

Grid Forward Answers During Testimony at Senate Subcommittee Hearing on Critical Energy Infrastructure

Bryce Yonker, Executive Director & Chief Executive Officer at Grid Forward, testified before the Senate Homeland Security Subcommittee Hearing on *Strategies for Improving Critical Energy Infrastructure* on October 27, 2021. A question and answer session followed the formal presentation. This document provides a summary from some of the questions and answers provided by Bryce, followed by screen shots of the hearing.

- [View Bryce's initial remarks](#) on YouTube

How to deal with grid threats

(Question by Committee Chair, Senator Krysten Sinema, D, Arizona)

Question 1: Grid threats causing grid interruptions are frequent and severe, what actions can States, the Federal government, or energy providers take respond to these threats?

The solution starts with the basics in robust vegetation management, critical infrastructure maintenance and repairs. Then comprehensive planning beyond grid to include other infrastructures such as public safety and health. Then you get into advanced deployments. Using real-time sensors as well as grid analytics will further aid in solving this issue. In Washington state Governor Inslee, has a Clean Energy Fund to support grid operators and the state passed resources specifically for wildfire impacts. Other solutions include wildfire assessment plans like the one BPA had to put into practice this wildfire season. Additionally, testing by National labs like in California is looking into de-energize a power line in under a second to help prevent power lines from causing fires.

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Demand response (DR) on the power grid

(Question by Senator Krysten Sinema, D, Arizona)

Question: Let's explore DR on the power grid and why it's important to involve it. How does peak energy demand on the grid complement renewables?

Leveraging flexibility for customers brings an overall value to the system. And customers benefit from their participation, by way of financial incentives but also in more stable and cost effective energy service. A commonly used form of demand response would be in leveraging smart thermostats. Nearly 200 GW of cost effective flexibility from traditional DR and tech-enabled DR could reduce the U.S. peak 20% while saving customers \$16 billion annually. A company called OHMconnect is building out 550MW of virtual power in California to help with grid flexibility and they said that could have been half of the need from last year's blackouts. They have 150MW now. My utility in Oregon is leveraging a portfolio of demand side, distributed

assets, and market resources alongside their grid modernization investments to help meet the needs including on that 115 degree day when very few people were out of power. They recently shared that they think by 2030 they can get as much as 25% of the power needed for the hottest and coldest days from customer demand flexibility and distributed resources.

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The role of resiliency and modernization in relation to protecting power sources

(Questions by Senator Tom Carper, D, Delaware)

Question: Climate change affects transmission, distribution, electricity demand, the electric sector is 25%, power plants is 25% of Greenhouse Gas Emissions (GHGs). People try to blame renewables for not performing, but all energy sources are vulnerable if not properly weatherized or make resilient. Do you agree that wind turbines and other renewables can generate the power in cold weather if proper resiliency measures are taken?

Yes, all grid assets if invested in properly can be resilient. Computational power gives us a new wave of opportunities and expands the value that can bring to the system. Pairing these sources with additional assets like a battery gives you flexibility, gives you a much higher capacity resource.

Question: If resiliency measures are not taken, will every source of energy be vulnerable?

Texas was not the failure of a single supply resource, it was failure of advanced planning for extreme grid conditions and cascading failures of various assets.

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Question: With respect to modernizing, critical infrastructure includes physical and cyber, pipelines and software. The Infrastructure investment and jobs act passed and includes funding for resiliency of infrastructure including cybersecurity, flood protection. In addition to electric grid investments, what can we do as lawmakers to support advanced grid modernization activities?

At Grid Forward, we see these eight places for additional support that were light in the bipartisan package or not in drafts of reconciliation package:

- Grid modernization and flexibility – while included not sufficient
- The Energy Act of 2020 appropriation—RD&D in that package including title VIII on grid modernization
- Cyber security for the grid is critical—\$600 million in bipartisan package is not enough funding
- Demand-side Management (DSM) programs were not funded—this is a key building block
- Wildfire mitigation and grid resiliency – included but we need more

- Workforce development
- Grid innovation support like long duration storage, advanced controls, microgrids, DER optimization
- Local support for energy transition
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Grid Threats from Underinvestment and Cyber Impacts

(Questions by Senator Alex Padilla, D, California)

Question: Weather related power outages are on the rise. Extreme weather is increasing in severity and frequency and this is straining electric grids. Proud to introduce the Power On act that provides critical funds for extreme weather and increase resiliency of the grid. Can you expand on the importance of the grid investment if we do not begin to evaluate the strength of our grid through resiliency.

In August 2021, the U.S. Senate voted to approve energy investments in the bipartisan Reconciliation Package. Section 40101 of the bill provides \$5 billion for resiliency and grid investments for utilities and others. Billions of dollars are definitely necessary. [A Washington Post article](#) described how outage time may accelerate, and [a Bloomberg article](#) quantified the impacts at data centers losing a thousand dollars a minute and large retailers five million dollars a day for power outages. Thousands of people have been affected as well as loss of life these past nine months due to weather events affecting the power grid. Heat, fire, wind, water, and ice are all stressing our grid which requires more grid resilience.

Question: Can you please go one more minute on the cyber security concerns in the same package.

The subtitle in the bipartisan energy package has \$600 million in funding which is not sufficient. A recent GAO Electrify Grid Cybersecurity report “regarding comments that DOE develop a plan that addresses the key characteristics of a national strategy, including a full assessment of cybersecurity risks to the grid.” DOE agrees and is working on this area. We believe that cyber security concerns have to be at the core of all significant grid investments.

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What we can do to improve innovation

(Question by Committee Chair, Senator Krysten Sinema, D, Arizona)

Question: Innovation is essential. Arizona utilities are taking on this work with integrated systems plans to include renewable energy, DR and responding to load growth for electric vehicles (EVs). We also have partnerships with military bases to ensure grid continuity. What can we do to encourage these activities in other regions?

Historically, grid operators haven't been incentivized to innovate. R&D investments in utilities has been negligible. Innovation must be a core competency for utilities as they move into the 21st century. Utilities should be looking at virtual power plants and experimenting with real-time monitoring. We shouldn't fear innovation, such as using machine learning applications to

pinpoint issues. Examples: Using a regulatory sandbox to put guardrails and restrictions as state regulators work in partnership with utilities. We need more aggressive ideas if things go well and share with other stakeholders. Federally, competitive grants like in package from the Department of Energy (DOE) and the programs of agencies are essential.

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Screenshots from the virtual hearing



