SMART ENERGY DECISIONS

THE VOICE OF THE CUSTOMER

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Insights from the Fall 2018

Renewable Energy Sourcing Forum

October 1–3, 2018 / Ponte Vedra Inn & Club, Ponte Vedra Beach, Florida

Collaboration drives the RE Sourcing Forum

Corporate buyers and suppliers at the 3rd *SED Renewable Energy Sourcing Forum* were inspired by the energetic collaboration, engagement and community on display at the event. We're humbled by the rave reviews from both corporate buyers and suppliers with 90+% of corporate buyers saying they would attend again and recommend the event to a colleague.

Here are just a few comments from *RE Sourcing Forum* evaluations:

"One of the best-organized events I have attended."
—Tom Schurmans, Senior Specialist Energy Optimization, Cargill

"Great opportunity to ask suppliers questions in 1:1 meetings that otherwise go unasked."
—Stanley Balloun, Senior Purchasing Manager, Duracell

"Best conference of the year."—Hans Royal, Director, Schneider Electric

"I had takeaways from every presentation."
—David Reid, Global Energy & Productivity Leader, Celanese

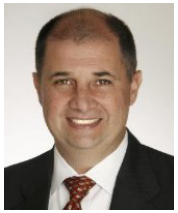
"Great conversations during my 1:1 meetings with suppliers."
—Wolfgang Bauer, Office of Executive Vice President, Michigan State University

"Nice to have customers ask for meetings with us."
—Bob Kinscherf, VP National Accounts, Constellation

"Super-productive event, good balance of session types. Great balance of supplier and buyers."
—Patrick Leonard, Manager & Resource Management, Starbucks

"The 1:1 meeting time was perfect. Not too long or too short."
—Jessica Johnson, Senior Renewable Originator, Avangrid

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 **2019 RE Sourcing Forum** in Ponte Vedra Beach, Florida, September 16–18. You can request an invitation to participate at the event website by **clicking here.**



Cordially,

John Failla, founder & editorial director
Smart Energy Decisions

SMART ENERGY DECISIONS
RENEWABLE ENERGY SOURCING FORUM

TABLE OF CONTENTS

Snapshots from the RESF Fall 2018 Forum

Opening keynote: A portfolio approach to RE strategy & execution

Patrick Leonard, manager, energy and resource management, Starbucks

Opening keynote: A portfolio approach to RE strategy & execution

I'll start off by saying that energy isn't really material to Starbucks if you're just thinking about the bottom line. But energy is super material when you think about the impact of climate change. The electricity we use in our stores is the single largest part of our carbon footprint. That's why we have a renewable energy program.

I'm going to give you a quick overview of our renewable energy program today. Two-and-a-half years ago, the only transactions we'd done were sourcing unbundled RECs. You can come a long way quickly if you've got the right partners and the right support.

Our goal for about the last five or six years has been 100%. We set a target in 2008 to source a percentage of renewable energy. We achieved 5%, 20%, 50%, and then when we got to 50% we said, okay, by 2015 we're going to be 100% renewable energy for our global retail footprint. We sourced RECs in the U.S. and Canada to achieve that goal, which was great. I think we were one of the early companies to have a 100% renewable target and an early achiever at hitting it.

Obviously, in those ten years, the market moved incredibly, especially with some of the leadership from the tech companies, to pioneer new paths to buy renewable energy. We knew that REC sourcing wasn't a leadership position anymore. When I started a couple of years ago we were just starting to talk about what's next for us. How do we take the 1.3 billion kilowatt hours of renewables that we buy every year in REC spend and do something more valuable with that? We wanted to impact the markets where we serve, markets where we have stores with our renewable energy purchase, so it was time to set the goal again and see what strategies were going to get us there.

Our current goal launched last year is 100% renewable energy to power operations globally. And it seems like semantics to go from 100% of stores to global operations, but it was done to bring in our supply chain organization, which is our manufacturing sites and our warehousing, primarily. It's a small part of the carbon footprint, but it's an energy intense part so we wanted to recognize the efforts they were making to improve their process and source renewables.

The other background was we've got some leadership kudos, we'd achieved some awards, but everyone else had gone further than we had in the space so we need to catch up. In the U.S. there were now lots of products and lots of different ways we could source renewable energy that might be relevant to us. We're a 100% leased portfolio in the U.S. and Canada—I think we own only two of 10,000 stores—so, for us, onsite didn't really make sense. We typically have a 10-year lease. Also, people were concerned about VPPAs mainly because all of the tech companies we were talking to in 2015, 2016 were saying they may have got out ahead of their skis and promised more than is being delivered. We still believe it was the right thing to do, we're still sourcing renewable energy, but maybe the vehicle wasn't quite ready for the corporate buyer. We didn't like the sound of that at the time, so we knew that a VPPA wasn't the first thing we wanted to take to our CFO.

Starbucks also has a lot of diversity in our stores' energy profile. We need electricity to be available 24/7, but we peak around 10 a.m. in the morning and then we have an afternoon peak. Morning is morning service. In the afternoon it's the air-conditioning load as all the equipment catches up. We do ice making, there's refrigeration. The stores heat up through the day. Those are some of our constraints.

Another thing that was really important foundationally for us was to have the right stakeholders across Starbucks involved. We have an executive steering committee, generally senior vice presidents. We have tax, treasury, accounting, store development—which is the organization I support—and

legal. This gives us a lot of credibility when we take an idea forward, as long as we've aligned with those leaders.

Our primary audience in the renewables program is our partners and partners are Starbucks' employees. We all are shareholders. Talking about additionality or incrementality and RECs and carbon is all pretty abstract to your average Starbucks barista so we have to humanize the story as well as we go.

We are a majority investor in a utility-scale solar farm in North Carolina. Last year a group of partners volunteered to do a coffee tasting at the opening of the facility. These partners were from all across the South. They drove 4-5 hours out to the site, because they were excited about what we were doing there, and that's a model that we want to continue through with the program.

Our goal in the U.S. and Canada is to source the renewables in the markets where we have stores. Six states have about 50% of our energy load—Washington, California, New York, Illinois, Texas, and Florida, that's most of our load in the U.S. We have some interesting differences between regulated markets, deregulated markets, cold markets up in the north and warm, sunny markets down in the south. So, we have to come up with a set solution that's going to help us across that portfolio of source renewable energy.

Essentially, we treat our electricity load in aggregate and we're trying to source 100% renewable energy equivalent to that. In the U.S. and Canada, about 15% of that today is direct source from projects where we have a stake, like the solar farm in North Carolina, and the other 85% is unbundled national RECS that we buy each year. The goal going forward is to take that 85% down to zero. And here's what we've done in the last two years: all in, it's about $140 million that we've committed.

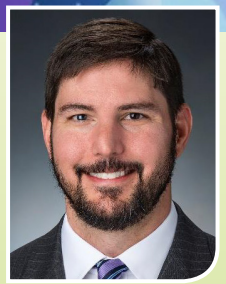
"You can come a long way quickly if you've got the right partners and the right support. The partnership piece is the most important."

—Patrick Leonard, manager, energy and resource management, Starbucks

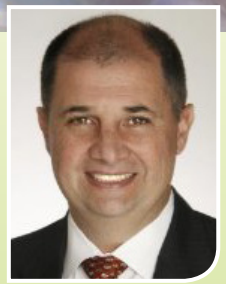
Panel: Innovation in utility green tariff programs

Quisha Light, project manager, Portland General Electric Company

Jeff Myrom, director, renewable energy & EV customer products, Consumers Energy



Pete Nettles, renewable energy planning manager, Georgia Power



John Failla, founder and editorial director, Smart Energy Decisions, moderator

Panel: Innovation in utility green tariff programs

FAILLA: Tell us about the development of your utility's green tariff programs for corporate customers.

MYROM: The first thing we look at when we talk to a customer about a new program is, what are your goals? For example, we're seeing a lot of cities that want to redevelop brownfields, to work with an industrial partner who still has that property and knows they're going to have a treatment plant on it for the next three decades. Some businesses also have land that is not a brownfield, but they want that billboard solar-type effect, so it's smaller than utility scale—maybe 1 to 10 MW on their property. That's another area of interest where we see a lot of potential expansion.

We want people to come forward to us with their own ideas. We see a lot of very tailored goals: could be carbon reduction, could be sustainability, could be that green image. We want to create those programs that are going to help people do that. The sooner we know, the better. Our regulatory process in Michigan is a minimum of 10 months and then there's a prep before that. So when we go in for a filing for a new program we really want someone to come in with us to say, yes, we're interested in this, we spoke with the utility about it, we would subscribe to this, and help us get through that with the commission. They tend to be more skeptical about a program that we think, well, this could probably work but we don't have anybody who's knocking on our door right now. I'd say definitely get in and talk with your utility if you have ideas.

FAILLA: Pete, tell us a little bit about your journey in putting those programs together. You seem to have a pretty diverse portfolio of solutions for customers.

NETTLES: We do. It all starts and ends with our integrated resource planning process. We go through that every three years. We're a regulated utility in Georgia. We have the largest voluntary renewable portfolio in the country and we've been aggressively adding renewables and doing it in a smart, disciplined way working in collaboration with our commission, and we've been able to do it, we think, the right way. It hasn't been a state mandate that's made us do this. We listen to our customers. We listen to our commission.

I'd say the journey, the way I would describe it, is we go through our REP process and we put forward a 20-year plan of what our resource is going to look like. That's also an opportunity for our stakeholders to voice their opinion and collaborate with us and we can work on an interest they're looking at for their program design. Community solar, the simple solar and the C&I-ready tariff were all products of that process.

I would say the C&I program that we worked at, in particular, is the type of program that most of the folks in this room would be interested in participating in. That journey really started with three sentences in the REP that said, "we will work to develop." That was my starting point and 200 MW was my vehicle to do it. Then we started working with our partners. We worked with the public service commission and our customers. We listened to them and they were key voices. And it had to be all voices — everybody had a seat at the table. Nothing productive is ever going to be developed in a vacuum and I certainly didn't want to have a tariff that existed with no program participation on the customer end. So we took that journey, we started together, and we got a tariff approved. It started in November of 2016 and I think by June or July we had a tariff in place and then we executed contracts for 177 MW. I believe that was approved in April this year and were finalized in December. In our world that was moving lightning fast.

LIGHT: In the state of Oregon, there's a little different world going on because we have direct access. We're partially deregulated and that created some interesting challenges for us as we started to go on this journey of creating a green tariff.

One of the things that we did in the beginning is spend a lot of talking with customers about the why. What are you doing? Why are you doing it?

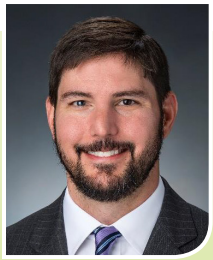
What's important? Why is it important? So, we got to hear a lot about sustainability goals. Those goals vary. Not everyone is necessarily looking to see more renewables come online. Some just want cheaper, local RECs. The scale was very broad for our customer base.

But, we also had a legislature that put down a bill that has made it a little challenging for us in Oregon because in 2014 Oregon started on the journey of creating a voluntary renewable energy tariff. That process went on for about two years with stakeholders, commissioners, commission staff, and customers trying to come together and figure out how to make this happen in Oregon. In that time, other states were passing us by. Washington went ahead and got something in place. Fast-forward to 2017 and PGE said, we have to make this happen. Yes, we have an aggressive RPS in Oregon and our mix is already 20% renewables. Our customers want us to move faster and do more. Yet we were faced with the challenges of a restrictive legislation and even more restrictive regulatory conditions for our commission. We could offer a green tariff but only under certain conditions. We had to do a lot of work in pulling our customers together and in bringing our regulators along in the process. We had to work with stakeholders that were involved in the process together to say, look, we have to make this happen, everyone's passing us by. It's no longer good enough that we have the number one renewable energy pricing program in the country. We have that, but it's for residential customers, it's not meeting the needs of our corporate customers or our large C&I customers. So that dynamic, that environment created an atmosphere for me to be able to say we have to make it happen, we're going to push hard.

FAILLA: What advice do have for the customers in the room about the most effective way to interact with you?

LIGHT: Most of the interaction with us starts with our key customer managers. I'd say just reach out because many utilities are open. We don't know what we don't know, so come to us.

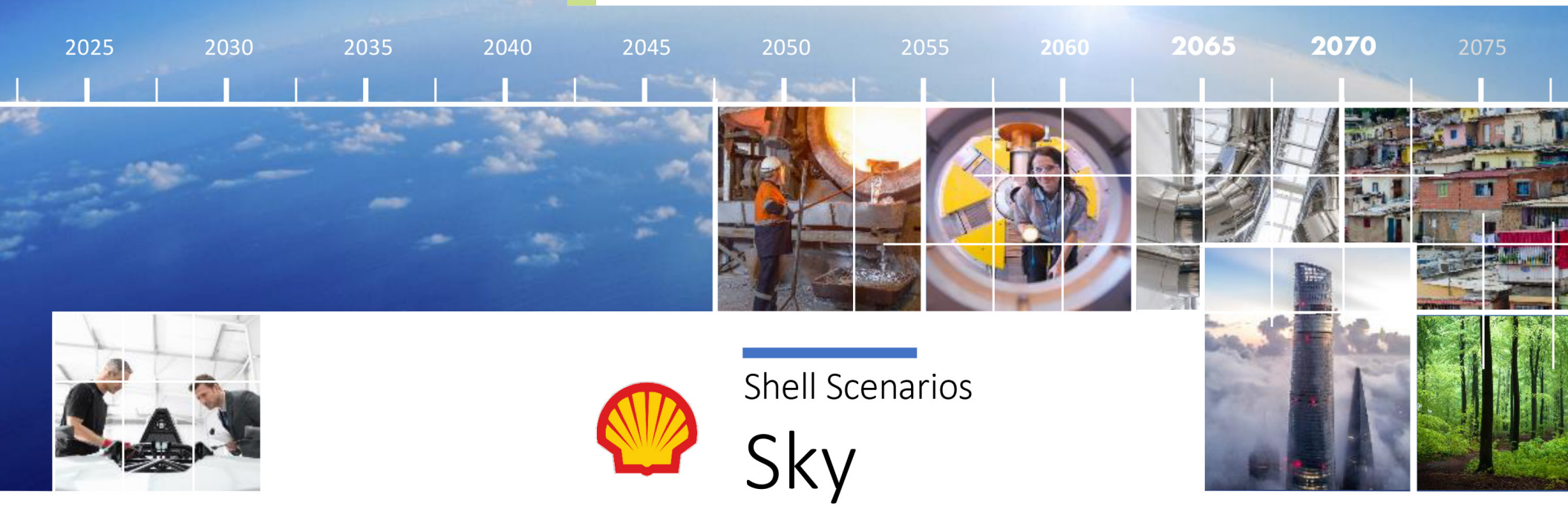
NETTLES: One thing that's been really helpful for me is having some sort of unified goal because every customer is different and unique. You have different rate classes, different sustainability goals, different load shapes. You all look different but you can find some commonalties of what you're looking for in a program design. Having a unified voice helps us provide a common solution and then we balance that with our risk appetite to find what works for both parties.



"One thing we did in the beginning is spend a lot of time talking with customers about the why. What are you doing? Why are you doing it? What's important? Why is it important?"

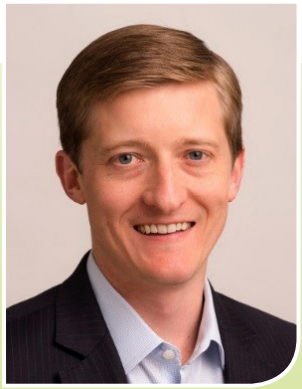
—Pete Nettles, renewable energy planning manager, Georgia Power

Keynote: Navigating the energy transition



Shell Scenarios

Sky



Jason Klein,
vice president,
US energy transition
strategy, Shell

Keynote: Navigating the energy transition

I'm going to talk about the Sky Scenario which Shell published earlier this year. What the Sky Scenario does is ask, what would it look like to actually deliver on the goals of the Paris Agreement? How can we get to net zero emissions in the next 50 years and deliver on the sustainable development goals that are also part of the Paris Agreement, which is to provide energy access to everyone in the world?

I should point out that Sky is not a forecast nor is it Shell's business plan. It's our way of engaging in dialogue about what could the future look like. We've been publishing scenarios for over 50 years. We do these to inform internal discussion and test the resilience of our portfolio. We also publish them externally to help engage all of our stakeholders and communities and shareholders in the discussion.

What these scenarios do is to help illuminate possible pathways to the future. We don't know which pathway it will take. It probably will be some variation of all these pathways. Sky is somewhat unique because rather than just looking forward at how this system might evolve from today, we've tried to back-solve. We've said, this is what it takes to get to net zero in 2070 and asked, how could we get to that place? We've worked with MIT, who provides the climate modeling to confirm our numbers, and we've published those numbers in great detail. You can actually go download an Excel spreadsheet that goes country by country, source by source, and use by use on how you could get to net zero emissions in that time frame.

It's useful to ask, where are we today? Over the course of the 20th century, energy demand went up 10-fold and the population on earth tripled, but there are a billion people without access to energy as we in this room know it today, who don't have light switches or cars or cell phones. At the same time, the current mix of energy is 80% fossil fuels and those fossil fuels produce greenhouse gases, which lead to climate change. Renewables are obviously a big part of the solution, but renewables are only good, for the most part, for producing electricity. Today, electricity only supplies 20% of global energy demand so we have to find a way to increase electrification in order to make renewables a viable solution.

Today, solar and wind are very, very small slivers of the global picture. They're hugely important, but they're very, very small slivers. Going forward, we see renewables, and solar in particular, playing a massive role. But we also see a role for fossil fuels. There are certain industries that are very difficult to abate. Look at cement, steel, fertilizers, plastics, and other chemicals. These are very hard to run off of electrons. You also look at things like seaborne freight, long-distance trucking, and commercial air travel that are very difficult to do with a battery. So we see a continuing role for fossil fuels, but, that's going to have to be offset with something.

The goal of the Paris Agreement is not zero emissions, it's net zero emissions. We see a role for carbon capture and storage and nature-based solutions to play critical solutions to address that remaining bit of fossil fuels in the system.

Doing this in 50 years is going to be very, very challenging. There's no opportunity in that timeframe for delayed deployment of technologies, for national backtracking, for consumer sentiment to be confused, or for a climate policy to not move forward. We've laid out seven essential elements. This isn't a menu where you get the pick a few. You have to get all of these solved in this timeframe to get to net zero emissions in 50 years.

What would it take? We would need to triple the rate of electrification. We would need to increase the penetration of new energies 50-fold. We need a step change in energy efficiency globally. We would need global comprehensive carbon pricing. We would need to have about 10,000 carbon capture and storage facilities where today we have 50 in the world, and we

need to end deforestation and actually turn it around and start reforesting. All that is underpinned by a change in consumer sentiment. This isn't going to work unless consumers actually start having a preference for low-carbon, high-efficiency solutions.

This isn't going to take the same path everywhere. It's going to go at different paces in different places. You see Western Europe is already in a slightly different place than the United States. And indeed, within the United States, California is not in the same place as Florida. We also have to look globally at how you break this up. In the developed world we need to decarbonize an existing system. We have enough energy, we just need to decarbonize it. In the developing world, we need to grow these countries without going through the fossil fuels that we've gone through over the last 100 years. They've got to grow somehow without carbon, which, of course, we've all taken for granted for the last 100 years.

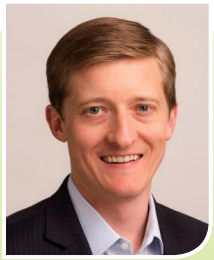
We see deep electrification as critical to this. Within the Sky Scenario, you see from 2040 onwards electricity becomes the dominant energy carrier, but we still see a role for liquid and gaseous fuels for some of those harder-to-abate sectors. That will be supplied by oil and natural gas in the near term, but, towards the back of the century, this scenario shows that being displaced more with biofuels and hydrogen.

Looking a bit deeper into that scenario at how the energy is sourced, clearly, we see solar playing a dominant role from 2040 onwards and really coming into the fore. But you still see there's a role for oil and gas and you see a big role for natural gas in this transition period to try to displace coal in the first place and then start displacing natural gas more and more with renewables.

What is Shell doing about all this? First of all, we've announced earlier this year an ambition to reduce the net carbon footprint of our portfolio to be in line with society by 2050, which is a roughly 50% reduction in our net carbon footprint. We have an interim target of a 20% reduction by 2035.

We're fairly unique in that when we talk about our net carbon footprint, we're not just talking about the CO_2 that Shell emits through our operations and in our refineries. We're actually including the CO_2 embedded in all the fuels we supply to our customers. So, we're talking about reducing our net carbon footprint by approximately 50% including all the CO_2 that we deliver into people's fuel tanks in their cars at our retail stations around the world. It's a massive ambition for a company of our size.

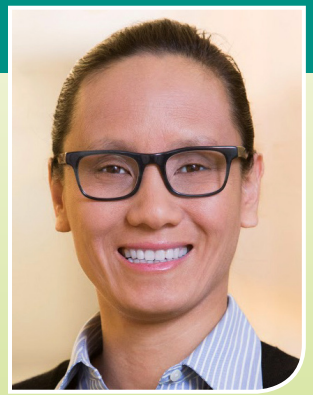
We've also committed to investing $1 to $2 billion a year in new energies. Here we look primarily at new fuels and power. That's where we think Shell can play a role and that's where we're putting our money right now, to grow this part of our business.



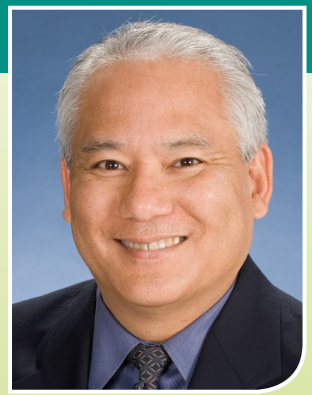
"The goal of the Paris Agreement is not zero emissions, it's net zero emissions. We see a role for carbon capture and storage and nature-based solutions to play critical solutions to address that remaining bit of fossil fuels in the system."

—Jason Klein, vice president, US energy transition strategy, Shell

Toyota Environmental Challenge 2050: Zero carbon quest



Nam Nguyen, executive vice president and general manager, commercial solar, SunPower



Mark Yamauchi, environmental sustainability manager, Toyota Motor North America

NGUYEN: Mark's been with Toyota now for over 30 years leading its sustainability efforts. I've been working with Mark for the last five years since joining SunPower, and it is a relationship that we are very, very proud of. With that, Mark, walk us through Toyota's sustainability program as well as the Challenge 2050.

YAMAUCHI: In North America we have four main areas of sustainability focus, around carbon, water, materials, and biodiversity. We've been working on these for many years. Three years ago our headquarters in Japan announced the Environmental Challenge 2050, which includes goals for those four main areas that we're working to achieve by 2050. For example, Challenge 1 is a reduction of our tailpipe emissions globally by 90 percent based on a 2010 baseline year by 2050. Challenge 2 is a life cycle zero carbon for our products including supply chain. Challenge 3 is zero carbon for all of our facilities globally by 2050. Challenge 4 is a water stewardship challenge. Challenge 5 is a material stewardship challenge. Challenge 6 is a biodiversity challenge.

A lot of what we do from here in North America relative to distributed and renewable generation falls within Challenge 3, to reduce carbon at all of our facilities. We say that by 2050 we're trying to get down to zero carbon emissions. Actually, what we're trying to push for is to be in a net positive position. Renewable energy is certainly a big piece of this. What we're trying to get our arms around now is, what does that mean relative to water, materials, and biodiversity? We are on a very exciting road to 2050.

NGUYEN: How would you describe the role of solar as it pertains to your different facilities or as it pertains to your Challenge 2050?

YAMAUCHI: Absolutely, solar plays a big part in reducing our carbon footprint, as well as other technologies, but we start first with efficiency, the Negawatts paradigm. Then we look at onsite distributed generation, offsite renewable energy, and other methodologies. What we love about onsite solar is that we have control of it and it inspires our team members and the communities around us.

NGUYEN: Are there any learnings that you can share with the group in terms of how you take a project from ideas and concept all the way to completion?

YAMAUCHI: We try to take a systems approach integrating conceptualization and implementation. We get all the stakeholders in the same room at the very beginning. [For Toyota's 8.79-megawatt solar system at their Plano, Texas headquarters] we had initial discussions with SunPower, the City of Plano, the local fire marshalls, and the utility companies to start the conversation and say, "This is what we're trying to do. How can we all get there together?"

NGUYEN: Looking at the Plano headquarters, five years prior to completion you started with a concept. You sat down with the schematics of what you needed the headquarters to look like, and asked: how do we design solar to complement that? Along the way, there were many conversations with utilities, around permits, and around interconnections. I think it was one of the first big projects behind the meter in Texas to be financed under a power purchase agreement. For us, it's really about being at the table with you and your team, trying to solve every problem along the way, and five years later getting to a project that's not only aesthetically beautiful but functioning and obviously meeting our sustainability goal and Challenge 2050.

Can you share with us some of the roadmap or key milestones that you and your team are contemplating?

Toyota Environmental Challenge 2050: Zero carbon quest

YAMAUCHI: One of our biggest footprints is our manufacturing base. We've been noodling over how we can get them to zero carbon by 2050 and, to be honest with you, they're not all electric so we have to work towards electrification in our facilities over time. I think one of the great starting points for us, for onsite generation and for plants, is the new 3.2 megawatt system—SunPower's system, by the way—we have at our San Antonio manufacturing plant. Any of you driving Tundras or Tacomas, they were built there. We love that plant but, yes, it is a challenge. We have a lot of space at our manufacturing facilities and we really like to work with the local communities to get them to embrace this technology as well. One of the challenges in trying to bring these technologies to certain areas that aren't as familiar with them is just getting them on board and educating all of the local jurisdictions, and agencies having jurisdiction, about the benefits of solar and establishing that common long-term goal.

NGUYEN: One of the benefits of sitting at the table with you or others who have very aspirational goals is that we get a chance to talk about innovations. You and I talked backstage about how storage potentially plays a role. I know that you have done quite a bit of work with fuel cells. Could you expand a little bit on how you see innovation and technology and how that fits into your thinking as you try to meet Challenge 2050?

YAMAUCHI: Solar is a great technology but it is not the only technology or methodology out there. We are also, as you know, a fuel cell manufacturer from a mobile application with our Mirai fuel cell electric vehicle, which is sold in California right now. We have partnered to develop a Class 8 heavy-duty truck that's powered by a fuel cell drive train that we provide. We have launched that at the Ports of Long Beach and Los Angeles in Southern California, one of the most heavily polluted, or worst air-quality from an emissions standpoint, areas in the country. Along with that we have this demand in Long Beach for hydrogen fuel. This is where all the Mirai are imported for North America. And we now have the portal trucks.

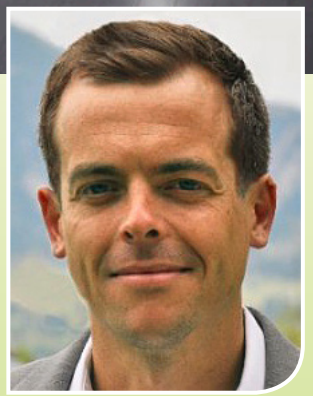
How do we fuel those vehicles? Well, we announced another partnership to develop a hydrogen fuel cell that not only provides power but will provide water and hydrogen fuel as well. It will be 100% renewable power and fuel. The exciting thing—as we start talking about energy storage as well—is to ask: is that in the form of electrochemical storage or hydrogen storage or some other technology? Do you integrate all that? This is where the fun comes in.

"We say that by 2050 we're trying to get down to zero. Actually, what we're trying to push for is to be in a net positive position by 2050."

—Mark Yamauchi, environmental sustainability manager, Toyota

Panel: Kohler's journey in RE sourcing

Nathan Nissen, principal engineer, sustainability, Kohler Co.



Hans Royal, director, strategic renewables, Schneider Electric Energy & Sustainability Services

Panel: Kohler's journey in RE sourcing

Earlier this year, Kohler announced the purchase of 100 MW of wind power annually, which is equal to their total U.S. and Canadian demand. This is part of their overall commitment to net zero in greenhouse gas emissions by 2035.

ROYAL: Can you share Kohler's perspective on sustainability?

NISSEN: We think it is very important to find ways to benefit not only our customers and the people who work for Kohler but also the environment and the company. We often share a quote from our President & CEO, David Kohler, "It's okay to be an industrialist and a capitalist and environmentalist all at the same time." We're working on the life-cycle impact of our operations and our products and services. We're also trying to expand our reach in how we influence the world around us. That's what expanded global reach really means.

ROYAL: What is your perspective on your goals and what you've set forth to accomplish in your sustainability program?

NISSEN: In 2008, we set a goal of NetZero 2035. Since 2010, we've reduced our greenhouse gas emissions by 25%, our water use by 40% and our waste-to-landfill by 54%. We started out with our footprint and we tried to reduce our own Scope 1 and Scope 2 emissions. When we say "NetZero 2035," that's our impact. As a company, we also have a huge impact on the world around us through the products we design. More Environmentally Favorable, or MEF, is our internal designation for sustainable products.

We evaluate two similar products to determine which has a lower environmental impact. We had about $1.5 billion in MEF product sales in 2016. We're also selling a lot of water-conserving products—that was close to $700 million. We look at footprint, we look at product, and our third area of focus is education. As I work with people around Kohler and even with stakeholders outside of Kohler, who wouldn't want to try to conserve natural resources? Who wouldn't want to try to use less energy, less water, try to save money? It's really not a matter of convincing, it's a matter of educating. We realize that two-thirds of our associates work in a factory making a product. We began reaching out factory by factory and training our associates on the front lines. This is sustainability. This is what it means to us. This is what your work impact is. How can you help us reduce it?

ROYAL: Now that you are 10 years into this program, let's talk about some major success that you've had. Kohler recently signed a 100 MW PPA. Let's talk about this wind deal because it is an exciting one—it got you to 100% renewable energy in U.S. and Canada. How did you think about the idea and decide that wind energy was a path that you'd like to pursue?

NISSEN: It goes back to our leader. About eight years ago David Kohler came to our leadership team and asked, where are the renewable energy projects? You're not bringing me any renewable energy projects. We came back in three months with a list of seven projects that we thought were most viable.

ROYAL: Eight years ago in the corporate renewable energy space might as well be a century ago. To have a leader, David Kohler, introducing renewable energy eight years ago, I think, is pretty advanced

NISSEN: Oh, it was. And we weren't ready. We presented the seven projects and he challenged us to be more aggressive. We slowly started to implement some small projects here and there. And then through that course, we reached out to Schneider and we asked them for help because it's a complicated process. You helped us with a bid solicitation. Now that renewables are more competitive, we found options that met Kohler's strict criteria for financial viability.

Panel: Kohler's journey in RE sourcing

ROYAL: You dipped your toe in with some smaller renewables projects and then decided, okay, let's look at something bigger with offsite renewables. Let's see how we can get to 100% renewable energy.

NISSEN: Exactly.

ROYAL: You launched a bid process out to a number of developers. Do you remember the order magnitude exactly?

NISSEN: It was about 20.

ROYAL: How did your evaluation process go internally to get from a variety of bids down to your chosen partner?

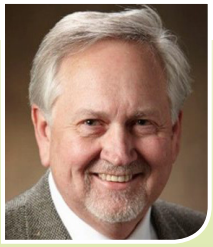
NISSEN: We worked with Schneider to come up with a scorecard and selected the top few. Once we got closer, we scheduled onsite interviews and presentations to understand what was proposed and ask questions. There are several ways to structure these contracts.

ROYAL: One thing that is unique about Kohler is that they're a private company. You don't open your books publicly, they're not publicly available. Tell us if there were differences from your perspective being a private company versus some of the folks in the room that are public and how that either benefited or didn't help the process as you sought to pursue these deals.

NISSEN: I can think of one example for that. It seems kind of minor, but it's actually significant, and that is where we were asked to produce our financial books to show that the company had the financial wherewithal to support the project—and it just doesn't happen.

ROYAL: So the answer was just hard no.

NISSEN: Yes. But there was a willingness and a desire, so we were able to do a letter of credit, which allowed us to demonstrate the financial viability of the project.



"We look at footprint, we look at product, and then the third big area is education. As I work with people around Kohler and even with stakeholders outside of Kohler, who wouldn't want to try to conserve natural resources?"

—Nathan Nissen, principal engineer, sustainability, Kohler Co.

Keynote: Walmart's Project Gigaton

Project Gigaton™

Joby Carlson, global director of sustainable energy and operations, Walmart

John Failla, founder and editorial director, Smart Energy Decisions

Keynote: Walmart's Project Gigaton

FAILLA: Project Gigaton is a bold initiative unlike anything else that's out there. Tell us about what you're doing at Walmart right now and how you've kicked off Project Gigaton.

CARLSON: We launched in April of 2017 and have one year under our belt. We're in the middle of the second reporting year now. In terms of what I do at Walmart, I look at our sustainable operation strategies globally. We operate in 28 different countries with actual retail units, and then we have hundreds of DCs and trucking fleets in the U.S., Canada, and U.K. So, I'm very keen on things that help define our climate strategy for our own operations, governing Scope 1 and 2 emissions. I also do our zero waste goals as well. We've have a lot of efforts over the years on zero waste in our operations, and also our contribution in the circular economy. Food waste is obviously a big topic for retailers these days as well. These all fit together if you look at them the right way and it's part of that vision of sustainability that everybody's aware of.

FAILLA: Can you tell us a little bit about Walmart's journey with renewable energy sourcing?

CARLSON: It all started in 2005 when our CEO at the time launched our sustainability journey by setting three aspirational goals. One was to operate with 100% renewable energy. The second was to generate zero waste and the third was to sell products that sustain people and the environment. That was pretty groundbreaking for Walmart at the time, which was really very private, didn't disclose much, didn't really have a lot of outward-facing sustainability messaging in stores and, in many cases, was thought of as the opposite of sustainability. That leadership created a North Star for our company that we've been working towards ever since.

As it relates to renewables, when we set the goal we probably had one solar panel on one of our sustainability flagship test stores that we bought ourselves and it was part of the capital investment. Other than that, I joke that solar calculators were the only thing else you could find in our stores that had a solar panel on them. In 2007, the term PPA started to become more mainstream in the U.S., so we start on onsite programs but also did some offsite projects. We signed our first PPAs in Mexico in partnership with WWF. We've followed the market and taken advantage of the opportunities as they exist and we still have a long way to go.

Most recently on the renewable energy side, we have set a new line in the sand. I know 100% renewables is very hard to achieve and we never did commit to a timeline but we are set to at least cover 50% of our load by 2025. That was part of our science-based target announcement at the end of 2016, to reduce our absolute emissions by 18% by 2025. Then, of course, if more than 50% of your impact is in Scope 3, you have to set a science-based target for that too. That's where we came up with the 1 billion metric ton commitment by 2030. Said another way, that's a gigaton of emissions and that's how later the following year we launched Project Gigaton, which is our official platform for engaging suppliers on helping us achieve that goal.

That's the whole thing about Scope 3, that they're not obviously in your direct control. It's hard to model our Scope 3 emissions because we have an immense chain. We've modeled it over the years and we estimate it to be that about 90%, 95% of our total indirect impact is in our supply chain. Our own footprint is very big but our supply chain is obviously that much bigger as basically the center of moving goods both up and downstream from our operations.

FAILLA: What has the supplier response been like? Is there a particular type of supplier that's been kind of first to embrace the program?

CARLSON: I'll back it up just a little bit about our engagement of suppliers. I think 2009 was our first emissions-related supplier engagement approach, and that was really just 15 questions that we sent to all of our suppliers. I wasn't there at the time, but many of them came back and said, why are you asking me about greenhouses? I don't own greenhouses, so I have zero greenhouse gas emissions. Shouldn't this go to the tomato farmers or something? Why are you asking me? We obviously deal with some very sophisticated suppliers that are way more knowledgeable than we are and then there are others that pay their utility bill and that's it. That's the challenge.

Then we announced the Sustainability Index, which really came into operation in 2012. That looked at all aspects of sustainability from a life -cycle impact standpoint and was targeted at what you sold to us. If you sold us shoes, we had questions that were focused on what we know are the hot spots or impacts within a shoe life-cycle from start to finish. If you're a supplier to us, you have to respond to the sustainability index every year. Our buyers get scorecards after that reporting cycle that ranks all the suppliers that they're responsible for. It tells the buyer and supplier where they fall in terms of percentile and what the key opportunities are for them to improve their score. We've seen year-over-year 5%, 10% improvements on average across the whole supply chain using the Sustainability Index.

Now here comes Project Gigaton, which I feel has had a really positive response from suppliers. The timing of the release was early 2017. We just changed over administrations in the U.S., and there was kind of lost hope on any kind of climate action from a federal level. We were able to come as one of the biggest companies in America and say it's still important to us and launch a new program that involved anybody that wants to participate. It's definitely volunteer-only and the response has been great. We've got 600 companies that have committed something in Project Gigaton and about 350 companies actually reported emissions. Obviously, there's a lot more than that in our supply chain, but we're focused on the biggest companies first because they have the biggest footprints. They also have the biggest opportunity to improve. Many of them are already leaders and we are not taking credit for the leadership they're already doing, but we're saying we love what you're doing, keep doing it and doing it more, help bring others in the supply chain along with you.

"We've seen year-over-year 5%, 10% improvements on average across the whole supply chain using the Sustainability Index."

—Joby Carlson, global director of sustainable energy and operations, Walmart

Intuit: Innovations in RE sourcing

Sean Kinghorn, global sustainability leader, Intuit

John Failla, founder and editorial director, Smart Energy Decisions

FAILLA: Let's zero in on the Purely Green program. How do you go from executing against your sustainability targets to saying, hey, let's make renewable energy available to our customers?

KINGHORN: The inspiration came two-fold. One was the two offsite wind power deals that we had done. We're in a leased environment so we can't do any sort of a PPA past that lease term. It's very restrictive. Also, we're in a commercial building setting and we don't have a big load so we're an incredibly unattractive customer for a renewable energy developer. The Mountain View deal was small volume and for a record-low term length, which was pretty unique to the market at that time.

I remember in the interview for my position I asked—which was incredibly premature—have we ever thought about our customers? We have upwards of 50 million customers. If we could ever create a solution that either saves or makes our customers money outside of our physical product or inside it, that surely doesn't look bad on our brand.

Once we did the Mountain View deal, we did the Plano, Texas deal and that was really the inspiration. What if we started the conversation, what could we do in the United States to provide a similar solution for our customers?

FAILLA: So it all started with a question: what about our customers? And the rest is history. Tell us a little more about the program in detail.

KINGHORN: The program launched in April. Anyone in the state of Texas who can choose retail for their electricity can buy wind power, 100% physical wind power, plus those bundled renewable energy credits from the same wind farm in Texas that we buy from.

It's unique in several different ways. I believe it's the first renewable energy offer in a retail setting in the United States. Other offers in the market are typically brown power plus an unbundled REC but this is a stronger narrative. Also, it's about the cost competitiveness. We joked when we were going to launch the program that we're going to TurboTax the experience. We have to make it easy to do the right thing.

Intuit: Innovations in RE sourcing

Originally we had thought about just offering it to Intuit customers, where typically our customers are residential small businesses, and then we took a step back and asked, what's really the impact we're trying to drive here? We want to create a huge market signal for renewable energy in the state of Texas. And so we actually opened it up to the public. Any resident in Texas for their home or small business can sign up for that program.

We are also looking to expand our Purely Green program to several new states in late Spring 2019.

FAILLA: That's incredible—broad impact, below-market pricing. When you look at this long-term, what do you think the potential impact of the program is and why does this benefit Intuit?

KINGHORN: We've got some really aggressive internal sustainability goals. We haven't set a new goal around the potential impact of our customers but there's a big movement in the industry in regards to being net positive. Depending on the success of this program, we would look at setting a net positive goal.

In regards to cumulative impact, we have huge potential here, given the significant number of customers we have in Texas. Our team calculated that if we have just 2% of our Texas customers sign up for the program, we have the potential to save five times more electricity than we use globally. People say, well, if it's for my home, does it really make a difference? When you add that up, the impact is huge. So, we're hoping, based on that success, to potentially expand that program to other states in the near-term.

FAILLA: Is it evolving the way you expected? Have there been many surprises?

KINGHORN: We've really tried to leverage our partners. For instance, we have one global property management partner who was able to send a message out to all of their Texas employees. One of the incentives beyond just spreading the word for partners like that—and we've had several other companies that have messaged their employees—is to create a situation where they can get credit for it. We can set up a separate landing page where those employees can go, so if they sign up, the company that we partner with can take credit for that. In the end, Intuit's not receiving a referral fee. If we have a partner come in or if there are other interested companies in the room that have a presence in Texas and they go gangbusters and sign hundreds or thousands of employees up, that's fantastic for us.

The surprise has been, we had some pretty good press come out in April when it launched. We were reached out to by about a dozen or so Fortune 500 companies. They were interested in the angle for employees, but they actually were struggling with the same issues Intuit has with buying renewable energy. They're in a lease environment, they have a small commercial load. So we've had multiple companies that are interested in actually signing up their buildings or their stores in the state of Texas, and that wasn't the intent of the program originally. In the end, we just want to create impact.

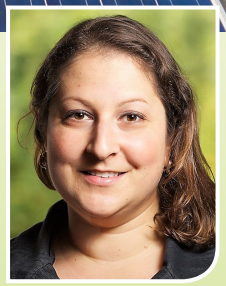
"We have upwards of 50 million customers. If we could ever create a solution that either saves or makes our customers money outside of our physical product or inside it, that surely doesn't look bad on our brand."

—Sean Kinghorn, global sustainability leader, Intuit

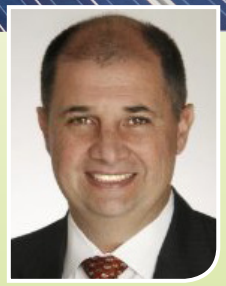
Panel: Cities getting on board with renewables

Michael Forrester, energy manager, City of Cincinnati

Adam Jacobs, energy manager, City of Boston



Emily Schapira, executive director, Philadelphia Energy Authority



John Failla, founder and editorial director, Smart Energy Decisions

Panel: Cities getting on board with renewables

FAILLA: Tell us a little bit about what you've been involved with in your city around renewable energy sourcing.

SCHAPIRA: A couple of years ago when I joined the Energy Authority, we launched an initiative called the Philadelphia Energy Campaign, which is a billion-dollar investment over ten years focused on investing in energy efficiency and clean energy projects for four sectors—city buildings, schools, low and moderate income housing, and small businesses—with the goal of creating 10,000 jobs. We're in year two right now and have done about $53 million of projects in year one and created 225 jobs, so we're on our way.

FORRESTER: In Cincinnati, we are trying to go 100% renewable by 2035. When we pulled out of the Paris Accord, I was sitting at my computer watching CNN with my head in my hands. The mayor called me up and said, hey, let's go on the steps of City Hall. So, we stood on the steps of City Hall with my city manager, my director of environment and sustainability, and myself and the mayor and we said, no, we're still in here. We're still going to do this. We are absolutely moving forward towards 100% renewable.

JACOBS: A lot of the work that we've done in Boston is the foundational steps in terms of making sure that we're going for energy conservation first. Without including any of the renewable purchases, we've reduced our greenhouse gas emissions by 20% simply through energy conservation since a 2005 baseline. That's a lot of our street light work. We're just now getting into a few energy savings performance contracts that we think are going to reduce emissions about 2% a year just in the pilot phase. We have the authorization to go ahead with a second phase that's about 3-1/2 to 4 times that size. The reason I mention energy efficiency is that I think a lot of what we're trying to do is make sure that when we do go out for renewable energy, we are right-sizing those systems so we're not signing a PPA that covers 100% of our load today when we know that our load is going to be 20%, 30%, hopefully 40% lower 15 years from now.

Earlier this year we announced an initiative to bring cities together to potentially explore an aggregated renewable energy purchase through a VPPA. You might imagine it would be a little difficult to explain to our CFO or even to our mayor as to why we would be investing in a renewable project far away from Boston. Mayor Walsh isn't going to jump on a plane and go cut a ribbon in North Dakota, necessarily. We have different challenges in that respect but I think we're headed in the right direction. We obviously have plans to execute some onsite solar but at the end of the day we know we're going to need to leave the confines of the city of Boston.

FAILLA: It is really exciting to hear about all of the work that's going on across the three of your cities. You're almost making it sound easy and I'm sure it wasn't easy. Tell us a little bit about some of the challenges that each of you faced, respectively, in establishing these programs.

FORRESTER: There are challenges and there are opportunities. One of the challenges that we face being in Ohio is that we're a deregulated environment. The challenge is that sometimes we've got cheap energy and we've got a regulatory environment that doesn't necessarily give us all the toys that other states get. That's one of my constant pitches. In Ohio, we have an RPS [Renewable Portfolio Standard], but that RPS has become such a battle that it's really sucked all the air out of the room. In my opinion, the RPS is neither here nor there. If you give me community solar, if you give me the ability to virtual net-meter, if you give me all of these other tools, renewables will flourish. That's one of the challenges that I deal with.

The other challenge is that my mayor wants to be 100% renewable yesterday. It's matching the political will with the realities of the procurement and managing expectations for what you can and cannot do. He is a wonderful man and he is very, very passionate but, yeah, there are definitely some challenges in managing expectations and being able to deliver on the promises that you make.

JACOBS: When Mayor Walsh came into office, he basically picked up where Mayor Menino left off in terms of our greenhouse gas reduction goals. We had signed ourselves on for reducing emissions 80% by 2050. If we didn't think that was hard enough already, Mayor Walsh recently announced that we were planning to be carbon neutral by 2050, so we'll knock out that last 20% as well. I think that is definitely a challenge. But, as Michael said, it's also an opportunity. It's getting our internal stakeholders to get their arms around what it really means. If we're going out to bid for constructing a new facility today, what does that mean for a building that's going to be there for 50 to 100 years? We need to think about electrifying our facilities. We need to think about putting solar on every new building that we're putting out there.

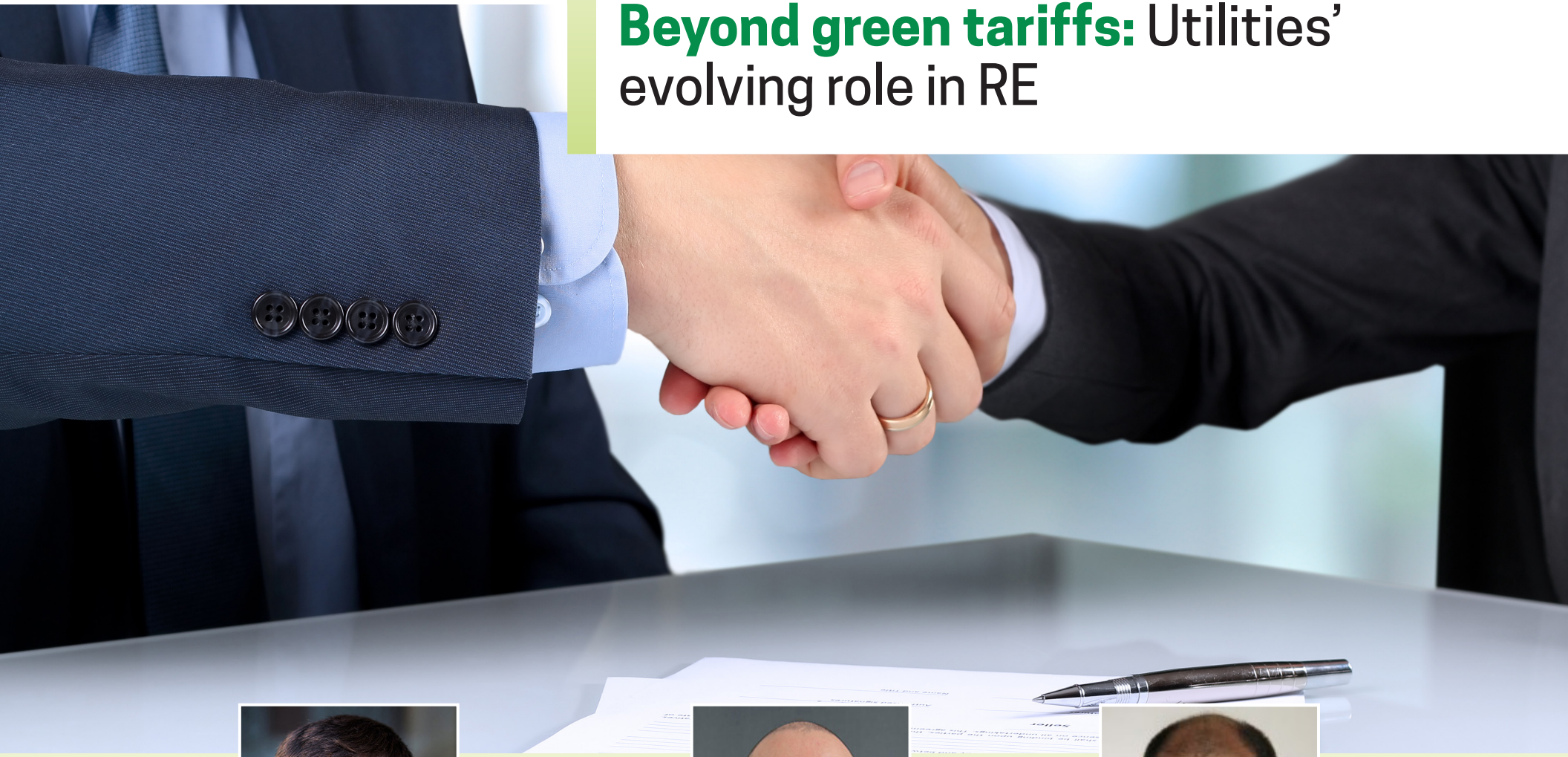
And then, of course, we've been purchasing renewable energy credits from national projects for upwards of eight years at this point, but we have a very informed constituency that looks at nationally sourced, unbundled RECs and might not necessarily see additionality in that. Additionality is something that in a conversation in a room like this everyone will understand but we don't necessarily expect that to come up in a community meeting. We have a very informed constituency that is expecting a lot from us. We need to manage their expectations and find what can be economically viable, but at the same time be legitimately impactful, creating new renewable energy and trying to get some of those co-benefits of all the jobs that Philadelphia has clearly been able to deliver. Congrats on that one.

SCHAPIRA: Thank you. In Philadelphia, we're a very progressive city and everybody believes in climate change. That's very helpful but it doesn't always move things forward, especially not at the speed you want them to move forward. We've really had to think about what matters to people today, especially to politicians who can move things and talk about this work in those terms. That's why we talk about jobs all day long. Philadelphia is the poorest big city in America. We have a 26% poverty rate that's been persistent for decades. The way that we can help solve that problem is by reducing household expenses and creating the jobs of the future so we talk about that all day long on every single program that we work on. When we do solar, energy efficiency in schools, we talk about the educational environment and what that means for test scores and for getting kids out of poverty. Just that framing, I think, has been both a challenge and a real asset for us in moving things forward. The wonkiness of power purchase agreements and the details of this are a challenge, but the energy authority was really created to find solutions. We've been doing that.

"In Philadelphia, we're a very progressive city and everybody believes in climate change. That's very helpful but it doesn't always move things forward, especially not at the speed you want them to move forward."

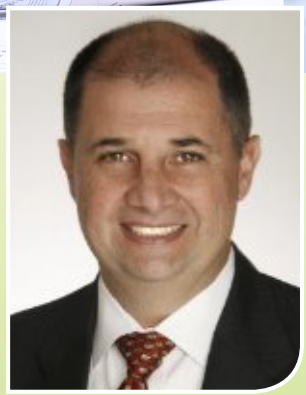
— Emily Schapira, executive director, Philadelphia Energy Authority

Beyond green tariffs: Utilities' evolving role in RE



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

Craig Noxon, VP, enterprise sales, REC Solar



John Failla, founder and editorial director, Smart Energy Decisions

FAILLA: We've talked a great deal about the evolving role of utilities. We'd now like to talk a little more about what utilities are in a position to do. How do you see customer needs evolving and how do you see the business model of the utility having to change and evolve to meet those needs?

NOXON: I think that there's choice, even for Duke, which is a regulated utility. They've had 115 years of saying, this is what we have and you're going to have it. That's really changed. I think that there's an understanding not only at Duke but at other utilities that there is customer choice.

That customer choice, I think of it as generally running down into cost, carbon, and control. Customers are going to be driven by cost and that is going to be a lens or a metric for the majority of decisions. With that, utilities need to be responsive because it is not a complete captured market. Even on the regulated side, there are options so they need to offer customers choice and to have different kinds of options that are always cost beneficial. Certainly, carbon has become a driving force and is sometimes THE driving force. There's a recognition that there needs to be green tariffs, other options that are better on our environment. And those two areas of cost and carbon no longer need to be diametrically opposed.

Finally, I think the customers are really looking for control. They want the ability to think of it like a dial, to be able to dial into what kind of power they're getting. I think those the three metrics are what customers are looking for and utilities are starting to become much more responsive to that.

MACMURDO: I have three bullet points—the rule of threes, I guess. First, especially in the offsite context, we've seen an evolution in terms of the length of contract terms around offsite, large renewable energy purchases. In the early and pioneering days when it was your tech companies—Google, Microsoft—going out to market, they had to sign on for about a 25-year commitment to lock in a specific energy price. That's just not palatable for corporations or cities, or any kind of any large-scale buyer in many ways. It's a long-term bet. A lot of companies aren't focused on what's going on in wholesale markets so they don't want to make that long-term commitment.

Where we've seen the industry go now is towards the shorter term, from 25 years down to 15 years and now at about 10 years as the standard, minimum offer for a new-build solar or wind project in competitive markets. Will we reach the 10-year wall? I think the answer is yes, eventually we'll get there, and it's going to take some creativity and talking with folks like yourself and others to make that happen. Customers need a short-term option for new-build renewables and we've got to figure out a way to deliver that.

Another kind of trend that we're seeing is in aggregation. Traditionally, to participate in the offsite market you needed a large energy load, 100,000 MW hours or more. That kept out a lot of corporates that wanted to participate in the market. Now we've seen the emergence of trusted middlemen, or aggregators, to bring different forces together, to package that into one larger pool of demand and then go out into market and contract together. I think that's a welcome development.

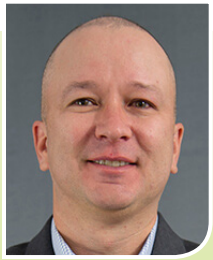
The third area I'd highlight is around risk allocation. Again, in the early days, there wasn't a ton of thought given to the different risks that come with signing the virtual PPA type of arrangement. Over time buyers have become more sophisticated. We've had the emergence of consultants and brokers to educate the buyers and bring them up to speed on all the various different contract mechanisms that they need to have included in order to push more of that risk onto the developer and away from them. We, as a company, are getting more comfortable taking on more risk and being more creative in the type of solutions that we offer to meet those customer demands.

NOXON: In terms of trends we also see that there's no one-size-fits-all. We are seeing more adoption and interest in storage. Microgrids have actually gotten more and more traction. We talk a lot more about that. In essence, the microgrid is the ability to island and therefore become your own little utility. There are different ways to be competitive with those utilities.

The other thing I think that I find within Duke is that economic development and having green electricity options are becoming table stakes to attract large companies. All these cities compete, all the utilities compete. And so Duke Energy is very active in their economic development to bring people to the six regulated states and their territory. In order to do that, a frequent question that comes up is, tell me about your grid. What are the green options? Duke is very interested and they've done some interesting things on the utility side. They are also working with us to figure out what we can do on the distributed generation side to help work with them and offer customers more choice. In the end, I think it comes down to more customer choice and the utilities are really being responsive to that.

FAILLA: That economic development piece is really interesting because we're seeing more and more local governments and state governments partnering with utilities to create a favorable environment, particularly for these large data centers from, for example, Facebook and Amazon. They will determine where they're going to place a data center in large part based on availability of renewable power and energy policy.

MACMURDO: I've got a good example of that. A few years ago Google was looking around at places to site a data center. They ended up settling in western North Carolina, Duke Energy service territory, and the reason they did that is because they worked with our utility side to craft a green source rider to be able to connect that facility with renewable energy. Without that, that would have been no deal. We've seen other examples. You can look at what Facebook did in Dominion territory in Virginia, where they negotiated a similar new green tariff. These things are happening and I think our company realizes that in order to attract these new industries and to maintain that base of underlying energy consumption in their territory, they have to be more proactive in courting businesses and giving them what they want and doing more for the customer.



"I think the customers are really looking for control. They want the ability to think of it like a dial, to be able to dial into what kind of power they're getting."

—Craig Noxon, VP, enterprise sales, REC Solar

Keynote: Driving renewable energy in the supply chain

Brent Trenga,
building technology director, Kingspan North America

SMART ENERGY DECISIONS
RENEWABLE ENERGY SOURCING FORUM

Keynote: Driving renewable energy in the supply chain

In the days leading up to Kingspan's announcement of science-based targets for Scope 1, 2, and 3 emissions, Brent Trenga explains how the company's "gentle nudge" for suppliers to get on board is turning into "a more formalized ask."

Kingspan is a building product manufacturer. I'm going to give some context to why we look at things the way we do—what's really driving initiatives and why we took this path. We look at the impact we have and we like to think that we're doing a great job, and I do believe we are. We're saving roughly year-on-year about 35 million tons of CO2 with a high efficiency. We're a global insulation company using high efficiency insulation and super insulate our buildings. We can make a huge impact, but that's just one metric.

In 2011 our CEO stood up and gave a directive that we were going to be 100% net zero energy by 2020—across the globe, every single manufacturing site, net zero energy consumption. That was a huge challenge and we had no idea that we were going to achieve it, but that was the direction and we were off and running. From that point, from 2012 to 2018 we've had a 13x growth in the amount of renewables that we're actually involved with, which is fantastic.

Now, digging into this, there's three main ways we've done it: saved more, generated more, and bought more. Every kilowatt hour we can save doesn't need to be generated. We are doing onsite generation where we can and we're relooking at projects constantly. Then what's left over we can buy on the market.

We provided a recent update to our senior leadership explaining that we now produce over 35 GWh, which is about 8% of our total consumption on site. The feedback was, of course, positive but it also made us ask, "Can we do more?"

This is our footprint: more than 120 manufacturing facilities across the globe in 80 countries. We're a publicly traded company. We have more than 14,000 employees. Since we put this goal out in 2011, we've acquired 22 businesses in 10 countries. The goal doesn't change, the marker never moves, we just have to bring them on and move faster and more efficiently and be more effective at what we're delivering.

[Looking at our journey from 2012 to 2017], everything's moving in the right direction. Our renewable usage is going way up. Our generation is going way up. Our cost is coming down. I think the most important part about what we're trying to deliver and how we're going to start engaging with our supply chain is that revenue and profit and turnover is up. We're doing this for a sustainable reason, but we're doing it to make a profit. We're not an NGO. We're not looking to make an even swap or cost money to do anything that any of these goals are achieving. This can be done properly and this is something that we're trying to then feed back into our supply chain and explain to them that there's a business add to why we're after this.

Tomorrow we'll have a press release to announce this formally, but what is it we're after? In terms of a climate resilience, this has an impact on our business both risk management and opportunity. So, understanding how this can impact or business was fundamental. And setting the targets appropriately, we're up for a good challenge and this was something we had already started looking at.

What we're formally announcing is our Scope 1 and 2 emissions, 10% by 2025 off a 2017 baseline. Above and beyond that, we're going for Scope 3 emissions, same 10% baseline of 2017 by 2025. That does not give us a lot of time. We've got a lot of these products already in the works.

[In terms of understanding the supply chain engagement aspect], we are in discovery mode. We've been talking to our suppliers over the last year or two, asking where are you with your carbon footprint? Where are you with renewable energy purchasing? Where are you with understanding your greenhouse gas footprint? Is it a local, is it national, is it global? We've been

gently nudging them to start aligning with what we're trying to do and trying the get them on board with it. That's now going to be a more formalized ask.

We went through third-party verification on the science-based targets. I think that was fundamental. We're going to encourage all of our suppliers to do the same so that they have a very clear path forward. We want to get them engaged with CDP reporting, another way to quantify where this goes and how we can impact them. And something that's been talked about here over the last couple of day is an aggregate buy. We don't have any particular sites that have a huge energy footprint or a huge energy draw, but we have the likes of some of the biggest chemical companies and the steel companies in the world that we do buy from. They can bring quite a bit to us. Sometimes we're the big fish, sometimes we're a very little fish to a much bigger supplier.

Supply chain management is done for us on a global scale. We have a number of people that do it on the procurement side. Managing this and minimizing the risk that we're exposed to is fundamentally key. Again, over the last two years as we've started to see what we can take down in our supply chain, our sustainability team, our net zero team, and our supply chain and procurement team are all going to start working quite a bit closer. They've been a bit separate but it's now a collective kind of thought process.

There's been some talk about kind of green guidelines for suppliers. It's something we're starting to look at. We've already been asking and understanding where our suppliers sit on health and wellness and the products and the chemicals that they're using that are coming in to us. We are now rethinking the entire way that we procure and the structure of how that's all done within our company. We do have a global procurement team and then it's done regionally based on geographic needs.

In the last seven years we've had a lot of success, we've had some failure on projects. We've learned a ton and we are very open to share anything we've done on these projects for this net zero energy goal. I don't want everybody to go and reinvent the wheel. That learning curve can be very steep, as we all know. As a team, we need to share best practices, collectively use resources. That's going to be a fundamental component and we feel as the asker and the buyer, educating them and bringing them into this is going to be a way that will engage them right out of the gate.

The biggest question is, will you join this type of challenge? If your company is involved in this, is there something that we can all collectively do to make the biggest impact on climate change?

"In the last seven years we've had a lot of success, we've had some failure on projects. We've learned a ton and we are very open to share anything we've done on these projects for this net zero energy goal."

—Brent Trenga, building technology director, Kingspan North America

Portfolio energy management: Integrating renewable power responsibly

Brad Christensen, managing director of risk management products, Calpine Energy Solutions

John Failla, founder and editorial director, Smart Energy Decisions

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FAILLA: In talking about renewable energy sourcing as a journey, we described the fourth stage of the journey as having a diversified portfolio. The issues we'll discuss now address what to consider as you're going down that road. Brad, why don't we start with you telling us about yourself, about Calpine, and your role there?

CHRISTENSEN: I am what it is called a risk management practitioner, which should immediately tell you two things about me: I don't get invited to a lot of parties and I'm in generally a paranoid condition. Right? Because I'm always thinking. As an organization, Calpine Energy Solutions is constantly thinking about the transactions and approaches that we are taking with our customers—our clients—in terms of not just what has happened, not just what is happening, but really looking at what is likely to come: what is the variability of an outcome in the potential realization of what costs we actually incur? We have started to look at the proliferation of the renewable energy market and balancing that into the portfolio that our clients are managing from a financial perspective.

FAILLA: Talk to us about your point of view on regionality.

CHRISTENSEN: The first thing you have to realize is how quickly these markets have been transformed in the U.S. For a developed economy to have this kind of transformation in the timeframe that it's taken place is unbelievably remarkable.

For the first time in our history, we've crossed the 10% threshold of electricity being generated from renewable resources. When you couple that with the fact that 7 to 8% of our produced electricity is coming from utility-scale hydro, and think about the fact that—depending on whose estimates you use—7 to 10% is coming from behind-the-meter renewable projects, we're looking at about a 25% to 30% adoption of carbon-free resources that is generating our electricity in the United States. [Let's look at] the bifurcation of the different technologies from a U.S. perspective as to where the dollars are being focused in the development of these renewable resources because understanding this leads us into a discussion of the regionality of those technologies. We look at that from a potential benefit in terms of the geographies that provide the best bang for the buck—in this case, for solar.

When we look at the map of the U.S., it's pretty intuitive. The desert is going to have a lot of sunshine. So we look down in Arizona and the southwest area and we see the level of intensity that solar has the opportunity to produce for us, whereas in the rest of country you see some of that intensity dispersing a bit, which gives us some perspective as to where solar may be the best option if a renewable resource is part of our corporate mandate.

What's interesting here is when you look at where the solar is being placed [in areas with less solar intensity], that belies the intuition that we see from the intensity map. Now, none of this, regardless of where it sits, is a bad idea. Just realize that a lot of the reasons that the proliferation of this technology a taking place is that it is being supported by incentive programs, by subsidies, by other financial methodologies to support the build of the solar technology.

I'm from Minnesota. If you look on a map, you see a lot of utility-scale solar projects being sited in Minnesota. I can tell you, there are two seasons in Minnesota: there's winter and the 4th of July, and that's it. So, it's a question of the logic of where we're placing these things.

Look at a similar story with wind. The wind intensity in the U.S. is right down the middle of the country. When you look at where the builds are [east and west], you can see the similar story here. That doesn't mean any of these things are bad ideas. It just means that the returns on the investment and the way those are calculated get a little trickier. You have to be aware as

you're making commitments to a lot of these new resources that if they are being supported by subsidization, by other incentives, think about what happens if those safety nets go away.

FAILLA: What about legislative guidelines and policies?

CHRISTENSEN: It was so heartening to me to see that when the administration pulled the U.S. out of the Paris Treaty, states, consumers, and municipalities continued their commitment to create a better environment. They just ignored the decision. What we've seen is that states have actually increased their commitments and decreased the timeframes at which they're going to achieve some level of renewable resources that comprise their generation fleet.

Now, from a risk management perspective, that's awesome. We love this. However, it's kind of like Newton's third law: every action has an equal and opposite reaction. So, in order to meet these standards, we are competing for any additional projects that we're trying to achieve with resources that are being committed to making sure that these RPS requirements are being met. That's putting some additional financial pressure on the cost to build and issues like that, and it's moving the dollars and the reality of that around a little bit.

FAILLA: What are some of the issues you've seen corporate buyers experience when they're not paying close attention to this regionality?

CHRISTENSEN: I think part of that is, what is motivating the activity? What is motivating the transaction? I think the key to this is understanding what the objective is. What is the end goal? What are we trying to get to? Is it something as simple as we need to have a PR presence announcing our commitment to environmental accountability? Is it that we need to actually reduce our carbon score? There is a complete spectrum of objectives that need to be defined prior to proceeding into some of these commitments because they are long-term. They do have significant relevance in terms of the financial outcomes.

From my perspective, what I have seen is a lot of times about motivation is that instead of being objective driven, it's being driven by a concept that's colloquially called FOMO. Anybody who watches Shark Tank should know what that is. It's the fear of missing out. Some of your CEOs worry about some other CEO who is committed to some level of renewable commitment. They'll say, we've got to do that too and I don't care what it costs. I don't care what you've got to do. Just make sure it gets done. Well, because a lot of times these deals require a 10, 15, 20-year commitment, at some point down the road somebody's going to start looking under the tent and say, what in the heck happened? How do we manage through what our deal looks like today versus what we thought it looked like yesterday? That's where being really diligent in understanding the variability of what could happen is so vitally important.

"For the first time in our history, we've crossed the 10% threshold of electricity being generated from renewable resources."

—Brad Christensen, managing director of risk management products, Calpine Energy Solutions

Smart Energy Decisions
Mastermind Community

Peter Kelly-Detwiler, principal, NorthBridge Energy Partners

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Smart Energy Decisions Mastermind Community

The Renewable Energy Sourcing Forum featured the creation of the "Mastermind Community"—a phrase for the harnessed collective intelligence of the entire assembled community of corporate renewables buyers and vendors. The Community was divided into separate groups and asked to address one of the following four issues: supply chain; PPA aggregations; utility offerings; and future improvements/what's next.

The main themes that emerged across the groups had several ideas in common:

1) A need for more communication with—and education of—investors, utilities, and suppliers
2) Development of contacts that involve less complexity and more flexibility
3) Ways to approach risk management

Addressing Scope 3 Issues In the Supply Chain: This group focused on how to increase the number of suppliers purchasing renewables. Nobody has really solved this issue yet, in large part because general awareness is still limited. This could be remedied through increased coordination with the various supplier industry groups and providing them with relevant information.

In addition, companies making purchases could do a better job educating the industry as to what they are doing and their underlying motivations. These statements would be most powerful coming from the C-Suite.

Members of the group felt that companies could emulate Walmart's Project Gigaton and challenge their suppliers. As one member commented, "Everybody likes a challenge…you'll probably be surprised what they will do once they're challenged."

Finally, the group indicated that companies could do a better job communicating with the investor community, increasing their awareness of the benefits of renewable purchases, so that investors can talk to suppliers they support.

Improving Purchasing Opportunities Through PPA Aggregations: The essential question here was how to increase the number of corporate buyers participating in aggregation aggreements. A key issue is term length, and the challenge of migrating from traditional 20-year agreements to something shorter (e.g., 10 years or less), and still have projects be financeable. The 9-year contract Cinemark recently signed would suggest that shorter terms are indeed possible.

Another topic discussed was contract complexity and length. The industry would be better served by shorter standardized contracts of no more than 8-10 pages.

Finally, the group focused on the issue of financing and the need to mitigate risk for tax equity, debt, and sponsor providers. Having a strong anchor tenant can be critical in setting up the deal and allowing others to ride along. The team also expressed hope for a concept involving staggered terms. Under this approach, various smaller buyers could potentially sign on for different contract lengths that are not necessarily the same length as the anchor tenant's term. The seller would have a lengthy PPA, but multiple companies could be signed on for different lengths. A critical issue here is to work with and educate investors to ensure they fully understand what the buyers are working to achieve.

Increasing Opportunities to Buy Renewables From Utilities: This team discussed the renewable purchasing options they would like to see from utilities. One of the main issues is communicating early with utilities as they evaluate and develop green tariffs, with buyers explaining specifically what they are looking for. Price and term length are critical factors, as is the minimal sized load capable of participating in these programs. The group suggested that development of advisory groups could be useful in clarifying the requirements of corporate buyers.

Future Improvements in PPAs/What's Next?: This group noted that international options were growing in importance, especially as companies grapple with Scope 3 and RE 100 commitments. Since parts of any supply chain may be offshore, the challenge quickly becomes an international one.

It was also believed that energy storage is on the near horizon; some on the team are already piloting lithium ion battery storage solutions. The key questions here related to performance and affordability.

Finally, there was much discussion devoted to the issue of risk, and possible future syndication of risk. As the federal tax credits wind down, the finance profiles of new projects will be affected. Thus the issues of financing, contract terms, and overall management of risk will be of great importance.

Next Steps: This element of the renewables industry is evolving quite rapidly, and growing in overall importance. What corporate buyers do matters. In just the past five years, corporate purchases have grown from a handful of buyers purchasing 1.2 gigawatts (GW) of renewables to numerous players committing to over 5 GW, including 20 first-time purchasers.

While progress is being made, the total number of unique buyers is still only about 70, indicating that there is clearly much work to do. With its vast experience on both the buy and sell side, the Smart Energy Decisions "Mastermind Community" has the potential to help direct this marketplace, and we look forward to further exercises with this group.

"This element of the renewables industry is evolving quite rapidly, and growing in overall importance. What corporate buyers do matters."

—Peter Kelly-Detwiler, principal, NorthBridge Energy Partners

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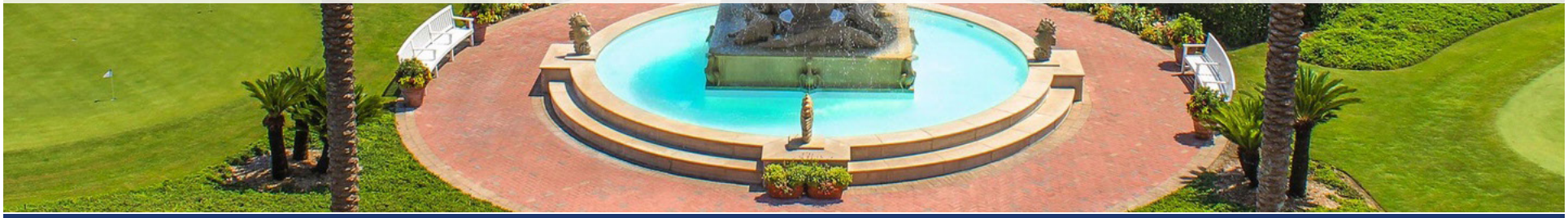

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