



## The Brattle Group Report on Transmission Planning – Summary

April 22, 2015

This study, commissioned by WIRES,<sup>1</sup> is a continuation of the ongoing efforts to assess transmission planning processes in the United States, to diagnose critical deficiencies, and to recommend improvements. The analysis focuses on the effectiveness of current and proposed planning practices in identifying the most valuable regional and interregional transmission investments. In doing so, it identifies three principal deficiencies that will lead to ineffective or insufficient infrastructure investments and could leave the North American electricity markets exposed to higher risks and higher overall costs. The three principal deficiencies are:

- Planners and policy makers do not account for the high costs and risks of an insufficiently robust and insufficiently flexible transmission infrastructure on electricity consumers and the risk-mitigation value of transmission investments to reduce costs under potential future stresses.
- Planners and policy makers do not consider the full range of benefits that transmission investments can provide and thus understate the expected value of such projects.
- The interregional planning processes are ineffective and are generally unable to identify valuable transmission investments that would benefit two or more regions.

These deficiencies collectively create significant barriers to developing the most valuable and cost-effective regional and interregional transmission projects and infrastructure. If not addressed, these deficiencies will lead to: (a) underinvestment in transmission that leads to higher overall costs; (b) lost opportunities to identify and select alternative infrastructure solutions that are lower-cost or higher-value in the long term than the projects proposed by planners; and (c) an insufficiently robust and flexible grid that exposes customers and other market participants to higher costs and higher risk of price spikes.

The case studies in this report show that challenging and extreme conditions regularly occur on the power system and that a more robust and more flexible transmission network can help to mitigate the

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<sup>1</sup> WIRES is an international non-profit association of investor-, member-, and publicly-owned companies dedicated to promoting investment in a robust, well-planned, and environmentally-beneficial high-voltage electric transmission grid. WIRES members include integrated utilities, regional transmission organizations, independent and renewable energy developers, and engineering, environmental, and policy consultants. The report, *Toward More Effective Transmission Planning: Addressing the Costs and Risks of an Insufficiently Flexible Electricity Grid*, co-authored by Johannes Pfeifenberger, Judy Chang, and Akarsh Sheilendranath is available at [www.wiresgroup.com](http://www.wiresgroup.com).

high-cost impacts of those conditions. A more flexible grid also reduces the cost of addressing the unprecedented long-term uncertainties faced by the industry today.

From this perspective, today's planning processes are anything but "conservative"—a term often used to describe planning analyses that err on the side of discounting the benefits of transmission investments, particularly in light of the significant long-term uncertainties. The study shows that today's "conservative" approach actually exposes customers and other market participants to greater risks and costs because by understating the benefits of and risks addressed by transmission, valuable investments in transmission facilities are either not made or delayed. In an industry where it can take a decade to plan, permit, and build major new transmission infrastructure, ***further delaying investment by understating transmission-related benefits can easily result in a higher-cost, higher-risk outcome that is exactly the opposite of the goals of "conservative" planning.***

Policy makers, including industry regulators, play a key role in influencing the scope of regional and interregional transmission planning efforts. In an effort to improve regional and interregional planning processes, the authors thus recommend that state and federal policy makers encourage transmission planners to pay more attention to the transformation that our power system is undergoing, the risks and costs associated with challenging and extreme market conditions, and the ability of a more robust, flexible transmission infrastructure to reduce the costs and risks of delivering power to consumers. To do so, the report recommends that policy makers:

1. Resist making the assumption that less transmission investment is always a lower-cost solution. Instead, policy makers should request that planners move from "conservatively" estimating transmission-related benefits to recognizing the full spectrum of benefits that transmission infrastructure investments can provide, including how having a more robust and flexible grid can insure customers and other market participants against the high costs and risks of unexpected events and long-term changes and uncertainties in market and policy conditions.
2. Urge planners to move from "least regrets" transmission planning that identifies only those projects that are beneficial under most circumstances to also considering the potential "regrettable circumstances" that could result in very high-cost outcomes because of inadequate infrastructure. Stating it in terms of providing insurance value: planners should move from focusing on the cost of insurance to considering the cost of not having insurance when it is needed.
3. Urge transmission planners to move from compartmentalizing projects into "reliability," "economic," and "public policy" projects to considering the multiple values provided by all transmission investments.

Regarding *interregional* planning processes, state and federal policy makers should urge planners to:

4. Expand interregional planning processes to allow for the evaluation of projects that address different needs in different regions, recognizing that most interregional transmission projects offer a wide range of economic, reliability, and public policy benefits and that the type and magnitude of these benefits can differ across inter-connecting regions.

5. Refrain from resorting to “least common denominator” approaches to interregional planning that consider only a subset of the benefits recognized in the individual regions. Instead, require that every region, at a minimum, consider in its evaluation of interregional transmission projects all project types and all project benefits that are already considered within its regional planning process.
6. Go beyond the benefits evaluated in their individual regions to:
  - a. Consider the *combined* set of benefit metrics from all interconnected regions, even if some of the benefit metrics from other regions are not yet used in some of the regions’ planning processes; and
  - b. Consider the unique additional values offered by interregional transmission projects, such as increased wheeling revenues or reserve sharing benefits that interregional transmission investments can provide.
7. Apply benefit-to-cost thresholds to interregional projects that are no more stringent than those applied within each region.

The report specifically notes the obvious: not all proposed transmission projects are justifiable economically nor should they be built. Rather than simply trying to build as much transmission as is justifiable under current planning standards, the emphasis of policy makers and planners should be to identify and invest in the most valuable, economically-beneficial bulk power infrastructure. This requires that the full benefit of transmission investments is recognized and that so-called “non-transmission alternatives” and means to more efficiently utilize existing infrastructure are evaluated as well.

Given the increased regulatory and environmental uncertainties facing the electricity industry today, the industry needs to start planning more actively in anticipation of possible future outcomes. Otherwise, time constraints on implementing solutions will leave the industry with fewer options that will make it more costly and more risky to address the challenges ahead. It is consequently important to identify the investments that provide the most benefit with the aim of reducing the overall costs and mitigating the risks faced by electricity consumers and other market participants over both the short- and long-term.

The risks and costs of inadequate infrastructure typically are not quantified but can be much greater than the costs of the necessary transmission investments. The authors therefore urge federal and state policy makers to ensure that planning processes include an assessment and documentation of those risks and costs. With an informed understanding and appreciation of those costs and risks, regions will be in a better position to plan a transmission infrastructure that can better protect market participants against these risks. Because leaving out or discounting the potential costs and risks of not having a sufficiently robust and flexible grid can significantly increase overall electricity cost for consumers and other market participants, the report encourages policy makers to fully examine the issues discussed in this report and consider the specific recommendations as providing a path toward more effective transmission planning.