A Grid New Deal

Rob Gramlich, Grid Strategies LLC

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Good afternoon and thank you for the opportunity to testify on this extremely important topic.

A **Grid** New Deal is essential for realizing the economic and environmental benefits of the Green New Deal. The original New Deal put America's hydropower resources to work powering the factories that helped lead us to victory in World War Two, while vastly improving living conditions for average Americans by bringing electricity to rural areas.[1] A Grid New Deal will similarly revitalize America's rural communities by providing an outlet for their vast wind and solar resources, while also helping to solve the greatest challenge of our generation: climate change. Best of all, this investment more than pays for itself by providing American homes and businesses with access to lower-cost sources of energy.

I have spent the last 25 years working electricity transmission and power markets to enable clean energy growth. That is the mission of a consulting firm I started two years ago called Grid Strategies, after leading policy for the American Wind Energy Association, serving as Economic Advisor to a FERC Chairman, and as Senior Economist for the grid operator called PJM Interconnection.

I want to make three points:

1) De-carbonization requires a vastly expanded grid;
2) We know how to build transmission;
3) Congress should advance policies on permitting, paying for, and planning transmission.

I'll take them in turn.

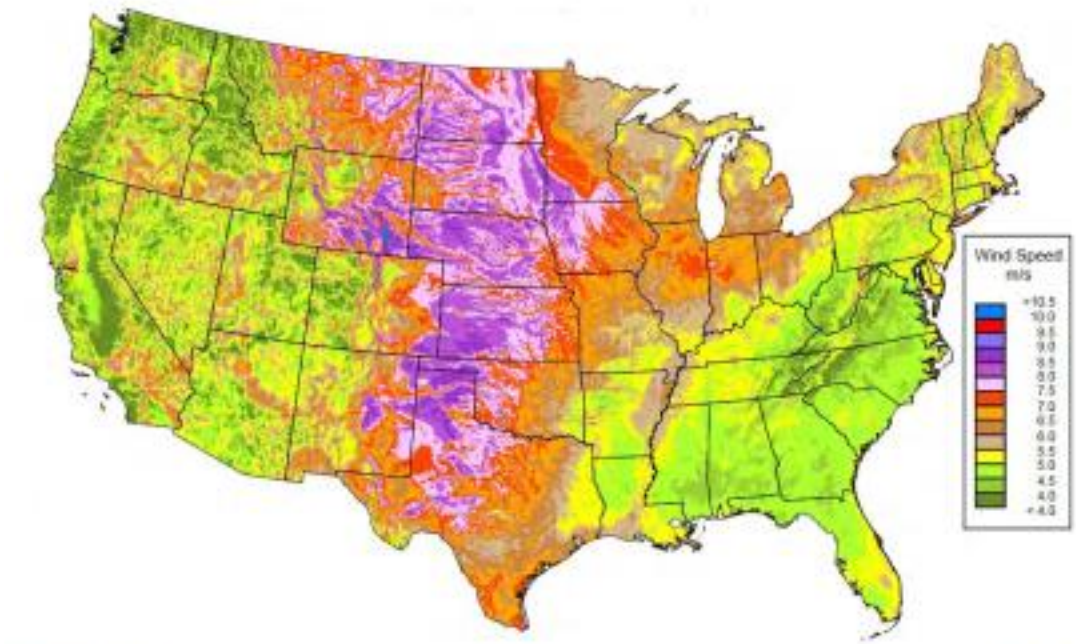
1) De-carbonization requires a vastly expanded grid

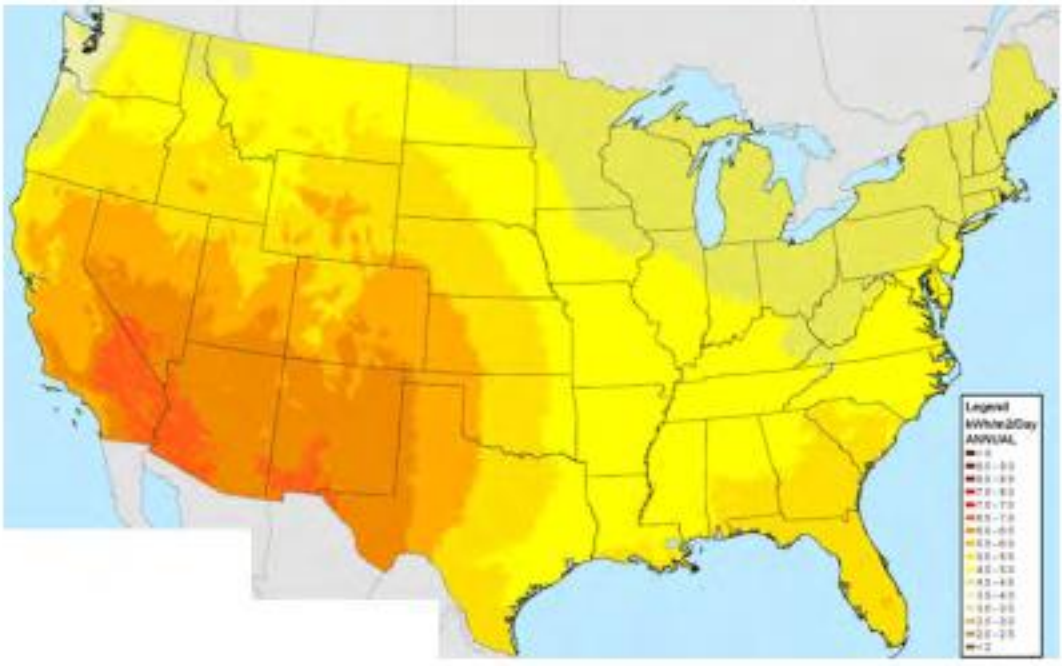
A strong transmission system enables renewable energy growth in two critical ways:

- Accesses remote high-quality resources; and
- Balances out local fluctuations in supply and demand.

[1] https://www.energy.gov/eere/water/history-hydropower

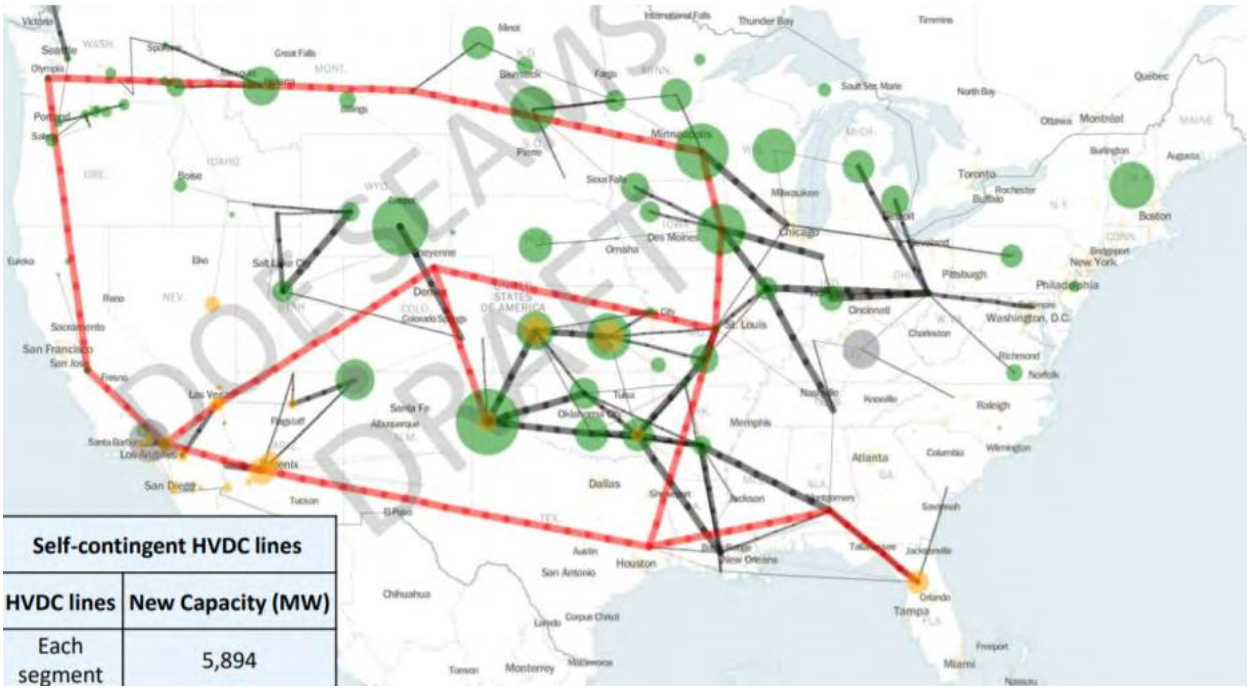
No other technology can substitute for transmission's ability to move electricity from point A to point B. As shown below, America's best wind and solar resources are currently stranded in sparsely populated areas where the grid is weak to nonexistent.





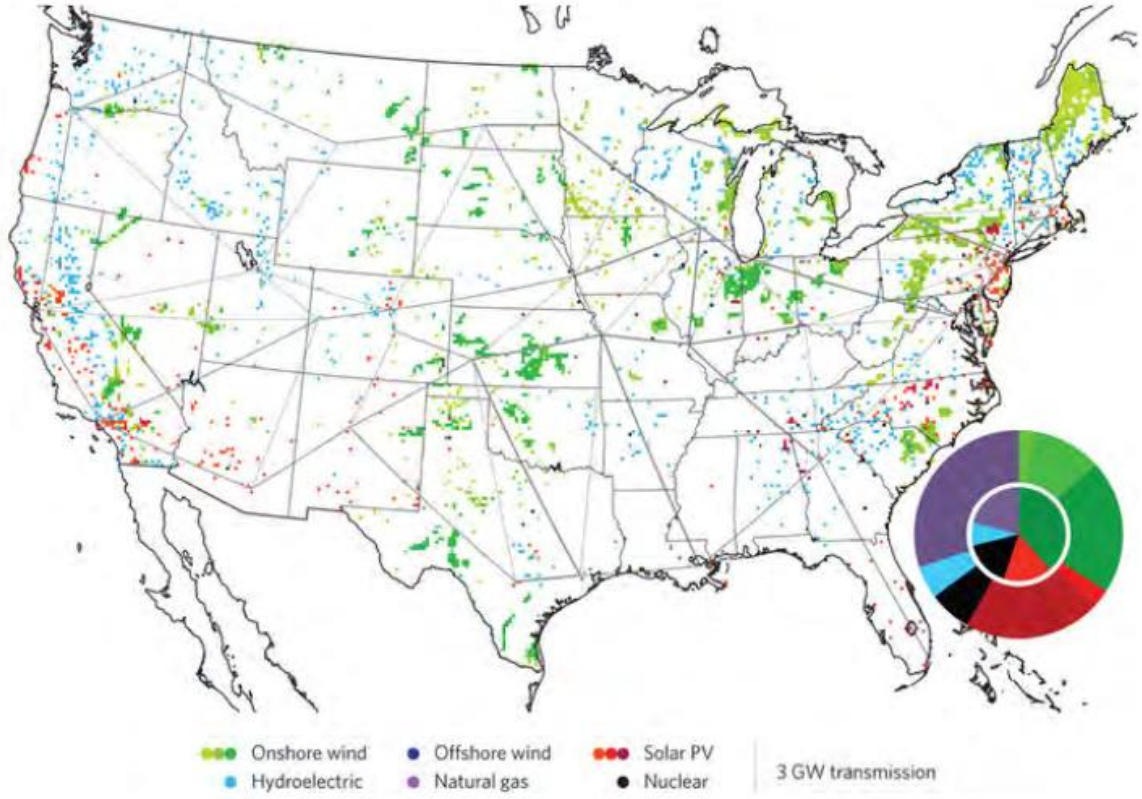
A variety of studies confirm that an expanded grid is necessary to provide American homes and businesses with access to large amounts of wind and solar energy. Recently the National

Renewable Energy Laboratory presented the "Interconnection Seams Study,"[2] which found the following transmission would enable America to obtain 40 percent of its electricity from wind and solar while conservatively saving consumers $2.50 to $3.30 per dollar spent.[3]



A similar study identified the transmission needed to obtain 55 percent of America's electricity from wind and solar resources.[4] The network would cut carbon dioxide emissions by 80 percent while saving consumers money.

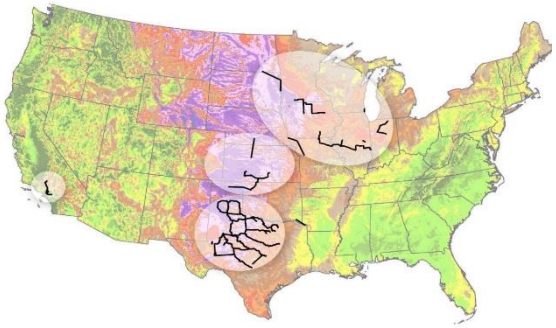
[2] https://www.nrel.gov/analysis/seams.html.
[3] Presented at Iowa State Transgrid-X Symposium, July 2018, https://iastate.box.com/s/vfgn9nikl1rz7r8x0vaoauzpm2210t35 . The savings estimate is only over 15 years but they continue over many decades.
[4] http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate2921.html . The outer circle in the lower right shows power plant capacity by energy source, while the inner circle shows electricity generation.



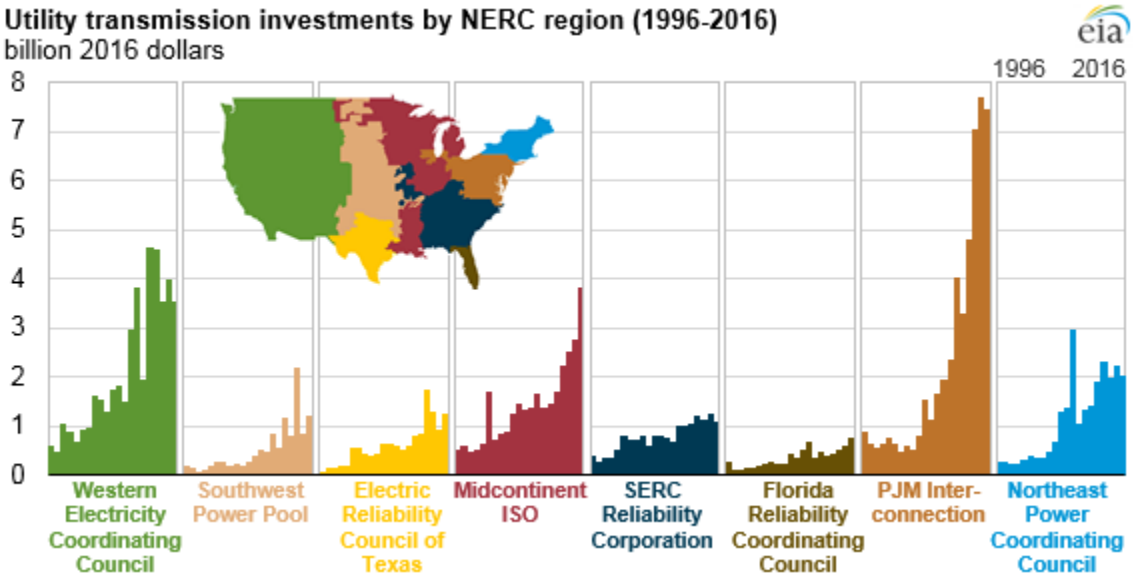
2) We know how to build transmission

America's power grid was historically balkanized into hundreds of separate utilities serving local consumption with local generation. Transmission spending lagged in the 1990s and early 2000s down at around $4 billion per year, but recently transmission investment has grown to around $20 billion per year. The image below shows new transmission lines in black connecting the highest quality wind resource areas (shown in red and purple) to population centers.

Figure 1: Recent High-Voltage Transmission and Wind Resources



The EIA chart below shows annual transmission investment expanding over the last 15 years.[5]



This success was driven by broad regional transmission planning and cost allocation policies in regions like Texas and the Midwest, enabled by Regional Transmission Organizations (RTOs). However, transmission construction is falling off as those regions complete their investments, and there are no major new projects on the horizon. To continue the momentum, Congress must help expand the planning and cost allocation policy successes of Texas and the Midwest to other regions, to transmission lines between regions, and eventually to a building a national network.

3) Congress should advance policies on permitting, paying for, and planning transmission.

The barriers to transmission can be called the 3 P's: planning, paying for, and permitting transmission. Policy makers should build on recent improvements and support expansion of these policies.

Planning

We need transmission planning processes that account for the multiple benefits of transmission, look beyond ten or fifteen years into the future, pro-actively plan to connect renewable energy resource areas, identify inter-regional transmission solutions, and account for uncertainty and transmission's ability to hedge against risks.

[5] https://www.eia.gov/todayinenergy/detail.php?id=34892

Congress can help by ensuring that every utility in the country joins a Regional Transmission Organization.

Paying

Like highways and national defense, transmission is a classic form of a "public good" that everyone gets to use, so no individual wants to pay for it. Regulators need to step up to allocate costs to those who benefit.

Congress can push the Federal Energy Regulatory Commission to exercise its considerable authority under the Federal Power Act to broadly allocate transmission costs to those who benefit on a regional and inter-regional basis.

Congress could also help alleviate the cost allocation challenge with an Investment Tax Credit for transmission. The entire nation benefits from greater access to low-cost clean energy, so it would make sense for taxpayers to pay for a share of the high-voltage grid. A tax credit to cover 1/3 of the cost of major regional or inter-regional transmission lines shown to increase reliability, resilience, and access to carbon-free energy could cost a few billion dollars a year while saving consumers money as shown by the studies mentioned above.

Permitting

Renewable energy faces an unlevel playing field against natural gas generation, as federal authority exists to permit interstate gas pipelines but not electric transmission lines. Policies should incentivize states to work together on transmission permitting and deploy federal authority where necessary for projects that serve the national interest. A stronger federal backstop siting provision could alleviate the total gridlock that can occur with national interest transmission developments.

Grid Operations

In addition to building new transmission, we should make sure the existing network is being used as efficiently as possible. New technologies are commercially available and are being deployed in other countries to reduce transmission congestion and improve reliability, such as Dynamic Line Ratings, power flow control, and topology optimization. Congress can direct FERC to ensure that transmission owners have an incentive to deploy these technologies.