

White Paper

Long-term Transmission Planning Task Force Recommendations

February 13, 2025

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Executive Summary

The Long-treem Transmission Planning Task Force (LTPTF) was established in July 2023 to address the need for 20-year transmission studies, the need for which was confirmed in May 2024 when FERC issued its Order No. 1920. This white paper outlines the LTPTF's approach to developing long-term data-sets, modeling assumptions, and planning methodologies to support WECC stakeholders in meeting regulatory requirements and ensuring grid reliability.

WECC will produce a <u>Year-20</u> production cost model (PCM) data-set and a <u>Yyear-20</u> reference power flow case that extend beyond the current 10-year models, providing a standardized foundation for long-term planning. <u>These data sets will be used by transmission providers</u><u>ransmission providers</u> <u>will use these datasets</u> to identify major transmission projects, evaluate long-term system trends, and integrate resource and transmission planning processes.

A primary focus of the LTPTF is to ensure that long-term transmission planning accounts for evolving industry challenges, such as increasing electrification and the rapidly changing resource fleet. The framework outlined in this document provides guidance on load forecasting, generation assumptions, and transmission topology considerations, and ensuring a comprehensive and consistent approach to long-term planning.

To facilitate compliance with Order No. 1920, WECC will collect and validate data from member entities, ensuring that the <u>Year-20year-20</u> models reflect the best available information. The LTPTF recommends aligning the development of the <u>Year-20year-20</u> data-set with the existing four-year planning cycle to maintain consistency with regional and interregional planning processes.

This white paper serves as a foundational document for WECC's role in long-term transmission planning, supporting stakeholders in adapting to policy and other changes in their operating environment, while ensuring a reliable and resilient bulk power system.

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Introduction

The Long-<u>t</u>Term Transmission Planning Task Force (LTPTF) was established to address the increasing need for long-term transmission planning in response to regulatory changes, evolving industry structural changes ,changes, and grid reliability concerns.

This white paper outlines the LTPTF's framework and recommendations on how WECC can support <u>Y</u>year-20 planning efforts, in ways that leverages WECC's support of 1 to 10-year modeling efforts. By developing standardized <u>Year-20</u> production cost model (PCM) dataset and power flow case, this initiative seeks to provide transmission providers with a reliable foundation for identifying long-term infrastructure projects, analyzing system trends, and integrating resource planning. Additionally, the framework may enable others to perform scenario-based planning that accounts for expected technological advancements, increasing electrification, and state policies.

This document serves as a foundational guide for WECC stakeholders engaged in long-term planning efforts, offering structured methodologies and data requirements to support coordinated regional and interregional planning initiatives.

Background

In response to WECC leadership recognizing the need for <u>Year-20</u> interconnection-wide modeling datasets, the LTPTF was established in July 2023.

Subsequently, FERC <u>issued_Order No. 1920</u>, titled *Building for the Future Through Electric Regional Transmission Planning and Cost Allocation*, was issued that mandates long-<u>t</u>Term regional transmission planning (LTRTP), emphasizing scenario-based analysis and benefit assessments. The primary goal of <u>Year-20year-20</u> analysis is to examine bulk power system challenges, assuming that local issues will be addressed within the 10-year <u>time</u>-horizon._National and regional long-term planning efforts:

- FERC Order No. 19201-Establishes LTRTP requirements.
- PJM Interconnection²—_Implements scenario-based LTRTP.
- NERC's Interregional Transfer Capability Study³—___Assesses long-term system transfer needs.

³ ITCS Final Report, NERC, <u>https://www.nerc.com/pa/RAPA/Documents/ITCS Final Report.pdf</u>, November 2024



¹FERC Order 1920, FERC, <u>https://www.ferc.gov/media/e1-rm21-17-000</u>, May 13, 2024

² PJM To Move Forward With Long-Term Planning Scenarios, PJM, <u>https://insidelines.pjm.com/pjm-to-move-forward-with-long-term-planning-scenarios/</u>, June 27, 2024

- CAISO 20-Year Transmission Outlook^{4,5}—_Incorporates long-term planning in its 15-year case⁶.
- Connected West⁷ Initiative & WestTEC⁸—_Evaluate interregional transfer and transmission challenges in the West.

Use Cases for Western Interconnection Stakeholders

WECC will develop a PCM <u>dataset</u><u>data set</u> and power flow case for <u>use by</u>-transmission planning entities to use as a starting point for transmission planning studies in the long-term planning horizon. Since most <u>dataset</u><u>data</u> sets available today</u> generally extend up to 10 years into the future, <u>dataset</u><u>data</u> sets representing system topology and conditions <u>fu</u><u>a</u>rther into the future will be needed. Several potential use cases for the long-term (20+ year) <u>dataset</u><u>data</u> set have been identified. Some potential use cases are:

- Transmission planning entities to propose new major transmission projects: Due to the amount
 of-time it takes to build large transmission projects, they need to be identified and proposed
 many years in advance of before the project being is built. This datasetdata set could be used to
 conduct studies to understand and assess potential system reliability needs beyond the existing
 10-year datasetdata set. -With such information, project sponsors can therefore identify projects
 earlier to allow adequate time for studies to support the projects through project-approval and
 implementation to the in-service date.
- Transmission planning entities to develop longer views of system issues and trends that can <u>impact affect</u> the scopes for mitigations identified through conventional transmission planning processes: <u>u</u>Understanding how reliability needs and economic benefits evolve beyond the next

⁵ 2024 20-Year Transmission Outlook, California ISO

⁸ WESTERN TRANSMISSION EXPANSION COALITION, <u>https://www.westernpowerpool.org/about/programs/western-transmission-expansion-coalition</u>,



⁴ 20-Year Transmission Outlook, California ISO <u>https://stakeholdercenter.caiso.com/initiativedocuments/draft20-yeartransmissionoutlook.pdf</u>, January 31, 2022.

https://stakeholdercenter.caiso.com/InitiativeDocuments/2024-20-Year-Transmission-Outlook-Jul-31-2024.pdf, July 31, 2024.

⁶ 2024-2025 Transmission Planning Process Unified Planning Assumptions And Study Plan, California ISO <u>https://stakeholdercenter.caiso.com/InitiativeDocuments/Final-Study-Plan-2024-2025-Transmission-Planning-Process.pdf</u>, June 25, 2024

⁷ Connected West Exploring "Next Generation" Transmission Investments to Support a Clean, Electrified, and Reliable Western Grid Final Report, Gridworks, <u>https://gridworks.org/wp-content/uploads/2024/09/Connected-West-Final-Report-240918.pdf</u>, September 2024

10 years may help system operators, utilities, and developers to propose <u>right sizetailored</u> mitigations. Without a future map of needs and benefits, interim mitigations may be suboptimal and result in re-work projects or missed opportunity.

- 3. Transmission planning entities to meet FERC Order No. 1920 requirements: FERC Order No. 1920 requires transmission providers under FERC jurisdiction to conduct a 20+ year Long-term Regional Planning process. While the order includes many requirements on scenario development that are specific to the transmission provider, such as stakeholder outreach and feedback, these scenarios would presumably be built from the <u>Year-20 year 20</u>WECC models and <u>datasetdata sets</u>. The ability for WECC to gather data from its members and create base cases could provide significant value by <u>both</u>-building <u>a</u> 20-year power flow base case and <u>Year-20year 20</u> production cost model for transmission providers to start from and by establishing a consistent reference dataset from all WECC members with information that relevant to the requirements of FERC Order No. 1920.
- 4. Transmission planning entities explore technology needs: With planned retirements of conventional generators, increased electrification, more inverter-based resources, and introduction of other new devices, it is expected that the technology of the future Western Interconnection will behave differently than that of the past. A future <u>datasetdata set</u> may help understand what requirements are needed on these technologies (or what new technologies will likely be needed) to maintain overall grid reliability, such as the needs for frequency support or grid-forming inverters.
- 5. Resource planning entities and transmission planning entities can work together to iterate on the <u>IRP-integrated resource plan (IRP)</u> process. Plan the transmission system based on the resources, then look at how the transmission system will allow additional resources. Locate resources where expected transmission is available. Allow the results of the base model to inform future IRP development processes.

The type of analysis needed to identify long-term system deficiencies for use cases <u>1-31 through 3</u> is primarily steady state The analysis is expected to look at all equipment in service and high impact outage scenarios, such as EHV lines and transformers. Potential of use cases beyond steady_state analysis are out of scope: -the LTPTF decided <u>not</u> to not-consider dynamics because: -(1) the uncertainty on dynamic models is too great for a <u>Year-20year 20</u> case; and (2) the incremental work to create such a <u>datasetdata set</u> is significant. Therefore, a <u>datasetdata set</u> with enough detail to perform steady_state analysis was determined to be adequate for the purposes of long-term transmission planning. However, this decision does not preclude entities from using the <u>dataset_data set</u> to create dynamic models for their own studies.

Timeline

<u>The t</u>Fimeline is in the Excel file on the LTPTF team site:

https://collab.wecc.org/teams/LTPTF/Shared%20Documents/4%20year%20planning%20process.xlsx?d= wc4cc6cc0824442e0bcbfefcd4406d676

		VeerO	Year 1A, Even-Numbered Year, FERC			Year 2A, Odd-Numbered Year, FERC			Year 1B, FERC 1000				Year 2B, FERC 1000						
	1000 1000			1000				Year 3, FERC 1920				Year 4, FERC 1920							
			Q3/Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WECC	Data Submittal	Power Flow data	Year 1A 10-year PF Year 1 20-year PF	Year 1A L&R		Year 2A 10-year Submittal				Year 1B 10- year submittal				Year 2B 10- year submittal				Next Cycle 10-year data submittal	
	to WECC	Production Cost L&R data	Year 1A 10-year PCM Year 1 20-year PCM	(Due Mid February) includes year 20 forecasts															
	10-year Model	Power Flow	Year 1A 10-year PF available			Year 2A 10-year PF Available				Year 1B 10- year PF Available				Year 2B 10- year PF Available				10-year PF available	
		Production Cost Model				Year 1A 10-year PCM Available		Year 2A Update to Year1A 10- year PCM						Year 1B 10- year PCM available		Year 2B update to Year 1B 10- year PCM			
	20-year Model	Power Flow		10-year Year 1A case available to start building 20-year			20-year FERC 1920 Case Available												
		Production Cost Model									20-year PCM Available								
FERC	Order 1000			Regional Planning Data submittal window for 10- year data, Cycle A				Data Submittal Window for data updates to 10-year OrcleA			Final 10-year plan FERC 1000 for Occle A	Regional Planning Data Submittal Window for 10-year data, Oxcle B				Data Submittal Window for data updates to 10-year Oxcle B			Final FERC 1000 Plan for Orcle B
	Order 1920			Regional Planning Data submittal window for 20- year data			Scenarios Developed 20-year power flow case modificati ons/analys es start				20-year production cost modeling starts				Draft 20- year Plan				Final FERC 1920 20-year Plan

Two of the three Western Interconnection FERC Order No. 1₂000 planning regions have committed to performing the FERC Order No. 1920 analysis on a <u>four</u>4-year cycle. Given that year 1A will begin January 1, 2026, for the FERC Order No. 1000 process, the LTPTF recommends that the development FERC Order No. 1920 <u>datasetdata set</u> process be <u>aligned withgiven</u> the same start date.

Long-term Data

The availability of data for a long-<u>termtime</u> horizon <u>([beyondgreater than</u> 10 years]] is one of the substantial challenges the LTPTF has identified for building <u>Year-20year 20</u> models. These include behind_-the_-meter resources, generation interconnection and transmission service status, resource retirements, and all other considerations specified in the Order No. 1920. -The LTPTF has discussed the appropriate data sources for several types of data that will allow the creation of a long-term model. The LTPTF recommends that, to build a <u>Year-20year 20</u> PCM dataset and <u>Year-20year 20</u> power flow case, the <u>Y</u>year-10 Anchor Data Set (ADS) and <u>Y</u>year-10 heavy summer planning case will be the best starting points. -The following data sources would be used to build the <u>Year-20year 20</u> ADS PCM dataset and power flow case.

Commented [CC1]: "Dataset" should be one word. We keep it as two words in "Anchor Data Set" because the mistake was codified several years ago and it is too far gone to correct.





Load Assumptions

The LTPTF has determined the best source of the load forecasts and assumptions are-is_the load serving entities. Based on information provided to the LTPTF₄ most load serving entities create a <u>Year-20year-</u>20 outlook for load₄ and that information is the best information available. The expectation would be to provide the <u>Year-20year-20</u> 1-in-2 forecast for peak load and energy via the L&R submittal process for the PCM dataset and submit an expected <u>Year-20year-20</u> heavy summer 1-in-2 load profile in the power flow case. Because this dataset <u>needs tomust</u> represent all systems in the <u>WECCWestern</u> <u>Interconnection</u>, since not all systems would peak at the same time, <u>the</u> 1-in-2 forecast for peak load would be the most appropriate for the starting case. -As required in Or<u>der</u>- 1920, a full_-year 8,760 hourly load profile will be needed to create production cost models.—<u>I</u> In addition, the LTPTF understands that some entities would forecast their loads with transmission losses included as an assumption, others would forecast approach is to be provided with the load forecast, so that the data can be correctly understood and used in the base case development. If an organization does not forecast out to 20 years, an approximation will be made based on the data they provide through the loads and resources.

The LTPTF also recommends that we request other load forecasts to be made available; in addition to the 1_-in_-2 load forecast to be used in the base case. To support individual entities who would need to develop power flow cases to study their own and surrounding transmission systems, the LTPTF recommends that the data requests for both PCM and power flow should-include 1-in-5 and 1-in-10 as well. WECC is developing a Year-20year 20 base case. –The development of any additional scenario cases will be done-developed by others.

The data should include specific forecast assumptions on behind-the-meter categories, including installed distributed generation and/or energy storage, output at peak for distributed generation and/or energy storage, demand side management, energy efficiency, transportation electrification, and building electrification. Several Factor Categories in FERC Order No. 1920, in particular Factor

Categories Two⁹, Three¹⁰, and Four¹¹, specifically reference the impact of these categories on demand and on long-<u>t</u>Term transmission <u>n</u>Needs. Assumptions on new large loads, such as data centers, should also be included. Load data could be submitted <u>as-in</u> a table format with both the overall peak load forecast and the specific breakout by category.

- 1. Data submitters should provide their <u>Year-20</u> load forecast to WECC as follows:
 - a. For power flow base case, a 1-in-2 peak load for all entities will be submitted as part of the WECC base case building process.—, Data submitters who do not submit a <u>Year-20year 20</u> forecast will incur the risk of not having their specific data represented by the <u>Year-20year 20</u> model building team.—<u>In the eventIf the Year-20year 20</u> load forecasts is not readily <u>availableavailable</u>, the data submitter should determine a scaling factor and apply it to the <u>Yyear-10</u> forecast. If available, <u>the data submitter should also submit</u> forecasts of 1-in-5 and 1-in_10 peak load forecast. -This will be needed to support individual entities that need to study peak load conditions in their system and surrounding systems.

 - c. All data submittals will include documentation with descriptions of the following:
 - i. Whether the load forecasts include assumed transmission losses.__If so, the magnitude of the transmission losses included.__This information is needed to ensure accuracy in the load modeled in the base case.
 - Disaggregated behind-the-meter assumed amount (as load modifiers) of installed distributed generation and energy storage, output of distributed generation based on the hour being used in the power flow data, energy storage, demand

¹¹ FERC 1920 458: "...we clarify that trends in fuel costs and in the cost, performance, and availability of generation, storage, and building and transportation electrification technologies may include, but are not limited to, cost and technology trends for: utility-scale generation construction costs for different generating technologies; distributed energy resources; storage technologies with differing duration limitations; carbon capture and sequestration; small modular nuclear; light-, medium-, and heavy-duty electric vehicles and electric vehicle supply equipment; and ground- and air-source heat pumps."



⁹ FERC 1920 440: "We clarify that this category of factors includes legally binding obligations, incentives, and/or restrictions that affect long-term transmission <u>n</u>Needs in different ways than Factor Category One, for example, by limiting the carbon intensity of electricity generation or electrifying energy end uses and thereby significantly increasing electricity use in certain sectors of the economy, such as transportation and building heating and cooling."

¹⁰ FERC 1920 447: "Further, incorporation of Factor Category Three into Long-Term Scenarios will ensure that transmission providers properly account for resource planning and anticipated changes to demand, including increased integration of distributed energy resources."

side management, energy efficiency, transportation electrification, and building electrification, contact person

iii. Any load assumptions, that are not included in the 10-year case. This information will help entities needing to develop scenario cases for their own compliance submission and studies.

Generation Assumptions

LTPTF recommends that WECC adopt the following philosophy with regard to resource placement: Data submitters are expected to submit complete and detailed data submissions, and submissions and acknowledge that they have the authority and responsibility of providing the location of generating resources. Data submitters will supply balanced load and resource portfolios for a Year-20year 20 future.-__Resource placement will happen solely at the discretion of the data submitter providing the Year-20year 20 forecasts. Data Submitter will use the NERC Codes for generation additions. Data Submitter will place all resources on buses specific to the seed base case being utilized for the Year-20year 20 case build. Data submitter shall include all necessary considerations in alignment with their resource planning, per Order No. 1920.-__These considerations include behind the meter resources, generation interconnection and transmission service status, resource retirements, or other considerations specified in the Order. Any resource placement should be guided by the Data Preparation Manual. The data submitter will be responsible for correcting any mapping issues with submitted data.-__

Transmission Topology Assumptions

Transmission assumptions for the produced <u>dataset</u>data sets will need to align with the modeling requirements detailed in FERC Or<u>der No.</u>, 1920, and as such, the data submitters must use "best available data inputs" that are developed from best practices to produce reasonably probable and plausible scenarios. It should be noted that the process data submitters will be using to produce "best available data inputs" must incorporate the input on stakeholders and prior 1920 studies.

To aid in developing <u>dataset</u>data sets with "best available data inputs" topology the LTPTF recommends the following:

Prior Power Flow Case and Production Cost Model Dataset Data Set Building:

Work with data submitters and with either WECC or regional entities to develop a standard of
project inclusion.—...This will provide clarity to transmission developers on the requirements for
projects to be included in the <u>dataset</u><u>data sets.</u>...<u>s.</u>

• Potential Criteria Elements:

 Project description, kV, length, type of conductor, route, points of interconnection with the transmission system, etc., project data in the format suitable for inclusion in WECC base case models.



- DOE Project list.
- Path Rating Process Progress.
- Path Rating Catalog.
- WestTEC study inclusion.
 - Identified or considered in any Regional Transmission Plan.
 - Identified in a Local Transmission Plan.
 - If available, Project study reports with information similar to WECC Comprehensive Progress Report.
- Provide a submittal window for transmission developers to submit topology projects for consideration. LTPTF is recommending that the review and inclusion of projects not provided by Data Maintainers in the standard SRS base case building process is done outside the SRS base case build of the <u>Year-20year-20</u> base case, but with the help of SRS-__Transmission providers in the impacted area of submitted projects should be part of the review and inclusion process.-__
- Projects should be limited to higher voltage levels (~200 kV+).
- Time should be provided for evaluation of the projects and opportunity for submitters to correct any inclusion criteria data deficiencies_
- WECC will document the submitted projects and their status with the elements of the inclusion criteria.

As Part of the Year-20 year-20 Datas-Set Building:

- Utilize the most recent <u>Y</u>ear-10 WECC produced planning case(s) as a starting point for the <u>Year-20year-20 dataset</u>data sets builds.
 - Request from the data submitters a list of all high voltage (~200 kV+) topology projects that were included in the <u>Y</u>year-10 case and would inherently be contained within the commensurate <u>Year-20year-20 dataset</u>.data set
- Request from the transmission providers, as part of their data submittals for the <u>Year-20year-20</u> <u>datasetdata sets</u>, a list of all high voltage (~200 kV+) topology projects that were included in the <u>Year-20year-20</u> <u>datasetdata set</u> builds and the status of the projects.

Data submitters will document the submitted projects and their status with the elements of the inclusion criteria.

Data Submission

The LTPTF determined that the current WECC data collection practices are adequate, provided the timelines are extended to include a $\underline{\text{Year-20}}_{\text{year-20}}$ future.



Tools and Software

No new tools or software are needed to develop $\underline{\text{Year-20}}$ cases.—. The techniques build on the $\underline{\text{Yy}}$ ear-10 cases.

LTPTF Task Force Members

Name	Organization	Role
Auld-Hill, Allison	Southern California Edison Company	Co-Chair
Augustin, Philip	Salt River Project	Member
Cardoza, Lorissa	Bonneville Power Administration – Transmission	Member
Davies, Enoch	WECC	Staff Liaison
Dorland, Kanya	California Public Utilities Commission	Member
Dobson-Mack, Gordon	Powerex, Inc.	Member
Galaway, Jennifer	Portland General Electric Company	Co-Chair
Garcia, Miguel	Sacramento Municipal Utility District	Member
Gopi, Biju	California Independent System Operator	Member
Gross, John	Avista Corporation	Member
Harris, Gerald	Quantum Planning Group	Member
Loomis, Chelsea	Western Power Pool	Member
Marrs, Richard	Quantum Planning Group	Member
Olson, Erik	PUGET SOUND ENERGY	Member
Richardson, Jacob	Western Resource Advocates	Member
Thomas, Chifong	Thomas Grid Advisor	Member
Tilghman, Henry	Tilghman and Associates	Member
Van Uytven, Guy	Guy Van Uytven	Member
Young, Jonathan	Bonneville Power Administration – Transmission	Member

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Mackin, Peter	Qualus	Active Participant
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Approving Committee, Entity, or Person	Approval Date	
Long-term Transmission Planning Task Force	February 13, 2025	 Formatted: Font: +Body (Palatino Linotype)
Reliability Assessment Committee	February- YY, 2025	 Formatted: Font: +Body (Palatino Linotype)

WECC receives data used in its analyses from a wide variety of sources. WECC strives to source its data from reliable entities and undertakes reasonable efforts to validate the accuracy of the data used. WECC believes the data contained herein and used in its analyses is accurate and reliable. However, WECC disclaims any and all representations, guarantees, warranties, and liability for the information contained herein and any use thereof. Persons who use and rely on the information contained herein do so at their own risk.

Long-term Transmission Planning Task ForceAppendix A

Appendix A: Year-20 Data Submission Checklist

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•	Required Load Data:	Formatted: Font: +Body (Palatino Linotype)
	 1-in-2 peak load and energy forecast. 	
	 Transmission loss assumptions. 	
	 Behind-the-meter generation/storage assumptions. 	
	 Load modifiers (e.g., energy efficiency, electrification trends). 	
•	Optional Load Data:	
	◦ 8760 hourly load profiles.	
	 1-in-5 and 1-in-10 peak load forecasts. 	
	 Large industrial load growth projections (e.g., data centers). 	
•	Required Generation Data:	
	 Balanced <u>Year-20</u> resource portfolios. 	Formatted: Font: +Body (Palatino Linotype)
	• Resource retirements.	
	 New interconnections and transmission service requests. 	
	 Behind-the-meter generation details. 	
•	Required Transmission Data:	
	• Transmission topology assumptions and modifications for High-voltage (200 kV+)	Formatted: Font: +Body (Palatino Linotype)
	transmission projects.	
	 Project status—-{what processes has the project completed to date?} 	
	• Word description of the topology changes (major transmission projects) between the	
	Y y ear-10 case and the <u>Year-20</u> year-20 case.	Formatted: Font: +Body (Palatino Linotype)

Long-term Transmission Planning Task Force Appendix B

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Long-term Transmission Planning Task ForceAppendix B

Appendix B: Year-20 Data Submission Guidelines

The following should be considered when preparing the <u>Year-20year 20</u> data submission:

- Coordinate with your ownership partner(s) regarding all shared ownership of <u>Year-20year-20</u> resources additions and/or retirements or transmission projects.
- Conform to all federal, <u>federally recognized federally recognized</u> Tribal, state, and local laws and regulations affecting the resource mix and demand.;
- 3. Conform to all federal, federally_recognized Tribal, state, and local laws and regulations on decarbonization and electrification_?
- 4. Include approved integrated resource plans and expected supply obligations.
- 5. Include trends in fuel costs and in the cost, performance, and availability of generation, electric storage resources, and building and transportation electrification technologies.
- Consider whether resource retirements are consistent with internal expectations for a <u>Year-</u> <u>20year 20</u> resource fleet.;
- 7. Consider generation interconnection requests and withdrawals
- Conform the utility or corporate commitments to federal, <u>federally recognized federally</u> <u>recognized</u> Tribal, state, and local policy goals that affect <u>l</u>Long-<u>t</u>Ferm <u>t</u>Transmission <u>n</u>Needs.;
- 9. Reflect any resources that have signed LGIA and transmission service agreements.

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