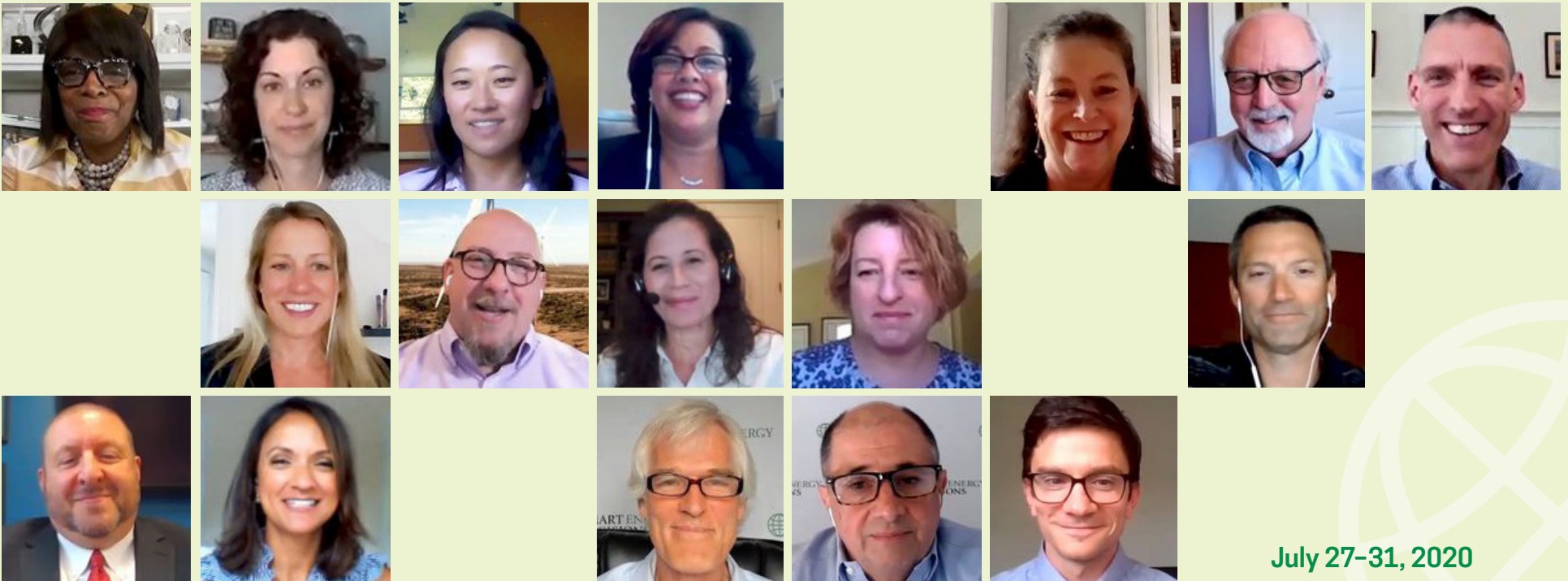


Insights from the 2020

SMART ENERGY DECISIONS

RENEWABLE ENERGY SOURCING FORUM



July 27-31, 2020

Virtual Collaboration Drives Success

A lot has changed in 2020, but not the need of large electric power users to execute on project plans and achieve sustainability goals. That's why, in the midst of a pandemic, we pivoted to present the 2020 Renewable Energy Sourcing Forum as a virtual event, in order to accelerate the adoption and facilitate best practices in renewable energy sourcing.

Using an exclusive platform created by Smart Energy Decisions, the Virtual Renewable Energy Sourcing Forum, presented July 27-31, provided a new way for corporate buyers of renewable energy and their suppliers to engage, network, and do business. Educational sessions from experienced corporate buyers and industry experts who have successfully implemented renewable sourcing strategies, networking with peers, and opportunities to engage with leading suppliers were all highlights of this virtual event.

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—a part of SED's culture that we are proud to be able to enable, even in a virtual world.

The Winter Edition of the [Virtual Renewable Energy Sourcing Forum](#) will take place on December 7–11, 2020. Buyers can [click here](#) to apply. Suppliers can [click here](#) to explore sponsorship opportunities.

Visit our [website](#) for information on our 2021 slate of events. You'll want to save the dates to participate in these cutting-edge programs. In both good and challenging times we remain steadfast in our commitment to your success.



Cordially,

John Failla

Founder & Editorial Director

john@smartenergydecisions.com



July 2020

TABLE OF CONTENTS

Editorial Director's Letter: Virtual Collaboration Drives Success	02
Opening Keynote: Goldman Sachs' Renewable Energy Journey	04
Panel: The Growing Role of Municipalities	07
Panel: Innovative Approaches to Achieving Renewable Energy and Climate Goals.....	10
Keynote: Opportunities and Risks in Long Term PPAs.....	13
Keynote: Multiple Approaches to the Climate Challenge.....	16
Panel: When it Comes to Renewables, There Are Few City Limits in Austin.....	19
Keynote: Inspiring Diversity in Energy	22
Keynote: Latest Developments in Green Energy Strategies.....	25
Keynote: Greening Cities—Phoenix Leads the Way	28
Q&A: 10 Questions with GM's Rob Threlkeld	31

Opening Keynote: Goldman Sachs' Renewable Energy Journey



Cindy Quan,
Global Chief of Staff
and Head of ESG,
Corporate and
Workplace Solutions,
Goldman Sachs



John Failla,
Founder and Editorial
Director, Smart Energy
Decisions

Opening Keynote: Goldman Sachs' Renewable Energy Journey

FAILLA: Keeping the focus of our conversation on Goldman Sachs' overall environmental, social and governance (ESG) strategy and how renewable energy sourcing fits in, let's zero in on renewable energy. Your goal referenced the direct purchase of 80% renewable energy procurement. What's the overall outlook and strategy?

QUAN: Our commitment was to align, one for one, 100% of all of our electricity use with renewable energy by the end of this year. We are on track to meeting that commitment so we decided to pivot a little bit for 2025. We want 80% of that 100% to come from long-term commitments, whether they are power purchase agreements or onsite projects. Being able to reduce our absolute energy use has always been most important for us. The remainder of the strategy is figuring out what we need to cover from a renewable energy procurement perspective.

We've been very successful over the past ten years by focusing on real estate consolidations. We moved from four to five legacy buildings into new, more efficient, LEED Platinum-certified buildings to bring down absolute energy use. We did it in New York City when we opened our headquarters in 2009. Then, last year we brought two new developments online with over two million square feet between them. That included our Bengaluru, India campus which is WELL Gold-certified including features that impact human health and wellness. By bringing in these highly efficient buildings, our absolute energy use will continuously decrease. Then, we'll focus on the Americas as well as the U.K. Both of those locations collectively represent more than 80% of our total consumption globally.

Where we are truly doubling down is being able to cover both of those locations on an aggregate basis. In the Americas, about 90% of our entire

load is in the PJM territory. With our remaining regional offices, we're looking to aggregate and consolidate consumption into that PJM area and be able to cover it with a virtual PPA. We're looking to do something very similar in the U.K. market as well, aggregating through a couple of different buildings including a data center and offices. For example, bringing a larger wind facility online in the U.K. would align us very closely with the remaining 20% of that load in the market.

We also don't want to forget about our smaller presence. As I mentioned, we have a global real-estate footprint. We are very much focused on some of those other areas such as India and the Bengaluru market, as well as Australia. If there's not an opportunity for us to provide onsite options, we are looking to directly source through local partnerships and aggregation opportunities to bring together a collective force where there is smaller consumption. If we're able to align all of the essentially strategic goals in the space, we'll be able to bring new segments and structures to market, specifically in the Australian market.

FAILLA: Do you have any preferences for offsite versus onsite PPAs and wind versus solar? Do you have any strategies that call for a particular type of renewable application?

QUAN: We certainly prefer a diverse portfolio versus putting all of our eggs into one basket. Unfortunately, due to the diversity of our facility types around the world, whether we own the facilities or if we're a single tenant and we lease space, it doesn't always allow for onsite installations.

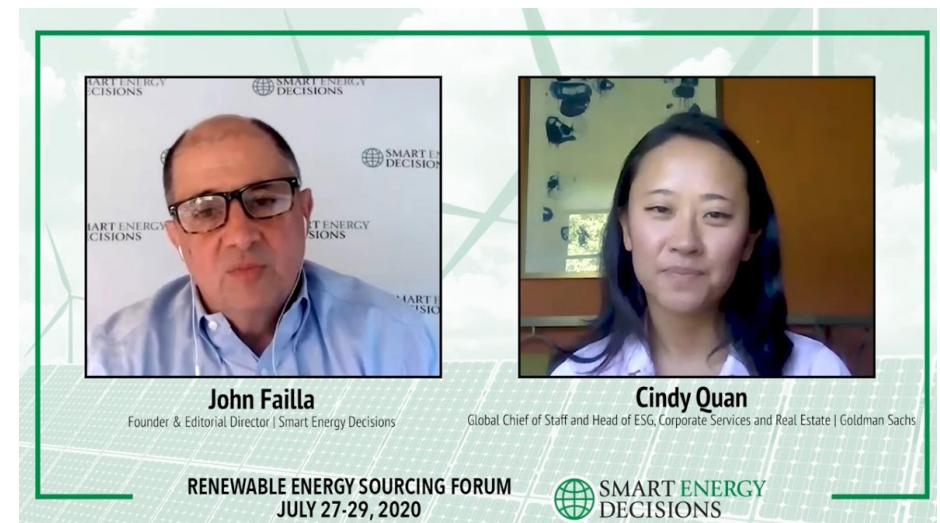
However, we are really excited to bring a brand-new solar carport project online later this year at our Acyo facility in upstate New York. It, hopefully, will be operational later this year. The facility should have been

Opening Keynote: Goldman Sachs' Renewable Energy Journey

operational last month but due to the supply chain disruptions stemming from COVID-19, we're now pushed out to a little bit later. We also have a solar array at our LEED and WELL-certified campus in Bengaluru and we're constantly evaluating onsite solar opportunities at our data centers in New York and London.

Where onsite is not feasible—onsite being mostly solar opportunities—we've spent the bulk of our time investigating virtual PPAs and partnerships with our landlords to source renewable energy. One of the things that we were really excited about at the end of last year was that we were the first tenant in our area of Tokyo to receive landlord-provided renewable energy from non-fossil fuel energy certificates. It was a brand-new instrument that came onto market at the end of last year for renewable energy. We started the conversation very early on in 2017 when that was not even feasible and we were the only tenant asking for it. Now, as we enter the RE100 phase, many of these corporations have 100% renewable energy targets by 2020. We were excited to bring this new structure onto the market. We've also worked with our utility provider directly in Australia and the U.K. market to provide us with renewable energy certificates. We try to mix and match where the local jurisdiction allows us to source renewable energy in different ways.

John, to your question around wind or solar, we're really technology-agnostic. As you know, we were previously involved in advanced conversations regarding a wind power purchase agreement in the United States. Right now, we're currently evaluating and investigating projects, both wind and solar, in the U.S. and we'll look to do the same in the U.K. 🌐



“Being able to reduce our absolute energy use has always been most important for us. The remainder of the strategy is figuring out what we need to cover from a renewable energy procurement perspective.”

—Cindy Quan, Global Chief of Staff and Head of ESG, Corporate and Workplace Solutions, Goldman Sachs

Panel: The Growing Role of Municipalities



Jacqueline Sargent,
General Manager,
Austin Energy



John Tzimirangas,
President and
CEO, Energy
New England



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart Energy
Decisions

Panel: The Growing Role of Municipalities

KELLY-DETWILER: As a municipal utility, who are the folks you answer to and how do those general directives get set?

SARGENT: I report directly to Austin's city manager, Spencer Cronk. Spencer reports to the City Council, which acts as Austin Energy's board of directors and sets the utility's policy and general direction. Importantly, we work closely with our stakeholder community. The City Council appoints customers to serve on electric utility, resource management and sustainability commissions. We engage with those groups to develop recommendations to take forward to City Council for approval. That process guides the principles behind how we approach our carbon emissions and how we serve our customers and our community.

KELLY-DETWILER: Jackie, you are in the renewable hotbed of the world and the interconnection queue is astonishing when you consider how much wind and solar are lined up. Obviously, it won't all get built, but it seems that you must be in a buyer's market right now. What does it look like interfacing with that wholesale market and trying to figure out your next moves on the chess board?

SARGENT: One of the things that Austin Energy has done that's been very effective is looking not only at resource diversity, including solar, wind, biomass and other mixes, but also looking at locational diversity. The Electric Reliability Council of Texas (ERCOT) market is designed in a way that allows us to manage renewable energy assets in various locations across the state. If the wind's not blowing or the sun isn't shining in one part of the state, it might be in another. By considering that in the planning process, we're able to gauge the market and access affordable projects. It has really helped us to diversify our portfolio.

Right now, we have more than 2,100 MW of wind and solar and another 1,000 MW in the pipeline. We expect to be 85% carbon-free by 2023, and we're really excited about that. In our Generation, Resource, Climate Protection Plan to 2030, we developed a concept called REACH—Reduce Emissions Affordably for Climate Health—which has us on a trajectory to be 100% carbon-free by 2035. One of the things that we are looking to further develop is energy storage to complement our resource mix. Creating locational diversity and coming up with a way to reduce our carbon emissions while keeping an eye on affordability is important not only to our customers but also to our community. Our location in Texas, in ERCOT, allows us that flexibility because of the way that they designed and operate the transmission system.

KELLY-DETWILER: John, you mentioned that you not only serve municipal entities, but also the Massachusetts Water Resource Authority (MWRA), which handles all the sewage treatment and water for Boston. You also mentioned the Massachusetts Bay Transportation Authority (MBTA). How do you supply customers like that with really unique consumption patterns?

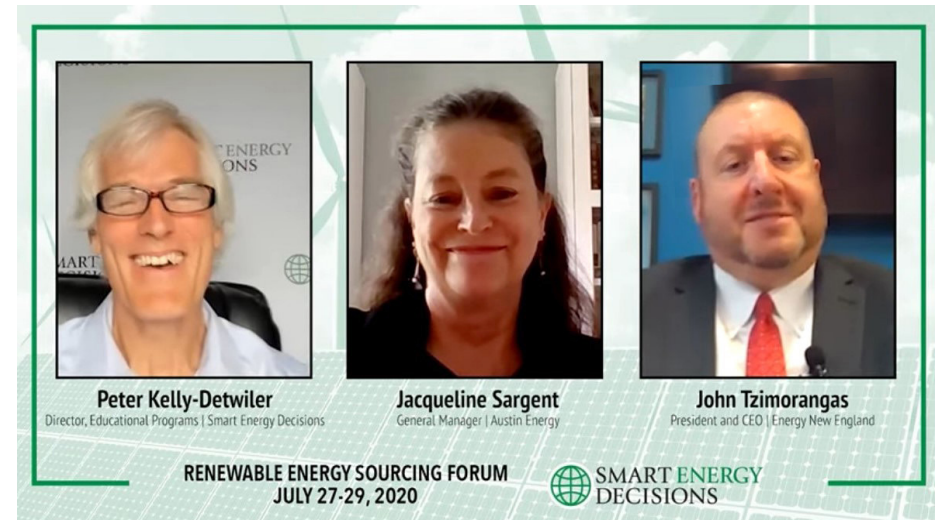
TZIMORANGAS: Customers such as MBTA are like a municipal utility. Their portfolios can look the same. Those entities have taken a little longer to get into the renewable market just because of how they have to provide service. For example, MBTA is providing electricity to all their trains every day, almost 24/7. It's very, very different for them. They're slowly getting into the renewable and greener side of things. We just have to be careful as we look at their portfolio and put all those things together. It goes back to energy storage because we're talking about peaks. The peak

Panel: The Growing Role of Municipalities

in New England has shifted from 1 p.m. to 4 p.m. in the afternoon, then to 5 p.m. to 6 p.m. Now, it's 7 p.m. to 8 p.m. at night. The sun doesn't shine all year long, especially up here. If we could charge storage and then discharge it when needed, it would make a big difference.

Something else that's causing a serious problem concerns ISO New England, which oversees the market and transmission. It has one set of criteria and the six New England states are going off in a fully different direction with their RFPs. I've given talks to our congressional delegation down in Washington about how, if we don't get those two aspects together, we're going to have a problem because 60% of the energy is going to come from these renewable projects that are state RFP driven. That means 40% is left in the market. That's not a market.

Those two things don't play together. There needs to also be some political involvement. Jackie and I can talk energy all day long, but if we can't get the politicians together and figure out what the heck we want, it's going to be hard. How do we look at projects and move forward? 🌐



“Creating locational diversity and coming up with a way that we can reduce our carbon emissions while keeping an eye on affordability is important not only to our customers but also to our community. Our location in Texas, in ERCOT, allows us that flexibility because of the way that they designed and operate the transmission system.”

—**Jacqueline Sargent**, General Manager, Austin Energy

Panel: Innovative Approaches to Achieving Renewable Energy and Climate Goals



Beth Wytiaz,
Senior Vice President,
Global Environmental
Operations Director,
Bank of America



Valerie Cardwell,
Executive
Director, Office of
Sustainability,
Comcast
NBCUniversal



Rebecca Sternberg,
Vice President,
Energy & Climate
Practice, 3Degrees

Panel: Innovative Approaches to Achieving Renewable Energy and Climate Goals

STERNBERG: Beth, could you talk about some of the innovations and opportunities that Bank of America's been able to take advantage of, particularly the renewable energy credit (REC) power purchase agreement (PPA) you did with 3Degrees? How are you enabling some co-benefits in the community?

WYTIAZ: Onsite solar certainly was our first focus, but it doesn't work out everywhere. When we looked beyond that, we identified a couple of tax equity deals with which we could do some related transactions to contribute to operations. From there, we looked at the main areas where we have load and a lot of employees and figured out what options existed, what we can do in these states or regions. At that point, we honed in on where we wanted to start first.

In conversations with 3Degrees, we talked through what was important to us as we make decisions around environmental, social and corporate governance (ESG) factors and around transacting for renewables. It became apparent that, particularly in North Carolina where we're headquartered, we had limited options. It's a regulated state and it's important to us to do something to add new renewables in the state. We worked with 3Degrees to identify four new solar projects that were mutually beneficial.

We've outlined a few key things that are important to us when choosing projects to support. We have priorities around land use, low-to-moderate income communities, they must support economic development and install pollinator habitats. As we go to contract, we think about the opportunities we have beyond just the addition of renewables. A big focus for us is to weave in co-benefits for the projects we support.

We also did a unique project in Michigan that covers our load. The

project is the first ever wind-solar hybrid farm that provides local community members of the co-op with a discount on their electricity. Those are the kinds of unique projects that we want to support in regions where we don't really have other opportunities to do something that also, perhaps, includes electricity.

STERNBERG: Valerie, what's been challenging in terms of educating your internal stakeholders on renewables, including the complexities involved and the different types of projects available to meet your goals? How have you internally approached overcoming those challenges?

CARDWELL: Identifying who the key stakeholders are and who has to sign off is a challenge in itself, depending on how large your company is and how many business units you have within a state. In this business, you must be patient and flexible because you could take the same story to a different stakeholder and they could have a completely different opinion or feedback. This is the long game. I bring people onto the team and warn them that not everybody is into sustainability. I feel like people bring their personal values and passions about sustainability to work. We have some leaders who are contacting us trying to partner, but in some cases, we've had to knock on their door and try to convince them.

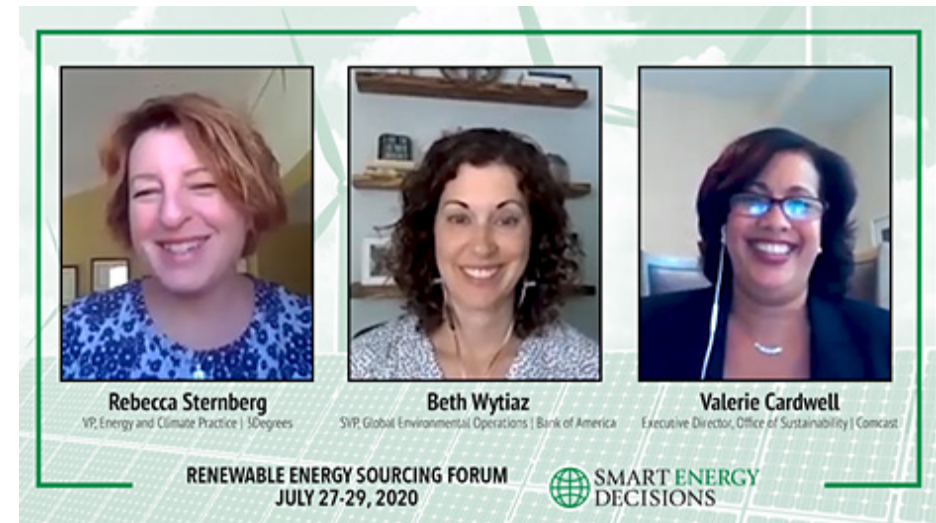
We also look at it from a brand impact perspective. We are a technology company, so sustainability and innovation are just where we should be because we know that it's important to customers, employees and shareholders. But, everybody is not personally there. We spend a lot of time telling the story over and over again, in some cases looking for little wins. Our Wells Fargo Center, where the Philadelphia Flyers play, was our first 100% renewable energy transaction. That got us on the map and helped give some lift to telling the story to all our different business units.

Panel: Innovative Approaches to Achieving Renewable Energy and Climate Goals

Sometimes there is a sense of urgency around these transactions. For example, in Oregon, we decided to take advantage of a green tariff offering. You had to sign up and push the button at an exact point in time and hope that you got it. You're going to these business units and selling them on these ideas, but you're also saying we might not get there and it might not work. You're always tempering your story. Again, it's the little wins that we try to use to continue to tell the story.

Comcast recently put out its 2020 values report and we were happy to be included, telling some of the great stories like having onsite solar in all four of our business units by the end of this year. Again, little strides mean a lot when it comes to sustainability. That's my personal belief and that's how we've been able to keep the wins going. Everything doesn't always cross the finish line, but just the race itself sometimes creates the momentum that you need to get other deals or transactions. It's a learning experience and there are a lot of surprises. Be patient, expect surprises, and be able to pivot. Have a plan but when the plan doesn't happen as you thought, make sure you have a plan B so that you can quickly allocate that money and get

something done. It may not look anything like what you started out with but, again, staying flexible will get you those small wins. That's been our key to success. 🌍



“As we go to contract, we think about the opportunities we have beyond the addition of renewables. A big focus for us is to weave in co-benefits for the projects we support.”

—Beth Wytiaz, Senior Vice President, Global Environmental Operations Director, Bank of America

SED Virtual Events Are For Real!

Click on the video to see a brief recap of VRESF events.



A video thumbnail featuring a woman, Cindy Quan, speaking. The background of the video shows a room with a painting. The entire thumbnail is set against a larger background with a green border, featuring faint images of wind turbines and solar panels.

**KEYNOTES FROM
INDUSTRY LEADERS**

Cindy Quan
Goldman Sachs

RENEWABLE ENERGY SOURCING FORUM
JULY 27-29, 2020

 **SMART ENERGY
DECISIONS**

Keynote: Opportunities and Risks in Long Term PPAs



Brian Faist,
Structuring and
Origination, Portland
General Electric



Tiffany Menhorn,
Senior Business
Development
Manager, Enel X

Keynote: Opportunities and Risks in Long Term PPAs

MENHORN: Portland General Electric (PGE) offered the Green Future Impact tariff for large-scale commercial and industrial customers to help them source 100% of their energy from new wind and solar facilities with a PPA through PGE. That was a huge initiative that you spearheaded and I'm really thrilled to be talking about it.

For those of you that don't know, that was about 160 MW fully subscribed by commercial and industrial customers within three minutes of releasing that tariff. The utility was able to do that in a very short period of time in the first phase of the larger-scale project. Brian, talk about what happened and why that was so successful.

FAIST: We heard from our customers that there were quite a few, including some of our municipalities here in the Portland area, that wanted to go further faster than what our state renewable portfolio standards require for renewable and carbon-free resources. We didn't have a way to offer that to them outside of something that was just more or less like a renewable energy credit (REC)-based program. They wanted something that they could point to, a resource, so additionality is very important to a lot of the commercial and industrial customers. They also wanted to be able to say that the electrons from that facility are serving their load.

Hearing that sort of demand from our customers, we engaged a third-party consultant to help us understand how our customers are thinking. Utilities very often think about things through their narrow lens and we wanted to understand what our customers wanted before we designed a tariff that was rather inflexible. We were lucky enough to work with some of our municipal, commercial, and industrial customers to help develop the tariff. It was a collaborative process that enabled us to go down to the commission and file for our tariff in a way that had everybody on board, which is always important for any regulatory filing.

MENHORN: Correct me if I am wrong: I think you signed on around 17 different customers and the majority of those were municipalities, including the City of Portland.

FAIST: Yes, about half and half, including the City of Portland, Multnomah County, Beaverton and Hillsboro. Many of our municipalities in the area are really committed to green products and they wanted to do it through the utility. We were happy to oblige.

MENHORN: This is PGE's first green tariff and it was really ambitious. I think you are paving the way for a lot of different utilities. When I get to work with utilities, and corporates as well, I think what is most unique to me is that the utility company is constantly stuck in this dynamic in which they want to be technologically advanced and move things forward, yet they're still burdened by the regulatory process, whether it be state or federal. What kind of hurdles did you see along the way of pushing this through that process so that you were working to meet your customers' needs?

FAIST: Luckily, we live in a state in which our governor and legislators are very committed to renewable power. We have a strong leg up in terms of delivering something like this for our customers. That being said, there are still challenges. One of the biggest ones is that not all customers look the same. There are folks that have the ability to staff energy industry experts and work through some of these more nuanced items in renewable procurement. Then, there are some folks that just want green energy. They don't have time to think about how to accomplish that, but they know they want it. The thing that is challenging is ensuring that we design something that incorporates the needs of all those people as well as our stakeholders and our regulatory process. We need to prevent unnecessary costs from

Keynote: Opportunities and Risks in Long Term PPAs

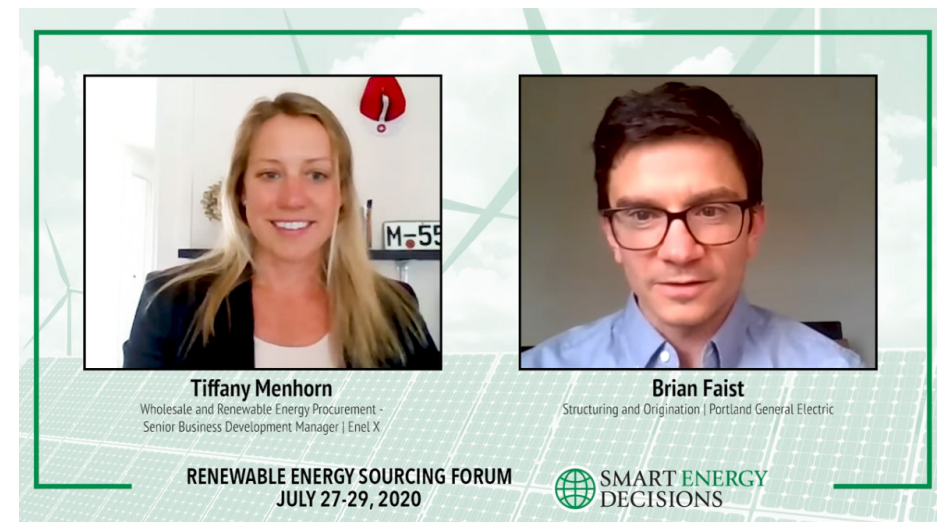
being shifted to different customer classes. These are utility customers that are paying for something extra and those extra costs shouldn't be passed onto all the non-participating customers as well.

MENHORN: What advice would you give to those mid-tier and smaller customers that can't go out and perhaps purchase their own renewable project but want to buy into something with maybe a core tenant?

FAIST: I think one of the really cool things about the green tariff was the ability to aggregate demand for one project and go out and get economies of scale as well as leverage the utilities' expertise and regional presence. We know what projects are in our region. We talk to developers all the time about who has projects and which are the good ones. Then, those customers get to essentially say, 'I want renewable power. Utility, go do all the work,' and we're happy to do that.

Going back to your question, one of the things that I think utilities in the past, including PGE, didn't do a good job of was engaging with customers in these conversations. If you haven't done that in the past five years—that's probably a good window—do it again. I don't think PGE is unique in trying to change from a more utility, essential-service organization to a customer-focused organization. We want to do what our customers want and renewable power is probably top of the list, right

below reliability. If you haven't had a conversation about renewable power in the past couple of years with a utility, go do it. See what they have available. We know that there are many programs like this across the country and I expect that there will be more that come out. Two years ago, the buzz word was additionality, now it's 100% carbon-free. It evolves so fast in terms of what customers want that I think and hope there will be endless offerings from your utility to help keep up. 🌐



“I don’t think PGE is unique in trying to change from a more utility, essential-service organization to a customer-focused organization.”

—Brian Faist, Structuring and Origination, Portland General Electric

Keynote: Multiple Approaches to the Climate Challenge



Jim Goudreau,
Head of Climate,
Novartis



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart
Energy Decisions

Keynote: Multiple Approaches to the Climate Challenge

KELLY-DETWILER: Let's start by talking about what you do at Novartis?

GOUDREAU: I joined Novartis about four years ago when they created the position of Head of Climate. With this position, they took the work that they had done in carbon emissions reductions and climate mitigation and paired it with climate adaptation. The focus now is a portfolio that includes reducing our emissions through a combination of efficiency, adopting renewables as rapidly as possible, creating a credible transparent program of offsets, and combining that with the flip side of the coin on adaptation and understanding what the risks, what the opportunities, what the responsibilities are associated with climate for a company like ours. What are we doing with our emissions that's impacting the climate? What is happening that impacts our patient population? What's our responsibility to understand how a changing climate impacts the communities that we serve, the patients we serve, our associates—and not only in our own operations but also for our extended supply chain?

KELLY-DETWILER: Let's focus on wind power. Tell us about Santa Rita.

GOUDREAU: The Santa Rita East wind farm in Texas is one of the first deals that Novartis closed to move toward renewables. With this one deal, we're an off-taker for 100 MW of electricity from the farm. That takes care of all the carbon for our procured electricity in the North American market, which was really exciting for us. It's important to have a foundation of efficiency and to do things like onsite renewables as well where you get resilience and business cost benefit. However, big deals like this really start to move the needle towards decarbonization, not only of our business but of extended supply chains and different sectors. We're pretty proud and we're excited to be doing more.

KELLY-DETWILER: How long did the process take from conception to pen on paper, and what was the internal process like, convincing folks that this was the right time?

GOUDREAU: The ideation started in 2016, about six months before I joined the company. By the time I joined, we had picked our buyer's agent for the deal and moved into more developmental and project-specific analysis. We were able to move through the education process within the company starting in the fall and working through the summer of 2017 when we got approval from the Executive Committee of Novartis (ECN). The developer reaching financial closing was another big milestone for us before we announced it publicly in 2018 when there was confidence that the deal would go through.

It was just shy of three years from a process-related perspective, which is not so unusual for a lot of companies, especially for the first time you do this. Instead of buying transactionally on the market for energy, or hedging and then executing within two or three years, you start to talk about contractual structures that are 10, 12 or 15 years. That's a big hurdle for folks and what is that risk exposure?

As a European company working a deal in Texas, we're subject to the International Financial Reporting Standards. These standards are basically a European version of Generally Accepted Accounting Principles (GAAP). Companies in the U.S. are under GAAP and companies in Europe are under IFRS. When you start to look at exactly how you structure a deal and what your risks are, a company in the U.S. may approach it very differently from a company based in Europe. We were happy to be able to work through all those issues with our treasury, finance, procurement, and legal departments and take it to leadership for

Keynote: Multiple Approaches to the Climate Challenge

final approval thanks to some of our really passionate champions.

KELLY-DETWILER: Are you working on projects in Europe as well?

GOUDREAU: We are. We're in the process of selecting a developer to be able to do a Pan-European virtual power purchase agreement which would take care of our own operations. This is a big step for us. Obviously, a lot of our business is concentrated in Europe from a production and research perspective. However, we're especially excited that we're starting to talk across our supply chain and find partners who are interested in thinking about an aggregated virtual power purchase agreement. We would go to the market and try to remove barriers and set up access to renewables for members of our supply chain both in the U.S. and in Europe.

KELLY-DETWILER: That's an interesting concept. Some of the larger buyers are thinking maybe they'll be able to play that lead sled dog role as well, which certainly could open up the market to many more players and get a lot more clean megawatt-hours out there.

GOUDREAU: I think it's important to do that. A company like Novartis has staff to be able to handle procurement, financing, and legal issues. While we may not sign as a direct off-taker for many of these new deals, we can help set up an umbrella structure that will allow smaller companies with

more limited resources to plug in. I would much rather have them effecting a permanent and enduring change in generation capacity as a result of these deals than buying an unbundled renewable energy credit. As a buyer, we're offering you the opportunity to be part of our supply chain solution instead of telling you that you have to change what you're doing and lower your footprint all on your own. We'd rather help you do it rapidly across a big portion of your business than force you to do it incrementally.

KELLY-DETWILER: Where and what sorts of projects are you looking at that are physically located on properties you own?

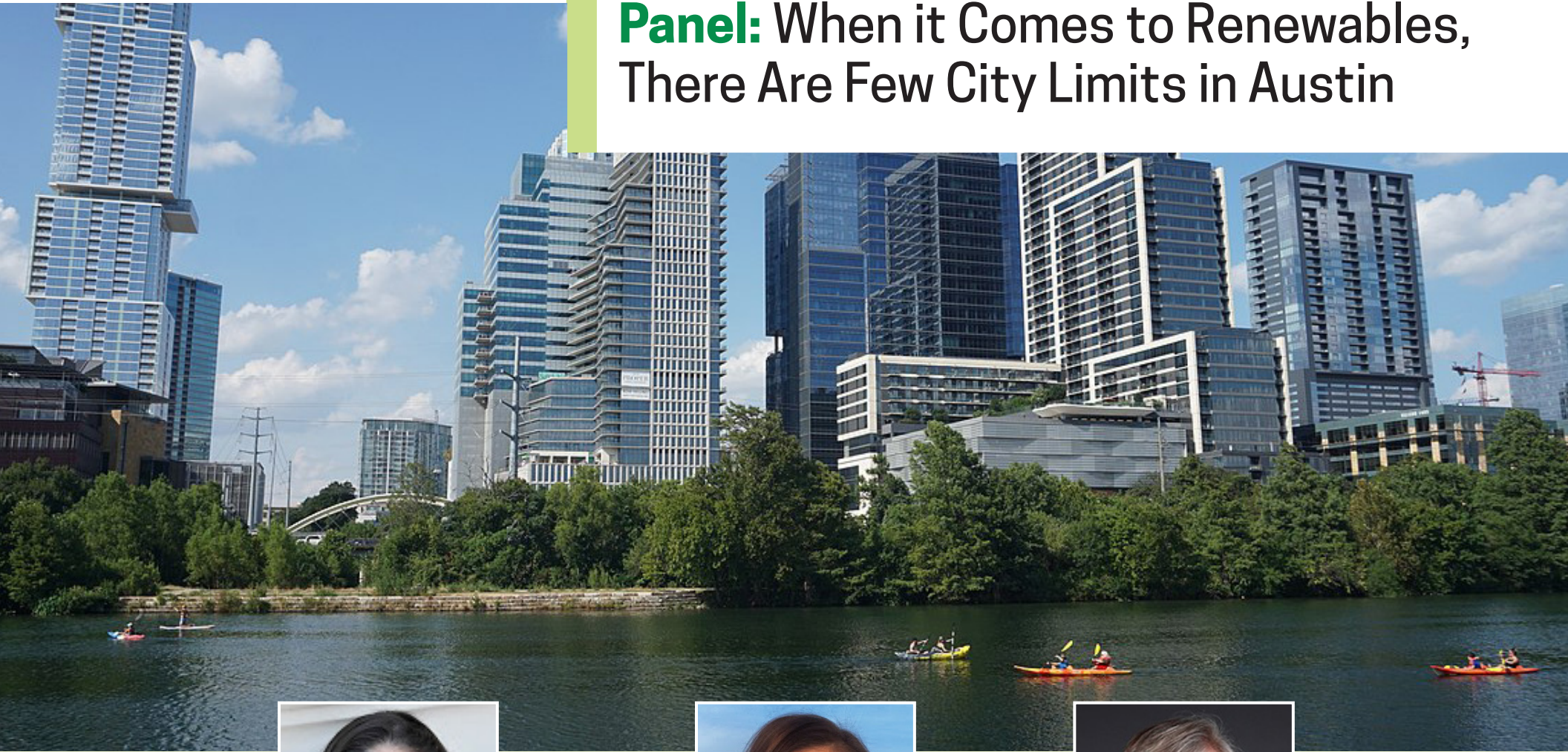
GOUDREAU: We've got a range of projects that we're looking at right now. We had a number that we've assessed and rejected for various reasons because it just didn't make sense in the market or at that particular site. We've got others; we've looked at deals in Asia, Europe and the U.S. Some are far enough along and into the permitting process. We're hoping to be able to get through. When you talk onsite project development, obviously, you start at the very beginning of that process. You can't jump into it like you can with a power purchase agreement off-site where all the grunt work is done up front and you can compress that development time frame. That's been a big learning process for us as well. 🌐



“It’s important to have a foundation of efficiency and to do things like onsite renewables as well where you get resilience and business cost benefit. However, big deals like this really start to move the needle towards decarbonization, not only of our business but of extended supply chains and different sectors. We’re pretty proud and we’re excited to be doing more.”

—Jim Goudreau, Head of Climate, Novartis

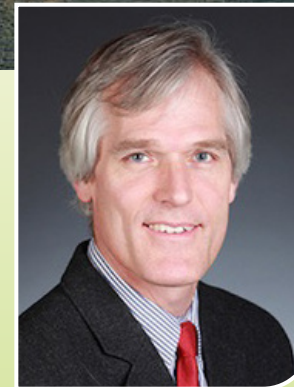
Panel: When it Comes to Renewables, There Are Few City Limits in Austin



Erika Bierschbach,
Vice President of
Energy Market
Operations and
Resource Planning,
Austin Energy



Teresa Kanter,
Business
Development
Manager,
Duke Energy



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart
Energy Decisions

Panel: When it Comes to Renewables, There Are Few City Limits in Austin

BIERSCHBACH: We are a city department of Austin. My team manages all of our assets and our load in the wholesale energy Electric Reliability Council of Texas (ERCOT) market. We originate the renewable power purchase agreements (PPAs) both short-term and long-term out to 20 or 25 years. We also are responsible for resource and generation planning for the utility and how it is associated with the city. I tell people we manage all of that risk with regard to the energy portfolio from the next five minutes to the next 25 years. We have a pretty long hedge horizon but it's exciting. This is an exciting time to be in energy, in renewables, and in ERCOT.

KELLY-DETWILER: Teresa, you're out there in the marketplace, a pretty competitive space with a lot of suppliers and developers. How do you work with prospects and customers to stay on top of what they are looking for today and also make sure you can continue to engage in conversations on what they'll need tomorrow? How do you stay ahead of that moving dynamic?

KANTER: It's different with every customer, but it's really great working with clients like Austin Energy because they always seem to be ahead of the game and put themselves at a higher level. They push themselves and their city council. They commission a lot of studies and want to be on the cutting edge of the next technology. They are really looking under every single rock for the best opportunity in regard to affordability and reliability to reach the goal of a greener future.

I've been in their position. I was buying gas for a load-serving entity on the Duke Energy side for a long time. I've been in their shoes and I feel their pain. I think that helps, but I also make an effort to keep that conversation going and stay up on the resource plans. It's important to know what's going on with them and also in their community. Duke Energy

really prides itself on not just putting some metal and equipment in the ground and then running off, but also staying involved in the community. We hire people in the area, so it's very important for us to be a part of it.

KELLY-DETWILER: Erika, obviously Austin Energy has been in this for a long time. In Texas alone, numerous cities have articulated 100% carbon-free goals by 2050 or earlier. You've been one of the leaders for a while. What would you tell other cities some of which have their own municipal utilities and some which do not in terms of where they are on the journey and what they should be thinking about going forward?

BIERSCHBACH: I would speak to my fellow buyers or city departments and say to do your research. Take your time and be choosy. You're the buyer so use that leverage. Your size doesn't so much matter as does understanding what your needs are and what the market is so you can make good choices for your portfolio. We all have different needs and profiles. Make sure that you've taken the time to pull the trigger and aren't moving too quickly.

KELLY-DETWILER: What are the top two or three risks to be aware of if you're going to engage in some kind of a sizable commitment?

BIERSCHBACH: Entities need to focus on their power agreements very closely to avoid congestion risk. That's a huge risk, depending on where you are going to pick up that power, and where it's being delivered by the developer or where that transfer of ownership occurs. Secondly, think about the location to gain an idea of what the profile will be and what you can expect to get as far as output.

Thirdly, pay attention to market rules and how ERCOT has developed over time because that will affect the value of the portfolio. It's a very

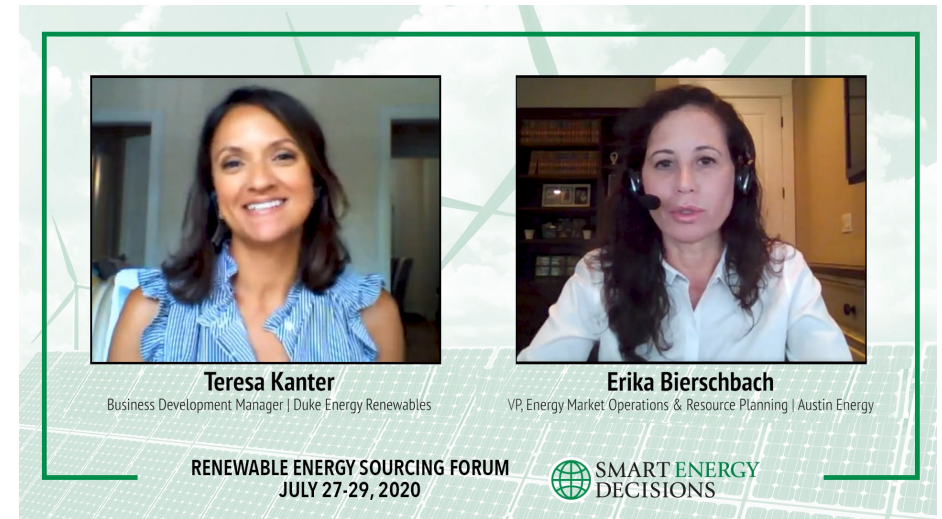
Panel: When it Comes to Renewables, There Are Few City Limits in Austin

engaged, involved stakeholder process. Some of the smaller cities and municipalities are part of a larger aggregated group. Know who your partners are. Not that the person on the other side of that contract isn't your partner, but you're coming together to agree to certain aspects and terms. Talk to the people that are also on your side of the contract and understand some of the things that they're doing to be able to transfer some of that risk, quantify that risk, and then to manage it on your side so you don't have to pay a heavy price if you think that you should transfer it away. Understanding those different aspects of the PPA is very important.

KELLY-DETWILER: You have projects located in different places around the state to help to mitigate some of that geographic exposure, correct?

BIERSCHBACH: We're all over the place. We're in the east and west; we're in the panhandle; we're on the coast; we're in the valley. We're also diversifying, getting close to load centers and on 345-kV transmission lines. We're not only looking at location diversity, but also other ways we can diversify in our renewable portfolio. It takes a little time so you need

to be patient, but those projects are popping up. ERCOT and Texas are great markets so we really want to try to reap the benefits of that as much as possible. 🌐



“I tell people we manage all of that risk with regard to the energy portfolio from the next five minutes to the next 25 years. We have a pretty long hedge horizon but it's exciting. This is an exciting time to be in energy, in renewables, and in ERCOT.”

—Erika Bierschbach, Vice President of Energy Market Operations and Resource Planning, Austin Energy

Keynote: Inspiring Diversity in Energy



Rose McKinney-James,
Managing Principal,
McKinney-James and
Associates and Energy
Works, LLC



John Failla,
Founder and
Editorial Director,
Smart Energy
Decisions

Keynote: Inspiring Diversity in Energy

FAILLA: You were involved in the development of the first renewable energy portfolio standard (RPS). You were in the middle of board discussions at MGM when they decided to write that famous \$87 million check to sever ties with NV Energy. Take us behind the scenes and tell us a little bit about your involvement in both of those seminal moments in Nevada renewable energy history.

MCKINNEY-JAMES: Both were pretty awesome opportunities to participate in. Starting with the RPS gave us an opportunity to establish an important baseline, a placeholder if you will. We did this in 1997. The passage of the RPS occurred during a pretty tumultuous time. We had the Western energy crisis and a conversation within our state legislature around deregulation. That was during my tenure as a chief executive officer for the Corporation for Solar Technology and Renewable Resources. It was a perfect time for us to try to stand up some policy. The opportunity to leverage the significant renewable resources in Nevada was the power play—pun intended—that we decided to pursue.

FAILLA: You've accomplished so much. What has it been like to be a woman of color in the energy industry?

MCKINNEY-JAMES: Until relatively recently, I described it as being lonely, isolating, and actually a bit frustrating. It's hard and overwhelming, in many instances, to be the first. It is hard to be the only. There's a feeling of exposure. On occasion, you feel dismissed and maybe under-valued. I've been fortunate because I have typically had a title and been in a leadership position that has given me an opportunity to balance things a little more. I can't say that it hasn't been stressful. I think I've just been fortunate to be imbued with this notion that I had an obligation to make others aware, to sort of power through this. Collectively, as you read about the backgrounds of my co-authors (of "The Energy Within Us"), you see that

we all come from different aspects of the industry but there is a very common thread around what it feels like to be a woman of color in the energy space.

FAILLA: In your book, you reference what it was like dealing with a principally white male world. What were the biggest challenges that you faced?

MCKINNEY-JAMES: I think it's challenging to overcome this feeling of invisibility. It's baked in with sexism and more than a tinge of racism. The challenge for me was to work around some of the subtle things, the unspoken, the micro-aggressions, the invisible outrage sometimes that I had to internalize for not being included or feeling that my opinions or my perspectives were not being adequately considered. Those are significant challenges and they are very personal in nature, though they clearly flow to the professional side. When you are surrounded by people who tend to think alike and you are the different person, no matter what you say, you are seen through a lens of being different. I try to encourage my colleagues who are more open in their thinking to embrace that difference, to look for diversity of experiences and perspectives to inform how decisions are actually made.

FAILLA: Rose, I have to tell you, from reading the chapter in the book on you and from this conversation, what's really striking to me is this combination of grace and strength that you've forged together to make you succeed and overcome obstacles. It's great to hear your story. Looking forward, what do you think it'll take to achieve a more appropriate representation of people of color in the energy industry?

MCKINNEY-JAMES: I refer to this as the all-in strategy. I think it is a necessity because the current national conversation around systemic

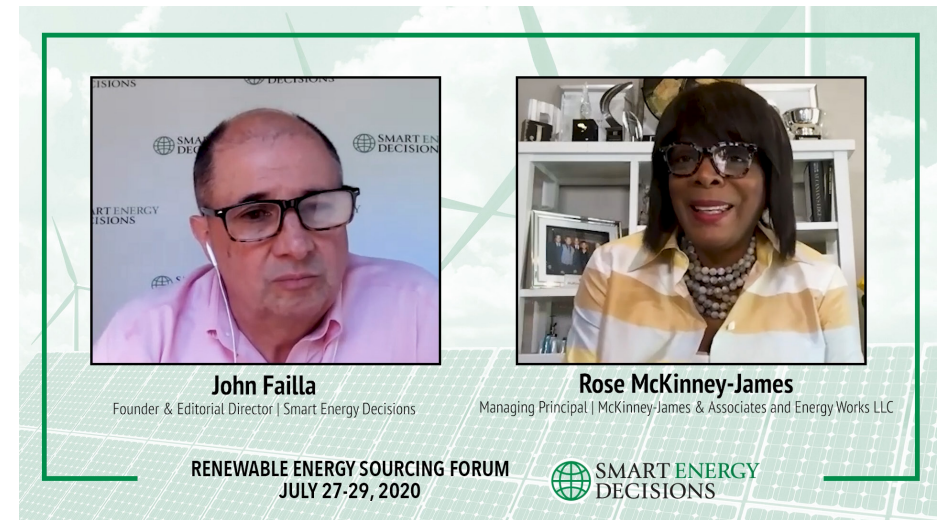
Keynote: Inspiring Diversity in Energy

racism is hitting our country and this industry very hard. We've been busy growing as an industry, overcoming our own challenges, fighting policy battles, dealing with the economic implications, but now I think it's important for us to turn our attention to building strong organizations that represent all of our stakeholders. That means focusing on the people, procurement, philanthropy, and investment.

Identifying people requires expanding your network, taking an uncomfortable step to have an uncomfortable conversation, and being very intentional in measured outcomes. It's the outreach. It's taking that first step and staying within your strategic goals and looking to see how your organization lines up, thinking about this through the same lens. As we're talking about the energy industry, we're all focused on resiliency and affordability, or we should be to the extent that this is an issue that we face in the communities where we want to conduct business. The way to do that is to make sure that our organizations reflect the communities where we work.

It's taking that step, making a plan, being intentional, and focusing on outcomes that improve the lives of your people. Think more creatively around procurement decisions and who you procure from and the people

who participate. Think about how you invest, how you show up in the communities where you do work. I think those are things that, if taken in a serious fashion through the business lens, will make a huge difference in how we move forward to address these and other important issues facing the industry. 🌐



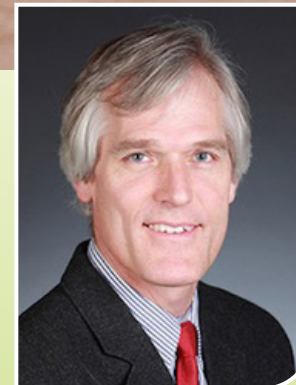
“(An all-in strategy) is a necessity because the current national conversation around systemic racism is hitting our country and this industry very hard. We’ve been busy growing as an industry, overcoming our own challenges, fighting policy battles, dealing with the economic implications, but now I think it’s important for us to turn our attention to building strong organizations that represent all of our stakeholders”

—Rose McKinney-James, Managing Principal, McKinney-James and Associates and Energy Works, LLC

Keynote: Latest Developments in Green Energy Strategies



Greg Kosier,
Director, Commodities
Management Group,
Constellation



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart
Energy Decisions

Keynote: Latest Developments in Green Energy Strategies

KELLY-DETWILER: Can you talk about how you manage risk? Previously, buying commodities included one, three or five-year contracts with customers. What were your main goals in a legacy environment to help customers manage their spend and cover risk?

KOSIER: These are the bread-and-butter aspects of energy risk management. You've got buying at market, in which you've either whittled your margin down with a supplier or you're not including a lot of forward premium in the price. That's probably No. 1 in terms of focus for buyers. Another one is looking to reduce volatility in spend. That may involve evening out your costs by month or quarter. Then, you've got considerations like meeting or beating budget and basis risk, which is the differential between where you're buying and consuming energy. That's something that's going to become an important part of the conversation when you bring a renewable purchase into the mix. Then, as a buyer, you're going to have some corporate directive such as volume restrictions on how much energy you can buy over a period of time, a term restriction on how far out you can buy and maybe a concentration of risk with suppliers so you don't put all your energy supply eggs into one basket.

KELLY-DETWILER: Greg, I know from working with you in the past that you actually took a lot of care in discovering each customer's risk profile was—what they were comfortable with and what they weren't—using a series of questions and ongoing dialogue over many years. If you look across the whole customer base, is it a very broad range of risk that some buyers are willing to accept versus others?

KOSIER: That's a great way of putting it—you have a huge swath. We might see buyers that have a lot of commodity in their portfolio. For example, a

manufacturer may buy something that feels more index-based in the shorter term. They may not necessarily want to buy a great deal of that energy in advance because they want their prices to be as close to market as possible. Energy factors into such a large portion of their cost stream. However, the retail and hotel industries may know where their costs are going in two to five years and want to know a large portion of their budget advance. They'll skew to the conservative side. In any event, to help an energy buyer build out their budget, you're going to need some sense of what these goals are in advance.

KELLY-DETWILER: You pay for certainty, in that sense.

KOSIER: Right, and the way you do that is typically by using a fixed-price product. When we think about the three main ways that buyers will purchase their energy, you're going to have these legacy purchasing strategies with very simple names like fixed price. That's going to remove a lot of uncertainty from the equation and provide a good sense of what that price will be at the time the invoice arrives. In many cases, if you do this in its most complete form, where you hedge a lot of the non-ancillaries, you include the non-energy parts of the price into the contract. It's going down to the usage fluctuation. You're taking out a lot of the variables. Then, you may have companies like that manufacturer in a commodity that is willing to buy at index. In its purest format, that's going to be simply the day ahead or real-time price, perhaps with no blocking. That's part of this strategy: no purchase of the energy or very little purchase of the energy in advance.

KELLY-DETWILER: You've likened this to a 401(k) portfolio, especially for large buyers with multiple sites. Can you provide a little color on that?

KOSIER: That's really the third category, the managed portfolio. You may

Keynote: Latest Developments in Green Energy Strategies

include a block in the index. The base component of the strategy is going to be a day ahead or real-time price. You're going to buy energy at the index and then make some purchases over time. The purchases may come in the form of a block or a percent layer. They may be guided by different parameters such as a calendar for timing. You may want to buy monthly or quarterly to spread out purchases. You may have a budget that guides the purchases, meaning that if the market price gets to a point at which it fits the budget, you take advantage of that and jump in. You may have a programmatic approach in which there's an algorithm involved on the supplier's part and they help use that algorithm to tune several of the factors to the way they buy the energy.

In any event, you're going to be spreading the purchases over a period of time. This is where that 401(k)-style approach lends some diversity over time in the way that you buy the energy. There's going to be other aspects that may involve performance reporting when you use a managed portfolio, but the idea is that you're making a series of purchases over time.

KELLY-DETWILER: Greg, can you discuss a little bit more about this challenge

of 401(k) and geographic diversification? How should we think about that?

KOSIER: That's a part of the conversation that will come from the managed product approach we hit on back in the legacy energy strategy. If you think about buying a 401(k) approach, you're buying in a manner that is not one large purchase. You have to think about multiple smaller purchases. This allows for buying across a variety of market conditions for improvements in technology. You may have benefits here in contract mechanisms that can get overlooked.

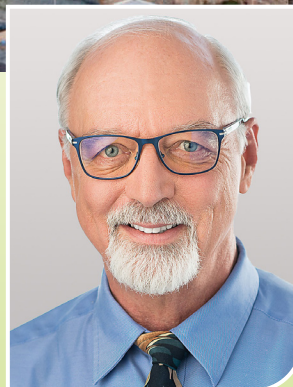
Another aspect is that if you make a series of renewable purchases, your PR and marketing departments will probably love it, right? They get to make multiple announcements around energy purchases and projects being built. There's a PR apple there that you get more than one bite at. If the buyer thinks that maybe the load is too small to buy multiple times, you can buy as part of a pool. Aggregations take place. Constellation does this—we will aggregate buyers to have multiple off-takers on a project so you don't necessarily have to buy and be the sole consumer on a project. That is something you're going to want to



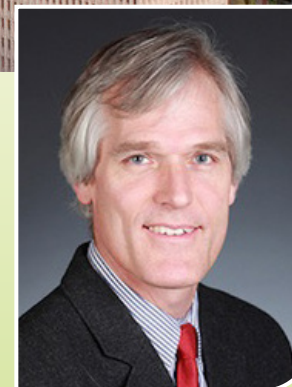
“... that 401(k)-style approach lends some diversity over time in the way that you buy the energy. There’s going to be other aspects that may involve performance reporting when you use a managed portfolio, but the idea is that you’re making a series of purchases over time.”

—Greg Kosier, Director, Commodities Management Group, Constellation

Keynote: Greening Cities— Phoenix Leads the Way



Nick Brown,
City Energy Manager,
City of Phoenix



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart
Energy Decisions

Keynote: Greening Cities—Phoenix Leads the Way

KELLY-DETWILER: Why are you in this job? You could be doing a million other things. Why this one?

BROWN: We're in a career in which we can really do well by doing good. Successful solar professionals could be doing a lot of things. There are thousands of services and products that we could be pushing through the marketplace. What we're doing, however, pushes good things through the marketplace and also leaves a somewhat more livable planet for our progeny.

KELLY-DETWILER: Let's talk about the program to place solar on city properties in Phoenix.

BROWN: We're finally at a point where solar energy can be developed at a price that's competitive with costs avoided on your utility bill. To that end, we're finding the largest facilities—I'm talking about significant sized office facilities, our shop and maintenance facilities, water services, some services out at the airport, and an enormous convention center. Each of those facilities might consume 4,000, 5,000 or 6,000 MWh per year. We then begin requesting a quote for solar, in a lot of cases a carport. We have about 150 or so buildings and other facilities that have more than 100 parking spaces. Shade is coveted here in the valley of the sun. It's what Rocky Mountain Institute calls Values Beyond Energy Conservation (VBECs).

Those facilities are the ones where we start via a power purchase or lease agreement. In a PPA, the utility, such as Arizona Public Service Electric (APS), is required by the corporation commission to provide us certain allowances for the avoided energy; we can then pay for the PPA from those savings. That's a no-cost project for us. Similarly, we can do a lease

agreement in which contractors come into our facility, sign a lease to own our solar asset and then we pay that over time as a lease. It functions very similarly to a PPA, with just a little bit of a different financial mechanism. Neither one requires front-end costs and we can do them one after another. We're limited in some ways—but only by the development team and the staffing—to manage these projects as they're developed.

KELLY-DETWILER: How long have you been in your role, how big are the projects, typically, and how many have you had installed so far?

BROWN: I've been in this position for a year and a half. It's been one of the most fulfilling roles in my career, so I feel very fortunate. Our average projects are in the 0.5 MW- to 1 MW-range. Again, these are facilities that consume a lot of energy. Our waste transfer stations, for example, have heavy equipment so they consume a lot of energy. Those are naturals for these kinds of projects. We put solar on libraries, museums, City Hall, and our other office towers downtown. We've currently got about 10 MW in place. Some of that happened before I arrived, but we've done about 3 or 4 MW since I came onboard.

We have about six projects that are currently underway. They're staggered so I hope they don't all land at one time—they require an awful lot of work. We've got 57 fire stations and only three have solar so far. I anticipate that we'll eventually see rooftop and carport parking at most of those locations. We've got ten police precincts and each of those is ripe for the very same kind of work. We're currently developing a 1-MW project at our police training academy. I think, overall, we have the capacity or the potential for 10 or 15 MW of additional distributed solar energy in city operations.

Keynote: Greening Cities—Phoenix Leads the Way

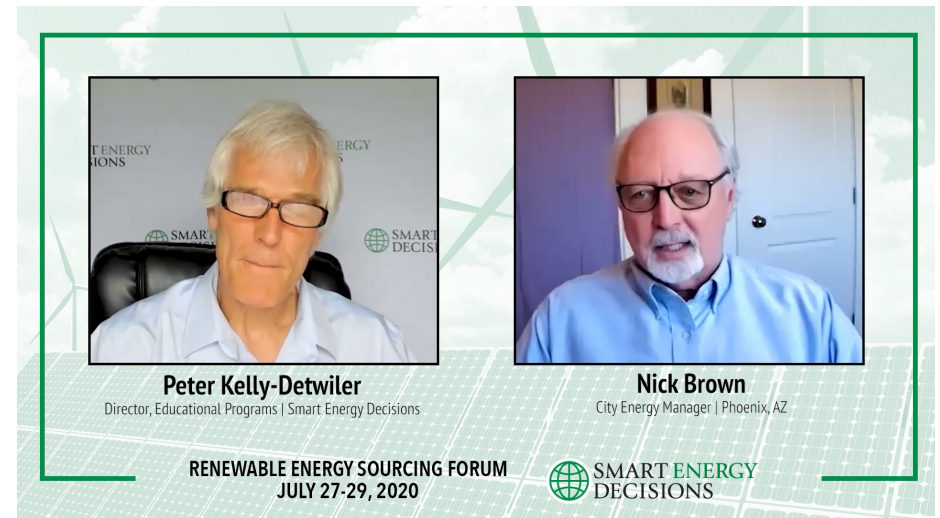
KELLY-DETWILER: I would think that, especially with the carport projects, the workers in those facilities must give you, literally, a warm welcome to get a place where they can park their car in the shade. They must be thrilled.

BROWN: Not very many office workers are heroes, but we get treated like heroes by folks who work in our facilities and go in every day.

KELLY-DETWILER: You also mentioned that there were some larger projects you were looking at out into the future that are not on parking lots. You were discussing bigger utility-scale types of approaches because you have so much energy you need to offset. What does that look like?

BROWN: Our consumption is immense. We consume about 650 GWh per year of energy. That's 650,000 MWh a year at our municipal operations. Because of that, distributed solar really won't get us where we need to be. There just aren't enough parking lots and rooftops. We will need something in the range of 300 MW of solar overall to get to climate neutrality by 2030 or so. That's a steep hill to climb. Additionally, some of our power comes from Arizona Public Service and the Salt River Project. We will have to split that between the two.

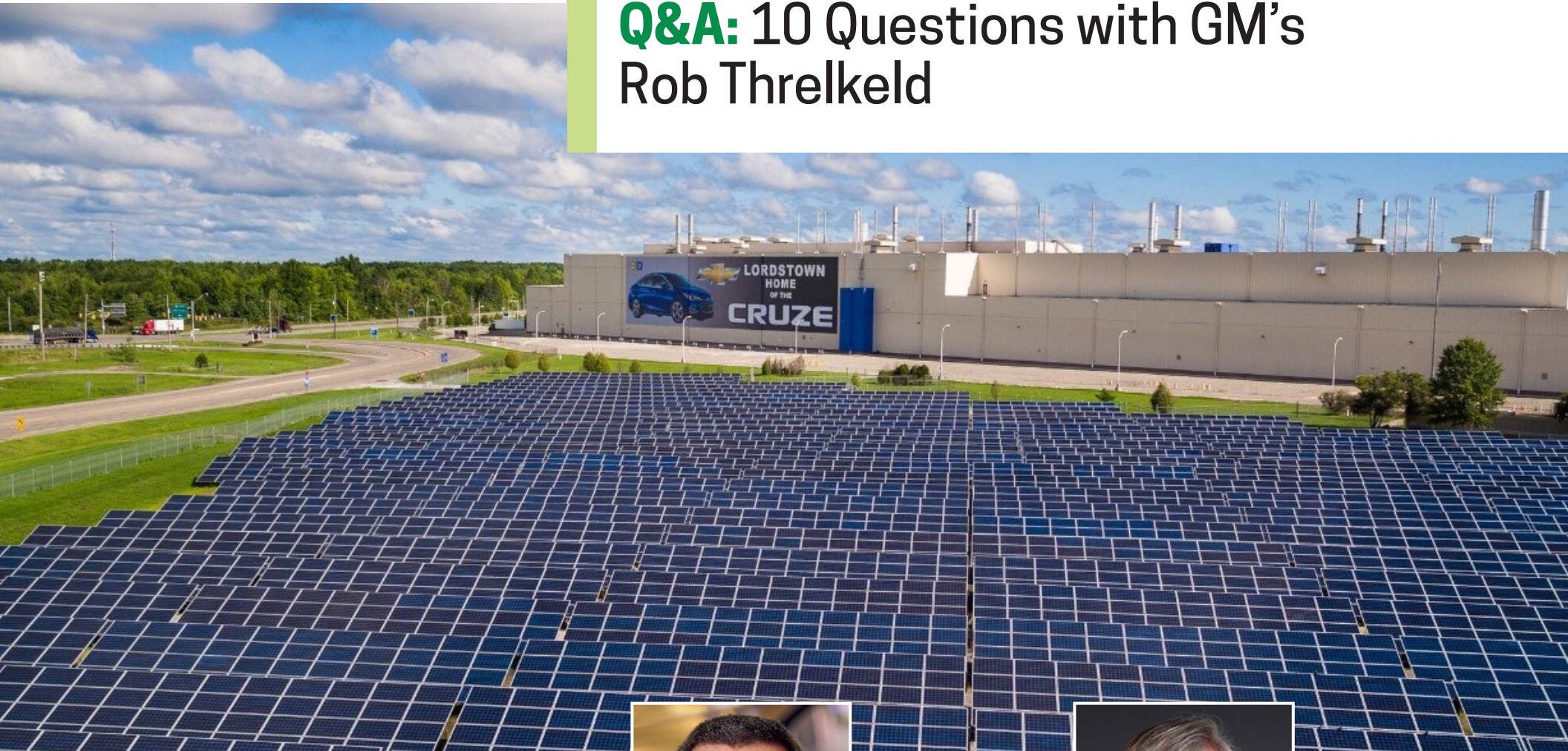
We've got a real challenge, as does everyone in the western interconnect, in regard to not having a regional transmission organization to do balancing and firming for renewable energy projects. That's a problem because it falls to the utilities, the transmission line owners. It's complicated and costly. It's not a barrier but it's a challenge. 🌐



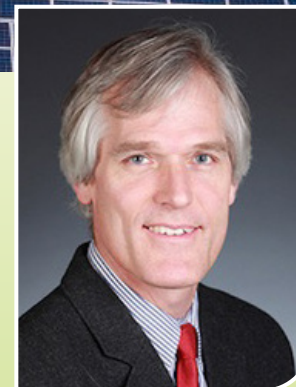
“We’re in a career in which we can really do well by doing good. Successful solar professionals could be doing a lot of things... What we’re doing, however, pushes good things through the marketplace and also leaves a somewhat more livable planet for our progeny.”

—Nick Brown, City Energy Manager, City of Phoenix

Q&A: 10 Questions with GM's Rob Threlkeld



Rob Threlkeld,
Global Manager of
Sustainable Energy,
Supply and Reliability,
General Motors



Peter Kelly-Detwiler,
Director of Educational
Programs, Smart
Energy Decisions

Q&A: 10 Questions with GM's Rob Threlkeld

KELLY-DETWILER: Rob and I decided to make this interesting by discussing 10 questions. Rob gets one minute to answer each. First, can you explain what you do at GM in the sustainability space?

THRELKELD: I lead a small team that procures all the energy for General Motors in continental North America. This includes gas, electricity, water, sewer, energy efficiency and renewables, supporting GM's RE100 goals and overseeing about \$750 million in annual procurement.

KELLY-DETWILER: How long have you been working on sustainability issues for GM and how did you get started in that role?

THRELKELD: I've been at GM for almost 20 years, always working in the energy space. I've designed, built, and operated powerhouses and power plants, looking at ways we can optimize efficiency. I led the energy efficiency efforts of one of our largest assembly complexes and then went back to a contracts role to support our energy savings program implementation, which is how we do energy efficiency projects within General Motors. That morphed into looking at renewables back in the "early days," around 2005 when we first started assessing some of our renewable projects. Fast forward to now, I lead the broader team that looks at how to procure 100% of our electricity from renewable resources. We're about a quarter of the way there now. It's been quite the journey.

KELLY-DETWILER: What's the biggest challenge you've encountered so far with respect to "greening up" the General Motors portfolio?

THRELKELD: I think it's getting everyone to focus on and understand that we're using a portfolio strategy. It's no different from how you would invest your money. You wouldn't invest it all in one stock because then you'd have to put all your horses into one stall. We use a four-pillar strategy that includes energy efficiency, sourcing renewables, and looking

at storage and waste. We address the intermittency that renewables bring to the grid and leverage policy and skill to drive our efforts. We think of our framework in terms of risk tolerance for a large company like GM. Energy efficiency, obviously, is low-hanging fruit. Sourcing renewables gets a little more complicated. You have to think about it as a portfolio within itself, doing cell phone projects in our own facilities using solar or landfill gas and sourcing through green tariffs or virtual or physical power purchase agreements with utilities.

KELLY-DETWILER: What have been the biggest surprises to date in your sustainability career?

THRELKELD: I think the biggest surprise to date has been how fast prices have come down. I remember when we built our first solar array in 2005, a 1-MW rooftop array. The cost to install that was more than \$9/W. Fast forward to 2020, it's less than \$1/W in some cases. We've seen the acceleration of technology adoption and advances driving down costs. A decade ago, it seemed like a very complicated process to think about how we were going to get renewables on even just a few of our facilities and then grow our number of megawatts. Our original sustainability goal was to source or promote the use of 125 MW of renewables, and here we are with a goal to be 100% renewable. We're well on our way.

KELLY-DETWILER: What can you tell us about the impact of COVID-19 on your efforts, both personally and within GM?

THRELKELD: Every day is an unknown. I remember when the situation started to be called a pandemic and everybody in this country still didn't fully comprehend what that was going to mean. By the middle of March, literally everything came to a standstill. I've never seen the entire operations of a company basically shut down to zero. For us, it was a big learning curve because we were lucky and fortunate enough to have quite

Q&A: 10 Questions with GM's Rob Threlkeld

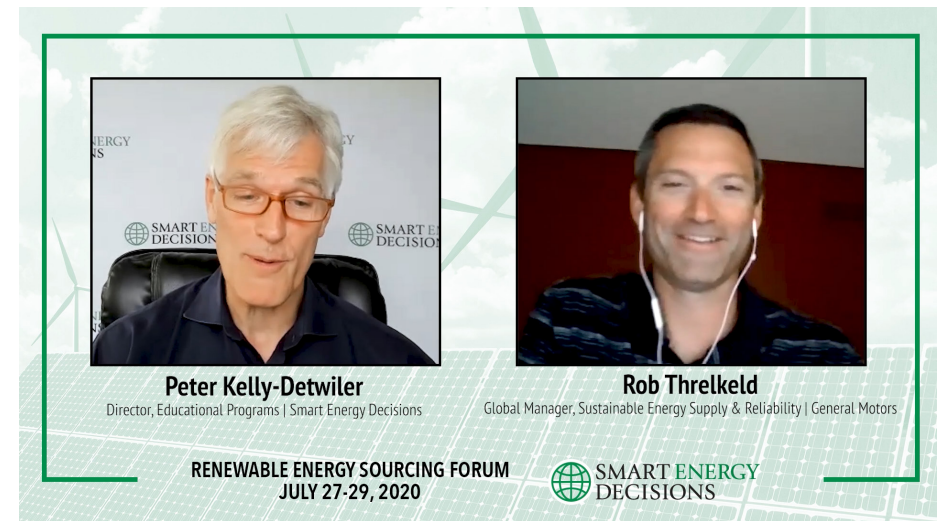
a bit of flexibility built into our contracts, but energy remained a big cost and we had to start to think about everything collectively. It's also been interesting to watch the industry as a whole start to share a lot more data very quickly as we all looked at how to save energy, all the way from retail to industrial companies like GM.

KELLY-DETWILER: That's pretty heartening. You've been involved in a lot of these deals. When a deal gets inked, you're committing the company and the company's committing itself to some pretty significant financial commitments. How do you think about managing the inherent risk involved with those financial transactions?

THRELKELD: It goes back to portfolio. I think it's having leadership understand that there are many different levers that we can pull. If we don't want to do another two or three large-scale renewable projects, where are we going to invest money in energy efficiency? Reducing the denominator has a direct impact of increasing your percent of renewables. Looking at it from a portfolio strategy perspective drives that.

The portfolio strategy is around each individual spoke. We're transitioning to an all-electric future. How do energy storage, fleets of EVs, and other

aspects come into play when you think about rates, tariffs, and designs? How do we leverage our policy and scale to use our collective voice to move the industry forward? Among our four pillars, it's about managing the risk. On any given day you can speed up and slow down any one of those levers. From a financial perspective, this is what leadership wants to hear because then you're not putting all your eggs into one basket. 🌐



"I think the biggest surprise to date has been how fast prices have come down. I remember when we built our first solar array in 2005, a 1-MW rooftop array. The cost to install that was more than \$9/W. Fast forward to 2020, it's less than \$1/W in some cases. We've seen the acceleration of technology adoption and advances driving down cost"

—Rob Threlkeld, Global Manager of Sustainable Energy, Supply and Reliability, General Motors



Virtual Renewable Energy Sourcing Forum/Winter "Collaborating for a Zero-Carbon Future"

December 7-11, 2020

[Click here for more information](#)



MANAGER OF CUSTOMER SOLUTIONS

Tim Gaghan

(267) 212-4983

tim@smartenergydecisions.com

.....

DIRECTOR OF RESEARCH & CONTENT

Debra Chanil

debra@smartenergydecisions.com

.....

www.SmartEnergyDecisions.com

