

MARTY ROSENBERG
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#301

DAN REICHER INTERVIEW

Hi, welcome to Grid Talk. Today, we're very pleased to have with us, Dan Reicher, who was Assistant Secretary of Energy in the Clinton Administration, in charge of Energy Efficiency and Renewable Energy initiatives. He also was one of a handful of candidates being seriously vetted for the job of Energy Secretary in the Biden Administration. Earlier in his career he was director of Climate Change and Energy Initiatives at Google. We're pleased to have him with us today to talk about where energy infrastructure is going now that Congress has passed a massive infrastructure spending bill under the Bipartisan Infrastructure Law.

Q: Hi, Dan. How are you today?

A: Great to be with you, Marty.

Q: So, let's get at it. There is a lot of money about to be spent. We don't want to get into the weeds about the follow-up law that's being considered, Build Back Better, but what has been passed. What impact will it have? And let's get talking about how it's going to roll out?

A: Well, it's a lot of money. It's an unprecedented amount of money and it's something that, as you know, administrations have been trying to pull off for a long time so I give the Biden administration and Congress a lot of credit and they did it in a bipartisan way. What's happening now is the various agencies that are seeing this money are now basically developing what they call their "spend plans" and in the case of the electric grid, a lot of that money is moving through DOE. DOE is seeing more than \$60 billion dollars coming from the Bipartisan Infrastructure Bill.

Q: Is there a timeframe that it has to be spent; is it a decade? Is it a few years?

A: Some of the money comes with specific deadlines; some of the money doesn't. In fact, more of the money doesn't so this is money that's going to be spent over three, five, ten years, and a lot of that depends on how quickly DOE and other agencies can get up to speed on this and how and how fast they move the money. Do they move it in competitive processes, in non-competitive processes? And do they have the people they need to get the spending done?

Q: So, early on in the Obama Administration there was major stimulus funding dedicated to the energy grid. A lot of it got spent but a significant portion did not get spent and was kind

of left hanging out there. Is there any plan to make sure that doesn't happen this time around?

A: I was involved in the Obama spending. I was on the Obama transition team and I was on the Secretary of Energy Advisory Board and I think the Obama DOE and other agencies did a pretty good job, but as you say, some money didn't get spent. I think a lot of lessons are being learned from that by the Biden Administration and I'm hopeful that they'll get their act together and do the hiring they need to do and get this money moving into very useful projects and programs all across the country.

Q: So, let's talk about that for a second. DOE announced the formation of a Clean Energy Corps and they set up a hiring portal to hire a thousand folks to work on climate change and clean energy. That would bring total employment at the Department close to where it was at the end of the Obama Administration. It shrunk during the Trump Administration, and it will get back closer to the 14,000 in 2016. Is it going to be hard to hire those folks? How do we do it intelligently? And how important will that be in the roll out of these programs?

A: Well, it's very important and I think it's a smart thing to be doing but it's a tough one with today's low unemployment rate and the highly competitive hiring market we've got these days.

It will be more difficult for DOE because at least as I understand things, the Department wants to hire career federal workers and not rely on contractors so that's a more complicated process. I think the good news is that DOE does have more than \$60 billion dollars in this bipartisan funding to spend and a very exciting and high-impact agenda to do so. It's a very well-thought-out program, a very broad program, and if I were looking for a cool energy and climate job right now, I would definitely look at DOE, so I'm hopeful they can hire a good share of those thousand workers they need.

Q: The utility sector and the energy sector has been spending on transmission all along and it's billions of dollars a year going out to invest in transmission. But this new Bipartisan Infrastructure Law calls for expanding it by 60% by 2030 and some estimates say tripling transmission expenditures by 2050. Talk about how that gets done intelligently. What are some of the first efforts that have to be made?

A: Well, I think the key question is what transmission projects should be prioritized with this new money to meet some of those goals that you just laid out. I think it's easy to say but hard to accomplish as to the ones that ought to see this money and those are the ones with the most benefits in terms of our climate and energy goals, and that also have the best

prospects of actually getting built. The latter is hard to predict with transmission projects and many of them can take a decade or more to develop, finance and build. And there's some real-world lessons here. We recently saw a major transmission line defeated from eastern Canada to New England that would have carried Canadian hydropower to the Northeast. There are lots and lots of lessons to learn with that project.

One type of transmission that I think really can use some help and one that I'm involved with is for offshore wind projects on both the East and the West Coasts. These are relatively short transmission lines, but they can be controversial with the fishing industry and they can also be expensive to develop. And, they also can be challenged by the limited points of interconnection in the onshore electric grid. And I've been involved with a transmission line that needs to get built for offshore wind projects that are going to get developed on the central coast of California. The interconnection point has been long thought to be where the Diablo Canyon nuclear reactors exist today, and they're expected to be shut down in 2024 and 2025, but there's been a recent and very high-profile push to keep those reactors online so that could make finding an interconnection point even more challenging if those reactors

stay online. So, these are very important transmission lines, but I think that they're going to be tough to develop.

Q: These kinds...this kind of level of spending - how much of it will be retrofitting existing lines that are already in place; how much of it will be new lines that you have to deal with local opposition, potentially from landowners?

A: I think much of it is expected to be new lines and I think as it should be but there are going to be some upgrades that we can do and in fact, upgrades are often politically less controversial so where those are substantial I think we're going to see some of those get built. But it's tricky to get new lines sited and I think that's going to determine how quickly we can site them; what kind of public support there is for siting those lines is really going to have a lot to say about how this money gets spent.

Q: Again, I don't want to get into a discussion of politics but this is half of the Biden program. The other is its fate is not too clear right now in Congress. With the spending that's been approved, will the Biden Administration be able to reach its targets on its emissions cutting of 50% in 2030, compared to 100% by 2050?

A: No. With the Bipartisan Infrastructure Bill, we're going to only have part of what we need to meet those goals. The other

part is in the pending, not enacted Build Back Better Bill, and if we don't get that passed, that's going to have serious impacts on emissions reductions and all sorts of things. In part, this is because we would lose the largest set of clean energy incentives, tax credits, and the like that we've ever seen before, measured in the hundreds billions of dollars, and that's for a very broad array of clean energy options: renewables, energy efficiency, electricity storage, transmission, carbon capture, nuclear, electric vehicles, low carbon heavy industry, and more. The good news on trying to get the Build Back Better Bill passed is President Biden talked about, for the first time, breaking up the Build Back Better package into pieces; not trying to move ahead with the entire Build Back Better Bill but break it into pieces, and if you combine that announcement with some recent signals actually from Senator Manchin about his support for the energy piece of the Build Back Better package, I think we might have a decent shot at getting those incentives actually finally enacted, and that will help a lot with the combination, the one-two punch of the Bipartisan Infrastructure Bill and the Build Back Better Bill, we'd have a real shot at meeting some of these goals.

Q: Okay, so let's again focus on the \$62 billion dollars that's coming down the pike. What will that do in terms of

allowing renewables to be more efficiently used; wind and solar? What will it do for the coming deployment of increased energy storage?

A: Well, it'll do some as I said. We really need to see a lot of those incentives that are contained in the not-yet passed Build Back Better Bill but you know, it can do a lot. I'll talk for a second about one thing that I've been heavily involved with recently which is hydropower and pump storage. There is substantial new funding in the Bipartisan Infrastructure Bill for both of those and that amounts to powering some of the large number of nonpowered dams in the United States. Only about 2^{1/2}% of the dams in the U.S. are powered, and it also involves support for building more pump storage hydropower. Turns out pump storage hydropower is over 90% of the electricity storage we have in the U.S. and the Federal Energy Regulatory Commission has recently licensed several new facilities, so the Bipartisan Infrastructure Bill has funding for both the powering nonpowered dams and for building pump storage facilities. So that's an example of where the infrastructure bill can do some good. It also, as we've discussed, has some money for transmission and the like but again, if we don't get the Build Back Better incentives put into place, if we don't have the one-two punch,

it's going to be a lot harder to get a lot of the goals accomplished that the Biden Administration has set.

Q: Let's focus for a second more on hydro and it's about 3% of the 90,000 dams are generating electricity, contributing about 7% of the electricity that we get from hydropower. And then at Stanford, you've been involved in the studies saying that could be doubled. Am I reading that right; you could go from 7% to 14% of our energy needs?

A: I don't know that we said it can be doubled but I think what we've found in a negotiation that we led between the hydropower industry and the U.S. river conservation and environmental community is that there's a lot of opportunities to power these 87,500 nonpowered dams. The Oak Ridge Lab did a big study of this, as did the Obama DOE and just powering a hundred or two hundred or so of these nonpowered dams, you'd be looking at quite a number of gigawatts of new electricity generation coming from hydro. And if we can get some of these pump storage projects built, we can add to the more than 90% of U.S. electricity storage that's provided by pump storage today. With FERC licensing some of these projects, I think we have a real shot at that. And the good news is that the solar and wind industry understand the importance of hydro because hydro and pump storage can fill in when the sun is not shining and the

wind is not blowing so, there's a real complementary relationship. At the same time, the reason we launched this negotiation between the hydropower industry and the river conservation community and the reason we succeeded at is because the hydropower industry was willing to say, yes, some of those 90,000 dams need to come down which has been a goal of the river conservation community. Not many of those are hydropower dams. A lot of those are dams that just no longer have any useful purpose. So, we forged this agreement and we think that we can add to hydropower and pump storage capacity in the U.S. and we can also take dams down that no longer serve a useful purpose and that's the very attractive idea that is now being implemented in part because of the money we were able to get in the Bipartisan Infrastructure Bill.

Q: Also, in that Bill could you talk a little bit about the impact on other emerging technologies like clean hydrogen, modular nuclear reactors as the three-dimensional grid gets more heavily deployed, will it encourage new energy technologies to make it to market faster?

A: I think it will. Carbon capture for example has some real opportunities and some very innovative uses. You know, capturing carbon dioxide from biomass power plants and biofuel production facilities, that's very smart because you can actually go

carbon-negative if you can capture the CO₂ from those kinds of facilities. Using carbon capture in high carbon-heavy industry like cement and steel production and there's some innovative ways you can use the captured CO₂ instead of pumping it underground as we do today. You can use it for example, in plastics production. Clean hydrogen: you know as wind and solar gets cheaper and cheaper, making hydrogen from this cheap, solar- and wind-generated electricity becomes more and more real and using that for vehicles, for industry, for power generation, so that's another exciting area. Small modular reactors as they're called, we have a shot at some of those. The Nuclear Regulatory Commission just said no to one of the leading designs, at least temporarily said no, but that company is going back to make another push. And others are coming along and again if we, if we pass Build Back Better, that has quite an array of incentives for both nuclear and for carbon capture. So, we've got a big broad range of technologies: renewables, efficiency, carbon capture, nuclear energy, efficiency, and if we can get both these bills passed, we could really be off to the races as far as encouraging the broadest possible array of clean energy technologies.

Q: Dan, have you looked at and studied how the roll out of the \$62 billion dollars will actually work in getting transmission

built? Will be in the form of grants to utilities? How's the rubber going to hit the road?

A: Well, I think first of all the Department of Energy is working on that now; on it's so-called "spend plan" on how it's going to allocate all the very different pieces of that \$62 billion. Some of that's going to be in the so-called "innovation hubs" where they're going to certain areas of the country and focusing on certain technologies and how to get those accelerated in terms of their development and deployment. Some of this is going to go through existing programs like the low-income home weatherization program to make buildings more efficient. So, it's going to be disbursed in a whole variety of ways. Some of that will be grants. Some of that will be we hope, through tax incentive. Some of that will be actually Federal procurement where the Federal government meets its own needs for its 300,000 buildings and its 600,000 vehicles, so this money is going to be spent in a broad array of ways. Some of it's going to be put out competitively; you're going to have to compete for these grants. Some of it may be put out non-competitively, so this is still very much a work in progress as far as how those \$62 billion dollars get spent, and if DOE can hire those thousand people, and if it can move out smartly on this planning, work with other agencies, working with the Office of

Management and Budget at the White House, which has a lot to say on how these spending plans get implemented, I think it can make a lot of progress.

Q: Dan, you are the founding executive director of the Steyer-Taylor Center for Energy Policy & Finance at Stanford and you're currently a Senior Scholar at Stanford Woods Institute for the Environment. What role do academic institutions like the two you are affiliated with play in strategizing on how we implement this spending and make and make sure it's effectively done?

A: Well, first of all, the Center that I founded at Stanford worked at what I think is a really important intersection between energy policy and energy finance. You know, those have got to be highly integrated if we're going to get these kinds of technologies that I've been talking about developed and deployed at scale and deployed quickly to address the climate crisis. A lot of what we work on at Stanford is at this intersection of policy and finance. The other thing that we can do and have been doing in the academic setting is bringing sometimes warring parties together and giving them sort of a safe place to debate and in some cases actually develop plans to work together. That's the success we had in the negotiation that we led between the U.S. hydropower industry and the environmental and river conservation community and we are looking to do something

similar in some of these other areas where there are controversies. At Stanford, it's called the Uncommon Dialogue Program where you bring these parties together on various sustainability issues, get them to sit down at the table, better understand their differences and develop plans, if they can, to work together more strongly. And that's what we've been doing with hydropower and river conservation and we got rewarded for that with several billion dollars in the Bipartisan Infrastructure Bill to start to implement the plan that these two formerly warring parties came up with. So, it's an exciting area and you know the academic community can be, can contribute a lot.

Q: Dan, focusing on carbon capture and where you think that could go, talk a bit about how successful we have been in the decarbonizing industry and what do you think our most ambitious hope can be?

A: So, it's an important question, Marty, because we've made almost no progress in the U.S. or I think globally in decarbonizing heavy industry and in our own country, it's about a fifth of the U.S. carbon emissions coming from steel, pulp and paper, aluminum; all those big heavy industries that put out a lot of CO₂, and one of the major opportunities with carbon capture technology is in fact to do that; to increasingly

decarbonize heavy industry so I think that's one big opportunity. Another is to use it for decarbonizing all the things we can do with biomass. You can decarbonize biomass power plants. You can decarbonize biofuel production plants and for example, DOE supported the development and construction of a successful carbon capture project at a major biofuels plant. I think it is in Indiana where it produces lots of ethanol. What bubbles off the production of ethanol when you make it is lots of CO₂ and it's very straightforward to put carbon capture technology on a plant like that. And what's also next..

Q: I was just going to ask; DOE's has been heavily involved in carbon capture for decades. Is the industry and the public generally aware how advanced that technology is today and is it on the shelf ready to deploy?

A: So, the public is not very well aware of how far we've gotten with various kinds of carbon capture technologies and a number of them are ready for deployment either in large demonstration projects or some of them in fully commercialized projects. The challenge is getting a couple of those built in each of the relevant technology categories so the private sector investment community is willing to take it from there and that's where this money -- much of it's sitting in the Build Back Better act, some of it in the Bipartisan Infrastructure Bill --

would help a lot. Get some of those big demo projects built. Get a couple of those first commercial projects built and then I think we could go from there to decarbonize places like heavy industry, biomass power, biofuels and the like.

Q: So, I'd like then kind in concluding for you to take a 30,000-foot view of the fact that it's been a long time since you been involved in the Clinton Administration since your work at Google and at Stanford. What is the moment we're in right now, given what's been passed? How excited are you by it and how transformational will it be?

A: It's a very, very big moment. Just the unprecedented amount of money in the Bipartisan Infrastructure Bill. The potential for a lot more coming from the Build Back Better Bill. The reception in the private sector that clean energy has gotten compared to five years or 15 years or 25 years ago. This is mainstream energy, clean energy: renewables, efficiency, carbon capture, electricity storage. It's mainstream: big investors looking to make real money from getting it developed and deployed so I think it's a very exciting moment. It's also though, a challenging moment. The politics is tricky on Capitol Hill where tensions between the Democrats and Republicans are very big. Tension between the White House and the Republican Party are very big, so this is a risky moment. At the same time,

it's a high opportunity moment. In terms of what we need to do to best realize this I think we've got to continue to find common ground between the warring parties and I think we've got to work at all three points of what I call the clean energy triangle: technology, policy, and finance. Technology has got to be front and center developing and deploying clean energy at scale, aided by real improvements in policy and radical increases in capital to get this technology moving fast and get these projects built in order to address the climate crisis. If we can integrate around that triangle: technology, policy, and finance; if we can find more common ground than we are finding to date, I think we've got a real chance to do well and to do good in clean energy and have a real shot at successfully addressing the climate crisis.

Q: Thanks, Dan.

A: Thank you, Marty. Great to talk to you.

And thanks for listening to Grid Talk to our guest, Dan Reicher for sharing his insights about changes in the industry coming as a result of massive federal spending on transmission and other new technologies. Please send us feedback of questions at GridTalk@NREL.gov. We encourage you to give the podcast a rating or review on your favorite podcast platform. For more

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