The Future of AI: Securing Energy for Innovation

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AI data centers, energy consumption, transmission challenges, electricity rates, grid optimization, renewable energy, federal permitting reform, state policies, AI infrastructure, energy efficiency, nuclear power, computational power, economic development, grid stress, data center flexibility.

SPEAKERS

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Ted Dubuque 00:04
Welcome to today's event. My name is Ted Dubuque, legislative assistant for Congressman Michael McCaul, who is co chair of the congressional internet caucus. I want to welcome you to today's luncheon event called "the Future of AI, Securing Energy for Innovation." I want to note that this event is hosted by the Congressional Internet Caucus Academy, in conjunction with the Congressional Internet Caucus and its co chairs. On the House side, the co chairs are my boss, Congressman Michael McCaul, and Congresswoman Haley Stevens. On the Senate side, it's Senate Majority Leader, John Thune.

The Internet Caucus was founded in 1996 and has been operating ever since, ever since, including hosting these luncheons regularly. We have an upcoming event in Rayburn on January 28 of next year. We'll be hosting a Tech Policy Preview for 2026 and we hope you all will join us for that event as well. Today we have a panel of experts who are on the front line of AI at the confluence of energy and innovation. Our moderator today is Rebecca Kern, senior correspondent for The Capitol Forum. And Rebecca, I will hand it over to you.

Rebecca Kern 01:21
Thank you. Thanks everyone for coming, and everyone who's joining online,

Rebecca Kern 01:26
As Tim mentioned, I'm Rebecca Kern. I'm a senior correspondent for The Capitol Forum, which is a publication that covers antitrust, competition and tech policy, and I'm a hill reporter for them, and we have a very distinguished panel with us today. I'll go down the line and introduce everyone. Levi Patterson is the Director of Energy science and AI infrastructure for the structure policy for NVIDIA. Leslie Abrahams is the deputy director and senior fellow at the energy security climate and climate Climate Change Program at CSIS. And then we have David Terry, the president of the National Association of State Energy Officials, Marsden Hanna, who is the head of energy and sustainability policy at Google, was sick, so I was unable to join us. So everyone's gonna have to pitch in on Google questions. No, I'm kidding.

Rebecca Kern 02:21
So we're here today because AI is obviously rapidly evolving, and it's coming to a head with energy consumption in our country and has become a critical policy concern for lawmakers in the federal government and on the state level, with the rising demands on AI data centers, leading to increasing costs for rate payers, and ultimately, could lead to an energy crisis, if not not enough energy is built within the next decade. So I wanted to talk to our panelists, initially about this, about the increased power demand that is expected to grow 25% by 2030 largely due to large AI data centers being built across the country. The same time consumers' electricity bills have gone up 30% since 2020 I wanted to see and we could start with Levi. Can you explain how AI data centers are impacting rate payer bills? And if there is a direct correlation, what is it and what are some immediate solutions that are being considered on the state and federal level?

Levi Patterson 03:31
Yeah, all right, is this working? Cool? So yeah, I'm Levi Patterson with the video, working on their energy policy. And

Levi Patterson 03:39
I think when we look at the impact of or the current state of electricity bills, like it's important to zoom out a little bit on first principles of the electricity grid and what changes prices so the your your electricity bill is not really you're not paying directly for the gas or Renewable Power that that is, that is putting energy under the grid. You're really paying for the bulk of how do you get that electricity from where it's generated to you? That's the largest set of costs. These are system costs, right? And so when, when we, when we, when we were taught economics in school, right? We were these supply and demand

curves, where you're like, Well, if you have more demand, then prices should go up. Well, that's a it's a misleading, because that's not how the grid works, right? So if the major cost of the grid are fixed, right? So the grid itself is the expensive part, that we're all sharing costs, if you add more demand to share those costs with the grid, then prices will actually go down, because you're all sharing these big fixed costs. And so the so the way to lower electricity prices is to reduce the cost of really its transmission and distribution across the grid. And so it's complicated. Story with different markets across the United States, but, but, but there is nothing from a physics perspective that says more demand should increase prices. In fact, it's the opposite, where more demand drives prices down because you're shit more people to share the cost of the grid with.

David Terry 05:18
Sounds like transmission is really the problem, though, and getting more transmission onto the grid is very costly. And I wanted to see David, if you could kind of talk about that difficulty, some of the difficulty, but also following up on what Levi said, He's absolutely correct the cost of transmission distribution. I think this doesn't fit well in a headline or a bumper sticker. We've under invested for a long time. We have cyber security costs, we have resilience costs, the generation part, we've gotten very cheap power from gas and wind and solar, and depending on the location, every state's different, all of those things are really contributing to the increase in cost. And I think the demand increase in many locations has the opportunity to better utilize the generation and transmission distribution assets we have. The catch, as you just noted, building transmission is not easy. There are state to state issues, environmental issues, there are federal lands, particularly if you're west of the Mississippi where there are large swaths of federal lands. So we have been working with many in Congress to advance federal permitting reform at the same time that we've been working at the state level to help centralize siting and permitting within the state so we can streamline and run processes in parallel, rather than rather than independently. The third part that's made it challenging is that, understandably, a lot of communities, a lot of people, don't want transmission or other energy infrastructure running through their backyard. They have a variety of good reasons, bad reasons, et cetera. But it is a conundrum, I think, where we are now with increased demand, not just because of data centers, just we have a lot of economic development generally, onshoring of manufacturing, more electrification some parts of the country, of heating, systems, of transportation, etc, all that contributes to it. And the idea that we're going to take 10 or 15 years to build a transmission line does not line up well with we have a one to five year window of very severe grit stress, stress in many places. So trying to break through that federal, state, local and community log jam of resistance to transmission, which has a lot of of different challenges with it, is something that I think we see many governors around the country focusing on, certainly some in Congress, rightfully so, in the industry writ large. And I just want to one other food for piece of food for thought, energy is an extremely high priority. Electricity, specifically in almost every state, we have 37 governors up for election or re election next fall. This is on the ballot in many locations for affordability, reliability and really the abundance of electricity so that you have good economic development. And those are all hands. They're not, ors, all three of those have to be met.

Leslie Abrahams 08:06
Yeah. So I just wanted to weigh in on this question of electricity rates and affordability. And I think that one thing that's important to know first is that the electricity grid is very regionalized, so when we're talking about what's happening across the United States in general, that hides some of the nuances.

But when we're thinking about what has happened to prices in the last few years, what's driven up those costs has really been like we talked about the increasing cost of transmission, distribution, and also volatility in prices from fossil fuels. So like natural gas prices that that's been rising. But the question about how data centers can impact affordability in prices is that when we're looking forward, what we're worried about is that, in general, on average across the United States, the grid is only used about 50% of its capacity at most times, and so at non peak times, we have a lot of room to add new demand, which, as we've talked about, can help reduce costs, because you're sharing that those infrastructure costs across more customers. But the problem is, when you start to get to the peak demand, that's when that excess capacity starts to get squeezed, and that's where we're talking about having to add new infrastructure, new capacity. And so the question that I'm worried about for affordability is not what's been happening and what the drivers of that have been but what is going to happen to our electricity bills moving forward, especially when we think about right now, we're already at a time where about one in six households are behind on their electricity.

Rebecca Kern 10:00
Bills, one one lever that's being considered as the federal government is considering the speed act in the house, which is looking to speed up NEPA permanent and permitting reform generally, it could be coming to a vote in the coming days, but it doesn't include transmission permitting reform, which, which we said, is one of the biggest challenges to getting new energy supply on the grid. So I wanted to see, you know, David and Levi, where you see, on the federal side, at least in Congress, how you're tracking that these developments and and is there are these solutions that would actually address the challenge we're seeing in the next one to five years and getting enough supply.

David Terry 10:50
I think I'm going to answer that sort of in reverse. We see this as a three part everywhere, everything all at once. From a state perspective, we have near term optimization, things that need to happen, medium term innovation in policy and siting, and longer term generation and transmission build out, and that's all within a one to call it 10 or 12 year time frame. It all needs to move forward. Looking at the speed act. We met with our board last week. They're considering the act. They're really more focused on that transmission component. So we're beginning to engage the Senate, in particular, Senate staff, Senate offices, about what the transmission component would look like to that. And are there innovative ways, either state agreements across states, that can be built into that, something to expedite it that still is a medium to longer term action. So it's an important part of the puzzle. We can't wait on it. It's holding things up. But that's really the framing that we have. I would say the other piece is that the we need, I think, something to break through the logjam at both the state and federal level. I always think of policy being something that's proactive and forward moving. We have some priority loads, whether it's AI data centers, from a security or economic perspective, defense, critical infrastructure, other critical economic development pieces that are important, manufacturing components that may need to move more quickly. And I think we're looking for, at least in our organization, different ways to address that there may be urgent transmission that goes on one track, less urgent on a more regional and conventional track, but we intend to weigh in heavily on that. In the previous Congress, we supported the Manchin Barrasso bill as an example. We think we need to go beyond that, but the conversation is just beginning.

Levi Patterson 12:35
Yeah, I don't have a ton of Acts. I think that's a really good landscape. I mean, I think it's important for us to understand where we're going from an energy perspective and recognize that if we if we care about things like onshoring manufacturing and building and onshoring manufacturing, we care about critical minerals and the processing that'll go in line with that. If we care about cancer research, you know, modeling proteins and building labs to test a lot of, a lot of a lot of therapies like those are all going to be very energy intensive industries going forward. And so we're going to see really demand drivers from lots of different areas, in the economy, on the energy sector. And these, these industries are going to invest where they have it, where they have energy. So, you know, when we talk about things like permitting or for the speed act, you know, it's, it's encouraging to see support behind solutions that allow us to or allow the United States to really be fertile ground for these important industries of the future, for our US competitiveness. And so I think it's critical that these conversations are accelerated.

Rebecca Kern 13:59
In Congress. Has NVIDIA taken a stance on any of the bill? No, we don't have

Levi Patterson 14:03
an official I mean, it's if any bills that we've ever taken a stance on. I don't think we have a formal position on pretty much any bill ever, but it's something that we're tracking very closely, that we're working with Congress and the administration on how we could be helpful in ensuring that we have enough energy to support our country's goals. So it's something that we're excited to be part of the conversation, but we're not an

Leslie Abrahams 14:33
official position. I think, just to put the transmission problem into context, we've been building somewhere between like 500 to like 800 miles of high voltage transmission in the United States each year in 2024 the department of energy grid needs study report said that we need 5000 miles a year for the next you know, five to 10 years. And that was even before all of this load growth projections from data centers. So we are really far behind on our transmission needs, and it takes, you know, 10 years, like we said. So we have to start thinking now, even though this is going to be kind of a longer term solution if we don't act now, we're not going to have this infrastructure when, when we need it. And what makes transmission particularly difficult is that where it's built is not necessarily where the benefits are felt, and because the grid is so networked, it's hard to even tell where those benefits are going to be felt. So how we distribute the cost of building that transmission, and then even how you get a state to agree to build the transmission there when they might not be the ones who will primarily benefit is really difficult.

Rebecca Kern 15:57
Are there other states' efforts that you're tracking, David, that could speed things along.

David Terry 16:02
There are, and I think part of it is trying to reach some agreement across, I'll say governors, but it's It spans governorships to see the cost and benefit. A piece of this cost allocation on transmission has

been a problem for literally decades, and I think we have to break through that with a policy solution distinct from regulation. Both are needed. That's one, two. I think you're actually correct, and the way you describe that, but one of the things in that multi prong approach that we're doing is we've been doing really a drive for strategic reconductoring of transmission lines, existing lines with composite, high voltage cables that have less line loss carry twice as much power and can be put in place where existing transmission is in some locations. It's not a solution for everything. And so we've seen states West Virginia, Virginia, being among them that have passed legislation or executive orders to encourage strategic reconductoring, to help relieve congestion, to help move some power. That's an action that can take place very quickly, within a matter of a year or two, at a much lower cost. It's a piece of the puzzle. It's definitely not the whole piece. The overall transmission portion is still the crux of the problem from a long term perspective.

Leslie Abrahams 17:19
So in addition to reconductoring, which is essentially like upgrading or replacing transmission lines, there are some other innovations in the near term that are possible to help us get more out of the existing system. And we're talking about streams that AI data centers can put on the grid. But there are also ways that AI can help the grid operate more efficiently. And so one example is something called dynamic line reading. And so what that means is that transmission lines are set for an average condition, so average temperature, average wind speed, but if you can use AI to dynamically change that based on the context of the weather conditions you can actually be able to transmit more electricity at different times. So that, again, is kind of a near term solution that actually can use AI and innovation to help us get more out of our existing infrastructure.

Levi Patterson 18:21
I think this is a critical point that you're making, because there's a lot of opportunity for AI infrastructure to reduce prices. Right? We spoke in the beginning of the panel about how electricity prices are from a first order, mostly transmission and distribution costs, and more people share that load, reduces prices. So if you have a big data center or a factory coming in willing to share that cost, it'll reduce prices there. But there's also, there's going to be more and more investment in energy systems like energy storage attached to these data centers that could be very responsive, and ensure that a data center or a factory is really a flexible asset to the grid. And so if you have a new person to share that load coming in, that can adjust their footprint based on what the conditions are, that can further drive down prices. And then there is the acceleration that we're seeing in a you know, can you, can you manage grid congestion better with AI? I mean, when we see grid events across the globe, there are things that happen on a very short, you know, one to two second timescales, and so there needs to be some sort of autonomous information and the decision making that allows a grid to operate in the most efficient way to further reduce prices. And so you know, it's one of those things where kind of the way forward is through, right? So there's a lot that data that AI factories and data centers can do to drive prices down.

David Terry 19:54
And I certainly agree with that. And I would just add two examples of that we have, one in reconductor, and one in optimization. In of a different kind. We have a reconduct, Major reconducting project being led by Utah, with five other states in the West to put more modern, higher capacity cable up in a short time period that projects just getting underway, huge load increase in that part of the country. So great

opportunity. We have states like Virginia that are working to put solar and storage in concert, much as Levi just described, to help fill those gaps. We're also in discussions with really innovative companies, one that's serving both California and Texas called critical loop, and it's bringing to distribution systems that have long wait times to add a new major load, like a data center or manufacturer, to bring in significant amount of storage, really sophisticated control systems that allow for high power quality. Those are the kind of solutions in the near term I think we need. And I guess just one other thought in this cost area, just to kind of make the point that I think data centers make a great headline to blame, but are just not the issue in terms of cost in general, we have supply chain cost five and six years for a gas turbine on order similar time frames for transformers in the electric system, which are generally not standardized. They are very unique products and long lead times the cost of those items have doubled and tripled and quadrupled less from demand in the US, but demand globally. So all these factors come together, and looking for those optimization solutions, I think is the right path.

Rebecca Kern 21:30
Could you kind of explain grid optimization and how a data center can actually maybe give energy back to the grid if it has its own battery supplies, or, I mean, even using its own backup generators, which are being discussed at these plants is that is our data centers even being considered as an asset to the grid.

Levi Patterson 21:57
Yeah, whoever wants. Yeah. So there's, there's, there's a lot that can be done here. So, I mean, AI factories are being built differently. I mean, we have energy constraint. What, like NVIDIA and the AI industry, is energy constrained, as in the United States going forward and and so what that, what that means is, as we're as we're scaling up and and out when it comes to these data centers, is that they are. The relationship between this asset and the grid is becoming more and more important, which means you really need energy systems built alongside your data center to manage both, like variations in or in training, right? Because all of a sudden, your data center might be using significantly less amount of power than it was previously, right? So, so you need more and more. It's not, it's not just simple diesel backup generators that you that you don't really ever expect to use, except in, you know, certain situations, because, I mean, a diesel generator is not a really convenient asset to keep on because you have a supply chain trucks, you know, to have to feed it. So it's not really meant to be running that much. But what we're seeing more and more investment in energy systems attached to it. And so if the grid operator for whatever reason, if it's a price consideration, if it's a if it's a grid instability issue, they can just send a simple press a button and send a signal to that data center's energy system and literally use AI. These tools are available and being deployed to be have the whole data center and the energy system be responsive to that grid. What is important is that this is a new way to do things. And so this, you know, for example, FERC is doing this, this ANOPR right now, this advanced notice of proposed rulemaking on flexible assets. You know, it's important for these relationships to be allowed, right? Like data centers can be really productive assets for reducing prices, if the rules allow them to bring their own energy systems to the grid to do that, right? And so there's this. It's the big job in front of DOE and FERC to figure this out, but there's a lot of opportunity there.

Leslie Abrahams 24:22

So when we're talking about data center flexibility, which I'm sure is something that you've all heard a lot about because it's been in the news headlines, the reason we're talking about it is going back to that issue of peak demand that I mentioned at the beginning. So most of the time, it's not an issue to have these new loads on the grid. The challenge is that during an extreme event, whether it's a really hot day in the summer there, that's when the capacity of the grid is being squeezed, and the way that our grid planning works for. Now is that we have to plan for the loads, that we have to be at their highest capacity on the worst day of the year, basically. And so what flexibility can do is say, well, maybe we don't need to plan for that. Maybe we can say that instead of this data center needing its full load at that really critical moment, it can reduce the demand so that we don't have to worry about those few hours of the year and the there are a few different ways that a data center can be flexible. One is that it can shift its own load. So either it can move some of its operations to a different time or a different part of the country, which you know. My colleagues here can tell me how difficult or realistic that is. But another option is called Bring your own capacity. So this is where you can a data center. Can have either natural gas plants, it can have battery backup or some combination of, you know, solar resources to be able to provide capacity when it's needed at those critical points. And so the issue with flexibility is that it hasn't been demonstrated at scale on the grid yet and data centers, because of how much capital they've invested in the chips they want to be operating all the time, and so this isn't really an economic proposition for them. What makes flexibility, I think, interesting to hyperscalers, is where it can allow accelerated speed to power. So if we can say, well, we don't have capacity on the grid for you yet. So either you would have to wait five years, maybe longer, until we can build this new capacity to be able to meet your demand, or we can get you online in one to two years, you just have to be able to have curtailable or flexible load. That's where it starts to become interesting and motivating, I think, for the companies,

David Terry 27:26
and I think that that flexibility is key. We have states like California, New York, even Virginia, to extent that have demonstrated not in the data center area, but this aggregated load flexibility that allows for meeting that peak from a data center perspective, though, the loads are quite large, the idea of them power, providing power back to the grid, except in pretty unique circumstances, is not realistic, at least not as it is the lay of the land is now. We have a couple of states that have moved Ohio and West Virginia, have legislation to really free up behind the meter options for generation, which I think has some positive attributes for those two states, the diesel backup issue is one that is very challenging. First of all, whether it's a data center, a hospital or this building, backup generation is typically for an emergency. There are emergencies you have to be prepared for it. Our organization and the state energy offices have worked on energy emergencies for decades. The challenge of getting enough diesel fuel to fuel a number of data centers to keep them operating for any length of time is completely impractical. It also curtails diesel for other purposes. It would increase prices of diesel. There's just a lot of challenges with that that make it not a great option. I really can't think of a circumstance of how it would work. Well, much as it would be nice that if it would battery storage to meet those peaks, much as just described, is just a perfect fit, provided we get the right policies and regulations to allow that to work in the marketplace, which we don't really have at the federal level or the state level, in most locations at all right?

Rebecca Kern 28:58

And one of the things that this administration is doing is cutting back on energy renewable tax credits with OBBA that expired this year, and then we're seeing this administration direct DOI to more or less put a moratorium on new solar permits. So these kind of attack, some would say, on renewable energy as which is currently the cheapest source of generation to the grid and also the cleanest, could be posing a challenge for grid operators. And, you know, the AI data centers being built. So, I mean, I wonder, David, you know, are you seeing in parts of the country that we're, you know, hoping for these offshore wind credits, for example, and these in the northeast, which already has a constrained energy supply, especially in the winter. How are you seeing that play out politically and just logistically? You. Going forward

David Terry 30:01
politically, certainly very challenging the Northeast and the Mid Atlantic. For offshore wind is somewhat unique. It's a large swath, huge power source potential. It also is very coincident with peak load, so it adds a lot to the grid. Onshore wind, if the peak is later than the day, peak power usage, it may not be coincident with the peak, with the peak needing the wind resource. So it's different in different locations. Onshore is a particularly good opportunity to address that in the mid Atlantic and the Northeast, solar and solar and storage in particular, huge benefit, because it's fast. It does provide a much greater consistency of power because of solar and storage. That's a very big hindrance we see. What we see in most states, of all political perspectives, is all of the above, literally, as in what resources, fastest, cheapest makes the most sense for our state. And we see governors of both parties just really moving that message forward. And I think that's what we're trying to convey in this sort of staging of near, medium, long term, all at once. In the longer term basket, we have a group of 11 states and some 20 observer states in an initiative to advance nuclear power, small modular reactors. That's a longer term item, but we need to work on it today. Those states are moving quickly. It's called the first movers advanced nuclear initiative. We have a similar one kicking off in two weeks with geothermal power, specifically, another 13 states working in that area. And alongside of that, geothermal heating and cooling, which is a much more rapid deployment activity, that's a less energy, a less electric, intensive way to operate a data center, a home a large load. So those are some of those options, I think, around renewables that our states are pushing forward with. I think offshore wind is facing some particular challenges. There's certainly news today on that, but the load is very coincident in New England and mid atlantic with that offshore wind, and it makes it super important.

Rebecca Kern 31:55
And I'm we're also seeing as a result of some of these policies that some of these large companies like Google are not meeting their climate and sustainability goals. In fact, their emissions are going up with AI data centers continuing being built around the country. And Nvidia has also reported emissions going up with with more AI data centers being built. So I'm wondering how the AI data center boom, and the less generous, let's say, support towards renewables in this administration is having an impact on increased emissions. And I mean, is that something you're working on in video, Levi, and how are you guys

Levi Patterson 32:45
addressing I mean, I think to the I imagine, if I'm trying to build a lot more energy, that that policy, policy stability is really helpful. I mean, we have, in the Biden administration, we the US government stopped

oil and gas development on federal lands, and then now we're sort of seeing a similar reaction of that on the renewable side from this administration and and I imagine that that that makes everyone's jobs a lot tougher. I mean, I think every electron is the same color, I assume, I guess I've never seen an electron, but so from a data center perspective, you know, it's, it's, it's really about being able to meet the energy demand of the new economic drivers. I think so, if I want to talk about kind of where we're going at from a efficiency perspective, on on on data centers. There's about 10 years ago the data center compute that we had to now, what we've seen is about an increase in efficiency of about 100,000 times. So that efficiency driver is what is allowing this current moment to train these big models at this current scale, and we were continuing to see that trend in efficiency. So what that, what that really means is, you know, if I said that your house was 100,000 times more energy efficient, you'd be like, All right, well, energy is free at my house, and so, you know, we expect, in 10 years or so, the models that we're using and training are essentially going to be through further efficiency trains, both in the hardware, at the stack, at the model level, you'll be able to get a model that's equally performant, that is orders of magnitudes more energy efficient. We're going to continue to see that trend. We're going to see the so we're going to see the AI that we're using today, similar power levels, way more efficient. I think, though, the challenge is, is, as things become more efficient, they get more broadly used in the economy, right? So if you can use a really powerful, deep research model, is now to run easily on your phone, right? You're You're. Going to see that diffuse a lot more in the economy and the manufacturing sector. And so we're going to with Compute. We're going to continue to solve more and more challenging problems, which are going to lead to that continual energy usage. As more people, as more industries, adopt AI technologies, they're going to see their energy footprint continue to expand, and they're going to be training their own models. For example, let's look at fusion energy. If we want to deploy fusion in this country, there's a lot of physics problems that need to be solved. A plasma that generates the energy is a wily organism that needs to be controlled. It changes on nanosecond time scales. And so what you really need is you need AI models that are able to control and make decisions with your magnets at really, really short time scales. And so in order to do that, what you need to do is you need to do tons and tons of simulation. In order to train models on the physics, you need to then train the models on real world data. So collect a bunch of real world data and train the models. So there'll be a ton of inner ton of energy use from computational methods to be able to deploy fusion technology. But at the end of the day, it's going to lead to a really new, important technology for for meeting the moment. And so I think in your question, I guess in where we're going on the meeting the energy demand from a multiple source perspective. You know, we're going to be able to, hopefully. We're working a lot with the Department of Energy and Idaho National Labs right now at trying to, they've set a goal through autonomous design and operation as part of this Genesis mission with the Department of Energy, they set a goal to pull in nuclear power deployment from like two to 5x so we're, we're going to see a really rapid acceleration of innovation, and this decade is going to be, is one of the most we're seeing an acceleration increase in scientific progress in this, in this, in this decade, and so continue to see that.

Rebecca Kern 37:10
And you guys are obviously you're investing in advanced small modular reactors as well, like TerraPower. Yeah, if we want to be able to

Levi Patterson 37:17

build nuclear power plants quick in this country, we're going to have to build them differently than we have in the past, right? So we're going to have past, right? So we're going to have to build them in the digital world. First, we're going to have to, again, have models that understand the physics of the reactor so that they can so a safety regulator can look at that reactor under a bunch of different scenarios and be be certain that it's safe. And so it's going to require a lot of public, private partnership investment in building these new tools for the industry broadly in order to see that deployment of nuclear reactors. And yeah, we're very excited to work with terror power. We've worked with on that. We're working with the industry to help do that.

Rebecca Kern 37:55
And you were with the OSTP in the Biden Administration, so I wonder if you could kind of observe this kind of switch on renewables, at least in this administration, and how you foresee that impacting this kind of crunch in energy supply we have right now, in the next one to five years, obviously we see long term, hopefully SMRs Online in five years. Maybe that'd be the soonest, and that's a large clean energy supply. But given renewables are some of the fastest sources of energy to build, and there's kind of a challenge in this administration to build it. How are you seeing that flip since last administration?

Leslie Abrahams 38:42
Yeah, I think that, you know, there's, there's rhetoric around renewables, but then there's the reality and the practicalities of what we need in order to be, you know, economically competitive, especially with AI. And I think just backing up. One thing to remember is that data center load is just the nearest source of increasing demand when we are thinking about our decarbonization, decarbonization strategy overall, the idea was always to increase our load through electrification, so people switching to electric vehicles, from gas stoves to induction stoves. And then, even just thinking about our economy, we want to onshore and reshore manufacturing. So data centers are really one of the smallest pieces of load growth that we're anticipating in the future. So if we can't figure out how to meet this demand in a sustainable way, then we're going to struggle in the long term overall. So that's part of the reason why this is such an important case study or example, because we have to get it right in order to set ourselves up for success moving. Moving forward, and when we think about what our energy options are, we've talked about large scale nuclear that can take maybe 10 years to build. We've talked about natural gas, but there are supply chain constraints with that too, not just the turbines that we've heard like, if you don't have something ordered right now, you're not going to be able to get something until 2030 maybe. But there are also constraints natural gas pipelines. So there are supply chain issues. There prices have gone up. And then we've heard about coal being kept online, longer retired plants that we're going to retire, no longer retiring, but that's not really an economically viable solution that's really expensive and also has pretty severe public health implications for local communities, and then for like, if you think about using all of those available solutions, we still have a substantial gap in the capacity that we need, and about 90% of the capacity that's come online this year so far has actually been from renewables. So I think there is what we're hearing about in the news versus what just is economically and technically feasible and viable right now, in terms of being able to match the speed that we need this electricity with the actual infrastructure that we can add to the grid. And there are still constraints like especially being able to connect wind solar to the grid, that's something that is slowing down our ability. That's something called the interconnection queue, which you also might have heard about as being a challenge to manage. But I think that, well, we've seen the tax credits being severely

diminished, and talks about permitting issues, really, the cost of renewables have come down such that they're still the least expensive option. Just taking away those subsidies is making it more expensive for consumers.

Rebecca Kern 42:22
I would open it up for questions in the room in a minute. So if everyone wants to kind of think of questions, if you have any, and I can switch to that soon. But another large topic is competition in the US, maintaining a lead, a competitive edge with China and AI race, and particularly in building new data centers and developing faster chips. And I was just wanting to see how, how this is all playing out. And I know I'm putting in the spotlight, Levi, but as as in videos representative here. You know, how are you guys imagining leadership on AI and in the chip space, and then also with Trump announcing the okay of exporting advanced AI chips to China, how does this affect the USS leadership on this in this race.

Levi Patterson 43:22
When I, when I think about us competitiveness on this issue, I really think about us pushing the frontier on AI for science, open source, AI in in this country. I mean, I think we're, it's, it's pretty clear that when we look at the competition and the power of models, we the United States has the best frontier models in the world, right with, with our model companies, they have, there's a there's a very clear market signal with kind of the chat bot like interface for us to continue to drive and drive there, where, where, where we're seeing increased competition is on the open source level and on specific models trained on physics, chemistry, science, and those are areas where there's, we're doing it, congressional briefing, where there's an important federal role is on the research side for training models on, on, on physics, chemistry, and so if you look at why, so I guess why is, why are open source models important for AI competitors? Well, if I'm a if I am a manufacturer, and I'm wanting to build a special model to help control a process or some robotics in my factory, I'm going to want to find an open source model that I can take, I can take the knowledge that it needs to know about the tasks that I'm trying to do, and I can fine tune it and teach it and build on top of that open model. And so what we're really seeing is the world, if you look at open source models being used, we're seeing people build on foreign models and. So we need to be able to really push the frontier on the open source side. And so you need open source models, and then you need models that are trained by that are solving fusion problems, that are solving health sciences problems that understand proteins, right? Those are, those are how we're going to win the AI races. So we're really encouraged by the recent announcement by the administration on the Genesis mission, where they're really looking at grand challenges across the federal mission and trying to pick out areas that they could really push our competitiveness on that. And I think that that kind of stuff is really important to

Rebecca Kern 45:41
anything else to add on. I think, I

David Terry 45:43
think the thing I would add is, there's not a governor in the country that doesn't want us to win on this race. I think it's important. And data centers, to the extent that it's a part of that, are critical. I would add to that, though, the the amount of computational power that companies, non data companies, are needing in order to make their businesses more productive, more efficient, whether it's banking,

manufacturing, etc, our energy directors are very cognizant of that as well. So it's about competitiveness, not only in the AI race, but competitiveness for how that's utilized, the computational demand inside companies. The second piece is as much as data center. Power demand is important. The largest cement manufacturer in North America has a huge electricity load. They rebuilt their plant. It's a state of the art facility. It's in Indiana. Huge power demand. We see manufacturing and autos in the southeast, same way electrification in the northeast, et cetera. So the power demand piece and an economic win is in so many different categories right now that I think that's the that's the message on fast optimization and cost, and on the cost front, we know that roughly half of US households have a negative net worth. So how cost affects those households is critically important. So there's a lot of pieces that come together at the state policy level in making these decisions. And I think it's why, when we think about competition, it's not only international competition, it's competition economically among the states, but it's also the well being of those consumers. And I think our members are keenly concerned about lower income folks, just as they are about job creation in this space. So there's a lot of those pieces that come together. I guess it's a short way of saying it's complicated, but I think we're all on board and doing our part.

Rebecca Kern 47:30
Does anyone have some questions in the room? We'll go with you right here, and then we'll go next. And you can speak loudly and I can repeat for the audience online. So I'm curious

Audience Question 1 47:48
about how I look at the future. And all 50 states have data center planning in every state. How do you get the people right? Universities especially kind of create non company centric data centers that can empower people in their local regional issues. But then it made more sense to empower universities kind of now do good research, how to build that out in multiple communities so that that way in the future, if there was all 50 states having multiple data centers, at least it isn't like Monopoly companies are controlling all the data centers, and we have more. Faculty and more practitioners on the ground that has taken Yeah,

Rebecca Kern 48:50
so I can repeat it real quick, just for people online, he was asking about getting community involvement in ownership of data centers, whether it's universities versus companies owning data. So I don't know if that's a model being considered, but yeah.

Levi Patterson 49:07
So the the point that you're making about how critical it is to get communities and universities access to compute is is central to our US competitiveness. They are going to solve different problems, often really challenging problems with this compute that the private sector might not be incentivized. You know, if there is, like, a billion dollar total addressable market, then the private sector is going to go solve that problem, right? But if there's, if there's not that right now, then that's a, generally, a space where the public sector can really, really move the needle. And so how to, how to give the university sector, more compute and communities is is really important to us, and so we, we recently worked with the National Science Foundation, for example, in the to help supplement open science model development by building a smaller AI factory in. With the Allen Institute is sort of an example of how to do that. It's there

is a we're also working with Argonne National Labs. We announced the super computers Equinix and Solstice. This it's essentially we're pre building a big AI factory for them, and the whatever local, regional, regional partnerships can come together. They can use a portion of that machine, and we can use the private sector interest to be able to go deploy it right now. And it allows us to build a machine for them much faster than we would if, if we waited for them to cobble up what they need. So there's, there's a lot of models to do that. It's a critical problem. It's an area that is important for Congress to pay attention to, to make sure that there's access to compute for these people. It's something that we're happy to be, be be helpful with. There's, there's challenges. I mean, computes can be expensive. There needs to be so you don't necessarily want, there needs to be some connectivity between all these all these resources, so that you make sure that you're using these public sector resources efficiently and getting the most out of them from the communities. But it's an important question that you raise, and something that we're seeing a lot of attention to from this administration on the Genesis mission is going to be helpful to that goal.

Rebecca Kern 51:20
So yes, there was another question.

Audience Question 51:23
Okay, I'll go with you. Yes. David or Leslie, if you could just reiterate how the speed Act would or would not address the

Rebecca Kern 51:34
transmission challenge. So she's asking how the speed Act would or would not address the transmission Building Challenge, which I my understanding speed, is not addressing transmission currently in the House version,

David Terry 51:47
it doesn't. It focuses purely on NEPA. So in in how that develops in the Senate, we hope there hope, we hope there is a transmission component. So it's great that it is moving in the house. That's, you know, very positive. But from a transmission perspective, that's going to be another bill.

Rebecca Kern 52:06
Okay, you had a question earlier, yeah, with the hat. Oh, this guy behind you with the hat. Yeah. So there's

Audience Question 52:12
been a lot of talk about an AI level, essentially, whether all of the money that's reporting various AI operations will eventually operations, there's no question that AI will provide value, but many are skeptical as to whether it will provide as much value and the cost

Rebecca Kern 52:40
required to keep them running. So he's asking about the supposed AI bubble, and how if it were to quote, unquote burst affect that AI data center build.

David Terry 52:51
I'll address that. I you know, I'm not qualified whether they say there's a bubble or not an AI. What I can say is there's huge demand. What states get concerned about is when they're making large infrastructure electricity investments that rate payers and to some extent taxpayers pay for, is the durability of that investment. How long is it going to deliver value? And I think that's why you see some states and many companies that are investing in this space looking at subsidizing or paying for a part of that themselves, or behind the meter solution, something to offer durability to the investment, so that the rate payers of the taxpayers aren't left in holding the bag. And I think least our experience with the companies that we've engaged with, they're very much, you know, contributing in a really responsible way in that conversation. So I I don't have a huge concern about it. But I think part of the reason I don't is I think I see both companies and state policymakers addressing some of those issues. If they weren't, then I would be concerned.

Rebecca Kern 53:49
We had time for one last question and the green here companies

Audience Question 54:02
like companies, given they have enormous influence in this administration, are talking

Speaker 4 54:10
to officials at DOI The Interior Department, North White House about this kind of walking on renewable Energy Project, because that is such an enormous power construction. Need to accelerate data for

Rebecca Kern 54:31
construction. So, yeah, so she's asking about the administration's putting some blockades on renewable build at the Department of Interior, and if Nvidia is talking to administration, raising concerns about this, and if there would be any action in Congress, if you'd support it,

Levi Patterson 54:52
unfortunately, I'm not familiar with all their engagements right there, right now, so I can't give you a full answer on that, but happy to. A follow up on that question. Great.

Rebecca Kern 55:05
Any last very quick questions from the audience? Well, yeah, seeing none, I wanted to thank our great panelists for really detailed and I thought thoughtful conversation today on a very complex topic. So thank you guys, and thank thanks Tim for helping organize this with the Congressional Internet Caucus. And appreciate you all attending. Thank you.