SERTP Order 1920 - Stakeholder Engagement

Long-Term Transmission Needs and Solutions

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Housekeeping

PARTICIPANTS

ATTENDANCE

PROTOCOLS

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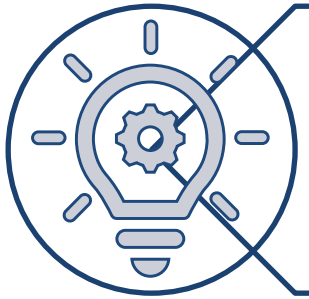
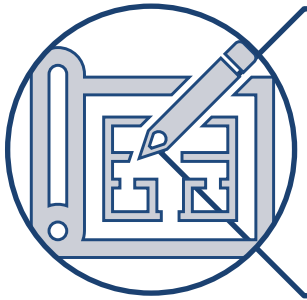
Opening Remarks and Agenda



FERC Order 1920

Long-Term Regional Transmission Planning



Long-Term Transmission Needs and Solutions

Future Stakeholder Engagement Events

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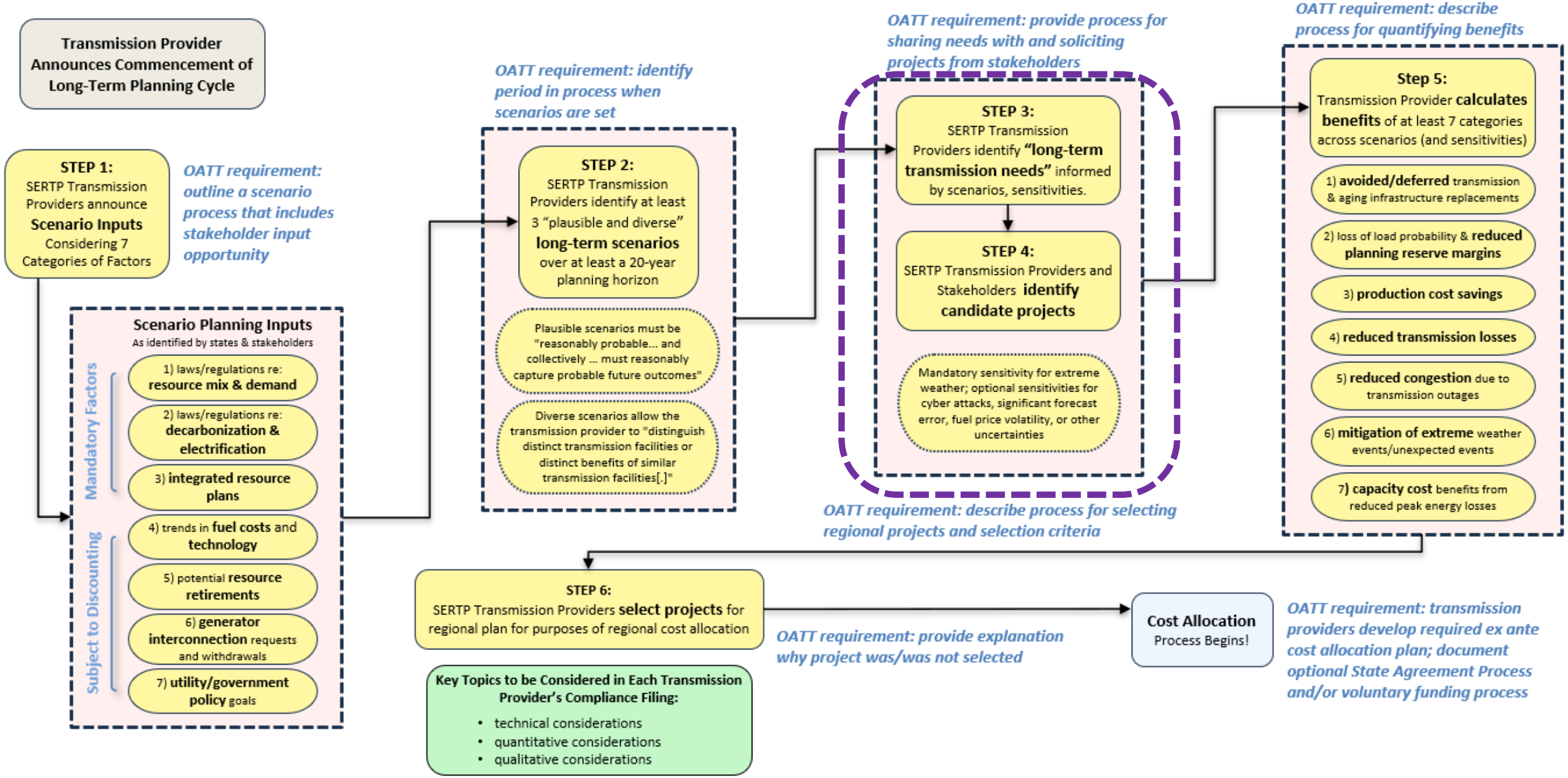
Acronym List

Acronyms used as part of this presentation

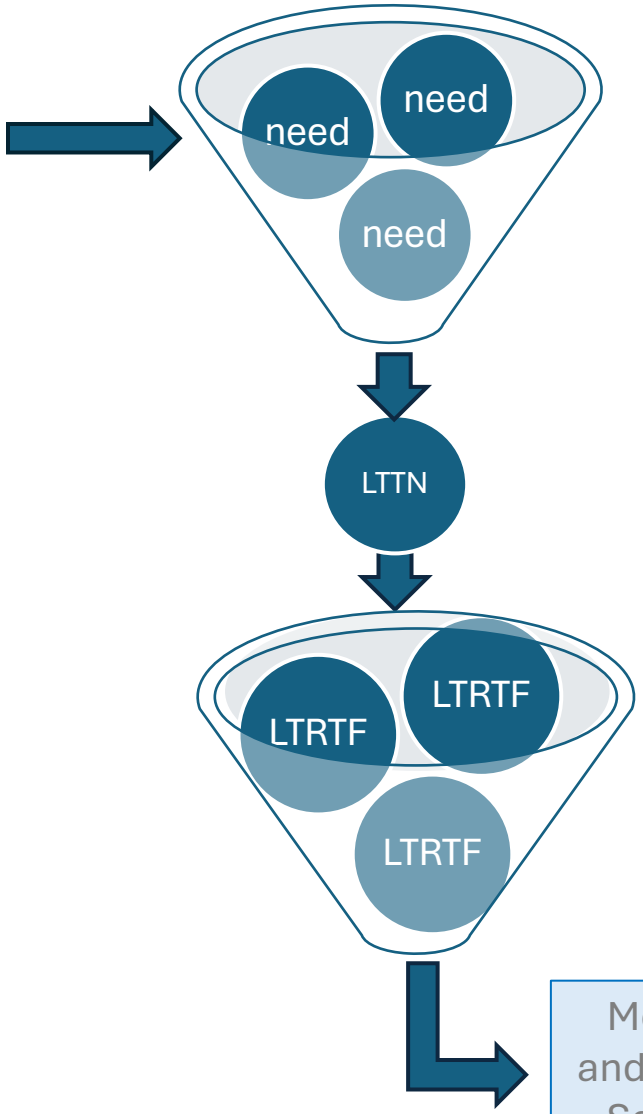
- LTRTP – Long-Term Regional Transmission Planning
- LTTN – Long-Term Transmission Needs
- LTRTF – Long-Term Regional Transmission Facility

LTRTP Overview



Identification of needs and solutions

Analysis performed on long-term scenarios and sensitivities to identify potential Long-Term Transmission Needs (LTTN)



Criteria to Determine the transmission needs that qualify as LTTN

Criteria to Determine LTRTF that qualify for further consideration

Measure Benefits and Apply Additional Selection Criteria

Decision Point to Select Or Not for Cost Allocation Purposes

Long-Term Transmission Needs (LTTN)

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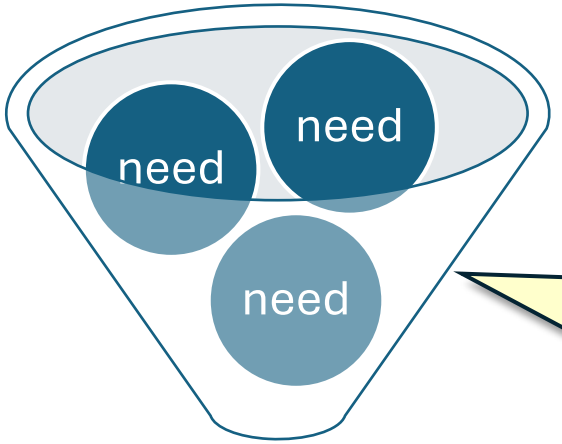
Identification of LTTN

Analysis performed on long-term scenarios and sensitivities to identify potential Long-Term Transmission Needs (LTTN)



Examples of “needs” include:

- Thermal constraints
- Voltage constraints
- Stability constraints

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How are “needs” determined?

- Transmission Planning analysis will be performed on the models that reflect the Scenarios / Sensitivities selected for the LTRTP cycle
  - Thermal and Voltage
  - Transfer Capability – Intra-regional and Inter-regional analysis
  - Short Circuit (as needed)
  - Stability analysis (as needed)

- This analysis will identify transmission constraints that will be used to determine LTTN for which LTRTF may be proposed to address.

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How are “needs” determined?

Power flow analysis will be performed for each scenario developed

- Thermal, Voltage & Transfer Capability analysis

- Monitored elements
  - All transmission facilities 100 kV and above within the SERTP plus tie lines will be monitored during the analysis for overloaded conditions.
  - This allows the SERTP to capture all potential constraints that could be resolved by an LTRTF.

How are “needs” determined?

Contingencies

- Individual transmission facilities internal to the SERTP operating at 138 kV and above will be modeled as a single contingency event,*
- Individual tie lines between sponsors and with the interregional seams (regardless of operating voltage) will be modeled as a single contingency event.*
- Sponsor selected multiple contingency events involving the loss of a generator unit followed by system adjustments and the loss of:
  - Another single generation unit,
  - Transmission circuit,
  - Transformer, or
  - Shunt device
- Any other contingencies determined to be necessary by each individual Sponsor will be included

* Only these single contingency events will be employed in intra-regional and inter-regional transfer capability analysis

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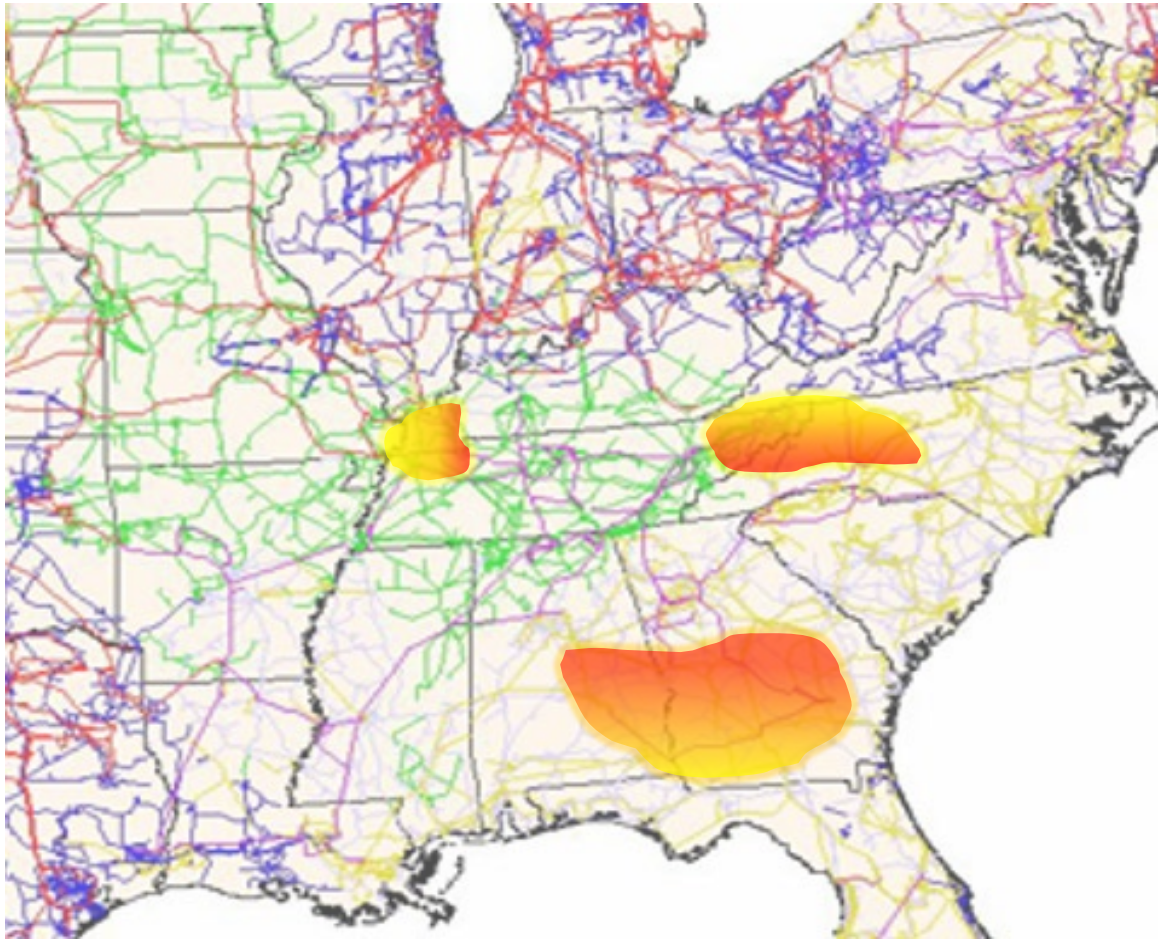
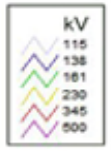
Illustrative example of transmission “needs”



United States transmission grid

Source: FEMA



Steady state analysis based on the assumptions of the scenario(s), identifies numerous needs in terms of thermal and voltage constraints under a variety of contingencies.

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Identification of LTTN

When identifying Long-Term Transmission Needs (LTTN), two conditions must be met:

The need must be regional in nature in that it affects more than one Sponsor in the SERTP.

Examples include, but are not limited to:

- Constraints occurring in multiple Sponsor balancing areas under the same contingency event,
- Constraint on one or more transmission tie line between sponsor regions, or
- An inability to meet firm commitments between Sponsors

The need must represent Significant Congestion

Transmission congestion is the condition where analysis indicates that transmission facilities (e.g., lines, transformers, terminal equipment) are in violation of individual Sponsor planning criteria, hindering the ability to deliver generation resources to load based on the scenario / sensitivity assumptions.

For the LTRTP process, only constraints involving multiple facilities operating at or above 161 kV will be considered Significant Congestion.

Illustrative example of LTTN

United States transmission grid
Source: FEMA

LTTN Requirement	Description
Regional in nature	A contingency on a 500 kV line causes constraints in both TVA and Duke Energy
Represents Significant Congestion	Multiple 230 and 161 kV lines result in thermal overloading

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Long-Term Regional Transmission Facilities (LTRTF)

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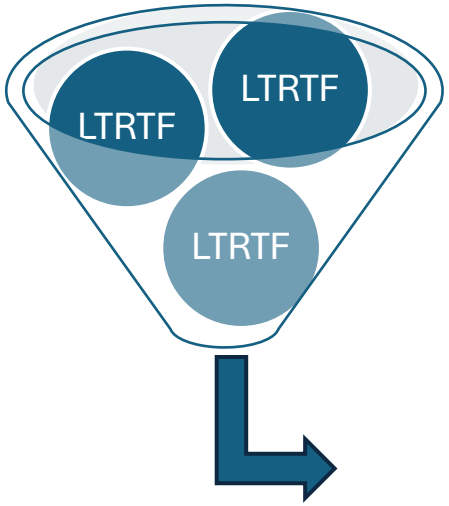
Long-Term Regional Transmission Facility



To qualify as an LTRTF, a proposed solution must:

- Operate at a voltage of **300 kV or higher**
- Be fully located **within** the SERTP region
- Be regional in nature in that it must be a transmission project effectuating significant bulk electric transfers across the SERTP and addressing significant electrical needs
- LTRTF must address an LTTN in the ‘base case’ scenario* + an LTTN in at least one other scenario/sensitivity.
- Be based on commercially available, proven technology that meets the requirements of any associated standard (e.g., IEEE).

* Order 1920 states that the “base case” scenario is the one considered most likely to occur

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Alternative Transmission Technologies

The following Alternative Transmission Technologies will be considered in determining potential solutions for each LTTN:

- Dynamic Line Ratings,
- Advanced Power Flow Control Devices,
- Advanced Conductors,
- Transmission Switching

Engineering judgement will be used to determine if the application of the Alternative Transmission Technologies is appropriate for the LTTN when evaluating new regional transmission facilities or upgrades to existing facilities.

General Description of LTRTF Assessment

- Candidate LTRTFs must meet the criteria on Slide 14
- Candidate LTRTFs will be assessed by placing into the Scenario models to determine if it favorably impacts an LTTN (in whole or in part) in the “base” scenario and one of the other scenarios.
  - If so, then the LTRTF will be tested in the Sensitivity cases developed for those same scenarios as a “stress test”
- If it is determined that the candidate LTRTF does favorably impact an LTTN, it will move forward in the evaluation process.

Example of Hypothetical Candidate LTRTF

United States transmission grid
Source: FEMA

Candidate LTRTF:
Antioch (Duke) – Sullivan (TVA) 500 kV TL

Distance: approx. 90 miles
Planning Level Cost Estimate: $500M

Favorably impacts many (but not all) constraints comprising the LTTN

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Stakeholder Recommendation for Candidate LTRTF

- Intake Forms will be made available for use in the submittal of LTRTF proposals by Stakeholders.
- Any stakeholder proposed transmission project to address an LTTN must meet the definition of an LTRTF and be materially different than other candidate LTRTFs addressing the same LTTN.
- Stakeholders submitting candidate LTRTFs must supply among other items, power flow analysis results indicating the LTTNs that are addressed and technical details (e.g., transmission line parameters) for submittals to be considered. The specific, required information will be detailed in the LTRTF Submittal Intake Form, which will be posted on the SERTP website.
- Stakeholders must provide modeling files (e.g., Python scripts, Read-Change files) to Sponsors which include the modeling parameters for any proposed LTRTF.
- In the event a Stakeholder submits an incomplete Intake Form, then following notification from the SERTP, the Stakeholder will have 15 calendar days to resubmit the necessary supporting documentation to remedy the identified deficiency.

Stakeholder Recommendation for Candidate LTRTF

- Cost Estimates will be required for each project submitted for evaluation.
- Any Stakeholder-recommended candidate LTRTF that meets the criteria described in Slide 14, will be assessed in the same manner as those candidate LTRTFs identified by Sponsors.
- The final list of LTRTFs determined to meet the identified LTTNs will move forward to the next stage of the process where benefits will be quantified.

Stakeholder Engagement Calendar

Tentative Schedule of Engagement Sessions*:

- Fall 2025: Project Evaluation and Selection Criteria
- Winter 2025/2026: Stakeholder Coordination Engagement Process
- Early Summer 2026: Near-Final Long-Term Regional Transmission Planning Process

* Meeting topics and timeframes subject to change

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