These investments are subject to interest fluctuations and will decrease in market value if interest rates increase. To minimize the exposure due to adverse shifts in interest rates, we maintain investments with an average maturity of less than seven months. A hypothetical 1% increase in interest rates would have resulted in an approximately \$0.3 million decrease in the fair value of our fixed-income debt securities as of December 31, 2018.

Item 8 — Financial Statements and Supplementary Data

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Energy Recovery, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Energy Recovery, Inc. and subsidiaries (the "Company") as of December 31, 2018, the related consolidated statements of operations, comprehensive income (loss), stockholders' equity, and cash flows, for the year then ended, and the related notes (collectively referred to as the "financial statements"). In our opinion, the 2018 financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018, and the results of its operations and its cash flows for the year then ended in conformity with accounting principles generally accepted in the United States of America.

The consolidated financial statements of the Company as of December 31, 2017 and for each of the two years in the period then ended (collectively referred to as the "2017 and 2016 financial statements"), before the effects of the adjustments to retrospectively apply the change in accounting discussed in Note 2 to the financial statements, were audited by other auditors whose report, dated March 8, 2018, expressed an unqualified opinion on those statements. We have also audited the adjustments to the 2017 and 2016 financial statements to retrospectively apply the change in accounting for the adoption of *Revenue from Contracts with Customers (Topic 606)*, ASU No. 2016-02, *Leases (Topic 842)* and ASU 2016-18, *Statement of Cash Flows (Topic 230)* in 2018, as discussed in Note 2 to the financial statements. In our opinion, such retrospective adjustments are appropriate and have been properly applied. However, we were not engaged to audit, review, or apply any procedures to the 2017 and 2016 financial statements of the Company other than with respect to the retrospective adjustments, and accordingly, we do not express an opinion or any other form of assurance on the 2017 and 2016 financial statements taken as a whole.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 7, 2019, expressed an unqualified opinion on the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, effective January 1, 2018, the Company adopted *Revenue From Contracts With Customers (Topic 606)*, using the full retrospective approach.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ DELOITTE & TOUCHE LLP

San Francisco, California

March 7, 2019

We have served as the Company's auditor since 2018.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Energy Recovery, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Energy Recovery, Inc. and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2018, of the Company and our report dated March 7, 2019, expressed an unqualified opinion on those financial statements and included an explanatory paragraph regarding the Company's adoption of a new accounting standard.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ DELOITTE & TOUCHE LLP

San Francisco, California
March 7, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Energy Recovery, Inc.
San Leandro, California

Opinion on the Consolidated Financial Statements

We have audited, before the effects of the adjustments to retrospectively apply the changes in accounting described in Note 2 for the adoption of *Revenue from Contracts with Customers* (Topic 606), ASU No. 2016-02, *Leases* (Topic 842) and ASU 2016-18, *Statement of Cash Flows* (Topic 230), the accompanying consolidated balance sheet of Energy Recovery, Inc. (the “Company”) and subsidiaries as of December 31, 2017, the related consolidated statements of operations, comprehensive income (loss), stockholders’ equity, and cash flows for each of the two years in the period ended December 31, 2017 and the related notes (collectively referred to as the “consolidated financial statements”). Further, the 2017 and 2016 financial statements before the effects of the adjustments discussed in Note 2 are not presented herein. In our opinion, the 2017 and 2016 consolidated financial statements, before the effects of the adjustments to retrospectively apply the changes in accounting described in Note 2, present fairly, in all material respects, the financial position of the Company and subsidiaries at December 31, 2017, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2017, in conformity with accounting principles generally accepted in the United States of America.

We were not engaged to audit, review, or apply any procedures to the adjustments to retrospectively apply the changes in accounting described in Note 2, and, accordingly, we do not express an opinion or any other form of assurance about whether such adjustments are appropriate and have been properly applied. Those adjustments were audited by Deloitte & Touche LLP.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company’s auditor from 2007 to 2018.

San Jose, California
March 8, 2018

**ENERGY RECOVERY, INC.
CONSOLIDATED BALANCE SHEET**

	December 31,	
	2018	2017
	<i>(In thousands, except share data and par value)</i>	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 21,955	\$ 27,780
Restricted cash	97	2,664
Short-term investments	73,338	70,020
Accounts receivable, net of allowance for doubtful accounts of \$396 and \$103 at December 31, 2018 and 2017, respectively	10,212	12,465
Contract Assets	4,083	6,278
Inventories	7,138	5,514
Income tax receivable	15	—
Prepaid expenses and other current assets	2,810	1,342
Total current assets	119,648	126,063
Restricted cash, non-current	86	182
Long-term investments	1,269	—
Deferred tax assets, non-current	18,318	7,933
Property and equipment, net	14,619	13,393
Operating lease, right of use asset	12,189	2,843
Goodwill	12,790	12,790
Other intangible assets, net	640	1,269
Other assets, non-current	282	12
Total assets	\$ 179,841	\$ 164,485
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 1,439	\$ 4,091
Accrued expenses and other current liabilities	8,019	7,948
Lease liability	926	1,603
Income taxes payable	—	432
Accrued warranty reserve	478	366
Contract liabilities	16,270	15,909
Current portion of long-term debt	—	11
Total current liabilities	27,132	30,360
Long-term debt, less current portion	—	16
Lease liabilities, non-current	12,556	1,698
Contract liabilities, non-current	26,539	40,517
Other non-current liabilities	236	—
Total liabilities	66,463	72,591
Commitments and Contingencies (Note 9)		
Stockholders' equity:		
Preferred stock, \$0.001 par value; 10,000,000 shares authorized; no shares issued or outstanding at December 31, 2018 and 2017	—	—
Common stock, \$0.001 par value; 200,000,000 shares authorized; 59,396,020 shares issued and 53,940,085 shares outstanding at December 31, 2018 and 58,168,433 shares issued and 53,905,600 shares outstanding at December 31, 2017	59	58
Additional paid-in capital	158,404	149,006
Accumulated comprehensive loss	(133)	(125)
Treasury stock, at cost, 5,455,935 shares repurchased at December 31, 2018 and 4,262,833 shares repurchased at December 31, 2017	(30,486)	(20,486)
Accumulated deficit	(14,466)	(36,559)
Total stockholders' equity	113,378	91,894
Total liabilities and stockholders' equity	\$ 179,841	\$ 164,485

See Accompanying Notes to Consolidated Financial Statements

ENERGY RECOVERY, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands, except per share data)</i>		
Product revenue	\$ 61,025	\$ 58,023	\$ 49,715
Product cost of revenue	17,873	19,061	17,849
Product gross profit	43,152	38,962	31,866
License and development revenue	13,490	11,106	8,069
Operating expenses:			
General and administrative	21,476	17,354	16,626
Sales and marketing	7,546	9,391	9,116
Research and development	17,012	13,443	10,136
Amortization of intangible assets	630	631	631
Total operating expenses	46,664	40,819	36,509
Income from operations	9,978	9,249	3,426
Other income (expense):			
Interest income	1,543	870	309
Interest expense	(1)	(2)	(3)
Other non-operating expense, net	(80)	(188)	(19)
Total other income, net	1,462	680	287
Income before income taxes	11,440	9,929	3,713
Benefit from income taxes	(10,653)	(8,425)	(6)
Net income	\$ 22,093	\$ 18,354	\$ 3,719
Income per share:			
Basic	\$ 0.41	\$ 0.34	\$ 0.07
Diluted	\$ 0.40	\$ 0.33	\$ 0.07
Number of shares used in per share calculations:			
Basic	53,764	53,701	52,341
Diluted	55,338	55,612	55,451

See Accompanying Notes to Consolidated Financial Statements

ENERGY RECOVERY, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Net income	\$ 22,093	\$ 18,354	\$ 3,719
Other comprehensive loss, net of tax:			
Foreign currency translation adjustments	(12)	57	(27)
Unrealized income (loss) on investments	4	(64)	(27)
Other comprehensive loss, net of tax	(8)	(7)	(54)
Comprehensive income	\$ 22,085	\$ 18,347	\$ 3,665

See Accompanying Notes to Consolidated Financial Statements

ENERGY RECOVERY, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

Years Ended December 31, 2018, 2017 and 2016

	Common Stock		Treasury Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit (1)	Total Stockholders' Equity (1)
	Shares	Amount	Shares	Amount				
	<i>(In thousands)</i>							
Balance at December 31, 2015	54,948	\$ 55	(2,479)	\$ (6,835)	\$ 129,809	\$ (64)	\$ (58,632)	\$ 64,333
Net income	—	—	—	—	—	—	3,719	3,719
Unrealized loss on investments	—	—	—	—	—	(27)	—	(27)
Foreign currency translation adjustments	—	—	—	—	—	(27)	—	(27)
Issuance of common stock	1,936	2	—	—	6,598	—	—	6,600
Repurchase of common stock for treasury	—	—	(1,243)	(9,375)	—	—	—	(9,375)
Employee stock-based compensation	—	—	—	—	3,269	—	—	3,269
Balance at December 31, 2016	56,884	\$ 57	(3,722)	\$ (16,210)	\$ 139,676	\$ (118)	\$ (54,913)	\$ 68,492
Net income	—	—	—	—	—	—	\$ 18,354	18,354
Unrealized loss on investments	—	—	—	—	—	(64)	—	(64)
Foreign currency translation adjustments	—	—	—	—	—	57	—	57
Issuance of common stock	1,284	1	—	—	5,237	—	—	5,238
Repurchase of common stock for treasury	—	—	(541)	(4,276)	—	—	—	(4,276)
Employee stock-based compensation	—	—	—	—	4,093	—	—	4,093
Balance at December 31, 2017	58,168	\$ 58	(4,263)	\$ (20,486)	\$ 149,006	\$ (125)	\$ (36,559)	\$ 91,894
Net income	—	—	—	—	—	—	\$ 22,093	22,093
Unrealized gain on investments	—	—	—	—	—	4	—	4
Foreign currency translation adjustments	—	—	—	—	—	(12)	—	(12)
Issuance of common stock	1,228	1	—	—	4,138	—	—	4,139
Repurchase of common stock for treasury	—	—	(1,193)	(10,000)	—	—	—	(10,000)
Employee stock-based compensation	—	—	—	—	5,260	—	—	5,260
Balance at December 31, 2018	59,396	\$ 59	(5,456)	\$ (30,486)	\$ 158,404	\$ (133)	\$ (14,466)	\$ 113,378

See Accompanying Notes to Consolidated Financial Statements

(1) Due to the full retrospective adoption of ASC 606 as defined in Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K, the balances for the years ended 2017 and 2016 were recast.

ENERGY RECOVERY, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Cash Flows From Operating Activities:			
Net income	\$ 22,093	\$ 18,354	\$ 3,719
Adjustments to reconcile net income to net cash provided by operating activities:			
Stock-based compensation	5,240	4,087	3,263
Depreciation and amortization	3,869	3,666	3,680
Amortization of premiums on investments	362	460	174
Provision for warranty claims	326	246	208
Reversal of accruals related to expired warranties	(180)	(200)	(236)
Unrealized (gain) loss on foreign currency translation	(10)	144	13
Provision for doubtful accounts	336	55	76
Adjustments for excess or obsolete inventory	197	201	(361)
Deferred income taxes	(10,385)	(8,865)	(459)
Loss on disposal of fixed assets	408	—	—
Other non-cash adjustments	—	(196)	(131)
Changes in operating assets and liabilities:			
Accounts receivable	1,917	(761)	(244)
Contract assets	2,196	(4,263)	(130)
Inventories	(1,872)	(1,250)	2,287
Prepaid and other assets	(682)	(39)	(402)
Accounts payable	(2,274)	2,118	(360)
Accrued expenses and other liabilities	87	611	(262)
Income taxes payable	(447)	385	398
Contract Liabilities	(13,616)	(11,858)	(6,268)
Net cash provided by operating activities	7,565	2,895	4,965
Cash Flows From Investing Activities:			
Maturities of marketable securities	81,268	49,106	7,535
Purchases of marketable securities	(86,192)	(80,641)	(46,552)
Capital expenditures	(5,235)	(7,376)	(1,112)
Net cash used in investing activities	(10,159)	(38,911)	(40,129)
Cash Flows From Financing Activities:			
Net proceeds from issuance of common stock	4,291	5,508	6,600
Tax payment for employee shares withheld	(150)	(270)	—
Repayment of long-term debt	(27)	(11)	(10)
Repurchase of common stock	(10,000)	(4,276)	(9,375)
Net cash (used in) provided by financing activities	(5,886)	951	(2,785)
Effect of exchange rate differences on cash and cash equivalents	(8)	(57)	(41)
Net change in cash and cash equivalents and restricted cash	(8,488)	(35,122)	(37,990)
Cash and cash equivalents and restricted cash, beginning of year	30,626	65,748	103,738
Cash and cash equivalents and restricted cash, end of year	\$ 22,138	\$ 30,626	\$ 65,748
Supplemental disclosure of cash flow information:			
Cash paid for interest	\$ 1	\$ 2	\$ 3
Cash received for income tax refunds	\$ 13	\$ 16	\$ 2

Cash paid for income taxes	\$ 610	\$ 57	\$ 51
Supplemental disclosure of non-cash transactions:			
Purchases of property and equipment in trade accounts payable and accrued expenses and other liabilities	\$ 30	\$ 475	\$ 66
Non-cash lease liabilities arising from obtaining right of use assets	\$ 10,411	\$ —	\$ —

See Accompanying Notes to Consolidated Financial Statements

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1 — Description of Business and Significant Accounting Policies

Energy Recovery, Inc. and its wholly-owned subsidiaries (the “Company,” “Energy Recovery,” “our,” “us,” or “we”) is an energy solutions provider to industrial fluid flow markets worldwide. The Company’s core competencies are fluid dynamics and advanced material science. The Company’s products make industrial processes more operationally and capital expenditure efficient. The Company’s solutions convert wasted pressure energy into a reusable asset and preserve or eliminate pumping technology in hostile processing environments. The Company’s solutions are marketed and sold in fluid flow markets, such as water, oil & gas, and chemical processing, under the trademarks ERI®, PX®, Pressure Exchanger®, PX Pressure Exchanger®, VorTeq™, MTeq™, IsoBoost®, IsoGen®, AT™, and AquaBold™. The Company owns, manufactures, and/or develops its solutions, in whole or in part, in the United States of America, (“U.S.”) and the Republic of Ireland (“Ireland”).

Basis of Presentation

The Company’s Consolidated Financial Statements include the accounts of Energy Recovery, Inc. and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Reclassifications and Retroactive Adjustments

Certain prior year amounts have been reclassified in the Consolidated Statements of Cash Flows and certain Notes to Consolidated Financial Statements to conform to the current year presentation. In addition, as of January 1, 2018 the Company adopted “ASU 2014-09”, “ASU 2016-08” and “ASU 2016-10” (the combination is also known as “ASC 606” or “New Revenue Standard”) using the full retrospective transition method, and the Company early adopted ASU No. 2016-02 (“ASU 2016-02”), Leases (Topic 842), also referred to as “ASC 842” or “New Lease Standard,” The Company also adopted ASU 2016-18 (“ASU 2016-18”), Statement of Cash Flows (Topic 230): Restricted Cash, also referred to as “New Cash Flow Presentation Standard” on January 1, 2018. See Note 2, “Recent Accounting Pronouncements,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data,” of this Annual Report on Form 10-K regarding the impact of these recent accounting pronouncements on our Consolidated Financial Statements.

Use of Estimates

The preparation of Consolidated Financial Statements in conformity with United States (“U.S.”) generally accepted accounting principles (“U.S. GAAP”) requires the Company’s management to make judgments, assumptions, and estimates that affect the amounts reported in the Consolidated Financial Statements and accompanying Notes to Consolidated Financial Statements.

The accounting policies that reflect the Company’s more significant estimates and judgments and that the Company believes are the most critical to aid in fully understanding and evaluating its reported financial results are revenue recognition; capitalization of research and development assets; allowance for doubtful accounts; allowance for product warranty; valuation of stock options; valuation and impairment of goodwill and acquired intangible assets; valuation adjustments for excess and obsolete inventory; deferred taxes and valuation allowances on deferred tax assets; and evaluation and measurement of contingencies. Those estimates could change, and as a result, actual results could differ materially from those estimates.

Cash and Cash Equivalents

The Company considers all highly liquid investments with an original or remaining maturity of three months or less at the time of purchase to be cash equivalents. Cash equivalents are stated at cost, which approximates fair value. The Company’s cash and cash equivalents are maintained primarily in demand deposit accounts with large financial institutions and in institutional money market funds. The Company monitors the creditworthiness of the financial institutions and institutional money market funds in which the Company invests its surplus funds. The Company has experienced no credit losses from its cash investments.

Allowances for Doubtful Accounts

The Company records a provision for doubtful accounts based on historical experience and a detailed assessment of the collectability of its accounts receivable. In estimating the allowance for doubtful accounts, the Company considers, among

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other factors, the aging of the accounts receivable, its historical write-offs, the credit worthiness of each customer, and general economic conditions. Account balances are charged off against the allowance when the Company believes that it is probable that the receivable will not be recovered. Actual write-offs may be in excess of the Company's estimated allowance.

Short-Term and Long-Term Investments

The Company's short-term and long-term investments consist primarily of investment-grade debt securities, all of which are classified as available-for-sale. Available-for-sale securities are carried at fair value. Amortization or accretion of premium or discount is included in other income (expense) on the Consolidated Statements of Operations. Changes in the fair value of available-for-sale securities are reported as a component of accumulated other comprehensive loss within stockholders' equity on the Consolidated Balance Sheet. Realized gains and losses on the sale of available-for-sale securities are determined by specific identification of the cost basis of each security. Short-term investments mature within 12 months and long-term investments mature greater than 12 months.

Inventories

Inventories are stated at the lower of cost (using the first-in, first-out "FIFO" method) or net realizable value. The Company calculates inventory valuation adjustments for excess and obsolete inventory based on current inventory levels, movement, expected useful lives, and estimated future demand of the products and spare parts.

Property and Equipment

Property and equipment is recorded at cost and reduced by accumulated depreciation. Depreciation expense is recognized over the estimated useful lives of the assets using the straight-line method. Estimated useful lives are three to ten years. Certain equipment used in the development and manufacturing of ceramic components is depreciated over estimated useful lives of up to 10 years. Leasehold improvements represent remodeling and retrofitting costs for leased office and manufacturing space and are depreciated over the shorter of either the estimated useful lives or the term of the lease. Software purchased for internal use consists primarily of amounts paid for perpetual licenses to third-party software providers and installation costs. Software is depreciated over the estimated useful lives of three to five years. Tangible assets acquired for research and development ("R&D") activities and have alternative use are capitalized over the useful life of the acquired asset. Estimated useful lives are periodically reviewed, and when appropriate, changes are made prospectively. When certain events or changes in operating conditions occur, asset lives may be adjusted and an impairment assessment may be performed on the recoverability of the carrying amounts. Maintenance and repairs are charged directly to expense as incurred.

Goodwill and Other Intangible Assets

The purchase price of an acquired company is allocated between intangible assets and the net tangible assets of the acquired business with the residual purchase price recorded as goodwill. The determination of the value of the intangible assets acquired involves certain judgments and estimates. These judgments can include, but are not limited to, the cash flows that an asset is expected to generate in the future and the appropriate weighted average cost of capital.

Acquired intangible assets with determinable useful lives are amortized on a straight-line or accelerated basis over the estimated periods benefited, ranging from one to 20 years. Acquired intangible assets with contractual terms are amortized over their respective legal or contractual lives. Customer relationships and other non-contractual intangible assets with determinable lives are amortized over periods ranging from five to 20 years.

The Company evaluates the recoverability of long-lived assets by comparing the carrying amount of an asset to estimated future net undiscounted cash flows generated by the asset. If such assets are considered to be impaired, the impairment recognized is measured as the amount by which the carrying amount of the assets exceeds the fair value of the assets. The evaluation of recoverability involves estimates of future operating cash flows based upon certain forecasted assumptions, including, but not limited to, revenue growth rates, gross profit margins, and operating expenses over the expected remaining useful life of the related asset. A shortfall in these estimated operating cash flows could result in an impairment charge in the future.

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Goodwill is not amortized, but is evaluated annually for impairment at the reporting unit level or when indicators of a potential impairment are present. The Company estimates the fair value of the reporting unit using the discounted cash flow and market approaches. Forecast of future cash flows are based on the Company's best estimate of future net sales and operating expenses, based primarily on expected category expansion, pricing, market segment, and general economic conditions.

As of December 31, 2018 and 2017, acquired intangibles, including goodwill, relate to the acquisition of Pump Engineering, LLC during the fourth quarter of 2009. See Note 7, "Goodwill and Intangible Assets," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for further discussion of intangible assets.

Fair Value of Financial Instruments

The Company's financial instruments include cash and cash equivalents, restricted cash, investments in marketable securities, accounts receivable, accounts payable, and debt. The carrying amounts for these financial instruments reported in the Consolidated Balance Sheets approximate their fair values. See Note 6, "Investments and Fair Value Measurements," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for further discussion of fair value.

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to the Company's customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services. At the inception of each contract, performance obligations are identified and the total transaction price is allocated to the performance obligations.

The Company's contracts with customers may include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative stand-alone selling price. The Company generally determines standalone selling prices based on the prices charged to customers.

With respect to termination, the Company does not have the ability to cancel a contract for convenience. In general, customers can cancel for convenience upon the payment of a termination fee that covers costs and profit. It is rare for customers to cancel contracts.

See Note 3, "Revenues" of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K, for more detail on product and service revenue recognition - Water segment, cost-to-total cost ("CTC") revenue recognition- Oil and Gas segment, license and development revenue recognition - Oil and Gas segment.

Research and Development ("R&D") Expense and Capitalization of R&D Assets

R&D expense consists of costs incurred for internal projects and for technology licensed to third parties. These costs include the Company's direct and research-related overhead expenses, which include salaries and other personnel-related expenses (including stock-based compensation), occupancy-related costs, depreciation of facilities, as well as external costs for equipment and supplies. Costs to acquire technologies that are utilized in research and development and that have no alternative future use are expensed when incurred. All R&D costs are expensed as incurred and are included in operating expenses.

The costs of materials that are acquired for research and development activities and have no alternative future uses (in research and development projects or otherwise) are expensed as incurred. With respect to tangible assets acquired or constructed for R&D activities, if the costs of materials that are acquired or constructed for a particular research and development project have alternative future uses (in other research and development projects or otherwise), they are capitalized as an asset and the cost of depreciation is charged to expense.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Warranty Costs

The Company sells products with a limited warranty for a period ranging from 18 months to five years. The Company accrues for warranty costs based on estimated product failure rates, historical activity, and expectations of future costs. Periodically, the Company evaluates and adjusts the warranty costs to the extent that actual warranty costs vary from the original estimates.

Stock-based Compensation

The Company measures and recognizes stock-based compensation expense based on the fair value measurement for all stock-based awards made to its employees and directors, including restricted stock units ("RSUs"), and employee stock options over the requisite service period (typically the vesting period of the awards). The fair value of RSUs based on the Company's stock price on the date of grant. The fair value of stock options is calculated on the date of grant using the Black-Scholes option pricing model, which requires a number of complex assumptions including expected life, expected volatility, risk-free interest rate, and dividend yield. The estimation of awards that will ultimately vest requires judgment, and to the extent that actual results or updated estimates differ from our current estimates, such amounts are recorded as a cumulative adjustment in the period in which the estimates are revised. See Note 12, "Stock-Based Compensation," for further discussion of stock-based compensation.

Foreign Currency

The Company's reporting currency is the U.S. dollar. The functional currency of the Company's Irish subsidiaries is the U.S. dollar, while the functional currency of the Company's other foreign subsidiaries is their respective local currencies. The asset and liability accounts of the Company's foreign subsidiaries are translated from their local currencies at the rates in effect on the balance sheet date. Revenue and expenses are translated at average rates of exchange prevailing during the period. Gains and losses resulting from the translation of the Company's subsidiary balance sheets are recorded as a component of accumulated other comprehensive income (loss). Gains and losses from foreign currency transactions are recorded in other income (expense) in the Consolidated Statements of Operations.

Income Taxes

Current and non-current tax assets and liabilities are based upon an estimate of taxes refundable or payable for each of the jurisdictions in which the Company is subject to tax. In the ordinary course of business, there is inherent uncertainty in quantifying income tax positions. The Company assesses income tax positions and records tax benefits for all years subject to examination based upon the Company's evaluation of the facts, circumstances, and information available at the reporting dates. For those tax positions where it is more likely than not that a tax benefit will be sustained, the Company records the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit is recognized in the financial statements. When applicable, associated interest and penalties are recognized as a component of income tax expense. Accrued interest and penalties are included within the related tax asset or liability on the Consolidated Balance Sheets.

Deferred income taxes are provided for temporary differences arising from differences in bases of assets and liabilities for tax and financial reporting purposes. Deferred income taxes are recorded on temporary differences using enacted tax rates in effect for the year in which the temporary differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Significant judgment is required in determining whether and to what extent any valuation allowance is needed on the Company's deferred tax assets. In making such a determination, the Company considers all available positive and negative evidence including recent results of operations, scheduled reversals of deferred tax liabilities, projected future income, and available tax planning strategies. See Note 10, "Income Taxes," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for further discussion of tax valuation allowances.

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On December 22, 2017, President Trump signed into law the Tax Act, which significantly changed existing U.S. tax laws. Following the enactment of the Tax Act, the SEC staff issued SAB 118, which provided guidance on accounting for the tax effects of the Tax Act. SAB 118 provided a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under ASC 740. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete but it is able to determine a reasonable estimate, it must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the provisions of the tax law that were in effect immediately before the enactment of the Tax Act. Our adjustments were final in 2017. See Note 10, "Income Taxes," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for a discussion of our income tax accounting related to the Tax Act.

The Company's operations are subject to income and transaction taxes in the U.S. and in foreign jurisdictions. Significant estimates and judgments are required in determining the Company's worldwide provision for income taxes. Some of these estimates are based on interpretations of existing tax laws or regulations. The ultimate amount of tax liability may be uncertain as a result.

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Note 2 — Recent Accounting Pronouncements

Recently adopted accounting pronouncements

In May 2014, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) No. 2014-09 (“ASU 2014-09”), *Revenue from Contracts with Customers (Topic 606)*, referred to as Accounting Standards Codification (“ASC”) 606 (“ASC 606”) or the “New Revenue Standard” ASC 606 supersedes the revenue recognition requirements of ASC 605, *Revenue Recognition*, and requires entities to recognize revenue when control of promised goods or services is transferred to customers at an amount that reflects the consideration to which the entity expects to be entitled to in exchange for those goods and services.

The update also requires more detailed disclosures to enable readers of financial statements to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. ASC 606 permits the use of either the full retrospective or cumulative effect transition (modified retrospective) method upon adoption.

In March and April 2016, the FASB issued ASU No. 2016-08 (“ASU 2016-08”), *Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net)* and ASU No. 2016-10 (“ASU 2016-10”), *Revenue from Contracts with Customers (Topic 606) Identifying Performance Obligations and Licensing*, respectively. The amendments in these updates are intended to improve the operability and understandability of the implementation guidance on principal versus agent considerations and to clarify two aspects of ASC 606: identifying performance obligations and the licensing implementation guidance, while retaining the related principles for those areas. The effective date and transition requirements for both ASU 2016-08 and ASU 2016-10 are the same as those for ASU 2014-09, as referred.

The Company adopted “ASU 2014-09”, “ASU 2016-08” and “ASU 2016-10” (the combination is also known as “ASC 606” or “New Revenue Standard”) as of January 1, 2018 using the full retrospective transition method. To assess the impact of and to implement ASC 606, the Company formed a project team, which has operated since 2014, to evaluate internal processes. The Company has implemented changes to its current policies and practices, and internal controls over financial reporting to address the requirements of the standard.

Water Segment Revenue. Performance obligations identified under ASC 606, are consistent with deliverables identified under ASC 605. Revenue recognition for performance obligations accounted for under ASC 606 is consistent with ASC 605 given the transfer of control of the promised goods or services follows the same pattern. Adoption of ASC 606 did not have a material impact on the timing of revenue and expense recognition.

Oil & Gas Segment - Cost-to-Total Cost (“CTC”) Revenue Performance obligations identified under ASC 606, are consistent with deliverables identified under ASC 605. Revenue recognition for performance obligations accounted for under ASC 606 is consistent with ASC 605 given the transfer of control of the promised goods or services follows the same pattern. Adoption of ASC 606 did not have a material impact on the timing of revenue and expense recognition.

Oil & Gas Segment - License and Development Revenue License and development revenue associated with the up-front non-refundable \$75.0 million exclusivity payment received in connection with the VorTeq license agreement (the “VorTeq License Agreement”) that the Company entered into with a technology corporation (the “VorTeq Licensee”) under ASC 605 was recognized on a straight-line basis over the 15-year term of the license, while the two subsequent milestone payments of \$25.0 million that could each be earned under the VorTeq License Agreement were to be recognized in full when achieved under milestone accounting.

License and development revenue under ASC 606, which includes both the upfront non-refundable \$75.0 million exclusivity payment and the two milestone payments of \$25.0 million each, when determined probable, is comprised of:

- revenue recognition over time based on an input measure of progress based on a cost driver, which management has determined is the best estimate of the progress made on the project during the period from inception until full commercialization, for the amount allocated to the exclusive Missile (as defined in Note 15, “VorTeq Partnership and License Agreement”) license, and research and development services, and

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- revenue recognition related to stand-ready, when and if available, upgrades subsequent to full commercialization, recognized over time ratably over the period, which matches the transfer of benefit to the customer on a daily basis, commencing after full commercial launch until the expiration of the contract.

The changes in license and development revenue due to the adoption of ASC 606 are as follows.

	Years Ended December 31,	
	2017	2016
	<i>(In thousands)</i>	
License and development revenue, as previously reported	\$ 5,000	\$ 5,000
Increase in revenue due to adoption of the New Revenue Standard	6,106	3,069
License and development revenue, as adjusted	<u>\$ 11,106</u>	<u>\$ 8,069</u>

The changes in the contract liability balance related to license and development revenue due to the adoption of ASC 606 are as follows.

	December 31,	December 31,
	2017	2016
	<i>(In thousands)</i>	
License and development contract liability, as previously reported	\$ 63,958	\$ 68,958
Decrease in contract liability due to adoption of the New Revenue Standard	9,465	3,359
License and development contract liability, as adjusted	<u>\$ 54,493</u>	<u>\$ 65,599</u>

For license and development revenue, performance obligations identified under ASC 606 differ somewhat from contingent and non-contingent deliverables identified under ASC 605 due to transfer of control considerations.

Under ASC 606, the Company concluded that the Missile license represents functional intellectual property and that the license is not distinct from the research and development services to be provided prior to product commercialization. The transaction price allocated to this combined performance obligation of a continually evolving license will be recognized over the estimated period required to result in full commercial launch using an input measure of progress of the cost of salaries and wages and travel expenses related to the project prior to full commercial launch.

The milestone method of accounting has been eliminated under ASC 606. Instead of recognizing the full amount of each milestone payment as revenue in the period in which it is achieved, the Company will revise its estimate of the transaction price to include development milestone payments only when they become probable of achievement and revenue will be recognized consistent with the input measure of progress.

The Company has concluded that its obligation to provide when and if available updates to its technology in the period subsequent to full commercial launch represents a performance obligation. The transaction price allocated to this stand-ready performance obligation will be recognized ratably over the period commencing after full commercial launch until the expiration of the contract.

See Note 15, "VorTeq Partnership and License Agreement" for additional discussion on the VorTeq License Agreement, and Note 3, "Revenues," for further discussion of revenue recognition.

In February 2016, the FASB issued ASU No. 2016-02 ("ASU 2016-02"), *Leases* (Topic 842), which supersedes ASC 840, *Leases* (Topic 840), and provides principles for the recognition, measurement, presentation and disclosure of leases for both lessees and lessors. The FASB has continued to clarify this guidance through the issuance of additional ASUs. The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification determines whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease, respectively. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than twelve months regardless of classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases.

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The Company early adopted ASU 2016-02 on January 1, 2018 concurrent with the Company's adoption of the New Revenue Standard and elected the available practical expedients. The adoption of ASU 2016-02 had no impact on the Company's Consolidated Statements of Operations. The most significant impact was the recognition of right of use assets and liabilities for operating leases. Adoption of the standard required the Company to recast certain previously reported results, including the recognition of additional operating lease right of use assets and liabilities.

In November 2016, the FASB issued ASU 2016-18 ("ASU 2016-18"), *Statement of Cash Flows* (Topic 230): Restricted Cash, also referred to as "New Cash Flow Presentation Standard." ASU 2016-18 is intended to reduce diversity in practice in the classification and presentation of changes in restricted cash on the Consolidated Statement of Cash Flows. ASU 2016-18 requires that the Consolidated Statement of Cash Flows explain the change in total cash and equivalents and amounts generally described as restricted cash or restricted cash equivalents when reconciling the beginning-of-period and end-of-period total amounts. The standard also requires reconciliation between the total cash and equivalents and restricted cash presented on the Consolidated Statement of Cash Flows and the cash and cash equivalents balance presented on the Consolidated Balance Sheet. ASU 2016-18 is effective retrospectively on January 1, 2018. The Company adopted ASU 2016-18 on January 1, 2018. The Company recast its Consolidated Statements of Cash Flows for the prior periods presented based on the restricted cash balance on the balance sheet date and has provided a reconciliation of cash, cash equivalents and restricted cash in Note 5, "Other Financial Information."

In January 2016, the FASB issued ASU No. 2016-01 ("ASU 2016-01"), *Financial Instruments - Overall* (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities. ASU 2016-01 modifies certain aspects of the recognition, measurement, presentation, and disclosure of financial instruments. For public entities, ASU 2016-01 is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017. The Company adopted ASU 2016-01 on January 1, 2018. The adoption of ASU 2016-01 did not have a material impact on the Company's financial position or results of operations.

In August 2016, the FASB issued ASU No. 2016-15 ("ASU 2016-15"), *Statement of Cash Flows* (Topic 230): Classification of Certain Cash Receipts and Cash Payments. ASU 2016-15 impacts all entities that are required to present a statement of cash flows under ASC 230, *Statement of Cash Flows*. The amendment provides guidance on eight specific cash flow issues. For public entities, ASU 2016-15 is effective for fiscal periods beginning after December 15, 2017 and interim periods within those years. Adoption should be applied using a retrospective transition method to each period presented. The Company adopted ASU 2016-15 on January 1, 2018. The adoption of ASU 2016-15 did not have a material impact on the Company's financial position or results of operations.

In October 2016, the FASB issued ASU 2016-16 ("ASU 2016-16"), *Income Taxes* (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory. ASU 2016-16 requires recognition of the current and deferred income tax effects of an intra-entity asset transfer, other than inventory, when the transfer occurs, as opposed to legacy GAAP, which requires companies to defer the income tax effects of intra-entity asset transfers until the asset has been sold to an outside party. The income tax effects of intra-entity inventory transfers will continue to be deferred until the inventory is sold. ASU 2016-16 is effective on January 1, 2018, with early adoption permitted. The update is required to be adopted on a modified retrospective basis with the cumulative-effect adjustment recorded to retained earnings as of the beginning of the period of adoption. The Company adopted ASU 2016-16 on January 1, 2018. The adoption of ASU 2016-16 did not have a material impact on the Company's financial position or results of operations.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation - Stock Compensation* (Topic 718): Scope of Modification Accounting. ASU 2017-09 provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting under ASC 718, *Compensation - Stock Compensation*. ASU 2017-09 is effective for annual periods and interim periods within those annual periods, beginning after December 15, 2017. The Company adopted ASU 2017-09 on January 1, 2018. The adoption of ASU 2017-09 did not have an impact on the Company's financial position or results of operations.

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Impact of Recently Adopted Accounting Pronouncements

The following table illustrates changes in the Condensed Consolidated Balance Sheets as previously reported prior to, and as adjusted subsequent to, the adoption of the New Revenue Standard and New Lease Standard at January 1, 2018.

	December 31, 2017			
	As Previously Reported	Adoption of New Revenue Standard	Adoption of New Lease Standard	As Adjusted
	<i>(In thousands)</i>			
Assets				
Current assets:				
Contract assets	\$ 6,411	\$ (133)	\$ —	\$ 6,278
Total current assets	126,196	(133)	—	126,063
Non-current assets				
Deferred tax assets, non-current	7,902	31	—	7,933
Operating lease, right of use asset	—	—	2,843	2,843
Total assets	161,744	(102)	2,843	164,485
Liabilities and Stockholders' Equity				
Current liabilities:				
Accrued expenses and other current liabilities	8,517	(469)	(100)	7,948
Lease liabilities	—	—	1,603	1,603
Contract liabilities	6,416	9,493	—	15,909
Total current liabilities	19,833	9,024	1,503	30,360
Non-current liabilities				
Lease liabilities, non-current	—	—	1,698	1,698
Contract liabilities, non-current	59,006	(18,489)	—	40,517
Other non-current liabilities	358	—	(358)	—
Total liabilities	79,213	(9,465)	2,843	72,591
Stockholders' equity:				
Accumulated deficit	(45,922)	9,363	—	(36,559)
Total stockholders' equity	82,531	9,363	—	91,894
Total liabilities and stockholders' equity	161,744	(102)	2,843	164,485

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The following table illustrates changes in the Condensed Consolidated Statement of Operations as previously reported prior to, and as adjusted subsequent to, the adoption of the New Revenue Standard effective January 1, 2018.

	Twelve Months Ended December 31, 2017			Twelve Months Ended December 31, 2016		
	As Previously Reported	Adoption of New Revenue Standard	As Adjusted	As Previously Reported	Adoption of New Revenue Standard	As Adjusted
	<i>(In thousands, except for per share data)</i>					
Product revenue	\$ 58,156	\$ (133)	\$ 58,023	\$ 49,715	\$ —	\$ 49,715
Product cost of revenue	19,061	—	19,061	17,849	—	17,849
Product gross profit	\$ 39,095	\$ (133)	\$ 38,962	\$ 31,866	\$ —	\$ 31,866
License and development revenue	\$ 5,000	\$ 6,106	\$ 11,106	\$ 5,000	\$ 3,069	\$ 8,069
Income from operations	3,276	5,973	9,249	357	3,069	3,426
Income before income taxes	3,956	5,973	9,929	644	3,069	3,713
(Benefit from) provision for income taxes	(8,394)	(31)	(8,425)	(390)	384	(6)
Net income	12,350	6,004	18,354	1,034	2,685	3,719
Income per share:						
Basic	\$ 0.23	\$ 0.11	\$ 0.34	\$ 0.02	\$ 0.05	\$ 0.07
Diluted	\$ 0.22	\$ 0.11	\$ 0.33	\$ 0.02	\$ 0.05	\$ 0.07
Number of shares used in per share calculations:						
Basic	53,701	—	53,701	52,341	—	52,341
Diluted	55,612	—	55,612	55,451	—	55,451

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The following table illustrates changes in the Company's segment activities as previously reported prior to, and as adjusted subsequent to, the adoption of the New Revenue Standard effective January 1, 2018.

	Twelve Months Ended December 31, 2017			Twelve Months Ended December 31, 2016		
	As Previously Reported	Adoption of New Revenue Standard	As Adjusted	As Previously Reported	Adoption of New Revenue Standard	As Adjusted
<i>(In thousands)</i>						
Water						
Product revenue	\$ 54,301	\$ —	\$ 54,301	\$ 47,545	\$ —	\$ 47,545
Product cost of revenue	16,032	—	16,032	16,353	—	16,353
Product gross profit	\$ 38,269	\$ —	\$ 38,269	\$ 31,192	\$ —	\$ 31,192
Income from operations	\$ 29,386	\$ —	\$ 29,386	\$ 23,073	\$ —	\$ 23,073
Oil & Gas						
Product revenue	\$ 3,855	\$ (133)	\$ 3,722	\$ 2,170	\$ —	\$ 2,170
Product cost of revenue	3,029	—	3,029	1,496	—	1,496
Product gross profit	\$ 826	\$ (133)	\$ 693	\$ 674	\$ —	\$ 674
License and development revenue	\$ 5,000	\$ 6,106	\$ 11,106	\$ 5,000	\$ 3,069	\$ 8,069
Income (loss) from operations	(10,184)	5,973	(4,211)	(7,016)	3,069	(3,947)

The following table illustrates changes in the Condensed Consolidated Statement of Comprehensive Income as previously reported prior to, and as adjusted subsequent to, the adoption of the New Revenue Standard effective January 1, 2018.

	Twelve Months Ended December 31, 2017			Twelve Months Ended December 31, 2016		
	As Previously Reported	Adoption of New Revenue Standard	As Adjusted	As Previously Reported	Adoption of New Revenue Standard	As Adjusted
<i>(In thousands)</i>						
Net income	\$ 12,350	\$ 6,004	\$ 18,354	\$ 1,034	\$ 2,685	\$ 3,719
Comprehensive income	12,343	6,004	18,347	980	2,685	3,665

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The following tables illustrate changes in the Condensed Consolidated Statement of Cash Flows as previously reported prior to, and as adjusted subsequent to, the adoption of the New Revenue Standard and New Cash Flow Presentation effective January 1, 2018.

	Twelve Months Ended December 31, 2017			
	As Previously Reported	Adoption of New Revenue Standard	Adoption of New Cash Flow Presentation Standard	As Adjusted
	<i>(In thousands)</i>			
Net income	\$ 12,350	\$ 6,004	\$ —	\$ 18,354
Changes in operating assets and liabilities:				
Accounts receivable	(761)	—	—	(761)
Contract assets	(4,396)	133	—	(4,263)
Inventories	(1,250)	—	—	(1,250)
Prepaid and other assets	(39)	—	—	(39)
Accounts payable	2,118	—	—	2,118
Accrued expenses and other liabilities	364	247	—	611
Income taxes	416	(31)	—	385
Contract liabilities	(5,505)	(6,353)	—	(11,858)
Net cash used in operating activities	2,895	—	—	2,895
Restricted cash	1,538	—	(1,538)	—
Net cash used in investing activities	(37,373)	—	(1,538)	(38,911)
Net change in cash, cash equivalents and restricted cash	(33,584)	—	(1,538)	(35,122)
Cash, cash equivalents and restricted cash, beginning of year	61,364	—	4,384	65,748
Cash, cash equivalents and restricted cash, end of period	27,780	—	2,846	30,626

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Twelve Months Ended December 31, 2016			
	As Previously Reported	Adoption of New Revenue Standard	Adoption of New Cash Flow Presentation Standard	As Adjusted
	<i>(In thousands)</i>			
Net income	\$ 1,034	\$ 2,685	\$ —	\$ 3,719
Changes in operating assets and liabilities:				
Accounts receivable	(244)	—	—	(244)
Contract assets	(130)	—	—	(130)
Inventories	2,287	—	—	2,287
Prepaid and other assets	(402)	—	—	(402)
Accounts payable	(360)	—	—	(360)
Accrued expenses and other liabilities	1,259	(1,521)	—	(262)
Income taxes	14	384	—	398
Contract liabilities	(4,720)	(1,548)	—	(6,268)
Net cash used in operating activities	4,965	—	—	4,965
Restricted cash	(577)	—	577	—
Net cash used in investing activities	(40,706)	—	577	(40,129)
Net change in cash, cash equivalents and restricted cash	(38,567)	—	577	(37,990)
Cash, cash equivalents and restricted cash, beginning of year	99,931	—	3,807	103,738
Cash, cash equivalents and restricted cash, end of period	61,364	—	4,384	65,748

Recently issued accounting pronouncements not yet adopted

In June 2016, the FASB issued ASU 2016-13 (“ASU 2016-13”), *“Financial Instruments - Credit Losses” (Topic 326)*. The FASB issued this update to provide financial statement users with more decision-useful information about the expected credit losses on financial instruments and other commitments to extend credit held by a reporting entity at each reporting date. The amendments in this update replace the existing guidance of incurred loss impairment methodology with an approach that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The updated guidance is effective for annual periods beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption of the update is permitted in fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. The Company expects to adopt this standard on January 1, 2020 and does not expect the adoption of ASU 2016-13 to have a material impact on its financial statements.

In January 2017, the FASB issued ASU No. 2017-04 (“ASU 2017-04”), *Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*. ASU 2017-04 eliminates Step 2 of the goodwill impairment quantitative test and allows for the determination of impairment by comparing the fair value of the reporting unit with its carrying amount. The amendments in this update should be applied on a prospective basis. For public entities which are SEC filers, this amendment is effective for annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019. Early adoption is permitted for testing dates after January 1, 2017. The Company expects to adopt this standard on January 1, 2020 and does not expect the adoption of ASU 2017-04 to have a material impact on its financial statements.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 3 — Revenues

Adoption of ASC 606, Revenue from Contracts with Customers

On January 1, 2018, the Company adopted ASC 606 using the full retrospective transition method. The Company recorded a net reduction to opening retained earnings of \$0.3 million as of January 1, 2016, due to the cumulative impact of adopting ASC 606. The impact to revenues as a result of applying ASC 606 was an increase of \$6.0 million, and \$3.0 million, for the years 2017 and 2016 respectively.

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to the Company's customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services. At the inception of each contract, performance obligations are identified and the total transaction price is allocated to the performance obligations.

The Company's payment terms vary based on the credit risk of its customer. For certain customer types, the Company requires payment before the products or services are delivered to the customer. The Company performs an evaluation of customer credit worthiness on an individual contract basis to assess whether collectability is reasonably assured at the inception of the contract. As part of this evaluation, the Company considers many factors about the individual customer, including the underlying financial strength of the customer and/or partnership consortium and the Company's prior history or industry-specific knowledge about the customer and its supplier relationships. For smaller projects, the Company requires the customer to remit payment generally within 30 to 60 days after product delivery. In some cases, if credit worthiness cannot be determined, prepayment or other security is required.

Sales commissions are expensed as incurred when product revenue is earned. These costs are recorded within sales and marketing expenses.

The following tables present the Company's revenues disaggregated by geography, based on the shipped to addresses of the Company's customers and revenue source. Sales and usage-based taxes are excluded from revenues.

	Year Ended December 31, 2018		
	Water	Oil and Gas	Total
	<i>(In thousands)</i>		
Primary geographical market			
Middle East and Africa	\$ 35,593	\$ 514	\$ 36,107
Americas	6,388	13,490	19,878
Asia	11,955	—	11,955
Europe	6,575	—	6,575
Total	\$ 60,511	\$ 14,004	\$ 74,515
Major product/service line			
PX, pumps and turbo devices	\$ 60,511	\$ 6	\$ 60,517
License and development	—	13,490	13,490
Oil & gas products	—	508	508
Total	\$ 60,511	\$ 14,004	\$ 74,515

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Year Ended December 31, 2017			Year Ended December 31, 2016		
	Water	Oil and Gas	Total	Water	Oil and Gas	Total
	<i>(In thousands)</i>					
Primary geographical market						
Middle East and Africa	\$ 26,190	\$ 3,708	\$ 29,898	\$ 19,436	\$ 2,170	\$ 21,606
Americas	7,023	11,120	18,143	5,419	8,069	13,488
Asia	12,974	—	12,974	17,397	—	17,397
Europe	8,114	—	8,114	5,293	—	5,293
Total	\$ 54,301	\$ 14,828	\$ 69,129	\$ 47,545	\$ 10,239	\$ 57,784
Major product/service line						
PX, pumps and turbo devices	\$ 54,301	\$ 15	\$ 54,316	\$ 47,545	\$ 10	\$ 47,555
License and development	—	11,106	11,106	—	8,069	8,069
Oil & gas products	—	3,707	3,707	—	2,160	2,160
Total	\$ 54,301	\$ 14,828	\$ 69,129	\$ 47,545	\$ 10,239	\$ 57,784

Arrangements with Multiple Performance Obligations and Termination for Convenience

The Company's contracts with customers may include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative stand-alone selling price. The Company generally determines stand-alone selling prices based on the prices charged to customers.

With respect to termination, the Company does not have the ability to cancel the contract for convenience. In general, customers can cancel for convenience upon the payment of a termination fee that covers costs and profit. It is rare for customers to cancel contracts.

Practical Expedients and Exemptions

In the Water segment, the time period between when the Company transfers control of products to the customer and the payment for the products is, in general, less than one year and, therefore, the practical expedient with respect to a financing component has been adopted by the Company.

With respect to taxes, the Company has made the policy election to exclude taxes from the measurement of the transaction price.

The Company does not disclose the value of unsatisfied performance obligations for (i) contracts with an original expected length of one year or less and (ii) contracts for which the Company recognizes revenue at the amount to which the Company has the right to invoice for services performed.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Contract Balances

Contract balances by category are presented in the following table. Prior year amounts have been adjusted for the adoption of ASC 606 on January 1, 2018. See Note 2, "Recent Accounting Pronouncements," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for reconciliation of prior year "As Previously Reported" and "As Adjusted" amounts.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Trade Receivable	\$ 10,212	\$ 12,465
Contract assets:		
Current contract assets	4,083	6,278
Total contract assets	\$ 4,083	\$ 6,278
Current contract liabilities:		
Customer deposits	\$ 706	\$ 414
Deferred revenue:		
Cost and estimated earnings in excess of billings	264	805
License and development	14,518	14,024
Product	548	550
Service	234	116
Total current contract liability	16,270	15,909
Non-current contract liabilities, deferred revenue		
License and development	26,485	40,469
Product	54	48
Total non-current contract liability	26,539	40,517
Total contract liability	\$ 42,809	\$ 56,426

The Company records un-billed receivables as contract assets. Significant changes in contract assets during the period were as follows.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Balance, beginning of year	\$ 6,278	\$ 2,015
Transferred to receivables	(8,865)	(2,909)
Additional unbilled receivables	6,670	7,172
Balance, end of period	\$ 4,083	\$ 6,278

The Company records contract liabilities when cash payments are received or due in advance of the Company's performance. Significant changes in contract liabilities during the period were as follows.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Balance, beginning of year	\$ 56,426	\$ 62,232
Revenue recognized	(13,493)	(5,892)
Cash received	(124)	86
Balance, end of period	\$ 42,809	\$ 56,426

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Transaction Price Allocated to the Remaining Performance Obligation

The following table includes estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied or partially unsatisfied.

	December 31, 2018
	<i>(In thousands)</i>
Year:	
2019	\$ 14,544
2020	14,480
2021	6,328
2022 and thereafter	5,677
Total	\$ 41,029

The Company applies the practical expedient in ASC 606, paragraph 10-50-14, and does not disclose information about remaining performance obligations that have original expected durations of one year or less.

The Company applies the practical expedient in ASC 606 paragraph 10-65-1(f)(3), and does not disclose the amount of the transaction price allocated to the remaining performance obligations and an explanation of when the Company expects to recognize that amount of revenue for the comparative period ended December 31, 2017.

Contract Costs

The Company recognizes the incremental cost of obtaining contracts as an expense when incurred if the amortization period of the assets that the Company otherwise would have recognized is one year or less. The costs of obtaining contracts are included in sales and marketing expenses.

Product and Service Revenue Recognition - Water Segment

In the Water segment, a contract is established by a written agreement (executed sales order, executed purchase order or stand-alone contract) with the customer with fixed pricing, and a credit risk assessment is completed prior to the signing of the agreement to ensure that collectability is reasonably assured.

The Company does not bundle performance obligations in the Water segment. The Company identifies each performance obligation separately along with its associated relative standalone selling price based on the prices and discounts that the Company would sell a promised good or service separately to a customer.

Generally, performance obligations consist of delivery of products, such as PX energy recovery devices, turbochargers, pumps, and spare parts. Service obligation amounts which are not material, are deferred as contract liabilities until the services are performed.

The transfer of control for the Company's products follows transfer of title which typically occurs upon shipment of the equipment in accordance with International Commercial Terms (commonly referred to as "Incoterms"). The specified product performance criteria for the Company's products pertain to the ability of the Company's product to meet its published performance specifications and warranty provisions, which the Company's products have demonstrated on a consistent basis. This factor, combined with historical performance metrics, provides the Company's management with a reasonable basis to conclude that the products will perform satisfactorily upon commissioning of the plant. Installation is relatively simple, requires no customization, and is performed by the customer under the supervision of the Company's personnel. Based on these factors, the Company concluded that performance has been completed upon shipment when title transfers based on the shipping terms, and that product revenue is recognized at a point in time.

The Company does not provide its customers with a right of product return; however, the Company will accept returns of products that are deemed to be damaged or defective when delivered that are covered by the terms and conditions of the product warranty. Product warranty is provided consistent with the industry and is considered to be an assurance warranty, not a separate performance obligation. Product returns and warranty charges have not been significant.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Revenue allocable to the Company's product is limited to the amount that is not contingent upon the delivery of additional items or meeting specified performance conditions. The Company adheres to consistent pricing in the stand-alone sale of products and services.

For large projects, stand-alone contracts are utilized. For these contracts, consistent with industry practice, the Company's customers typically require their suppliers, including the Company, to accept contractual holdback provisions (also referred to as a retention payment) whereby the final amounts due under the sales contract are remitted over extended periods of time or alternatively, stand-by letters of credit are issued. These retention payments are generally 10% or less of the total contract amount and are due and payable upon the passage of time, generally up to 24 to 36 months from the date of product delivery. These retention payments are generally replaced by bank guarantees which have had no history of being exercised, and they align with the product warranty period. Given that they are not material in the context of the contract, they are not considered to be a financing component. The Company has no performance obligation and they are recorded as contract assets.

Shipping and handling charges billed to customers is a pass-through from the freight forwarder and is included in product revenue. The cost of shipping to customers is included in cost of revenue.

Cost-to-Total Cost ("CTC") Revenue Recognition - Oil & Gas Segment

IsoBoost and IsoGen systems are highly engineered, customized solutions that are designed and manufactured over an extended period of time and are built specifically to meet a customer's specifications. Given the facts and circumstances of these projects, the Company concluded that the CTC method of accounting is appropriate for IsoBoost and IsoGen systems. In the event that a purchase order for an IsoBoost or IsoGen system does not meet these facts and circumstances, then the CTC method of accounting does not apply. The Company had one CTC contract for IsoBoost turbochargers in fiscal years 2016 through 2018, which was completed in 2018, and last units were shipped in the first quarter of 2019. A standard assurance type warranty was provided.

Revenue from fixed price contracts is recognized with progress measured in the ratio of costs incurred to estimated final costs. Contract costs include all direct material and labor costs related to contract performance. Pre-contract costs with no future benefit were expensed in the period in which they were incurred. Since the financial reporting of these contracts depends on estimates, which are assessed continually during the term of the contract, recognized revenues and profit are subject to revisions as the contract progresses to completion. Revisions in profit estimates are reflected in the period in which the facts that give rise to the revisions become known, using the cumulative catchup method. If material, the effects of any changes in estimates are disclosed in the notes to the consolidated financial statements. When estimates indicate that a loss will be incurred on a contract, a provision for the expected loss is recorded in the period in which the loss becomes evident. No loss has been incurred to date. Revenue is recognized only to the extent costs have been recognized in the same period.

Cost and estimated earnings on uncompleted contracts is presented in the following table.

	December 31, 2018	December 31, 2017		
		As Previously Reported	Adoption of New Revenue Standard	As Adjusted
		<i>(In thousands)</i>		
Estimated earnings to date	\$ 6,477	\$ 6,000	\$ (133)	\$ 5,867
Estimated costs to date	(5,289)	(4,525)	—	(4,525)
Subtotal	1,188	1,475	(133)	1,342
Net billings to date	(108)	2,718	—	2,718
Total	\$ 1,080	\$ 4,193	\$ (133)	\$ 4,060
Included in accompanying balance sheets:				
Unbilled project costs	\$ 1,343	\$ 4,998	\$ (133)	\$ 4,865
Cost and estimated earnings in excess of billings	(263)	(805)	—	(805)
Total	\$ 1,080	\$ 4,193	\$ (133)	\$ 4,060

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Unbilled project costs and Cost and estimated earnings in excess of billings are included in Contract assets and Contract liabilities on the Condensed Consolidated Balance Sheets, respectively.

License and Development Revenue Recognition - Oil & Gas Segment

License and development revenue is comprised of revenue recognition over time of the upfront non-refundable \$75.0 million exclusivity fee received in connection with the VorTeq License Agreement, as well as the revenue recognition over time of the two milestone payments of \$25.0 million each when uncertainty of receipt is resolved and receipt of each milestone payment is considered probable.

The VorTeq License Agreement is comprised of a 15-year exclusive license for the Company's VorTeq technology ("VorTeq"). In performing the obligations under the license, the Company provides research and development services to commercialize the technology in accordance with the Key Performance Indicators ("KPIs"), defined in the VorTeq License Agreement. After commercialization is achieved, payments will be received for the supply and servicing of certain components of the VorTeq. All payments are non-refundable. See Note 15, "*VorTeq Partnership and License Agreement*," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for further details.

The Company recognizes license and development revenue in accordance with ASC 606. Revenue is recognized when control of the promised goods or services is transferred to customers. Stand-alone selling price was established at the inception of the VorTeq License Agreement by taking the transaction to market on a non-exclusive basis, and pricing in an exclusivity premium. Since the VorTeq License Agreement included an up-front non-refundable payment at the inception of the VorTeq License Agreement and future products and services are provided after initial commercialization, the Company completed an analysis and concluded that there was no material right included in the pricing of the VorTeq License Agreement.

Performance obligations, such as the exclusive license to the Missile technology and upgrades prior to and subsequent to the date of full commercial launch, have been identified. Value has been allocated to the performance obligations and revenue is recognized over time based on the input measure of progress of the cost of salaries and wages related to the project prior to full commercialization, and ratably for the unspecified upgrades for the period subsequent to full commercialization until the expiration of the VorTeq License Agreement.

Once commercial launch is achieved and cartridges are provided under the contract, revenue from those royalty payments will be recognized in accordance with ASC 842, with the Company as the lessor. It is expected that the cartridge leases will be classified as operating leases, and lease revenue will be recognized as earned.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 4 — Income Per Share

Net income is divided by the weighted average number of common shares outstanding during the year to calculate basic net income per common share. Basic earnings per share exclude any dilutive effects of stock options and RSUs.

Diluted net income per common share reflects the potential dilution that would occur if outstanding stock options to purchase common stock were exercised for common stock, using the treasury stock method, and the common stock underlying outstanding restricted award was issued. Diluted earnings per share for the years ended December 31, 2018, 2017 and 2016, includes the dilutive effects of stock options and RSUs. Certain common stock issuable under stock options and RSUs have been omitted from the 2018, 2017 and 2016 diluted net income per share calculations because their inclusion is considered anti-dilutive.

The computation of basic and diluted net income per share is presented in the following table.

	Year Ended December 31,		
	2018	2017	2016
	<i>(In thousands, except per share amounts)</i>		
Numerator:			
Net income	\$ 22,093	\$ 18,354	\$ 3,719
Denominator:			
Basic weighted average common shares outstanding	53,764	53,701	52,341
Weighted average effect of dilutive stock awards	1,574	1,911	3,110
Diluted weighted average common shares outstanding	55,338	55,612	55,451
Net income per share:			
Basic	\$ 0.41	\$ 0.34	\$ 0.07
Diluted	\$ 0.40	\$ 0.33	\$ 0.07

The potential common shares were excluded from the computation of diluted net income per share as their effect would have been anti-dilutive is presented in the following table.

	Year Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Anti-dilutive shares excluded from net income per share calculation	2,176	1,810	2,987

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 5 — Other Financial Information

Cash, Cash Equivalents and Restricted Cash

The Company pledged cash in connection with certain stand-by letters of credit and company credit cards. The Company deposited corresponding amounts into accounts at several financial institutions. See Note 8, “*Long-term Debt and Lines of Credit*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplemental Data,” of this Annual Report on Form 10-K for additional discussion related to the Company’s stand-by letters of credit and restricted cash requirements.

The Company’s cash, cash equivalents, and restricted cash are presented in the table below.

	December 31, 2018	December 31, 2017
<i>(In thousands)</i>		
Cash and cash equivalents	\$ 21,955	\$ 27,780
Restricted cash	183	2,846
Total cash, cash equivalents, and restricted cash	\$ 22,138	\$ 30,626

Allowance for Doubtful Accounts

The allowance for doubtful accounts activities are presented in the table below.

	Allowance for Doubtful Accounts
<i>(In thousands)</i>	
As of December 31, 2015	166
Additions	76
Changes in Estimates	(112)
Deductions	—
As of December 31, 2016	\$ 130
Additions	55
Changes in Estimates ⁽¹⁾	(77)
Deductions ⁽²⁾	(5)
As of December 31, 2017	103
Additions	336
Changes in Estimates ⁽¹⁾	(43)
As of December 31, 2018	\$ 396

(1) Collections of previously reserved accounts

(2) Uncollectible accounts written off, net of recoveries

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Inventories

Inventories are stated at the lower of cost (using the first-in, first-out method) or net realizable value and are presented by category in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Raw materials	\$ 2,238	\$ 1,899
Work in process	2,689	2,191
Finished goods	2,211	1,424
Inventories, net	<u>\$ 7,138</u>	<u>\$ 5,514</u>

Valuation adjustments for excess and obsolete inventory, reflected as a reduction of inventory at December 31, 2018 and 2017 was \$0.7 million and \$0.7 million, respectively.

Prepaid and Other Current Assets

Prepaid expenses and other current assets by category are presented in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Interest receivable	\$ 478	\$ 439
Supplier advances	591	124
Insurance	238	256
Software license	161	193
Prepaid and refundable VAT and import duty	289	—
Income tax refund	465	—
Other prepaid expenses and current assets	588	330
Total prepaid and other current assets	<u>\$ 2,810</u>	<u>\$ 1,342</u>

Property and Equipment

Property and equipment held for use by category are presented in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Machinery and equipment	\$ 23,675	\$ 20,813
Leasehold improvements	10,458	10,458
Software	3,013	2,985
Office equipment, furniture, and fixtures	2,970	2,699
Automobiles	199	114
Construction in progress	945	466
Total property and equipment	<u>41,260</u>	<u>37,535</u>
Less: accumulated depreciation and amortization	<u>(26,641)</u>	<u>(24,142)</u>
Property and equipment, net	<u>\$ 14,619</u>	<u>\$ 13,393</u>

Construction in progress costs at December 31, 2018 and 2017 primarily relates to R&D equipment received but not placed in service.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Depreciation expense related to all depreciable property and equipment is presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Depreciation expense	\$ 3,228	\$ 3,035	\$ 3,049

Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities by category are presented in the following table.

	December 31,	December 31,
	2018	2017
	<i>(In thousands)</i>	
Payroll and commissions payable	\$ 5,843	\$ 6,071
Other accrued expenses and current liabilities	2,176	1,877
Total accrued expenses and other current liabilities	<u>\$ 8,019</u>	<u>\$ 7,948</u>

Accumulated Other Comprehensive Loss

There were no reclassifications of amounts out of Accumulated Other Comprehensive Loss, as there have been no sales of securities or translation adjustments that impacted other comprehensive loss during the years presented. The tax impact of the changes in Accumulated Other Comprehensive Loss was not material.

Advertising Expense

Advertising expense is charged to operations during the year in which it is incurred. Total advertising expense was not material for the years ended December 31, 2018, 2017 and 2016.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 6 — Investments and Fair Value Measurements

Available-for-Sale Investments

The Company's investments are all classified as available-for-sale. As of December 31, 2018, \$73.4 million was classified as short-term and \$1.3 million was classified as long-term. At December 31, 2017, all available-for-sale-investments were classified as short-term. There were no sales of available-for-sale investments during the years ended December 31, 2018 and 2017.

Available-for-sale investments as of December 31, 2018 and 2017 are presented in the following tables.

December 31, 2018				
Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Fair Value	
<i>(In thousands)</i>				
Short-term investments				
U.S. Treasury securities	\$ 8,102	\$ 1	\$ (2)	\$ 8,101
Corporate notes and bonds	65,324	1	(88)	65,237
Total short-term investments	\$ 73,426	\$ 2	\$ (90)	\$ 73,338
Long-term investments				
Corporate notes and bonds	\$ 1,269	\$ —	\$ —	\$ 1,269
Total long-term investments	\$ 1,269	\$ —	\$ —	\$ 1,269
Total available-for-sale investments	\$ 74,695	\$ 2	\$ (90)	\$ 74,607

December 31, 2017				
Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Fair Value	
<i>(In thousands)</i>				
U.S. Treasury securities	\$ 16,755	\$ —	\$ (14)	\$ 16,741
Corporate notes and bonds *	53,367	—	(77)	53,290
Municipal notes and bonds	247	—	—	247
Total available-for-sale investments	\$ 70,369	\$ —	\$ (91)	\$ 70,278

* \$0.3 million of corporate bonds were classified as cash & cash equivalents.

The Company monitors investments for other-than-temporary impairment. It was determined that unrealized gains and losses at December 31, 2018 and 2017, are temporary in nature, because the changes in market value for these securities resulted from fluctuating interest rates, rather than a deterioration of the credit worthiness of the issuers. The Company is unlikely to experience gains or losses if these securities are held to maturity. In the event that the Company disposes of these securities before maturity, it is expected that the realized gains or losses, if any, will be immaterial.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Expected maturities can differ from contractual maturities because borrowers may have the right to prepay obligations without prepayment penalties. The amortized cost and fair value of available-for-sale securities that had stated maturities as of December 31, 2018 are shown by contractual maturity in the following table.

	December 31, 2018	
	Amortized Cost	Fair Value
	<i>(In thousands)</i>	
Due in one year or less	\$ 73,426	\$ 73,338
Due in greater than one year	1,269	1,269
	<u>\$ 74,695</u>	<u>\$ 74,607</u>

Fair Value of Financial Instruments

The Company follows the authoritative guidance for fair value measurements and disclosures that, among other things, defines fair value, establishes a consistent framework for measuring fair value, and expands disclosure for each major asset and liability category measured at fair value on either a recurring or nonrecurring basis. Fair value is defined as an exit price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability.

Level 1 — Quoted prices (unadjusted) in active markets for identical assets or liabilities;

Level 2 — Inputs other than quoted prices included within Level 1 that are either directly or indirectly observable; and

Level 3 — Unobservable inputs in which little or no market activity exists, therefore requiring an entity to develop its own assumptions that market participants would use in pricing.

The carrying values of cash and cash equivalents, restricted cash, accounts receivable, un-billed receivables, cost and estimated earnings in excess of billings, accounts payable, and other accrued expenses approximate fair value due to the short-term maturity of those instruments. For the Company's investments in available-for-sale securities, if quoted prices in active markets for identical investments are not available to determine fair value (Level 1), then the Company uses quoted prices for similar assets or inputs other than quoted prices that are observable either directly or indirectly (Level 2). The investments included in Level 2 consist of corporate notes and bonds, municipal notes and bonds and U.S. Treasury securities.

The fair value of financial assets and liabilities measured on a recurring basis is presented in the following tables.

	December 31, 2018	Fair Value Measurement at Reporting Date Using		
		Level 1 Inputs	Level 2 Inputs	Level 3 Inputs
	<i>(In thousands)</i>			
Assets:				
Cash equivalents				
Money market securities	\$ 6,661	\$ 6,661	\$ —	\$ —
Total cash equivalents	<u>6,661</u>	<u>6,661</u>	<u>—</u>	<u>—</u>
Short-term investments				
U.S. Treasury securities	8,101	—	8,101	—
Corporate notes and bonds	65,237	—	65,237	—
Total short-term investments	<u>73,338</u>	<u>—</u>	<u>73,338</u>	<u>—</u>
Long-term investments				
Corporate notes and bonds	\$ 1,269	\$ —	\$ 1,269	\$ —
Total long-term securities				
Total assets	<u>\$ 81,268</u>	<u>\$ 6,661</u>	<u>\$ 74,607</u>	<u>\$ —</u>

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	December 31, 2017	Fair Value Measurement at Reporting Date Using		
		Level 1 Inputs	Level 2 Inputs	Level 3 Inputs
<i>(In thousands)</i>				
Assets:				
Cash equivalents				
Money market securities	\$ —	\$ —	\$ —	\$ —
Corporate notes and bonds	258	—	258	—
Total cash equivalents	258	—	258	—
Short-term investments				
U.S. Treasury securities	16,741	—	16,741	—
Corporate notes and bonds	\$ 53,032	\$ —	\$ 53,032	\$ —
Municipal notes and bonds	247	—	247	—
Total short-term investments	70,020	—	70,020	—
Total assets	\$ 70,278	\$ —	\$ 70,278	\$ —

During the years ended December 31, 2018 and 2017, the Company had no transfers of financial assets and liabilities between Level 1 and Level 2.

The fair value and gross unrealized losses on the available-for-sale securities that have been in a continuous unrealized loss position, aggregated by type of investment instrument as of December 31, 2018 and 2017 are summarized in the following table. Available-for-sale investments that were in an unrealized gain position have been excluded from the following table.

	December 31, 2018		December 31, 2017	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
<i>(In thousands)</i>				
U.S. Treasury securities	\$ 8,101	\$ (2)	\$ 10,162	\$ (14)
Corporate notes and bonds	61,809	(88)	53,222	(77)
Municipal notes and bonds	—	—	247	—
Total available-for-sale investments	\$ 69,910	\$ (90)	\$ 63,631	\$ (91)

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 7 — Goodwill and Intangible Assets

Goodwill

The net carrying amount of goodwill as of December 31, 2018 and 2017 was \$12.8 million. Goodwill resulted from the Company's acquisition of Pump Engineering, LLC in December 2009. The Company's annual impairment test performed as of July 1, 2018 determined that goodwill was not impaired. As of December 31, 2018 and 2017, no impairment of goodwill has been recorded in the accompanying Consolidated Financial Statements.

Other Intangible Assets

The components of identifiable intangible assets, all of which are finite-lived, as of the date indicated were as follows in the table below. All intangible assets are amortized on a straight-line basis over their useful life.

	December 31, 2018				
	Gross Carrying Amount	Accumulated Amortization	Accumulated Impairment Losses	Net Carrying Amount	Weighted Average Useful Life
	<i>(In thousands, except for weighted average useful life)</i>				
Developed technology	\$ 6,100	\$ (5,541)	\$ —	\$ 559	10
Patents	585	(462)	(42)	81	18
Total	\$ 6,685	\$ (6,003)	\$ (42)	\$ 640	

	December 31, 2017				
	Gross Carrying Amount	Accumulated Amortization	Accumulated Impairment Losses	Net Carrying Amount	Weighted Average Useful Life
	<i>(In thousands, except for weighted average useful life)</i>				
Developed technology	\$ 6,100	\$ (4,931)	\$ —	\$ 1,169	10
Patents	585	(443)	(42)	100	18
Total	\$ 6,685	\$ (5,374)	\$ (42)	\$ 1,269	

Accumulated impairment losses for patents at December 31, 2018 and 2017 include impairment losses from 2007 and 2010. No other impairment of intangible assets was identified during the periods presented for intangible assets.

Amortization of intangibles was \$0.6 million for each of the years ended December 31, 2018, 2017 and 2016.

Future estimated amortization expense as of December 31, 2018 on intangible assets is presented in the following table.

	Future Amortization
	<i>(In thousands)</i>
Year:	
2019	\$ 576
2020	16
2021	12
2022	11
2023	11
Thereafter	14
Total	\$ 640

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 8 — Long-term Debt and Lines of Credit

Installment Loan

In March 2015, the Company entered into a loan agreement with a financial institution for a \$55 thousand fixed-rate installment loan with an annual interest rate of 6.35%. The note is secured by the asset purchased. The loan is payable in equal monthly installments with a maturity date of April 2, 2020. The loan was fully paid off in 2018.

Long-term debt as of December 31, 2018 and 2017 is presented in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Loan payable	\$ —	\$ 27
Less: current portion	—	(11)
Total long-term debt	\$ —	\$ 16

Loans and Stand-by Letters of Credit

Loan and Pledge Agreement

On January 27, 2017, the Company entered into a loan and pledge agreement (the “Loan and Pledge Agreement”) with a financial institution (“Financial Institution 2”). The Loan and Pledge Agreement provides for a committed revolving credit line of \$16.0 million and an uncommitted revolving credit line of \$4.0 million. The Loan and Pledge Agreement was amended on March 17, 2017, to increase the permitted indebtedness under the agreement and to modify certain revolving loan credit options. No other provisions of the Loan and Pledge Agreement were amended. The Loan and Pledge Agreement was further amended on March 30, 2018 to extend the termination date of the Loan and Pledge Agreement from March 31, 2018 to March 31, 2020. No other provisions of the Loan and Pledge Agreement were amended at that time. The Loan and Pledge Agreement was further amended on August 24, 2018 to permit the Company to incur indebtedness owed to a foreign subsidiary in an aggregate amount not to exceed \$66.0 million, which amount is subordinated to any amounts outstanding under the Loan and Pledge Agreement. As of December 31, 2018, no debt was outstanding under the Loan and Pledge Agreement, however, the standby letters of credit outstanding with Financial Institution 2 are deducted from the total revolving credit line.

Stand-by Letters of Credit

In connection with a previous loan agreement, entered into in June 2012 and terminated in June 2017, Financial Institution 1 issued stand-by letters of credit to the Company that were subject to customary fees and expenses for issuance or renewal. The unused portion of the credit facility was subject to a facility fee in an amount equal to 0.25% per annum of the average unused portion of the revolving line. The loan agreement required the Company to maintain a cash collateral balance equal to 101% of all outstanding advances and all outstanding stand-by letters of credit collateralized by the line of credit. With the termination of the loan agreement, the cash collateral requirement was increased to 105% on all stand-by letters of credit and corporate credit cards at Financial Institution 1.

In September 2016, Financial Institution 2 issued stand-by letters of credit to the Company that were subject to customary fees and expenses for issuance or renewal. Initially, Financial Institution 2 required a cash collateral equal to the full outstanding amount of the stand-by letters of credit until the Loan and Pledge Agreement was put in place on January 27, 2017. As of that same date, this cash collateral requirement was removed when the Company entered into a loan and pledge agreement with Financial Institution 2 (see Loan and Pledge Agreement above) and replaced with pledged U.S. Investments held at Financial Institution 2 equal to the full outstanding amount of the stand-by letters of credit. These stand-by letters of credit are subject to fees, in an amount equal to 0.7% per annum of the face amount of the letter of credit, that are payable quarterly and are non-refundable.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

In October 2016, the Company entered into stand-by letters of credit with a financial institution ("Financial Institution 3"). Financial Institution 3's stand-by letters of credit were secured by a cash collateral balance required equal to the full outstanding amount of the stand-by letters of credit.

The financial institutions where the outstanding amounts of stand-by letters of credit are collateralized by restricted cash or pledged U.S. investments are presented in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Financial Institution 1	\$ 92	\$ 1,687
Financial Institution 2	8,680	7,745
Financial Institution 3	—	990
Total	\$ 8,772	\$ 10,422

The Company's total restricted cash balances by financial institution are presented in the following table.

	December 31, 2018	December 31, 2017
	<i>(In thousands)</i>	
Financial Institution 1	\$ 97	\$ 1,771
Financial Institution 2 ⁽¹⁾	—	—
Financial Institution 3	—	990
Financial Institution 4	86	85
Total	\$ 183	\$ 2,846

⁽¹⁾ Financial Institution 2 requires pledged U.S. Investments in lieu of restricted cash balances as of January 27, 2017.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 9 — Commitments and Contingencies

Operating Lease Obligations

The Company leases office facilities and equipment under operating leases that expire on various dates through 2028.

In April 2018, the Company renegotiated the lease of approximately of 170,000 square feet of space in San Leandro, California, with the lessor (“New Doolittle Lease”). The New Doolittle Lease is effective from April 2018 through December 2028 and has a renewal term of one additional period of five years. The initial monthly rent is approximately \$135 thousand with an annual increase of 3% and a total of nine months of rent abatement. Under the new lease standard, ASC 842, which was early-adopted by the company in 2018, the New Doolittle Lease was accounted for as a modification with changes in lease term and consideration. As a result, the Company re-measured the lease liability using the updated discount rate using secured borrowing discount rate and revised lease payments and recognized the amount of \$10.4 million as an increase to the lease liability, with a corresponding adjustment to the right-of-use asset.

In October 2017, the Company entered into a sublease agreement for office space in Houston, Texas. The sublease agreement is for a term of 3 years commencing in November 2017.

Rent and lease expense related to all of the Company’s leased property is presented in the following table.

	Twelve Months Ended December 31, 2018	Twelve Months Ended December 31, 2017	Twelve Months Ended December 31, 2016
Operating lease cost	\$ 1,888	\$ 1,699	\$ 1,422

Other information related to the operating leases are presented in the following table.

	Twelve Months Ended December 31, 2018	Twelve Months Ended December 31, 2017	Twelve Months Ended December 31, 2016
Cash payments	\$ 964	\$ 1,395	\$ 1,337

The weighted average remaining lease term and discount rate as of December 31, 2018 related to the operating leases are presented in the following table.

Weighted average remaining lease term	9.8 years
Weighted average discount rate	6.95 %

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company leases facilities under fixed non-cancellable operating leases that expire on various dates through December 2028. Maturities of lease liabilities as of December 31, 2018 are presented in the following table:

	Lease Amounts
	<i>(In thousands)</i>
Year:	
2019	\$ 1,855
2020	1,653
2021	1,811
2022	1,714
2023	1,922
Thereafter	8,122
Imputed interest	(3,595)
Total	\$ 13,482

On January 10, 2019, the Company entered into an industrial lease agreement pursuant to which the Company has leased approximately 25,200 square feet to be constructed office and warehouse space and approximately 4.5 acres of yard space in Katy, Texas, for a new commercial development center for oil & gas field testing and training. The Company's monthly base rent obligation is approximately \$26,000 for the first year of the Lease and increases three percent annually thereafter. In addition, the Company will pay its share of operating expenses, which is currently estimated to be approximately \$12,000 per month. The initial term of the Lease is one hundred twenty (120) months after the commencement date, and the Company has two options to extend the Lease by an additional five-year term, which must be exercised by written notice at least six months prior to the end of the relevant term.

Warranty

Changes in the Company's accrued product warranty reserve are presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Balance, beginning of year	\$ 366	\$ 406	\$ 461
Warranty costs charged to cost of revenue	340	246	208
Utilization charges against reserve	(48)	(86)	(27)
Release of accrual related to expired warranties	(180)	(200)	(236)
Balance, end of year	\$ 478	\$ 366	\$ 406

Purchase Obligations

The Company has purchase order arrangements with its vendors for which the Company has not received the related goods or services as of December 31, 2018. These arrangements are subject to change based on the Company's sales demand forecasts, and the Company has the right to cancel the arrangements prior to the date of delivery. The majority of these purchase order arrangements were related to various raw materials and components parts. As of December 31, 2018, the Company had approximately \$8.0 million of open cancellable purchase order arrangements related primarily to materials and parts.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Guarantees

The Company enters into indemnification provisions under its agreements with other companies in the ordinary course of business, typically with customers. Under these provisions, the Company generally indemnifies and holds harmless the indemnified party for losses suffered or incurred by the indemnified party as a result of the Company's activities, generally limited to personal injury and property damage caused by the Company's employees at a customer's desalination plant in proportion to the employee's percentage of fault for the accident. Damages incurred for these indemnifications would be covered by the Company's general liability insurance to the extent provided by the policy limitations. The Company has not incurred material costs to defend lawsuits or settle claims related to these indemnification agreements. As a result, the estimated fair value of these agreements is not material. Accordingly, the Company had no liabilities recorded for these agreements as of December 31, 2018 and 2017.

In certain cases, the Company issues warranty and product performance guarantees to its customers for amounts generally equal to 10% or less of the total sales agreement to endorse the execution of product delivery and the warranty of design work, fabrication, and operating performance of our devices. These guarantees are generally stand-by letters of credit that typically remain in place for periods ranging up to 36 months. All stand-by letters of credit at December 31, 2018 and 2017, were \$8.8 million and \$10.4 million, respectively. See Note 8, "*Long-term Debt and Lines of Credit*," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for additional information about the Company's stand-by letters of credit arrangements.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 10 — Income Taxes

The Company's U.S. and foreign components of consolidated income before income taxes and the benefit from income taxes is presented in the following table.

	Years Ended December 31,		
	2018	2017 (1)	2016 (1)
	<i>(In thousands)</i>		
Income (loss) before income taxes:			
U.S.	\$ 12,139	\$ 11,549	\$ 6,158
Foreign	(699)	(1,620)	(2,445)
Total income before income taxes	<u>\$ 11,440</u>	<u>\$ 9,929</u>	<u>\$ 3,713</u>
Current tax provision (benefit):			
Federal	\$ (297)	\$ 441	\$ —
State	(2)	12	16
Foreign	25	18	46
Current tax provision (benefit)	<u>\$ (274)</u>	<u>\$ 471</u>	<u>\$ 62</u>
Deferred tax (benefit) provision:			
Federal	\$ (9,773)	\$ (9,025)	\$ 248
State	(606)	(1,141)	3
Foreign	—	1,270	(319)
Total deferred tax benefit	<u>\$ (10,379)</u>	<u>\$ (8,896)</u>	<u>\$ (68)</u>
Total benefit for income taxes	<u>\$ (10,653)</u>	<u>\$ (8,425)</u>	<u>\$ (6)</u>

(1) Due to the full retrospective adoption of ASC 606 as defined in Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K, the balances for the years ended 2017 and 2016 are recast.

On December 22, 2017, President Trump signed into law the Tax Act, which significantly changed existing U.S. tax laws. Following the enactment of the Tax Act, the SEC staff issued SAB 118, which provided guidance on accounting for the tax effects of the Tax Act. SAB 118 provided a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under ASC 740. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete but it is able to determine a reasonable estimate, it must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the provisions of the tax law that were in effect immediately before the enactment of the Tax Act. Our adjustments were final in 2017.

The Company has evaluated the impact of the new global intangible low taxed income (GILTI) and has concluded that the impact to the Company of the GILTI is immaterial.

The tax benefit of \$10.7 million for the year ended December 31, 2018, included a \$12.3 million U.S. federal and state deferred tax benefit related to the income tax effects of a tax election related to a change to the Company's international tax structure in Ireland that was effective Q2 2018. This election resulted in a deferred tax asset related to tax expense previously recorded on earnings and profits under the Tax Act on deferred revenue not yet recognized under US GAAP. The 2018 tax results also reflect an \$800k tax benefit from stock based compensation tax deductions in excess of the related book expense. For more details on the impact of tax credits and other factors that impact the Company's annual income tax expense, please see the reconciliation of the statutory federal income tax rate to the effective tax rate table below.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The tax benefit of \$8.4 million for the year ended December 31, 2017, consisted of a net \$10.1 million U.S. federal and state deferred tax benefit after taking into consideration a valuation allowance release on all but \$1.4 million of our U.S. federal and state deferred tax assets, less a valuation allowance for the Irish deferred tax assets of \$1.3 million less U.S. federal, state and foreign current tax expense of \$0.4 million. In addition, as a result of enactment of the legislation, during the fourth quarter of 2017, the Company incurred a one-time income tax expense of \$7.0 million related to the deemed repatriation tax on accumulated foreign earnings (of which \$0.3 million is a cash charge and the remaining \$6.7 million represents a non-cash discrete tax expense largely from the utilization of net operating loss carryovers). The Company also incurred a non-cash income tax expense of \$2.5 million related to the re-measurement of certain deferred tax assets and liabilities based on the tax rates from the Tax Act. For more details on the impact of tax credits and other factors that impact the Company's annual income tax expense, please see the reconciliation of the statutory federal income tax rate to the effective tax rate table below.

A reconciliation of income taxes computed at the statutory federal income tax rate to the effective tax rate implied by the accompanying Statements of Operations is presented in the following table.

	Years Ended December 31,		
	2018	2017 (1)	2016 (1)
U.S. federal taxes at statutory rate	21 %	34 %	34 %
State income tax, net of federal benefit	(6)%	1 %	— %
Deemed repatriation transition tax	— %	71 %	— %
Deferred tax re-measurement - Change in tax rates	1 %	24 %	— %
Foreign rate differential	(1)%	(10)%	45 %
Change in tax status of foreign operations	(102)%	— %	— %
Stock-based compensation	(3)%	(6)%	— %
Non-deductible expenses	1 %	1 %	2 %
Federal research credits	(6)%	(4)%	(11)%
Valuation allowance	3 %	(197)%	(70)%
Other	(1)%	1 %	— %
Effective tax rate	(93)%	(85)%	— %

(1) Due to the full retrospective adoption of ASC 606 as defined in Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K, the balances for the years ended 2017 and 2016 are recast.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The Company's total deferred tax assets and liabilities is presented in the following table.

	December 31, 2018	December 31, 2017(1)
	<i>(In thousands)</i>	
Deferred tax assets:		
Net operating loss carry forwards	\$ 5,636	\$ 5,918
Accruals and reserves	12,157	2,847
Research and development credit carry forwards	4,609	3,957
Acquired intangibles	859	909
Charitable contributions	24	11
Total deferred tax assets	<u>23,285</u>	<u>13,642</u>
Valuation allowance	(2,850)	(3,411)
Net deferred tax assets	<u>20,435</u>	<u>10,231</u>
Deferred tax liabilities:		
Depreciation on property and equipment	(937)	(650)
Unrecognized gain on translation of foreign currency	(9)	(5)
Goodwill	(1,171)	(1,643)
Total deferred tax liabilities	<u>(2,117)</u>	<u>(2,298)</u>
Net deferred tax assets	<u>\$ 18,318</u>	<u>\$ 7,933</u>
As reported on the balance sheet:		
Non-current assets	\$ 18,318	\$ 7,933
Non-current liabilities	—	—
Net deferred tax assets	<u>\$ 18,318</u>	<u>\$ 7,933</u>

(1) Due to the full retrospective adoption of ASC 606 as defined in Note 2, "Recent Accounting Pronouncements", of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10K, the balances for the years ended 2017 and 2016 are recast.

The Company had gross deferred tax assets of approximately \$23.3 million and \$13.6 million at December 31, 2018 and 2017, respectively, relating principally to accrued expenses and tax effects of net operating loss and tax credit carry-forwards. In asserting the recoverability of deferred tax assets, management considers whether it is more likely than not that the assets will be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible.

The Company assesses the available positive and negative evidence to estimate if sufficient future taxable income will be generated to use the existing deferred tax assets. In making such a determination, we consider all available positive and negative evidence including recent results of operations, scheduled reversals of deferred tax liabilities, projected future income, and available tax planning strategies. A significant piece of objective positive evidence evaluated was the cumulative profit incurred in the U.S. and the cumulative losses incurred in Ireland over the three-year period ended December 31, 2018.

On the basis of this evaluation, as of December 31, 2018, the Company recognizes all of its U.S. federal and state deferred tax assets with the exception that the Company continues to maintain a valuation allowance on its California R&D credit carryovers of approximately \$1.7 million. The Company will maintain a valuation allowance on its California R&D credit carryovers because it is more likely than not that the Company will continue to annually generate more California R&D tax credits than it utilizes, resulting in no net reduction of credits. The Company's policy with respect to California R&D credits is that they are utilized on a last-in first-out basis.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

In addition, as of December 31, 2018, the Company is reporting a full valuation allowance on its Irish entity's deferred tax assets totaling \$1.2 million. The valuation allowance represents a provision for uncertainty as to the realization of tax benefits from these deferred income tax assets. The Company will continue to evaluate the tax benefit uncertainty and will adjust, if warranted, the valuation allowance in future periods to the extent that the Company's deferred income tax assets become more likely than not to be realizable.

The Company continues to assert that the accumulated foreign earnings of its subsidiaries in Spain and Canada are permanently reinvested. Due to the Tax Act, any future repatriation of the earnings of its subsidiaries in Spain and Canada would not be subject to U.S. federal income tax. The Company has estimated that the foreign withholding taxes and U.S. state income taxes related to a potential future repatriation of these earnings would be immaterial.

The following table presents the Company's Federal, California, and foreign net operating loss carryforwards.

	December 31, 2018	December 31, 2017
<i>(In thousands)</i>		
Federal	\$ 16,838	\$ 14,227
California	12,681	12,081
Ireland	9,363	16,644
Total net operating loss carryforwards	<u>\$ 38,882</u>	<u>\$ 42,952</u>

The net operating loss carryforwards, if not utilized, will begin to expire in 2019 for Federal, and 2031 for California. Utilization of the net operating loss carryforward may be subject to a substantial annual limitation due to the ownership change limitations provided by the U.S. Internal Revenue Code ("IRC") and similar California provisions. The annual limitation will result in the expiration of the net operating loss carryforwards before utilization. The Company has estimated the amount which may ultimately be realized and recorded deferred tax assets accordingly. The Ireland net operating loss carryforwards does not have an expiration date.

The following table presents the Company's Federal and California R&D credit, minimum tax credit and foreign tax credit carryforwards.

	December 31, 2018	December 31, 2017
<i>(In thousands)</i>		
Federal	\$ 2,925	\$ 2,572
California	2,132	1,753
Total credit carryforwards	<u>\$ 5,057</u>	<u>\$ 4,325</u>

The federal R&D credit carryforwards, if not utilized, will start to expire in 2030. The foreign tax credit carryforwards will begin to expire in 2026. The federal minimum tax credit carryforward will be refunded if not utilized no later than 2021. The California credit carryforwards do not expire. Utilization of the credit carryforwards may be subject to a substantial annual limitation due to the ownership change limitations provided by the IRC and similar California provisions.

Accounting for uncertain tax positions is based on judgment regarding the largest amount that is greater than 50% likely of being realized upon the ultimate settlement with a taxing authority. The aggregate changes in the balance of the gross unrecognized tax benefits is presented in the following table.

	December 31, 2018	December 31, 2017	December 31, 2016
<i>(In thousands)</i>			
Unrecognized tax benefits as of December 31,	\$ 911	\$ 603	394
Increases related to prior year tax position	—	117	—
Increases related to current year tax position	251	191	209
Unrecognized tax benefits as of December 31,	<u>\$ 1,162</u>	<u>\$ 911</u>	<u>603</u>

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

As of December 31, 2018, the Company had \$1.2 million of unrecognized tax benefits, \$0.6 million of which, if recognized, would affect our effective tax rate.

The Company adopted the accounting policy that interest and penalties are classified as part of its income taxes. There are no accrued interest or penalties associated with any unrecognized tax benefits.

There are currently no examinations for Federal, California taxing authorities, and foreign tax authorities. The Company believes that, as of December 31, 2018, the gross unrecognized tax benefits will not materially change in the next twelve months. The Company believes that it has adequately provided for any reasonably foreseeable outcomes related to any tax audits and that any settlement will not have a material adverse effect on the consolidated financial position or results of operations. However, there can be no assurances as to the possible outcomes.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 11 — Stockholder's Equity

Preferred Stock

The Company has the authority to issue 10,000,000 shares of \$0.001 par value preferred stock. The Board of Directors has the authority, without action by the Company's stockholders, to designate and issue shares of preferred stock in one or more series. The Board of Directors is also authorized to designate the rights, preferences, and voting powers of each series of preferred stock, any or all of which may be greater than the rights of the common stock including restrictions of dividends on the common stock, dilution of the voting power of the common stock, reduction of the liquidation rights of the common stock, and delaying or preventing a change in control of the Company without further action by the Company's stockholders. To date, the Board of Directors has not designated any rights, preferences, or powers of any preferred stock, and as of December 31, 2018 and 2017, no shares of preferred stock were issued or outstanding.

Common Stock

The Company has the authority to issue 200,000,000 shares of \$0.001 par value common stock. Subject to the preferred rights of the holders of shares of any class or series of preferred stock as provided by the Board of Directors with respect to any such class or series of preferred stock, the holders of the common stock shall be entitled to receive dividends, as and when declared by the Board of Directors. In the event of any liquidation, dissolution, or winding up of the Company, whether voluntary or involuntary, after the distribution or payment to the holders of shares of any class or series of preferred stock as provided by the Board of Directors with respect to any such class or series of preferred stock, the remaining assets of the Company available for distribution to stockholders shall be distributed among and paid to the holders of common stock ratably in proportion to the number of shares of common stock held by them.

At December 31, 2018, 59,396,020 shares were issued and 53,940,085 shares were outstanding. At December 31, 2017, 58,168,433 shares were issued and 53,905,600 shares were outstanding.

Stock Repurchase Program

The Company accounts for stock repurchases using the cost method. The aggregate cost includes fees charged in connection with acquiring the outstanding common stock.

On March 7, 2018, the Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, may repurchase up to \$10.0 million in aggregate cost of the Company's outstanding common stock (the "March 2018 Authorization"). Under the March 2018 Authorization, purchases of shares of common stock may be made through September 30, 2018, from time to time in the open market, or in privately negotiated transactions, in compliance with applicable state and federal securities laws. The timing and amounts of any purchases will be based on market conditions and other factors including price, regulatory requirements, and capital availability. The March 2018 Authorization does not obligate the Company to acquire any specific number of shares in any period, and may be expanded, extended, modified or discontinued at any time without prior notice. Under the March 2018 Authorization, as of September 30, 2018, the Company repurchased 1,193,102 shares at an aggregate cost of \$10.0 million. The March 2018 Authorization expired in September 2018 and there was no repurchase authorization in place at December 31, 2018.

In March 2017, the Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, could repurchase up to \$15.0 million in aggregate cost of the Company's outstanding common stock through September 30, 2017 (the "March 2017 Authorization"). As of December 31, 2017, 541,177 shares, at an aggregate cost of \$4.3 million had been repurchased under the March 2017 Authorization.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

In January 2016, the Board of Directors authorized a stock repurchase program under which the Company, at the discretion of management, could repurchase up to \$6.0 million in aggregate cost of the Company's outstanding common stock through June 30, 2016 (the "January 2016 Authorization"). In May 2016, the Board of Directors rescinded the January 2016 Authorization and authorized a new stock repurchase program under which the Company, at the discretion of management, could repurchase up to \$10.0 million in aggregate cost of the Company's outstanding common stock through October 31, 2016 (the "May 2016 Authorization"). At December 31, 2016, 673,700 shares, at an aggregate cost of \$4.1 million, had been repurchased under the January 2016 Authorization and 568,500 shares, at an aggregate cost of \$5.3 million, had been repurchased under the May 2016 Authorization. The May 2016 Authorization expired in October 2016 and there was no repurchase authorization in place at December 31, 2016.

Under the Company's stock repurchase programs, from March 2012 through December 31, 2018, the Company spent an aggregate of \$30.3 million to repurchase 5.5 million shares. In addition to repurchases under the Company's stock repurchase programs, during the years ended December 31, 2018, and 2017, the Company spent \$0.2 million and \$0.3 million respectively, to settle employee tax withholding obligations due upon the vesting of RSUs and withheld an equivalent value of shares from the shares provided to the employees upon vesting.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 12 — Stock-Based Compensation

Stock Option Plans

In June 2016, the stockholders approved the 2016 Incentive Plan (the “2016 Plan”), that permits the grant of stock options, stock appreciation rights (“SARs”), restricted stock (“RSUs”), performance units, performance shares, and other stock-based awards to employees, officers, directors, and consultants. Prior to the approval of the 2016 Plan, the Company maintained the Amended and Restated 2008 Equity Incentive Plan (the “2008 Plan”). Stock option awards granted under the Plan and the 2008 Plan, generally vest over four years and expire no more than 10 years after the date of grant. Subject to adjustments, as provided in the 2016 Plan, the number of shares of common stock initially authorized for issuance under the 2016 Plan was 4,441,083 shares (which consist of 3,830,000 new share awards plus 611,083 share awards that were authorized and unissued under the 2008 Plan) plus up to 7,635,410 shares that were set aside for awards granted under the 2008 Plan that are subsequently forfeited. The 2016 Plan supersedes all previously issued stock incentive plans (including the 2008 Plan) and is currently the only available plan from which awards may be granted.

Shares available for grant under the Plan were 2,603,183 shares and 3,945,653 shares at December 31, 2018 and 2017, respectively.

Stock-based Compensation Expense

Stock-based compensation expense related to the fair value measurement of awards granted to employees by financial line and by type of award is presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Stock-based compensation expense by financial line:			
Cost of revenue	\$ 87	\$ 158	\$ 113
General and administrative	3,266	2,218	2,057
Sales and marketing	694	821	524
Research and development	1,193	890	569
Total stock-based compensation expense	<u>\$ 5,240</u>	<u>\$ 4,087</u>	<u>\$ 3,263</u>
Stock-based compensation expense by type of award:			
Options	\$ 3,873	\$ 3,331	\$ 3,005
RSUs	1,367	756	258
Total stock-based compensation expense	<u>\$ 5,240</u>	<u>\$ 4,087</u>	<u>\$ 3,263</u>

The Company estimates forfeitures at the time of grant and revises those estimates periodically in subsequent periods if actual forfeitures differ from those estimates. The Company uses historical data to estimate pre-vesting option forfeitures and records stock-based compensation expense only for those awards that are expected to vest. All stock-based payment awards are amortized on a straight-line basis over the requisite service periods of the awards, which are generally the vesting periods. If the Company’s actual forfeiture rate is materially different from its estimate, the stock-based compensation expense could be significantly different from what the Company has recorded in the current period.

The estimated forfeiture rates used in determining the expense in the table above are presented in the following table.

	For years ended December 31,		
	2018	2017	2016
4-year options	14.866%	16.275%	13.513%
1-year options	—%	—%	—%

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Share-based compensation cost related to unvested stock options and RSU's will generally be amortized on a straight-line basis over the remaining average service period. The following table presents the unamortized compensation cost and weighted average service period of all unvested outstanding awards as of December 31, 2018.

	Unamortized Compensation Costs	Weighted Average Service Period
	<i>(In thousands)</i>	<i>(In years)</i>
Stock options	\$ 5,065	2.5
RSUs	2,128	2.2

Vested Stock Options and RSUs

The total grant date fair value of stock options and RSUs vested during the period are presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Stock options	\$ 3,607	\$ 3,375	2,977
RSUs	841	783	—
Total grant date fair value of stock options and RSUs vested during the period	\$ 4,448	\$ 4,158	2,977

Stock Option Activity

The following table summarizes the stock option activity under the 2016 Plan and 2008 Plan.

	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)	Aggregate Intrinsic Value ⁽¹⁾
	<i>(In thousands, except for weighted average exercise price and weighted average remaining contractual life)</i>			
Balance, December 31, 2015	7,198	3.97		
Granted	904	8.63		
Exercised	(1,936)	3.41		14,665
Forfeited	(283)	5.30		
Balance, December 31, 2016	5,883	4.81		
Granted	677	9.57		
Exercised	(1,226)	4.49		6,798
Forfeited	(242)	6.60		
Balance, December 31, 2017	5,092	\$ 5.43	6.6	\$ 17,735
Granted	1,232	\$ 7.96		
Exercised	(1,160)	\$ 3.73		
Forfeited	(183)	\$ 3.98		
Balance, December 31, 2018	4,982	\$ 6.36	6.56	\$ 6,572
Vested and exercisable as of December 31, 2018	3,193	\$ 5.44	5.39	\$ 6,124
Vested and exercisable as of December 31, 2018 and expected to vest thereafter	4,759	\$ 6.27	6.44	\$ 6,560

⁽¹⁾ The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying options and the fair value of the Company's common stock at the time of exercise. The aggregate intrinsic value at December 31, 2018 is calculated as the difference between the exercise price of the underlying options and the fair value of the Company's common stock as of the end of the period.

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Restricted Stock Units

RSUs awarded in 2016 vest 25% on the first anniversary of the grant date and 1/48th monthly thereafter dependent upon continued employment. RSUs awarded in 2017 vest 25% annually over the 4 years from date of grant and is dependent upon continued employment. RSUs awarded in 2018 vest 25% annually over the 4 years from date of grant and is dependent upon continued employment. As RSUs vest, the units will be settled in shares of common stock based on a one-to-one ratio. The units were valued based on the market price on the date of grant.

The following table summarizes the RSU activity under the 2016 Plan.

	Shares	Weighted Average Grant-Date Fair Value
	<i>(In thousands, except for weighted average grant-date fair value)</i>	
Balance, December 31, 2015	—	—
Awarded	214	8.65
Balance, December 31, 2016	214	8.65
Awarded	162	10.14
Vested	(91)	8.65
Forfeited	(11)	8.52
Balance, December 31, 2017	274	9.54
Awarded	280	9.54
Vested	(90)	9.33
Balance, December 31, 2018	463	8.49

Fair Value Assumptions

Stock Options

The fair value of stock options granted to employees is based on the Black-Scholes option pricing model. To determine the inputs for the Black-Scholes option pricing model, the Company is required to develop several assumptions, which are highly subjective. The Company determines these assumptions as follows:

Expected Term: The Company uses its historical data to determine the expected term of options based on historical exercise data. As there was no historical exercise data for non-employee directors, the Company determines the expected term based on the simplified method.

Expected Volatility: The Company determines expected volatility based on its historical data and the corresponding expected term that was determined using the Company's historical exercise data.

Risk-Free Interest Rate: The risk-free rate is based on U.S. Treasury issues with remaining terms similar to the expected term on the stock options granted.

Dividend Yield: The Company has never declared or paid any cash dividends and do not plan to pay cash dividends in the foreseeable future; therefore, the Company uses an expected dividend yield of zero in the valuation model.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

The estimated grant date fair values of stock options granted to employees were calculated using the Black-Scholes option pricing model based on the assumptions in the following table.

	For years ended December 31,		
	2018	2017	2016
Weighted average expected life (years)	4.19	4.50	4.38
Weighted average expected volatility	67.41%	80.22%	80.35%
Risk-free interest rate	2.48% – 3.01%	1.64% – 1.99%	1.03% – 1.32%
Weighted average dividend yield	—%	—%	—%

Restricted Stock Units

The fair value of RSUs granted to employees is based on the Company's common stock price on the date of grant.

Awards Granted in 2019

On January 31, 2019 and February 1, 2019, the Company granted options and RSUs to certain officers. and on February 12, 2019, the Company granted options and RSUs to other employees. The options and RSUs granted are presented in the following table.

January 31, 2019 Grants	Shares	Exercise Price	Vesting Term ⁽¹⁾	Expiration from Date of Grant
Options	228,571	\$ 7.60	4 years	10 years
RSUs	136,510	7.60	4 years	**
Total	365,081			

February 2, 2019 Grants	Shares	Exercise Price	Vesting Term ⁽¹⁾	Expiration from Date of Grant
Options	95,622	\$ 7.87	4 years	10 years
RSUs	19,059	\$ 7.87	4 years	**
Total	114,681			

February 12, 2019 Grants	Shares	Exercise Price	Vesting Term ⁽¹⁾	Expiration from Date of Grant
Options	67,888	\$ 7.70	4 years	10 years
RSUs	228,228	\$ 7.70	4 years	**
Total	296,116			

** Not applicable.

⁽¹⁾ Any unvested options and RSUs are forfeited upon the employee's termination.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 13 — Business Segment

The Company is an energy solutions provider to industrial fluid flow markets worldwide. The Company manufactures and sells high-efficiency ERDs and pumps as well as related products and services. The Company's chief operating decision-maker ("CODM") is the chief executive officer ("CEO").

The Company's reportable operating segments consist of the Water segment and the Oil & Gas segment. These segments are based on the industries in which the products are sold, the type of energy recovery device sold, and the related products and services. The Water segment consists of revenue associated with products sold for use in reverse osmosis water desalination, as well as the related identifiable expenses. The Oil & Gas segment consists of product revenue associated with products sold for use in gas processing, chemical processing, and hydraulic fracturing and license and development revenue associated with hydraulic fracturing, as well as related identifiable expenses. Operating income for each segment excludes other income and expenses and certain expenses managed outside the operating segment. Costs excluded from operating income include various corporate expenses such as income taxes and other separately managed general and administrative expenses not related to the identified segments. Assets and liabilities are reviewed at the consolidated level by the CODM and are not accounted for by segment. The CODM allocates resources to and assesses the performance of each operating segment using information about its revenue and operating income (loss).

The summary of financial information by segment is presented in the following tables.

	Year Ended December 31, 2018		
	Water	Oil & Gas	Total
	<i>(In thousands)</i>		
Product revenue	\$ 60,512	\$ 513	\$ 61,025
Product cost of revenue	17,211	662	17,873
Product gross profit	43,301	(149)	43,152
License and development revenue	—	13,490	13,490
Operating expenses:			
General and administrative	2,078	1,771	3,849
Sales and marketing	5,783	1,264	7,047
Research and development	1,711	15,276	16,987
Amortization of intangibles	629	—	629
Operating expenses	10,201	18,311	28,512
Operating income (loss)	\$ 33,100	\$ (4,970)	28,130
Less: Corporate operating expenses			18,152
Consolidated operating income			9,978
Non-operating income			1,462
Income before income taxes			\$ 11,440

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Year Ended December 31, 2017		
	Water	Oil & Gas	Total
	<i>(In thousands)</i>		
Product revenue	\$ 54,301	\$ 3,722	\$ 58,023
Product cost of revenue	16,032	3,029	19,061
Product gross profit	38,269	693	38,962
License and development revenue	—	11,106	11,106
Operating expenses:			
General and administrative	1,401	1,565	2,966
Sales and marketing	5,787	2,228	8,015
Research and development	1,064	12,217	13,281
Amortization of intangibles	631	—	631
Operating expenses	8,883	16,010	24,893
Operating income (loss)	\$ 29,386	\$ (4,211)	25,175
Less: Corporate operating expenses			15,926
Consolidated operating income			9,249
Non-operating income			680
Income before income taxes			\$ 9,929

	Year Ended December 31, 2016		
	Water	Oil & Gas	Total
	<i>(In thousand)</i>		
Product revenue	\$ 47,545	\$ 2,170	\$ 49,715
Product cost of revenue	16,353	1,496	17,849
Product gross profit	31,192	674	31,866
License and development revenue	—	8,069	8,069
Operating expenses:			
General and administrative	1,081	1,000	2,081
Sales and marketing	5,076	2,985	8,061
Research and development	1,331	8,705	10,036
Amortization of intangibles	631	—	631
Operating expenses	8,119	12,690	20,809
Operating income (loss)	\$ 23,073	\$ (3,947)	19,126
Less: Corporate operating expenses			15,700
Consolidated operating income			3,426
Non-operating income			287
Income before income taxes			\$ 3,713

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Depreciation and amortization expense by segment and corporate is presented in the following table.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands)</i>		
Water	\$ 2,060	\$ 2,723	\$ 3,043
Oil & Gas	1,377	448	244
Corporate	432	495	393
Total depreciation and amortization	<u>\$ 3,869</u>	<u>\$ 3,666</u>	<u>\$ 3,680</u>

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 14 — Geographical Information and Concentrations

Product Revenue

The following geographic information includes product revenue to the Company's U.S. and international customers based on the customers' requested delivery locations, except for certain cases in which the customer directed the Company to deliver its products to a location that differs from the known ultimate location of use. In such cases, the ultimate location of use, rather than the delivery location, is reflected in the table below.

	Years Ended December 31,		
	2018	2017	2016
	<i>(In thousands, except for percentages)</i>		
Product revenue by geographic location:			
United States	\$ 1,645	\$ 1,706	\$ 1,203
International	59,380	56,317	48,512
Total product revenue	\$ 61,025	\$ 58,023	\$ 49,715
Product revenue by country:			
Egypt	17%	15%	8%
Saudi Arabia	31	13	14
China	8	9	13
Others ⁽¹⁾	44%	63%	65%
Total	100%	100%	100%

⁽¹⁾ Includes remaining countries not separately disclosed. No country in this line item individually accounted for more than 10% of the Company's product revenue during any of the years presented.

Product Revenue - Customer Concentration

Product revenue from customers representing 10% or more of product revenue varies from period to period. For the year ended December 31, 2018, two customers represented 15% and 11% of the Company's product revenue. For the year ended December 31, 2017 no customer represented 10% or more of the Company's product revenue, and for the year ended December 31, 2016, one customer represented 11% of the Company's product revenues.

License and Development

One international Oil & Gas segment customer accounts for 100% of the Company's license and development revenue for the years ended December 31, 2018, 2017 and 2016.

Customers

The Company's accounts receivable is derived from sales to customers located around the world. The Company generally does not require collateral to support customer receivables, but frequently requires export letters of credit securing payment. The Company performs ongoing evaluations of its customers' financial condition and periodically reviews credit risk associated with receivables. An allowance for doubtful accounts is determined with respect to receivable amounts that we have determined to be doubtful of collection using specific identification of doubtful accounts and an aging of receivables analysis based on invoice due dates. Actual collection losses may differ from the Company's estimates, and such differences could be material to the financial position, results of operations, and cash flows. Uncollectible receivables are written off against the allowance for doubtful accounts when all efforts to collect them have been exhausted, while recoveries are recognized when they are received.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Customers accounting for 10% or more of the Company's combined accounts receivable and contract assets by segment are presented in the following table.

	Segment	December 31, 2018	December 31, 2017
Customer A	Water	**	16 %
Customer B	Water	**	10
Customer C	Water	**	11
Customer D	Water	**	**
Customer E	Water	20 %	**
Customer F	Water	11 %	**
Customer G	Oil & Gas	26	26

** Less than 10%

Vendor Concentration

Vendors accounting for 10% or more of the Company's combined accounts payable by segment are presented in the following table.

	Segment	December 31, 2018	December 31, 2017
Vendor A	Oil & Gas	**	11 %
Vendor B	Oil & Gas	10 %	**

** Less than 10%

Long-lived Assets

All of the Company's long-lived assets were located in the U.S. at December 31, 2018 and 2017.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 15 — VorTeq Partnership and License Agreement

The Company's VorTeq technology enables oilfield service hydraulic fracturing operators to isolate their high-pressure hydraulic fracturing pumps from fracturing fluid thereby reducing operating and capital costs. In 2014, the Company entered into a strategic partnership with Liberty Oil Field Services ("Liberty") to pilot and conduct field trials with the VorTeq. Through this agreement, Liberty has the rights to lease up to 20 VorTeq Missiles (defined below) for a period of up to five years following commercialization.

On October 14, 2015, the Company and the VorTeq Licensee entered into the VorTeq License Agreement, which provides the VorTeq Licensee with exclusive worldwide rights to the Company's VorTeq technology for use in hydraulic fracturing onshore applications. The VorTeq License Agreement provides an exception for Liberty's contractual rights to utilize the VorTeq. In performing the obligations under the agreement, the Company provides research and development services to commercialize the technology in accordance with the KPIs, defined in the VorTeq License Agreement. After commercialization is achieved, royalty payments will be received for the supply and servicing of cartridges. All payments are non-refundable.

The VorTeq is made up of Pressure Exchanger cartridges, housed in a high-pressure manifold (the "Missile") through which a motive fluid is used to pressurize hydraulic fracturing fluid, which is processed and sent down the well bore. The VorTeq License Agreement includes up to \$125.0 million in upfront consideration paid in stages: (i) a \$75.0 million non-refundable upfront exclusivity payment; and (ii) two milestone payments of \$25.0 million each upon achievement of successful tests in accord with KPIs specified in the VorTeq License Agreement ("Milestone Payment 1 and 2"). Milestone Payment 1 of \$25.0 million is payable upon a successful five stage yard test at the VorTeq Licensee's test facility. The Milestone Payment 2 of \$25.0 million is payable upon a successful twenty stage hydraulic fracturing at one of the VorTeq Licensee's customer's live wells. The achievement of each milestone and the receipt of each of the related payments are subject to a high degree of uncertainty.

After initial commercialization, the VorTeq Licensee will begin paying ongoing recurring royalty fees to the Company for supply and service of the cartridges based on the number of VorTeqs in operation which is subject to the greater of a minimum adoption curve or the adoption rate of the technology. During the period, from initial commercialization to full commercialization, the technology will be deployed commercially; and through continuous improvement and cost refinement, the efficiency and effectiveness of the product will fully stabilize. The exclusive nature of the agreement terminates if the VorTeq Licensee does not meet the specified minimum adoption curves. In the event the Company is not able to achieve full commercialization under the terms of the VorTeq License Agreement, the exclusivity right of the VorTeq Licensee under the VorTeq License Agreement continues throughout the term.

See Note 2, "Recent Accounting Pronouncements," and Note 3, "Revenues," of the Notes to Consolidated Financial Statements in Part II, Item 8, "Financial Statements and Supplemental Data," of this Annual Report on Form 10-K for further discussion of revenue recognition.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 16 — Litigation

The Company is named in and subject to various proceedings and claims in connection with our business. The Company is contesting the allegations in these claims, and the Company believes that there are meritorious defenses in each of these matters. The outcome of matters the Company has been, and currently are, involved in cannot be determined at this time, and the results cannot be predicted with certainty. There can be no assurance that these matters will not have a material adverse effect on our results of operations in any future period and a significant judgment could have a material adverse impact on our financial condition, results of operations and cash flows. The Company may in the future become involved in additional litigation in the ordinary course of its business, including litigation that could be material to its business.

The Company considers all claims on a quarterly basis and based on known facts assesses whether potential losses are considered reasonably possible, probable and estimable. Based upon this assessment, the Company then evaluates disclosure requirements and whether to accrue for such claims in its consolidated financial statements. The Company records a provision for a liability when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. These provisions are reviewed at least quarterly and adjusted to reflect the impacts of negotiations, settlements, rulings, advice of legal counsel and other information and events pertaining to a particular case.

On September 10, 2014, the Company terminated the employment of its Senior Vice President, Sales, Borja Blanco, on the basis of breach of duty of trust and conduct leading to conflict of interest. On October 24, 2014, Mr. Blanco filed a labor claim against ERI Iberia in Madrid, Spain, challenging the fairness of his dismissal and seeking compensation (“Case 1”). A hearing was held on November 13, 2015, after which the labor court ruled that it did not have jurisdiction over the matter. Mr. Blanco appealed and the appeals court reversed the labor court’s finding and instructed the labor court to make a ruling on the merits on November 21, 2017. On February 14, 2018, the Company received notice that the labor court issued a ruling in favor of Mr. Blanco declaring the termination an unjustified dismissal and ordered the Company to pay a dismissed severance. The Company appealed the decision on February 21, 2018. The Company denies any allegations of wrongdoing and intends to continue to vigorously defend against this lawsuit. Based on currently available information and review with outside counsel, the Company has estimated and accrued a potential loss.

On November 24, 2014, Mr. Blanco filed a second action based on breach of contract theories in the same court as Case 1 (“Case 2”), but the cases are separate. In Case 2, Mr. Blanco seeks payment of an unpaid bonus, stock options, and non-compete compensation. The court ruled that this case is stayed until a final ruling is issued in Case 1. The Company denies any allegations of wrongdoing and intends to continue to vigorously defend against this lawsuit. Based on currently available information and review with outside counsel, the Company has determined that an award to Mr. Blanco is not probable. While a loss may be reasonably possible, an estimate of loss, if any, cannot reasonably be determined at this time.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 17 — Supplementary Data — Quarterly Financial Data (unaudited)

The following tables present certain unaudited consolidated quarterly financial information for each of the four fiscal quarters in the periods ended December 31, 2018 and December 31, 2017. Due to the Company's full retrospective adoption of ASC 606, period numbers for years 2017 are recast. This quarterly information has been prepared on the same basis as the audited Consolidated Financial Statements and includes all adjustments, consisting only of normal recurring adjustments, necessary for a fair presentation of the information for the periods presented. The results for these quarterly periods are not necessarily indicative of the operating results for a full year or any future period.

2018 QUARTERLY FINANCIAL DATA ⁽¹⁾
(unaudited)

	Three Months Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
	<i>(In thousands, except per share amounts)</i>			
Product revenue	\$ 11,058	\$ 17,406	\$ 18,578	\$ 13,983
Product cost of revenue	3,314	5,976	5,022	3,561
Product gross profit	7,744	11,430	13,556	10,422
License and development revenue	2,749	3,358	3,661	3,723
Operating expenses:				
General and administrative	5,837	4,927	5,266	5,446
Sales and marketing	1,912	1,858	1,873	1,903
Research and development	3,917	3,605	4,270	5,220
Amortization of intangible assets	158	158	158	156
Total operating expenses	\$ 11,824	\$ 10,548	\$ 11,567	\$ 12,725
Income (loss) from operations	\$ (1,331)	\$ 4,240	\$ 5,650	\$ 1,420
Provision for (benefit from) income taxes ⁽²⁾	\$ (357)	\$ (11,122)	\$ 1,339	\$ (516)
Net income (loss)	\$ (726)	\$ 15,743	\$ 4,658	\$ 2,421
Income (loss) per share:				
Basic	\$ (0.01)	\$ 0.29	\$ 0.09	\$ 0.04
Diluted	\$ (0.01)	\$ 0.28	\$ 0.08	\$ 0.04

(1) Quarterly results may not add up to annual results due to rounding.

(2) During second quarter of 2018, the Company recognized an income tax benefit of \$11.1 million, which included a \$12.1 million discrete tax benefit. This discrete tax benefit includes an \$11.9 million tax benefit related to the income tax effects of a tax election related to a change to the Company's international tax structure in Ireland that was effective Q2 2018.

ENERGY RECOVERY, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

2017 QUARTERLY FINANCIAL DATA ⁽¹⁾
(unaudited)

	Three Months Ended			
	March 31, 2017(2)	June 30, 2017(2)	September 30, 2017(2)	December 31, 2017(2)
	<i>(In thousands, except per share amounts)</i>			
Product revenue	\$ 12,245	\$ 10,864	\$ 13,860	\$ 21,054
Product cost of revenue	4,612	3,572	4,217	6,660
Product gross profit	7,633	7,292	9,643	14,394
License and development revenue	2,248	3,050	3,197	2,611
Operating expenses:				
General and administrative	4,408	3,927	4,034	4,985
Sales and marketing	2,453	2,174	2,061	2,703
Research and development	2,509	3,077	3,038	4,819
Amortization of intangible assets	158	158	157	158
Total operating expenses	\$ 9,528	\$ 9,336	\$ 9,290	\$ 12,665
Income (loss) from operations	\$ 353	\$ 1,006	\$ 3,550	\$ 4,340
Provision for (benefit from) income taxes ⁽²⁾	48	188	310	(8,971)
Net income	\$ 422	\$ 929	\$ 3,472	\$ 13,531
Income per share:				
Basic	\$ 0.03	\$ 0.02	\$ 0.06	\$ 0.25
Diluted	\$ 0.02	\$ 0.02	\$ 0.06	\$ 0.24

(1) Quarterly results may not add up to annual results due to rounding.

(2) Due to the full retrospective adoption of ASC 606, period numbers for the year 2017 are recast.

Item 9 — Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

On April 13, 2018, the Company’s principal accountant, BDO USA, LLP, was dismissed. Such dismissal was recommended and approved by the Audit Committee of the Board of Directors (the “Audit Committee”). The Audit Committee engaged Deloitte & Touche LLP as the Company’s new principal accountant on May 2, 2018. During the preceding two years, BDO USA, LLP’s reports on financial statement did not contain an adverse opinion or a disclaimer of opinion, was not qualified or modified as to uncertainty, audit scope, or accounting principles. There were no disagreements with BDO USA, LLP on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedure within the Company’s two most recent fiscal years and any subsequent interim periods preceding the former principal accountant’s dismissal.

Item 9A — Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management has evaluated, with the participation of our Chief Executive Officer and Chief Financial Officer, the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, or “Exchange Act”) as of the end of the period covered by this Annual Report on Form 10-K. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of such date, our disclosure controls and procedures were effective to ensure that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in Securities and Exchange Commission rules and forms and that such information is accumulated and communicated to management as appropriate to allow for timely decisions regarding required disclosure.

Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their objectives, and our Chief Executive Officer and Chief Financial Officer have concluded that these controls and procedures are effective at the “reasonable assurance” level. Our management, including the Chief Executive Officer and Chief Financial Officer, believes that a control system, no matter how well designed and operated, cannot provide absolute assurance that the objectives of the control system are met, and that no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within a company have been detected.

Management’s Annual Report on Internal Control Over Financial Reporting and Attestation Report of the Registered Public Accounting Firm

Management’s Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over the Company’s financial reporting. Management assessed the effectiveness of the Company’s internal control over financial reporting as of December 31, 2018. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control — Integrated Framework (2013)*. Based on the assessment using those criteria, management concluded that, as of December 31, 2018, our internal control over financial reporting was effective.

Attestation Report of the Registered Public Accounting Firm

The Company’s independent registered public accountants, Deloitte & Touche LLP, audited the Consolidated Financial Statements included in this Annual Report on Form 10-K and have issued an audit report on the Company’s internal control over financial reporting. The report on the audit of internal control over financial reporting appears in Part II, Item 8, “Financial Statements and Supplementary Data,” in this Annual Report on Form 10-K.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B — Other Information

None.

PART III

Item 10 — Directors, Executive Officers and Corporate Governance

The information required by this Item is included in and incorporated by reference from our definitive proxy statement (the “Proxy Statement”) which will be filed with the Securities and Exchange Commission prior to April 30, 2018. The Proxy Statement is for our Annual Meeting of Stockholders which will be held on June 14, 2018.

Item 11 — Executive Compensation

The information required by this Item is included in and incorporated by reference from the Proxy Statement under the captions “Election of Directors,” “Director Compensation,” “Compensation Discussion and Analysis” and “Report of the Compensation Committee of the Board of Directors on Executive Compensation.”

Item 12 — Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The following table sets forth equity compensation plan information as of December 31, 2018.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants, and Rights	Weighted-Average Exercise Price of Outstanding Options, Warrants, and Rights	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in the First Column)
Equity compensation plans approved by security holders ⁽¹⁾	5,444,804	6.5	2,603,183
Equity compensation plans not approved by security holders	None	Not applicable	Not applicable

⁽¹⁾ Represents shares of the Company’s common stock issuable upon exercise of options outstanding under the following equity compensation plans: the 2006 Stock Option/Stock Issuance Plan, the 2008 Equity Incentive Plan, the Amended and Restated 2008 Equity Incentive Plan, and the 2016 Incentive Plan.

The information under the caption “Security Ownership of Certain Beneficial Owners and Management” in the Proxy Statement is incorporated herein by reference.

Item 13 — Certain Relationships and Related Transactions and Director Independence

The information required by this Item is included in and incorporated by reference from the Proxy Statement under the caption “Related Person Policies and Transactions.”

Item 14 — Principal Accounting Fees and Services

The information required by this item is included in and incorporated by reference from the Proxy Statement under the caption “Principal Accountant Fees and Services.”

With the exception of the information specifically incorporated by reference in Part III to this Annual Report on Form 10-K from the Proxy Statement, the Proxy Statement shall not be deemed to be filed as part of this report.

PART IV

Item 15 — Exhibits and Financial Statement Schedules

- (a) The following documents are included as part of this Annual Report on Form 10-K:
- (1) *Financial Statements*. The financial statements included in Part II, Item 8 of this document are filed as part of this Annual Report on Form 10-K.
 - (2) *Financial Statement Schedule*. See Note Not Used, “*Allowance for Doubtful Accounts*,” of the Notes to Consolidated Financial Statements in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K. Schedules not listed have been omitted because information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.
 - (3) *Exhibit Index*. See Exhibit Index immediately following the Signature page for a list of Exhibits filed or incorporated by reference as a part of this Report.
- (b) *Exhibit*. See Exhibits listed under Item 15(a)(3).
- (c) *Financial Statement Schedules*. All financial statement schedules are omitted because they are not applicable, not required, or because the required information is included in the Consolidated Financial Statements, the Notes thereto, or in the Exhibits listed under Item 15(a)(2).

Item 16 — Form 10-K Summary

None

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Leandro, State of California, on the 7th day of March 2019.

ENERGY RECOVERY, INC.

By: /s/ CHRIS GANNON

Chris Gannon

President and Chief Executive Officer

Pursuant to the requirements of the Securities and Exchange Act of 1934, this Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ CHRIS GANNON</u> Chris Gannon	President and Chief Executive Officer (Principal Executive Officer)	March 7, 2019
<u>/s/ JOSHUA BALLARD</u> Joshua Ballard	Chief Financial Officer (Principal Financial and Accounting Officer)	March 7, 2019
<u>/s/ HANS PETER MICHELET</u> Hans Peter Michelet	Director and Chairman of the Board	March 7, 2019
<u>/s/ ALEXANDER J. BUEHLER</u> Alexander J. Buehler	Director	March 7, 2019
<u>/s/ OLAV FJELL</u> Olav Fjell	Director	March 7, 2019
<u>/s/ SHERIF FODA</u> Sherif Foda	Director	March 7, 2019
<u>/s/ ARVE HANSTVEIT</u> Arve Hanstveit	Director	March 7, 2019
<u>/s/ OLE PETER LORENTZEN</u> Ole Peter Lorentzen	Director	March 7, 2019
<u>/s/ ROBERT YU LANG MAO</u> Robert Yu Lang Mao	Director	March 7, 2019

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation, as filed with the Delaware Secretary of State on July 7, 2008.	10-K	001-34112	3.1	3/27/2009	
3.2	Amended and Restated Bylaws, effective as of July 8, 2008.	10-K	001-34112	3.2	3/27/2009	
10.1*	Form of Indemnification Agreement between the Company and its directors and officers.	S-1/A	333-150007	10.1	5/12/2008	
10.2*	2006 Stock Option/Stock Issuance Plan of the Company and forms of Stock Option and Stock Purchase Agreements thereunder.	S-1	333-150007	10.5	4/1/2008	
10.3*	Amendment to 2006 Stock Option/Stock Issuance Plan of the Company.	S-1	333-150007	10.5.1	4/1/2008	
10.4*	Second Amendment to 2006 Stock Option/Stock Issuance Plan of the Company.	S-1	333-150007	10.5.2	4/1/2008	
10.5*	2008 Equity Incentive Plan of the Company and form of Stock Option Agreement thereunder.	S-1/A	333-150007	10.6	5/12/2008	
10.6*	Energy Recovery Inc. Amended and Restated 2008 Equity Incentive Plan.	DEF14A	001-34112	Appendix A	4/27/2012	
10.7	Modified Industrial Gross Lease Agreement dated November 25, 2008, between the Company and Doolittle Williams, LLC.	10-K	001-34112	10.17	3/27/2009	
10.8	First Amendment to Modified Industrial Gross Lease dated May 28, 2009, between the Company and Doolittle Williams, LLC.	10-Q	001-34112	10.17.1	8/7/2009	
10.9	Second Amendment to Modified Industrial Gross Lease dated June 26, 2009, between the Company and Doolittle Williams, LLC.	10-Q	001-34112	10.17.2	8/7/2009	
10.10	Third Amendment to Modified Industrial Gross Lease dated November 10, 2010 between the Company and Doolittle Williams, LLC.	10-K	001-34112	10.14	3/12/2013	
10.11	Control Agreement dated July 7, 2011, between the Company, Citibank, N.A., Citigroup Global Markets Inc., and Morgan Stanley Smith Barney LLC.	10-Q	001-34112	10.43	8/8/2011	
10.12*	Energy Recovery, Inc. Change in Control Severance Plan dated March 5, 2012.	8-K	001-34112	10.1	3/9/2012	
10.13	Loan Agreement dated June 5, 2012 between Company and HSBC Bank, USA, National Association.	8-K	001-34112	10.1	6/11/2012	
10.14*	Energy Recovery, Inc. Annual Incentive Plan dated January 1, 2014.	8-K	001-34112	10.1	4/30/2014	
10.15*	Offer Letter dated June 26, 2014, to Mr. Joel Gay.	8-K/A	001-34112	99.2	7/8/2014	
10.16*	Draft Consulting Agreement with Thomas S. Rooney, Jr.	8-K	001-34112	10.2	1/13/2015	
10.17*	Energy Recovery, Inc. 2015 Annual Incentive Plan.	8-K	001-34112	10.1	4/29/2015	
10.18*	Offer Letter dated April 22, 2015 to Mr. Joel Gay.	8-K	001-34112	99.2	4/29/2015	
10.19*	Promotion Letter dated April 30, 2015 to Ms. Sharon Smith-Lenox.	8-K	001-34112	99.1	5/1/2015	
10.20*	Offer Letter dated May 5, 2015 to Mr. Eric Siebert.	10-K	001-34112	10.25	3/3/2016	
10.21	Settlement and Mutual Release Agreement.	8-K	001-34112	99.1	5/13/2015	
10.22*	Offer Letter dated May 13, 2015 to Mr. Chris Gannon.	8-K	001-34112	99.1	5/15/2015	
10.23	Second Amendment to Loan Agreement with HSBC Bank USA, National Association.	10-Q	001-34112	10.7	8/6/2015	
10.24*	Offer Letter dated September 17, 2015 to Ms. Emily Smith.	10-K	001-34112	10.30	3/3/2016	
10.25**	License Agreement by and between ERI Energy Recovery Ireland, Ltd. and Schlumberger Technology Corporation.	10-K	001-34112	10.31	3/3/2016	
10.26*	Energy Recovery, Inc. Annual Incentive Plan effective as of January 1, 2016.	8-K	001-34112	10.1	3/1/2016	
10.27*	Transition and Separation Agreement dated March 15, 2016 by and between Energy Recovery, Inc. and Mr. Juan Otero.	8-K	001-34112	99.1	3/18/2016	

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
10.28*	Energy Recovery, Inc. 2016 Incentive Plan.	DEF14A	001-34112	Appendix A	4/27/2016	
10.29*	Offer Letter dated May 27, 2016 to Mr. William Yeung.	8-K	001-34112	99.1	6/22/2016	
10.30	Loan and Pledge Agreement between Energy Recovery, Inc. as Borrower, and Citibank, N.A. as Lender.	10-K	001-34112	10.34	3/10/2017	
10.31	First Amendment to Loan and Pledge Agreement by and between Energy Recovery, Inc. and Citibank, N.A.	10-Q	001-34112	10.1	5/4/2017	
10.32	1717 Doolittle Lease Agreement.	8-K	001-34112	10.1	4/18/2018	
10.33	Settlement Agreement and Release.	8-K	001-34112	10.1	4/24/2018	
10.34	First Amendment to Loan and Pledge Agreement by and between Energy Recovery, Inc and Citibank, N.A.	10-Q	333-15007	10.1	5/12/2018	
10.35	Offer of Promotion to President and Chief Executive Officer.	8-K	001-34112	10.1	5/08/2018	
10.36	Offer Letter to Mr. Joshua Ballard.	8-K	001-34112	10.1	08/15/2018	
10.37	Employment Agreement with Mr. Eric Siebert.	8-K	001-34112	10.1	8/27/2018	
10.38	Employment Agreement with Mr. Nocair Bensalah.	8-K	001-34112	10.1	8/27/2018	
10.39	Employment Agreement with Mr. Nocair Bensalah.	8-K	001-34112	10.2	8/27/2018	
10.39	Employment Agreement with Mr. Rodney Clemente.	8-K	001-34112	10.3	8/27/2018	
10.40	Third Amendment to Loan and Pledge Agreement by and between Energy Recovery, Inc. and Citibank N.A.	10-Q	333-15007	10.5	11/1/2018	
14.1	Code of Ethics of Energy Recovery, Inc. Additional Conduct and Ethics Policies for the Chief Executive Officer and Senior Financial Officers.	10-K	001-34112	14.1	3/27/2009	
18.1	BDO USA, LLP, Letter re Change in Method of Accounting for Inventory Valuation.	10-Q	001-34112	18.1	5/8/2014	
21.1	List of subsidiaries of the Company.					X
23.1	Consent of Deloitte & Touche LLP, Independent Registered Public Accounting Firm.					X
23.2	Consent of BDO USA, LLP, Independent Registered Public Accounting Firm.					X
31.1	Certification of Principal Executive Officer, pursuant to Exchange Act Rule 13a-14(a) or 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
31.2	Certification of Principal Financial Officer, pursuant to Exchange Act Rule 13a-14(a) or 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
32.1	Certification of Principal Executive Officer and Principal Financial Officer, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
101.INS	XBRL Instance Document.					
101.SCH	XBRL Taxonomy Extension Schema Document.					
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.					
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.					
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.					
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.					

* Indicates management compensatory plan, contract or arrangement.

** Portions of this exhibit have been omitted based on a request for Confidential Treatment submitted to the Securities and Exchange Commission (the "SEC"). The omitted information has been filed separately with the SEC as a part of the confidential treatment request. In the event that the SEC should deny such request in whole or in part, the relevant, previously omitted portions of this exhibit shall be publicly filed.

Energy Recovery, Inc.**List of Subsidiaries**

Company Name	Country/State of Incorporation/Formation
ERI Energy Recovery Holdings Ireland Limited	Ireland
ERI Energy Recovery Ireland Limited	Ireland
Energy Recovery Iberia, S.L.	Spain
Energy Recovery Canada, Corp.	Canada

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement No. 333-152142, 333-165559, 333-180076, and 333-212707 on Form S-8 of our reports dated March 7, 2019, relating to (1) the 2018 financial statements and the retrospective adjustments to the 2017 and 2016 financial statements of Energy Recovery, Inc. (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the Company's adoption of a new accounting standard), and (2) the effectiveness of Energy Recovery, Inc.'s internal control over financial reporting as of December 31, 2018, appearing in this Annual Report on Form 10-K of Energy Recovery, Inc. for the year ended December 31, 2018.

/s/ DELOITTE & TOUCHE LLP

San Francisco, California

March 7, 2019

Consent of Independent Registered Public Accounting Firm

Energy Recovery, Inc.
San Leandro, California

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-152142, 333-165559, 333-180076, and 333-212707) of Energy Recovery, Inc. of our report dated March 8, 2018, relating to the consolidated financial statements as of December 31, 2017 and for the years ended December 31, 2017 and 2016 (before the retrospective adjustments to the consolidated financial statements for the adoption of *Revenue from Contracts with Customers (Topic 606)*, ASU No. 2016-02, *Leases (Topic 842)* and ASU 2016-18, *Statement of Cash Flows (Topic 230)*), which appears in this Form 10-K.

BDO USA, LLP
San Jose, California

March 7, 2019

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a) OR 15d-14(a), AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES OXLEY ACT OF 2002**

I, Chris Gannon, certify that:

1. I have reviewed this annual report on Form 10-K of Energy Recovery, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations, and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 7, 2019

/s/ CHRIS GANNON

Name: Chris Gannon
Title: President and Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a) OR 15d-14(a), AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES OXLEY ACT OF 2002**

I, Joshua Ballard, certify that:

1. I have reviewed this annual report on Form 10-K of Energy Recovery, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations, and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 7, 2019

/s/ JOSHUA BALLARD

Name: Joshua Ballard
Title: Chief Financial Officer
(Principal Financial Officer)

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER,
PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE
SARBANES-OXLEY ACT OF 2002***

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities and Exchange Act of 1934, as amended (the "Exchange Act"), and Section 1350 of Chapter 63 of Title 18 of the United States Code, Chris Gannon, President and Chief Executive Officer, and Joshua Ballard, Chief Financial Officer of Energy Recovery, Inc. hereby certify that, to the best of his knowledge:

1. The Company's Annual Report on Form 10-K for the period ended December 31, 2018, to which this Certification is attached as Exhibit 32.1 (the "Annual Report") fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act, and
2. The information contained in the Annual Report fairly presents, in all material respects, the financial condition of the Company at the end of the period covered by the Annual Report and results of operations of the Company for the period covered by the Annual Report.

IN WITNESS WHEREOF, the undersigned has set his hand hereto as of the 7th day of March 2019.

/s/ CHRIS GANNON

Chris Gannon

President and Chief Executive Officer

/s/ JOSHUA BALLARD

Joshua Ballard

Chief Financial Officer

* This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Energy Recovery, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.