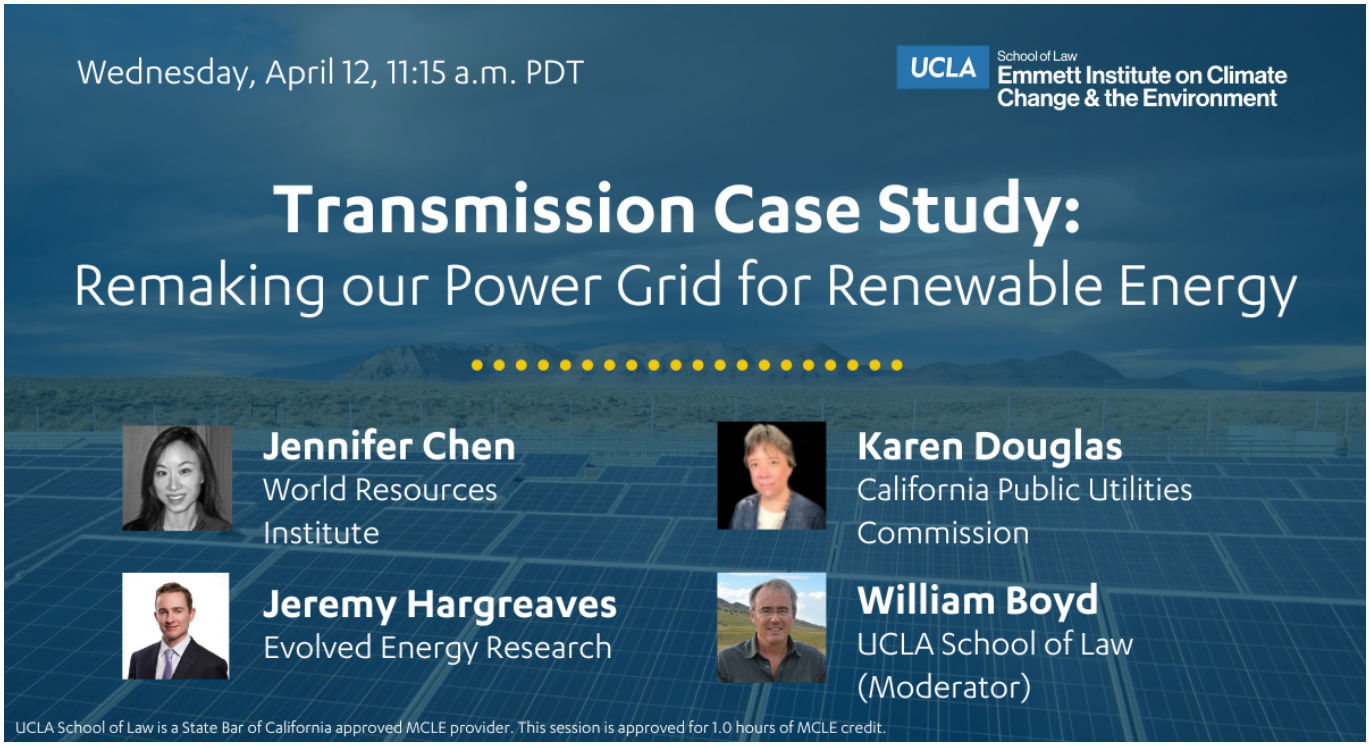


This is the second of a series of posts previewing the Emmett Institute's 2023 Symposium, coming up on April 12. Check out the first post, introducing some of the big questions around the IIJA and IRA, and the third post, on transportation infrastructure; and RSVP for the Symposium here!

The clean-energy transition that is one focus of the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA) will require big changes in our electric grid. On the demand side, switching our buildings, industries, and vehicles to electric power could double our electricity usage. On the generation side, replacing coal- and gas-fired power plants with renewables will change the location and the nature of our power supply; solar, wind, and battery-storage projects are already delayed as they wait for access to the power grid. And since the amount of power generated by wind and solar fluctuates more than typical fossil-fuel generation, the grid needs to be ready to shift power from one area to another.

To connect all that new supply to new demand, we need to upgrade our transmission system. In the energy world, "transmission" specifically refers to the high-voltage wires that move power from generating stations (like a power plant, solar array, or wind farm) to local distribution systems (the standard wires-on-poles setup that you see along most surface roads). Transmission lines allow us to use

electricity from far-away generators with only a small loss in power, enabling vast regions of North America to share a single grid.

But far more transmission lines need to be built, or upgraded, to achieve the goals of the IIJA and IRA. Modeling from Evolved Energy Research (where our panelist Jeremy Hargreaves is a principal) and Princeton University shows that reaching the IRA's full potential for greenhouse-gas reductions will require transmission capacity to grow at a rate of about 2.3% per year—double last decade's growth rate. ("Transmission capacity" is measured in the length of a transmission line times the amount of power it can carry.) Similarly, the National Academies recommend that the U.S. increase its transmission capacity by about 40% by 2030 in order to achieve carbon-neutrality by mid-century.

The ways in which the IIJA and IRA address the need for new transmission capacity will be the subject of the second panel in our symposium, *Transmission Case Study: Remaking our Power Grid for Renewable Energy*.

Obstacles and Controversies around Transmission Development

A big part of the problem with electricity transmission is that the lines need to go somewhere. The high-voltage wires must be well insulated, kept cool, and set at a safe distance from any people or obstacles. This is usually done by mounting wires overhead or burying the lines in specialized underground installations. And to do that, transmission products must both get access to the land—by purchase or eminent domain—and get the necessary permits from state, and sometimes local, governments.

Property and permits can be hard to come by, for many of the same reasons that renewable-generation projects face. Overhead lines typically require removing trees and vegetation all along the corridor, potentially causing harm to local ecosystems. They are also highly visible, which can damage the aesthetics of any area and may cause economic harms to areas dependent on tourism or recreation. Underground lines, besides being expensive and difficult to maintain, also require substantially more disturbance to the land and nearby people or businesses.

Another key issue is that the people impacted by transmission projects are often

not the people that ask for them. To take one prominent example, Massachusetts has been trying for years to get a transmission line built that would directly connect it to hydropower from Hydro-Québec, in Canada, to help satisfy the state's renewable-energy goals. The most convenient routes for that line would require a large amount of new construction in New Hampshire or Maine (Vermont was considered but rejected as too expensive). Hydro-Québec stands to gain customers, and the state of Massachusetts would be able to meet its renewable energy goals, but the benefits to the state where the new transmission would be built—and in particular to the people who live, work, or play near the proposed construction sites—have not been enough to win support. (The Maine version of the transmission project may still go through: although it was rejected by a state referendum, the state's supreme court has ruled that the referendum may be unconstitutional, depending on facts that will be developed at trial.)

As a result, transmission development is a crucial consideration for large-scale renewables planning. Major clean-energy projects—such as the Desert Renewable Energy Conservation Plan or potential offshore-wind developments that our panelist Karen Douglas worked on as California Energy Commissioner—must be designed around existing transmission infrastructure or find a way to carefully and responsibly build out new lines in ways that minimize local harms and can win stakeholder support.

Reforms from the IIJA

The IIJA and IRA both take steps to reduce barriers to new siting—though not necessarily the controversies that come with them. The biggest change comes from the IIJA, which has two major elements as regards transmission: First, the law created the "Transmission Facilitation Program," which allows the Department of Energy (DOE) to become much more involved in promoting large transmission projects—including by promising to purchase up to half of the project's capacity, for up to 40 years. This is paired with a $2.5 billion fund for the DOE to support such projects.

Second, and perhaps more controversially, the IIJA amended provisions in the Federal Power Act dealing with the "backstop" authority of the Federal Energy Regulatory Commission (FERC) and the DOE. This power originated in the Energy Policy Act of 2005, which gave DOE authority to designate "National Interest Electric

Corridors" (NIETCs), if, based on a "Congestion Study" released once every three years, it found that a region's lack of transmission capacity was already constraining economic growth. Within those NIETCs, the law allowed FERC to issue federal permits for transmission, in place of state permits, if a state permit application had not been approved within one year of filing.

But two appellate-court decisions strictly limited this authority: A 2009 Fourth Circuit decision, *Piedmont Environmental Council v. FERC*, found that FERC could not issue a "backstop" permit for an application that the state had denied, only an application that had been neither approved nor rejected for at least a year. Two years later, in *California Wilderness Coalition v. DOE*, the Ninth Circuit struck down the only two NIETC designations that DOE has ever made and established stringent requirements for future designations.

The IIJA essentially reverses the *Piedmont* decision and reinforces DOE's authority. DOE can now create a NIETC based on predicted *future* transmission needs, and can take third-party studies into account. And FERC can now issue transmission permits in a NIETC even when a state has denied the permit (in certain cases). This creates the potential for project proponents, after having their permit denied at the state level, to go to DOE and FERC themselves to override the state decision—a path which DOE seems likely to take.

Money from the IRA

The IRA does not revolutionize electricity transmission to the same extent, but does use its funding to encourage new development. Most directly, the IRA builds on NIETCS by providing $2 billion in funding for transmission projects in those areas. It also offers $0.76 billion for states and Tribes to use to facilitate their review of proposed transmission projects, so long as they make a decision on those projects in two years or less. This provides something of a carrot to states, to pair with the stick of DOE and FERC's expanded "backstop" authority.

The IRA also provides $9.7 billion for rural electric cooperatives to develop clean-energy resources. Rural electric cooperatives are nonprofit electric utilities owned by their customers, rather than investors or governments, and while small in terms of total power supplied, are the dominant utility type for rural areas. They have been slower to divest from coal power, partially because they have a large debt load, often secured by their coal-fired plants, and partially because, as nonprofits,

they cannot benefit from traditional renewable-energy tax credits (though the IRA's "direct pay" tax credits avoid this problem). While the nearly $10 billion is intended to fund a variety of clean-energy projects, a good portion of that may well go to the transmission projects necessary to connect rural cooperatives to renewable generation.

Using This Power Responsibly

The massive buildout of new transmission necessary to decarbonize our economy will be difficult. Continuing the status quo will make it hard to get renewable energy from where the sun, wind, and water are to where the people are, extending the use of coal, gas, and oil. Forcing transmission projects through, as the IIJA makes possible, may not be fair and will almost certainly create resentment for climate policy generally. Even now—as our panelist Jennifer Chen has written—DOE and FERC are trying to develop an equitable and effective means of wielding the powers and funding that the climate laws have given them, but that may be the hardest path of all.