

PUBLIC UTILITIES FORTNIGHTLY®

The Sustainable Resilient Affordable Debates

JUNE 12, 2023

Matthew Satterwhite, Ann McCabe
David Terry, Louise Anne Comeau
Clayton Scott, Melissa Boyd
Guidehouse Lightning Round

Special Issue State and Future of Power





Lighting the Way
for Our Clients to
Lead the Way

PUBLIC UTILITIES FORTNIGHTLY®

The Sustainable Resilient Affordable Debates

June 12, 2023 • Volume 161, No. 7

4 From the Editor: *Transformation Tales*

6 Getting IRA/IIJA Funding

*Conversations with AEP Senior Vice President Matthew Satterwhite,
NASEO President David Terry, Illinois Commerce Commission Commissioner
Ann McCabe, EEI Executive Vice President Phil Moeller, U.S. DOE
Grid Deployment Office Chief of Staff Whitney Muse, Emera VP of New Energy
Markets and Innovation Louise Anne Comeau, Idaho Office of Energy
and Mineral Resources Administrator Rich Stover, Idaho Power
Senior Manager of Operations Support Melissa Boyd.*

32 Lightning Round on Power's Future

*Fourteen Guidehouse experts hit their buzzers and answer our questions:
Chris Rogers, Raquel Malmberg, Britt Harter, Ed Batalla, Robyn Link,
Graham Dickson, Nicole Wobus, Shaun Fernando, Danielle Vitaff, Lisa Frantzis,
Patrick Di Gregory, Peter Shaw, Jenny Hampton, and Erik Larson.*

46 Small Modular Reactors are Indeed Coming

*Conversation with NuScale's Executive Vice President for Business Development,
Clayton Scott.*

50 PUF Annual Pulse of Power Survey

*By Guidehouse's Mackinnon Lawrence and Richelle Elberg,
an analysis of the survey results.*

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by the generous support of Guidehouse.

Front cover, a painting by PUF's Paul Kjellander, "Wind Walker 2." Elsewhere in this issue, on page 5, his painting "Git Along Little Turbines;" on page 19, his painting "Linemen After the Storm;" on page 29, his painting "Transmission Construction 1;" on page 37, his painting "Shepherding Innovation;" on page 41, his painting "Transmission Construction 2;" on page 45, his painting "Wind On The Range;" on page 49, his painting "Wind Walker 1."

Transformation Tales

Never So Great a Threat, Never So Great a Test

BY STEVE MITNICK, EXECUTIVE EDITOR

There has never been so great a threat to the grid as the threat to the globe of climate change. That the effects are gradual over decades, and imperceptible most days, and inconsistent across the myriad interfaces of nature and man, impairs our resolve to act.

Were the effects like in the 2004 flick, *The Day After Tomorrow*, with a tsunami covering Manhattan, whoever would be left would have no doubts and no qualms about the most aggressive climate change plans. Fortunately, the drama of climate change is less dramatic. But that just means that climate change's call to us to act, decisively so, is deceptively less than clarion.

The effects are nowhere as clear as in that film. Yet, and here's the crux of the matter, the costs, the disruptions, and the risks of forestalling the effects are quite clear.

One can for instance propose a transmission project crossing states to enable thousands of megawatts of clean generation capacity. We all know what

happens next. The conversation immediately turns to its expense, its community opposition, and alternatives real and imagined. The talk about its role countering climate change is inevitably drowned out (pun intended).

As if we have all the time in the world. As if it is acceptable, indeed as if it is completely without consequence, that the time from the drawing board to grid interconnection for such a project is rarely less than a decade. And whenever the time is less than a decade, a rarity, it is so by precious little.

The origin of the problem can be found during the Richard Nixon Administration over a half century ago. A growing environmental movement

(*Cont. on page 54*)



Steve Mitnick has authored four books on the economics, history, and people of the utilities industries. While in the consulting practice leadership of McKinsey & Co. and Marsh & McLennan, he advised utility leaders. He led a transmission development company and was a New York Governor's chief energy advisor. Mitnick was an expert witness appearing before utility regulatory commissions of six states, D.C., FERC, and in Canada, and taught microeconomics, macroeconomics, and statistics at Georgetown University.

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Getting IRAIJA Funding

Conversations with AEP Senior Vice President Matthew Satterwhite,
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U.S. DOE Grid Deployment Office Chief of Staff Whitney Muse,
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Idaho Office of Energy and Mineral Resources Administrator Rich Stover,
Idaho Power Senior Manager of Operations Support Melissa Boyd



he Inflation Reduction Act's \$370 billion in clean energy investments, effective August 2022, are designed to accelerate private investment in clean energy solutions in all sectors of the economy. That includes strengthening supply chains from critical minerals to efficient electric appliances, and ensuring the U.S. leads the way in climate change efforts.

The IRA builds on the foundational climate and clean energy actions in the Infrastructure Investment and Jobs Act or Bipartisan Infrastructure Law, effective November 2021. The IIJA authorizes \$1.2 trillion for transportation and infrastructure spending, with five hundred fifty billion going to new investments and programs. That includes billions to modernize the electric grid, build a nationwide network of electric vehicle chargers, strengthen the battery supply chain, invest in new clean energy and emissions reduction technologies, improve resilience, and more.

Here, Public Utilities Fortnightly's Paul Kjellander examines the federal funds coming into the energy and utilities space and how State Energy Offices are playing a role. Listen in as he talks to the experts who are already dealing with the big funding issues, for there is much to learn.

Matthew Satterwhite

American Electric Power Senior Vice President

PUF's Paul Kjellander: As a utility that operates in eleven states, what are the challenges from this unprecedented level of federal funding and tax incentives for a company like yours?

Matthew Satterwhite: You want to keep things as local as possible, even when funding comes from the federal government. You want to make sure, first, that you are partnering with your local public utility commission to understand what they want, so what you're bringing to them fulfills their energy policy objectives and needs.

Since we're in eleven states, it's eleven different processes. Part of the issue for a large company is the administrative cost of looking at it so many ways, through so many lenses.

A lot of funding the federal government has made available has specialized, unique requirements for certain areas of the country. We're in Appalachia, we serve Native American lands, we have different areas that we have to make sure we're specialists on as we move forward.

It's not easier because we're bigger. It's more difficult because we can't assume one thing and move on. We must look closely at everything, but we also have more opportunities.

PUF: What are you doing that's a bit different now as you're navigating through this new scenario with more federal funding, programs, and tax incentives?

Matthew Satterwhite: We've established teams to make sure we're focused on this. We're busy with all the headwinds facing the industry overall. Just like others in the industry, absent all of this availability of federal support, there's still a lot of attention needed to stay focused on our core work that we normally do.

We stood up a team that was focused on this to make sure we could take advantage of these opportunities. A lot of the deadlines

Since it's competitive, you can't be sure you're going to get it. Putting the applications together costs us staff resources, time, and funds to hire experts to help us put together strong applications.

come quickly in this space. The portal opens, you've got to act, and you've got limited time to get something in.

Trying to find consultants who can help you is difficult too, because everybody in the country is applying for the same funding. It's not just utilities. Others are trying to get their noses in to say, "Hey, we could be a part of this and provide this to utilities." When this much money is on the table, it sparks a lot of interest.

I lead our regulatory team. I make sure that, even though there's a team focused on this, what does that mean for the regulatory side? What are we saying to the federal government that maybe would not put our state or request in the best light?

When we're trying to get a grant, we make sure we're reviewing these over a short period of time because we want to be consistent with what our commissions and our states' leaders want to achieve with their energy policies.

PUF: Are there some federal programs that are starting to rise to the top, which seem to make a little more sense for a large utility like yours?

Matthew Satterwhite: There's a lot. It's so broad. It depends



Sometimes when there are official proceedings in front of a commission, people go to their corners and think it's time to fight. This isn't what that is.

This is about consumer groups, commissions, utilities, all being on the same page to make sure you can leverage federal funding to help customers.

on which state you're looking at. With assistance for emerging clean generation technologies, we have a lot of territory in the Appalachian region in the east, and there're some special items in there that allow us to explore these opportunities and make sure the region remains a part of our energy future.

We're looking at all of those to make sure that we can keep our communities strong. Most utilities, when they have plants or generation facilities, have built them in areas where the plant becomes the backbone of the community. You can't just walk away from that and leave the community behind.

You look at that as you move forward, not just the core

Z can happen," you have a much better chance of getting that funding and being successful for customers.

PUF: It appears money alone won't resolve the infrastructure needs of the nation. Are there other considerations, other challenges? Are there potential problems as funding rolls out?

Matthew Satterwhite: Yes, we've got to make sure we have a cohesive policy that lasts through multiple administrations. It's difficult to start and stop and start and stop.

So, clarity, and that's where those dockets can help, with ensuring we are all on the same page. We always joke a bit about the exercise of, "Hey, bring me a rock." Then you take a rock with

function of making sure you have capacity for generation, but what are you doing to make sure you're building that community, bringing jobs, adding reliability, or extending technology to the region, all making sure it can be strong overall. Because a healthy community means you have a healthy utility, so you want to make sure they go hand in hand.

PUF: Some commissions around the country have opened dockets. Is that something that's been beneficial as you look at moving forward?

Matthew Satterwhite: Yes. Any communication is good. So, we have a better idea of where we stand. It also provides a venue to make sure that everybody's at the table.

Sometimes when there are official proceedings in front of a commission, people go to their corners and think it's time to fight over something. This isn't what that is. This is about consumer groups, commissions, utilities, all being on the same page to make sure you can leverage as much of the federal funding to help customers in your territories.

Our approach is: "Hey, here's what we want to do. If we can get this, how fast can we move so that we have a better chance?"

A lot of the federal grants and loans are based on your move to the top of the stack essentially, if you can show you're going to be able to use the funds quickly.

If you're lined up within your state, and your consumer advocates, commission, and everybody else are saying, "Yes, if you get X, we will move to Y, and then

a new program, and someone says, "That's not the rock I want. Bring me another rock." The utility's left with always saying, "I hope this is the right rock."

If we're talking more about where we want to end up, it's a lot easier to solve problems versus bringing programs that are found inadequate without real guidance on what is needed. We want to be efficient and not hear, "Well, that's not what we want. Go try again."

While the money's great, if we don't have focus, we don't know if we're spending the money in the right way. Getting that cooperation, being on the same page with everyone is vital.

We also need to remember that some of this comes with huge administrative costs. You think it's easy money, but is it really when it takes a lot of work to qualify and to comply once you get that money? You have to consider the administrative costs to operate and maintain the facilities, whatever they may be.

Sometimes you must apply for it, and since it's competitive, you can't be sure you're going to get it. Putting the applications together costs us staff resources, time, and funds to hire experts to help us put together strong applications.

We're trying to move forward and say, "Let us do this to save money for customers, while understanding there's a lot of competition, so this might not come to fruition."

Working together helps create an understanding that, yes, it's worth using these resources and it's worth taking that risk. The stakeholders working together can move forward with confidence.

PUF: One of the unintended potential consequences is increasing that backlog of renewable projects and with a deeper interconnection queue.

Matthew Satterwhite: It's that concept of more players involved because there's more money on the table. Remember, the queue is already five years behind. There are 2017-2018 projects waiting in almost all the queues.

It's not projects that someone decided recently to get involved with and enter into the queue. It takes a while to get through that process. But the federal funding potential puts more focus on what the queue is.

We've got to find a way to take the load-serving entities that have a capacity responsibility and give them some advantage in the queue. AEP has raised that possibility.

If you have the public responsibility and penalties associated with providing that capacity, but can't get access and can't do any self-help, because in 2017, you weren't thinking about the increase in reserve margins and everything else, there's got to be a way to help load-serving entities navigate the queue.

Also, what you see in the queue right now is mostly renewables

due to the lack of fuel costs. What aren't renewables, are other resources already promised somewhere, and you can't get access to those. There's a resource adequacy question, of if the state policy is to have some diversity of fuel, but everything in the queue is renewable, how do you bring that diversity in?

Potentially the federal dollars can help, but we've got to have consistency and cohesiveness of policy to make sure we're chasing resource adequacy and not developing tunnel vision. We need to be thinking about the overall picture.

PUF: Are there any recommendations that might help resolve that in terms of a more cohesive policy?

It's that concept of more players involved because there's more money on the table. The queue is already five years behind. Federal funding potential puts more focus on what the queue is. We've got to find a way to take load-serving entities that have a capacity responsibility and give them some advantage in the queue.

Matthew Satterwhite: Conversation is always good. Queue reform is needed so we can apply the policy in a better manner. I don't think it was contemplated that there would ever be time with so many projects in development at once.

Entities that have capacity responsibility must be given more rights to make sure they're protecting customers at the lowest cost. There're people in the queue who paid their cost to be there and are doing what they're supposed to do, but don't have the penalties and the public responsibility to make sure that capacity is there.

Maybe we can develop different rules to help them through the queue so customers can maintain the lowest cost and get what they're paying for.

PUF: It sounds like transmission is still a key piece of the puzzle, and probably the biggest problem that needs to be resolved.

Matthew Satterwhite: A good transmission system and a policy across the country is going to deliver power more efficiently and cheaply across a broad area. If we can commit to that and all the states can agree on how we're going to run that, that is a way to help customers, lower congestion, and deliver energy from the areas where it's most efficient to put the renewables to the areas that need it most. ○

In the west, the average electric bill when a home is less than 1,000 square feet was \$64 monthly. The average bill when a home is more than 3,000 square feet was \$143.

David Terry

President – National Association of State Energy Officials

PUF: How would you describe the potential impact of the funding programs that have been set up to implement and accelerate energy projects?

David Terry: It is historic, and both Congressional actions, the Infrastructure Investment and Jobs Act and the Inflation Reduction Act – particularly the tax components of the IRA, are game changers for modernizing our energy system.

PUF: Which funding buckets have the most direct impact on states and state energy officials who are part of your membership?

David Terry: At a high level, what's different about the IIJA and IRA from, for example, the American Recovery and Reinvestment Act (ARRA) of 2009, is the number of programs and size. The vast majority of the IIJA and IRA programs are targeted, competitive actions that will need to be knitted together by the states, private sector, and local governments. It's a tough task.

In contrast, ARRA was primarily delivered by formula through several large energy programs that gave states great flexibility in meeting local market conditions. The IIJA and IRA means a massive increase in the number of federal energy procurement actions.

While extremely large-scale competition can be good, it comes at a cost of time, procurement resources, and inadvertently creates silos across infrastructure programs. That leaves our members with the task of navigating and assembling the program elements of transmission, distribution, storage, electric vehicle charging infrastructure, and codes, along with the private sector and local governments to create more value.

States' abilities to accomplish that task is due in large part to one flexible bipartisan program funded under the IIJA, the five hundred-million-dollar State Energy Program. In the scheme of these bills, SEP is a modest amount of money, considering it is spread across all states.

However, Congress designed SEP with the idea that governors need flexible funds to plan and implement energy programs and policies tailored to energy opportunities. Collectively, this adds tremendous value to federal energy investments in planning, innovation, and infrastructure.

The IIJA-provided SEP funding from the U.S. DOE began arriving at State Energy Offices the last week of April 2023 and we anticipate all states will receive these funds over a two-month period. The SEP funds support State Energy Offices as they work across their energy sectors.

States then knit policies and projects together across sectors in ways that address innovation, resilience, climate, and economic

Among the larger programs under IIJA, electric vehicle charging infrastructure is important to states.

Over \$5 billion is provided to the State Departments of Transportation, typically in partnership with State Energy Offices, to establish a national electric vehicle charging network.

goals. The pieces of competitive money that will go out from federal agencies to the private sector, local governments, and states are silos of opportunity – challenges – that address markets that generally don't operate in silos. SEP funds are foundational to the IIJA and IRA working for American consumers and businesses.

Other critical pieces under the IIJA are the Section 40101(d) \$2.5 billion in grid resilience funds, managed by State Energy Offices, with another \$2.5 billion competitively awarded to utilities. DOE required governors to decide which state agency should oversee formula resilience funds.

In about ninety percent of states, the governor selected the State Energy Office because they are suited to work across utility types, state, and local agencies, and they often lead state energy security planning. There are additional IIJA grid resilience funds, all of which are competitive.

In grid resilience, \$2.5 billion is and isn't a lot of money. From a taxpayer perspective it's a great deal of money but given the amount of electric infrastructure, it simply makes for a great start.

These funds are a game-changer in that it's getting large and small utilities – and mission critical end-use facilities – to think more about resilience and how they spend their customer-derived funds, as well as state and federal resources.

Among the larger programs under IIJA, electric vehicle charging infrastructure is important to states. Over five billion dollars is provided to the State Departments of Transportation, typically in partnership with State Energy Offices, to establish a national electric vehicle charging network.

There are additional billions in funding for other vehicle electrification elements, such as school buses and community charging. This program is administered by DOE and the U.S. Department of Transportation under a Joint Office.

NASEO and the American Association of State Highway

Transportation Officials partnered with DOE and DOT under an MOU and cooperative agreement to support states' work in implementing these programs. All acted rapidly to complete electric vehicle charging infrastructure plans and move funding to states. There are challenges and much work remains, but this program is a federal-state success story under the IIJA and those making it work deserve thanks.

Another major chunk of energy funding, the IRA tax elements, comprise as much as two-thirds of the entire spending under the bill. These credits cover electric generation, carbon management, hydrogen, nuclear, efficiency, manufacturing, and more over a ten-year period.

The IIJA-funded U.S. State Energy Program, SEP, which each of the fifty-six State and Territory Energy Offices oversee, is the only flexible federal energy funding out of the IIJA and IRA. SEP funding helps braid these opportunities into meaningful actions and investments for states.

The State Energy Offices work closely with public utility commissions and utilities to think through what these energy opportunities mean for state residents and how they can meet goals set by governors and state legislators.

PUF: Is it becoming clearer what the role of states will be as these federal programs continue to roll out and mature?

David Terry: It is, and it varies by state. From our members' perspectives, they're dealing with a number of highly visible programs that the private sector and everyday citizens hear about in the news media.

The State Energy Offices are primary point of planning for the state on most of these programs; hydrogen hubs, carbon capture and utilization, residential energy efficiency rebates, energy security, and critical energy product manufacturing and supply chain, to name a few. Some issues require immediate attention, others are mid- and longer-term opportunities.

For example, the hydrogen hubs attracted a tremendous amount of private sector, governor, and multi-state interest. The State Energy Offices in each region helped shape and lead the state portion of the eight-billion-dollar hub application process now underway.



The State Energy Offices are primary point of planning for the state on most of these programs; hydrogen hubs, carbon capture and utilization, residential energy efficiency rebates, energy security, and critical energy product manufacturing and supply chain, to name a few. Some issues require immediate attention, others are mid- and longer-term opportunities.

That's an immediate role that involves policy and planning. If successful, long-term implementation and policy support roles also. It's a great opportunity for them to reach out to their public utility commissions to help inform them about the potential impacts of these programs on their states.

There are a few other near- and mid-term programs with a substantial state role, such as the residential energy efficiency rebates and carbon capture and utilization funds. State officials are managing their time and resources among these priority activities.

One of the State Energy Offices' more important roles is

informing their governors and legislatures about the relative value of different options so that resource, policy, and management decisions can be made to benefit the state's residents.

About one month ago, I briefed a group of congressional staff about what the states thought of IIJA and IRA opportunities and how things are progressing. During the presentation, one staffer said, "What can our offices and our bosses do to help?" I said, "it's critically important for your offices to help set timing expectations for the public regarding delivery of these programs and associated funding."

By design, most of these programs were not intended to be rushed out the door and must be thoughtfully prepared to address once-in-a-generation energy infrastructure, economic, and climate challenges. These funds must produce good value for the nation and the states.

Our federal agency partners, State Energy Offices, state utility commissions, and businesses must have time to work together and with other state leaders to position these funds to maximum benefit.

PUF: Are you beginning to see best practices or common threads among states as they start to move these programs forward?

David Terry: Yes. Across a wide range of states politically and geographically, governors have appointed staff and agency leadership to work together, look across opportunities, and inform decisions on which opportunities to pursue. They may be acting from an economic development perspective or maybe it's climate lens or both.

I had the privilege of participating in a Louisiana state government meeting a year ago that brought together agency leaders to strategize on how best to support their states' consumers and businesses in accessing IIJA funding for energy infrastructure improvements. They looked across state agencies and worked with local governments to make sure as many Louisiana-based companies and residents could take advantage of the IIJA as possible.

I've seen this approach repeated in most states. It is not the kind of story that jumps to the front page of the news, but it should. It is an example of the government working well for nearly everyone.

Recognize that states are careful with their spending and look for value. It's tough to hire people whether you are a state agency or a private-sector entity.

The good news is we have seen state legislatures and governors across the political spectrum approve hiring by State Energy Offices because they recognize the value in capturing these resources for their states. They want the best energy infrastructure to deliver cleaner, affordable energy now and to prepare their states for the future.

PUF: How important is it for utilities and stakeholders to follow what's happening at the state level regarding the role of the State Energy Offices?

David Terry: It is critically important and there are several reasons to follow State Energy Offices closely. First, the State Energy Offices are in the catbird seat in looking across all energy elements of the IIJA and IRA led by different federal agencies, such as DOE, DOT, USDA, and EPA.

For example, there are two billion dollars in renewable energy programs for farmers, ranchers, and small rural communities, with another ten billion in grant and loan funds from USDA. And EPA has twenty-seven billion in financing funds for clean energy projects. State Energy Offices typically have the lead relationship with DOE on access to the grid resilience and transmission funding – billions – that investor- and consumer-owned utilities can utilize.

An important change happened after passage of the IIJA and IRA, one that was not a factor during development of these bills, which is higher interest rates. We've had the most rapid rise in interest rates in U.S. history and that's made a lot of capital-intensive projects look different than they did a year or two ago.

Another reason for utilities to work more closely with their State Energy Offices is to utilize them as a convener on challenging energy issues and opportunities that may involve non-utility partners. The nonregulatory nature of State Energy Offices allows them to engage in a freer flow of information and from a perspective that includes all types of energy supply and demand options.

State Energy Offices are uniquely positioned to see, and often support, technology innovations in every energy production and end-use sector. Their purview often includes opening markets, convening businesses and consumers to inform governors' policy decisions, and envisioning how energy can create jobs and lower energy costs, while improving the environment.

They see the near- and longer-term future of energy in their states and are amazing resources. NASEO's growing list of private-sector Affiliate Members, including Google, Exxon, Air Products, Home Depot, TVA, Lowes, EEI, AGA, and more, suggests State Energy Offices are important to businesses of all types.

PUF: Talk about how utilities and other parties should be engaging with State Energy Offices, as they look at federally competitive projects moving forward.

David Terry: We're seeing states, such as Michigan, Tennessee, Indiana, New York, and others engaging with

consumer- and investor-owned utilities to discuss grid resilience needs or other IIJA opportunities. Similarly, product manufacturers and retailers, such as Whirlpool, Rheem, Home Depot, and Lowes are talking with State Energy Offices about how to collaborate on implementing the energy efficiency rebate program under IIJA.

The answer to the how part of your question is often through NASEO events or one-on-one calls with State Energy Offices to explore the unique energy landscape of each state.

Another important way utilities should consider engaging their State Energy Offices is around grid planning. In many cases, the State Energy Office has a grid planning role and works in close coordination with the public utility commission and consumer-owned utilities.

If the State Energy Office doesn't have that direct grid planning role, they typically advance energy programs and policies – electrification, security, energy storage, solar – that may have a great impact on the utilities' grid planning and operations.

Often, federal energy officials are aware of the State Energy Office vantage point and call on them to offer guidance on implementation of energy policies, programs, and other matters.

Federal agencies take what the State Energy Office says about energy seriously, which is helpful to their states, and can be helpful to the utilities where views align with state goals.

PUF: If you are serious about a competitive project and State Energy Offices have been direct planning in coordination with DOE, if you want a letter of support from the state, you better develop a relationship with the state energy offices. Is that what I'm hearing?

David Terry: Yes. That's correct, but I would add it's a relationship built on what's in the best interest of the consumers and businesses of the state and goals set forth by the governor. You're competing for something at the federal level and having the state agree it's a valuable project means a great deal.

The State Energy Office is also likely to be in a position to understand where state and federal priorities align. For example, there is a White House committee focused on electrification, mostly in the transportation sector, and how that impacts demand on the grid.

The State Energy Offices are at the center of that issue in many states and can inform utilities about the forward-looking policies and actions they see unfolding. Having that information to inform a utility's competitive federal funding proposal seems important to me.

PUF: A lot of State Energy Offices are getting more money through State Energy Program funds because of increased federal funding. For these state-driven programs, is the benefit to push forward some projects that were on the margins?

David Terry: Keep in mind, those funds are only starting to arrive from DOE to the states, but I think there're going to be

two general types of projects. One is moving projects forward that were on the margins economically but that have a long-term value proposition.

The other, and more typical example, is helping to speed up projects that were contemplated, not fully planned, and wouldn't have happened at as fast a pace or scale without some state support.

An important change happened after the passage of the IIJA and IRA, one that was not a factor during the development of these bills, which is higher interest rates. We've had the most rapid rise in interest rates in U.S. history and that's made a lot of capital-intensive projects look different than they did a year or two ago.

Large infrastructure projects require substantial capital, and a few points of interest rate increase is huge. That may mean some projects fall out, but it'll also mean something that wasn't on

Another important way utilities should consider engaging their State Energy Offices is around grid planning. In many cases, the State Energy Office has a grid planning role and works in close coordination with the public utility commission and consumer-owned utilities.

the margins a year ago is now. For critical energy infrastructure and our long-term security, finding ways to move many of these projects from maybe to a yes has value.

PUF: How are relationships between NASEO and NARUC members across the country? Is this having an impact on dialogue between state energy offices and state regulators?

David Terry: They both have a great deal on their plates, so it's difficult to have as many discussions as they would like but the relationship is positive and valuable. The State Energy Office and public utility commissions are informing each other about important issues and their different roles.

These agencies' actions, taken together, help states move their economies forward. State Energy Offices' forward-looking policy role helps to inform commission decisions, and commissions' expert understanding of electricity markets and rate impacts is critical to implementation of those ideas.

I'll give one example, among many, regarding electric vehicle charging infrastructure. Medium- and heavy-duty electric vehicle infrastructure is being contemplated in several western, mid-western, and northeast states and the electric demand for this infrastructure is at a scale rarely seen.

The State Energy Offices are at the forefront of this work with vehicle manufacturers and end-users and their view of the pace and potential outcomes can be enormously helpful to commissions.

Similarly, the state commissions are uniquely positioned to understand the potential rate and reliability impacts of these new loads on all consumers. The synergies are greater than ever for the NASEO-NARUC partnership, in my view, and reflect the value of the new NARUC-NASEO partnership in the nuclear energy area.

PUF: How long will this new surge of federal funding and the programs associated with it be top of mind for NASEO?

David Terry: Certainly, for the next several years and likely

longer. As we get a few years out, the implementation actions will become more routine.

However, we will also see what adjustments are made to programs to reflect new information, market changes, and lessons learned. Many of these programs are highly visible, can't-fail actions and the states take that challenge seriously.

The element of these two bills that may be most important and that more public and private leaders should focus on are the energy tax credits and incentives. These incentives are already starting to reshape portions of our energy system. It is critical for the public and private sectors to work together to ensure we deliver value for taxpayers and lay a solid foundation for our energy future. ○

Illinois Commissioner Ann McCabe

PUF's Paul Kjellander: Why is it important for state utility regulators to be following federal energy dollars and incentives coming from IIJA, the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act?

Commissioner Ann McCabe: For several reasons, including that the IIJA and IRA are helping us develop standards and best practices as we move to an electrified transportation sector.

With decarbonization goals, federal funds will help us implement clean energy goals set by major legislation in 2021. We're striving to be net zero by 2050 and have an electric vehicle goal of one million electric vehicles by 2030.

PUF: Could you elaborate on how those federal funds are helping with some of those standards and best practices?

Commissioner Ann McCabe: That's still a work in progress. We are working with utilities and state agencies to identify opportunities. In Illinois, we have an Illinois Finance Authority.

They're our green bank and were awarded a big chunk of money over the next few years. They're providing technical support for grants, such as the 40101(d), GRIP, HOMES, EPA Greenhouse Reduction Fund, and other programs that directly relate to the grid's energy efficiency, renewables integration, and electrification.

The IFA is involved in our state's interagency EV working group that includes our Environmental Protection Agency, Department of Natural Resources, Department of Transportation, the ICC, and state EV coordinator, among others.

This group is identifying and applying for as many grant opportunities as possible in the IRA and IIJA that can promote deployment of EVs and EV charging infrastructure. This group is collaborating to identify state-owned sites to deploy EV charging and to accelerate the process of electrifying the state's vehicle fleet.

PUF: It sounds like the Illinois Commerce Commission is playing a facilitative role with other state agencies that are seeing some of this money coming in.

Our staff regularly meets with other states and the federal government to learn about new funding opportunities. The ICC can't apply directly for grants, but we're working closely with other agencies to provide the technical assistance needed as they apply for those grants.

Commissioner Ann McCabe: The ICC staff sit on the inter-agency electric vehicle working group. Our staff regularly meets with other states and the federal government to learn about new funding opportunities.

The ICC can't apply directly for grants, but we're working closely with other agencies to provide the technical assistance needed as they apply for those grants.

PUF: You want to ensure they're aware of broader policy implications of importance to the State of Illinois as it relates to energy and the utilization of these funds.

Commissioner Ann McCabe: Yes. There's a lot that various groups have written about the states' and PUCs' roles on IIJA and IRA. I particularly like the point that Advanced Energy United made, that states can be effective by focusing on a few things and looking for ways to weave multiple federal and state programs together.

PUF: It's what can we target?

Commissioner Ann McCabe: Right, and that's going to vary from state to state depending on their priorities.

PUF: The Illinois Commerce Commission is one of a long list of states that have opened official dockets related to this funding

and potential impact. What's behind the need to create a formal process?

Commissioner Ann McCabe: Over a year ago, we did a notice of inquiry on the IIJA in part to find out what other groups, utilities, and stakeholders were thinking about applying for, as well as to ask them what we should be thinking about, both as the Commission and as the State, and eleven entities responded.

That information helped inform us of the opportunities for the state, investor-owned utilities, munis, co-ops, and provided more information on the different kinds of grants for which the state was eligible, and what grant opportunities can help with our CEJA – Climate and Equitable Jobs Act – legislation goals.

In addition to that NOI report, we also have inter-agency work groups that are talking regularly and working with the Illinois office in Washington.

PUF: As an individual Commissioner, what do you hope can come out of this in three, four, five years?

Commissioner Ann McCabe: We're hoping that utilities, agencies, and other organizations seek and secure some of these grant opportunities, which will help the state do a lot of what we're trying to do and supplement existing funding.

PUF: What do you see as the highest priorities as you look forward and perhaps what this money could do for the State of Illinois?

Commissioner Ann McCabe: Help on electric vehicle infrastructure and other measures that help achieve our clean energy and decarbonization goals. EV infrastructure alone is complex and requires different solutions.

Fast charging on highway interstates could have different impacts on the grid than installing chargers in multifamily buildings in urban centers like Chicago. The federal funding will make this work possible, but still requires significant effort by state, utility, community, and consumer advocates. Coordination is crucial.

At the same time, we have to ensure that this new charging infrastructure coming on the grid doesn't threaten the cybersecurity of the grid. Our Director of Cybersecurity and



Over a year ago, we did a notice of inquiry on the IIJA in part to find out what other groups, utilities, and stakeholders were thinking about applying for, as well as to ask what we should be thinking about, both as the Commission and as the State, and 11 entities responded.

Risk Management has been working closely with the federal government, utilities, and other states to develop best practices for utility vendor screening processes to ensure that any chargers deployed through utility programs don't pose a threat.

PUF: What's your sense as your utilities are looking at this unprecedented opportunity for funding?

Commissioner Ann McCabe: It varies. One large utility submitted four concept papers under the IIJA and we're encouraging another one to think about opportunities.

PUF: Are there words of caution or encouragement that you could offer?

Commissioner Ann McCabe: I encourage states to coordinate with their sister agencies and their Washington office, if they have one. There are great resources and analyses coming out of various groups on what the states can be thinking about due to this influx of federal funding.

PUF: Energy efficiency is a big piece of this. How important is it to see more money coming in for energy efficiency?

Commissioner Ann McCabe: Well, we often hear efficiency is the first fuel and there's still a lot more to do on energy efficiency. I'll give you an example.

In Illinois, before we passed CEJA, The Cook County Community and Economic Development Association, CEDA, said that the deferral or walkaway rate from energy efficiency

applicants was up to thirty-nine percent. That's due to needs for things like roof repairs or mold reduction, and CEJA provided funding in those areas.

We call it health and safety funding. That helps low- and moderate-income homes and multi-family buildings qualify for weatherization and efficiency that they wouldn't otherwise be eligible for. My understanding is that federal funds do not include health and safety-related support.

PUF: Some of this money may prompt trying to find additional funding for some of the first line of activities that need to occur so you can more fully take advantage of federal funds that are coming.

Commissioner Ann McCabe: Right. ○

Phil Moeller

EEI EVP – Business Operations Group and Regulatory Affairs

PUF: There are a lot of federal funding opportunities and incentives that could impact some of your members. How do you keep that straight?

Phil Moeller: We have a team at EEI focusing on that, as there are many new programs being implemented. The Department of Energy is reorganizing and staffing up to help facilitate them all.

Our team is following all the developments, whether requests for information or proposals, guidance, and rules that come out of various agencies. They are on it almost full time in keeping our members updated as to what's happening, and when and how to be involved in the process.

PUF: Which one of these incentives and funding opportunities seem to be generating the most interest with EEI member utilities?

Phil Moeller: The National Electric Vehicle Infrastructure – NEVI – program for charging infrastructure got a head start on some of the others. Our team has been working with the Joint Office of Energy and Transportation to make sure we're facilitating relationships with the states that will be dispersing those funds and setting the policies for EV charging.

That one got a quick start from the beginning. Also, a lot of progress on efforts to bring broadband to unserved and underserved communities.

PUF: For broadband, you are talking about the middle mile piece of the puzzle?

Phil Moeller: Yes. That's the middle mile, where our member companies could, at low incremental costs, add additional capacity for fiber optics that then can be used for the last-mile companies that would be providing the service.

A lot of times though, there are state policies involved – they could be related to rights of way or easements – and sometimes those require state legislation to be clarified so this can be done.

As soon as the Bipartisan Infrastructure Law passed, EEI quickly shifted our focus to becoming the central hub where our member companies can learn about and keep track of all the funding opportunities.

But there has been progress made in several states to resolve that potential set of conflicts and move forward with making broadband access more universal.

PUF: People may look at some federal funding mechanisms and if it doesn't say energy, may not look further. Not all the incentives in these packages are perceived to be intuitive funding mechanisms for energy utilities.

Phil Moeller: That's why it's important that we have a team that knows the details, can follow up, and provide information to our member companies and the state regulators, who of course have a critical role in the implementation process.

Not just state regulators, but other state agencies, some of whom may not have experience in this area. A lot of these opportunities are ones where you must partner with a third party, so facilitating those conversations and making those connections is critical to ensuring states are ready to apply for funding opportunities when the application windows open.

PUF: How is EEI helping members navigate through funding opportunities?

Phil Moeller: As soon as the Bipartisan Infrastructure Law passed, EEI quickly shifted our focus to becoming the central

hub where our member companies can learn about and keep track of all the funding opportunities. We've been sending our members weekly updates, hosting webinars, and are about to host our third in-person Implementation Summit.

These resources are helping our members easily navigate this set of new opportunities that may require developing new relationships with state agencies that our member companies aren't necessarily used to working with.

PUF: With state energy officials, state energy offices, some states running programs through their Department of Commerce or elsewhere, it could mean new relationships for utilities. Is it time for utilities to pay more attention to other state agencies?

Phil Moeller: I think it is, and electric companies are quite aware of that. The challenge is that each state is going to do things its own way, and that may involve agencies that companies work with on a regular basis, or ones they've worked with but never on significant funding opportunities under tight deadlines.

So, making sure that each company approaches their state in the way that their state is approaching these funding opportunities is part of the challenge, but ultimately, it's a good situation to have versus not having it.

PUF: Public service commissions have open dockets related to funding opportunities and are looking to the utilities. What are you seeing?

Phil Moeller: Our state regulatory team has been following this very closely, and we have a compilation of what various states have been doing. About half the states have opened an inquiry or a formal docket in looking at this. There are other states that they're paying attention to, of course.

PUF: What are you seeing as far as state regulators who have open dockets related to the funding and the utilities they regulate?

Phil Moeller: State economic regulators, roughly half of them, have had some kind of open proceeding that, as of now, deals with these issues. It's important that our member companies continue to keep that information coming as these programs are developed.

PUF: It's clear that one size doesn't fit all and that's making it more complex.

Phil Moeller: That's right. States are taking their own unique approaches toward these. Some of them, again, without even



My hope is the focus will be on infrastructure, at the transmission level and increasingly the distribution level. That is as we look toward more electrification, more demand, and need to build out infrastructure, while having visibility into systems, notably the distribution system, so as the system evolves, we can maintain reliability.

having the formal type of proceeding open, are still interested in what the opportunities are as they develop.

PUF: What are your thoughts as far as how utilities need to be interacting with state regulators, whether there's an open docket or not?

Phil Moeller: It's going to probably depend on the specifics of each program. As I mentioned earlier, some of these will require partnerships, either with agencies or with third parties, and so

knowing what opportunities are out there and with who, is going to be important.

PUF: Are you seeing any numbers come in, anything encouraging in relationship to how all this is coming together with utilities and states?

Phil Moeller: Well, we're talking about a lot of money here, and twenty percent, which is thirty-four billion of the one hundred seventy-one billion dollars in electric sector-relevant, five-year funding opportunities that were released in calendar 2022. Sixty percent of which electric companies were directly eligible to apply.

That's quite a lot of funding. Also, notable electric sector-relevant grant programs included the middle-mile broadband grants, one billion dollars for regional clean hydrogen hubs of seven billion, and 3.8 billion dollars in fiscal year 2022-'23 funding for grid resilience and innovative partnerships, often called GRIP funding.

PUF: You mentioned a lot of these funding opportunities require partnerships, and I'm assuming EEI is being approached by vendors. What are you seeing to help navigate that space?

Phil Moeller: There are some unique areas required that have been embraced in the past by electric companies but are more formalized now. For instance, some of these issues related to cost sharing, the Justice40 initiatives, and the public-private partnerships.

There're the Buy America provisions and investing in the U.S. workforce requirements. So, those are areas that are very important and may require a renewed effort to ensure that the requirements in the funding packages are met.

Again, even though many of these areas are ones that electric companies have prioritized in the past, the more formal nature of addressing these issues is new and will require focus to make sure that they're complied with.

PUF: As the money and programs develop and mature over several years, there are unknowns that could be a niche that EEI can help navigate through.

Phil Moeller: Absolutely. Overall, whenever there's a new federal program, and in this case, there are lots of them, EEI's team gets to work evaluating and summarizing the opportunities for our member companies and the customers and communities they serve.

Also, making sure the expectations of regulators and customers are aligned with the required legal implementation of these programs so that everything is done correctly. But again, newness,

and need for the federal government, and in some cases state governments, to increase staffing to manage these programs, and so realize it may take some time to get things rolling.

The great opportunity in these projects is that the funding is out there, but patience will be important so that expectations are in line with the reality of how these programs are implemented.

PUF: What do you hope this new era of funding might result in, and are there any words of caution?

Phil Moeller: The caution, as I mentioned earlier, is to make sure that stakeholders have the right amount of patience as these programs get up and running. Of course, we all want these programs to be effective and we want to ensure these investments are responsible, since they are taxpayer dollars.

My hope is that the focus will be on infrastructure, both at the transmission level and increasingly at the distribution level. That

The caution, is to make sure that stakeholders have the right amount of patience as these programs get up and running.

is as we look toward a future of more electrification, more demand on the system, and the need to build out the infrastructure, while having the visibility into the systems, notably the distribution system, so we can assure that, as the system evolves, we can maintain reliability.

Then there's always that issue of the right structures, if customers are given the right rate signals. This can be a huge opportunity where it's a win for everybody, using our infrastructure more efficiently.

In other words, shaving peak load, moving that load into low-peak times when prices are typically lower. That is so we can maximize use of the existing and expanded infrastructure in the most efficient way, which has the potential, particularly with electric transportation, of lowering overall household energy expenses by shifting largely from petroleum to electricity in the transportation sector, but it's not limited to that.

So, it'll be a lot of work for a lot of people to make sure that customers get the right signals to consume at the most efficient and appropriate times as we electrify more of the economy. ○

Some states like California, where residential electric bills were a small percentage of expenditures on all goods and services, were Colorado, Illinois, Massachusetts, New York, New Jersey. In all these states, residential electric bills were around one percent of expenditures on all goods and services.

Some other states like Alabama, where electric bills were a considerably greater percentage of expenditures, were Mississippi, Louisiana, Georgia, Texas. These are generally states with relatively high air conditioning usage per household. And relatively low income, and hence relatively low expenditures on all goods and services per household and per capita.



Whitney Muse

U.S. DOE Grid Deployment Office Chief of Staff

PUF's Paul Kjellander: Share a high-level overview of some of the energy funding programs related to the IIJA and other federal funding mechanisms that will impact utilities and regulators?

Whitney Muse: It's an exciting time to be at the U.S. Department of Energy. Through President Biden's Bipartisan Infrastructure Law, or BIL, the Department of Energy got sixty-two billion dollars of funding, and the Inflation Reduction Act, or IRA, added another thirty-five billion dollars across the portfolio, principally for demonstration and deployment activities.

In the DOE's Grid Deployment Office, or GDO, we're focused on grid resilience investments, keeping clean generation assets online, and all aspects of transmission deployment. Across those three areas, GDO received twenty-two billion dollars from BIL and another three billion through the Inflation Reduction Act.

However, DOE is not the only agency to receive high-level energy funding through BIL and IRA. There are additional federal dollars and potential programs that could be of interest to public utilities.

There are over ten billion dollars available through the U.S. Department of Agriculture through the Rural Utilities Service and the Rural Development portfolio of IRA-funded programs to help the rural co-ops transition to cleaner sources of energy and make upgrades to their generation and transmission assets.

The Environmental Protection Agency has a number of programs, including the Greenhouse Gas Reduction Fund, a twenty-seven-billion-dollar program to accelerate deployment of clean energy financing. For those of you in states with Tribes, there's additional funding for Tribal electrification at the Department of Interior.

This is just a snapshot of programs across the federal government that address energy funding. Now back to what I know best, the GDO. To start, we have programs for grid resilience, including competitive grants through the Grid Resilience and Innovation Partnership Program or GRIP, a ten and a half billion-dollar program running over five years to enhance grid flexibility and improve the resilience of the power system against the growing threats of extreme weather and climate change.

GRIP is a combination of three different BIL-funded programs that work toward those same grid resilience and innovation goals. For states, we also have the State and Tribal Grid Resilience Formula Grants, and that's 2.3 billion dollars over five years to strengthen and modernize the power grid against wildfires, extreme weather, and other natural disasters that are exacerbated by the climate crisis.

These programs accelerate the deployment of transformative

GRIP received more than 700 concept papers for the first round of funding.

That's an extraordinary level of interest and signals that the direction we're going in standing up the Grid Deployment Office and implementing these programs, is resonating with the broader public.

projects that will help to ensure the reliability of the power sector's infrastructure, so that all American communities have access to affordable, reliable, clean electricity.

The formula grants were open for the first two years of funding for States and Territories through May 31, with an August 31, 2023, deadline for Tribes.

PUF: It's a lot to organize, so how are these programs progressing? Is it becoming a little more manageable now?

Whitney Muse: Staffing up and increasing the resources available to help execute these programs is helpful. We also are at the point where all our BIL-funded programs are either currently open for applications or applications received are being reviewed.

Now, we also are better able to understand what States, Territories, Tribes, utilities, and industry are interested in with this funding. The ability to get our arms around the interest helps to inform how the programs are evolving.

We're seeing keen interest from States and utilities for these programs. For example, GRIP received more than seven hundred concept papers for the first round of funding. That's an extraordinary level of interest and signals that the direction we're going in standing up the Grid Deployment Office and implementing these programs, is resonating with the broader public.

I talked about grid resilience programs, but the other big swath of activities that will be of interest to utilities and to regulators are our transmission programs.

Right now, we're reviewing applications for our \$2.5 billion revolving fund, the Transmission Facilitation Program. Support from this program will help to overcome some of the financial hurdles facing large-scale, new transmission development or upgrades to existing projects. We also have programs that can help address some of the siting and permitting challenges that go along with transmission.

That's often something that is a hindrance to the evolution of these projects. For example, earlier this year we issued a Request for Information for our Transmission Siting and Economic Development Grant Program, another tool to help address the broader grid and transmission challenges. We're currently reviewing responses and standing up the program.

PUF: What is it you're learning so as you start to take those next steps, you can make midterm corrections or take advantage of what you're learning?

Whitney Muse: We've had an opportunity to get lots of feedback from the public through a variety of ways. All these programs started with a request for information where we received written feedback. We've done a number of webinars or listening sessions about the programs to get input from the public as well.

As we are standing up these programs, we are bringing forth the Department's knowledge, while also recognizing that program success requires public stakeholder input and industry and community collaboration.

We're seeing that through the life cycle of these various programs. We're also learning that as we go through the first round of funding, that process allows us to learn where there are areas we may want to target a bit more narrowly and with more definition.

We supplemented written responses with webinars and listening sessions to get more public feedback. We've also engaged at the national and regional meetings for NARUC, and other national groups such as NASEO, NGA, EEI, and utility related organizations at a number of events around the country.

We are broadly looking to get feedback as we fine tune and refine the approach to these longer-term investments. We have an opportunity with the BIL and IRA funding to have an influx of capital, and long-term commitments to transmission deployment and grid resilience to support ongoing growth. Evolving and learning as part of these processes is a key piece of success here.

PUF: People need to recognize this isn't a one-time competitive grant program. This is going to roll out over a couple of years.

Whitney Muse: That's the key message we have been putting



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forth. While all of GDO's programs are open mostly for the first round of funding right now, the first round of funding will have multiple funding cycles.

The key difference between the American Recovery and Reinvestment Act of 2009 versus these efforts, is that the Bipartisan Infrastructure Law programs generally have five-year lead times, and the Inflation Reduction Act programs have eight to ten years. DOE has a significant amount of time to implement these programs.

We're also not faced with the immediate push to get funding out the door quickly. We want these programs to make a real impact on the grid across the country.

PUF: What guidance seems to be working best as you start to look at the resources you're able to provide to applicants?

Whitney Muse: One of the key tools that GDO set up was our Grid and Transmission Program Conductor. It acts as a clearinghouse for all of GDO's transmission and grid resilience financing programs, as well as bringing in some of the other existing DOE programs that can also finance transmission and grid efforts.

We created this tool to be a one-stop shop to streamline questions with an interactive format to help guide you to the program that best fits your circumstance. It helps cut through a bit of the noise with there being so many programs available.

We also have a news and events forum both for breaking news and events, and a monthly newsletter that summarizes the work we've done previously, and what is to come to give the public an opportunity to get their arms around the work that we're doing here in GDO.

Those two resources have been well received by States, Tribes, stakeholders, and utilities and are helping them better understand what GDO is putting forth and the opportunities available to them.

PUF: What's your vision of how this would be determined as successful as far as participation from stakeholders and potential applicants?

Whitney Muse: This is not something that the DOE can do alone. We alone can't build out the transmission systems to meet the 2035 and 2050 goals of the Biden administration.

Nor can we ensure that we have a resilient and reliable grid if we're doing this work by ourselves. We need partnership. We need collaboration with States, industry, and utilities to do so, and a successful path will only emerge with significant collaboration.

It is incredibly important for us to collaborate around transmission and distribution planning. Our National Transmission Planning Study looks at interregional transmission planning and is a longer-term transmission planning analysis.

The nearer term National Transmission Needs Study is more of a state-of-the-grid report to identify high-priority national transmission needs. We're working to collaborate on offshore wind transmission planning before we start standing up those infrastructure investments.

We're setting up processes to facilitate interstate and interregional transmission efforts. One example is our work on the National Interest Electric Transmission Corridor designation process.

On May 9, we issued a request for feedback to improve the designation process to more accurately pinpoint areas experiencing the greatest transmission need and with the greatest potential for immediate transmission deployment. Feedback to this RFI will be critical in setting up this program for long-term success.

PUF: There's a lot of federal funding from DOE going directly to states. A lot of State Energy Offices will be the beneficiaries. What are you seeing on that front?

Whitney Muse: We're seeing that States are getting a significant

amount of funding through the BIL, the IRA, other DOE programs, and many other agencies.

We are sending a lot of money from the federal government down to the states for execution, implementation, and deployment to ensure that this broader vision is met.

We are committed to providing extensive technical assistance to States, Territories, and Tribes, particularly as a part of the Grid Resilience State and Tribal Formula Grants. We also have technical assistance efforts through a number of the national groups, including NARUC, NASEO, NCSL, and NGA.

We're partnering with several of the DOE's National Labs to help provide technical assistance. With them, we're developing activities that focus on in-person grid resilience trainings and virtual meetings, technical guidance and analysis, baselining

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efforts, and better tracking of grid resilience policies, as well as fomenting peer sharing and case studies around equity planning, utility planning for wildfire risk, and other key challenges states are facing.

We work closely with other offices at DOE, such as the Office of State and Community Energy Programs that works closely with the State Energy Offices, the Arctic Energy Office, and the Indian Energy Office to leverage outreach opportunities across DOE.

PUF: Are there any words of caution or support that you can offer to State Energy Offices as they navigate through the increased funding levels?

Whitney Muse: There are a lot of great opportunities for State Energy Offices right now. As they're moving through the processes, thinking about the breadth of funding and opportunities through GDO, we are happy to be a partner and a resource.

GDO wants to connect early and often for technical assistance, guidance, and collaboration. As I said earlier, only by working together can this opportunity be successful.

We look forward to being a partner to States as they move through the many funding opportunities and help them achieve the broad goals that these new pieces of funding and legislation offer. ○

Louise Anne Comeau

Emera VP of New Energy Markets and Innovation

PUF's Paul Kjellander: What is your role at Emera?

Louise Anne Comeau: I'm Vice President of New Energy Markets and Innovation at Emera. Emera is an energy holding company based in Canada with over 2.5 million customers and operations in the States including in Florida, Tampa Electric and Peoples Gas, and New Mexico, New Mexico Gas. Also, in Canada and the Caribbean.

The bulk of my focus in this discussion is on BlockEnergy, a rate-based distributed energy startup we launched a few years ago for utilities. We are interested in seeing how it can make the most of the current federal funding opportunities and help contribute to the new energy market.

PUF: How much of a priority is it for your company to engage in this process to access an unprecedented level of federal funds for energy projects and why?

Louise Anne Comeau: We consider the administration's – what I would call – ambitious policy initiatives, as an important trigger or impetus to build the clean energy economy. At Emera, we are fully engaged in that vision and are assessing closely all the funding opportunities coming from the IIJA and the IRA. We see the opportunity and we intend on capitalizing on it.

PUF: This funding opportunity is speculative. There are no assurances you're going to get any funding. What makes it worthwhile to pursue?

Louise Anne Comeau: Although the grant funding is speculative, the sums available for eligible projects are significant and that is a driver. In addition, a lot of the funding is open to innovative solutions that are on the cusp of commercialization, such as the distributed energy startup that we have at Emera called BlockEnergy.

BlockEnergy might or might not have access to similar funding through more traditional streams, and certainly not at the scale currently available with the U.S. Department of Energy initiatives that allow BlockEnergy to pursue large projects that increase resilience and augment grid capacity more quickly. Although there's no certainty in the funding, it is worth pursuing.

PUF: This represents a funding opportunity that could kick-start some of Block Energy's activities?

Louise Anne Comeau: More than kickstart, it could be the foundation of commercialization. BlockEnergy has one project commissioned and operating in Florida – a regulated market – right now, and a second one with Pepco that is launching in Maryland – a deregulated market – at the end of the year. A third project is in the works.

Although grant funding is speculative, the sums available for eligible projects are significant and that is a driver. A lot of the funding is open to innovative solutions that are on the cusp of commercialization, such as the distributed energy startup we have at Emera called BlockEnergy.

But the scale of projects we can deliver with the DOE funding would move the business from batch production to volume production and commercial production quickly. That is something we wouldn't be able to do as rapidly without that kind of support.

PUF: As you look at some of these funding opportunities, how important is it for you to be developing partnerships as you start to move through this process?

Louise Anne Comeau: Partnerships are key. With our application that we submitted for GRIP funding, we partnered with utilities of all types – IOUs, co-ops, munis tribes, veterans' groups, and a low-income community.

The goal of the DOE with this funding is to fund solutions that can apply broadly across the grid and serve various communities. It's important to showcase the wide-ranging relevance of solutions to achieve success or to have a chance of success. You do that through partnerships.

PUF: Have those been easy to set up? Difficult?

Louise Anne Comeau: We were impressed with the speed at which we were able to bring together a consortium. There's an appetite in the market generally – and a recognition – that new solutions are needed, that the status quo is not going to be enough, and partners are also recognizing the value of the DOE contribution. That opens the opportunity for new solutions that are not yet commercially priced, but with the DOE funding, can quickly achieve commercial pricing.

Everyone is recognizing the value. Our view with this startup, BlockEnergy, is that we can build the grid better and we should, and this is one solution that contributes to that future grid, which serves the needs that we all see evolving, like growing electric vehicle loads.

PUF: There's a lot of funding and you seem to have found the programs that are the best fit. Which ones are they?



The DOE wants real projects with clear timelines to completion. Conceptual ideas are not going to win. Make sure you've got real projects lined up. Finally, identify partners early. That process can take time.

Louise Anne Comeau: We've looked at two programs to date. The GRIP funding opportunity, where we were encouraged to proceed and submitted a full application. We've also looked at another opportunity with OCED for rural communities, which is at an earlier stage.

We see opportunity in a number of programs. I come back to the notion that the DOE is seeking solutions with broad applicability for the grid. If you can solve to that objective, you'll find several opportunities open.

PUF: What kind of guidance are you able to get from DOE as these programs begin to mature?

Louise Anne Comeau: Yes. That's a bit complicated. Once an application is live, there's little guidance that the DOE can provide, save through Fed Connect-type general questions that are accessible to all applicants to ensure impartiality.

This can make it a bit hard for newer players like us to wade through the various elements of an application. But we've relied on our advisors to assist with interpretation where necessary. And the DOE did organize a few workshops during the process that were very helpful.

As the programs mature next year, and as we develop our relationships with DOE, we will be in a better place to apply for funding because we will have a better understanding than we did this year.

PUF: As you look at the first year of this process, how challenging has it been to navigate through this?

Louise Anne Comeau: It's been interesting. The DOE has done a good job with the funding application opportunities. There's a lot of clarity on what is applicable, what is not, the goals of the program and the process.

I will admit the timelines have been demanding for people who are new to the system. These are sophisticated applications. They require robust consideration of various aspects from the technical solution to the budget to the team required to deliver the project, always keeping in mind the DOE goals.

Even submitting the application with its numerous components can be a bit daunting. But we did it. We feel good about the application we have submitted and next time we'll have a bit more perspective and experience.

PUF: As you look at these funding opportunities in some of

the processes you've been through so far, are you experiencing any potential barriers to success?

Louise Anne Comeau: No. Not really. The DOE has, in my view, developed a strong set of criteria for selection. They're well-defined and clearly inform the path for funding opportunities. I haven't seen any material barriers.

PUF: We talked a lot about the federal programs but there's also a lot of money that will be directed to the states to be administered. Is that a near-term priority for you?

Louise Anne Comeau: We are just digging into that now. We are trying to get a better handle on eligible participants and what types of projects will be funded. We do believe there's real opportunity there as well, and we intend to add that to our focus, but it's a new area for us.

PUF: Let me ask two last questions. One, what advice would

you give vendors interested in funding programs? The other is, you are about eight months into this, what advice would you give yourself as you're starting out based on what you know now?

Louise Anne Comeau: The answers are very similar. First, start at the RFI stage to familiarize yourself with the requirements and opportunities. Read any draft FOAs that are released. Do not wait until the formal FOA is released. It will not give you enough time to develop a strong application.

Second, the DOE wants real projects with clear timelines to completion. Conceptual ideas are not going to win. Make sure you've got real projects lined up.

Finally, identify partners early. That process can take time.

Bringing partners to the table will bolster the application and prove the relevance of the solution to the grid and its various constituents. ◎

Rich Stover

Idaho Office of Energy and Mineral Resources Administrator

PUF's Paul Kjellander: What role is your Idaho State office playing related to the increased federal funding targeted for a lot of these energy related projects?

Rich Stover: This office operates under executive order. The current executive order 2020-17 provides that the Office of Energy and Mineral Resources is responsible for coordinating, among other things, energy planning in the State of Idaho.

As a result of the Infrastructure Investment and Jobs Act, the office will receive at least three major funding programs. Those are IIJA Section 40101(d), the SEP BIL, the State Energy Program Bipartisan Infrastructure Law increase, as well as Energy Efficiency and Conservation Block Grant, or EECBG. Those are the three under the Infrastructure Act we are focused on.

Of those, Section 40101(d), the Preventing Outages and Enhancing the Resilience of the Electric Grid Grants Program, is the one we are dedicating the most amount of attention to.

PUF: Why are you focused on that aspect and what is the intent behind that funding?

Rich Stover: The reason we are focused on it is, while the office has been around for a long time, it operates on a small budget. With passage of the Infrastructure Act, the State of Idaho can receive about twenty-five million dollars over the next five years to make investments in grid hardening and modernization.

We've never done that before. The State of Idaho relies on utilities and regulators, specifically the PUC, to decide when and how to shape those investments.

But now, we've got an opportunity to help facilitate investments. We are also the administrative arm of the Idaho Strategic Energy Alliance, which is a group of experts and stakeholders

With the Infrastructure Act, the State of Idaho can receive about \$25 million over five years to make investments in grid hardening and modernization.

We've never done that before.

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Now, we've got an opportunity to help facilitate investments.

who come together to address energy issues for the betterment of the State of Idaho, its citizens, and economy.

We enlisted the Strategic Energy Alliance to help us formulate a plan for these investments. Through the Alliance, we established working groups. One is specifically related to section 40101(d), and the work group is comprised of utilities, INL, economic development professionals, academia, and other key stakeholders.

They helped us identify priorities and criteria for funding. Through that we solicited projects from the utilities and compiled a list of eighty projects that utilities want to take on with this funding.

We will administer the funds through a competitive process with the help of advisory groups and review committees in a public and transparent way.

PUF: What type of projects have the most interest?

Rich Stover: We got a lot of feedback from the utilities and grid operators that mirrored for the most part the list of eligible projects under the program. What stood out to me, which I saw repeatedly, are transmission capacity, congestion, and wildfire-related investments.

The latter is probably the highest on the list in Idaho, where we see many wildfires and have our infrastructure running through a lot of public lands that are forested and range lands susceptible to fires. There is an overwhelming need for hardening and resiliency investments that will hopefully mitigate the effects of fires.

PUF: You talked about two other pots of money, and how are those shaping up?

Rich Stover: In a similar process, we utilized a working group in the Strategic Energy Alliance to help identify priorities for the SEP-BIL funding. The State Energy Program is the federal grant that State Energy Offices have taken advantage of since the 1970s. Under the Infrastructure Act, the amount of Idaho grant funding has doubled.

We can invest that money in Idaho. Through the working groups, we identified priorities. At the top was energy efficiency investments. Number one is K-12 educational facilities.

Under the program, we would provide audits for educational facilities and identify areas for energy efficiency retrofits. That's for light bulbs, windows, HVAC systems, et cetera. Another identified priority is agricultural energy efficiency, and it would be a similar type of program.

Finally, we identified a need for a program we are calling the Energy Independent Local Communities, where we would help local communities, cities, and counties address energy issues in their planning. These are all programs targeted on specific areas that can be coordinated and compliment other funding sources available through the Infrastructure Act.

PUF: You were fortunate being a small Office of Energy and Mineral Resources. You had the infrastructure to help with planning and to move it along through the Strategic Energy Alliance.

Rich Stover: Yes. I'm not going to take credit for that. I was new last year. I've got a great staff and fortunately the governor and previous governors had the foresight to put together groups like the Strategic Energy Alliance, who are the experts.

As knowledgeable as my staff is, we can't make these types of decisions with taxpayer money without the input of people who work on the ground. I think that approach leads to the best results, and that's the approach I take.



Instead of waiting for the federal program, we decided to run a pilot program, see how it works, and learn lessons. Essentially, it was a state version of Section 40101(d).

I'm trying to build upon existing relationships with utilities, regulators, and the Department of Commerce, so we can get a full picture of where to invest the money and what the impact would be. I'm hopeful the impact will be noticeably beneficial to the citizens of Idaho.

PUF: You're trying to avoid squandering an opportunity.

Rich Stover: Absolutely. It's not often an opportunity comes to invest this amount of money in the grid and with energy-related issues.

PUF: You mentioned having competitive grant programs in which utilities and stakeholders will apply for funds through your office. You've already done a pilot project?

Rich Stover: That is correct. When we set up the working

groups, there was a timeline established for an application and receipt of the Infrastructure Act funding, and that was originally for September. We worked with our national organization, the Strategic Energy Alliance, and working group to identify priorities and got the application ready with the vision for how funds would be sub-granted out.

The U.S. Department of Energy extended the deadline for that application. All the states looked at each other and said, "What should we do? Do we need to take another look through our application? Make sure we dotted our Is and crossed our Ts?"

We decided to utilize the funding the legislature appropriated for this office for a State Energy Resiliency Program. Instead of waiting for the federal program, we decided to run a pilot program, see how it works, and learn lessons. We advertised that to all recipients who would be eligible under Section 40101(d).

Essentially, it was a state version of Section 40101(d). We received thirty-seven applications from utilities across the state, public utilities, co-ops, and IOUs. We funded sixteen projects totaling approximately \$4.4 million.

Projects included mesh wrapping on power poles, artificial intelligence, satellite-based vegetation management, undergrounding distribution and transmission lines, and capacity upgrades. They all generally fit within parameters of transmission congestion, capacity, and wildfire resilience.

PUF: When the federal money shows up, your office is ready to move.

Rich Stover: We are ready. The contract terms will be a little different because we've got to make sure we're complying with federal requirements.

We're going to make a couple of tweaks in terms of how we do the application process. We will include more people in the review component of it, ensure transparency, and have a thorough review. But, generally, as soon as those funds hit the account here, we're ready to launch.

PUF: We've talked about competitive projects through your State Energy Office, but for federal money for energy projects under large federal competitive programs, should potential applicants, vendors, and others be looking to you?

Rich Stover: I would encourage them to do so. We have made it known to the utilities and others who would be eligible for those funds, that we would like to coordinate with them.

It makes the most sense if we have priorities for how we can shape the investments of the Section 40101(d) funds. Utilities should see that as an opportunity and go after the other competitive opportunities for different projects.

Simply put, we want to coordinate and make the most of these funding opportunities. So, yes, we've asked them to work with us and we've received quite a bit of feedback.

We worked with utilities that were going after specific funding, so we were aware, and they've been quite open with us about

what they're going after, and what would still be available for utilities under our programs.

PUF: One of the benefits of working with you as they go after nationally competitive funding programs, is it might help get some letters of support that represent the State of Idaho.

Rich Stover: Yes, that's exactly what's occurred. For those whom we've talked to and have worked with us, when they've come back around, gotten through the concept paper portion, and got the encouragement to proceed, we've held ourselves out as partners in terms of technical support and letters of support. We're looking at those opportunities and helping support those folks.

PUF: As you get a chance to spend millions of dollars, what's surprising you the most as you work through the planning and opportunities this funding represents?

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Section 40101(d) funds.**

Rich Stover: The biggest surprise is how much need there is for funding and then how complicated the issues are related to the grid and the energy transformation issues that are currently pending. It's easy to say, "We need to upgrade this conductor."

At the same time, you've got to take into account that certain baseload power facilities might be slated for retirement and the utilities are replacing that resource with renewables.

Does it make sense to invest in a conductor that is tied to, for example, a coal plant where they know that the plan is going to be to hook up to wind turbines or solar panels in different locations? The complications involved in planning continue to surprise me.

I'm pleasantly surprised with the level of cooperation we're achieving with the utilities. They have their business plans as you're probably aware, and we're not heavy-handed.

The utilities lead the way with their business plans. We're trying to assist them. I've been pleasantly surprised with the level of cooperation of all the stakeholders in general that we brought together.

People have different priorities in terms of how quickly or what kind of energy transition we're dealing with here. Overall, it's been robust and productive conversations, and I've been happy about that. ○

Melissa Boyd

Idaho Power Senior Manager of Operations Support

PUF's Paul Kjellander: What is your role with the federal funding opportunities?

Melissa Boyd: I'm on a team that's leading the program office and efforts relating to grants and infrastructure programs, both in strategy and execution.

PUF: There's a lot to navigate as a utility with all this funding and opportunities that have emerged. How is your utility approaching some of these federal funding elements?

Melissa Boyd: When this started to roll out in late November 2021, our senior executives had the foresight to say, "Hey, this is big, and we need to get our arms around it." They reached out to me and my team and asked if we could take it, figure out how to navigate this, and build a program.

It came to us as a concept. We worked with the Department of Energy and got input from other utilities and the state, because everybody's figuring this out together. There was no cookbook.

I remember thinking, "It's a federal program, how hard could it be?"

What we learned is that this is new for everyone. We're writing it for the first time. Everybody's in it together, and that's the fun part. We've tried to establish some organization within the programs.

This program brings a trillion dollars of infrastructure into energy funds over five years. More than eighty-five programs are electric industry programs. Together, those represent about one hundred eleven billion dollars of funding opportunities, of which a little over fifty billion are available directly to the electric industry.

We needed a way to figure out what was important and relevant but at the same time make sure we're looking at everything as it's coming out. It's coming from everywhere. There are so many offices playing in this space, and it comes out in different formats.

The beginning was understanding where the information and programs were coming from. We've done a good job of that. Then we got our senior executives together and said, "Let's be strategic about this."

We want to stay true to our roots as a utility to our customers. We want to make sure we are doing what's right for our customers and the future.

History will judge us on whether we make wise investments and decisions. We identified six priorities, broad buckets, that as a company we need to take a hard look at.

Those are all grid modernization and large transmission projects. Gateway West is important to us. Wildfire infrastructure, dam infrastructure, dam safety, and transmission builds.

We submitted two concept papers for the GRIP programs aimed at grid resiliency infrastructure. One for grid modernization and infrastructure enhancement to reduce wildfire.

We were invited to apply on two concept papers, which is remarkable because about 50% were requested to apply for a grant.

Then, keeping an understanding of electric vehicles and charging infrastructure. Those programs are indirect, but we want to make sure we're supporting our partners in that space.

Not everything fits in a bucket. But at least we followed a strategy around what was important to us.

PUF: As you've identified broad buckets, are you finding funding mechanisms that fit well, whether through competitive programs or other incentives? Is it starting to mesh?

Melissa Boyd: It is. Now we have experience. We started to find some programs that fit within these buckets, both at the federal level with competitive grants and at the state level.

We are paying close attention to the IRA provisions that came out later. Those fit into many of our energy, renewable energy, dam safety, generation work, and other missions.

We've submitted RFI responses to various programs. The Department of Energy and the state have been reaching out and asking for input.

The DOE has assured us they read every comment. We've spent time and given thoughtful comments to them as they're constructing these programs.

Then the grant goes to the FOA, or the concept paper phase. We have seen where they've taken some of our feedback and the programs have changed from how they were originally drafted.

We've applied for grants at the state level with the Office of Energy and Mineral Resources in Idaho, and we've had some success. Those fit in our grid modernization and wildfire infrastructure buckets.

PUF: Is there anything a little different with the federal programs? Are you having to develop partnerships as you put together these packages?

Melissa Boyd: We submitted two concept papers at the end





We have taken key learnings from that experience and applied it to the federal level. As we've responded to RFIs, we've said, "These are what you should be thinking about because we had that experience from the State of Idaho."

of December for the GRIP programs aimed at grid resiliency infrastructure. One for a grid modernization project and one for an infrastructure-enhancement project to reduce wildfire.

The timeline was short. There were lots of ideas floated up in various areas and we listened to anybody who wanted to talk to us about these programs.

We looked for opportunities to partner. We selected the two opportunities that we submitted as concept papers. We were invited to apply on two concept papers, which is remarkable because only about fifty percent of the concept papers submitted were requested to apply for a grant. We're proud of that, and we've subsequently applied for the grants.

We're interested in partnering. These grants at the federal level are competitive. We want to make sure we're putting forward our best effort. As our programs compete with others, we're hopeful that ours is chosen. We don't know what others are doing, which is the fun of it.

I have a bit of competitor in me, and I'm curious. When we

got those two requests to apply, I was ecstatic. I can't wait to see how our applications do.

PUF: At the state level, there's a lot of federal funding coming in. What's the focus at, say, the State Energy Office in Idaho, regarding potential funding for projects?

Melissa Boyd: The federal government has extended the deadlines for grants through the Department of Energy multiple times.

Idaho wants to make wise investments in infrastructure. I appreciate that the Idaho Office of Energy and Mineral Resources (OEMR) has a defined strategy, purpose, and mission statement, and has stayed true to those principles.

OEMR reached out to stakeholders throughout the State of Idaho asking for shovel-ready project ideas and applications for competitive grants to pay for them.

Our team talked about that strategy, figured out what fits within our strategic buckets, what's good for our customers, and the future. We identified a couple of projects, took them to OEMR, and were successful in gaining three grants.

We added pull mesh to some transmission lines, which in the event of a fire, will protect our infrastructure so we can reduce outage time. It's a wise, preventive control for our customers.

We started a long-term project around grid modernization. We're doing modeling around vegetation management and artificial intelligence and trying to understand if there's more we can do to approach how we manage our vegetation.

We used satellite and LIDAR technology to test it. We like looking for projects that we can turn around and demonstrate the value.

PUF: OEMR got in front and created a pilot project of what a competitive process might look like. Did that set you up well as you look forward to more funding and competitive grant programs via the state?

Melissa Boyd: Oh, absolutely. What we loved about it was OEMR was so ahead of what the programs, both at the state and federal levels, were doing.

The OEMR stepped up and said, "Okay, we got this." They were able to turn a value-added grant program around quickly. We learned from that. That was our first step into the infrastructure grant process.

We have taken key learnings from that experience and applied it to the federal level. As we've responded to RFIs, we've said, "These are what you should be thinking about because we had that experience from the State of Idaho."

PUF: Utilities have capital plans, but this changes the dynamics. Are you seeing potential to accelerate deployment of projects that were on the margins? Beneficial to customers, but not high up in the queue?

Melissa Boyd: The intent of all the infrastructure programs at the federal and state levels isn't to fund work you would've already done. We look at that as part of our application process, are these dollars going to allow us to do something that we can do faster?

Maybe it tips it over so it's good for our customers and rate-payers. That's part of the considerations we look at in each of these programs. Because without that, I don't think it merits a grant application.

We take a hard look, as we want to make sure investments we're making today don't create an unneeded burden for our customers. For example, as we're applying for grants, we're

looking at total costs. Is this something that in the long term is the right thing to do?

PUF: Is it important to work with State Energy Offices to coordinate, even though they won't be handing out the federal government awards through their competitive programs? Is there some benefit?

Melissa Boyd: Oh, absolutely. We see them in Oregon and Idaho as key partners. We stay in contact with them. We keep them engaged on which way we're going.

There are a lot of ideas to share. The gift of these dollars is that it creates what-if scenarios, creative ideas, and innovation. We listen to all of those. We participate in those and take a hard look at them. Our State Energy Offices are critical partners.

The gift of these dollars is that it creates what-if scenarios, creative ideas, and innovation. We listen to all of those. Our State Energy Offices are critical partners.

PUF: Any words of caution or encouragement for other utilities about this process as they move forward?

Melissa Boyd: Don't be afraid of the grants. Just coming in, there were a couple points where it was holy cow, this is craziness. But what I've learned is sometimes you've just got to roll up your pants, wade into the stream a bit, and get back to fundamentals.

Don't be afraid to put pen to paper and take a stab at it. It doesn't have to be perfect. There's no perfect grant application. Especially in the federal space. They're all different.

Talk to smart people in your company, your engineers, operators, et cetera. They have great ideas. Then vet it out and see what happens. That's what the concept papers did for us. I appreciated that approach at the federal level. We had two weeks to tell our story in twelve pages.

That was a healthy exercise for us. Then they liked it. Don't be afraid to reach out to the state, to the federal government, to the DOE. Everybody wants to help. Everybody's trying to do the right thing. **PUF**

Californians' residential electric bills averaged just nine-tenths of one percent of all their expenditures on goods and services in the year 2021. This according to the data used to calculate the Gross Domestic Product. California's average was well below the national average, 1.26 percent. Per kilowatt-hour rates are high in California, as compared to other states, but kilowatt-hour consumption is low.

In contrast, Alabamians' residential electric bills averaged two and a fifth percent of all their expenditures. Which was well above that 1.26 percent national average. Per kilowatt-hour rates are comparatively moderate, but kilowatt-hour consumption is high. The average annual residential bill was \$473 per capita in California and \$858 in Alabama. And the average annual expenditures on all goods and services were \$51,781 per capita in California and only \$39,208 in Alabama.

Lightning Round on Power's Future

Fourteen Guidehouse experts hit their buzzers and answer our questions:
Chris Rogers, Raquel Malmberg, Britt Harter, Ed Batalla, Robyn Link,
Graham Dickson, Nicole Wobus, Shaun Fernando, Danielle Vitoff, Lisa Frantzis,
Patrick Di Gregory, Peter Shaw, Jenny Hampton, and Erik Larson

You have a short elevator ride alone with the chief executive of a major utility. What would you advise him or her to immediately prioritize to lead in the energy transition?

Chris Rogers: Achieving the future state where utilities provide clean energy to the masses affordably and reliably requires a collaborative and integrated approach. It requires individual utility departments to work together in ways they have not previously and requires the utility to collaborate across external entities such as state agencies and their local municipalities. We must break down real and perceived barriers and work collectively to leverage multiple funding sources to maximize benefits to customers and communities we serve.

Within the utility itself, this means that light can no longer exist between the organization and its technology strategies. Where there were two, now there can only be one.

Embracing and infusing technology smartly throughout the organization allows energy providers to address three key challenges simultaneously: the aging workforce conundrum, increasing operating cost pressures, and capability deficits. No



No practical path to the net-zero future provides clean energy to the masses affordably and reliably without leveraging technology to reduce human error, effort, and variability.

– Chris Rogers

practical path to the net-zero future provides clean energy to the masses affordably

More destructive and frequent weather events pose a direct threat to the communities that utilities serve. What infrastructure investments will utilities need to accelerate, and with whom will they need to partner to mitigate impacts to their customers?

Ed Batalla: In many jurisdictions, especially in adverse weather-prone geographies, many utility providers and regulatory agencies have shifted their focus from service reliability to infrastructure hardening for capital investments in transmission and distribution (T&D) infrastructure.

Traditional T&D planning and engineering processes center around reliability improvement, as well as network

capacity and stability. Planning processes must evolve to include adverse weather risk analysis and second-order impacts of distributed energy resources (DER), EVs, and electrification.

Given the impacts of EV charging, electrification of industrial processes, and commercial and residential heating and cooling, new approaches are required to future-proof infrastructure capital investments.

and reliably without leveraging technology to reduce human error, effort, and variability.

Some in the workforce may fear that technology will displace them, but humans have never been outmoded. From the earliest stone age tools to today's AI, technological advances haven't changed humans' significance. Rather, they've changed the character and nature of the tasks that humans perform.

Each time, these advances have freed human thought and energy to focus on the next, more complex opportunity. Innovation affords the chance to transform the workforce within the utility and across the community.

So, with this energy transition – a potentially steep functional change for humanity – organizations must develop, embrace, and execute a strategy that makes no distinction between business and technology. And they must look for ways to partner with state and local government agency stakeholders to deliver the maximum benefits to their customers. ○

Resilience risk assessments allow utility providers to develop a well understood, quantified, and prioritized resilience investment plan. This plan is part of a comprehensive asset-level analysis, which incorporates second-order impacts related to DER deployment, EVs, and electrification.

Federal and state-level policymakers and regulators will continue to evolve

greenhouse gas regulations. Utility providers must identify diverse stakeholder groups and regularly engage with them on resilience risks and shared opportunities.

With adverse weather events increasing in frequency and severity, utility providers should evaluate risks from low probability to high consequence climate impacts and assure T&D and generation asset resiliency through well devised capital investments and adaptive actions for maintenance programs.

Existing electric T&D infrastructure was built for past or current climate conditions. In the future, these systems are likely to be exposed to more usage and to extreme climate conditions that are



beyond their design failure thresholds. State and federal government entities and energy providers should conduct climate

Planning processes must evolve to include adverse weather risk analysis and second-order impacts of distributed energy resources, EVs, and electrification.

— Ed Batalla

risk assessments and develop climate resilience plans to future-proof these long-lived assets. ○

Does an increased focus on environmental, social, and corporate governance (ESG) metrics and performance represent a threat or opportunity for utilities? What immediate steps should utilities consider to effectively align with evolving societal, shareholder, and board expectations?

Britt Harter: The trend of measuring expectations and being transparent about ESG impacts is unmistakably on the rise. Investors and capital market regulators are increasingly demanding transparency, aligned to the Sustainability Accounting Standards Board, Global Reporting Initiative, and the Edison Electric Institute ESG framework.

The Securities and Exchange Commission has proposed rules that will require disclosure of certain ESG metrics, including

greenhouse gas footprint and climate risks, based on the Task Force on Climate-Related Financial Disclosures framework.

Utilities are well positioned to meet and exceed these ESG data expectations. Because of federal and state regulations, they already gather rigorous environmental data. And they are well positioned to expand to greenhouse gas data, including Scope 3.

Utilities also do substantial work on social topics already, such as community engagement, energy access, and equity.

Investors and capital market regulators are increasingly demanding transparency, aligned to the Sustainability Accounting Standards Board, Global Reporting Initiative, and the Edison Electric Institute ESG framework.

— Britt Harter



However, not only are expectations about the number of key performance indicators expanding, the expectations about the data's completeness and accuracy are also increasing.

Despite having time to ramp up the rigor of their data collection, utilities should act today, by:

Identifying the material metrics and key performance indicators that stakeholders expect;

Building durable governance and systems to gather accurate data; Disclosing with confidence; and Reaping the financial and brand benefits of leadership. ○

How can utilities partner with state and local governments to strengthen and accelerate community resilience across the jurisdictions they serve?

Raquel Malmberg: Utilities provide critical services to communities and play a central role in their resilience. The service outages that impact residents and businesses can have severe economic consequences on their livelihoods. As severe weather events threaten more and more communities, utilities and local governments must collaborate on resiliency plans that strengthen and harden utility networks and account for before, during, and after events.

Multiple emerging technologies provide a platform for innovation across the community ecosystem. Intelligent buildings and transportation electrification, for example, are not only transforming infrastructure across communities, but

also changing the way in which residents access everyday services.

The interaction of technologies and people is evolving quickly into a dynamic network of connected infrastructure. As utilities engage local leaders and governments to commercialize these networks, there is opportunity to not only improve the lived experience of customers but accelerate hardening efforts across the utility network.

Besides partnering on reliability, governments can support utilities by creating or supplementing energy efficiency programs that reduce the demand for energy use, especially during critical times. Additionally, with



new programs being built and rolled out through the Inflation Reduction Act, utilities can help garner interest and build trust in government rebate programs. ○

Besides partnering on reliability, governments can support utilities by creating or supplementing energy efficiency programs that reduce the demand for energy use, especially during critical times.

— Raquel Malmberg

How likely are commercial and industrial (C&I) customers to defect from their utility? What proactive steps can utilities take today to strengthen their relationships with their largest customers?

Graham Dickson: Some utility service territories are experiencing a perfect storm for serving C&I customers. Increased extreme weather events coupled with the perennial trends of decarbonization, digitalization, and decentralization are forcing many C&I customers to take a long, hard look at their energy contracts.

Could they receive a more reliable, resilient, and predictably priced supply through power purchase agreements or behind-the-meter assets at scale? As they become cheaper and ubiquitous, the answer is increasingly “yes.”

Understanding the pace of change

for C&I customer segments is critical, particularly when viewed through the lens of load defection. Guidehouse recently helped a large manufacturer – a household name – develop its electrification product strategy.

The organization can radically change how its millions of residential and commercial customers interact with energy each day. And the time needed to change its production line to enable a radically new product focused on electrification? One rate cycle? Two years? A matter of months.

A couple of items are worthy of



consideration so that utilities can meet C&I customers where they are: Ensure organizational structures are anchored in the customer, with aligned incentives. All too often, the industry refers to split incentives for demand side management

programs, but doesn't consider the misalignment of an account manager, an energy efficiency or demand response program manager, and a deregulated solutions team.

Move the conversation away from dollars per megawatt per hour, and toward lowering the total cost of a customer's bill over time. Few of Apple's customers are likely to have walked into a store and bought the whole ecosystem from iPhone to MacBook, Apple Music to Apple TV.

How can utilities partner with their customers to meet shifting demand for clean, distributed, connected, and mobile energy solutions?

Robyn Link: The energy transition is underway and will continue to accelerate as the Inflation Reduction Act and National Electric Vehicle Infrastructure Formula Program funds become available through rebates and tax credits for homes, businesses, EVs and chargers, and solar and storage. For decades, utilities have been engaging with their customers and bringing energy and rebate programs to them, so they are best equipped to



help them take advantage of these new funding sources.

Utilities can continue to partner with their customers through several key actions:

Collaborate with local, state, and federal governments to reduce market confusion through unified messaging on how customers can best access and benefit from the funds;

Educate, provide tools, and share customer insights with vetted trade allies to identify eligible customer opportunities for decarbonizing homes, businesses, buildings, and transportation;

Help accelerate fleet conversions, reduce carbon emissions, and manage customer costs by early involvement in

will happen overnight. Large energy buyers don't behave that way. They crawl, walk, and then they run. ○

Some utilities seem to believe that they can develop a comprehensive energy as a service business model that will happen overnight. Large energy buyers don't behave that way. They crawl, walk, and then they run.

— Graham Dickson

planning grid capacity needs and being proactive with rate, incentive, and managed charging program designs for medium and heavy-duty vehicles;

Leverage partners and work with community-based organizations to support disadvantaged communities in obtaining affordable clean energy solutions;

Prepare for residential rooftop solar demands with platforms that make the application and interconnection process simple, streamlined, transparent, and timely.

Utilities are at the intersection of these actions and have an opportunity to strengthen relationships and continue serving as trusted advisors for their customers. ○

For decades, utilities have been engaging with their customers and bringing energy and rebate programs to them, so they are best equipped to help them take advantage of these new funding sources.

— Robyn Link



How can utilities maximize their impact in improving the livability of the communities and cities they serve?

Nicole Wobus: Utilities can be good stewards to the communities they serve and improve livability by initiating communications and seeking to align interests through coordinated planning. Proactive collaboration (rather than just communicating on an as-needed basis) can build relationships that lay the foundation for transforming local economies and quality of life. Collaboration can also open doors to many federal funding opportunities that require community benefits planning.

For example, utilities can work with local government representatives to identify areas planned for increased development or in need of infrastructure improvements. They can bring together engineers, planners, and local stakeholders to prioritize locations for advanced infrastructure and outreach.

Convening partners, improving awareness of incentives, and offering

Convening partners, improving awareness of incentives, and offering engineering expertise and other resources, utilities can play a pivotal role in creating hubs for energy innovation and resilience.

— Nicole Wobus



equipment, microgrids, and building integrated solar or battery storage in priority locations.

They can also facilitate shared mobility solutions, improving the convenience and affordability of many living situations. Streamlined processes, enhanced partnerships, and improved resiliency attract businesses and residents, helping to create thriving, livable communities and reduced carbon footprints. ○

What are lessons learned from utility-supported smart city pilot projects? What is an example of a successful public-private partnership?

Shaun Fernando: Utilities have been near the top of the list as pioneers and early adopters in smart city applications. From smart meters to smart

streetlighting, utilities have been an integral part of the conversations that allowed these early-stage deployments to occur.

However, for smart city programs to succeed, a coordinated effort is necessary across a complex and fragmented ecosystem of stakeholders, including

city government, public service entities (such as police, fire, and libraries), transportation operators, and landlords and residents.

After an initial foray into smart city applications, utilities are finding that they are uniquely positioned to play an integral role in bringing this ecosystem

In San Jose, California, the city and utility worked together to explore opportunities that include Internet of Things devices on utility-owned light poles – an elegant solution to complex right-of-way issues that inevitably come up when planning smart city infrastructure.

— Shaun Fernando



together, because a large part of the shared infrastructure that smart city technologies require will be connected to a utility distribution system.

In San Jose, California, for example, the city and utility worked together to explore opportunities that include Internet of Things devices on utility-owned light poles – an elegant solution to complex

right-of-way issues that inevitably come up when planning smart city infrastructure.

Since COVID-19 made the fault line more apparent between in-person working and learning, and doing so from home, broadband and digital equity has risen in the agenda for utilities and government. With the federal government committing forty billion dollars of broadband

funding to close the digital divide, utilities are exploring ways to help.

As in many other contexts, utilities are finding that the smart city and digital equity mission are earning them a seat at the table. What they now need is vision, boldness, and the willingness to act in unorthodox ways, so they can bring smart city benefits to life. ○

What electrification pathways also present the most compelling decarbonization pathways for communities?

Danielle Vitoff: Transportation emissions make up the largest portion of greenhouse gas emissions for most communities, followed by buildings. Beyond decarbonization efforts, electrifying transportation and buildings can drive important co-benefits for communities, including improved air quality and supporting equitable energy access.

Transportation should be a key target for electrification efforts, with a particular

focus on fleet and passenger vehicles. EVs are already a key and growing market trend, but their adoption can be further accelerated through incentives, education, and aggressive buildout of charging infrastructure.

When working to achieve transportation electrification, keeping in mind when the vehicle charges can have a significant impact on the achieved decarbonization value is important. Vehicles charging during peak times can increase rather than reduce emissions. Therefore, transportation electrification must be paired with appropriate rate structures and demand response programs to ensure that charging needs can be better aligned with renewable energy production.

The electrification of buildings has received much press in recent years, with many advocates on both sides of the debate. However, much of the energy use in residential and commercial buildings must be electrified to meet aggressive decarbonization goals. That is a non-negotiable point.

New construction should be a primary target for electrification and should be

Vehicles charging during peak times can increase rather than reduce emissions. Therefore, transportation electrification must be paired with appropriate rate structures and demand response programs to ensure charging needs can be better aligned with renewable energy production.

— Danielle Vitoff

considered for all electric solutions. For existing buildings, hundreds of studies indicate that in many geographies electrifying most of the loads in existing buildings – but not all – is sensible. Building loads that align with peak loads and cannot be shifted, such as, heating during the system winter peak, may be better off by utilizing dual-fuel or backup heating systems. ○



Chris Rogers is a partner at Guidehouse responsible for the overall general management of Guidehouse's West U.S. energy practice, ensuring his teams are bringing the best of Guidehouse to our clientele and delivering with delight. An accomplished leader with twenty-five years-plus in

management and technology consulting across multiple industries, for the past seven years, Chris has focused on solving the most complex challenges and opportunities brought by the triple transformation afoot within the energy industry: business and regulatory model change, the

clean energy transition, and industrial revolution 4.0.

Raquel Malmberg is a partner in Guidehouse's U.S. State and Local Government Advisory Practice and leads the Community Building and Investment team. She has twenty years of experience working for and with

government agencies to improve their operations and implement strategies and recommendations to fulfill their missions. Raquel works with clients around the country to design and implement federally funded projects. She works to ensure clients are maximizing their federal

Does the regulatory process work today? How must it evolve to support an equitable energy transition?

Peter Shaw: One line of thinking is that regulatory is the new strategy. A utility's ability to thrive financially and operationally through the energy transition requires regulatory incentives, pricing

structures, and recovery mechanisms that yield reasonable returns, protect customers from inequitable cost burdens, and ensure service reliability and resiliency on both sides of the meter.

Utilities, regulators, and stakeholders must work collaboratively to achieve mutually beneficial outcomes that help achieve an equitable energy transition. Gone are the days when regulatory debate was focused solely on how much to increase rates.

Today, regulatory strategies focus on prioritizing new investments to meet policy goals, managing customer costs to ensure that impacts are not inequitable, and creating performance incentives that better tie utility earnings to desired policy and customer outcomes.

Gas system decarbonization and net energy metering present clear challenges to an equitable energy transition.



Incentivizing customers to electrify and adopt solar self-generation can shift costs toward lower income customers and renters who may not have the means or circumstances to make those investments. Galvanizing utilities, regulators, and stakeholders to agree on fit-to-purpose utility rate designs and alternative earnings mechanisms will do much to accelerate an equitable energy transition. ○

Galvanizing utilities, regulators, and stakeholders to agree on fit-to-purpose utility rate designs and alternative earnings mechanisms will do much to accelerate an equitable energy transition.

— Peter Shaw



How important are hydrogen hubs to the future of community resilience? Should utilities invest?

Lisa Frantzis: Hydrogen hubs will be a critical piece in a portfolio of options necessary for achieving U.S. decarbonization goals and thus helping to reduce potential impacts on communities from climate change and extreme weather events.

The technology can reduce carbon emissions in hard-to-decarbonize applications, such as heavy-duty transport, ammonia production, power plant fuels, district heating, and select industrial applications (such as

steel, cement). Renewable energy generation can also be used to make hydrogen that is stored and later used for power generation or added grid or community resiliency.

For utility companies, hydrogen can currently be blended with natural gas between five percent and twenty percent in many cases for power-generation applications, cutting carbon emissions by approximately seven percent with blends of twenty percent.

dollars and developing strategies to meet the unique needs of their constituents. Raquel supports state and local governments with project development, financial management and tracking, monitoring and compliance, and closeout. Prior to joining Guidehouse, Raquel worked

for more than nine years for the City of New York.

Britt Harter is a partner at Guidehouse. He is the leader of Sustainability consulting for North America, covering both the public and private sector. Britt has twenty-plus years of experience on sustainability topics, accelerating

organizations on their sustainability journey. He has created recognized ESG and sustainability strategies for Fortune 500 firms across sectors including energy, consumer goods, financial services, materials, and technology as well as major public sector entities like the City of Los Angeles.

Ed Batalla is a director in Guidehouse's Energy, Sustainability, and Infrastructure segment, delivering full life cycle solutions to transform energy markets, system operations and infrastructure, assets, and technologies for a more sustainable, resilient, and secure energy system.



Power-generation turbines throughout the U.S. that integrate hydrogen blending would have a significant impact on U.S. decarbonization targets.

— Lisa Frantzis

How can utilities take a leadership role in catalyzing local resilience and facilitating energy equity? What are some successful programs and initiatives?

Patrick Di Gregory: Utilities can play a leadership role in resiliency and energy equity by tapping into the large amount of federal investment in these overlapping areas. The Bipartisan Infrastructure Law



Pilots are also being implemented across the U.S. with newer gas turbines that can handle even higher percentages of hydrogen blends. However, utility companies must assess the feasibility of using hydrogen in their turbines as well as their pipeline infrastructures.

Power-generation turbines throughout the U.S. that integrate hydrogen blending would have a significant impact in helping achieve U.S. decarbonization targets, especially as we eventually move to green

hydrogen for blending.

Utility and private sector investments are needed, however, to help drive down the cost to make hydrogen more economically attractive. Willingness to pay, for example, for hydrogen blending is estimated to be around \$.40 - \$.50/kg, and blue hydrogen today can be produced for \$1 - \$2/kg and green hydrogen \$4 - \$7/kg, so investments will be needed to support economies of scale and reduced costs. ○

customers can support the Justice40 Initiative embedded in federal funding opportunities.

Community outreach provides another leadership opportunity for utilities. They can partner with community organizations, educational institutions, and local businesses to organize events, workshops, and training sessions on energy resilience.

This dialogue provides an opportunity for utilities to build trust and goodwill with their customers and to promote energy efficient behaviors and offerings to all communities, including those with energy equity concerns.

The Tennessee Valley Authority's Connected Communities initiative focuses on this outreach. For TVA, connected communities are towns, main streets, neighborhoods, and cities in its service region that use technology and data-related solutions to address community challenges and prepare for a modern energy system. TVA helps these communities become more connected by linking them to resources, funding opportunities, and tailored support. ○

and Inflation Reduction Act are funding utilities and communities to extend and expand initiatives in energy efficiency and renewables, with particular focus on traditionally underserved communities.

Utilities' knowledge of their customers and dynamics provides them a unique vantage point for discussing how their

Utilities' knowledge of their customers provides a unique vantage point for discussing how customers can support the Justice40 Initiative in federal funding.

— Patrick Di Gregory

Ed has a strong track record that spans more than thirty years in the electric utility and energy industry environments and associated technologies. Ed assists energy, utility, and governmental clients in crafting their smart grid and energy system transformation strategy, vision, and mission, leveraging the integration of new technologies to transform the

business and organization, as well as in developing their energy vision.

Robyn Link is a director within the Energy, Sustainability, and Infrastructure segment, where she leads the commercial and industrial solutions consulting group. She brings more than seventeen years of experience successfully driving, accelerating, and delivering organic growth for

both established and early-stage businesses within the energy sector. Robyn has partnered with eighty-plus utility companies (IOUs, Co-ops, and Municipal) in North America to create and deliver new, transformational load management, and customer engagement solutions that drive results and resolve significant business challenges for utilities.

Graham Dickson is a director at Guidehouse, leading the business strategy and transformation team within the Energy, Sustainability, and Infrastructure practice. Graham has developed and executed customer strategies impacting more than fifty million energy customers in the U.S. and abroad, with a focus on building innovative business models

How can utilities take advantage of funding options under state-led infrastructure investments?

Jenny Hampton: The Inflation Reduction Act is introducing roughly three hundred sixty-nine billion into the customer-facing energy program market through rebates, grants, and tax credits. The opportunity is exciting and unprecedented, and for those who work in the program space, it is a bit daunting.

Experts from all corners of the industry are asking how they can avoid conflicting program delivery efforts; enable people to take advantage of all the incentives coming from utilities, and federal, state, and local governments; and account for Inflation Reduction Act funding in state-level attribution discussions.

Given how much there is to figure out together, getting bogged down in details is easy, but the Inflation Reduction Act is an opportunity to accelerate participation in existing utility programs and an incentive multiplier for utility customers.



The number one piece of advice for utilities right now is, “Don’t sit on the sidelines.” Utilities must be proactively engaged in the conversation, rather than wait for the U.S. Department of Energy and individual states to move forward.

Utilities must connect with their state

Don’t sit on the sidelines. Utilities must be proactively engaged in the conversation, rather than wait for the U.S. Department of Energy and individual states to move forward.

—Jenny Hampton

energy offices to understand their visions and to offer ideas and support. They must understand how rebates and grants map to their programs and outline how they want their customers and trade partners to experience this new environment. And they must take those ideas to state partners and other related agencies.

Utilities are experts on customer program design and delivery and have deep customer and workforce relationships. Now, they must own that role and help drive what happens next. ○

and designing operating models to navigate the energy transition for utilities and technology companies.

Nicole Wobus is a director at Guidehouse with more than twenty years of experience managing projects and programs that address environmental policy, planning and markets, with areas of focus including land use, energy efficiency, and renewable energy. She focuses on climate action, sustainability, and resilience-related planning for local governments and other organizations, as well as clean energy program design, evaluation, policy, and market studies for a range of clients nationwide. Her work helps guide resource and policy decisions aimed at tackling climate change and building more sustainable, resilient communities and operations.

Having worked as Long-Range Planning and Policy Manager for

Boulder County for four years, Nicole is experienced in managing policy and regulatory updates involving stakeholder collaboration and engagement. She is an American Institute of Certified Planners certified planner with a master's degree in Urban and Environmental Policy and Planning, and has a broad background in sustainability and green building practices.

Shaun Fernando is a partner at Guidehouse, leading strategy and economics consulting services, working with governments, utilities, transportation agencies, and the private sector on a range of strategic and public policy initiatives, specifically in the areas of economic development and industrial policy, climate change and net-zero decarbonization, and broadband and connected communities. Shaun sits on the eight-member Economic Roundtable

for the Southern California Association of Governments, the federally mandated planning organization for the region. Shaun is also a Fellow at the Atlantic Council, advancing the council's agenda on the net-zero economy and social capital.

Danielle Vitoff is a director within Guidehouse's Energy, Sustainability, and Infrastructure practice. She focuses on strategic engagement around decarbonization, resilience, and sustainability for governments, corporations, and utilities. Danielle is a skilled project manager who has successfully led clients in exploration and public engagement to develop defensible sustainability strategies that support multifaceted business goals. Notable engagements include the San Antonio Climate Action and Adaptation Plan, leading the development of the American Gas

Foundation resilience study, decarbonization roadmaps for multiple natural gas utilities, managing the California Sustainability Alliance, and the development of a science-based target for The Coca-Cola Company.

Lisa Frantzin is a partner in Guidehouse's Energy, Sustainability, and Infrastructure segment, responsible for decarbonization go-to-market initiatives such as clean hydrogen, e-mobility, and renewable energy solutions. Throughout her forty years of consulting experience, she has determined clean energy integration options for utility companies; identified energy program options for international government agencies; developed business strategies for clean energy manufacturers; and conducted due diligence for financial firms considering clean energy investments. Recently, she

How will traditional energy provider business models evolve through 2030? How can utilities expand their impact in state and local communities over the next decade?

Erik Larson: The end of the current decade will usher in a new phase of the energy transition. U.S. greenhouse gas emissions are targeted at a fifty percent reduction from 2005 levels, EVs will likely represent fifty percent of new car sales, and a significant influx of capital from the

To keep up with the pace of change, utilities must continue evolving in three fundamental business model shifts: build an energy network for the future; deploy data to automate at scale; and sell outcomes, not kilowatts.

– Erik Larson

Infrastructure Investments and Jobs Act and Inflation Reduction Act incentives will have unlocked new sectors and business opportunities. A net-zero economy with a hundred percent carbon-free electricity grid is on the horizon.

To keep up with the pace of change,



utilities must continue evolving in three fundamental business model shifts:

Build an energy network for the future. A carbon-free economy requires a dynamic system with real-time sensing to integrate and orchestrate new energy sources matched with flexible customer demand.

Deploy data to automate at scale. Rethink all processes in the age of AI and robotic process automation with a hundred percent digital mindset.

Sell outcomes, not kilowatts. Partner with customers to meet shared sustainability and electrification goals with competitive and innovative pricing models. This will require a proactive shift to existing regulatory constructs.

With these shifts in mind, utilities can partner with state and local customers and expand their impact with solutions that address shared outcomes across infrastructure, decarbonization, and connected communities. PUF

is leading Guidehouse's Hydrogen Consortium, building the clean hydrogen economy, with more than twenty companies working together to create and launch innovative pilot projects/hubs that use clean hydrogen to decarbonize heavy transport, increase renewables integration, and decrease emissions in the U.S. energy sector.

Patrick Di Gregory is a director in the Energy Providers practice. Patrick brings more than fifteen years of management consulting and analytical experience, working in both public and private sectors. He optimizes financial and operational information to improve performance, minimize risk, and illuminate data for decision making. Patrick's qualifications come from analyzing complex problems, developing strategic

recommendations, and leading improvement initiatives, in a business advisory role as a consultant at Guidehouse and in an executive role leading special projects in the sports and entertainment industry. Patrick holds an MBA from University of Massachusetts Amherst and Master of Public Policy degree from the University of Virginia.

Peter Shaw is a director within the Energy, Sustainability, and Infrastructure segment, and advises energy companies on enterprise and technology transformation, with a focus on the industry's clean energy transition. His strategy clients encompass electric and gas utilities, competitive energy solutions providers, and grid-edge tech startups. He channels his passion for business model innovation into helping utilities tackle

customer experience transformation, Distributed Energy Resource strategy, and revenue growth.

Previous to joining Guidehouse, Peter's energy industry work included senior roles at EY, J.D. Power & Associates, and cleantech startups in demand response, AI/machine learning, and industrial energy services.

Jenny Hampton is a partner in Guidehouse's global Energy, Sustainability, and Infrastructure segment, with more than ten years of experience implementing and evaluating energy efficiency and renewable energy programs in the residential, commercial, and industrial sectors. She has led the evaluations of dozens of behavior-change programs, conducted customer engagement and market segmentation research, managed primary data collection and analysis

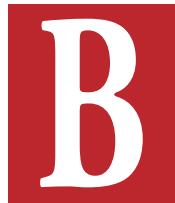
efforts, developed campaign creative and media plans, and coordinated program partnerships between local communities and utilities.

Erik Larson is a director in Guidehouse's global Energy, Sustainability, and Infrastructure segment, with more than thirteen years of management consulting and advisory experience. He has advised some of the world's largest energy companies and utilities, midsize generation and distribution companies, and energy startups. He provides valuable support to both regulated and unregulated business segments across the energy value chain, with a focus on market assessment, utility business models, investment due diligence, mergers and integration, regulatory and growth strategy, and operations improvement. ○



Small Modular Reactors are Indeed Coming

Conversation with NuScale's
Executive Vice President for Business Development,
Clayton Scott



aseload power is the perfect partner to manage intermittency issues from increased use of renewables on the journey to a decarbonized electric grid. NuScale wants to be the first mover along the way with its carbon-free solution of small modular reactor technology.

The company is on a mission to bring SMR to the global energy market. It made history in 2020 as the first SMR to receive design approval from the U.S. Nuclear Regulatory Commission and would make history again by bringing the first SMR plant online by 2030.

Significant milestones are being achieved as NuScale moves forward in the U.S. and abroad, which made it the perfect time for a discussion with NuScale's EVP for Business Development, Clayton Scott. The latest advancements that portend the future of nuclear power are found here.

PUF's Steve Mitnick: Talk about what's exciting that NuScale is doing, getting to the point of putting steel on the ground in North America.

Clayton Scott: Our first project is the Carbon Free Power Project with the Utah Associated Municipal Power Systems, a consortium of utilities primarily in Utah. For the project, we have the site at Idaho National Labs, and we've done fifty or so bore drillings to set up the environmental studies.

We put the meteorological tower up and we're going through the process of getting the environmental studies done. In parallel, we've put in the order for the long lead materials for the forgings with Doosan, and we've got other announcements that will come out shortly.

We're not at a point yet where we're moving bulldozers and dirt around, but we're going through the process of prepping the land and moving the project forward.

PUF: NuScale moved to the front of the line, with review and regulation by the Nuclear Regulatory Commission. Talk about that process and your distinctive small modular reactor design.

Clayton Scott: We've achieved some significant milestones. Clearly, obtaining the U.S. NRC certificate and approval, an SER, a safety evaluation report on the technology, is a key fundamental step.

We had a record-breaking forty-two months to achieve that. Part of the reason why, is because the premise of the design has been based off sixty or seventy years of PWR experience, light-water experience.

We've taken that same aspect and made it simpler, safer, down to the technology we have today where each module produces seventy-seven megawatts of power, and we've not reinvented metals or technologies. We use the same traditional fuel that's being used in a good chunk of reactors globally today.

Having the certification was a significant effort. We put in a five-hundred-million-dollar effort to do all the support work to get the certification from the NRC. As I said, it took forty-two months.

In addition, what sets us a bit further ahead as well is our Emergency Planning Zone, EPZ. The EPZ required a seven-year process to get the final ruling, obtained last year.

We see opportunities, especially with the Inflation Reduction Act. There's a lot of benefit to coal plant repurposing from a cost-per-megawatt-hour savings with the tax credit. You gain more tax credit benefit from hydrogen production.

Our methodology to calculate the EPZ was approved by the NRC. We're the only nuclear technology to have this ruling, and for most potential sites in the U.S., it allows us to keep it at the sites' boundaries.

Our EPZ for our site is approximately sixty acres. Whereas a traditional plant is a ten-mile radius. It's a significant difference. Having that achievement, the certification, and being the

first and only one in the United States puts us out front from a regulatory and a licensee comfort position.

PUF: Talk about the qualities that make this technology so promising.

Clayton Scott: We have a lot of firsts. We're the first design that doesn't need to be connected to a grid as part of our safety case. That's key.

We can use one of the modules as a cold start or a black start island operation. Enduring as mission critical, for example, if there's a significant event, such as a hurricane, we can maintain about a hundred fifty megawatts of power.

We can ensure ninety-nine percent reliability to support mission critical facilities, such as hospitals, in the event of a catastrophe. That's something we can provide for the community.

The plant does not necessarily need to be connected to the grid for the plant's safety systems to operate. It's a convection operated reactor. There are no pumps.

We've removed a lot of the complicated safety systems you would typically find in a normal large-scale plant. They've been removed because of the simplicity of the design, which has allowed us to enhance the level of safety.

We're the only reactor technology to be licensed for twelve



We have a lot of firsts. We're the first design that doesn't need to be connected to a grid as part of our safety case. That's key. We can use one of the modules as a cold start or a black start island operation. Enduring as mission critical if there's a hurricane, we can maintain about 150 MW.

modules, nine hundred twenty-four megawatts. We can operate the plant with three operators.

Not only that, but there are usually station technical advisors (STA) required in a normal facility, in addition to the operators. We're the only technology that does not require STAs. It truly is a walkaway design.

Those are significant benefits that design features allow us to access. A lot of it is where we're placed, the water in the pool, and how our power modules are submersed below ground. Many aspects of the design provide safety benefits.

PUF: What's the timeline for milestones, producing power in the Idaho, Utah areas, and what is coming in the next few years?

Clayton Scott: The carbon-free project in Utah is driven by consumption needs. They don't need offtake until 2029. We're on schedule to meet a 2029 date with the UAMPS project.

Next, a similar timeline in 2029 would be the opportunity in Romania. That is a NuScale VOYGR-6 power plant at the Doicesti site, which is a coal plant conversion, and that's with Romania's state nuclear power corporation, S.N. Nuclearelectrica.

KGHM is a mining company in Poland, and they're looking to deploy a six-module site, as well. It'd be in the 2030, 2031 timeframe.

The most immediate one at this point is UAMPS. We are talking to some customers who have pre-approved sites, and if we were able to secure one of those, there's potential where we could accelerate to an earlier timeline, but that's yet to be seen.

PUF: Is it possible by the early 2030s that you could be scaling up and installing a few of these?

Clayton Scott: Projections for power needs in North America by 2050 are around two hundred gigawatts of additional nuclear. That's just in the United States.

Global needs are higher, because this is turning into – not just a carbon issue – an energy security issue, and we're finding that in many countries in Europe, especially eastern Europe. Combine that with continued energy needs and the SMR market is tremendous.

There's room for more than one player. We want to be the first mover. But we see opportunities, especially in the U.S. with the Inflation Reduction Act.

There's a lot of benefit to coal plant repurposing from a cost-per-megawatt-hour savings with the tax credit. Plus, you gain more tax credit benefit from hydrogen production. Take all those combined, there's a large market.

PUF: There're concerns about fuel, labor, and materials. How are you at NuScale thinking about this?

Clayton Scott: Around the fuel, we must look at the fact there're two different reactor designs. The light-water designs don't have the fuel issue you see with designs that require HALEU fuel.

For example, NuScale's SMR design runs on conventional nuclear fuel, which is available today and can be sourced by existing PWR fuel suppliers, ensuring consistency with existing supply chains and a choice of suppliers from several countries.

On the regular fuel, we need to be conscious because there's a huge market ahead of us, and we have the existing fleet that needs to keep running. Fuel is something we need to pay attention to.

(Cont. on page 54)



PUF Annual Pulse of Power Survey

How You Answered Eight Questions

By Guidehouse's Mackinnon Lawrence
and Richelle Elberg



tilities today, along with the people living and working in the communities they serve, face myriad evolving threats and challenges. In the midst of the ongoing energy transition – wherein new industrial norms such as digitalization, automation, and electrification are being adopted – utilities must keep the lights on while simultaneously upgrading sometimes century-old infrastructure and integrating distributed energy resources (DER). Add rising costs and an uncertain economic outlook, ongoing supply chain bottlenecks, increasing storm intensity, and new Environmental, Social, and Corporate Governance mandates to the picture, and the depth and breadth of power industry challenges is clear.

While the future remains uncertain, based on Guidehouse's ninth annual survey of industry stakeholders, in partnership with Public Utilities Fortnightly, utilities are embracing the opportunity to redefine resilience and improve the lived experience of their customers. The power grid is foundational to a thriving community, and utilities understand the critical role they play in helping constituents weather climate change impacts, reducing greenhouse gas emissions, integrating sustainable renewables into the power generation mix, and electrifying building and transportation infrastructure, all with the goal of a more resilient, sustainable grid.

Increasingly, the utilities industry's role in supporting social equity is also prioritized, as can be seen in recent legislation such as the green energy-focused U.S. Inflation Reduction Act (IRA), which provides enhanced benefits for investments made in lower-income communities. Below, we explore how utility sentiment is evolving across four key energy transition themes.

Technology Advances Support Industry Goals

According to survey responses, technological advances for meeting energy transition demands are keeping pace with transformation and utilities recognize the need to accelerate integration. When asked what energy transition outcome should be prioritized within their territories, a majority of survey respondents (64.5%) pointed to integration of clean and distributed energy.

A growing number (21%) suggested that facilitating the development of livable, sustainable communities to meet broader resilience goals must be top-of-mind. Nearly 14% prioritized supporting equitable community growth, another sign that social equity is gaining mindshare as an important outcome, but lags as a priority issue for utilities within the energy transition.

The focus on clean and distributed energy coincides with a wave of emerging technology deployment across the industry. Utilities are upgrading to second-generation smart meters. Guidehouse Insights estimates that more than 8.5 million will be installed by year-end.

They are embracing more robust networking protocols for increased grid visibility and control, and implementing an enhanced, 360-degree view of the customer solutions. EV-charging infrastructure is proliferating at an accelerating pace. Guidehouse Insights forecasts a tenfold-plus increase in charging points across North America by 2031, when more than fifty million locations are forecast, up from fewer than five million today.

Battery storage continues to ride an accelerating wave of demand to optimize intermittent generation from wind and

More than ever before, the utilities that operate the grid, their regulators, and society at large, understand their fates should be increasingly intertwined going forward.

Climate change and GHG reduction mandates make DER integration a necessity, along with building and transportation electrification.

solar. Clean hydrogen is increasingly central to decarbonization strategies and drones are increasingly used to inspect power lines, reduce costs, and improve network visibility.

Finally, cybersecurity efforts have ramped up markedly in recent years. Indeed, the cyber threat was considered the greatest risk to utilities in 2022's State and Future survey and utilities are no longer just "checking the box" when it comes to cybersecurity.

Power Industry Embraces Leadership Role, Struggles Under Restrictive Regulatory Constructs

Utilities have embraced the changing world in which they operate and are making the investments to achieve their goals, but challenges remain. Most survey respondents feel the industry should take the lead in driving change to mitigate disruptive threats. In fact, more than 60% agreed that the industry should push public sector officials and regulators to innovate ahead of looming threats.

Indeed, the restrictive environment in which most North American utilities operate is seen as the industry's biggest hurdle in terms of meeting its goals and investing more aggressively in the energy transition. Fifty-three percent of respondents cited regulatory challenges as the biggest hurdle, followed by 42%

who said the immaturity of new business models and the time to scale new solutions prevented more aggressive investments.

Building on the notion that restrictive regulation impedes progress, nearly 60% of survey respondents felt that state and local governments and regulators should be prioritized as partners in navigating the energy transition. Solution and emerging tech providers and large corporations were seen as less of a priority.

For the first time in this year's survey, respondents were asked what the most disruptive threat was to business-as-usual in the communities in which they operate, as opposed to their business. Aging infrastructure and a decline in the overall quality of life were most often cited, followed closely by climate change and related disasters. Of course, the two are interrelated: aging infrastructure is less resilient and less able to withstand growing challenges, such as flooding, fires, and the high winds seen in more violent hurricanes, and extended power outages, due either to failing equipment or storms, can have outsized negative impacts on quality of life.

The digitalization of infrastructure can help. In Smart Cities, for example, Guidehouse Insights estimates that investment in predictive AI leveraging municipal data will increase nearly tenfold by 2032, becoming a \$6.5 billion market. Use cases include reducing traffic pollution and congestion and helping cities better understand and conserve energy and water resources.

Mixed Views on IRA and BBB Impact, Transportation Electrification Most Cited

When asked about the long-term impact of the historic IRA, passed in August 2022, and the Infrastructure Investment and Jobs Act (IIJA), the bills' impact on electrifying the transportation sector was most often selected (66%), followed by anticipation of a dramatic acceleration in upgrades to the transmission and distribution (T&D) grid and improved resilience (54.5%).

Notably, the impact on EV adoption due to IRA is not expected to be immediate, as the domestic materials requirements have meant that fewer EVs on the market today are eligible for rebates than under previous rules. Still, according to Guidehouse Insights data, plug-in electric vehicle (PEV) sales more than doubled in 2021 and rose another 50% in 2022.

PEVs accounted for more than 5% of total light duty vehicle sales last year; this level has proven to be a key inflection point for adoption in countries with higher EV penetration. Twenty years out, survey respondents believe the IRA/IIJA's most memorable impact will be the mainstreaming of electrified transportation and charging infrastructure.

Focusing on grid modernization, following passage of the IIJA and IRA, the U.S. will be investing billions of dollars toward replacing fossil fuels with low-carbon and zero-emissions alternatives, and building out the transmission and distribution system required to get clean power to where it is needed. The IIJA appropriated nearly \$5 billion specifically for transmission expansion, a

DISRUPTIONS

Q1. Which is most disruptive threat to business-as-usual in the communities in which we operate?

Climate change and destructive climate-related disasters.



Aging infrastructure and decline in overall quality of life / community livability.



Inequity and fracturing social fabric.



Q2. What role should utilities play in the territories in which they operate to mitigate disruptive threats?

Lead by example. Mobilize the public sector and regulators to innovate out in front of looming threats.



Be flexible and adapt cautiously. Align goals and initiatives to blunt likely shocks to the system. But don't rock the boat.



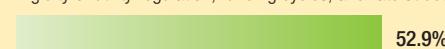
Resist change. Looming threats are overblown. And regardless, the energy system is strong as it is.



CHALLENGES

Q5. What is the primary barrier to utilities more aggressively investing in the energy transition?

Rigidity of utility regulation, funding cycles, and rate structures.



Immaturity of new business models and time to scale new solutions.



Accessing federal and state funding programs.



relatively small investment considering that Guidehouse Insights data indicates that nearly \$3.9 billion in new transmission projects are being added each year.

The IRA provides another \$7 billion-plus in funding for transmission upgrades and, overall, Guidehouse Insights expects a significant increase in T&D investment, although funding gaps remain, and it may not be enough to meet all goals.

Twenty years out, nearly half of all survey respondents expect clean renewable generation sources to be well-established, and, finally, clean hydrogen solutions are projected to have been given

BUSINESS STRATEGIES

Q3. Which energy transition outcome should future utility investments prioritize across service territories?

Integrating clean and distributed energy.



Facilitating the development of livable and sustainable communities.



Supporting equitable growth within the communities they serve.



Q4. Which stakeholder group should utilities prioritize partnering with to successfully navigate the energy transition?

Large commercial and industrial customers.



State and local government, including regulators.



Solution and emerging technology providers.



Q6. How can utilities best direct investments to improve the quality of life within the communities in which they operate?

Support the development of emergency / backup power solutions for critical infrastructure.



Electrify building and transportation infrastructure.



Digitalize assets and infrastructure to increase system flexibility.



an important boost toward commercialization due to IRA.

When asked about their attitude toward the IRA and the 2021 Build Back Better Act, survey respondents were measured in their enthusiasm. More than 58% said they are keeping an eye out for opportunities but admit there is confusion around where the best opportunities are. More than a quarter of respondents fully embrace the legislative support, but 16% disagreed, saying these bills are throwing “good money after bad.”

No Consensus on How to Improve Quality of Life

While survey responses overall indicate growing industry

HISTORIC LEGISLATION

Q7. How would you describe utility sentiment towards the Inflation Reduction Act and Build Back Better?

Let's go! The more federal funding, the better.



Keeping an eye out for opportunities. But not entirely sure where the opportunities are.



Pump the breaks! There is too much change and disruption as it is. This is just good money chasing bad.



Q8. Twenty years from now, how will the Inflation Reduction Act be remembered? Select three.

Dramatically accelerated transmission and distribution upgrades and improved power system resilience.



Jumpstarted clean hydrogen manufacturing and advanced recycling research, development and demonstration.



Led to a wholesale expansion of cybersecurity and digitalization integration across the energy system.



Mainstreamed transportation electrification and charging infrastructure.



Established clean power and renewables as the largest share of generation capacity in the U.S.



Commercialized carbon capture, direct air capture and industrial emission reduction.



Catalyzed large-scale deployment of advanced nuclear reactors.



Significantly accelerated progress toward net zero through energy efficiency and weatherization.



appreciation for the role utilities play in social equity and community quality of life, there remains no consensus on what direct investments utilities can make to achieve these goals. Roughly one-third each said development of backup power solutions,

building/transportation electrification, or digitalization for improved grid flexibility represented the best path forward. In reality of course, all three must be achieved to support longer-term goals, as the even split among respondents implies.

More than ever before, the utilities that operate the grid, their regulators, and society at large, understand their fates should be increasingly intertwined going forward. Climate change and GHG reduction mandates make DER integration a necessity, along with building and transportation electrification.

But the resultant changing nature of power loads and flow means that Industry 4.0 technologies – automation, sensing and

measurement, systems, cybersecurity – must be implemented. And the increasingly competitive environment – as opposed to the virtual monopoly utilities enjoyed for more than a century – means they must dramatically improve their customer engagement capabilities.

It won't be easy, nor happen quickly, but all these advances have the potential to drive increased quality of life and improve social equity. As we said upfront: The power grid and the utilities that enable it are foundational elements to a successful society and resilient economy. And based on this pulse survey, it appears the industry stands ready to meet the challenge. **PUF**

Small Modular Reactors

(Cont. from p. 48)

The labor force is a reality. The general construction labor force is an area of need in this country, whether it's in the nuclear sector or not. That's something the whole infrastructure industrial aspect of the country needs to look at.

The good aspect is that our plants are simple. For a twelve-module plant, we need approximately two hundred seventy employees to operate the plant.

Most coal plants have a similar amount of people or maybe a few more. Most of those people can be retrained into positions within a NuScale VOYGR plant.

The operators need to go through formal operator training, but aside from that, the engineers, technicians, et cetera, they can learn the ins and outs of a NuScale plant with minimal training and typically better pay. We're not concerned about people working at the plant if we repurpose facilities.

If you look in the past, when you start seeing an industry move, people start refocusing their career paths. I'm confident the country and industry will get there. But yes, these are all realities.

PUF: Talk about the people of NuScale and how you look at

your challenges and successes so far.

Clayton Scott: I'm relatively new. I've been at NuScale a little over a year, but I've been in the nuclear industry for about forty-two years, so I'm not new to the industry. I knew Dr. José Reyes, our co-founder, from when he was at the NRC before he was at NuScale.

As for the company, I have been impressed that there're a lot of young people and energy when you put them in the same room. A lot of bright minds.

It's amazing that the company started out with this new design, walked it through some hard times financially, but everybody believes in it, regardless of what's happened.

With recent achievements getting the certification, people are pumped up. They want to see this happen. They've been in the research and development mode for most of the company's operations.

It's time to change into deployment mode, into commercial movement. That's where I've come into the scene, to change the dynamic to move forward in a sales perspective and into a deployment mindset.

The company knows we are well advanced compared to others, and we see movement. I guarantee that once the bulldozers start moving on the site, people will be excited. But I don't see any lack of commitment from anybody in this company. **PUF**

Transformation Tales

(Cont. from p. 4)

wanted to slow down large industrial projects to give opponents the time and a deliberate process to examine and expose their potential effects. The National Environmental Policy Act was born and with it the Environmental Impact Statement that is now required for a far broader range of projects than anyone envisioned in 1970.

The sad irony is this. Twenty-first century projects to diminish the environmental harm of climate change are often prevented by a twentieth century process to defeat environmentally harmful projects. Talk about unintended consequences.

Often lost in this litigious process, the proportions that are involved. A project might endure years of delay, all because a few property owners perceive that they would lose some environmental quality. While that delay – let alone the probability that the project developers will ultimately just give up – effectively allows a considerable quantity of climate change gases to be emitted, that the project would have avoided, affecting us all.

Republicans and Democrats in the Congress and the Administration too are united, a particularly rare condition these days, wanting to enact reforms to this process, to enable more projects to be permitted. And more expeditiously as well. It has emerged as a top priority in Washington. Giving hope to all those that have a sense of urgency about slowing down the oncoming train of a changing climate. **PUF**



Edison Congress 2023

Thanks to the thirty-two represented utilities and everyone participating making this such a great success. See you all next year at Edison Congress 2024.





Lighting the Way
for Our Clients to
Lead the Way