Interview with Scott Henneberry

Conducted by Lia Abady, *JEI* Interview Editor
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When Hu Jintao, China's president, visited France last year, he saw just one company's factory: Schneider Electric. Scott Henneberry, VP of Smart Grid Strategy at Schneider Electric, speaks to Lia Abady for the Journal of Environmental Investing. In the interview, Mr. Henneberry talks about the importance of energy deregulation and the need for more collaboration between policy makers, municipal governments, and big utility companies. He also highlights the smart grid investment opportunities for asset owners.

Interview:

Ms. ABADY: *Thanks for taking the time to talk to the JEI. I'd like to begin with a rudimentary question: Is the smart grid a "thing for the future"?*

Mr. HENNEBERRY: In the electricity transmission and distribution industry, there are many people who are put off by the notion of the smart grid being a "thing for the future." They would respond by saying that grids might get smarter but they've actually been smart for some time. I'll give you a couple of useful perspectives. One perspective is that in terms of pure automation on the grid, we consider the transmission grid as separate from the distribution grid. The transmission grid has in fact been automated for some time and it's had to be automated given its huge complexity. What we are seeing now is a growing level of automation on the distribution grid. As part of the smart grid, the automation is now happening at both the transmission and the distribution level. This is possible not only because it's necessary, but critically, it's now much more affordable given the low cost of micro processors, chips, sensors, and software that are available on the distribution side with an added return on investment (ROI) where there wouldn't have been one in the past. The other perspective is the level of debate around whether the smart(er) grid is a good and worthwhile investment. I think that's an irrelevant question because clearly changes are happening that will increasingly mandate a smart grid and we will have no choice but to have a highly optimized grid in place. For example, the growth in renewable energy generation and the growth in electric vehicle ownership will demand

the automation of highly efficient distribution grids by distribution operators. It will be impossible to manage the distribution of energy in the same way as in the past with the increasing diversity in energy supply and demand. Instead of having a one-way power flow, which is quite easy to manage passively, we will have power flow coming from various sources and it will have to be actively managed. So the smart grid's happening and it's here to stay. The question is, can we develop it intelligently? Can we make sure the right applications are deployed? Can we balance supply and demand in an optimal fashion?

Ms. ABADY: *There seems to be a clear need for grids to get smarter. Can you please explain to us what necessary regulatory changes are required and can you please give us examples of enabling and disabling regulatory environments.*

Mr. HENNEBERRY: A smarter grid does require new business models and it does require a new view to regulation. There is no question that the challenges around the smart grid are to some degree technical but, by and large, we understand the technologies that need to be implemented. The regulatory and commercial challenges are far greater. On the technological side, for example, there is a need for greater demand response designed into the grid system and more sophisticated business models to create the right incentives for customers. Demand response is generally used to refer to mechanisms that encourage consumers to reduce energy demand, thereby reducing the overall peak demand for electricity at any one time. There are two types of demand response—emergency demand response and economic demand response. Emergency demand response is primarily needed to avoid outages. Economic demand response is used to help utilities manage daily system peaks. Smart grid applications improve the ability of electricity producers and consumers to communicate with one another and make decisions about how and when to produce and consume kilowatt-hours (kWh). Emerging technology will allow customers to shift from an event-based demand response wherein the utility requests the shedding of load, toward a more 24/7 based demand response where the customer sees incentives for controlling load all the time.

In the U.S., we have a very good example of a regulatory implementation for demand response. In 2005 the Energy Policy Act mandated the Secretary of Energy to submit to the U.S. Congress a report that identifies and quantifies the national benefits of demand response and makes a recommendation on achieving specific levels of such benefits by January 2007. The report estimated that in 2004 potential demand response capability equaled about 20,500 megawatts (MW) or 3% of total U.S. peak demand, while actual delivered peak demand reduction was about 9,000 MW or 1.3% of peak demand, leaving plenty of margin for improvement. To encourage the use and implementation of demand response in the U.S., the Federal Energy Regulatory Commission established a new rule in

March 2011, which defines a certain level of compensation for demand response providers. This was a big deal to the extent that the federal government regulates transmission and state governments regulate distribution. The federal government directed transmission operators to make certain that the demand side could participate in the flow of energy and that is what really grew the whole demand response marketplace. Today it's worth about $2 billion only in those selected areas that are deregulated enough to have independent system operators in the U.S. It's clearly brought more efficiency into the marketplace. There is no question that the introduction of demand response has brought the peak price of electricity down and has reduced the likelihood of electrical outages, so that's one clear example of an enabling regulatory environment. Where it hasn't worked well, for example, also in the U.S., is with some of the smart metering initiatives that took place as a result of the stimulus spending that the federal government provided through the DOE (Department of Energy). There was circa $5 billion available for smart grid grants in 2008–9, and almost all of that capital was awarded to deploy smart meter devices. One of the grant criteria requirements was a 50/50 funding between the federal government and state utilities. The utilities would submit an application to the DOE to deploy smart meters, for example, in businesses and households, and the federal government would match the funding. However, each individual state has a regulatory body, usually some sort of a Public Utility Commission (PUC) that approves any matter concerning the structure of state utilities' tariffs and spending. Many smart meter projects were rejected by state regulators because of a perceived lack in payback on the investment. The state regulatory bodies needed more evidence for a return on investment for smart meters in order to justify the match funding by the utilities. There is clearly value for a distribution utility to have smart meters installed with industrial and commercial consumers, but the question remains as to the value of smart meters for residential consumers. There have been various pilots to explore this question but the benefits are yet unclear—some of the pilots have demonstrated that a properly constructed residential program from a utility perspective will change residential consumer behavior but others have been less successful. Nevertheless, there is no question that the cost of energy will go up in the future, households will become more sensitive to the rising price, and there will be a need for better incentives for residential energy consumers to more proactively manage their energy consumption—particularly in the context of the abolishment of energy subsidies by the federal government.

Ms. ABADY: *Can you please explain what smart grid initiatives the state regulators would have preferred to approve instead of smart meters?*

Mr. HENNEBERRRY: When the federal government announced the stimulus package for smart grid grants, they listed a whole range of initiatives that could qualify, including distribution automation, voltage regulation, smart meters, demand response, and new

types of business models for demand response. They received a deluge of proposals and decided to take a strategic approach to granting funds by directing almost one hundred percent of grants toward smart meters. The speculation is that the federal government saw it as their role to help lay the infrastructure for the smart grid. Much of the smart grid applications are data driven that require energy consumption information supplied by smart meter devices. So while a smart meter rollout would have had its merits, state regulators saw it as their roll to protect customers and demand more evidence of a return on investment on any initiative they approved.

Ms. ABADY: *Do you see the electricity distributors of today being the same electricity distributors of tomorrow, specifically in the U.S.?*

Mr. HENNEBERRY: The U.S. has a hybrid energy market model with some states still highly regulated and others deregulated. We got half way through the deregulation process in the nineties, which ceased following the Enron scandal. About 60% of the U.S. is regulated and about 40% is unregulated with most of the energy being consumed by the unregulated market. We don't particularly think we have to have one or the other to drive smart grid optimization, but by necessity, the business models of the future will be different. Business models in highly regulated areas like China can also be effective as they are highly tuned in to their regulatory environment. We do business all over the world—China, India, Europe, and the U.S.—and the solutions we have to develop for customers vary by territory.

Ms. ABADY: *What is the estimated cost of developing a smart(er) grid throughout the U.S. and what are the estimated cost savings of an active smart(er) grid?*

Mr. HENNEBERRY: The estimated cost is about $300 million in the U.S. and €200 billion in Europe but we don't think of it as a pure cost, per se. If the right technologies are in place within the right commercial and regulatory environments, then there will be cost savings through energy efficiency and optimization of capital expenditure (CAPEX) with an ROI. It might be that the CAPEX will turn out to be €200 billion in Europe but it won't be an investment on anyone's part. It will be savings that drive the growth in the smart grid. The timeframe for deployment to get grids smarter and smarter very much depends on the geography. In China for example, I was blown away by the speed in which they can implement changes once a commitment to a decision has been made, as there is little room for debate and stakeholder dialogue. The smartening up of the grid will extend through at least 2050 in Europe and the U.S. I think we'll continue to see more applications—it's just like anything when you continue getting into cost reduction capabilities, if you have the right framework, you'll continue to dig deeper and find more technology improvements.

Ms. ABADY: *Are we headed towards a Jetson–like universe of energy distribution?*

Mr. HENNEBERRY: That's an interesting perspective. I'll give you one example of an application that may fit the picture. An application that Schneider provides today for renewable energy generated from wind farms and solar farms can inform utilities in real-time of the amount of energy that can safely travel through the transmission cables. The capacity of the cable that connects the energy generated from the wind farm and solar farm to the end-user is ordinarily calculated by the cable manufacturer. In order to prevent cables from overheating, there are two capacity ratings: One for winter and one for summer. In the winter the worst case scenario is assumed given the limited number of amps that can be driven through the cables, and in the summer it's different because of heat and solar radiation, so the number of amps that can be driven through the cables need to be limited. Schneider has developed an application that can calculate in real-time (with a 20–30 minute delay) the actual capacity of the cable. So we now have an application where sensors on the cables measure variables such as temperature, wind direction, and solar radiation and with a model that intelligently informs the cables the carrying capacity at any given time rather than making assumptions that lead to energy waste as in past experience.

Ms. ABADY: *Can you please explain to us how the €200 billion required for the smarter grid in Europe will be self-funding.*

Mr. HENNEBERRY: As previously mentioned, the general answer is that the funding comes from savings. So the smart grid technology won't come from taxes, for example, but from a return on investment in energy efficiency improvements with real monetary returns for investors. However, the regulatory environment must exist to facilitate and monetize the savings. We are very interested in understanding this environment and advocating for end-users to make those savings available to them. We are working hard in Europe with the E.U. to understand what regulatory policies are needed to create this investor-friendly environment. Furthermore, we believe in learning by doing and we're very interested in collaboration with governments, large commercial end-users, and residential customers in order to prove the technical and commercial models that drive this investment thesis. Holding pilots to figure out learning by doing is a real focus of our strategy.

Ms. ABADY: *Can you please share with us what some of the smart grid investment opportunities could be for asset owners?*

Mr. HENNEBERRY: There are several opportunities certainly for wholesale energy users because they can invest in energy efficiency projects and have a direct return. Some of those projects are done in a business model called "performance contract" business

model so they don't actually pay for the capital. Whether you're the owner or the financier, there is clearly a whole raft of opportunities, particularly with software companies that are developing innovative applications that can be used for implementing smart grid technologies. There are a number of investment bankers focused on these technologies and there are at least 50–100 new software companies trying to prove that they have the best applications. Investments in the software companies would be more of an opportunity for private equity or venture capital with a higher appetite for risk. There are also a number of companies working on infrastructure plays in order to provide the necessary energy to electric vehicles, for example, in order for them to mobilize; so there are a lot of different areas related to the smart grid that are opportunities for investment.

Ms. ABADY: *Is Schneider actively making acquisitions in smart grid technologies?*

Mr. HENNEBERRY: Schneider recently announced the acquisition of leading software firm, Telvent, and is now going through regulatory approval. We don't anticipate regulatory approval issues and expect to get final approval sometime in the third quarter. Telvent is a Spanish company, and they are directly involved in the supply of smart grid applications. We also acquired Summit Energy from Louisville Kentucky, an energy management and sustainability solutions company. There are commercial and technical smart grid investment opportunities. While Schneider is invested in both sides, it's the commercial side that is bringing the new opportunities to end-use customers, including new energy procurement models for wholesale customers.

Ms. ABADY: *Is there anything else that you'd like to share with the readers of the* JEI*?*

Mr. HENNEBERRY: Well, I guess I would say that in many parts of the world the liberalization of energy markets, or the deregulation of the markets as we say in the U.S., is one of the key drivers for the solutions to a smarter grid, and optimization will naturally emerge from an open market, so we want to support the notion of an open market, where demand can compete with supply, and customers can shop around for their power. The other message is what I said earlier about collaboration. As an industry, we won't know what the right solutions are from a purely academic perspective. We need to trial various solutions so the idea of collaboration with policy makers, municipal governments, and big utilities—"trialing" solutions to see what is successful and understand where to increase our strategic focus.

Ms. ABADY: *Thank you for your time and for taking a moment from your busy schedule to talk to us during your visit to the UK.*

Mr. HENNEBERRY: It was a pleasure. Thank you for the opportunity.

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Scott Henneberry has spent many years in the electrical industry. During the first 20 years of his career, he worked for Siemens, which encompassed various marketing and operational management positions in the switchgear and power quality fields, including as marketing director for the substation automation and protective relaying division. For the next five years, he served as an executive officer of Power Measurement, Inc. (PMI), a small high-tech company in the electrical industry that provided turnkey hardware and software solutions to utility and industrial customers in the power-monitoring field. In his capacity as an executive officer at PMI, he was responsible for all aspects of marketing, business development, strategy, and mergers and acquisitions. Since the acquisition of PMI by Schneider Electric in 2005, Mr. Henneberry has focused on the strategic aspects of the power monitoring and control business for Schneider Electric. Most recently, he has been assigned to its global corporate strategy department, where he is responsible for defining and coordinating the implementation of the Schneider Electric Smart Grid Strategy.

Schneider Electric is a global specialist in energy management and provides technology and integrated solutions to energy infrastructure, manufacturing, data centers, buildings, and residential markets. In 2010, total reported sales for Schneider Electric were circa $28 billion. They employ 110,000 people in 100 countries. Schneider Electric SA shares are traded on the Paris Stock Exchange.