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THE VOICE OF THE CUSTOMER

Insights from the 2019 Renewable Energy Sourcing Forum



September 16-18, 2019 / Ponte Vedra Inn & Club, Ponte Vedra Beach, Florida

RE Sourcing Forum: Collaboration drives progress

pportunities for collaboration—among peer groups of energy buyers as well as between buyers and suppliers—continue to be a highlight of Smart Energy Decisions' **2019 Renewable Energy Sourcing Forum** as conversations lead to the advancement of best practices and new business deals.

The 4th Renewable Energy Sourcing Forum welcomed our community of large electric power users from commercial, industrial, institutional and cities/municipal entities on September 16–18, 2019 at the Ponte Vedra Inn & Club in Ponte Vedra Beach, Florida. Exclusive pre-conference workshops for both buyers and suppliers, general sessions featuring energy management executives sharing their renewable energy experiences, and more than 500 one-to-one meetings between customers and suppliers offered the chance to explore these opportunities, all wrapped in a package of high-quality networking in an intimate environment.

This *Insights* report, part of our continuing series, offers excerpts from each general session to give you a taste of the thought-provoking content, as well as the spirit of collaboration in evidence throughout the event.

We're extremely grateful for the ongoing support of the SED Advisory Board and the growing ranks of supplier sponsors who form a central element of the content at the Forum. We hope you'll join the community at our 2020 Renewable Energy Sourcing Forums. Strong interest and participation has led us to offer two Forums for the year:

- RESF Spring, June 15-17, 2020 at the Ponte Vedra Inn & Club in Ponte Vedra Beach, Florida
- **RESF Winter,** December 7–9, 2020 at the Hyatt Regency Huntington Beach Resort and Spa in Huntington Beach, California

The RE Sourcing Forum presents a focused series of educational sessions, one-to-one meetings with suppliers and networking opportunities with peers to accelerate adoption and facilitate best practices in renewable energy sourcing.

<u>Click here</u> for more information on these events as well as Smart Energy Decisions' full slate of events for 2020.



Cordially,

John Failla founder & editorial director john@smartenergydecisions.com

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Snapshots from the Fall 2019 RESF





Opening keynote: Creating a global renewable energy sourcing strategy at Cargill



Eric Hoegger, director, global renewable energy, Cargill



Cargill

Opening keynote: Creating a global renewable energy sourcing strategy at Cargill

Sustainability means many things for Cargill, particularly in the agriculture space. Cargill recently refreshed our sustainability priorities. One priority involves farmer livelihoods, which gets into some of the agricultural practices around farming, such as no-till or low-till farming and the associated carbon emissions. Other priorities include water resources, food waste, land use, and climate change. My focus is helping Cargill to achieve our goal of reducing absolute emissions in our plant operations 10% by 2025, against a 2017 baseline.

Climate change is something that directly impacts our businesses. We are reliant on originating crops to process into food products. When we have certain U.S. cold-weather crops—canola seed or red winter wheat generally grown in the Northern states—and start to see areas in which those crops will grow recede even further north, that creates business issues for us. We have a meaningful need to help address this issue and do our part to combat climate change.

While our current goal is based on absolute emission reduction, we had previous goals based on energy intensity. Even back to the early 2000s, we measured gigajoules of energy per ton of product produced. We also formerly had a goal that set a percentage of renewable energy we wanted to have in our supply mix. The problem was that these goals didn't consistently move in tandem to reduce our absolute greenhouse gas emissions. Our new goal leaves us squarely focused on reducing our actual emissions.

While 10% may sound like a modest goal, we did size this with the idea that if we wanted to eventually certify this as a science-based goal, we could. With this being an absolute goal, it is quite challenging because it's a bit of a moving target. In 2017, I was told that I needed to reduce our footprint by 1.25 million metric tons of CO2e. As we're expanding, we're adding new plants globally. Thermal energy represents 80% of Cargill's energy consumption because we have industrial processes that require heat, generally in the form of steam. In some parts of the world, we may not have access to the absolute cleanest fuel supply to provide thermal energy. By the time we're done, we'll need to achieve significantly more reduction than when we started to meet our commitment to the goal. This all makes the goal more ambitious than reducing 10% of our absolute emissions alone would imply.

There were many parties involved in creating this goal. Our environmental, health, and safety team was involved because they previously managed our carbon footprint and set our energy efficiency goals. I've been a part of our energy supply team, which was also involved by looking at how we could help make our energy supply greener. Additionally, our plant operations team provides the continuing leadership necessary to make the changes needed within our industrial operations. Lastly, our internal corporate affairs team, comprised of our corporate branding, government relations, and communications teams, has always had a role within sustainability, particularly around some of the more social issues. Then we took the new strategy to our C-suite.

The result of this collaboration was the establishment of a new sustainability hub. The hub is responsible for carbon accounting, carbon foot-printing and the policy issues around sustainability. For example, if I'm looking at a renewable energy project in which we're buying power at one spot and consuming the power at another, I look to that team for guidance on some of the policy issues around how we count the carbon associated with the project, so I know what needs to be done to achieve our goal.

The new climate goal also shifted our operational thinking within our plant operations team. Before, we were extremely focused on cost and not



Opening keynote: Creating a global renewable energy sourcing strategy at Cargill

incurring additional price risk. The new goal has everyone moving in the same direction so we're not just considering cost and risk but also GHG emissions. Because we have an absolute reduction goal, new carbon reduction projects will be needed to offset new growth. In recognition of this need, I lead our sustainable energy category, which has been separated into its own master category.

One of the results of having everyone interested in the new goal and moving in the same direction is that suddenly sustainability has become so popular that I started getting phone calls from everyone asking for help. There is a desire to put the sustainability tag on just about every project. To address this, I came up with a model that's fairly simple and provides some focus around what we will consider to be an actual energy sustainability project. If someone has a project they want to call sustainable, they must check at least two of three boxes, such as reducing our carbon footprint, focusing on additionality, or creating cost savings. If we have a project that only produces tremendous cost savings we're still going to run with it, although we just might not call it sustainable. How will we meet our goal? When I think of greenhouse gas reduction within Cargill's operations, it primarily translates into energy. To reduce greenhouse gases within our carbon footprint we can reduce our consumption, operate more efficiently and use cleaner energy sources. The only way we're going to do this is by adding renewable energy to the mix, by pursuing both onsite and offsite renewable energy solutions.





"Suddenly sustainability has become so popular that I started getting phone calls from everyone asking for help. **There is a desire to put the sustainability tag on just about every project.**"

-Eric Hoegger, director, global renewable energy, Cargill



Panel: Going global with RE sourcing



Ryan Spies, director of sustainability, energy and stewardship, Saint-Gobain North America



Rob Threlkeld, global managersustainable energy, supply and reliability, General Motors



Todd Wheeler, energy and sustainability management, operational optimization, Cisco



John Failla, moderator, editorial director, Smart Energy Decisions





Panel: Going global with RE sourcing

FAILLA: When doing renewable energy deals in different countries, what are some of the key differences you've encountered concerning terms and structure in foreign markets?

THRELKELD: We've done a lot of rooftop solar in China. You're only allowed to do solar onsite there so we've done power purchase agreements. When you look at actual terms associated with our PPAs on the rooftop solar, the terms have been very similar at 15 or 20 years. In the China market, we are building new facilities, so we don't have to deal with the roof issues. In other areas of the world, our roofs are 20, 30 years old and it doesn't make sense to put a new asset on an old roof. As a result, we've gone primarily offsite in many regions globally.

With these newer places, we primarily look at our rooftop spaces and then work with organizations to find ways to move some of that wind energy from Western China to the load-heavy East. The Chinese government is definitely looking at ways to move power and address renewables and they are starting to think about this in an inter-province way. They are also looking at it from a competitive standpoint as a way to reduce their rates. I think from China's perspective they're going to move relatively quickly as they start to understand and break down those barriers that kept things the way they were for so many years.

As an automotive company in China, we have joint ventures. It's challenging to have to convince two companies to do something, but once you do, they go big and quick and it's interesting to see how it moves. We've sought to implement some of these methods in our global operations in Brazil, China, India, Argentina, as well as in the U.S.

WHEELER: India has a lot of similarities with the U.S. market. It lacks maturity when it comes to dealing with the utilities and with the

deregulated market. A lot of the regulations are not really firm. The local and national politics are a little different as far as how much you can trust some of those regulatory changes in the long run. There is so much uncertainty. As a result, we built an opt-out in our agreement in India, so if there are regulatory changes that affect our price, we're able to opt out of the long-term contract. That's a big plus for us.

Right after we signed the deal in India, we had to get the project in the ground at a specific date to qualify for certain incentives, which is similar to some of the rules in the U.S. After we finished, a new government came in and changed how they were going to do things. Some issues are still uncertain with that project, but we were able to get a lot more language into the contract.

We're looking at opportunities in China. In Australia, we feel like the systems are there, but we don't yet have a deal. We are still looking at opportunities there, as well as in the U.K. What may be a little different in our case is that we have large, concentrated loads—data center-type of loads—in concentrated places around the globe, but in much of Europe we have mostly sales offices and multiple locations, which makes it that much harder for us to deal with long-term renewable energy PPAs and the like. From a long-term strategy, site strategy, we really are limited on what we can do in most of Europe.

SPIES: [As a French-headquartered company], in order to do a long-term deal in the U.S., we have to get everybody on board here and then go to our colleagues in Paris and get their approval. They like the longer length of the deals here but many deals in Europe are shorter or involve green tariffs. You can get comfortable with a one- or two-year price premium, but you don't know what that's going to look like in year three or four.

Panel: Going global with RE sourcing

We're starting to see shorter-term green tariffs pop up in the U.S. but we haven't found those attractive because we don't have certainty in the long-term. Our goals, and I would imagine many people's greenhouse gas or renewable energy goals, are longer-term. You want to make sure that you still have that deal when it comes time.

There are things you're going to have to explain and learn if you're a U.S.-based company with deals in other markets. For example, I trained my colleagues in Paris on the virtual power purchase agreement. They didn't understand all of our various markets as much as they did for direct and regulated environments. Education must go both ways.

FAILLA: Based on your experience, what words of wisdom can you share with others who may be starting to look at doing deals internationally?

WHEELER: Keep an eye on the regulatory landscape because sometimes these opportunities open up for a short period of time.

THRELKELD: Develop your roadmap. When you make a goal, make sure you have a detailed plan and update that plan at least annually. This will allow you to assess situations as they arise because the market evolves so quickly.

SPIES: Take advantage of all the people here at this conference, all your peers. I want to see us get this done. I want to see us grow this industry and make a huge impact and the only way we're doing that is if we're helping each other get there. There are a lot of resources out there so take advantage of them.





"The Chinese government is definitely looking at ways to move power and address renewables and they are starting to think about this in an inter-province way. They are also looking at it from a competitive standpoint as a way to reduce their rates." **—Rob Threlkeld,** global manager-sustainable energy, supply and reliability, General Motors



Cities driving RE sourcing: Three approaches



Nick Brown, city energy manager, City of Phoenix



Emily Schapira, executive director, Philadelphia Energy Authority



Lara Cottingham, chief of staff of the Administration and Regulatory Affairs Department, chief sustainability office, City of Houston



Debra Chanil, research and content director, Smart Energy Decisions (moderator)



September 2019

Cities driving RE sourcing: Three approaches

COTTINGHAM: The City of Houston is proudly known as the Energy Capital of the World. We recognize that we have the responsibility to power the future, just as we have powered the past. That means embracing all forms of energy, including renewables, as well as energy efficiency and emissions reduction technology.

After three five-hundred-year floods in three years, culminating with Hurricane Harvey, the largest rainfall event in North America, Houstonians are demanding action on climate change. Even an average Tuesday rain shower can quickly escalate into a major rain event, shutting down parts of the city and creating serious public safety issues.

Our challenge is to find solutions to the climate and resilience challenges that fit the size, diversity, and growth of our city. Houston is in a deregulated electricity market, meaning the city does not control the electric utility. Houston has more sprawl and less transit than other cities, so as a city, we have to lead by example. We are the largest municipal user of renewable energy in the nation and are working to build the largest urban solar farm in Texas in a neighborhood aptly called Sunnyside. We have to show that if a city the size of Houston with 22,000 employees and a fleet of 8,000 vehicles can make our operations as sustainable as possible, anyone can. If it can be done in Houston, it can be done anywhere.

SCHAPIRA: Philadelphia is in Climate Mayors. We are committed to remaining in the Paris Agreement. We've made some great commitments on climate change: 80% carbon reduction by 2050, 100% renewable electricity for city government by 2030, and a handful of other goals that get at the city beyond just the government footprint. Those goals have been really helpful and having that political platform has given us the license to do the work that we're doing.

At the Philadelphia Energy Authority, we sit firmly on the implementation side of things. We have an Office of Sustainability inside

city government that does all of our big visioning and policy. We've been able to get a lot of things done together in Philly. We run Solarized Philly, which is a residential group buying program, and the largest solarized effort in the country. Over 500 households now have gone solar through it. We just passed a city solar rebate. Inside city limits, any solar project built after July 1, 2019 will receive 20 cents a watt for residential projects and 10 cents a watt for commercial projects from the city. I think it is funded well enough for the size we are now, and, hopefully, we're going to oversubscribe it and go back and ask for more money.

BROWN: Cities really are the quiet partners in renewable energy and in climate change work. We purchase around 700 GW hours of power per year, which makes me small- to mid-size in this room. Phoenix is right in the middle of a real crisis. Our overnight temperatures have risen by seven degrees in the last 50 years—seven degrees! This is not a small thing. Every time I think of renewable energy, what I'm really thinking of is greenhouse gas reduction and what we can do for that. Maricopa County had 180 heat-related deaths last year and that's despite having around 500 city-managed cooling centers. We have approximately 200 locations where people can go for water. Our donation centers don't take cases of water anymore—if you don't have a pallet, we can't work with you. It's really a difficult situation and this isn't just for charity or something that we're doing because we think eventually somebody will benefit from it. It's work that we think is essential for cities as well as for companies.

We see our obligation as a two-pronged opportunity. First is municipal operations. We have direct control, of course, over that 700 GW in terms of where it comes from and how we purchase it as well as what the resulting emissions and impacts might be. We also take very seriously our leadership role in managing energy consumption and greenhouse gas emissions at the community level. From 2012 to 2016, our GHG emissions community-wide



Cities driving RE sourcing: Three approaches

were reduced by about seven percent. We feel we've got some things that are quite effective, and that's the result of aggressive energy conservation programs in conjunction with our utilities. We've got programs of all kinds that encourage, inspire, and sometimes pressure businesses and residences into consuming less energy and to purchase cleaner energy. It's a deep, wide, and broad responsibility as well as an opportunity.

CHANIL: Nick, tell us what's next for Phoenix.

BROWN: What's next for us is a good, strong, substantive adaptation and resilience strategy. I think that most of us spend most of our time working on mitigation efforts and so that's really what our solar sourcing opportunities are about and that's why we're here at this meeting. What seems to be underplayed, not well understood, and poorly developed are our adaptation strategies so that we can get through the difficulties and challenges that are certainly ahead and that we're seeing mounting all the time with the physical and meteorological climate change impacts that we see. That's next for us.

CHANIL: *Smart Energy Decisions* is heading to Philadelphia in December for our next event, *Accelerate Philly*. Emily, tell us what want to see accomplished in the city with this event.

SCHAPIRO: We estimate the clean energy market at about \$5 billion in Philadelphia, not even including the eleven surrounding counties. We know we have a huge, untapped market in both efficiency and renewables so it's important to bring the large energy users in the region together with suppliers and developers to learn about what's going on in this space. It's important to build those relationships and make those connections.

CHANIL: *Accelerate Houston* is planned for March 2020. Lara, what do we have to look forward to in that city?

COTTINGHAM: We are thrilled that you are coming to Houston. The city is finishing up our first Climate Action Plan, which will set a strategy for reducing emissions across the buildings, transportation and waste sectors. Houston has one of the highest per capita GHG emissions in the country, which means there is ample opportunity for Smart Energy Decisions to be made. We hope this event will help spark investment in clean and efficient energy technology and put us on a path toward a clean energy transition in the Energy Capital of the World. (#)



"We've got programs of all kinds that encourage, inspire, and sometimes pressure businesses and residences into consuming less energy and to purchase cleaner energy. It's a deep, wide, and broad responsibility as well as an opportunity." —**Nick Brown,** city energy manager, City of Phoenix



Keynote: Opportunities in renewable energy sourcing



Art Justice, director of utilities and energy management, Cinemark



Hans Royal, head of new business development, North America, Schneider Electric Energy & Sustainability Services





Keynote: Opportunities in renewable energy sourcing

In October 2018, Cinemark signed a landmark nine-year VPPA for up to 40 megawatts of wind energy from AEP's Trent Mesa Center in Nolan County, Texas, with Schneider Electric as advisor. This shorter-term, smaller project allowed Cinemark to get "over the hump" to complete their first renewable energy deal. In this session, Art Justice of Cinemark and Hans Royal of Schneider Electric discuss how the strategy for this agreement was developed.

ROYAL: Can you discuss your onsite solar success and how you initially set your strategy around renewables? What did that mean for Cinemark?

JUSTICE: I've been managing energy for Cinemark for 20 years. When I started, we showed that we could save money through energy efficiency and fluorescent lighting. About ten years ago, some of our past and current executives developed an interest in solar but it didn't quite meet our needs at the time, such as a certain payback period. We also have a combination of owned and leased buildings. We just started looking for incentives in addition to the federal investment tax credit (ITC) and successfully completed our first solar project seven years ago. We've built on that, continuing to find incentives, and now have 20 completed rooftop solar projects. One was a power purchase agreement with a landlord and the others are owned. We've also done LEED projects and purchased renewable energy credits.

ROYAL: How did you then build upon that experience to do things at a slightly larger scale and look into the virtual power purchase agreement as a method to increase your renewable penetration?

JUSTICE: We knew we weren't going to be able to do onsite solar everywhere. At best it provides 35% to 40% of the energy consumption for a given theater. We knew we were going to have to do something else in

order to scale up. Through Smart Energy Decisions and other conferences, we were introduced to PPAs and virtual PPAs.

When we introduced these concepts to our C-suite team, it was challenging because it was a totally foreign concept to them. We got a group together including our VPs of accounting, CEO and CFO. The accounting guys didn't quite get it until one said, "You know, this is what we do all the time in credit swaps." That helped them understand a bit more. Still, we were asked: Why are we doing it? Should we be doing it? Ultimately our CEO kept it alive. While we currently don't have a commitment to be 100% renewable, we do have a desire. We do want to be an industry leader. If it makes sense to do it, then the CEO is on board. All our deals have to make sense. Whether they're solar or energy efficiency, they all have to make some sort of financial sense in addition to being environmentally friendly. We can also hedge against future rising prices. We were looking at larger deals with more risk, but as we considered alternatives it became more palatable to try an initial project.

AEP Energy was one of the developers who came to the table and we've done business with them on the regulated side for years. While there are smaller deals now, at the time we were looking at a standard project of 100 MW. That, in addition to talking about 15- to 20-year terms, made people nervous. AEP brought a deal to the table that allowed us to do a smaller project and a shorter term. That really got us over the hump to be able to do our first deal. That's not to say that we wouldn't consider different terms in the future, but I think we needed that one as our first deal to get our C-suite comfortable.

ROYAL: I think one theme here is that developers are creating innovative products and solutions. For example, deals under 10 years are unique, as are repower projects. Tell us what a repower project is.



Keynote: Opportunities in renewable energy sourcing

JUSTICE: A repower project is an existing wind farm that's at or near the end of its life and is repowered. New turbines are set on the towers so it's basically a brand-new wind farm. I think that allows some flexibility.

ROYAL: Certainly, I think repower is not only good for the long-term stability of this industry, but it also adds additional renewable energy capacity to the grid when you go from smaller turbines to much larger models. Another interesting aspect of this transaction is that you were able to enter into the agreement and have that PPA start relatively soon after signing. Tell us about that.

JUSTICE: We were anxious to do a deal, but we also didn't want to wait two or three years, as we would with in a traditional project. We wanted to have something now so we could start to build our case and show results. AEP was able to work with us and allow us to have 10 MW now. We now have a year of history and that's helping us build our case for future projects.

ROYAL: What advice do you have for newer energy buyer, folks who haven't done this before?

JUSTICE: Talk to the advisors. This process stretched over a pretty long period of time—longer than I thought it would be in terms of selling it— but they were there to help us. We would not have done this deal without

an advisor. Also, talk to your peers who have been through the process. Ultimately, you're going to have to convince your team so educate yourself.

ROYAL: What has this journey meant to you personally and/or professionally?

JUSTICE: On the personal side, it's something that I believe in so it's very rewarding for me to do these kinds of projects. I love doing them and it's a passion of mine. On the professional side, influencing my company and at the same time influencing other companies is very rewarding as well.





"All our deals have to make sense. Whether they're solar or energy efficiency, they all have to make some sort of financial sense in addition to being environmentally friendly." **—Art Justice,** director of utilities and energy management, Cinemark



Executive interview: The evolution of renewable sourcing



Sayun Sukduang, president and CEO, energy management division, ENGIE North America



John Failla, founder and editorial director, Smart Energy Decisions



Executive interview: The evolution of renewable sourcing

FAILLA: In terms of the energy transition from fossil fuels to renewable energy, what do you see companies and utilities doing to get ready?

SUKDUANG: I think utilities are starting to be pushed into this energy transition rather than jumping in on their own. The customers, especially larger commercial and industrial businesses, are demanding it.

Coming up in a rent-seeking environment in which you are rewarded for deploying infrastructure gives you a different perspective when you're used to being rewarded through customer admiration. Regulated utilities will start to transform. I think if you went to any energy company and asked about their chief design officer, utilities would probably think of the person in charge of a transmission line or power plant design, not the person who interfaces with the customer. Whether it's a utility or independent power producer, we as an industry have yet to converge around a customer. I think the utilities will get there; I see progress in some of the programs they have around smart meter deployment and the electrification of transportation. It will be difficult, however, in a rent-seeking business model to actually design around the job as the customer needs.

For example, if you go to buy an electric car you face a perplexing decision. Do you buy the P-90 battery or the P-100? You have to make that choice around your peak demand. Do you need to go 350 or 280 miles on any one trip? It's also a cost decision. Do you want to spend \$15,000 more or \$15,000 less? It's actually a suboptimal decision because most of the time you only need to go 20 miles with that car. You want to be able to get to work five days a week, get to your child's soccer game that's 100 miles away once a month, and maybe twice a year you might take a trip that is 350 miles in any one drive. All the rest of the time, that \$90,000, \$80,000, \$70,000 vehicle has value to the grid that is so much more than the value in

getting you from one point to another—you have a massive energy storage device. In the future, each vehicle in a parking garage will probably be networked.

Does the utility get infrastructure remuneration in that rent-seeking business model? You as a consumer have infrastructure that is so valuable to the grid, but a utility doesn't own your car. How do you get remunerated for that value? If your energy provider was hooked up to your calendar and knew you were going to work five days a week and you had 60 kWh of energy storage available almost every hour that you're not using in the car, what could that do to help us bring more wind, solar and optimization and less cost and carbon to the overall system? It's massive. Our capabilities are increasing massively because of technology. What's missing is that we have yet to figure out how to engage with society to take those capabilities and optimize the overall system.

FAILLA: What do you think will be necessary to accelerate utility adoption of renewables and the deployment of a more customer-centric business model and philosophy?

SUKDUANG: It will take a bit of an earthquake somewhere. We look at a lot of the sharing economy-type companies and I think a business model will emerge around energy in some small corner of the world, maybe the United States, and it will spread like wildfire and cause everybody to change. For example, Uber didn't come about seeking to modify the rent-seeking business of buying a cab and getting a medallion. Instead, it created what we all cared about, which is that the cab will show up, it will be clean, the driver will have a good rating, and payment will be easy. Uber provided a solution to those bad cab experiences. That is what caused it to spread like wildfire and challenge the existing rent-seeking model.



Executive interview: The evolution of renewable sourcing

I think two things will come together: energy and a megabyte. Electrons have no intrinsic value, but they have extrinsic value because they can be turned into something such as light next to your bed or the heat on your stove. Megabytes also have extrinsic value when they turn into an e-mail or a video. When you can pair an electron with a megabyte, you can start to deal with things that have intrinsic value. You can start to sell light, climate control, and device functionality. Those are the three things people want around energy. When you can start to engage around those things of intrinsic value, you'll be able to connect with society in a much more prolific way.

Transportation has intrinsic value to people. You shouldn't have to make complex decisions around the car, battery size and the electric rate plan of on-peak and off-peak pricing. Similarly, you shouldn't have to make decisions around buying energy under the U.S. generally accepted accounting principles—GAAP—or international financial reporting standards—IFRS. That will start to become easier when we connect those things. When that happens, the business model will spread like wildfire, and business and regulated utilities will be disrupted and we'll have to figure out how to adapt. What I think will happen is that more larger companies will get involved that are used to dealing with risk, especially energy risk. There will be products that don't require as much brainpower as what you're seeing today. They'll be lower tenor with smaller volumes and less discussion around basis and settlement points. Just saying that you want all your energy to be clean and you want to know where it came from will be a simpler request. I don't think three or five years from now it will be anywhere near as complex as what you're seeing today.





"Our capabilities are increasing massively because of technology. What's missing is that we have yet to figure out how to engage with society to take those capabilities and optimize the overall system."

-Sayun Sukduang, president and CEO, energy management division, ENGIE North America



Executive interview: Navigating the key risk factors of VPPAs



Aaron Thomas, vice president, **Calpine Energy Solutions**

John Failla. founder and editorial director, Smart Energy Decisions



RIS

Executive interview: Navigating the key risk factors of VPPAs

FAILLA: Given that customers are increasingly interested in reducing carbon emissions, can you talk about your experience in working with clients towards that objective?

THOMAS: Almost a decade ago, our business pivoted to focus on risk and cost management as part of the core supply work we do with customers. We've seen customers want to integrate their greenhouse gas ranking into their programs and contemplate it from a risk perspective as well. Just in the last couple of years, I've been shocked at the number of customers motivated to engage in green commitments, even in the oil and gas sector and petrochemical interests as well. There was a time when I wouldn't have believed it, but I could probably hold up three or four major press releases just this year from traditional oil and gas interests making long-term renewable commitments. Part of that is also price-driven. Prices have fallen substantially over recent years, particularly in solar, which has motivated some of these actions.

FAILLA: If I'm a business that is focused on carbon reductions, how I should go about evaluating possible transactions available to me to accomplish that goal?

THOMAS: That is where our engagement typically starts with a customer, once there's been a goal set for the organization. Those goals may have kind of a laddering to them, so it becomes a matter of finding the best way to meet the objective. We like to say, start with the press release. Start with the statement you want to make to the stakeholders or to your market.

FAILLA: What's your sense on the financial focus on renewable energy and procurement? Should it really be looked at more as more of an investment?

THOMAS: The analysis that goes into those commitments, particularly when you're talking about terms 10, 15 years or longer, requires rigor, but it is somewhat of a misstatement to think about it as an investment. These

companies are not in the business of being merchant renewable suppliers or market participants, but it is, in fact, what they end up being in certain cases when you think about a VPPA.

With that in mind, it's the sustainability initiative that drives the commitment, but the rigor you need to apply to it does need to speak to the finance and treasury departments. It is about understanding the best and worst outcomes and providing a range of how things could settle and evolve over time. There's a need to understand the assumptions that you are making in your cost estimates over time and what the revenue streams from the assets are going to be as well as structural changes that could affect those.

It is better to provide the analysis behind the numbers as to what your assumptions are so that you're essentially documenting the information you had available at the time in this decision and setting forth a range of potential outcomes rather than coming up with a specific yield, return or savings number that may be hard to defend. Over a 10, 12 or 15-year time horizon, change will just naturally occur in the marketplace.

These markets are evolving substantially in terms of retiring resources. Changing the grid mix does impact price. California's the extreme example with negative prices in the middle of the day. We've seen that price shift in terms of the peak pricing change in the hour it occurs, but not necessarily go away. It doesn't mean the end of volatility, but it does change where it is expressed.

FAILLA: Let's talk about both PPAs and VPPAs with minimum 10 and 15-year terms. What are some of the key issues or risks that buyers need to be aware of in both of those types of deals?

THOMAS: I think of the VPPA as an instrument for customers that they can use to make a fix-for-float swap commitment at a location that's really dislocated from their load or short positions. That may be



Executive interview: Navigating the key risk factors of VPPAs

because the loads are highly dispersed, or it may be for other reasons. That's important to understand compared with a PPA, which I would generally define as being a source or a commitment that is like a delivery location for the load. The PPA format is more tightly integrated to where the load source is and so provides an additional value stream. It's a riskreducing transaction, maybe more so in solar but not to a zero degree in the case of wind.

That's really where we see it going, greater integration of the load and the associated risks that the load has in deregulated markets and the commitments that are being made around sustainability. All things being equal, ideally, a PPA is going to have more net value to you because of that risk-reducing aging part.

At the other end of the continuum, the most ideal scenario—if you have the land and space available—is to build all of those resources behind the meter. Obviously, there are other operational considerations, but from a pure price and cost-mitigation perspective, you're avoiding wires and mitigating the energy exposure.



"It is better to provide the analysis behind the numbers as to what your assumptions are so that you're essentially documenting the information you had available at the time in this decision and setting forth a range of potential outcomes rather than coming up with a specific yield, return or savings number that may be hard to defend."

-Aaron Thomas, vice president, Calpine Energy Solutions

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Panel: Pathways to achieving global emission reduction targets



Erika Vasconcellos, global environmental manager, Mondelēz International



September 2019

Sarah Penndorf, director, Energy and Climate Practice, 3Degrees



Debra Chanil, editorial director, Smart Energy Decisions



Panel: Pathways to achieving global emission reduction targets

In June 2019 Mondelēz International signed a VPPA, the company's first U.S. agreement, covering 65 MW from Enel Green Power North America's Roadrunner Solar Farm. This will help Mondelēz International reduce 80,000 metric tons of carbon emissions which is about 5% of its global manufacturing emissions.

CHANIL: How did Mondelēz International first come to think about sustainability and setting goals?

VASCONCELLOS: At Mondelēz International we're committed to making snacks the right way, for people and planet. And to us, sustainable snacking means building resilient supply chains while reducing our impact by minimizing emissions and creating less waste. We've been on our journey for some time and a big part of making our snacks the right way means minimizing CO₂ emissions across our value chain, with a focus on energy efficiency within our own facilities. Energy efficiency has been a focus for us, so we're also scaling up our plans to continue to invest in renewable energy sources to support our operations. Our partnership with Enel is an important step as we progress against our larger sustainability goals.

CHANIL: We have an ongoing conversation in our office about what comes first: implementing renewables or setting a goal. Sarah, what path did Mondelēz International take?

PENNDORF: It is a good question and one that we see our clients asking, too. Actually, the first step is measurement. Most of our clients have a good handle on at least Scope 1 and 2 emissions and many have a good handle on Scope 3. That's the first thing that organizations wrap their head around, quantifying the emissions. After that, the question is:

which do you do first, take action or set a goal. For the vast majority of our clients, goals are set first. It's much easier to mobilize resources for any action or solution if you have a goal established, especially with executive level accountability assigned to it. Typically, the stronger the goal the more empowered our clients are to finding solutions. If you have a big goal, you've got a lot of ground to cover.

There's another interesting question, which is how do companies set goals? We're working with many organizations that are thinking about 2025 or 2030 goals. Should they sign up for RE100 or a science-based target? We see two approaches. One is where you set an ambitious target —a moon-shot idea—and figure out how to get there later. The other is to develop line-of-sight, where you figure out how you're going to get there, understand what it will take in terms of resources and time, and then set your goal. Neither way is right or better. When Mondelēz International came to us in 2016–2017, they had a goal already in mind but the pathway to get there wasn't clear. Looking at a post-2020 world, they could be looking at a hybrid approach, but Erika, you're really data driven and looking to understand the impacts. Would you agree with that?

VASCONCELLOS: Yes. We build targets in both ways. We think of the numbers we have, the amount of effort that would take to deliver, and then we see what has to be delivered to really make an impact at scale. We try to take both approaches.

PENNDORF: I think you have a level of ambition you are trying to reach and then you try to understand what it'll take to get there. That's why I call it a hybrid.



Panel: Pathways to achieving global emission reduction targets

CHANIL: Focusing on the VPPA that Mondelēz International signed, what is the importance of completing a deal in the U.S.? What did that mean for the company?

VASCONCELLOS: The U.S. is one of our key markets This was our first big renewable agreement and the implementation and learnings will enable us to speed up our renewables agenda. We were invited to the U.S. Congress to talk about the project. They invited us to a caucus in D.C. and we proudly went there to talk about the agreement and about Mondelēz International. It was a pleasure and it shows the visibility this type of agreement generates.

CHANIL: Now that you've got this first big deal completed, what have you learned?

VASCONCELLOS: At Mondelēz International we focus on two things to help drive decisions making: focusing on where we can have the greatest impact at scale and focusing on the ability to implement agility in order to move with speed and learn and adjust as we go. To these points it is also

important that we have the right external advisors at the table. 3Degrees was a great partner because negotiating a VPPA is a very complex process. It is something we had never done before and having the right partner helped us implement the agreement the right way.





"We were invited to the U.S. Congress to talk about the project. It was a pleasure and it shows the visibility this type of agreement generates." —**Erika Vasconcellos,** global environmental manager, Mondelēz International



Keynote: Look who switched to renewables



Amy Bond, energy and sustainability program manager, Sprint



Scott Macmurdo, business development director-corporate accounts, Duke Energy Renewables



John Failla, editorial director, Smart Energy Decisions (moderator)



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BOND: I could not be more pleased to present in this forum and to announce to this audience Sprint's very first virtual power purchase agreement in partnership with Duke Energy Renewables and orchestrated with our wonderful buyer's agent, Schneider Electric. In support of this 12-year VPPA Duke Energy Renewables will build and operate a 182 MW windfarm in Nolan County, Texas called Maryneal and Sprint will purchase 95% of the project output. This agreement will match almost 30% of Sprint's energy consumption and that will greatly offset our carbon footprint. Other than those of us that worked on the deal, you are the first to know! The press release hits the newswire tomorrow. It's very fun to let you in on the inside track.

MACMURDO: If I can just add to that, Amy hit on a really key message, which was that this was fun! I'd be lying if I told you that there weren't moments throughout this long process where things would go a little bit differently than what you planned, but I think for those of us who are here in this community, this has to be fun for you. This has to be something that you're passionate about to really roll that ball up the hill, especially if you're a first-time participant in this market, as Sprint was in this case. From our perspective, it's really rewarding when you get to be part of seeing our customers' first renewable energy announcement. It's always fun to do deals with repeat customers that have done three or four and there's actually a lot of expertise here in the audience with buyers who have done that before. But any time that we can be on board with a company like Sprint who is really moving these things for the first time, it's a lot of fun for us. We really appreciate it.

FAILLA: Congratulations to both of you. Let's start the conversation by having you tell us about the start of the journey.

BOND: It's quite a story. I attended your Smart Energy Decisions Conference in Austin, Texas about 18 months ago and through the education provided there and the relationships that were initiated there, that really launched Sprint onto the trajectory towards the success that we announced today. And I like to joke that the perfect analogy is that I went to Austin, found a VPPA puppy and brought it home and said, please Sprint, it's really cute. Can we keep it? It'll feed itself, it'll walk itself, and it'll get a job and earn money.

But, to give a little more historical perspective, Sprint launched environmental goals, very aggressive goals in 2008, with a 2017 deadline. There were 10 of them. One of them happened to be to acquire 10% of our energy from alternative sources. Back in 2008 and 2009, other than hydrogen fuel cells, our only strategy was purchasing RECs and that quickly became unaffordable for us. So, that goal was tabled until 2014 when we actually considered our first VPPA. At the time, the economics just didn't make sense for us but the great byproduct is that we already had an internal team assembled of about 20 people who were all still at Sprint. We reassembled them for a 2018 evaluation.

MACMURDO: Sprint's journey is a little bit unique in the sense that they started out on this process without an overarching climate goal. You had your earlier iterations of a renewable energy goal that then had a life of their own and moved on. What I think the case of Sprint proves is that as a corporate buyer in this market you can walk and chew gum at the same time. I think it is easier a lot of times if you have an overarching goal that's directed from the top. Maybe that came from a top-down approach where



you picked a science-based target and then said, what actions do we need that can help us hit it. Maybe it comes from a bottom-up approach where you survey the landscape and say, okay, let's set a percentage based on that and then add 5% for a stretch goal. Sprint illustrates that even in the absence of that goal, you can actually get some of these deals done which I think is a really remarkable achievement. I would say that's a little bit rarer, but it gives hope to some of those folks out there who may be lacking in overarching renewable energy goals or climate goals. These deals make sense a lot of times on the economics alone and so even without sort of that sustainability aspect or individual mandate, you can get it done.

FAILLA: We know that these deals are difficult to get done. I haven't heard of one yet that was totally smooth sailing. What were some of the challenges or obstacles that you faced internally to convince people to let you keep the puppy?

BOND: You know, you can educate your teams all day long, you can bring forward the most financially reasonable evaluation and, at the end of the day, if you have a member of your executive team that is, not even against it but neutral, it can really tank the project. In my case, when our team was presenting to our executive management, one of the executives said, I don't get it. You know, this is not core business. If we're going to create another revenue stream, why not do something that is a little more proven? And I couldn't have written this into a script, but we're in a glass-walled conference room. And who happens to be walking by but the CEO. He sees the slides, and he knew what the presentation was because he had approved it the day before. He bursts into the room and very enthusiastically says, V-P-P-A, V-P-P-A. So, if you were on the fence or on the other side of the fence, you probably flipped. There's nothing better than having executive support.



"What I think the case of Sprint proves is that as a corporate buyer in this market you can walk and chew gum at the same time. I think it is easier a lot of times if you have an overarching goal that's directed from the top."

-Scott Macmurdo, business development director-corporate accounts, Duke Energy Renewables







Brianna Esteves, manager, state policy, Ceres



Keynote: Regulatory hot spots

t Ceres, we work with companies on policy and regulatory issues at both the state and federal levels. We dig deep into about a dozen states and keep our eye on a number of others, as well as what's going on in Congress and the Administration. A big piece of our work at the state level is corporate access to renewable energy and ensuring companies are able to complete renewable energy deals.

When asked to think about regulatory hot spots, I think about it in two ways. First are the states with deregulated markets. They typically have easy access to renewables or to electric choice, in general, and this is why you see so many corporate renewable energy deals happening. This includes VPPAs in Texas, for instance, where wind energy is affordable and abundant and it's fairly easy to get corporate renewable energy deals done.

Secondly, there are the regulated markets, which include most states in the U.S. Regulated markets feature utilities that are usually statesanctioned monopolies. Typically, there's very little electric choice and the utilities enjoy a good amount of power. Under current regulatory and compensation structures, if these utilities relinquish control or enable companies to leave their service territory, their bottom line could be in jeopardy. Given this structure, utilities in regulated states tend to be more guarded. Sometimes they're more wedded to their traditional way of doing things and this can pose a challenge.

When I think about regulatory hot spots for corporate renewable energy procurement, I think about one state in particular: Virginia. There are a lot of businesses with significant operations and ambitious corporate clean energy goals located in the state and they want access to renewables.

Like the rest of the Southeast, Virginia is a regulated electricity

market with a monopoly utility structure. However, uniquely it has access to a wholesale power supply. An independent power producer can establish a plant in Virginia and sell to the wholesale grid whether or not it's directly related to the utility or ratepayers. Also, while Virginia has a monopoly utility system, there are a couple of very limited cases where, if certain criteria are met, you are allowed to leave the utility service territory to shop elsewhere for electricity.

A couple of years ago, businesses and NGOs started getting together to investigate how they could access better renewable energy in Virginia, including holding closed-door conversations with the utilities. This also happened in other states; unfortunately, it didn't work well in Virginia. Goldman Sachs once called Virginia the most favorable regulatory environment for utilities in all the U.S. In short, utilities weren't exactly used to being told what they should do. They weren't used to being told to change, and so these closed-door conversations didn't work. Companies realized that they needed to do something in a more public way.

Beginning in 2016, Ceres worked with groups like REBA to bring companies together to shine more attention on this issue. Eighteen companies signed a letter in November 2016, which was featured in the *Richmond Times-Dispatch* under the headline, "Major Companies Call for More Renewable Energy Options in Virginia." That article was followed by several in-person, lawmaker education meetings in Richmond. We brought companies to these meetings so they could tell their story: they wanted to stay in Virginia, access renewable energy, and make local investments in the state. This engagement caught lawmakers' attention and has led to some progress. Today, I think every single legislator understands that to



Keynote: Regulatory hot spots

make Virginia attractive to companies, it needs to be able to offer access to renewables. It's clear we're making inroads, but we're not finished yet.

Another hot spot is Nevada—again, a regulated state where companies tried talking with their utilities to be able to access renewables. It didn't work. In Nevada, you are allowed to leave your utility if you apply to regulators and pay an agreed-upon exit fee, which is oftentimes millions of dollars. Some companies realized that they were able to get renewable energy from outside their utility, and still get a very favorable ROI in less than ten years, even if they paid this exorbitant exit fee. This sentiment resulted in a large ballot initiative attempting to deregulate Nevada's electricity system. The initiative ultimately lost but demonstrated to utilities that are unwilling to change that they are likely to be met with a lot of resistance from large power users. Nevada companies have continued applying to leave the utility service territory so today there's an ongoing conversation between utilities and their corporate customers, which has led to utilities now finally looking at offering some renewable energy products to their large ratepayers.

Ohio is another hot spot and it provides another unique example. Technically there is retail electric choice in the state but instead of only being a regulatory issue it's actually been a legislative issue. Despite public outcry from citizens, experts, and businesses, legislators continue to put up so many barriers on renewable energy that I would be surprised if we see much, if any, investments in renewables deployed in Ohio within the next couple of years, barring any further legislation. This summer, for example, Ohio lawmakers passed a law that essentially destroyed the REC market and instead propped up uneconomical coal and nuclear power plants. Ohio is an example of how the legislature can actually be the barrier and showcases why it's important to engage at both legislative and regulatory levels to ensure companies have access to renewable energy across the country.





"Given their structure, utilities in regulated states tend to be more guarded. Sometimes they're more wedded to their traditional way of doing things and this can pose a challenge."

-Brianna Esteves, manager, state policy, Ceres



Keynote: Bank of America's innovative solar initiative



Beth Wytiaz,

senior vice president, global environmental operations director, Bank of America



Keynote: Bank of America's innovative solar initiative

s a global financial institution, Bank of America has a responsibility to act. We can play a vital role in moving toward a low-carbon economy.

We've been on this journey for quite a while. Our strategy focuses on some key areas around our business, operations, partnerships and certainly our employees. Ultimately, we're focused on engaging every part of our company to tackle climate change and address demands on natural resources. We always feel like there's more to be done so we're constantly thinking about how we can drive change.

We have five key pillars of our environmental strategy. The first is our business. We have been making public financial business commitments since 2007 and have deployed \$126 billion toward energy efficiency, solar, wind, geothermal and more. We're about to complete our current \$125 billion environmental business commitment by the end of this year, six years ahead of schedule. We're going to kick off an additional \$300 billion new environmental business commitment in January. We see this as an important business and are dedicated to it. We have folks that are working to generate products that fit into our environmental category within our environmental, social, and governance (ESG) approach.

Another pillar is our partnerships, which is where we work with nonprofits and academics to support the work that they do. Last year we invested about \$19 million in environmental philanthropy.

A third pillar is our people. We do an excellent job engaging our employees. We have a program that we rolled out nine years ago called My Environment. It has almost 25,000 members now across 30 different countries. Essentially, the program focuses on helping our employees act as better environmental stewards at work, at home, and in the community. A fourth pillar is ESG risk. It's embedded into everything that we do and ultimately governed by a committee consisting of leaders from across the company in each line of business.

The fifth pillar is operations, which is what I'm responsible for. This ultimately means that we want to make sure we're walking the talk. We are focused on what we can do internally. This is our second round of public goals and we're working to achieve these by the end of 2020. They're mostly split between facilities and supply chain, so there are a lot of reduction-focused goals within our real estate. We also have a goal around LEED certification. When it comes to our supply chain, we have a variety of goals around the products we're sourcing and engaging with our suppliers.

In regard to our strategy, we're on a journey. The first thing we're doing to get to carbon neutrality is around energy efficiency. We're continuing to shed space and implement energy efficiency projects. The next step is focusing on 100% renewable energy purchases. We are part of RE 100, a group of companies committed to using 100% renewable power. Our goal is to get there as efficiently as we possibly can while making sure we're driving innovation and impact. We ultimately want to be responsible for adding new renewable energy into the communities we serve as well as in other underserved communities.

For example, we did a wind and solar hybrid project in Minnesota that was the first of its kind. This project covers all of our load in the state and serves a low-to-moderate income community by providing discounts to the co-op members. This is an example of how we can leverage our purchasing to increase impact.



Keynote: Bank of America's innovative solar initiative

One of the things that is unique about being a financial institution is that we do a lot of tax equity investments. In fact, Bank of America is the largest tax equity investor in wind and solar in this country. I've been working with bankers to see if there are deals we can do together that would contribute to our 100% renewables goal.

We also look at physical power purchase agreements (PPAs), which for us includes utility products. We want to do as much as we can where we're not only getting the renewable attributes but also electricity. We want to support new renewables coming online in the areas in which we operate. Obviously, we're going to have to make some international renewable energy credit (REC) purchases. We do a lot of procurement already along with our electricity outside of the United States, but we're going to have a lot of gaps so that's something we're going to focus on this year.

Another important aspect of meeting our goals was onsite solar. Not only did we think we had an opportunity to perhaps get ahead of our peers and reap tax benefits but also do something that was tangible to our employees and our customers. We realized that all of the other things that we're probably going to do to get to our 100% renewables goal are not easily understood by people outside the room. That's where onsite solar became really important.

We're currently at 90% of our 100% renewable goal. That has mostly been through unbundled RECs here in the United States. We are on track to begin to move to things that we think are overall more impactful. (





"Not only did we think we had an opportunity to perhaps get ahead of our peers and reap tax benefits, but also do something that was tangible to our employees and our customers."

-Beth Wytiaz, senior vice president, global environmental operations director, Bank of America



Executive interview: Moving beyond VPPAs



Ben Chadwick, executive director, Constellation Offsite Renewables, Constellation

CONTRACT



John Failla, founder and editorial director, Smart Energy Decisions



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Ben Chadwick announced at the RE Sourcing Forum that major commitments from an aggregation of commercial customers, including Johns Hopkins University, McCormick & Company and TJX Companies, resulted in a 175-MW agreement for Constellation to supply renewable power and project-specific renewable energy certificates (RECs) from the Skipjack Solar Center in Virginia. The project, which is the largest of its kind for Constellation, will allow each customer to use Constellation's offsite renewables retail power product (CORe) to remove hurdles that accompany traditional offsite PPAs.

FAILLA: How do you see the corporate renewable procurement market evolving?

CHADWICK: This is a demand-driven market and I'd like to think that we're a credible retail supplier crafting unique solutions. There are a lot of forces on the supply side helping. Still, this remains a demand-driven market and an incredibly exciting one.

I've been at Constellation for 15 years and I've never been more excited about what I'm doing—I mean that genuinely and honestly. When you're at events like this and you're talking to people you can see it on their faces too. People are very excited to be working on transactions like this because they are complicated but in a fun way. We all know that we're making a real difference that the world needs.

Thinking back to two years ago, I spoke about this demand-driven market and that we're in the middle of a customer-driven renewable revolution. I still think that's the case but two things have changed. Customer demand is changing or evolving. That can mean complication and it could get messy, but I don't think it will. It will mean a better solution for the end-user and the buyer. Customers are demanding an offsite renewable solution that better aligns with the way they do business and with less risk. We're being pushed to ask the developers and retail suppliers to create ways of contracting for renewable energy that meet the risk tolerance of the buyer community, which has an incredible amount of power. We're all trying to adjust to shorter terms and price protection. Customers are demanding something that starts looking a lot less virtual and more like the electricity that you buy today. I'm biased here because that is our product offering, but it's actually the way that this market should work.

The second change is that there are more industry players. We're not the only retail electric provider. There are other people trying to meet the needs of customers. The broker and consultant community is growing. You have banks that are coming to the table as project intermediaries with risk management solutions. You have insurance companies. You have the non-government organizations and the nonprofits that are here to help. You have this vibrant and growing community on the supplier and intermediary side.

FAILLA: In terms of evolving beyond the virtual power purchase agreement (VPPA), what other types of products do you think will emerge?

CHADWICK: The VPPA isn't going away, and it shouldn't. It is an incredibly powerful transaction tool. It has fundamentally changed the U.S. generation stack. Five years ago, I wouldn't have believed we would be putting more than 20 GW of newly-built renewable energy on the grid on the backs of corporate and institutional off-takers who raised their hands and said, "We want to buy power off that and we're going to pay a fixed price for 20 years." It's just mind-blowing to me. That is in large part due to the VPPA. What a fantastically powerful structure!



Executive interview: Moving beyond VPPAs

We all know that it can be improved. The desire for reliable electricity that meets the sustainable growth objectives this country needs from large corporations, households and corner bakeries isn't going away. We know that transmission and distribution lines and the physical infrastructure of the power market aren't going away either. The utilities and leading electric providers want to meet the needs of their customer base by creating renewable product offerings. The broker and consultant community will continue to play a vital role in this space.

The wholesale world and the retail world are colliding. We're already seeing green tariffs, an example of a utility making a wholesale procurement and allowing that to flow through to their customer. Constellation's CORe program is exactly that. We're taking wholesale PPA procurement and flowing that through to the retail level.

I am highly confident that in the balance of this year and next year we will be doing multiple transactions with end-users through a broker or consultant. A lot of the end-users are telling their advisors that they want to pursue a retail sleeve structure. They want to see if they can take this virtual transaction and find a way to have it appear on their retail bill. The physical players in the market like Constellation and the other electric providers are going to need to work more closely with the broker and consultant community, and vice versa, to meet the needs of the buyers.

VPPAs are here to stay, but they need to evolve. You have a whole group of players that are all bumping into one another trying to figure out how that's going to occur. You have a buyer community that's ultimately going to be the beneficiary in a positive way. I take all that together and one word comes to mind: convergence. We're at a time in this industry in which it's converging and it's going to mean good things for the end-user and for the continued growth of newly built U.S. renewable energy.



"I've been at Constellation for 15 years and I've never been more excited about what I'm doing. People are very excited to be working on transactions like this because they are complicated, but in a fun way. We all know that we're making a real difference that the world needs."

-Ben Chadwick, executive director, Constellation Offsite Renewables, Constellation



Solar-plus-storage: Key drivers and considerations for execution





Paul Robinson, energy division chief, U.S. Army Corps of Engineers



Chris Elias, senior director, energy storage, SunPower



Solar-plus-storage: Key drivers and considerations for execution

ROBINSON: I serve as the chief of the energy division at the U.S. Army Corps of Engineers Huntsville Engineering and Support Center. The difference between Huntsville and other Corps districts is that we have a global and a national footprint. The programs that reside at the center lend themselves to specialization and centralization. The center administers energy programs as specialized businesses in support of the U.S. Army and other military and federal agencies. Think of Huntsville as a crossroads for energy execution, whether it's efficiency projects or supporting renewable energy execution or resilience. We have a reimbursable business fee-for-service reaching about \$200 million in annual obligations and \$200 to \$300 million in capital investment every year. In the last two years, we've seen a shift into the resilience space and growth in third-party financing. We're beginning to see that the center is going to have billion-dollar annual programs in alternative financing using other people's money to achieve energy goals. It's a very interesting dynamic. The government continues to be fiscally constrained and, at the same time, we've got these ambitious goals. We're seeing that third-party financing, complexity, and project size are all beginning to increase.

ELIAS: In 2017, SunPower and the U.S. Army brought online a 12.5-MW solar power plant at the Redstone Arsenal adjacent to Huntsville including a 1-MW/2-MWh energy storage system. The system produces about 18 million kWh of renewable energy each year, which offsets 20% to 25% of the facility's energy consumption. The energy storage system is operating to enhance savings by offsetting peak energy the base would otherwise purchase from the Tennessee Valley Authority (TVA), and reducing demand charges. Talk about the importance of that system.

ROBINSON: Redstone Arsenal is one of our key facilities. You have the headquarters of Army Materiel Command and Contracting Command, so key procurement and logistics provide support across the Army. You also have the Missile Defense Agency. The FBI has put in new offices. NASA does a lot of work in Huntsville. There are tremendous missions there. Our focus is to look at the key installations and our major power projection platforms—the Fort Hoods, the Fort Braggs—that closely support the war effort. We want to secure our critical infrastructure, not necessarily a whole base, but secure ourselves so we can continue to operate and execute our core mission.

ELIAS: Did you consider offsite procurement or virtual power purchase agreements in gearing up for renewable energy for this facility?

ROBINSON: Typically, we will want to do renewable energy projects onsite or on land adjacent to the site. Part of that is driven by the statutory authorities used for executing power purchase agreements. The second part of that is aligning with resilience. If we want to secure our installations, we typically want to have more control over the power produced and consume this energy. There are some alternatives and variants. For example, in Georgia, the U.S. Army executed an enhanceduse lease with 30 MW of solar. That power goes into the grid, but the U.S. Army has certain first-rights in the event it needs access to that power. Typically, we're looking to put the power in so we can use it and build in redundant sources of energy.

ELIAS: Let's talk about how you ended up using storage on this project.

ROBINSON: We were the execution agent for this project, and it just happened we were beginning construction when we learned of unforeseen



Solar-plus-storage: Key drivers and considerations for execution

site conditions with the project and quickly had to bring the project to a halt to consider alternatives. Since SunPower had previously provided various alternative site locations, we were able to pivot rather quickly to a new location. At that point, there were some changes due to that new location, which allowed us to consider how storage might become part of the solution and enhance resilience.

ELIAS: When we moved the solar system to a new site on the base, we had an interconnection constraint with a 12.5-MW photovoltaic system but only 10 MW of interconnection infrastructure, so the battery charges from the solar power. If the array is producing more than can pass through the 10-MW interconnection point, the battery stores power and then discharges to deliver renewable energy to the base at a time when it offsets demand charges incurred under the base's tariff with TVA. It was a unique circumstance that led to the application of energy storage at the base, but we often see this interconnection constraint challenge when we go to interconnect with utilities, or when maybe a customer isn't getting as much credit for exports as they do for offsetting load. This idea of storing extra solar generation and using it at another time when it's more valuable is pretty common.

ROBINSON: It was good timing. From an execution standpoint, I look at this project as a stepping stone to where we ultimately want to go.

ELIAS: What are your plans for the future? You've done a lot of other projects, but how are you thinking about investing in renewables and resiliency going forward?

ROBINSON: Resilience drives our goals, so renewable energy becomes a means to an end. We're looking at building microgrid systems that enable us to isolate. We want redundant sources of energy, the ability to recover quickly and to be self-sufficient if we need to—at least with our critical infrastructure. The changing environment is also requiring that we look at execution more broadly. Where do cyber-security and data come into this? How do industrial control systems play a role? And how do they contribute to executing cost-effective energy solutions that meet the need? We're seeing a convergence on solutions as we go forward.



"Resilience drives our goals, so renewable energy becomes a means to an end. We're looking at building microgrid systems that enable us to isolate." —Paul Robinson, energy division chief, U.S. Army Corps of Engineers



Snapshots from the Fall 2019 RESF





2020 Renewable Energy Sourcing Forums



RESF Spring: **Ponte Vedra Inn & Club** Ponte Vedra Beach, FL June 15–17 RESF Winter: Hyatt Regency Huntington Beach, CA December 7-9

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