

ETI ALPHADIRECT MANAGEMENT SERIES

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IN FOCUS: FUELCELL ENERGY, INC. AND ITS KEY ROLE AS PART OF A DIVERSIFIED CLEAN ENERGY PORTFOLIO

This report focuses on FuelCell Energy, Inc. (FCEL), its competitiveness and key role as part of a broader renewable power portfolio.



Source: www.fuelcellenergy.com

THE ENERGYTECH INVESTOR INSIGHT

In our opinion fuel cells can be an attractive solution as part of broader power portfolio for a number of reasons including technical, financial and environmental advantages. Within a baseload power portfolio, there are a number of advantages and disadvantages to each asset type and we believe utilities and power users will continue to adjust and expand their strategies to find an optimal mix that could include more fuel cells. Broad commercialization of intermittent sources of renewable power such as solar and wind have become significant components in portfolios, but the need for an environmentally compliant source with reliability, high power density and lower land cost clearly exists. To this end we believe Fuel Cell Energy, Inc. (FCEL) can help power suppliers and users solve this problem. Another advantage fuel cells can bring to users is the ability to generate up to four times the REC's in specific regions, creating a higher revenue stream and return on the project. In addition, fuel cells are often placed near the electrical substations or directly on-site where the power is used, thus reducing the high transmission costs. In summary, we believe this technology will be increasingly considered to play a role in power portfolios, which should provide FuelCell Energy, Inc. with a significant market opportunity.

FCEL Business Snapshot

Founded: 1969

Headquarters: Danbury, CT, USA

Ticker: FCEL (NASDAQ)

Full Time Employees: 500

Stock Price: \$1.10*

Market Cap: \$67.83M*

Website: www.fuelcellenergy.com

*As of June 9th, 2017



About EnergyTech Investor

EnergyTech Investor, LLC (ETI) is an independent research and Investor Intelligence firm that creates and implements digital content and programs to help investors better understand a company's key drivers including industry dynamics, technology, strategy, outlook and risks as well as the impact they could have on the stock price. EnergyTech Investor's expertise encompasses a variety of sectors including Clean Transportation, Emerging EnergyTech, Energy Services, Smart Buildings, Solar, Water Value Chain and Industrial. EnergyTech Investor was founded by Wall Street veteran and research analyst, Shawn Severson, after seeing a significant shift in the investment industry that resulted in less fundamental research conducted on small cap companies and a significant decline in information available to all investors. ETI's mission is to bridge that information gap and engage companies and investors in a way that opens information flow and analytical insights.

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Participants

Mr. Arthur A. (Chip) Bottone
President and CEO
FuelCell Energy, Inc.

Mr. Bottone joined FuelCell Energy in 2010 to accelerate the adoption of the Company's power generation solutions. Prior to joining FuelCell Energy, Mr. Bottone spent 25 years at Ingersoll Rand, a diversified global industrial company, including President of the Energy Systems business, operational roles in Europe and Asia, as well as mergers & acquisitions. Mr. Bottone began his career as an engineer with the Southern Company.

Mr. Shawn Severson
Founder and CEO
EnergyTech Investor, LLC

Mr. Severson is the founding partner and CEO of EnergyTech Investor, LLC. He has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Prior to founding ETI he lead the Energy, Environmental and Industrial Technologies practice at the Blueshirt Group. Mr. Severson was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Starmine's top three stock pickers.



ABOUT FCEL

FuelCell Energy, Inc., together with its subsidiaries, designs, manufactures, sells, installs, operates, and services stationary fuel cell power plants for distributed power generation. It develops SureSource plants that generate electricity, heat, and hydrogen for industrial and/or transportation uses, as well as a fuel cell carbon capture solution for coal or gas-fired power plants; and solid oxide fuel cell plants for adjacent sub-megawatt applications to the markets for megawatt-class SureSource plants, as well as energy storage (reversible solid oxide fuel cell) applications utilizing hydrogen as an energy carrier. The company serves various markets, such as utilities and independent power producers, industrial and process applications, education and health care, data centers and communication, wastewater treatment, government, and commercial and hospitality. It primarily operates in the United States, South Korea, England, Germany, and Canada. The company has strategic alliances with POSCO Energy Co., Ltd.; The Fraunhofer Institute for Ceramic Technologies and Systems IKTS; and E.ON Connecting Energies GmbH. FuelCell Energy, Inc. was founded in 1969 and is headquartered in Danbury, Connecticut, USA.

Shawn Severson: First, I would like to thank you, Chip, for taking the time to speak with us again today. The last time we spoke, we discussed FuelCell Energy from a general overview perspective. Today we would like to focus on the competitiveness of fuel cells when compared to other renewable power resources. Can you start by giving us quick overview of the fuel cell technology?

Chip Bottone: I appreciate the opportunity. There is a significant distinction between the different types of fuel cell technologies. At FuelCell Energy we use carbonate fuel cells. Some technologies are oriented more toward mobility, whereas ours are targeted at the larger scale applications for power generation such as grid support. Carbonate fuel cell technology is also very versatile as demonstrated by our fuel cell carbon capture and distributed hydrogen solutions. The fuel cell, whether fueled by renewable biogas or natural gas, internally reforms the methane in the fuel to hydrogen, which is mixed with ambient air in the presence of a catalyst material, generating power, water and heat.

It is a very clean, silent, efficient means of generating predictable power as the fuel cells use chemistry to directly convert fuel to power in contrast to the multiple steps burning a fuel requires to generate power. This high electrical efficiency is a key aspect of the affordability.

Shawn Severson: What are some of the main advantages of including fuel cells as part of a broader portfolio of power? I don't think there is a single solution and it would be helpful to better understand a power portfolio approach and what that means to FuelCell Energy.

Chip Bottone: We agree that a portfolio of power generation sources, including Baseload, intermittent and peaking is appropriate. We fit nicely into that portfolio since we can really monetize the attributes of our fuel cells, meaning that we are a predictable source of power compared to intermittent sources of power that require peaking support when the weather or time of day is not cooperating with power demands.

Secondly, we can install our solutions almost anywhere so next to an electrical substation or near where the power used. Clean, quiet and a high energy density that results in only modest land use needs enables siting in urban areas. Because of our siting ease, the efficiency, the affordability, along with the predictability, we provide the utility companies with a number of attributes they find very attractive to place into their networks, particularly if the fuel cell project allows them to avoid capital expenses for upgrading their network.

Shawn Severson: Thank you for the introduction, Chip. As we talked about in our previous discussion, many investors are familiar with the fuel cell technology, however, I believe many are unclear as to how fuel cells compare to other renewables? The conventional thinking is that solar power is often a much cheaper alternative. Can you share some thoughts about why you think that is?

Chip Bottone: Certainly, Shawn. FuelCell Energy's megawatt and multi-megawatt installations can be competitive with any other type of technology, including solar power. Within renewables, if you look at the cents per kilowatt, it is a function of many aspects of the project - the technology, the

capital cost of the project, the operating costs, land cost and availability. It's also a function of transmission or distribution needs and associated capital for a project. We know on a properly evaluated basis, that we can be competitive with anything that is part of that portfolio, so an evaluation that is based on the overall cost of delivered power and that accounts for the cost implications of power demand when the sun isn't shining.

For example, if you were to put in distributed solar, you will be limited by how much power that can be placed on a rooftop for example. If you place the supply near the demand, you may run into real estate issues as solar can require hundreds of acres to generate the same annual megawatt hours of power that fuel cells can generate from just one acre of land. With fuel cells, we don't have the same constraint because our power density is very high and our land cost is therefore low. In markets like California for example and other places where they have high population densities and little land, the cost of land can have a dramatic impact on the price of the project.

Secondly, when you put in intermittent resources you have to have something to counteract that intermittency, such as a Peaker plant. Peaker plants burn gas or coal so emit pollutants, and are typically expensive forms of power as their utilization is generally unpredictable. Even with the emissions that those plants would generate, the cost of that peaker power would be several cents per kilowatt that would have to be applied as a means of counteracting that intermittency.

Thirdly, the transmission or distribution improvements needed could be significant because FuelCell Energy installs our plants close to the source. Because our efficiencies are high, we cannot compare ourselves to resources that might be in a centralized basis, given the many differences such as the requirement for transmission which adds cost from constructing, maintaining and accounting for line losses during transmission. If you compare centralized generation with another comparable efficiency, you will see that by the time the power is delivered, there is a significant advantage for fuel cells in terms of cost and resiliency of power supply.

Finally, locating fuel cell projects in urban areas supports local economic development. So, when doing the math, including the economic development aspect of paying local and State property and sales taxes and municipalities returning brownfield sites into tax paying sources, fuel cells clearly have significant advantages that allow us to be competitive for the right type of applications discussed.

Shawn Severson: Thank you, Chip. Let's dig into that a bit more. How important is consistency and availability to a power user or utility and what considerations need to be made when making decisions about which technologies to use - especially when it comes to solar vs. a fuel cell and issues such as energy resiliency/reliability, local and regional economic development benefits, land use and ease of siting and transmission? How does that compare and contrast with a large scale commercial solar facility?

Chip Bottone: So, here is where you are really hitting at the heart of FuelCell Energy's advantages. There are technical, financial and environmental differences. Let me start with the technical. If you put in a solar facility, there is the technical issue of intermittency that must be dealt with as it effects various parts of the grid differently. It is helpful when we provide the power to counteract solar because we have a very strong way of addressing the quality from electrical inverter that is part of our power plants.

Second is financial. We operate at availabilities in excess of 90%, whereas solar may only approach 20% in the northeast USA or parts of Europe. Renewable energy credits or REC's are used in some regions and are generated from the megawatt hours of clean power produced. Our projects may generate four times the REC's as intermittent sources and since each REC has monetary value, it adds to revenue that goes toward improving the return of the project. Additionally, renewable portfolio standards (RPS) are based on power used so a 10 megawatt fuel cell project generates as many REC's as a 50 megawatt northeast USA solar project that will require hundreds of acres of land.

Lastly is environmental. We can put a lot of megawatts on only an acre or two of land, which is often available in industrial areas or within cities. Intermittent power requires a lot of land and is typically distant from the cities, using farm land and requiring land for transmission towers. So again, an attribute of ours is our high-power density as previously mentioned, putting our projects on brownfield sites that we convert into a revenue paying parcel for the town, city or country.

Shawn Severson: Then the real issue comes down to cost or at least perceived costs. We know that there is much more to providing power than simply deploying panels on any given site. Certainly, things like Peaker support, transmission cost, infrastructure investments and utility infrastructure spending all come into play. Perhaps compare and contrast regarding fuel cells would be helpful.

Chip Bottone: If you have an intermittent source, you need to have corresponding Peaker source or storage that needs to be accounted when doing any kind of procurement or project. Clearly, those two things are not inexpensive. Peaker plants are very costly to operate. If you have an asset that is inexpensive to build but doesn't run very often, you are amortizing much of the cost over a small number of megawatts increasing the expense. Storage is still in its early phases and very costly technology. Thus building the resiliency is expensive.

Transmission costs can be significant, and can represent a significant portion of a residential or business customer monthly power bill. If you can get a new transmission project built, the reality is that it is going to be very costly due to the project and permitting process cost. For these reasons, it is preferable to try to avoid the need to add transmission, a condition that our solutions avoid.

Finally, you talked about economic developments. We have done many projects where we have been able to place these near the source of the demand for power. We are able to put a large number of megawatts on a very small plot of land generally located in pockets in the

city rather than on farmland or in remote areas. We gladly pay the property and sales taxes which adds to the local and regional economic development and also often creates additional investments around the initial investment, creating more jobs and tax revenue for the city.

For these reasons, our projects are welcomed by city mayors and economic development directors. As your readers can appreciate, local support for power generation projects is important.

Shawn Severson: So, expand on that a bit. How does government policy come into the picture when comparing fuel cell to other technologies? Is there a perception issue that the industry needs to address with both government bodies as well as investors?

Chip Bottone: Yes, I think that is true. Our focus is getting smart regulatory improvements over incentives. Regulatory items such as optimizing MW size thresholds to provide maximum locational benefits or contract terms that allow for lower cost of capital and attracts private project investment capital. We have focused on regulatory items that do not cost the rate payers anything and allow us to build bigger plants, which ultimately lowers the cost to rate payers. When these networks were originally envisioned, I don't believe people had the use of fuel cells in mind. As a result, we are constantly having to have discussions with regulators and with utility operators proposing how we can solve several different issues. Within these discussions, we are focusing on things that actually enhance the value for the rate payers and don't cost the government money rather than the other way around. Examples include avoiding transmission,

upgrading local gas, water and electric infrastructure, returning unused property to tax rolls, and enhancing local power resiliency.

Shawn Severson: From an emissions point of view, can you discuss annual emissions avoidance and renewable energy credits for fuel cells vs. solar?

Chip Bottone: Yes, I again return to the idea that the holistic view must be considered of predictability and delivered clean power. Our customers value the near zero emissions of pollutants by the fuel cell power generation process. Intermittent power needs to be evaluated in conjunction with the Peaker plants that support the intermittency. As consumers in developed countries demand power 24 hours a day, regardless as to whether it is cloudy or the wind is blowing. As a result, the emission profile is dramatically different when you look at an all-in solution of intermittent and peaker power, relative to only using power when it is sunny or windy.

The world wants affordable, cleaner energy with resiliency. FuelCell Energy can provide renewable energy from biogas, and our solutions, such as fuel cell carbon capture clean the grid by addressing the CO₂ and NO_x emissions from coal or gas fired power plants. Additionally, our fuel cells are a great source of producing electricity and hydrogen simultaneously and we are in the process of addressing applications that produce renewable hydrogen for fuel cell transportation applications. Transportation produces about 40-50% of the emissions that society is trying to address with power generation sharing a significant additional portion. Thus, we are working on both sides, trying to clean up the air that we all breathe

while producing either renewable fuel for transportation or clean power for power generation.

Shawn Severson: Thank you, Chip. I know we have touched on several aspects of fuel cells by comparing and contrasting them with solar, but when you get down to the bottom line, can you talk about the all-in costs to utilities, grid operators and ratepayers for fuel cells vs. solar?

Chip Bottone: Geography is a consideration as regions with inexpensive and excess land with very, very high solar availability or consistent wind and available transmission make sense for these intermittent technologies. When clean and affordable power is needed near where it is used, such as in a city, fuel cells are a very compelling solution. I believe it is incumbent upon the people making the decisions to ensure that they truly holistically consider what the all-in cost of the solution proposed is going to be to the rate payers.

Or to be more specific, transmission can cost up to 2.4 cents per kilowatt hour so we focus on the delivered cost of the electricity. Our solutions can avoid this transmission cost entirely by siting them near electrical substations or on-site where the power is used. Peaking power can cost 20 cents per kilowatt hour or more so that cost, plus consideration of emissions, must be factored into evaluating intermittent projects if reliable power is required.

Shawn Severson: Is it safe to say that this is not a niche application, this is something that has a very wide scope of applications in regions and states as well as globally?

Chip Bottone: Correct, the applications and opportunities are very sizable and global as we have installations operating on three continents. So, there is no question that we will play a role in the greening or cleaning of the power grid and transportation systems around the world. The market for our solutions is sizeable with material benefits for ratepayers and for society.

Shawn Severson: Thank you Chip. Lastly, another subject that has been widely discussed in today's marketplace is the ability to create job opportunities domestically. How does FuelCell Energy affect and influence the domestic labor market?

Chip Bottone: The foundation of the fuel cell business resides in the United States with a very interesting profile as our company and the industry represent domestic innovation and advanced manufacturing, which supports scientist, engineering and manufacturing jobs. We want to maintain the leadership in the United States, retaining the significant amount of domestic content. In addition, we want to recognize other companies that are doing this work as well and support them accordingly, including our supply chain and peers using other types of fuel cell technologies.

Shawn Severson: Thank you very much, Chip. We look forward to having another conversation with you very soon.

Chip Bottone: Thank you, Shawn, and have a great rest of your day.

SHAWN SEVERSON FOUNDER AND CEO

Mr. Severson founded EnergyTech Investor in 2016 after seeing a significant communication and information gap developing between small and micro-cap companies and the financial community. Mr. Severson has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Previously, he was Managing Director at the Blueshirt Group where he was the head of the Energy, Environmental and Industrial Technologies practice. Prior to the Blueshirt Group, Mr. Severson was at JMP Securities where he was a Senior Equity Research Analyst and Managing Director of the firm's Energy, Environmental & Industrial Technologies research team. Before joining JMP, he held senior positions at ThinkEquity, Robert W. Baird (London) and Raymond James. He began his career as an Equity Research Associate at Kemper Securities. He was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Starmine's top three stock pickers.



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