



Incorporating Equity Objectives into Transmission Planning

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Energy Justice Tenets and Equity Dimensions

Recognition Justice (who?)

- The practice of cultural domination, disregard of people and their concerns, and misrecognition

Procedural Justice (how?)

- The fairness of the decision-making process

Distributive Justice (where?)

- The unequal allocation of benefits and burdens and unequal distribution of the consequences

Restorative Justice

- The response to those impacted by the burdens of energy projects

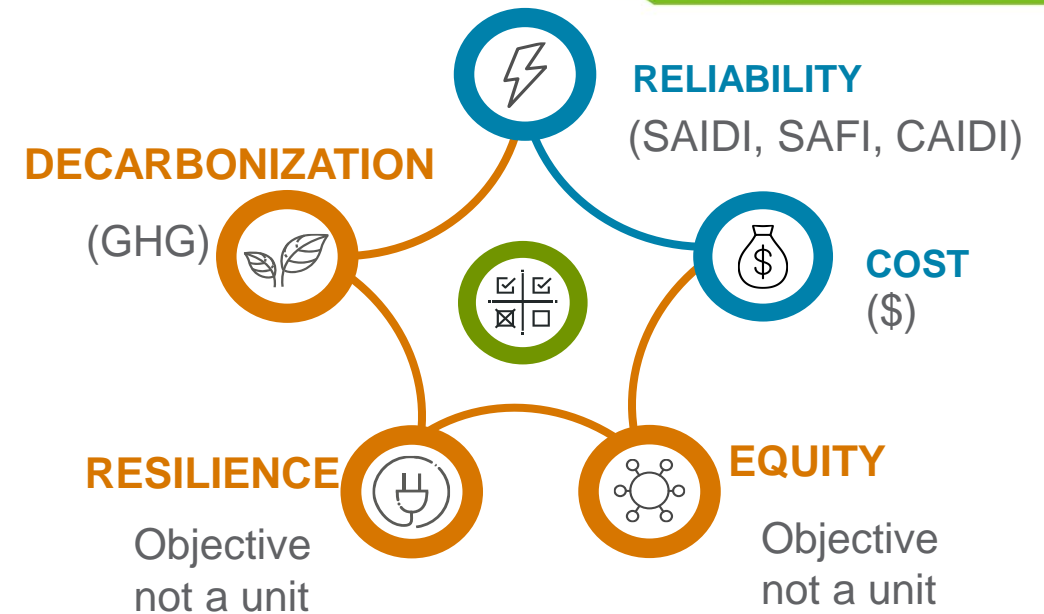
Key Principles:

- Availability
- Transparency and accountability
- Due process
- Intergenerational equity
- Affordability
- Sustainability
- Intragenerational equity
- Responsibility

Key Terms	Definition
Energy Burden	Percent of household income spent to cover energy cost.
Energy Insecurity	The inability to meet basic household energy needs.
Energy Poverty	A lack of access to basic, life-sustaining energy.
Energy Vulnerability	The propensity of a household to suffer from a lack of adequate energy services in the home.

Emerging Objectives in Grid Planning

- Traditionally electric grid planning strives to maintain **safe, reliable, efficient, and affordable** service for current and future customers.
- As policies, social preferences, and the threat landscape evolve, additional considerations for power system planners are emerging, including **decarbonization, resilience, and energy equity and justice**.
- Relative to traditional objectives, these emerging objectives are not well integrated into grid planning paradigms.



$$\text{SAIDI} = \frac{\text{total duration of interruptions for a group of customers}}{\text{Number of all customers}}$$

$$\text{SAIFI} = \frac{\text{total number of interruptions for a group of customers}}{\text{Number of all customers}}$$

$$\text{CAIDI} = \frac{\text{SAIDI}}{\text{SAIFI}}$$

Regulations and Policies that Govern Transmission Planning

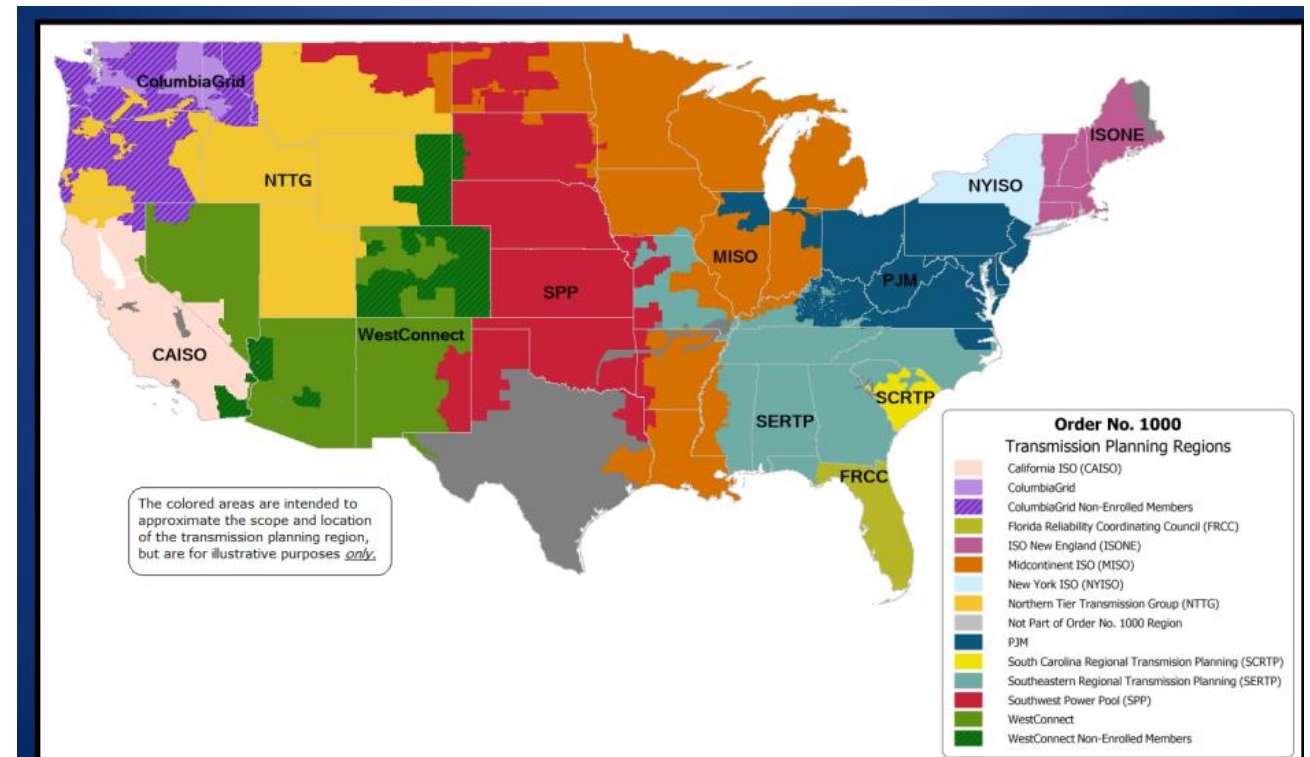
The North American Reliability Corporation (**NERC**): Reliability Standard TPL-001-5 describes the transmission planning requirements that every transmission-owning entity must satisfy

- Every utility must maintain a planning model that accurately represents its system and use that model to study the system's reliability on an annual basis
- TPL-001-5 includes many planning requirements covering various scenarios and time horizons
- In the simplest terms, system planners study different potential contingency events by removing a system component, such as a generator or transmission line, and simulating how the system would respond
 - Contingency events may be $n-1$ events (where n represents the system and 1 represents the removed component), $n-1-1$ events (where the removal of one component causes another component to fail), or $n-2$ events (where two components fail at the same time)
 - Where a contingency study reveals a reliability violation, planners are tasked with developing a corrective action plan to maintain reliability in that scenario

Regulations and Policies that Govern Transmission Planning

The Federal Energy Regulatory Commission (**FERC**): Through its jurisdiction over interstate electric transmission, FERC has issued several orders and policies that establish the procedural requirements of the transmission planning process

- **Order 890:** Requires transmission owners to engage in transparent, public planning processes
- **Order 1000:** Requires transmission owners to collaboratively plan the transmission system with neighboring utilities and consider a wide range of technology options in the process
- **Docket RM21-17:** FERC has an active rulemaking to consider new requirements for long-term regional transmission plans, cost allocation, ownership, and other issues



FERC Order 1000 In Detail

- Order 1000 identifies three types of transmission system investments:
 - Reliability: Those identified during contingency analyses to ensure system reliability
 - Economic: Those that increase system efficiency and reduce system costs by reducing congestion on the system
 - Public Policy: Those that are necessary to comply with a state or federal policy (i.e. connecting new renewable generation to the grid)
- Order 1000 also establishes guidelines for how regional processes select projects and allocate their costs:
 - Regional transmission planning processes must evaluate, on a non-discriminatory basis, possible transmission solutions (and non-transmission alternatives)
 - The potential project must be more efficient or cost-effective compared to alternatives to address regional transmission needs
 - The region must have an established method to allocate the costs of the selected projects in a manner that is generally commensurate with the project's benefits subject to principles set forth in Order 1000

Equity Implications in Transmission Planning

In both how they are conducted and the conclusions that they reach, transmission planning processes have significant impacts on energy system equity. Some of these relationships are described below:

Recognition Impacts	Distributional Impacts	Procedural Impacts	Restorative Justice
<ul style="list-style-type: none">• Identification of how previous decisions have affected different groups	<ul style="list-style-type: none">• Contingency service prioritization• Customer rate impacts	<ul style="list-style-type: none">• Inclusion of affected populations in planning process• Intervenor funding	<ul style="list-style-type: none">• Thermal unit retirements• Infrastructure siting

Opportunities for Addressing Equity in the Transmission Planning Process

- **Recognition Opportunities**

- Physical Impact Analysis: In what ways have past transmission siting decisions created or perpetuated inequality amongst different groups? Who are those groups, and in what ways have they been affected? How are they treated differently with leasing and easement agreements?

- **Distributional Opportunities**

- Corrective Action Load Shedding: A common element of corrective action plans is the temporary interruption of service to groups of customers (load shedding) until the system can be rebalanced. What customers are being interrupted, and how are those decisions being made?
- Energy Burden Analysis: What impacts have past transmission planning outcomes had on customer rates? How much of a customer's bill is driven by transmission system costs? Have current cost allocation policies exacerbated underlying inequities?

Opportunities for Restorative Justice in Transmission Planning Processes

- **Procedural Opportunities**

- Representative Proceedings: Are affected groups represented in the planning process? Are training materials in place to develop their capacity to participate? Are sources of intervenor funding available to support groups unable to pay for representation?
- Integrated Planning Coordination: Can shifting from a regional to integrated planning approach create processes to reduce customer cost while increasing reliability and resiliency?

- **Restorative Opportunities**

- Thermal Generator Retirement: Where customers have historically borne an inequitable share of the health and economic impacts of being near thermal generation sources, can the planning process be used to identify investments that would facilitate retirement of those generators?
- Investment Selection Process: When studying corrective action alternatives, are their socioeconomic impacts considered?

Reading Material

- **Defining Energy Equity:**
<https://www.pnnl.gov/projects/energy-equity>
- **Energy Equity Metrics, 2021:**
https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-32179.pdf
- **Justice 40:**
<https://www.whitehouse.gov/omb/briefing-room/2021/12/02/delivering-on-justice40/>
- **The White House Fact Sheet:**
<https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/27/fact-sheet-president-biden-takes-executive-actions-to-tackle-the-climate-crisis-at-home-and-abroad-create-jobs-and-restore-scientific-integrity-across-federal-government/>
- **Initiative for Energy Justice:**
<https://iejusa.org/>
- **Edison Electric Institute (Transmission):**
<https://www.eei.org/issuesandpolicy/transmission/Pages/default.aspx>



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THANK YOU

