Public Interest Principles for Electric System Planning: Earning Consent for New Transmission

I. Goal

Transmission planning better able to support timely development of a smart, reliable, secure electric grid that facilitates a clean energy economy, enhances national security and prosperity, and aligns electricity supply with environmental sustainability.

II. Statement of Problem and Need

With few exceptions, transmission planning today focuses on operational reliability and congestion relief.[1] Transmission planning typically fails to evaluate the energy security benefits of increased connectivity and access to clean, indigenous and inexhaustible resources; or regional economic activity and job creation stimulated by new grid infrastructure. Planning and approval focus on single transmission projects, with little consideration of the benefits individual projects provide to our large, interconnected system. The narrow focus on operational reliability and congestion relief provides an insufficient basis for interstate cooperation on siting, cost allocation, and cost recovery. Current planning efforts do little to build public consent to bear the costs and impacts of new infrastructure. Exclusion of public interest concerns limits transmission development, creates contentious project approvals and litigation, and delays the transition to a cleaner electric sector.

Although FERC Order 890 requirements have helped make planning procedures and assumptions more transparent, grid expansion plans are often geographically limited and responsive primarily to a narrow range of utility company self interests. Planners across the country still use a wide variety of assumptions, models, and approaches to create grid expansion plans. This complicates cooperation on siting, cost allocation and cost recovery for interstate project.

At the same time, transmission planners are increasingly being asked to consider a broader set of concerns as more stakeholders participate in transmission planning under FERC's requirements for open and transparent planning. For example, as part of the Order 890 reform docket, FERC encouraged planners to look beyond economics and congestion during scenario planning stages of new transmission infrastructure development.[2] Additionally, the public is asking regulatory officials to consider the effects of transmission on wildlife habitat, water use and availability, and other land uses. Despite these requests, public utility commissioners are often restricted by statute from considering factors other than

[1] Electric transmission facilities are said to be congested when actual or scheduled flows of electricity across a line are restricted below design levels. These restrictions may be imposed either by the physical capacity of the line, or by operational restrictions created and enforced to protect grid reliability or the contractural rights of transmission owners or transmission customers. Reliability ensures delivery of an uninterrupted flow of electricity to customers, including through unexpected loss of generation, transmission or distribution facilities.

[2] Notice of Proposed Rulemaking regarding Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities under RM10-23.

reliability and congestion, and transmission planners do not have the tools necessary to address these issues.

A more effective system planning framework can provide regulators and planners the tools to guide development of projects able to earn public consent

III. Proposed Solution: New Planning Principles and Evaluation Measures

In the absence of Congressional or federal agency action setting enforceable national energy and environmental goals or specific new federal planning requirements, an improved focus on and broad discussion of new transmission planning objectives and evaluation measures may offer the most effective way to make progress toward overcoming transmission development barriers.

Purpose

A reasonable, broadly supported set of objectives and measures can help to:

- Enable grid planners and decision makers, including regulators in all regions of the country, to ensure that stakeholder concerns; water, land, and wildlife impacts; greenhouse gas and other emission reductions; and economic development effects are addressed in transmission planning
- Improve plans for new infrastructure by reducing potentially adverse impacts and delivering a wider range of benefits;
- Build broader public support for infrastructure development;
- Enable timely and thoughtful regulatory approval of appropriately planned and sited projects; and
- Expedite the transition to a cleaner energy future.

Pertinent Venues

To this end, new planning objectives and measures to quantify them can be used in:

- State and regional planning processes (including DOE-funded Eastern Interconnect and Western Interconnect planning processes),
    - helping utility and non-utility participants understand impacts and benefits essential to developing stakeholder support for proposed projects; and
    - helping stakeholders determine which future resource scenarios should be modeled and the types of transmission plans to be evaluated.
- State and regulatory proceedings, providing record evidence and helping to counter opposition to proposed transmission projects.
- Investment-level due diligence processes, providing information about transmission costs and returns to meet investment requirements.

Timing

Discussion of broader transmission planning objectives is timely, given current efforts to restrict the types of benefits that may be considered in transmission approvals.[3] Narrowing the factors that can be

[3] e.g., Corker Amendment to the American Clean Energy Leadership Act of 2009 (S.1462)

evaluated in planning major infrastructure could hamstring transmission development. It would also preclude or severely limit stakeholder involvement and exclude consideration of factors that most concern the public.

The Transmission Planning Principles developed by NWCC in 2004 included standards for transparency and inclusiveness that were ultimately reflected in the planning principles adopted in FERC Order 890.[4] Measures to guide the consideration of a broader set of costs and benefits in transmission planning could inform future planning policy development at FERC and across the country.

IV. Proposed Planning Principles and Evaluation Measures

New standards can help ensure that issues of most concern to the public are considered in system planning. Workshops or town hall meetings around the country can help forge agreement on what such best practice standards should include and how progress toward living up to the standard should be measured. To begin this discussion, we propose illustrative standards and evaluation measures below.

In our view, expanded stakeholder involvement in planning to be a prerequisite for achievement of each of these objectives.

1. Environmental Sustainability Metrics

Emissions Reductions

- Do system plans consider the risks and possible costs of GHG emissions?
    1. One metric might be a GHG performance standard, applied to the generation connected by the proposed transmission. A 250 lbs CO_2/MWh performance standard would support, e.g., a mix of 25% natural gas and 75% zero-carbon generation.[5]
- Will all standards for criteria pollutants, including NOx and Particulate Matter, be met under proposed transmission plans?
- Will plans manage risks that additional emissions and pollution sources (e.g., mercury and ash disposal) will be regulated, or regulated more stringently, in the future?

Protection of Wildlife, Habitat and Ecosystem Integrity

- Have environmental exclusion areas been identified (where transmission development is prohibited by law or policy; or where development will be so controversial that litigation will unacceptably slow development)?

[4] The NWCC submitted comments to FERC in response to Docket No. AD04-13-000 on January 28, 2005

[5] For calibration, the current California GHG performance standard for new generation is 1100 lbs CO2/MWh, which was set at a heat rate of 10,000 BTU/kWh (the efficiency of older gas-fired units now in operation). With new gas-fired generation (7500 BTU/kWh), a 25% gas/75% renewables mix would support a GHG standard of about 200 lbs CO2/MWh. Most coal generation is in the 2,000 lb CO2/MWh range.

- Have wildlife corridors and habitat for at-risk species been identified and planned around? Have mitigation strategies or standards been agreed on?
- Have water impacts of proposed generation-transmission development been considered?
- Has planning considered ways to minimize the footprint of generation-transmission development?
- Have generation development areas and transmission routings been evaluated and ranked using environmental concern criteria?
- Has the potential value of environmentally sustainable generation been considered? Measures could include:
    1. avoided water use;
    2. public health benefits, including avoided public health costs;
    3. avoided degradation (e.g., mountain-top removal, strip mining, gas drilling); avoided remediation.; and avoided clean-up (e.g., coal ash); avoided control technology retrofits (mercury, NOx).

2. Energy Security Metrics

National and System Security

Reliability

- Do the planned additions maintain or enhance reliable operation of the grid?
- Have the potential reliability benefits of connecting geographically dispersed, small capacity generators having high mechanical availabilities been evaluated?
- Have the reliability benefits of increased utilization of solar generation and demand response during peak load hours been evaluated?
- Have benefits provided by the low voltage ride through capability of current wind turbines to system stability during disturbances been evaluated?
- Has the economic value of increased reliability produced by added network connections to the grid been evaluated (dollar value of fewer, shorter outages, less production time lost)?
- What is the potential security value of increased connectivity to an economy overwhelmingly dependent on electronic communications.
- What is the potential value of indigenous, inexhaustible power supply? Metrics may include: reduced US trade deficit; enhanced control over US money supply and valuation of the dollar.

Personal/Consumer Security

- **Has the effect on consumer electricity price risk from access to resources having no or low fuel costs been evaluated?**
- **Has the effect of proposed plans on electric prices for low income consumers been considered?**

- **Will rates of change in electric prices driven by proposed plans maintain economic competitiveness for business customers?**

Efficient Utilization of the Existing Grid

- Has the amount of new generation that can be added to the existing transmission system without major upgrades been quantified?
- Have actual flows been compared to transmission capacity reservations, to identify the amount of unused capacity that could be utilized, under Conditional-Firm tariffs or otherwise?,[6]
- Has the amount of new generation that could be connected under Special Protection Schemes (SPS), under operational nomograms, or through expanded Conditional-Firm tariffs been quantified? Doing so will help minimize the need for new transmission. Criteria can clarify or establish the circumstances under which such approaches are cost-effective and reliable.
- Is there a least cost integration strategy for large scale additions of variable generation resources that optimizes system performance with minimum required transmission?

Comparable Treatment of Demand and Supply Resources

- Do planning assumptions treat dynamic load resources (demand resources) on an equivalent basis with supply resources?
- Do they consider time- and location-specific demand reduction in load centers, including peak-shifting, distributed PV and Combined Heat and Power (CHP)? Is the need for new grid facilities calculated net of the contribution of all DR resources found to be cost-effective?
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Utility Company Viability

- What is the utility's stake in planning outcomes? Have their concerns been addressed in the planning process?
- How can we address all interests, including utility interests?

3. Economic Metrics

Robust Stakeholder Participation

- Does the planning process give stakeholders the opportunity to help shape the plans?
- Do stakeholders have a reasonable basis for supporting proposed developments?
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- Have stakeholder comments been analyzed and responses provided?

[6] The State-Provincial Steering Committee of the DOE-WECC Regional Transmission Expansion Planning process (RTEP) has established a Grid Utilization Workgroup which may be able to help establish such criteria. It will build on analysis of actual historical flows on major paths in the Western Interconnection using data compiled by the WECC Historical Analysis Work Group.

Reduced Net Economic Costs

- Are there net customer savings from displacement of gas-fired generation with renewables when the costs of required new transmission are included?[7]
- Are there net customer savings from increased access to lower cost electricity from other regions?
- Is the total cost of electric service to customers lower with planned generation and transmission added if appropriate estimated energy efficiency program savings, demand resources and distributed generation penetrations, and achievement of carbon reduction targets are incorporated in planning analyses?
- What is the effect on natural gas prices economy-wide estimated to result from decreased utilization of gas for electric generation, as renewables and efficiency meet larger shares of electric demand?
- What is the value to electric customers of avoided environmental and public health costs likely to result from reduced power plant emissions if renewables and energy efficiency displace fossil fuel plants? (Externality calculations, e.g., those produced by the European Commission in 2007, quantify several of these metrics).

Economic Development

- How many direct jobs are likely to be created by the proposed transmission development and the generating projects enabled by additional access to load created by the new transmission facilities?
- How many indirect and induced jobs are likely to be created by such new generation and transmission development (i.e., multiplier effect on local economies)?
- What is the likely effect on regional economic activity of lower power costs resulting from congestion relief and access to lower cost generation?

Scale/Right Sizing of System Facilities

- Have economic and public interest costs and benefits of maximizing power flow in proposed routings or corridors been considered?
- What is the value of larger-scale transmission projects that are developed in anticipation of future needs and that provide benefits of increased connectivity to larger populations?
- Has the cost of right-sized projects been compared to the cost of smaller capacity projects justified only to meet current needs across the 60-year life cycle of new transmission?
- Has line spacing been evaluated with the goal of efficient and reliable utilization of rights of way?.

[7] Colorado and Texas experience provides data on customer bill savings. In California, the benefits of displacing natural gas-fired peakers with large-scale solar generation range from 13.9-32.7 cents/kWh; when displacing a natural gas combined cycle plant, the value ranges from 9.4-22.9 cents/kWh. ("Waterfall Value Proposition of Large-Scale Solar Power Technologies In California," CEERT, May 2009).

Planning Horizon and Scope

- Is the planning period appropriate in light of the service lives of the transmission assets proposed to be built?
- Do the planning assumptions look beyond current interconnection requests?
- Is the planning period long enough to anticipate some electrification of transportation, greater utilization of demand resources, and the achievement of carbon reduction goals proposed in national legislation?
- Has a broad range of scenarios been considered that develop radically different futures, so as to allow analysis of new transmission likely to be required by most, or all, scenarios?

Assessment of Technology Alternatives

- Do planning alternatives consider application of higher voltages, advanced conductors or other new technologies?
- Do planning alternatives consider undergrounding, or other technologies to minimize the environmental footprint of new transmission?