

# COP26, Infrastructure, Build Back Better

Excerpts from the remarks of EPRI CEO Arshad Mansoor,  
NYPA Interim CEO Justin Driscoll,  
Gridwise Alliance CEO Karen Wayland,  
Anterix CEO Rob Schwartz,  
Keystone Policy Center Board Chair Paula Gold-Williams,  
Guidehouse Segment Leader Jan Vrins,  
and Dentons US Energy Practice Chair Clint Vince,  
at a timely Dentons think tank event



Entons partnered with the Keystone Policy Center in early December to hold its Smart Cities and Connected Communities Think Tank with Keystone's Key Conversations. The virtual gathering was held to sort through recent developments with ramifications for the energy and utilities industry.

These events, domestic and global, are sure to shape the future of power. Many hot energy topics were explored, including the signing of COP26, passage of the Infrastructure and Investment Jobs Act, and the future of the Build Back Better Act.

From the keynote by EPRI CEO Arshad Mansoor, to the panel of experts, this is a dialogue not to be missed. Enjoy these memorable moments.

## Keynote: EPRI CEO Arshad Mansoor

COP26, I had the pleasure and privilege to be there representing EPRI. COP26 to me, it's the papers that have been signed by two hundred countries. We are seeing our aspirations for a clean energy future becoming ambitions. We are putting a stake in the ground, not for 2050, for 2030, near term on what we want to accomplish across every country.

I'm going to peel the onion on three key things we'll have to do in the near term for this ten-year target. Let's see what it will take for the U.S. to reduce emissions by fifty percent economy wide by 2030.

First, we can re-imagine the grid. We have to build the re-imagined grid that is ready for renewables, and for electric vehicles.

Let's take renewables, wind and solar. To meet our 2030 goal, we need to make sure the largest source of carbon free energy, nuclear and hydro, are working online and they're staying. We'll need to add a lot more wind and solar. Our model shows that anywhere between three X to four X.

What it means is from two hundred gigawatts installed capacity today, to six hundred to eight hundred gigawatts installed capacity. The cost of wind and solar, even though we are seeing because of supply chain related impact, the cost is going up a bit, it will continue to go down, not at the same pace, but it will go down.

In order to make the grid ready for that amount of renewables, first we have

to double or triple the pace at which we are adding transmission. If you don't add transmission, you're not going to be bringing in six hundred gigawatts of wind and solar. That's a policy issue, that's a regulatory issue. If we don't address that, we will not reach fifty percent decarbonization.

Second, when we bring six hundred or eight hundred gigawatts of wind and solar, it's a different resource mix. We are seeing what happened in Texas, what's happening in Europe. That weather is becoming more extreme, and those extremes are happening more frequently.

To get the grid ready for that level of renewables, we'll have to rethink what resource adequacy means in the way we plan our power system. Resource adequacy means we will have resources available not just seasonally during peak winter or peak summer season, but on an hour-by-hour basis.

The resources are available when we have common market failures like we saw in Texas. The resources are there for the new weather pattern we are seeing.

If you look at what's happening in Europe, it's not the fault of wind and it's not the fault of gas, where they're not bringing in gas. It's the fault of inability to plan, that we have a wind drought. What you're seeing happening in Europe is a wind drought.

It's a wind drought that's more than sixty days. Our planning process did not make that. We use a one in a ten-year loss of load probability. That is no longer

sufficient. We have embarked EPRI with working with NARUC, with Department of Energy, and more than thirty utilities to rewrite, rethink.

What are the planning processes needed for this decade? What are the tools we need to do the plan? It's not a technology but addressing resource adequacy, and in parallel addressing markets so when the wind doesn't blow and the sun doesn't shine, there is enough market incentive for people to keep their capacities, which are going to be critical.

We have to be thoughtful on how natural gas will be a key player in this decade. When we say that U.S. emissions were reduced by one gigaton, two thirds of that happened because of coal to gas conversion.

We see more coal to gas conversion in this decade. But we are seeing industries, large chemical industries, petroleum industries that use petroleum as the raw material, are thinking of switching to natural gas.

This will allow the industry to do the same thing the electric sector did. By going from coal to gas you reduce by fifty percent. By going from petroleum to natural gas, industry has the opportunity to do that by fifty percent.

On the electric vehicle side, the biggest challenge is not technology, it's regulatory. We fully expect within three years' time, by 2025, there will be first cost parity. Which means when you buy a twenty-thousand-dollar car, an electric vehicle would be at the same price.



**If you don't add transmission, you're not going to be bringing in 600 GW of wind and solar. If we don't address that, we will not reach 50% decarbonization.**

*— Arshad Mansoor*

It will open the door to electric vehicles, for what I call the average U.S. household; family of four, with forty-five-thousand-dollar income that has two cars. If they're able to convert both their cars to electric, net on their energy bill, they will save a thousand dollars.

But they will not be able to do that unless there is ubiquitous charging infrastructure. If you look at the way charging infrastructure is happening, you get it in affluent neighborhoods, you don't get in underprivileged places. We need a societal focus.

We will need balancing resources. We'll have to balance variability. Is the balancing resource going to come from batteries, gas turbines? Yes, they will.

But let's rethink and see how we can get some of the balancing resources from customer resources. This is the decade where a lot of work on demand response that has happened over past decades becomes

a reality of what we call a Shared Energy Economy Model.

What is a Shared Energy Economy Model? Uber, and Airbnb are Shared Economy Models. If I have a house, a room, and I don't need it and you need it, you pay me, but you get to use the room. Same on a car. Same on the energy industry.

If I have a water heater that breaks, maybe I can get a water heater from the utility or a third party that is grid ready, so I get it at half the price. I use it for my hot water, but the grid uses it for the flexibility.

Resiliency is not only about resource adequacy and transmission and distribution. Look at cities. When you have power that goes out, traffic light traffic accidents are a top five cause of death and injury.

Why can't we put a ten kilowatt, eight-hour storage across every major traffic intersection all over U.S.? 99.99 percent of the time, those resources are the grid resource. But the one time the power goes

out, when we have a storm, that is also providing traffic lights for people.

All these things are predicated by a comprehensive communication infrastructure the electric sector has to rethink. They're already rethinking. Ameren, Evergy, Southern Company, San Diego Gas and Electric. I can keep on naming. What does it mean?

What it means is if you have to enable customer flexible resources. If communities have microgrids, that is part of flexibility. If fleet operators have batteries that are resiliency resources for their transportation, but flexibility resources for the grid, you need ubiquitous communication.

Communication technology, whether it's LTE, 5G, it's progressing at a pace that this is a reality. Before we add another communication infrastructure, if you look at any utility, anywhere between twenty to twenty-five different types of special purpose communication infrastructure exist today.

This is an opportunity to rethink that architecture and come up with a communication architecture that has the latency, security that can support multiple applications. You will hear about that, in this journey to reimagine the grid, communication will play a key role.

If you have a chance, Google these four words, Low-Carbon Resource Initiative. You'll go to our website. You'll see a lot of documents on innovation, advanced nuclear, carbon capture. In this decade, we are not only working to reduce emissions to fifty percent, and that's not an easy task, but we are also working on the innovation, so tools are ready by 2030 to get to the net zero glide path. ○

## Global and Domestic Events Panel

**T**his panel was moderated by the Chair of Dentons US Energy Practice, Clint Vince, also a former chair of the Keystone Policy Board of Trustees, as well as the Keystone Policy Energy Board. It brought together five

leaders in the energy industry to discuss the latest big issues, global and domestic.

Herein, you will find New York Power Authority Interim CEO Justin Driscoll, Anterix CEO Rob Schwartz, Guidehouse Segment Leader of Energy, Sustainability

and Infrastructure Jan Vrins, Gridwise Alliance CEO Karen Wayland, and Keystone Policy Center Board Chair Paula Gold-Williams. Enjoy these memorable moments.

**Moderator and Chair, Dentons' US**

**Energy Practice, Clint Vince:** Karen, what are the most important features of the Infrastructure Act as they relate to grid modernization? I know you were integral in shaping many of those features.

**CEO, Gridwise Alliance, Karen Wayland:** It was an industry-wide effort to develop recommendations for Congress and advocate to Congress for those investments they put into the infrastructure package.

When I add up what's in the infrastructure package, that is separate from all the storage incentives, battery recycling, and clean energy incentives. The grid package itself is historic, on the order of maybe close to about twenty billion.

If you look at the amount of money that's available in the broadband area, which is a separate part of the bill that doesn't flow to DOE, there are more billions that are available for the utility industry to make investments in utility and communication.

There's eleven billion for different kinds of resilience programs, there's three billion for grid flexibility, and there's increased funding for cybersecurity, although we'll be working to increase that number further. There's a whole suite of other sets of investments for electric vehicles, batteries and other things. They're enabling programs to help the grid evolve to be this platform for decarbonization.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** We're seeing tremendous opportunity for tax credits for renewables, essential for decarbonization goals articulated in COP26. But it's also going to place stress on the grid. What are you focused on in terms of challenges and potential solutions to maintain resilience?

**CEO, Gridwise Alliance, Karen Wayland:** Helping DOE think through the best way to implement the eleven million of resilience funding in a way that helps de-risk the decisions that policymakers, particularly regulators, have to make about ratepayer impacts.

One of the crucial issues we are going to focus on is how DOE will structure those programs in a way that some are split



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*— Clint Vince*

between DOE funding and state funding. How will you work with the states to set up the rules, to set up the kinds of eligibility, so states can have the flexibility to address the big resilience issues, because resilience needs differ geographically.

Also thinking through how to make sure we have a lot of data on reliability and the impacts of investments on reliability. We have growing sets of data on the impacts of resilience investments and the benefits of those investments, but it is a little more difficult to make the benefit cost pencil out for pure resilience investments.

One of our goals in advocating for federal funding across this grid space was to help ease the kinds of decisions and accelerate the decisions at the state and local levels to make this transition happen.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** Our client CEOs are expressing a lot of concern about, if we do need to increase renewables by three to four X in the next ten years, we are going to have to make significant changes to our transmission and communications systems related to the grid. What essential point would you like to convey?

**CEO, Gridwise Alliance, Karen Wayland:** We asked our members about

emerging technologies, what one of the fundamental backbones of the modern grid would be, and from the small utility all the way up to the major independent IOUs, the answer was an upgraded communication network.

We're beginning to see a lot more attention to the fundamental role that communication networks, whether it's wireless, broadband, are going to play in smart grid, smart cities, and having a grid that is flexible and responsive enough to deal with the increased amount of renewables.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** You can't modernize the grid without modernizing communications. Can you explain that a little more carefully?

**CEO, Anterix, Rob Schwartz:** The availability of both the spectrum, which is the asset we bring forward as Anterix, as well as the ability to understand how to deploy this and solve these kind of use cases, we want to make sure that is available, not just individually, but collectively to the industry.

For us to reach our renewable goals, to reach distributed energy integration, sensor situational awareness, and use that data to make important and critical actions, that's



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For customers, it means giving information that allows them to understand energy supply and demand, lower cost, and increase productivity of their energy, infrastructure, and ecosystem.

– Justin Driscoll

going to require a significant increase in the communications capabilities. What we're driving is using LTE, which is long term evolution, the same technology in the phone in all your pockets. The evolution is that evolves into 5G as it's needed by the industry.

There is this collective effort I talk about. We see the network across the country as this nationwide network of networks. We are currently working with San Diego Gas and Electric, Ameren, Evergy, and other utilities. Southern Company has deployed LTE. The issues that are faced in the collective effort to be able to figure out the best technology drive vendors to be interested in this.

We just announced something called, The Anterix Active Ecosystem Program. Now, over seventy companies are collectively helping drive the ecosystem only because we've defined this as a collective effort. It used to be that individual utilities were trying to get vendors to help them do things.

Now that we have the collective vision in this sandbox, in this active ecosystem program, we've got companies like Cisco,

Motorola, GE, NOKIA, Burns & McDonnell, Black & Veatch, the list goes on.

We just launched a subset of that, a new effort to drive a focus on cybersecurity. We call it the Anterix Security Collective. Because recognizing the complexity facing utilities and addressing the security challenges, we wanted to be able to bring that collective action together.

Communication is such a critical piece. The number of sensors we're seeing utilities planning to deploy within their infrastructure, to be able to be aware of what's happening both from a cyber standpoint and an operational standpoint, is mind blowing.

Millions and millions of sensors, and the ability to make sure that also brings the layer of cybersecurity that's required uniquely by utilities as they deploy and operate their own communication networks.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** How does a private LTE network assist in a utility's cyber security protection?

**CEO, Anterix, Rob Schwartz:** The first thing is the word, private, in private LTE, and that stands for a network owned, built,

operated by utilities, the way they need it in the places they need it, and with the level of resiliency and security we talked about. Private says that, unlike using an off the shelf commercial product, no one else is going to have access to that network.

You're air gapping, and firewalling that from the public internet. That's the level one of making sure it's cybersecure, and then the information that flows through that. That's where the initial six companies that we pull together in this security collective are focused on things like cyber threat intelligence and zero trust security data authentication.

It's the availability of that secure private network to monitor all the assets. We're talking about the deployment of a lot more assets into this network, that each of them is going to have a level of interaction with the incumbent utility, but also there's going to be third parties operating those, and the way in which we're going to secure that environment is critical.

Ameren, when we deploy with them, is planning to consolidate over twenty different existing legacy networks onto their single LTE network. You then have a single resilient, secure network.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** Jan, what are you seeing from a practical industry standpoint, your client standpoint, regarding the new Infrastructure Act and prospects under Build Back Better?

**Segment Leader - Energy, Sustainability and Infrastructure, Guidehouse, Jan Vrins:** I want to comment about what's happening at the global scale. There are over seven hundred billion euros in the European Commission spent on resiliency and decarbonization of the energy system in Europe. The infrastructure bill in total is about six hundred, which is a lot more than physical infrastructure in roads, et cetera.

We work with our clients to figure out what are the programs that the federal government is looking at to fund. It cuts across many of the agencies. Department

of Energy, Transportation, but also Department of Defense, Interior. This will come from multiple agencies, it will then go to state and local levels, as well as some of the cities and counties. There will be other recipients like utilities. There's a lot of money.

We can't forget the distributed grid as well. The DER side, and I've been talking about this for many years. This concept of energy cloud. It is one system from generation, transmission to distribution, to behind the meter.

It connects to buildings; it connects transportation infrastructure. We're not going to have an energy system and a separate EV charging infrastructure. It's going to be an integrated system. That's why the behind the meter elements and the distribution side of our system are going to be key and we need to invest more.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** Can you elaborate on what you expect to see with distributed energy resources and demand response?

**Segment Leader - Energy, Sustainability and Infrastructure, Guidehouse, Jan Vrins:** Arshad spoke about how we need to accelerate large scale renewables three X. Distributed energy resources will grow at a faster pace than that.

It will grow at a faster pace and central station expansion in the next ten years. What we mean by that are things like energy efficiency, demand, response, distributed generation, behind the meter solar, behind the meter storage, and electric vehicles, that's also a DER.

I use this example all the time, if twenty percent of the personal vehicles in the U.S. would be electric, that would give you three hundred gigawatts of battery storage capacity available. Now that's theoretically available, it doesn't mean it's all the time available, but on average we use our car at most twenty percent of the time.

Fleets like school buses, they are available after four, exactly when the peak starts to kick into the system. There's a huge opportunity to use that resource, which is



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a distributor resource to help with peak shaving, as well as provide resiliency to the grid. So, we can't forget the DER side.

A lot of the DER is driven not so much by policies and regulations but more by technology and even more so by customer demands. Customers want solutions that serve their specific needs.

There's a lot of good ones out there that are behind the meter.

At the community level, things like microgrids, a lot of opportunities there. I'm glad the current administration believes energy efficiency is important and will continue to invest in energy efficiency.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** One of the more interesting projects the New York Power Authority is doing is creating the first end to end digital utility. Tell us what that means.

**Interim CEO, New York Power Authority, Justin Driscoll:** In 2012, we started to experience some failures in our transformers and other elements of the aging power system. At the same time, there was a lot of R&D going on in development of accelerating computing power, advanced software, and analytics.

We saw everything's going to be digital. We started a quest to become an end-to-end digital utility. That kicked off in about 2017.

On the generation and transmission side, it means combining these digital processes, data technology, and people to drive business insights through the connectivity, big data, and analytics that the technology and digitization provides.

For customers, it means giving them business insights and information that allows them to fully understand their energy supply and demand, lower the cost, and increase productivity of their energy, infrastructure, and ecosystem.

The digital utility that we're creating has three pillars. One is our integrated smart operation center. That takes data from our transmission and generation system and feeds it into a central location in our central office, in White Plains. It's effectively creating digital twins of our generation facilities and our transmission, so we can model real-time performance against what is supposed to be happening.

Ideally, we can identify deviations and spot problems that can then eliminate unplanned outages. We've already seen huge

savings as a result of the analytics from that data flow.

The other component is what we call AGILE or Advanced Grid Innovation Laboratory for Energy. This is another digital twin. It's the digital twin of the transmission system that we've modeled. We share with other utilities and academia.

It's a closed loop system, so we can take a proposed utility scale farm, solar farm, or wind farm and plug it into the model and see what impacts it would have on the grid, performance, congestion, and other issues that might develop.

The third is what we call New York energy manager, which is the building data set. It's a unique data set of seventeen thousand governmental buildings. Given the nature of our customers, we can help them analyze their energy use. We can also do our own analytics. It's valuable and another thing that makes this digital journey unique.

On the sensor side, we have eighty thousand sensors deployed across our system, and we're looking to go to a hundred and thirty thousand sensors. That sort of captures our digital journey.

**Moderator and Chair, Dentons' US Energy Practice, Clint Vince:** We've heard about resource adequacy issues, especially impacting Texas. Talk about those issues and comment on your perspective on social equity in our industry.

**Board Chair, Keystone Policy Center, Paula Gold-Williams:** I live in a state that experienced Uri and it was an emotional journey for the citizens of San Antonio and Texans. We had the experience of what a lack of resource adequacy can feel like when you're being pressured by a major event. When you look at it technically, we use all these complicated terms, resource adequacy.

What we're really talking about is, do we have enough capacity to serve the customers that need power? We try as great professionals to plan for these peak times. When do we need peak, and Texas has



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— Paula Gold-Williams

been known for having a summer peak.

What Uri did in the middle of our short winter, is increased the demand for power beyond anything we had seen in summer, historically. You are not only planning for a dual season, but you're also planning for these unknowns.

We experienced more demand for power that caused us to have to force outages. We got instructions from ERCOT. We must take outages to customers, and it got to be so big in Texas, that we couldn't even rotate them.

That's what caused the challenges where we had people out for days, some of them five days, and it was a horrible experience. Right now, the State of Texas has a tremendous amount of anxiety trying to make sure we know we're ready for this next winter.

Based upon current technology, that can't change a whole lot in one year. We are coming together to try to give confidence to our citizens, that we are running our plant hard as we can. We are fine tuning them. We're coming out of the period of increased maintenance and higher levels of maintenance.

We have enhanced how we weatherize our units. We're collaborating extremely well. But the unknown again is how extreme this storm will be if there is one,

how extreme the weather and the cold frigid temperatures will be.

Even more than the depth of how cold it will be, will be the duration of that in experience. How long can it go below freezing and almost close to zero, which again is something highly unusual in Texas, but we did experience it.

So, resource adequacy. We had to think about how you talk to the average citizen about this.

We talked about customers have preferences and they're driving how we're supposed to be investing more in cleaner and new technologies, but they also have a level of anxiety around how we serve them.

When you think about how many people, from an economic standpoint, are still being plagued by the challenges of the pandemic. If you're serving a community that already has a high level of poverty like San Antonio, you think about that complexity, and the digital divide.

We're talking about all this technology that we need to put in place, but the average citizen doesn't have that awareness, comfort, and may not have that level of access. Communities can't find enough resources and keep bills affordable enough to increase the pace and velocity of how we're going to have to implement change. **PUF**

## Renewables in the Rockies

(Cont. from p. 41)

You might have people who say, we want to force more renewables. We want our coal plants closed. At our main utility, Rocky Mountain Power, they have to balance a lot, and take care of investors, to keep rates as low as possible.

We have some of the lowest rates in the country. That's important to us because we have one of the best economies in the country. You don't want to mess it up with increasing your electric rates. That means there's a critical balance that must be achieved and I believe best accomplished through market forces.

These renewable projects have benefits in terms of job creation. Although there were a hundred or so construction people at the site that I toured recently, there are only a handful of workers required to keep it going. But those are still plus jobs for some of our counties looking for viable and sustainable job creation.

Then you have the property tax implications. The land was just sagebrush. There was no water. You couldn't graze cattle. You couldn't do anything with it.

The property owner said, this is a good deal for the school district, and the community. If we can have cleaner energy, and keep the prices low, it's a win-win for everyone.

We have a lot of geothermal assets in our state, that we're growing even more. One of our co-ops, the Utah Association of Municipal Power Systems or UAMPS, is involved in the small modular nuclear project with the Idaho National Laboratory. That's super exciting.

You can see the quantification of the economic impact in our rural counties in this report and the explosion of projects. It's pretty exciting and something our rural counties are constantly evaluating.

**PUF:** What's the potential here, three to five years out?

## Nebraska Utilities Shaping the Future

(Cont. from p. 32)

system, which is the electrical equivalent of about half a megawatt for six hours. All that was already there and can now work with this LES generator to serve the microgrid.

**PUF:** You've got a lot of plans to build on this, right?

**Scott Benson:** On top of that, earlier this year, we issued a request for proposals for an energy storage project in part, because we wanted to learn more about it, probably a battery storage project. Beyond that, where we're locating it is right downtown in the middle of that microgrid.

Not only can we play around with energy storage to learn what it might look like in the Southwest Power Pool market, but

**Steve Handy:** We're always going to need a baseload of coal for many years going forward until we get this issue of storage figured out, that you can get past the two- or three-hour storage. But there's going to be breakthroughs.

In the meantime, we can transition in a smart market-based way that's acceptable for communities. My constituents are all in favor of a greener environmental future.

I love the mission statement of The Western Way, to make this transition in a smart market-based way. Let the market make this happen, rather than making government mandate it.

## We hope these reports influence policymakers to say, what can we do to make sure the counties are open for business?

— *John Karakoulakis*

**John Karakoulakis:** As we're seeing the rapid acceleration of innovation, and what technology is bringing across all aspects of our life, we'll continue to see development accelerate.

This doesn't have to be a zero-sum game. That's where the pitfalls are that we see a lot of times in our political arguments, and in our more polarizing issues. It's one or the other.

There could be a great partnership with mining, in terms of critical minerals, lithium ion. We're seeing now supply chain issues with farming this out to China. When we get our act together on critical minerals, it's a huge opportunity for the mining industry and the West with these new technologies.

We've got mines that can produce this, but it's cheaper to do it in China and they've got lower environmental standards. But as the world awakens to that, it's a big opportunity, and more options for rural parts of the West to bank on. **PUF**

also what it might look like to help us defer peak load on our transmission and distribution system. It's also one more resource to support the microgrid should we ever need to lean on it.

**PUF:** What aspect is most rewarding for you?

**Scott Benson:** I'm the manager of resource and transmission planning. On the books we do all the long-term planning for LES's generation assets, as well as the transmission to serve both those assets and the load area.

Unlike most planning areas though, we get to see a lot of projects come to fruition. When we do renewables under power purchase agreement, like the wind, or the first utility scale solar project in the State of Nebraska in 2016, or when we're looking at doing this energy storage project, we continue to hold the ball under those projects, driving the contract and the project until we see them to fruition. **PUF**