Comments: Long-term Transmission Planning

Question 1: The draft paper highlights a number of considerations for long-term transmission planning in the Western Interconnection. Are there any considerations missing?

	WECC Response
Gerald Harris (Quantum Planning Group, Inc.): Yes, the paper does not adequately address the use of planning scenarios (once developed) in making capital allocation or project selection. A full reading of the MISO MVP process indicates how the scenarios were used to make project recommendation to regulators who then had to make final approval decisions. Properly used scenarios can show both robust project selections (work reasonably in all scenarios) and contingent project selections (work in a limited number of scenarios). Also, scenarios can be used to create early indicators which can be used to add resilience to project planning so that contingent projects can be moved on quickly under the right conditions. Regulator, project developers and transmission utilities can all be involved in this 'use of the scenarios" process.	Project selection and capital allocation is the responsibility of respective Transmission Planners, Planning Coordinators and Regional Planning Groups. WECC intends to identify risks and opportunities for respective entities to take further action.
Guy Van Uytven (Guy Van Uytven Consultant Inc.): see item 8.	
Allison Auld-Hill (Southern California Edison): No	
David Wiley (Arizona Public Service Company): APS has not identified any missing considerations at this time. However, we believe that the considerations included are broad enough that the draft paper leaves room for modifications in the future.	
Henry Tilghman (NIPPC): The paper does not acknowledge that FERC's NOPR assigns the primary role to conduct 20-year scenario planning to regional planning organizations. WECC and its committees should ensure that any new responsibilities they undertake with regard to planning on a 20-year horizon support—and do not attempt to duplicate—work by regional planning entities.	WECC agrees with the comment. WECC does not intend to duplicate efforts. Rather the intent is to support planning entities with the datasets and/or analysis that will provide value.
Michael Watkins (Seattle City Light): City Light recommends the paper further explore the benefits of "no regrets" approach to providing solutions to a probabilistic transmission planning. City Light additionally recommends WECC to develop a Transmission Planning Guide to aid entities in addressing each of the topics and issues addressed in the FERC NOPR. The white paper addresses them in a general discussion fashion but falls short of making specific recommendations or guidance.	The intent with this transmission planning paper was to touch on each of the pertinent items at a high level and then drill down further in the future with support from a taskforce under RAC.

Richard Marrs (Quantum Planning Group): There probably are and they will become apparent during the Task Force's work as a more diverse group pf people become involved. This almost always happens when the knowledge base and experience focusing on the work become larger and denser.

Kanya T. Dorland (Cal Advocates Office): The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) provides these comments on the Western Electricity Coordinating Council's (WECC) Reliability Assessment Committee (RAC) draft Long-Term Transmission Planning in the West report (WECC Report). Cal Advocates is an independent consumer advocate with a mandate to obtain the lowest possible rates for utility services, consistent with reliable and safe service levels, and the state's environmental goals.

What is Missing?

Greater Coordination Between Western Planning Regions

The CAISO and Cal Advocates are in agreement that FERC Order No. 1000 did not provide a framework for engaging in meaningful discussions on interregional transmission projects benefits and decisions on cost allocation and joint projects. In the western planning regions' coordination meetings, there should be discussions focused on whether there are transmission solutions that would benefit more than one region other than considering the projects developers submit for consideration. There also should be discussions on whether a proposed interregional transmission project could provide a higher value to the Western Interconnection if the proposed project had a different transmission capacity, alignment, or on-line date.

Cal Advocates recommends that WECC or another neutral entity facilitate discussions between the transmission planners at the CAISO, NorthernGrid, and WestConnect on transmission projects that could benefit more than one region. WECC is well-positioned to facilitate such discussions. Discussions could cover, for example, the costs and benefits of a joint offshore wind grid for Oregon and California. Cal Advocates recommends that WECC or another neutral entity assist with developing the western planning regions' transmission planning coordination framework to guide discussions on needed solutions to meet the Western Interconnection's future needs and joint transmission projects.

At a minimum, Cal Advocates agrees that WECC should play a role in ensuring data consistency and standard processes for modeling future trends.

WECC agrees.

Common Set of Benefits

The transmission planning NOPR also suggested benefits that should be considered for transmission project evaluation. Cal Advocates recommends that transmission providers in the Western Interconnection use a common set of benefits to evaluate interregional transmission projects. This common set of benefits should focus on common reliability and resiliency benefits to achieve broad agreement.

Cal Advocates agrees with the WECC that "new transmission is beneficial in two ways—it provides the needed mechanism to transport energy from the new resources, and it enhances the grid against the impacts of extreme weather." Extreme events (extreme heat and cold and wildfires) are becoming more frequent and their effects on demand and resources are significant. Thus, the resiliency capacity that transmission can provide to respond to extreme events should be more highly valued.

Cal Advocates recommends the following common set of benefits for transmission project selection and cost allocation:

1. Avoided or deferred reliability transmission projects and aging infrastructure replacement;
2. Reduced loss of load probability or reduced planning reserve margin (demonstrated resource adequacy benefit);
3. Reduced transmission energy losses;
4. Reduced congestion due to transmission outages;
5. Increased transfer capacity to mitigate extreme events, system contingencies, as well as weather or load uncertainties.

Cal Advocates also recommends that the quantification methods for these benefits be consistent across the Western Interconnection. Planning regions should be allowed to develop their own calculation methodology to determine regional reserve, transfer capacity, and resiliency needs. However, WECC should review and approve these calculations.

WECC intends to support transmission planning while at the same time allowing regional planning groups, transmission planners, and planning coordinators to perform their functions.

Ken Wilson (Western Resource Advocates): FERC generally focusses on regions that already have comprehensive RTOs. The FERC NOPR on transmission planning is no exception. The West, except for California (which does a creditable job of transmission planning and is not considered here), does not have an RTO. While, in general, RTO regions have been very deficient in Order 1000 interregional transmission planning, in the West, there has been virtually no interregional transmission planning. The regional and sub-regional planning groups meet regularly to coordinate transmission plans made by each utility, but these reviews merely verify the accuracy of safety and reliability assessments done by the utilities. There is no overall plan for the region that could look for efficiencies over multiple Transmission Owners. In short, the Western Interconnection is deficient in FERC Order 1000 regional or even interstate transmission planning. Utilities have focused on intrastate transmission and the two planning entities, WestConnect and Northern Grid, are exclusively focused on assuring that new transmission projects in their regions meet NERC standards through upgrades or reliability driven needs. FERC should require WestConnect and Northern Grid to engage in real interstate, regional and interregional transmission planning. Without strict requirements, we fear that it will be business as usual for the next decade.

This will be problematic for grid reliability, economic efficiency, and the transformation to clean generation. The WECC comments currently do not recognize or address these specific issues and should do so.

WECC's intent with this paper is to provide support to planning entities within the established planning functional constructs. The issues mentioned are pertinent, however WECC believes they are outside the strict reliability mandate of WECC.

Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): BPA has commented on the paper itself and will submit separately to accompany our comments.
Comment highlights are:

1. Page 3—Need to add government policy as a key input of scenario development
2. Page 5—Under Planning Mindset Shift—DER and EE should be considered now in long term transmission planning. In addition, the consideration of size and location of renewable resources should also be included.

Noted.

Noted.

Question 2: Does the draft paper adequately capture the challenges associated with long-term transmission planning? If not, what is missing?

Gerald Harris (Quantum Planning Group, Inc.): Yes, this is done very well. What may help in explaining this more is to discuss the current state of the market in various places where there is more generation being built and proposed than can be quickly connected to the grid. There is a crisis here and it may generate some unexpected developments at the distribution grid level.

The focus of this paper was to highlight considerations for long-term (>20 year) planning. As datasets are developed for the long-term planning time horizon, regions of the system with significant generation development potential will need to be considered as part of scenario development.

Guy Van Uytven (Guy Van Uytven Consultant Inc.): There should be a discussion on the need to concentrate potential renewable energy potential locations in order to facilitate the transmission to load centres. Also, do not restrict yourselves to the U.S. BC and Alberta are also part of WECC.

The focus of this paper was to highlight considerations for long-term (>20 year) planning. As datasets are developed for the long-term planning time horizon, regions of the system with significant generation development potential will need to be considered as part of scenario development.

Allison Auld-Hill (Southern California Edison): Yes.

David Wiley (Arizona Public Service Company): APS agrees that given the uncertainty in a single assumption or base case, multiple scenarios should be developed by WECC to improve the chances of selecting a portfolio of solutions of "least regret."

Henry Tilghman (NIPPC): In many ways the paper may overstate the challenges associated with long-term transmission planning. The individual particular drivers of load growth (i.e., increased temperature extremes v. electrification) are less important for transmission planning than the overall forecasts for peak load, planning reserve margin, and annual energy (that incorporate those drivers).

Not fully captured in the paper, however, is the challenge associated with forecasting resources on the 20-year horizon, which can impact peaks, and how the transmission system will be used. Generation resource additions will largely be driven by public policy choices made by each state. NIPPC encourages WECC and the RAC to remember that FERC does not intend that the 20-year planning process will yield an actionable construction plan which requires cost allocation. Rather the purpose of studying a 20-year time horizon is to provide insights into plausible future scenarios that will in turn inform regulators and utility procurement processes on future resource development and transmission needs.

WECC agrees with the commenter on the implications of FERC NOPR if a final rule was to come to pass as proposed. The focus of this paper was to highlight considerations for the long-term (>20 year) planning. As datasets are developed for the long-term planning time horizon, regions of the system with significant generation development potential will need to be considered as part of scenario development.

Michael Watkins (Seattle City Light): The draft paper does not adequately address the challenge of the regulatory requirement differences between public and non-public entities. Additionally, the draft paper does not address the challenges for entities whose system resides in multiple state jurisdictions.

WECC agrees that there are challenges with jurisdictional issues. However, those challenges are related to business challenges and not necessarily technical challenges with planning for transmission. The focus of this paper was to identify technical challenges associated with long-term planning.

Richard Marrs (Quantum Planning Group): The biggest missing in the paper and discussion far is the critical differentiation between scenarios and sensitivity/study cases. The term scenario and the process as used in the draft NOPR is not a suite of sensitivity studies (these terms are used interchangeably when they are not interchangeable). The scenario described in the NOPR are traditional multiple key driver multi-variable narrative scenarios, and not single variable sensitivity/study cases. Once the scenarios are developed and modeled, then and only then should sensitivity studies be done. This is the process WECC has used for the past 12 years.

WECC agrees that there is a difference between scenarios and sensitivities. The paper did not intend to define either terms. WECC will work with stakeholders to create scenarios that are specifically designed to help entities involved in making transmission planning decisions and are used in their transmission planning processes.

Kanya T. Dorland (Cal Advocates Office): *Four Long-Term Scenarios*: Cal Advocates supports a scenario-based approach to long-term transmission planning. Cal Advocates agrees with the American Clean Power Association, Clean Grid Alliance and WECC that this approach allows for the identification of solutions that are least regrets given future uncertainty. Cal Advocates also agrees that transmission providers should be required to develop three to four plausible and diverse long-term scenarios for the following reasons:

- First, one significant transmission planning challenge is the uncertainty around load demand forecasts. In California, the California Energy Commission develops low, medium, and high load forecasts, which now account for expected increases in peak demand with electric vehicle (EV) adoption. To address the challenge of load uncertainty, Cal Advocates supports the Midcontinent Independent System Operator's (MISO) long-term planning approach. This approach involves developing scenarios that serve as bookends of uncertain futures and then performing robustness tests to determine the system responses to these scenarios under various system conditions.
- Second, Cal Advocates agrees with the WECC that long-term forecasts should consider the impact of energy efficiency. Cal Advocates recommends that long-term scenarios also consider and compare the impact of greater demand response programs and new technologies, such as solar-plus-storage, long-duration storage, and off-shore wind.

Noted. As long-term planning datasets are developed, WECC will discuss with stakeholders how to best incorporate energy efficiency and demand response assumptions into the datasets.

Ken Wilson (Western Resource Advocates): The draft paper adequately captures the general challenges associated with long-term transmission planning. However, it does not capture the unique challenges in the West. Some of these challenges are listed in the comments to question 4 above. Beyond those concerns, the West has additional specific challenges that need to be addressed. First, with no RTO, there is no cost allocation or cost allocation process for new transmission lines that would cross state boundaries, except for the PacifiCorp system. While cost allocation is not within WECC's purview, the WECC comments should clearly state that the lack of cost allocation between states is a stumbling block for regional transmission planning. Second, there is no comprehensive approval process for new transmission that would cross state lines. New interstate transmission would need approval in multiple states, with any state potentially blocking approval of the whole line. Third, individual utilities are not required by any entity to do detailed 20-year transmission planning within their service area or connecting to other utilities in the BA or outside of the BA. Much less interstate, intraregional, or interregional planning. The WECC comments should cover these issues in detail and the significance of how the Anchor Data Set could be leveraged more effectively.

WECC agrees with the commenter and WECC has covered these challenges in detail in the following paper 'Transmission Planning in the West - Challenges and Opportunities" located in the December 2022 board book at: 2022 December Board Book.pdf (wecc.org)

Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): Comments added to the WECC paper.

- Page 6—Study Approaches—Using solely power flow analysis and equipment failure rates for long term planning is not sufficient. Probabilistic transmission planning should include other factors as discussed previously in the paper.

WECC agrees.

Question 3: The RAC will be creating a task force to advance this work. Are you interested in being a member of that task force?

Gerald Harris (Quantum Planning Group, Inc.): Yes
Guy Van Uytven (Guy Van Uytven Consultant Inc.): Yes
Allison Auld-Hill (Southern California Edison): Yes
David Wiley (Arizona Public Service Company): No
Henry Tilghman (NIPPC): Yes
Michael Watkins (Seattle City Light): No
Richard Marrs (Quantum Planning Group): Yes
Kanya T. Dorland (Cal Advocates Office): Cal Advocates is interested in becoming a member of WECC's long-term planning task force.
Ken Wilson (Western Resource Advocates): Yes—Ken Wilson (backup—Vijay Satyal)
Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): Yes

Question 4: Does the draft paper's discussion of modeling and assumptions adequately cover these considerations? If not, what is missing?

Gerald Harris (Quantum Planning Group, Inc.): Yes. New modeling tools will be developed that might help in the future.

Development of the modeling tools will be discussed as datasets are developed.

Guy Van Uytven (Guy Van Uytven Consultant Inc.): Modeling implies knowledge of generating sites and transmission links. Before modeling we need to determine where these generating sites and transmission links will be located. (see item 8).

Agreed.

Allison Auld-Hill (Southern California Edison): Yes

David Wiley (Arizona Public Service Company): APS believes that more discussion about the zonal modeling approach would be beneficial to the interconnection as this is a new approach for WECC.

Agreed.

Henry Tilghman (NIPPC): The paper does not address the policy assumptions that would be needed to conduct 20-year planning. NIPPC suggests, as an initial response, that the RAC may not be best suited to develop this expertise internally. Rather WECC is well suited to provide planning entities with data for 20-year studies that can be incorporated into scenarios designed to meet the differing policy regimes of each transmission planning entity.

WECC staff will work with RAC stakeholders to develop the approach needed to create the required datasets. The actual datasets will be developed by WECC.

Michael Watkins (Seattle City Light): The draft paper's discussion of modeling and assumptions essentially provides an overview of the range of ways entities approach modeling and assumptions. What is missing is a recommendation for a regional guideline that suggests principles for choosing when and where in system modeling to use a granular bus-breaker models instead of nodal models.

As WECC discusses the approaches for long-term planning, WECC intends to discuss with stakeholders on possible approaches for the development of datasets.

Richard Marrs (Quantum Planning Group): NO. One of the most compelling issues is the data needed to support the multiple variables and the desired metrics for modeling. The data will have to be created and can be thought of as speculative. There will not be a single source of "already created data" ready for WECC (or any other planning group) to simply plug and play. Consider three types of data - past tense data, present tense data, and future tense data - long term planning of any type requires future tense data created by extrapolation from present tense data and modified through thoughtful consideration of the 20-year future narrative. Past tense data does not well serve an environment changing as fast as the current operating environment of the power system. This process has worked well in creating and modeling WECC's past scenarios.

WECC agrees with the commenter. Going forward WECC intends to create scenarios that will be well suited for actual transmission planning work used by entities involved in transmission planning.

Kanya T. Dorland (Cal Advocates Office): At this time, Cal Advocates does not have any comments on this issue.

Ken Wilson (Western Resource Advocates): WECC needs the ability to use several different modeling tools. Grid View is an adequate tool for to fill some modeling needs, but as we discovered during the analysis of long duration storage, it has some limitations. Plexos should be evaluated as a modeling tool with perhaps more flexibility. Key assumptions are very important in long term modeling. Load, weather extremes, generation mix and other factors must be practically considered. The draft comments raise good questions and concerns.

WECC agrees with the commenter that as long-term datasets are developed, discussions around the appropriate tools will need to occur and if necessarily tools other than GridView may need to be considered.

This section of the paper could list more explicit assumption domains that are being considered in the 20-year extreme event analysis that is underway at WECC. The teams working on those studies have had extensive discussions on assumptions that would give more detail on this section.

WECC agrees with the commenter. WECC intends to share the lessons learned with the development of 20-year datasets and build on these lessons as future discussions occur.

Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): Comments added to the WECC paper.

- Page 11—The resource assumptions are very important in terms of size, location and factors affecting their development. L&R data for the ADS data process should document the assumptions used.

WECC agrees that there is a need to better understand the assumptions used in L&R data.

Question 5: What long-term planning datasets and assessments could WECC create that would be valuable to your organization?

Gerald Harris (Quantum Planning Group, Inc.): NA (We do not own any assets).

Guy Van Uytven (Guy Van Uytven Consultant Inc.): I am a one-man organization. Just trying to keep my brain busy and help out where I can.

Allison Auld-Hill (Southern California Edison): Include interconnection-wide power flow and dynamics datasets for a 20+ planning year summer and/or winter peaking systems.

Noted.

David Wiley (Arizona Public Service Company): APS is supportive of developing a power flow data set (zonal or nodal) and a production cost model. We would not support the development of a stability dataset.

Noted.

Henry Tilghman (NIPPC): WECC should focus on its role of providing consistent interconnection-wide data for use in planning by regional planning groups and individual utilities.

The primary challenge that needs to be addressed is a 20-year forecast for load and resources. WECC should serve as the data clearing house for 20-year load and resources forecasts. WECC should collect and share data from transmission providers that elect to prepare a 20-year load and/or resource forecast.

For transmission providers that do not prepare a 20-year load forecast, WECC should develop a mechanism to convert 10-year load data into a 20-year time-frame and share those extrapolations with transmission providers and regional planning organizations. WECC should also consider developing assumptions regarding the transmission facilities that will be in place for the 20-year time horizon. There should be a standardized model for selecting what transmission expansions should be included in the system topology applied to the 20-year planning process.

WECC intends to create datasets for 20-year planning as well as assumptions associated with the datasets. The individual transmission planning entities would then use those datasets to create their transmission plans.

WECC and the RAC should also determine what types of generation resource forecasts and assumptions WECC should collect and make available for use in 20-year studies. WECC should build on its role in providing transmission planners across the Western Interconnection with consistent data. Resource forecasts, however, will be highly dependent on state policy choices. WECC and the RAC should consider what type of generation resource data will be useful in supporting regional planning processes. This generation data might be limited to forecasts of cost and operational characteristics, rather than specific generation additions.

WECC agrees with the commenter. WECC will work with stakeholders to determine what types of assumptions should be included in the datasets.

Michael Watkins (Seattle City Light): WECC could provide a transmission adequacy assessment and that uses the 10-year base case with all carbon emitting resources removed.

WECC does perform assessments that identify reliability risks under various system conditions. WECC has studied specifically the impacts to reliability with changing resource mix under various scenarios. Please see assessments below for reference:

1. 2040 Clean Energy Scenarios (wecc.org)

2. Executive Summary, System Inertia (wecc.org)

Richard Marrs (Quantum Planning Group): N/A

Kanya T. Dorland (Cal Advocates Office): At this time, Cal Advocates does not have any comments on this issue.

Ken Wilson (Western Resource Advocates): The Anchor Data Set is a good start. Beyond the Anchor Data Set, WECC should develop 10- and 20-year data sets for load, generation, weather and other factors that are developed from a variety of sources such as NREL, PNNL, and the utilities. WECC has adequate financial resources to consider investing in a long-term commitment with NREL and PNNL to provide such data on a periodic basis. As is mentioned in the paper, load 20 years in the future is difficult to forecast, especially with the electrification of transportation and heating. Consideration should be given to creating datasets with both high and low and "expected" load forecasts, for example. The same could be done with forecasts on generation growth and generation type and expected weather and climate change. These issues should be addressed in the paper.

Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): BPA recommends that the Western Interconnection needs a WECC wide 20-year L&R forecast for the scenarios requested by FERC similar to the 10-year ADS. In addition, we need a document that records the assumptions used for the L&R forecasts.

- Page 9—the paper explains the need for building an interconnection-wide scenario, presumably by WECC. Bonneville objects to this approach. The development of load and resources should be WECC's primary function, not scenario modeling. One option for WECC would be to develop and document consistent load and resource data for scenario development guidelines by the members according to the FERC anticipated scenario rules discussed in the NOPR. For example, develop load data bases under different assumptions such as a high, medium and low growth set of assumptions. This would help members in their transmission and resource planning modeling by keeping load assumptions consistent.
- In page 9, the idea in the paper is to focus on a particular future driver. Again, the scenario or case development should be left to the member utilities. Only on specific cases at WECC such as groups or subcommittees designed to study special situations should WECC be involved in the development of scenarios.

There appears to be a misunderstanding of the terminology with scenario development. The focus of this effort is to development datasets associated with various loads/resource development scenarios which planning entities can use for their planning purposes.

Question 6: Do you have any other comments or considerations for WECC?

Gerald Harris (Quantum Planning Group, Inc.): Yes, stakeholder involvement is critical to creating scenarios and making planning project relevant. Finding a way to include as many as possible is prudent, including covering some cost of NGOs. DOE may offer some funding for this greater stakeholder involvement. Also showing how WECC member entities can use planning work and scenarios in their own internal planning is important. This way the work can have more support and direct relevance to the involved stakeholders. Finally, focusing on the learning aspects of planning work can be helpful. Capturing the lessons learned and the key questions going forward once planning work is completed in one cycle can help focus the next cycle of work.

WECC intends to engage with stakeholders for this effort.

Guy Van Uytven (Guy Van Uytven Consultant Inc.): After reading this draft report on Long-term Transmission Planning in the West I offer the following comments which may, or may not, be useful.

1. Who should do the long-term transmission planning in the West?

The logical choice would be the Regional Transmission Organization (RTO) which is the de facto balancing authority for the region. However, the West, as defined by WECC, has several RTO's and long-term transmission planning should cover the combined area. Because WECC already has the system data on these RTOs, and because they are already conducting load flow and stability studies on proposed transmission expansions, it would make sense to have WECC in charge of long-term transmission planning. This would of course entail increased staffing and budget requirements.

2. What are the requirements to do long-term transmission planning?

With the requirement of net-zero emission in the power sector by 2035 there will be a rapid expansion of renewable generating sites which, in contrast with fossil-fuel generating sites, will be located farther away from the load centres. This provides the impetus for building more transmission. There is now general agreement that inter-regional transmission will provide:

i) Enhanced reliability.
ii) Improved resource adequacy; and
iii) Access to lower cost and diverse resources

Because at present there are difficulties in obtaining transmission to the load centres for the many renewable generation sites which have been proposed, the Federal State Task Force on Electric Transmission has put forward the idea of concentrating generating sites in single areas (sources) to connect to the transmission link. There is thus a requirement to identify these potential areas of renewable generation (sources), including BC and Alberta, and to identify the load centres (sinks, points of interconnection, POI) to which these sources need to connect.

3. How will the transmission grid be optimized?

For each source the cost of generation should be determined. Each source will have a maximum generating capacity which will dictate the voltage and capacity of the transmission link(s) and allow transmission cost, including convertor stations, to be determined. Future load at each POI, say 20 years from now, would consist of forecasted load less existing generating capacity assigned to that POI.
An operations research algorithm can then be developed which will optimize the transmission links needed to supply the sinks with the available generating capacity provided by the sources, at the lowest cost.

Allison Auld-Hill (Southern California Edison): SCE is interested in looking at high-impact/low-probability events such as extreme weather conditions and/or cyber-security breaches.

Though there is still significant uncertainty on the system data needed to model and assess such events, which would be further complicated by layering on uncertainties around how to develop long-term transmission planning models. As such, SCE encourages WECC to proceed with their initial thoughts on developing a 20-year transmission model and consider incorporating such high-impact/low-probability events in future.

David Wiley (Arizona Public Service Company): APS thanks WECC for the opportunity to provide input on this topic. Regardless of the outcome of the FERC Rule, this is important work for the planning of new transmission resources and the continued reliability of the grid.

Henry Tilghman (NIPPC): I am interested in serving on the task force. My experience as a member of WECC's Scenario Planning Steering Group from 2011 until 2017 where we developed 20-year transmission planning scenarios would be valuable to that work. I am already familiar with the challenges and complexities of developing interconnection wide scenarios with regard to the technical challenges detailed in the report as well with regard to the divergent policy perspectives of states in the Western Interconnection.

Michael Watkins (Seattle City Light): WECC should provide a specific best practice guideline for entities that includes all the FERC NOPR issues without regard to industry past or current practice. Such a guideline ahead of eventual regulation would give entity executives a foundation to present needs, plans, solutions, budgets, and underlying rate decisions to their boards and state regulators.

Richard Marrs (Quantum Planning Group): Past WECC long term planning work has shown the critical importance of having well designed diverse teams with not only a broad and continually updated knowledge not only of the electric power system itself, but also of the plausible drivers that can affect the system over time.

Kanya T. Dorland (Cal Advocates Office): At this time, Cal Advocates does not have any other comments or considerations for WECC.

Ken Wilson (Western Resource Advocates): WRA would like to see WECC take an active role in transmission planning for the West. WRA has suggested that WECC could act as an Independent Transmission Monitor (ITM) for the West. In this role, WECC would have oversight of the transmission planning process to ensure that the process produces efficient and cost effective regional and interregional transmission plans and assess the overall system resiliency and adaptability to future resource mix changes. The ITM role would improve transparency of the process, provide expertise in understanding and replicating planning assumptions, and ensure that the design of the regional transmission planning process remains just and reasonable. Our vision of the WECC ITM is strictly a regional and interregional transmission planning oversight function, with no cost allocation or cost containment function.

Rather than conducting the transmission planning process, as the transmission provider does today, the ITM would serve as an independent and neutral technical expert on the physical transmission system, using its visibility into the system to (1) identify inefficiencies and potential solutions and (2) assist stakeholders with better understanding data assumptions, inputs, and methodologies as part of the planning process. Thus, the ITM should be viewed as a third party that comments on potential improvements to be made to the transmission system but does not actively engage in the planning process, serving instead in a largely educational and information providing or review capacity.

Lorissa Cardoza and Ravi Aggarwal (Bonneville Power Administration): Comments added to the WECC paper.

- Page 11—Modeling tools—Load and resource forecasting tools should help integrate the multiple assumptions used in the member scenario work. These modeling tools should be designed to facilitate the preparation of the pre or post processing data.
- Page 11—FERC NOPR—The planning entity will not have much discretion for picking scenarios. The NOPR specifies the four scenarios required by FERC. Within that context, the planning entity may have some discretion.