**Opportunities and benefits for increasing transmission capacity between the US Western and Eastern Interconnections**

Historically, the primary justification for building wide-area transmission lines in the US and around the world has been based on reliability criteria. Today, the influence of renewable portfolio standards (RPS), Environmental Protection Agency (EPA) regulations, transmission needs, load diversity, and grid flexibility requirements drives interest in high capacity wide-area transmission. By making use of an optimization model to perform long-term (e.g., 20 years) co-optimized generation and transmission expansion planning, this work explored the benefits of increasing transmission capacity between the US Eastern and Western Interconnections under different policy and futures assumptions. The model assessed tradeoffs between investments in cross-interconnection HVDC transmission, AC transmission needs within each interconnection, generation investment costs, and operational costs, while satisfying different policy compliance constraints. Operational costs were broken down into energy supply, up-/down regulation reserve, and contingency reserve. In addition, the system operating flexibility requirements were modeled as a function of net-load variability so that the flexibility of the non-wind/non-solar resources increases with increased wind and solar investment. In addition, planning reserve constraints are imposed under the condition that they be deliverable to the load. Thus, the model allows existing and candidate generation resources for both operating reserves and deliverable planning reserves to be shared throughout the interconnections, a feature which significantly drives identification of least-cost investments. This model is used with a 169-bus representation of the North American power grid to design high-capacity interregional transmission. Results from this analysis suggest that, under policy that imposes a high-renewable future, the benefits of high capacity transmission between the Eastern and Western Interconnections outweigh its cost. A sensitivity analysis is included to test the robustness of each design under different future assumptions and quantify the range of benefits.