

Tecogen Inc. (TGEN)

Company Report – May 27, 2017

Tecogen Inc. designs, manufactures and sells industrial and commercial CHP (Combined Heat & Power), or cogeneration, systems that produce combinations of electricity, hot water, and air conditioning. It's a well-established Company, as it has already shipped over 2,500 units, some of which have been operating for more than 25 years.

Tecogen couldn't have started 2017 in a better way. For its first quarter, ended March 31, 2017, the Company reported revenue of \$6,846,767 compared to \$5,075,515 for the same period in 2016, an astonishing increase of 34.9%.

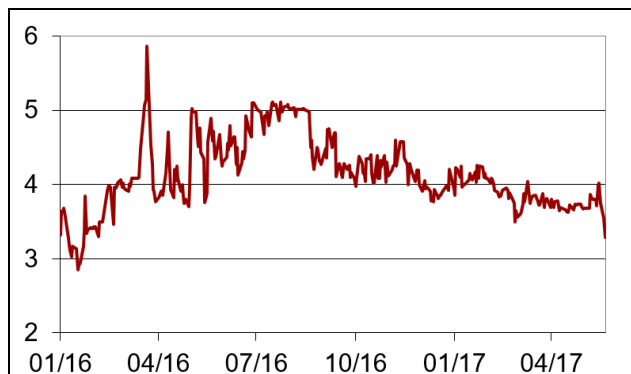
Net income for the quarter ended March 31, 2017 was \$44,787 or \$0.00 per diluted share, compared to a loss of \$893,168 or \$0.05 per diluted share for the comparable period last year. Another excellent achievement, especially knowing that this is Tecogen's third straight quarter of profitability.

The Company's sales backlog of equipment and installations currently stands at \$17.5 million driven by strong traction in the InVerde product line. The number is well above Tecogen's goal of maintaining sales backlog above \$10 million.

Based on the intrinsic value of Tecogen's shares derived from our model, we reiterate our buy recommendation for Tecogen Inc. with a price target of \$9.44, which is 169% above today's stock price.



- ▣ At ULTRATEK everything is going as planned. The paper presented at the SAE World Congress described how the use of Tecogen's Ultera resulted in significant reductions of carbon monoxide (CO), nitrogen oxides (NOx), and non-methane organic gas (NMOG) emissions, with no measurable effect on fuel economy. Discussions with potential automotive partners have been initiated.
- ▣ The development of Ultera for the propane-powered fork truck market is exciting, as it extends the technology into new platforms and verticals. Note that approximately 70,000 propane powered fork lift are sold annually in the United States alone.
- ▣ The acquisition of American DG is completed. Its existing customers will add a steady, predictable income to Tecogen's bottom line.



Market Data	
Price	\$3.51
Sector	Technology
52-Week Price Range	\$2.46 - \$6.50
Shares Issued (m)	20.04
Market Cap (m)	\$70.35
Listings	TGEN (NASDAQ)
Website	www.tecogen.com

THE COMPANY

Tecogen designs, manufactures and sells industrial and commercial cogeneration systems that produce combinations of electricity, hot water, and air conditioning using engines that have been specially adapted to run on natural gas. This technology is called cogeneration, or Combined Heat and Power (CHP).

Cogeneration systems are efficient because they drive electric generators or compressors, which reduce the amount of electricity purchased from the utility. Plus they use the engine's waste heat for water heating, space heating, and/or air conditioning at the customer's building, vastly improving fuel efficiency.

The main drivers for end users to opt for a CHP system are a significant reduction in energy costs, fuel efficiency, emissions reduction, and backup power generation and Microgrid capabilities that allow for participation in demand response and load shaving incentive programs.

Existing customers for these CHP systems include hospitals and nursing homes, colleges and universities, health clubs and spas, hotels and motels, office and retail buildings, food and beverage processors, multi-unit residential buildings, laundries, ice rinks, swimming pools, factories, municipal buildings, and military installations.

The Company's products are sold directly to end-users by its own sales team and by established sales agents and representatives, who are compensated by commissions. Various agreements are in place with distributors and outside sales representatives for certain territories and product lines.

The Company is supported by an established network of engineering, sales, and service personnel across the United States. Service contracts make up a reliable and growing part of the Company's total sales.

Tecogen is a well-established and respected Company in the industry, as it has shipped over 2,500 units so far,

some of which have been operating for almost 25 years.

Tecogen couldn't have started 2017 in a better way. For its first quarter, ended March 31, 2017, the Company reported revenue of \$6,846,767 compared to \$5,075,515 for the same period in 2016, an astonishing increase of 34.9%.

The strong rise in revenue was driven by both product and services related sales. Total services related revenues grew 43.8% over the prior year period, driven by installation activity. Product revenue grew 23.9% compared to the first quarter of 2016, due to the tremendous success of the Company's flagship product, the InVerde e+ CHP. The technical superiority of the product is ever more recognized by Tecogen's customers, such as engineering companies, ESCOs, and product developers.

Net income for the quarter ended March 31, 2017 was \$44,787 or \$0.00 per diluted share, compared to a loss of \$893,168 or \$0.05 per diluted share for the comparable period last year. Another excellent achievement, especially knowing that this is Tecogen's third straight quarter of profitability.



Thanks to the tremendous success of the InVerde e+, Tecogen's product revenue grew 23.9% in the first quarter of 2017.

Moreover, gross margin improved 25.7% in the quarter, bringing it up to 42.6% compared to 33.9% in first quarter of 2016, and above management's targeted 35-40% gross margin range. The increase in gross margin was the

direct result of cost control initiatives and product upgrades.

Finally, the Company's sales backlog of equipment and installations currently stands at \$17.5 million driven by strong traction in the InVerde product line. The number is well above Tecogen's goal of maintaining sales backlog above \$10 million.

Note that the backlog does not include service contract revenues, or sales of TEDOM products by the TTcogen joint venture. Mr. Ben Locke, Tecogen's Co-CEO did mention during the first quarter conference call that the backlog at TTcogen is approximately \$710,000.

Commenting about the quarter, Tecogen Co-Chief Executive Officer Benjamin Locke noted, "The first quarter of 2017 is the third straight quarter of profitable operation for the company. This is a direct result of the hard work completed in 2016 on cost controls, product improvements, and strategic sales partnerships. We are very pleased with these results, and hope to continue this trend throughout 2017."

As of year-end 2016, Tecogen had 83 full-time employees and 3 part-time employees, including 7 sales and marketing personnel and 35 service personnel.

Revenue Sources

Tecogen manufactures, sells, installs, and maintains four types of products:

- Combined Heat and Power (CHP) units that supply electricity and hot water;
- Chillers that provide air-conditioning and hot water; and
- High-efficiency water heaters

Next to the three products above, Tecogen also markets an emissions control technology called Ultera. This is a muffler-like kit that dramatically reduces a natural gas powered engine's harmful emissions such as NO_x, CO, and hydrocarbons.

In 2012, a 75 kW CHP unit equipped with the Ultera system became the first unit to obtain a conditional air permit in Southern California,

an area with one of the strictest emissions regulations worldwide.



The Ultera Emissions System mounted to a CHP unit. The Ultera is designed to deliver simple, cost-effective solutions for natural gas engines to meet stringent emissions standards.

Since then, the Ultera technology has been installed on hundreds of cogeneration systems and functions impeccably. **There is no comparable technology on the market today. It truly sets Tecogen apart from its competition** (also read Ultera on page 8).

Moreover, Tecogen will shortly add another important revenue source. A couple of weeks ago, the Company completed its acquisition of American DG Energy (NYSE Mkt: ADGE), which offers On-Site Utility energy solutions without any capital or start-up costs to the customer and at lower costs than charged by conventional energy suppliers.

Thanks to the acquisition, Tecogen will be able to offer a cost-free-installation option to customers that don't have access to financing, or that are not interested in owning and maintaining the equipment.

Noteworthy is that when combined, approximately half of Tecogen's annual revenue will be derived from stable, long-term contracted sources (Tecogen Service revenue and American DG Energy revenue). This revenue base will provide a reliable funding source for both operating expense and growth initiatives, while also making Tecogen's revenue profile more predictable, as the revenue volatility caused by somewhat cyclical equipment sales and installations is reduced.

Another major advantage of the acquisition is that there will be plenty of cost saving

opportunities. For instance, the combined companies are expected to benefit from approximately \$1 million of general and administrative cash savings as duplicative functions are eliminated. Also, the merged companies will allow for more efficient deployment of service technicians thanks to Tecogen's wide service network. In addition, a consolidated inventory will improve purchasing economics and shipping costs (Also read Growth Drivers).

Case Study – Toren Tower

The Company's business model, and its benefits for all parties involved, will become perfectly clear on the basis of a case study.

Toren is an iconic skyscraper that forever changed downtown Brooklyn. The 37 story building offers 240 condominium homes with breathtaking floor-to-ceiling views of the Manhattan skyline and New York Harbor as well as the opportunity to live in the most environmentally advanced high-rise residential building in New York, perhaps even in the U.S.

Toren uses five Tecogen InVerde 100kW cogeneration modules, located on-site, to meet much of the building's energy needs.

The cogen modules provide electricity, while the waste heat they produce is recovered and used to heat interior spaces, provide domestic hot water, heat the pool and even run the air conditioning.

That way, the remarkably efficient cogeneration system reduces Toren's carbon footprint by more than 2000 tons of CO₂ each year while providing annual cost savings of \$540,000.

Toren's CHP plant is designed to automatically follow the building's electric demand. As demand for electricity increases and decreases within the building, the electrical output from each of the five CHP modules will also increase and decrease.

Through highly sophisticated load control software built into each unit, the amount of electricity being purchased from Consolidated

Edison, the electric utility in Brooklyn, can be maintained at less than 20kW.



Tecogen's cogeneration system reduces Toren's carbon footprint by more than 2000 tons of CO₂ each year while providing an annual energy cost savings of \$540,000.

Another innovative, unique and very desirable feature of Toren's cogen system is that it is a "Microgrid" with the ability to run independent from the grid in "Island Mode", providing power for the building if New York should ever experience a blackout like the one in 2002.

Nationwide Factory Service

Besides selling machines, which in many cases are one-off deals, Tecogen generates plenty of revenues through service contracts. This is a reliable and growing part of the Company's total sales. In fact, more than half of Tecogen's installed units have a service contract.

Most of the service revenue is in the form of annual service contracts. Customers are invoiced based on equipment run-time hours

without unforeseen add-ons for such items as unscheduled repairs or engine replacements.

Tecogen offers service support on all its CHP products nationwide through a network of nine field service centers in California, the Midwest, and the Northeast. These centers are staffed by full-time Tecogen technicians and have been an essential part of Tecogen's growth and success through the years, as good factory support from Tecogen allows its customers to focus on their core missions and businesses. Factory service also keeps Tecogen in close touch with its customers and their specific site issues.

Competition

Tecogen's products fall into the broad market category of distributed generation systems that produce electric power on-site to mitigate the drawbacks of traditional central power and the low efficiency of conventional heating processes.

The Company's CHP products use reciprocating engines originally designed for gasoline fuel and modified to run on natural gas. Although gas-fueled CHP units are relatively common, Tecogen is confident that no other company has developed a product that competes with its inverter-based InVerde e+ CHP, which is highly efficient, facilitates battery or solar array integration, and is compliant with the NFPA 110 standard for emergency and standby power systems.

If competitors wanted to develop a similar product, development time and costs would be significant. In addition, certain Tecogen patents and licenses for microgrid software would prevent others from offering certain important functions.

Government Regulations

Several kinds of government regulations affect the Company's current and future business, such as:

- Air pollution regulations, which govern the emissions allowed in engine exhaust;
- State and federal incentives for CHP technology; and

- Electric utility pricing and related regulations.

Strict regulations that control **air quality and greenhouse gases** increasingly favor Tecogen's low-emission products. In some states that have strict emissions regulations, such as California, the pollution from natural gas engines presents a challenge.

However, the development of the Ultra low-emissions technology has addressed this issue. In January 2013, a state-certified source test at a customer's site verified that emissions levels of a CHP unit equipped with the Ultra technology, were well below the new permitting requirements.

In addition, there are currently 23 states that recognize CHP as part of their Renewable Portfolio Standards. New York and New Jersey, for example, have **incentive programs** that rebate a significant portion of the CHP project cost.

Similar incentive programs also exist in Massachusetts, Rhode Island, and Maryland albeit with different structures and terms. Massachusetts has an additional CHP incentive in the form of an annual rebate proportional to the carbon savings versus conventional technology.

Finally, the Company is targeting customers in states with **high electricity rates** in the commercial sector, such as California, Connecticut, Massachusetts, New Hampshire, New Jersey, and New York. These regions also have high peak demand rates, which favor utilization of modular units in groups so as to assure redundancy and peak demand savings.

TTCOGEN JV

In May 2016, Tecogen formed a 50/50 joint venture corporation with the Czech company TEDOM, one of Europe's largest Combined Heat and Power manufacturers.

The new company, called TTCogen LLC offers a complete package of 27 different CHP modules, ranging in size from 35 kW up to 4 MW, making it the premier packaged CHP provider with the widest range available in the United States.

Most notably, TEDOM's specialized line of cogeneration equipment has the power to operate on biofuel, a renewable energy source with a rapidly growing market. This is an important feature as the United States is expected to implement new regulations in the coming years which require that all food and agricultural waste be recycled.

Soon after the formation of the JV, the initial sale was booked for a TEDOM Micro 35 kW Combined Heat and Power unit. The CHP was recently installed in a 138 unit multi-family residential building in Brooklyn, NY. Close on the heels of the initial one, the second order was received from an elementary school in New Jersey.



The first TEDOM Micro 35 kW CHP unit arriving in the United States.

With a less than 3 year payback period after incentive rebates and annual savings estimated to be in excess of \$60,000, the Micro 35 kW unit is a natural fit for many residential buildings.

The true beauty of this joint venture is that Tecogen in the past often received inquiries from potential clients who ended up not buying a CHP unit from Tecogen because its equipment was not an appropriate size for the customer's facility.

The building's required load was either too big or too small for Tecogen's equipment. Now, thanks to the much expanded offering, TTcogen is able to service those potential customers, quadrupling Tecogen's addressable market for CHP.

TECHNOLOGY

Combined Heat & Power (CHP) is truly a way to get "two for the price of one". It produces the electricity or cooling power that a customer needs, and it captures much of the thermal energy that is normally lost during the energy conversion into power.

With CHP, the "waste" thermal energy gets captured and put to good use on site, for heating water or building spaces.

Following is an overview of the three types of CHP systems that Tecogen offers. Also, the highly efficient Ultra system that makes CHPs meet the most stringent emissions standards is described in more detail below.

Combined Heat and Power

Tecogen's premier cogeneration product is the InVerde e+ CHP system. The revolutionary unit combines the best technologies in the field, and features a unique set of proprietary innovations.

The InVerde incorporates an inverter, which converts direct current, or DC, electricity to alternating current, or AC. With an inverter, the engine and generator can run at variable speeds, which maximize efficiency at varying loads. The inverter then converts the generator's variable output to the constant-frequency power required by customers (50 or 60 Hertz).

Thanks to the cutting edge inverter technology, an innovative power control, and a new and improved engine, the InVerde e+ reaches an electrical efficiency of 33%, while its nearest competitor achieves efficiencies between 27 and 29 percent.

Note that this efficiency only refers to the produced electricity and that the harvested heat to produce thermal energy is not taken into account. A Tecogen CHP system that also uses the recovered heat, achieves efficiency between 80 to 90 percent.

The DC input capability, facilitating battery or solar array integration, is another huge innovation. It allows for a seamless transfer of

energy between the CHP unit, other energy generators, such solar panels, windmills, and backup batteries, eliminating the need for costly converters.

Moreover, the InVerde e+ automatically start up within 10 seconds in the event of a full blackout of the grid, making the CHP compliant with the new strict Type 110 standard for emergency and standby power systems by the National Fire Protection Association (NFPA). This is yet another innovation that very few competitors offer.

NFPA 110

The NFPA 110 standard covers performance requirements for emergency and standby power systems providing an alternate source of electrical power in buildings and facilities in the event that the normal electrical power source fails. Amongst these requirements is that the backup equipment needs to supply electrical power within 10 seconds of the blackout in order for it to qualify.

This is also the first engine-driven product to carry full UL 1741 Certification for "utility-safe" interconnection. So it doesn't need any additional permitting for interconnecting to the electric grid, speeding the installation process.

Ilios High-Efficiency Water Heaters

The Ilios high-efficiency water heater product operates like an electric heat pump but uses a natural gas engine instead of an electric motor to power the system.

The water heater, uses a heat pump, which captures warmth from outdoor air even if it is moderately cool outside. Heat pumps work somewhat like a refrigerator, but in reverse. Refrigerators extract heat from inside the refrigerator and move it outside the refrigerator. Heat pumps extract heat from outside and move it indoors.

In both cases, fluids move the heat around by flowing through heat exchangers. At various points the fluids are compressed or expanded, which absorbs or releases heat.

The gas engine's waste heat is recovered and used in the process, unlike its electric counterpart, which runs on power that has already lost its waste heat.

The net effect is that the efficiency of an Ilios' heat pump far surpasses that of conventional boilers for water heating. This translates directly to lower fuel consumption and, for heavy use customers, significantly lower operating costs. Gas engine heat pumps can deliver efficiencies in excess of 200%.

The Ilios market continues to expand both geographically and into different end-market segments. The high-efficiency water heater is ideal for locations with a gas demand of at least 4000 Therms/month, such as water parks, swimming pools, hotels, hospitals, apartment buildings and recreation centers.

The Ilios system also attracts customers that consistently have the simultaneous need for heating and cooling, such as manufacturing and R&D type facilities.

Chillers

TECOCHILL natural gas engine-driven chillers provide building owners with a reliable, proven, efficient, and cost-effective alternative to conventional electric motor-powered chillers. It's the only natural gas engine-driven chiller on the North American market in its size range.

The engine drives a compressor that makes chilled water; while the engine's free waste heat can be recovered to satisfy the building's needs for hot water or heating. This process is sometimes referred to as "mechanical" cogeneration, as it generates no electrical power, and the equipment does not have to be connected to the utility grid.

A TECOCHILL's benefits are significant. It cuts a building's cooling costs in half, by eliminating most of the electrical demand (kW) associated with providing cooling. In addition, it offers optional "waste" heat that is always available at the same time. This high-quality heat source (up to 230°F hot water) literally comes for free, whenever the chiller is running.

The TECOCHILL chillers are available in capacities ranging from 25 to 400 tons, with the smaller units air-cooled and the larger ones water-cooled. They are ideal in facilities where new chilling capacity is desired, as replacements for aging electric chilling equipment, where the local electric utility's kW demand charges are high, or where the site's electrical capacity is limited.

Basically, they make sense wherever large chillers are needed, including hospitals, colleges, schools, office buildings, aquariums, government buildings, large residential facilities, industrial facilities, hotels, and ice rinks.

Ultra

In 2008 there was a dramatic change in the air quality regulations in Southern California. At that time no technology could meet the new, stricter, emission standards. In reaction to the new regulations, Tecogen developed the Ultra technology.

Tecogen decided to look at the chemistry of emissions instead of the mechanical controls of the engine to simultaneously get rid of NOx compounds, CO and hydrocarbons. They broke the catalyst process into two steps and ran each step at a different temperature.

By controlling the temperature in the first stage, the system could achieve very low NOx emissions. In a second stage process the remaining pollutants were oxidized by injecting a little air between the first and second stages and altering the process conditions.

In 2012, a 75 kW CHP unit equipped with the Ultra system became the first unit to obtain a conditional air permit in Southern California since the strict regulations went into place in 2009. A state-certified source test, administered in January 2013, verified that the emissions levels of the system were well below the new permitting requirements, and the final permit version was approved in August 2013.

Tecogen originally developed and patented the Ultra-low emission control technology for

its own CHP products but has since decided to make the technology available for retrofit on non-Tecogen applications.

The Ultra retrofit kits deliver simple, cost-effective and robust solutions for meeting even the most stringent emissions standards. The patented system provides peace of mind to its customers by lowering NOx and CO to near-zero levels without the need for complex additional controls or frequent maintenance.

ULTRATEK JV

Adapting the Ultra technology to gasoline fueled automotive engines, represents an exciting and potential game-changing new market for Tecogen. The prospect of vehicle and stationary engines, with standard engine technology, but realizing fuel cell like emissions, is tremendously compelling from a policy and market standpoint.

In December 2015, following the outbreak of the Volkswagen emissions scandal, Tecogen formed Ultra Emissions Technologies Ltd (ULTRATEK), a joint venture to pursue this once-in-a-lifetime opportunity.

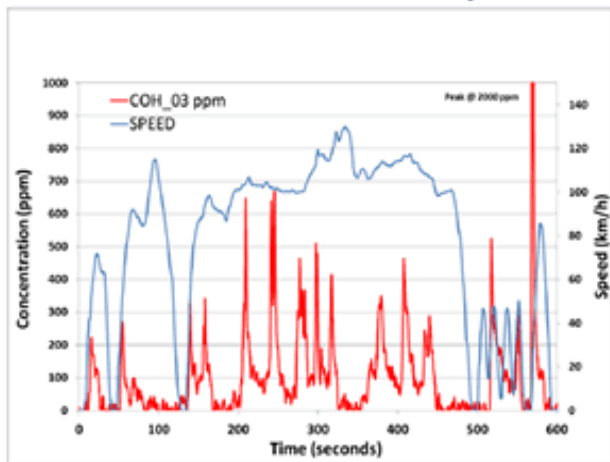
Tecogen received an initial 50% equity interest in the JV in exchange for a fully paid-up worldwide license to use Tecogen's Ultra emissions control technology in the field of mobile vehicles burning gasoline. The other half of the joint venture equity interest was purchased for \$3,000,000 by a small group of offshore investors.

In August 2016, the ULTRATEK stakeholders invested an additional \$4 million, and the following month another \$6.25 million was raised in a third round financing. Very interesting to know is that investors in the third round of funding paid a substantial premium to prior funding rounds, giving ULTRATEK a valuation of \$58.2 million!

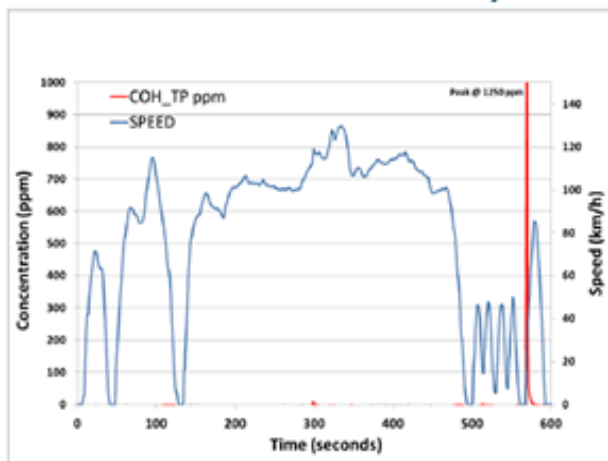
Although the emissions scandal for vehicles has primarily been about diesel engines, for which the Ultra technology is not suited, gasoline vehicles have been included in the larger problem of being certified in tests that

underrepresent their true on-road emissions levels. In fact, European regulators are now implementing on-road, real-world driving tests for vehicle emissions compliance - the United States is considering similar testing standards.

Standard Vehicle Emission System



With the addition of the Ultra System



The above graphs show the measured CO concentration in ppm (red) and the speed of the vehicle in kilometer per hour (blue). CO emission is nearly eliminated when the Ultra is added.

Outstanding Phase I and Phase II Test Results

It was a proud moment for Tecogen representatives when they presented a paper at the prestigious SAE World Congress early April 2017. After all, when a provider of clean energy products is invited to present a paper on a platform as big as the SAE, it speaks volumes about the kind of research the Company is undertaking to eliminate criteria

pollutants and significantly reduce the carbon footprint of engines.

The paper, entitled "Development and Testing of the Ultra® Dual Stage Catalyst System on Gasoline-Fueled Light Duty Vehicles", was a compilation of the results achieved in Phase I and Phase 2 of the Ultra tests on automobile engines conducted in 2016. It was presented by Prof. Ahmed Ghoniem, Ronald C. Crane Chair Professor of Mechanical Engineering at MIT and Tecogen Board member.

SAE INTERNATIONAL

SAE is a U.S.-based, globally active professional association and standards developing organization for engineering professionals in various industries. The organization has more than 127,000 engineers globally. Principal emphasis is placed on transport industries such as automotive, aerospace, and commercial vehicles.

The main objective of the Phase I test was to verify that the favorable performance of the Ultra technology, which had been proven on stationary natural gas engines, could be repeated on a gasoline engine on a vehicle. The tests were conducted on two light duty trucks.

The so-called US06 standard drive cycle was performed. This cycle encompasses a high speed/quick acceleration loop that lasts 10 minutes, covers 8 miles (13 km), averages 48 mph (77 km/h) and reaches a top speed of 80 mph (130 km/h). It includes four stops and a brisk acceleration.

The test results show that carbon monoxide (CO) emissions are reduced by as much as 94%. In addition, levels of non-methane hydrocarbons (NMOG) are lowered by 81%.

	CO	NMOG	NOx	Nox + NMOG
Standard Vehicle	332	5.234	5.763	10.997
With Ultra	20	1.001	5.072	6.074
% Reduction	94%	81%	12%	45%
Drive cycle test results - Emissions (mg/mile). Source: Company Presentation				

Needless to say these were outstanding test results. As far as we know no other technology in the world has ever accomplished similar results with gasoline powered engines.

As a result of these highly encouraging Phase I results, Phase II testing on a broader range of vehicles commenced in September of 2016. This phase was concluded late October and was successful in accomplishing its goals with an Ultra device that was even more accurate than the unit used in Phase I. According to the Company, the tests have provided plenty of data showing the system's effectiveness.

Recently, discussions have been initiated with potential automotive partners. More news from these initiatives is expected later in the year.

RECENT EVENTS

Seven InVerde e+ Units To Power Multiunit Residential Complex In New York City

A couple of days ago, Tecogen signed an agreement with WGL Energy Systems to install seven Tecogen InVerde 100 e+ CHP modules at a large, multiunit residential complex in Manhattan, New York.

WGL Energy, which operates distributed generation systems in 19 states and the District of Columbia, will own the combined heat and power (CHP) system and sell the energy to the complex at a discounted rate from the existing electric utility. Tecogen will install, commission and provide operations and maintenance services for the 700 kW CHP plant over a 20-year term. The system will also provide backup power to the complex in the event of a grid outage.

"This project has been under development at Tecogen for some time," noted Tecogen Co-CEO Benjamin Locke. "Large residential buildings are a perfect fit for our CHP systems, and no other CHP manufacturer can provide the same savings and operational capabilities as our InVerde e+ system. WGL Energy provided a savings package to the

complex that was extremely compelling. We look forward to working with WGL Energy on future projects that require outside financing."



Seven 100 kW InVerde e+ CHPs will soon be installed in a large, multiunit residential complex in Manhattan, New York.

The project is expected to finish in phases over the next 9-12 months and be fully operational in 2018. The project is also partially financed through incentives from the New York State Environmental Research and Development Agency (NYSERDA).

Tecogen Chiller Provides Significant Cost Savings to Massachusetts Ice Rink

Early May 2017, Tecogen took a 200 tons TECOCHILL natural gas-engine driven chiller into operation at the Valley Sports Arenas ice rink in Concord, MA. The TECOCHILL system provides Valley Sports with a reliable, proven, efficient, and cost-effective alternative to the conventional electric motor-powered chiller, which it replaced.

The #1 cost of operating a rink is making the ice, as the glycol-water mixture that circulates beneath the ice sheet at the rink, has to be maintained at 15°F. This is where the TECOCHILL stands out. It can cut a building's cooling cost in half by eliminating most of the electrical demand (kW) associated with providing cooling.

Moreover, state-based incentives for natural gas-engine driven chillers are a boon for ice rinks across the Northeastern states. Rinks can qualify for incentives for both the thermal

savings and for the electricity that a chiller removes from the grid. In Massachusetts, for example, an incentive of between \$0.25 and \$0.30 per kilowatt hour that is removed from the grid, is provided. In this particular case, Valley Sports qualified for an \$87,000 custom incentive from National Grid.



The new TECOCHILL installation at the Valley Sports Arenas van cut the building's cooling costs in half.

Other states, such as Connecticut, New Jersey and Pennsylvania also offer incentives for similar installations. These incentives are mainly designed to cover the majority of the incremental cost, thereby encouraging customers to make the energy efficient choice.

In the particular case of ice rinks, the TECOCHILL adds several other benefits. First, the chiller's heat recovery can provide the hot water for the Zamboni machine. Each time the Zamboni resurfaces the ice, it deposits hundreds of gallons of hot water onto the ice surface. The hot water melts the top of the ice and freezes to form a fresh, smooth surface. By using the hot water byproduct from the chiller, the rink will be cutting its overall energy usage.

In addition, as a natural gas-fired chiller significantly reduces the cost to cool the ice sheet, operating costs are low enough to keep the rink open for skating beyond its usual October-to-March skating season.

And finally, in some instances, a TECOCHILL can also supply comfort cooling during the summer months, making it possible to use the rink as a recreation hall.

GROWTH DRIVERS

Tecogen and American DG Energy Complete Acquisition

A couple of weeks ago, Tecogen and American DG Energy shareholders voted in favor of the proposed acquisition.

American DG distributes, owns and operates natural gas powered cogeneration systems that produce electricity, hot water, heat and cooling. ADGE's business model is to own the equipment that it installs at customers' facilities and to sell the energy produced by these systems to the customer under long-term contracts at prices guaranteed to the customer to be below conventional utility rates.

As of December 31, 2016, ADGE had 92 installed energy systems, representing an aggregate of approximately 5,445 kilowatts, or kW, 41.6 million British thermal units, or MMBtu's, of heat and hot water and 4,500 tons of cooling.

The transaction creates a vertically integrated clean technology company able to offer equipment design, manufacturing, installation, financing, and long term maintenance service.

The seeds for this merger were sown in early November 2016 when the Boards of Directors of both companies unanimously approved a definitive agreement under which Tecogen would acquire all of the outstanding shares of American DG in a stock-for-stock merger.

The combined company retains the Tecogen Inc. name and is led by Co-Chief Executive Officers John Hatsopoulos and Benjamin Locke.

The vision behind the merger is threefold:

- **Make Tecogen More Competitive** – American DG Energy offers On-Site Utility energy solutions without any capital or start-up costs to the customer and at lower costs than charged by conventional energy suppliers. Consequently, bringing American DG under the Tecogen umbrella allows Tecogen to offer a cost-free-installation option to customers without access to financing,

sufficient capital on hand, or for those who may not be interested in owning and maintaining the equipment. This will make Tecogen a vertically integrated clean technology company that is well poised to compete with other distributed generation peers offering in-house financing arrangements.

- **Give Tecogen a More Stable Revenue Base** - Approximately half of the revenue generated by the merged entity will come from stable, long-term contracted sources (Tecogen Service revenue and American DG Energy revenue). This revenue base will provide a reliable funding source for both operating expense and growth initiatives. In addition, it will make the combined company's revenue profile more predictable, reducing the revenue volatility caused by somewhat cyclical equipment sales and installations.
- **Derive More Profits and Savings for Shareholders** - Shareholders of the combined company will benefit from Tecogen's ongoing growth initiatives and joint venture interests, such as the automotive emissions control joint venture ULTRATEK and the cogeneration joint venture TTcogen. Moreover, the combined companies can benefit from approximately \$1 million expected general and administrative savings as duplicative functions will be eliminated.

FINANCIALS

Product sales grew by 23.9% in the first quarter of 2017 over the prior year comparable quarter. Higher cogeneration product sales more than delivered the entirety of the growth in product revenues, partially offsetting a year-on-year decline in chiller and heat pump sales. Variations in product mix are typical from quarter to quarter as customer orders for different products are not entirely predictable.

Services revenues grew 43.8% year-on-year, benefiting from increasing penetration in service contracts and favorable operating

metrics for the installed fleet as well as an active period for installations work. This was the 17th consecutive quarter of year-over-year quarterly service revenue growth. Continued penetration of the Company's 'turnkey lite' offering, which includes custom value-added engineering design work as well as custom factory engineered accessories and load modules, has been a strong source of services revenue growth and is expected to continue to develop as an important revenue stream.

Note that **Product Revenue** is derived from the sale of the various cogeneration and chiller units. Because the equipment is built to last 20 or more years, most of the product sales are to first time customers. The Company's **Service Revenue**, however, lends itself to recurring revenue from long-term maintenance contracts, which provide the Company with a somewhat predictable revenue stream.

Amounts in \$000's	03/31/17	03/31/16
Product Revenues	2,807	2,266
Service Revenues	4,039	2,809
Total Revenues	6,847	5,076
Cost of Product Sales	1,757	1,553
Cost of Services Sales	2,175	1,803
Total Cost of Sales	3,932	3,356
Gross Profit	2,915	1,719
Operating Expenses	2,175	2,626
Income (Loss) from Operations	78	(907)
Total Other Expenses	33	39
Net Income (Loss)	45	(893)
Diluted EPS	0.00	(0.05)
Diluted Shares Outs.	20,317	18,479
Most important income statement data for the quarters ending March 31, 2017 and March 31, 2016. Source: Company Filing		

Total cost of sales in the first quarter of 2017 was \$3,932,094 a rise of only 17.2% compared with the same quarter last year. Another remarkable achievement, knowing that total revenues increased by almost 35%.

Gross profit for the first quarter of 2017 was \$2,914,673 compared to \$1,719,344 in the first quarter of 2016, an increase of 69.5% versus the prior year and a record number. This substantial growth was generated by

improvement in both top line revenues and gross margins.

Product gross margin was 37.4% compared to 31.5% in first quarter of 2016. Product gross margin was primarily helped by the materials and supplier arrangements put in place over the past several quarters as well as by the product mix shift toward the new InVerde e+ model.

Services gross margin improved to 46.1% in the period compared to the 35.8% in the same prior year period. Services gross margin grew thanks to continued cost control as well as increasing penetration of the Company's high-margin 'turnkey lite' offering on the installation side.

Income from operations was \$77,702 compared to a \$906,866 loss in the prior year comparable period.

Consolidated net income for the three months ended March 31, 2017 was \$44,787 compared to a consolidated net loss of \$893,168 for the same period in 2016.

Balance Sheet as of March 31, 2017

Amounts in \$000's	03/31/17	03/31/16
Cash and Cash Eq.	2,149	4,254
Accounts Receivable	9,102	5,888
Inventory	6,075	5,302
Total Current Assets	20,611	17,547
Property & equipment	548	549
Intangible Assets	1,095	1,048
Total Assets	24,423	19,244
Accounts Payable	4,012	2,377
Accrued Expenses	1,1547	1,080
Total Current Liabilities	6,073	4,441
Promissory Note	3,149	2,963
Total Liabilities	9,712	7,728
Total Stockholder Equity	14,712	11,516
Most important balance sheet data for March 31, 2017 and March 31, 2016. Source: Company Filing		

Consolidated working capital at March 31, 2017 was \$14.54 million compared to \$13.11 million at March 31, 2016, an increase of

\$1.43 million. Included in working capital were cash and cash equivalents of \$2.15 million at March 31, 2017, compared to \$4.25 million in cash and cash equivalents at March 31, 2016, a decrease of \$2.1 million.

The decline in cash and cash equivalents can be more than attributed to the surge in accounts receivable from \$5.89 million a year ago to \$9.10 million at March 31, 2017, along with the modest rise of inventories of \$0.77 million.

Overall, Tecogen has a solid and improving balance sheet.

OUTLOOK & VALUATION

2016 represented a year of tremendous progress for Tecogen in terms technology development, sales & marketing improvements, business development activities and financial performance. The Company now continues to build on that solid foundation.

Consequently, we expect 2017 to be a very successful year for the Company, as its systems create energy efficiency, financial savings, and emissions reductions to many different types of products and applications.

The merger between Tecogen and American DG Energy is now complete, creating a vertically integrated clean energy company with strong recurring revenues, which will supplement Tecogen's existing revenues. This will add steady revenue with good margins to the financials of Tecogen, helping to offset some of the peaks and valleys of products sales. In 2016, ADGE made substantial improvements to the operational and financial production of their installed fleet. As a result of the merger, further improvements to the fleet are possible, which will provide more revenue and improved operating margins.

Also TTcogen, the joint venture with Czech CHP-manufacturer TEDOM, continues to make steady progress. So far, three smaller units have been installed with several more planned.

Tecogen continues to strengthen its relationships with various energy service

companies, or ESCOs. CHP has become an important part of performance contracts that ESCOs provide for school systems, municipalities, and other large energy consumers seeking cost saving measures.

Moreover, the emissions program for the fork truck and automotive markets is steadily progressing and creates substantial upward potential for the Company's stock price.

Tecogen has the best in class technology, a sophisticated and informed customer base and game-changing emissions technology. In addition, its key financial metrics such as revenues, margins, and backlog are turning in the right direction.

This is clearly an exciting time for Tecogen and its shareholders.

Valuation

We see tremendous potential for Tecogen as its management believes it will be profitable going forward, while its growth opportunities come to fruition.

Given the still emerging nature of Tecogen's earnings, a multiple-based valuation is challenging. Instead, we apply a Discounted Cash Flow (DCF) model.

Based on our estimate of 22.3 million diluted shares outstanding, the intrinsic value of Tecogen's shares derived from our model is \$9.44, about equal compared to our previous report.

We reiterate our buy recommendation for Tecogen Inc. with a price target of \$9.44, which is 169% above today's stock price.

SHARE DATA & OWNERSHIP

As of April 30, 2017, Tecogen had 20,043,052 common shares outstanding. In addition, as of December 31, 2016, an aggregate of 1,367,918 shares of common stock are issuable upon exercise of outstanding warrants and options. And finally, Tecogen has \$3,148,712 convertible debt, which is convertible into 889,830 shares of common stock.

The principal owners of the Company's common stock are John Hatsopoulos (16.2%), Tryfon Natsis (8.1%), George Hatsopoulos (6.9%), Wincrest Capital Ltd. (6.2%), and Michaelson Capital Partners (6.0%).

MANAGEMENT

▣ DR. JOHN N. HATSOPoulos – CO-CHIEF EXECUTIVE OFFICER

Dr. Hatsopoulos has been the Chief Executive Officer of the Company since the organization of Tecogen in 2000. He has also been the Chief Executive Officer of American DG Energy Inc. since 2000, and the Chairman of EuroSite Power Inc. since 2009. Mr. Hatsopoulos is a co-founder of Thermo Electron Corporation, which is now Thermo Fisher Scientific (NYSE: TMO), and the retired President and Vice Chairman of the Board of Directors of that company. Mr. Hatsopoulos graduated from Athens College in Greece, and holds a bachelor's degree in history and mathematics from Northeastern University, as well as honorary doctorates in business administration from Boston College and Northeastern University.

▣ BEJAMIN LOCKE – CO-CHIEF EXECUTIVE OFFICER

Mr. Locke was named Co-Chief Executive Officer in October, 2014. He joined Tecogen in June, 2013 as the Director of Corporate Strategy and was promoted to General Manager prior to his appointment as Co-CEO. Previously Mr. Locke was the Director of Business Development and Government Affairs at Metabolix, responsible for developing and executing plans for partnerships, joint ventures, acquisitions, and other strategic arrangements for commercializing profitable clean energy technologies. Mr. Locke has a B.S. in Physics from the University of Massachusetts, an M.S. in Electrical Engineering from Tufts University, and an MBA in Corporate Finance from Boston University.

▣ ROBERT PANORA – CHIEF OPERATIONS OFFICER

Mr. Panora has served as President of Tecogen since 2000. He had been General Manager of Tecogen's Product Group since 1990 and Manager of Product Development,

Engineering Manager, and Operations Manager of the Company since 1984. Over his 27-year tenure with Tecogen, he has been responsible for sales and marketing, engineering, service, and manufacturing. Mr. Panora contributed to the development of Tecogen's first product, the CM-60 cogeneration module, and was Program Manager for the cogeneration and chiller projects that followed. Mr. Panora has B.S. and M.S. degrees in Chemical Engineering from Tufts University.

■ BONNIE BROWN - CHIEF ACCOUNTING OFFICER

Ms. Brown served as ADGE's Chief Financial Officer, Treasurer and Secretary since September 2015. From September 2015 to

January 2017, Ms. Brown served as Chief Financial Officer, Treasurer, and Secretary of EuroSite Power Inc. Ms. Brown was a Financial Advisor at Barker Financial Group, a strategic wealth management advisement company, from July 2014 to September 2015. From 2009 to December 2014, Ms. Brown served as the Chief Financial Officer of Ilios Inc. She joined Tecogen as its Controller in 2005 and became the Chief Financial Officer in 2007 and remained in that position until December 2014. Prior to 2005, Ms. Brown was a partner at Sullivan Bille PC, a regional accounting firm, for 15 years where she provided financial, accounting, audit, tax, and business consulting services for mid-sized companies.

ANNUAL INCOME STATEMENT FY 2014 – 3M 2017

All numbers in thousands

PERIOD ENDING	FY 2014	FY 2015	FY 2016	3M 2017
Total Revenue	19,343	21,443	24,490	6,847
Cost of Revenue	12,944	13,809	15,190	3,932
Gross Profit or (Loss)	6,399	7,633	9,301	2,915
Operating Expenses				
General & Administrative	7,265	7,998	7,994	2,209
Selling	1,796	1,687	1,637	447
R&D	1,041	592	667	181
Total Operating Expenses	10,102	10,277	10,289	2,837
Operating Income or (Loss)	(3,703)	(2,643)	(997)	78
Other Income or (Expense)				
Interest & Other Income	10	14	12	(1)
Interest Expense	(177)	(172)	(176)	(32)
Income or (Loss) attributable to the non-controlling interest	125	74	65	-
Net (Loss) attributable to Tecogen Inc.	(3,746)	(2,727)	(1,096)	45

Annual Income Statement FY 2014 – 3M 2017. Source: Company Filings



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