

# NORTH CAROLINA'S ENERGY EDGE

**Experts discuss recent changes and future advances in the state's energy industry.**

The round table was hosted and sponsored by N.C. State University and N.C. State University Continuing Education. Additional sponsors were ElectriCities of N.C. and Sunbelt Rentals. The transcript was edited for brevity and clarity.

## **CAN YOU TELL US ABOUT GOV. COOPER'S EXECUTIVE ORDER TO ADDRESS CLIMATE CHANGE AND WHAT KIND OF IMPACT IS EXPECTED BY HIS ADMINISTRATION?**

**HODGE** The governor issued Executive Order 80 on Oct. 29, 2018, and our office has been turned upside down ever since. We are the State Energy Office, we are a totally federally funded agency, and all of our Department of Energy program managers are calling every week. They're so excited about this clean-energy future that we're looking at in North Carolina, and they're wanting to know how they can help us, what are some of the best practices that they can share with other states and how North Carolina can be a leader.

The four main goals are, first, a 40% reduction in greenhouse gas emissions by 2025, based on 2005 levels. Second, we'd like to have 80,000 registered zero-emissions vehicles in the state of North Carolina. Currently, there are between 8,000 and 9,000, so we're working with the Department of Transportation on a plan for how we get those ZEVs. Third, a 40% reduction in energy intensity usage in state agencies by 2025, based on 2002-03 levels.

The fourth thing is the Clean Energy Plan. We want everyone across the state to be involved in developing this plan. We have several methods in which we have been going about this. First of all, we have facilitated workshops. There are six of those scheduled, four of them have already taken place, and we have two more that are occurring right here in North Carolina.

We're very fortunate that we have the Regulatory Assistance Project and the Rocky Mountain Institute helping us facilitate and coordinate those efforts here in Raleigh, but you have to





From left:

**Star Hodge**, manager, State Energy Program, *N.C. Department of Environmental Quality's Division of Mining, Energy and Natural Resources*

**Brian Bednar**, founder, president, *Birdseye Renewable Energy*

**Kevin Poet**, head of plant operations, *Siemens Charlotte Energy Hub*

Moderator: **David Doctor**, president and CEO, *E4 Carolinas*

**Christina Kopitopoulou**, program manager, *Energy Production and Infrastructure Center, UNC Charlotte*

**Joseph DeCarolis**, associate professor, department of civil, construction, and environmental engineering, *N.C. State University*

**Andy Fusco**, vice president of member services and planning, *Electricities of NC*

## ENERGY ROUND TABLE

submit a letter to us saying that you want to participate. The listening sessions are across the state and anyone can come. We've been at the Energy Production and Infrastructure Center at UNC Charlotte, where we held the first listening session. We've been to Asheville, Greensboro, Rocky Mount, Fayetteville and Wilmington. At some of those events, we've had up to 100 to 150 attendees. Those that attended were very informed and wanted to make sure that their input was incorporated into this Clean Energy Plan. We also tagged along with other energy events across the state of North Carolina. One of the most recent was the Sustainable Energy Conference at N.C. State, where our director, Sushma Masemore, gave a presentation about the Clean Energy Plan, and we were able to get some feedback that we will incorporate into

the plan. We also have online input for those who can't make it to the sessions, so they can just send comments to us by email on our website.

#### HOW ARE UNC CHARLOTTE AND N.C. STATE UNIVERSITY RESPONDING TO THE VERY RAPID CHANGE IN THE ENERGY INDUSTRY AND THE NEED FOR TALENT?

**KOPITOPOULOU** Obviously, the change is coming whether we like it or not. We have noticed that a lot of our students are very interested in clean energy and that realm. EPIC, together with UNC Charlotte, has created an energy concentration. This concentration is offered for each department under the College of Engineering, which helps students pick the right courses, have the right advisers and connect with the industry, so they can really focus in energy. Some are more

interested in clean energy, and some are interested in conventional energy. We cover it all. We do have a lot of partners such as Siemens and Duke Energy with whom we work closely; they take our students in, they have interns, they work with them and then even mentor them as they go through their studies. I think that really helps the students understand where the industry is going because it's changing very rapidly. The more involved the students are with our industry, the more quickly they also understand how these changes are happening. Besides having those concentrations, which we also offer at the MBA level at UNCC, we have a lot of applied research projects with players in the industry, federal labs, federal grants and state grants. We have a project with the Department of Environmental Quality and the North Carolina Clean Energy Technology Center for the Grid Resiliency Plan. So there's a

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lot of collaboration between the universities, the students and the industry. I think that's the way we can get our students prepared for what is coming up next.

**IN NORTH CAROLINA WE HAVE A LARGE CONCENTRATION OF ENERGY COMPANIES AND ORGANIZATIONS. IN OUR UNIVERSITIES, ARE YOU ABLE TO BE MORE RELEVANT IN RESEARCH BECAUSE OF THAT?**

**DECAROLIS** I think there's lots of opportunity for partnership, and universities can fulfill a critical role by doing the fundamental research and then partnering with industry professionals when it comes time to bring the product to market. There's also an opportunity to work with policymakers to figure out the best path forward. We contribute to helping develop new technology and provide unbiased advice to decision-makers.



“

From the university side of things, it's really exciting for our students because there are a lot of opportunities for them.”

**CHRISTINA KOPITOPOULOU**  
UNC Charlotte



## ENERGY ROUND TABLE

**WE HAVE BEEN THE UNFORTUNATE RECIPIENT OF A LOT OF STRONG WIND AND RAIN OVER THE PAST FOUR YEARS. HOW DOES THE INCREASED FREQUENCY AND SEVERITY OF THESE STORMS AFFECT THE POWER INDUSTRY'S THINKING, ESPECIALLY PUBLIC-POWER AUTHORITIES?**

**FUSCO** Last year, much of New Bern was underwater. Same with Lumberton, Red Springs and Laurinburg. If you're an electric utility and a storm's about to hit, there's not a lot that you can do about that. What you can do, though, is be prepared and have action plans.

That's one thing that public power does really well. We have several communities across the state and into South Carolina and Virginia. Well before storms get here, we enact our emergency-response plan. We get all of the utilities communicating, and we make sure that we're staging crews where we need to beforehand. Every utility does this, not just public power, but since we're operating independent utilities, this is how we work.

Last year was very unique because we had to respond in particular to New Bern, but also down in Lumberton and deal with flooding there. And a couple weeks later, we had another storm come up the middle of the state, so as we're getting things wrapped up on the East Coast, we had to redeploy a lot of our crews out west. We helped restore those communities as well, and then we worked our way up into Virginia to some of our members there.

Electric utilities do collaborate amongst themselves really well in these situations. We provide power at incredibly high rates of reliability even during storms, and we go far outside of the state as well. Two years ago, the hurricanes hit Florida; they didn't hit North Carolina. We sent crews who worked their way through South Carolina and Georgia and ended up in Florida. We still get letters from people in Florida saying, "I'm glad that crew



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**JOSEPH DECAROLIS**  
N.C. State University

from Greenville came down and helped us out."

**N.C. STATE HAS A SIGNIFICANT FOCUS ON GRID TECHNOLOGY. IS THERE AN INCREASING INTEREST IN RESILIENCY AND RECOVERY FOR POWER GRIDS IN STORM CONDITIONS?**

**DECAROLIS** I think that that's a really core topic that a lot of folks in and around campus are working on, including distributed energy and the development of microgrids. But we need more research on the components that will enable the cost-effective development of microgrids. We need modeling to understand how well these

microgrids will work under storm conditions. There's a lot of interest in resilience, but I think there's still a lot of work to figure out how do we harden these systems, make them more resilient in a way that's cost-effective? I think university research can help in that regard.

**HOW DID THE SOLAR INDUSTRY FARE DURING THE HURRICANES?**

**BEDNAR** It fared really well. North Carolina is the second-largest solar-installed base after California. From a generation point of view, solar does extremely well. Last year, there was damage to four or five facilities that wasn't immediately addressable. I think

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## ENERGY ROUND TABLE

there's a lot of work to be done there still, but I think the good news is we design for high winds and floodplains. A section may be damaged, but it can be easily isolated.

**THINKING OUTSIDE OF YOUR ROLE WITH YOUR COMPANY OR ORGANIZATION, WHAT DO YOU THINK IS NEXT FOR ENERGY TECHNOLOGY?**

**HODGE** We've been going across the state and having all these listening sessions and facilitated workshops with all of our stakeholders. A recurring theme is equity and access to distributed energy resources. We've also heard a lot in our sessions from communities that have been directly impacted by all of the storms that are coming, so I think microgrids and figuring out ways to be more resilient will definitely be a part of it. Also, even though we already have a lot of collaboration, we need even more to

keep North Carolina in the forefront and help us be an example for other states.

**BEDNAR** There is a bit of a battle brewing where big-money, corporate industrial customers want more choice. The corporations are going to want to really push on the regulated model, especially in the Southeast. They want to really drive their own costs down and they're willing to tip over the apple cart a little bit. We're going to have to figure that out and still keep our utilities and figure out a model that works for the Southeast.

My development cycle has gone from 24 months to now 36 to 48 months, so I'm starting to think about what that will look like in 2025. For entrepreneurship, we're being forced into the arms of bigger partners. We want to make sure we don't accidentally suffocate out this industry of entrepreneurship. If we want to hit the kinds of audacious goals we have, we're going

to have to get the backbone figured out in a way that is going to help get projects done more quickly. I think those are two things you're going to see — one, how will we have more control of our price of energy for ourselves, and is the utility the right fit? And two, how in the near term are we going to make sure that we don't smother out creativity and entrepreneurship within renewables in the Southeast?

**KOPITOPOULOU** We were just in Germany, at KIT — the Karlsruhe Institute of Technology — for a workshop that had to do with, of course, the future of energy. We talked a lot about what else there is besides your typical engineer positions. Distributed energy is the future, but besides the technology, there's so much to think about when you're talking about social studies and consumer behavior, and how all these things will fit together with economics and demand response.



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## ENERGY ROUND TABLE

What are all the different services, besides just your typical equipment, that we will need in the near future to make sure that everything the engineers and scientists design will be actually used?

We can come up with the best things, but that doesn't mean that consumers are going to take them and use them. I think that's where I see a lot of the efforts coming in the next few years: How do we get everybody engaged in this new future to make sure that it is successful? Besides the engineering and technology, how do we bring everybody else in the fold to go together and reach the goals that we have?

**POET** I think large portable power is going to become more and more important, maybe not so much in the U.S., but in other parts of the world. Additionally, I was in the auto industry when there were a lot of debates about electric vehicles and hybrids, around how much to put into it, how fast to switch to it and what the market looks like. I was involved in some of those arguments about the investment versus the payback period.

One of the things that I think is interesting is some of the forecasts about electric vehicles and how much the volume could increase. If you compare that to the forecast of the population that's going to be in urban areas in the coming years, I'm not sure where we're going to hit those numbers that are forecasted for electric vehicles. That doesn't mean we're still going to be buying internal combustion cars and trucks. I think there's a potential for that with the population. If 70% of the world's population lives in urban areas by 2050 as projected, and those urban areas all make strides on mass transit, will there be a need for those folks to own a vehicle? If they do own one, there will be a good electric option, but what will be the need?

#### DO ANY OF YOU HAVE ANY CLOSING THOUGHTS?

**FUSCO** We really can't lose focus on



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#### STAR HODGE

N.C. Department of Environmental Quality

the customers we serve. I mean, they are why we are here, and we need to focus on their needs first. If we have a solution that they don't want, then we've got to find another solution.

**DECAROLIS** I think there's a lot of great things going on in North Carolina, but I would also acknowledge that we're entering a period of really rapid technological change. That's really brought down, for example, the cost of solar and the cost of batteries. When we were working on a storage study, we paid for commercial battery cost data at the beginning of the first quarter in 2018. By the time we had our last public stakeholder meeting in October 2018, stakeholders were complaining

that our numbers were out of date. Luckily, we were able to update all the numbers with late 2018 estimates, and the cost had gone down 20%. Everything is moving really, really rapidly in an industry that's not used to responding so quickly. I think trying to find our way forward is going to be challenging.

**KOPITOPOULOU** It's an exciting time to be in North Carolina in this industry. From the university side of things, it's really exciting for our students because there are a lot of opportunities for them. It's a great place to be because things are changing rapidly, because what's happening today does not mean what's going to happen tomorrow. It keeps us all engaged and on our toes. ■

NC STATE

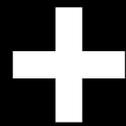
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