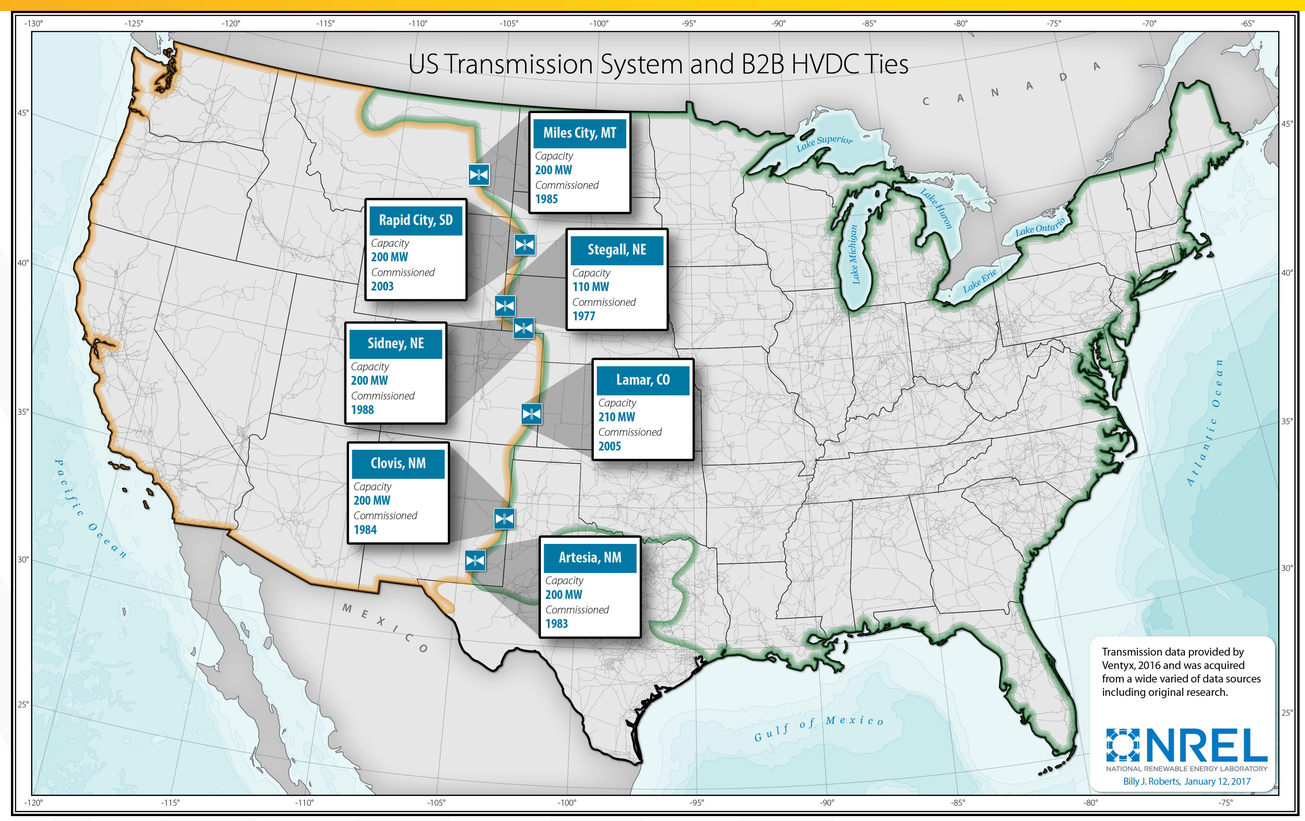
Interconnections Seam Study 1.3.33

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

A Diverse and Divided System

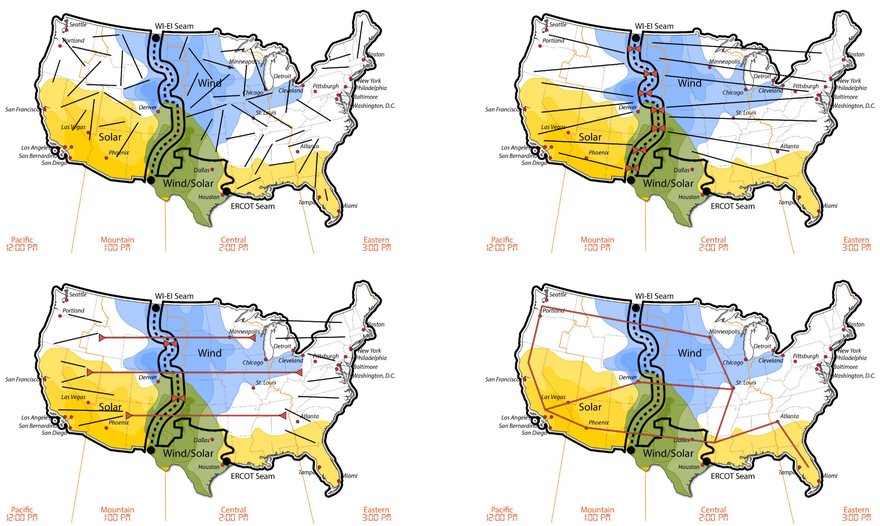
At the western edge of the American prairie, just east of the Rocky Mountains, lies a collection of electrical resources that string together the workhorse of the American economy: the United States power system. Seven back-to-back high voltage direct current facilities (top right) enable ~1,400 megawatts of electricity to flow between the Eastern and Western Interconnections. The 1,400 MW of transfer capability between the interconnections isn't much more than a rounding error compared to the size of the networks they connect—the larger Eastern Interconnection is home to 700,000 MW of generating capacity. But these facilities, located strategically where the East meets the West, are aging rapidly and they present a timely and impactful opportunity to modernize the U.S. electric grid.

System planners in central U.S.—utility executives, entrepreneurs and investors, land use authorities at the local, county and state level, as well as various utility industry regulators—are faced with a dilemma. On one hand, power system planners in this part of the country could act locally, and focus on their individual footprints, meeting their system demand as they see it. On the other hand, system planners could see a national opportunity to use the region's natural resources to drive down electricity costs and drive national economic growth. How big are the differences between these futures, and what are the options for getting the most out of the region's natural resources?



Too Big?

The Interconnections Seam Study is the most ambitious power systems study ever conducted. It is an industry driven regional partnership with the **Midcontinent Independent System Operator**, **Southwest Power Pool**, and **Western Area Power Administration**. These three groups, and a Technical Review Committee (bottom center), knew the questions they wanted to answer, but they needed National Laboratories and **Iowa State University**. They came to DOE to leverage the state-of-the-art data, advanced methods, High Performance Computing, and ability to convene a stakeholders to analyze 4-transmission futures (below).



U.S. DEPARTMENT OF ENERGY

Advanced Methods, Deeper Insights

The Interconnections Seam Study provides a wide area view of the reliability and efficiency of 4-transmission futures for the U.S. The analysis includes three classes of power systems modeling tools: System Expansion, Production Cost, and Steady State (bottom right). This is the first time DOE has funded a project of this scale that includes all three power systems modeling domains. Because of the computational burdens associated with a project this broad, new methods (right) and models are being developed and applied to this work. Using these capabilities they are exploring questions that were never before possible, and they are answering those questions with increased confidence.