



Grid Modernization Advisory Group

Whitepaper Series

#7: Create a Statewide Transmission Planning Group

Draft version as of January 2021

CREATE A STATEWIDE TRANSMISSION PLANNING GROUP

1 – DESCRIPTION OF ACTION

The Grid Modernization Advisory Group (GMAG) participants recommend **the creation and ongoing support for a coordinated statewide transmission planning group.**¹ The transmission planning group could be charged with delivering a statewide transmission modernization strategy. Transmission planning is currently done by individual utilities and documented to some degree in each utility's Integrated Resource Plan (IRP), but transmission modernization requires integrated planning as well as investments over many years. New Mexico lacks a forum for key stakeholders to share information and develop a transmission modernization strategy that anticipates and accommodates the state's changing electricity scene.

This changing electricity scene includes decarbonizing the grid, offering renewably generated electricity to in-state and out-of-state customers, and providing more economic development opportunities in New Mexico. The transmission planning group will help navigate these changes while preserving and enhancing resiliency, reliability and efficient use transmission and generation assets. Secondary objectives for the group's effort include electricity affordability, integration of distributed resources, reduction of carbon emissions, improvements to system efficiency, and adaptation to changing loads.

New Mexico's transmission planning group will be comprised of representatives from the state's electric utilities, transmission service providers, state agencies, land managers, and one or more independent technical analysis organizations.

The charter for the group must include sharing of information for the purpose of modernizing the transmission infrastructure in New Mexico. The charter could be analogous to that of the Colorado Coordinated Planning Group (CCPG), which serves as a technical forum for transmission planning discussions.² For more details regarding the group's proposed composition and actions, see Section 5: Steps to Implementation (page 8).

Electricity users in New Mexico currently enjoy lower-than-national-average electricity rates (according to EIA data, 2018) and a grid that is resilient, reliable and secure – but the future will present new stressors, new threats, new challenges and new opportunities for the electricity infrastructure. These

¹ Implementation of changes to the New Mexico's transmission system is not included in this action. The authors recognize that challenges associated with implementation include rights-of-way, potential increased costs to customers, financing, and NM Public Regulation Commission approval. Changes involving interstate transactions also require Federal Energy Regulation Commission approval.

² The purpose of the Colorado Coordinated Planning Group (CCPG) is to assure a high degree of reliability in the planning, development, and operation of the high voltage transmission system in the Rocky Mountain Region. The CCPG provides the technical forum required to complete reliability assessments, develop joint business opportunities and accomplish coordinated planning under the single-system planning concept in the Rocky Mountain Region of the Western Electricity Coordinating Council. The members of the CCPG are electric utilities and transmission providers, but state agencies and regional entities serve as liaisons to working groups within CCPG. More information about the CCPG, including the group's charter, is available at <http://regplanning.westconnect.com/ccpg.htm>.

challenges require a coordinated transmission modernization strategy among many entities and the time to put the mechanism in place to develop this strategy is now.

SECTION 2: CONTEXT AND CURRENT SITUATION

The electric transmission infrastructure, which is the system of conductors 115kV and above, support systems, substations, and controls that connects electric generation to electricity consumers, is an essential component of the nation's electricity system.

This infrastructure is organized in a variety of ways. As shown in Figure 1, New Mexico is located at the intersection of three of the National Electric Reliability Council (NERC) regional entities and three electricity market organizations. NERC oversees the reliability functions for the nation's electric grid. Regional transmission organizations and independent system operators coordinate electricity delivery and generation functions. New Mexico's location complicates the number of interfaces required by electricity providers which operate in the region. These interfaces are critical for both transmission planning as well as operations.

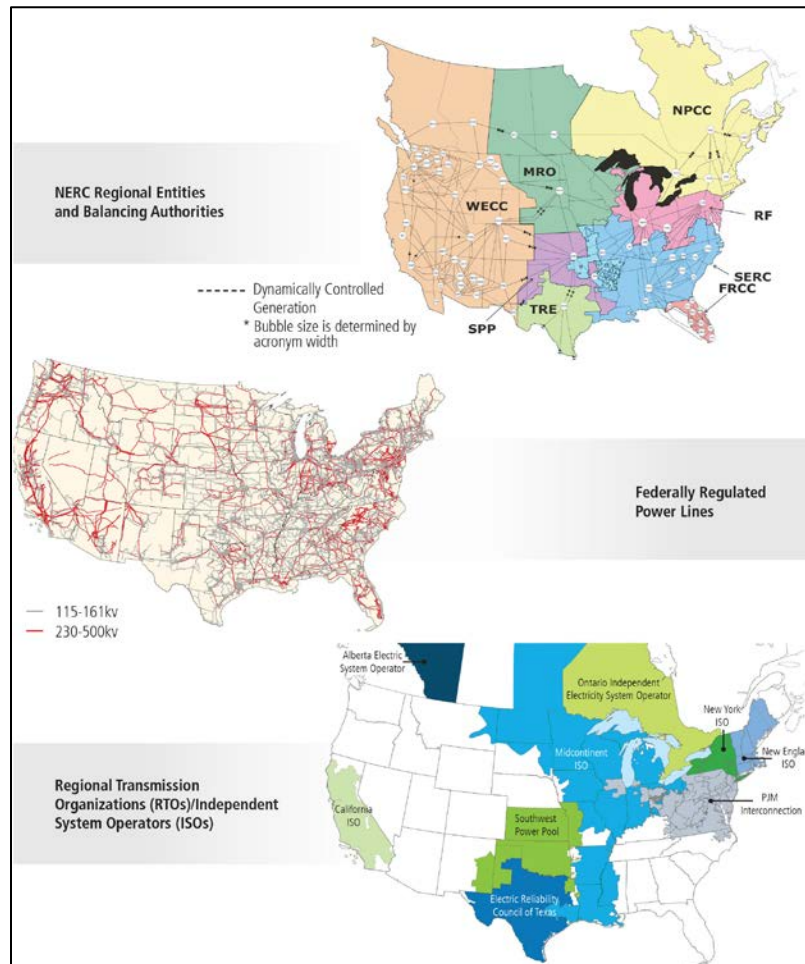


Figure 1: National Electric Infrastructure Jurisdictions (Source: Quadrennial Energy Review Task Force, 2015)

A map of New Mexico’s transmission lines by service provider is shown in Figure 2 below.

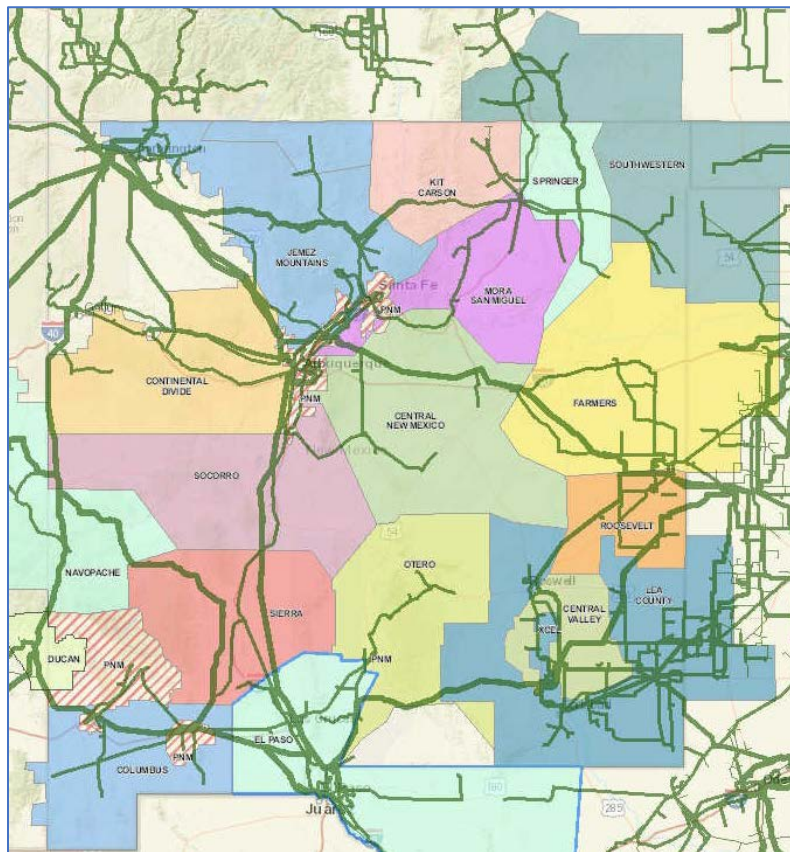


Figure 2. New Mexico Electric Power Supplier Territories and Transmission Lines (Source: NM SBA study, Dec. 2019. Figure used by permission of the study’s sponsors.)

Most of New Mexico’s transmission lines and substations, which are owned and operated by electricity providers, are old. Many of the high voltage transmission lines were constructed over 50 years ago when the large central station generating plants were built in the four corners region. Aging physical infrastructure, changes in generation assets and loads, and opportunities to participate in out-of-state electricity markets provide motivation for an integrated approach toward modernizing New Mexico’s electricity grid.

TRANSMISSION PLANNING IN NEW MEXICO

Several recent plans and studies include transmission-related issues across New Mexico. A description of the most well-known of these documents is summarized here.

New Mexico’s transmission infrastructure needs are currently considered in two types of planning documents: 1) the Integrated Resource Plans (IRPs) of the three investor-owned electric utilities (IOUs), and 2), a NM Renewable Energy Transmission and Storage Study (completed for RETA and released in June 2020, referred to in the remainder of this document as the RETA Study). The IRP transmission

planning components of the three IOUs and the RETA 2020 study characterize statewide mid-term and long-term visions.³ Differences in processes and objectives of the two types of planning documents are important to understand. Additional information is included in Section 8: Appendix Summarizing Transmission Issues in Integrated Resource Plans and the 2020 Transmission Study.

The IRPs and RETA Study differ in their primary objective. The IRPs are focused on short-term action plans based on characterizing loads, supply-side resources, and demand-side programs. In contrast, the RETA Study is specific to transmission infrastructure and future upgrades that are needed to support the New Mexico ETA goals.

The IRPs are limited as transmission planning tools, only accounting for each separate utility service territory. They are submitted to the New Mexico Public Regulation Commission (PRC) for review. Each of New Mexico's three IOUs has a current IRP in place that includes transmission resource information as a portion of a comprehensive assessment of all utility resources. However, these most recent IRPs do not address NM ETA goals because the law had not been enacted at the time of the IOUs' public participation process, submittal to the PRC, and acceptance by the PRC. The three IRPs currently in effect under the IRP rule achieved PRC acceptance in 2017, 2018, and 2018 (amended January 2019). The ETA was passed in March of 2019.

The RETA Study is a statewide plan for transmission needs based on projected growth in utility-scale renewables, for the 10-year planning horizon. It specifically addresses the NM ETA goals and includes estimated costs and benefits associated with transmission investments required to meet those goals. The RETA Study was commissioned by the Legislature in 2019 through the budget process and was completed in 2020 by ICF Resources LLC.⁴

Both the IRPs and RETA Study provide valuable transmission planning information, the former addressing short term actions and the latter focusing on a 10-year horizon encompassing significant growth in utility-scale renewable generation. IRPs are limited as tools to support statewide transmission planning, as they do not address 10- and 20-year planning horizons. Current IRPs also do not reflect current goals of the NM ETA. However, it is worth noting that the one IRP which contains a listing of potential new transmission lines coincides with needs identified by the RETA Study.⁵

In addition to the plans and the study described, public entities and private businesses have also commissioned or completed studies to explore ideas for strengthening or expanding the transmission infrastructure in the 10-year horizon.⁶ The cost and benefit of increasing electricity transfer between the Eastern and Western Interconnections in the United States has also recently been examined.⁷ However,

³ "Transmission" applies to 115 kV or greater high-voltage power lines for both IRPs and the RETA Study.

⁴ RETA, 2020. New Mexico Renewable Energy Transmission and Storage Study, consultant ICF Resources, LLC. <https://nmreta.com/nm-reta-transmission-study/>.

⁵ See Section 8 for more information.

⁶ As an example, five New Mexico businesses sponsored two studies in 2018-2019 to assess the adequacy of the state's transmission system and to estimate the costs and benefits of removing transmission bottlenecks.

⁷ "The Value of Increased HVDC Capacity Between Eastern and Western U.S. Grids: The Interconnections Seam Study," IEEE Transactions on Power Systems, 2020, <https://www.nrel.gov/docs/fy21osti/76850.pdf>. The results show benefit-to-cost ratios that reach as high as 2.9, indicating significant value to increasing the transmission

the state lacks a forum for sharing, comparing, and integrating the findings from all relevant studies. New Mexico also lacks the policy backdrop required to spur action to realize the transmission modernization plans on a predictable timeline, which must be accelerated to reach New Mexico’s energy transition goals. As a result, New Mexico lacks a unifying, long term strategy for transmission modernization. A statewide transmission planning group can help with or be charged with closing this gap.

RENEWABLE ENERGY MARKET OPPORTUNITIES

New Mexico competes with neighboring states to export renewables to California and Arizona. This situation presents some urgency in forming the planning group and developing a near term strategy that supports the NM ETA goals regarding renewable electricity generation for in-state and export markets. States around the West have passed aggressive clean energy goals, which will require them to tap into the most cost-effective renewable resources around the region. New Mexico can provide geographic and supply diversity through its low-cost renewables, lowering consumer costs overall. The following table, compiled in late 2019, reflects the clean energy targets through 2035 established in surrounding states.⁸

| Year | California | Northwest | | | | Intermountain | | Rockies | | Southwest | | | |
|--------------|------------|-----------|-----|--|-----|---------------|-----|---------|----|-----------|-----|-----|-----|
| | CA | OR | WA | ID | MT | NV | UT | CO | WY | AZ | NM | | |
| 2020 | 33% | 20% | 15% | 4% | 15% | 22% | 0% | 30% | 0% | 10% | 20% | | |
| 2021 | 33% | 20% | 15% | 8% | 15% | 22% | 0% | 30% | 0% | 11% | 20% | | |
| 2022 | 33% | 20% | 15% | 12% | 15% | 26% | 0% | 30% | 0% | 12% | 20% | | |
| 2023 | 33% | 20% | 20% | 16% | 15% | 26% | 0% | 32% | 0% | 13% | 20% | | |
| 2024 | 44% | 20% | 25% | 20% | 15% | 34% | 0% | 36% | 0% | 14% | 20% | | |
| 2025 | 44% | 27% | 30% | 24% | 15% | 34% | 0% | 40% | 0% | 15% | 25% | | |
| Study Period | 2026 | 44% | 27% | Cap and Invest Carbon Cap and 80% RPS by 2035 | 35% | 28% | 15% | 34% | 0% | 44% | 0% | 15% | 30% |
| | 2027 | 52% | 27% | | 40% | 32% | 15% | 42% | 0% | 48% | 0% | 20% | 35% |
| | 2028 | 52% | 27% | | 45% | 36% | 15% | 42% | 0% | 52% | 0% | 25% | 40% |
| | 2029 | 52% | 27% | | 50% | 40% | 15% | 42% | 0% | 56% | 0% | 30% | 45% |
| | 2030 | 60% | 35% | | 55% | 44% | 15% | 50% | 0% | 60% | 0% | 35% | 50% |
| | 2031 | 63% | 35% | | 60% | 48% | 15% | 50% | 0% | 64% | 0% | 40% | 53% |
| | 2032 | 66% | 35% | | 65% | 52% | 15% | 50% | 0% | 68% | 0% | 45% | 56% |
| | 2033 | 69% | 35% | | 70% | 56% | 15% | 50% | 0% | 72% | 0% | 50% | 59% |
| | 2034 | 72% | 35% | | 75% | 60% | 15% | 50% | 0% | 76% | 0% | 55% | 62% |
| | 2035 | 75% | 45% | | 80% | 64% | 15% | 50% | 0% | 80% | 0% | 60% | 65% |

California’s Renewable Portfolio Standard (RPS) requires investor-owned utilities and municipal utilities to provide electricity retail sales from renewable resources in the following amounts: 44% by 2024, 52% by 2027, and 60% by 2030. These renewable goals have been accelerated twice since the RPS was put into place in 2002. The same standard requires 100% carbon-free electricity by 2045. In general,

capacity between the interconnections under the cases considered, realized through sharing generation resources and flexibility across regions.

⁸ Energy Strategies, “Western Flexibility Assessment, Table 7, p. 53. <https://westernenergyboard.org/wp-content/uploads/2019/12/12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf>.

California's retail sellers either met or exceeded the interim 27% target as of the end of 2017 and are on track to achieve their compliance requirements.⁹

Arizona's Renewable Energy Standard requires that investor-owned electric utilities and retail suppliers of electricity acquire increasing amounts of the electricity they sell from renewable resources. The overall target is 15% of retail electricity sales by 2025.¹⁰ Arizona also recently opened a formal rulemaking to consider rules which would require utilities to reduce their carbon emissions by at least 50% of average 2016-2018 levels by 2032, 75% by 2040, and 100% by 2050.¹¹

3 – IMPACTS OF THE ACTION

The primary positive impact of a functioning statewide transmission planning group is the ability to discuss, develop, recommend actions to implement and monitor a statewide strategy with respect to transmission modernization. Other positive aspects include utility coordination with RETA, which could provide support for integration of more large-scale renewable energy resources; exploration of possible multi-party projects for joint-venture or cost-shared investments; improved cooperation among utilities; and increased transparency of the planning process for New Mexico stakeholders. Peer vetting of transmission investment options prior to regulatory consideration might be another positive aspect of this effort.

One potential negative impact of an integrated transmission planning group is the perception that such effort would bypass or jeopardize the regulatory processes and authorities of the Federal Energy Regulation Commission (FERC) and the PRC. The perception of bias or favoritism in the planning recommendations would need to be mitigated by populating the planning group with participants from a broad range of interests. Another potential concern is adding another layer of bureaucracy to the planning process. If the planning group is effective and respects utility transmission operation and planning experience, the hope is that transmission modernization implementation projects will happen more quickly and without as many delays as are currently experienced.

Operation of the planning group will require time and resources. A coordination function will make the group operate efficiently and participation will require additional work by all utilities. Success will require active participation by all utilities and other key players.

4 – PREREQUISITES, RISKS, ROADBLOCKS, AND ENABLERS

PREREQUISITES

The first step toward implementing an integrated statewide transmission planning group is to initiate the discussion about the merits, benefits, risks, and costs of forming such a group. This document aims to provide a starting point for these discussions.

⁹ <https://www.cpuc.ca.gov/rps/>.

¹⁰ US Energy Information Administration, Arizona state profile: <https://www.eia.gov>.

¹¹ <https://docket.images.azcc.gov/E000010319.pdf>

Two specific actions must be completed before forming New Mexico's Coordinated Transmission Planning Group. First, the state legislature or administration must name a convening organization for this effort. Candidates among existing entities include the Energy Conservation and Management Division within New Mexico's Energy, Minerals and Natural Resources Department (EMNRD); RETA, albeit with an expanded mission; the State Land Office, and perhaps others. Should none of these entities seem well suited, a new entity with responsibility for the state's grid modernization strategy could be formed under the Secretary of Energy, Minerals and Natural Resources. Transmission planning must be one of the new entity's responsibilities.

Second, the convening entity must share and vet the concept of an integrated transmission planning group with key stakeholders. Input regarding the composition and charter for the group will be collected and considered. This process will also confirm that no existing forum is available to provide the function of the proposed planning group. Models of planning group functions in other states might provide additional insights. A draft charter along with list of authorities and outcomes are necessary prerequisites for establishing the working group.

Two potential models for the charter with associated authorities for the transmission planning group are possible. A "Technical Forum/Information Exchange" charter is modelled after the CCPG, which is sanctioned by WEST CONNECT as part of the Southwest Area Transmission regional planning effort. A "Strategy Development" charter is more closely aligned with a public-private partnership model. This latter charter includes the authority for developing and regularly updating a statewide transmission modernization strategy. The initial charter for the group shall include "high priority" focus areas such as IRP coordination, voltage matching, meeting the NM ETA goals, and reliability metrics.

RISKS AND ROADBLOCKS

The primary risk associated with the formation of a statewide transmission planning group is the potential disenfranchisement of those parties currently responsible for transmission planning, namely the IOUs, cooperative utilities, RETA and the PRC. Another roadblock is making resources available for the operation of the planning group.

A risk that key entities will not participate exists. Reasons include the lack of time for personnel to attend meetings and concern about sharing company confidential information about transmission plans. This risk can be mitigated by making participation mandatory by legislation and instituting an information sharing policy among the participants. Voluntary participation is not recommended because the absence of any key entity will weaken the group's effectiveness. As a hypothetical example, a lack of representation by providers who service New Mexico's rural customers or native communities may create a rural-urban divide bias in the strategy.

ENABLERS

Legislation or PRC action is needed to require all electric utilities and transmission service providers operating in New Mexico to participate in the planning group. Such legislation must provide enduring (more than 2 years) support. Resources for administrative/facilitative coordination and technical

support is vital. An estimated cost is \$500,000 per year for staff and operations.¹² A key decision regarding how to pay for the operation of the planning group will need to be a part of the enabling legislation or regulatory action.

A policy enabler, such as was adopted in Colorado, would require utilities to receive transmission planning information on a coordinated basis, and would also require utilities to prepare a joint filing with the PRC on a biannual basis. This process includes a coordinated review and comment venue for stakeholders.

5 – STEPS TO IMPLEMENTATION

MILESTONES

Prerequisite actions and implementation steps for having a functioning transmission planning group for New Mexico are summarized in the table below.¹³

| ACTION | TIMETABLE | LEAD ENTITY |
|--|-----------------------|---|
| Name convening entity | February 1, 2021 | Legislature and/or Governor |
| Share concept with key stakeholders, develop draft charter and authorities | July 1, 2021 | Convening Entity |
| Establish the group through appropriate legislation, regulation or other means | February 1, 2022 | Legislature and/or Governor |
| Secure resources for operation | July 1, 2022 | Legislature and/or Governor |
| Name participants | February 1, 2023 | Convening Entity |
| Hold quarterly planning workshops | Starting July 1, 2023 | Planning Group Chair |
| Develop statewide transmission modernization strategy, update regularly | December 31, 2023 | Planning Group Chair |
| Reflect coordinated strategy in 10-year IRP submissions and transmission plans | Starting Jan. 1, 2024 | Utilities, RETA, transmission providers |

PLANNING GROUP COMPOSITION

The planning group includes entities with a stake in transmission modernization. These include electricity providers (investor-owned utilities, municipal utilities, independent power producers, and cooperatives), merchant transmission providers, state agencies (PRC, RETA, EMNRD, Department of Indian Affairs), regional entities (Western Electric Coordinating Council or WECC, and WEST

¹² This budget does not include the cost of independent review of transmission modeling results. Perhaps this presents an opportunity for partnering with the state’s national laboratories.

¹³ Ties to and interdependencies with actions resulting from other grid modernization working groups and white papers have not been integrated into the action table. Specific actions related to modifications to IRP statutes, feasibility of participation in regional transmission organizations or regional markets, distributed energy resource integration, and distribution system planning are all topics that will inform discussions of the transmission planning group.

CONNECT), and land managers (military, NM State Land Office, US Bureau of Reclamation).¹⁴ Note that this group serves in a planning capacity, therefore FERC participation is not necessary; however, the group will need to determine if or how it will keep informed of changing FERC requirements. A subset of the above listed entities may be appropriate as core members, depending on the group's charter.

Each group of participating entities represent a part of the transmission picture in New Mexico. Utilities represent the electricity providers and the entities responsible for transmission planning under FERC requirements. Transmission service providers operate the system and invest in new assets. PRC is New Mexico's regulator and mediator, balancing legislative direction with ratepayer impact. PRC is also the overseer of the IRP process. RETA, WECC, and WEST CONNECT provide information and coordination functions. They may also assist with developing transmission projects. Prospective renewable merchant generation providers and land managers are potentially useful participants.

6 – UTILITY COMMENTS/CONCERNS/QUESTIONS

COMMENTS FROM PNM

- This whitepaper has not resolved how to integrate/interface this potential transmission planning group into other groups that are currently functioning in the West (WECC, WestConnect, SWAT AZ-NM, etc.) It instead references CCPG, which PNM does not have experience with as a potential model. The Arizona utilities' biannual transmission plan and its method of integration into SWAT AZ could make more sense as a potential fit for New Mexico (which may be the same as Colorado).
- PNM interprets this whitepaper to state that creating this group will enable New Mexico to have a holistic approach to integrated resource planning via providing a technical venue that would somehow advise the PRC. PNM is not sure as to whether this would help. The biggest impact could be to PNM's internal 10-year planning process. It is possible that the intent of the white paper is to state that if enough work/time/money is spent on infrastructure, then integration of new resources would not be a heavy lift. Again, this could be good, but it may be a long way from reality. PNM is unable to determine a position on this whitepaper until further structure is hammered out.

COMMENTS FROM XCEL ENERGY/SPS:

- This whitepaper should include some language recognizing that SPS, and a handful of rural electric cooperatives, are in the Southwest Power Pool (SPP) which is part of the eastern grid and distinct and separate from the western grid. There are only two AC/DC ties in New Mexico with limited transfer capacity between the eastern and western grids, which limits transmission planning benefits on a statewide basis. Utilities located in the western grid are more likely to benefit from a statewide transmission planning process since an RTO does not currently exist in their area. The state of New Mexico would see limited value in having SPS participating in a statewide process since it is already part of an RTO that is separate from the western grid.

¹⁴ The roles for large electricity users and consumer advocates in the planning group is not clear and should be discussed further. Interests of these groups may be adequately represented by the NM PRC.

APPENDIX I – TRANSMISSION MODERNIZATION ISSUES TO CONSIDER

Development and implementation of a statewide transmission modernization strategy is not an easy task. Among the issues that will need to be considered by the planning group are the following:

| | |
|--|--|
| Reliability and Resiliency ¹⁵ | Planning efforts must preserve or enhance grid resiliency, reliability and security. |
| Customer Enablement | The planning should take into consideration the impact of distributed generation on transmission needs, both negative and positive. Transmission enhancements should not be planned without considering non-wires alternatives, which may offer less expensive solutions, or defer investments. |
| Adopt Clean Energy Technologies | Increased use of clean energy technologies will impact both transmission and distribution systems. The incorporation of large scale renewable systems will be a large factor in transmission planning. |
| Affordability | Significant private or public financing will be needed to build or upgrade transmission assets. Understanding how transmission investments will impact the cost of electricity is a key element of planning. |
| Asset Optimization | Prioritizing reliability and security could reduce transmission development for renewables. Employing new technologies (e.g., dynamic line ratings and wide area control systems) could allow for greater utilization of existing and new transmission lines, maximizing line capacities and minimizing losses, while still prioritizing reliability, resiliency and security. |
| Property Value Issues | Proposed transmission routes could cause devaluation of property values and reduced county revenue, impacting landowners and local governments. |

An important topic in preparing a transmission modernization strategy is the state’s plans regarding the build out of renewable generation. Clear targets for the following elements will be useful input: 1) desired mix between export and in-state use; 2) central station, distributed, or both; and 3) how New Mexico will generate revenue from this build-out.

In addition, NM should establish clear targets (and use a common reporting systems) with respect to reliability, resiliency, and affordability. The planning group can use this information to inform transmission planning. (The carbon free generation goal is already in place through the NM ETA, so this target should be included as well.)

Transmission planning should be informed by results from Action Item #5, which recommends the establishment of a New Mexico Regional Transmission Organization (RTO) task force to engage in various regional RTO forums and make recommendation to the state. These two efforts should happen on parallel tracks to avoid and sort of “chicken and egg” scenario on market development and transmission. Once there is clarity on what emerging markets the resources are designed to serve, then the transmission infrastructure needed to serve those markets can be identified. Similarly, thoughtful expanded transmission planning can help illuminate market pathways for load-serving entities around the region. The NM RTO Task Force recommendation envisions several possible studies on market design characteristics, as well as New Mexico economic development benefits derived from regional market

¹⁵ For more details on NM electricity system reliability and resiliency metrics, see section 2.9 of the “Grid Modernization Roadmap Baseline Report of New Mexico’s Electricity Sector”, Aug. 2020.

expansion. Transmission build-out would likely be considered in these studies, and accordingly there should be communication and information sharing between the two entities.

It is important to note that the federal government, through the FERC, regulates wholesale electricity sales and interstate transmission of electricity. If NM engages in regional electricity markets, FERC requirements will need to be integrated into planning efforts.

| | |
|--|--|
| Assuming integrated planning leads to implementation of transmission modernization investments, the positive benefits of implementation include: | |
| Reliability and Resiliency | A stronger transmission system with additional options for moving electricity to in-state and out of state markets provides more reliability, resiliency, and security. It also allows for improved optimization of generation assets. |
| Affordability | The opportunity to bring revenue to the state (export of wind and solar electricity could create a new revenue stream for NM). The ability to move resources to customers more easily. Improved access to in-state generated wind and solar electricity to New Mexicans. |
| Economic Development | Transmission planning and implementation could bring tax revenue to areas of the state where economic activity is currently low. |

APPENDIX II – SUMMARY OF TRANSMISSION ISSUES IN INTEGRATED RESOURCES PLANS AND THE 2020 TRANSMISSION STUDY

This section provides additional details about the IRP process, the RETA Study, and in the case of the PNM IRP, correlation between the most recent IRP and the RETA study conclusions.

INTEGRATED RESOURCE PLANNING PROCESS

The IRPs developed by electric utilities follow detailed requirements of the IRP rule in the New Mexico Administrative Code (NMAC), at 17.7.3 NMAC. As administered by the New Mexico PRC, the IRP processes and submittals are repeated on a three-year cycle, with the utilities’ 20-year planning horizon advancing an additional three years forward each time.

The IRP rule and the PRC play significant roles in guiding the documentation to be provided by the utilities for public review. In the detailed requirements of the IRP rule, transmission is one of many important areas for consideration. The following are the two NMAC provisions where transmission resources are identified for evaluation by the electric IOUs:

- *17.7.3.9C – Description of existing resources. The utility’s description of its existing resources used to serve its jurisdictional retail load at the time the IRP is filed shall include:*
 - ...
 - (12) *existing transmission capabilities:*
 - (a) *the utility shall report its existing, and under-construction, transmission facilities of 115 kV and above, including associated switching stations and terminal facilities; the utility shall specifically identify the location and extent of transfer capability limitations on its*

transmission network that may affect the future siting of supply-side resources;

(b) the utility shall describe all transmission planning or coordination groups to which it is a party, including state and regional transmission groups, transmission companies, and coordinating councils with which the utility may be associated.

- *17.7.3.9G – Determination of the most cost-effective resource portfolio and alternative portfolios.*

...

(2) Each electric utility shall provide a summary of how the following factors were considered in, or affected, the development of resource portfolios:

...

(f) transmission constraints...

The IRPs reference Renewable Portfolio Standard requirements, which relate to energy generation (e.g., megawatt-hours, MWh). The IRP rule requirements emphasize load management and projecting loads over the planning period, which relates to peak demand (e.g., megawatts, MW) and the ability to reduce or shift demand. Similarly, supply-side resources are evaluated in terms of capacity, MW. The IRPs are valuable in covering the short-term period of the three-year filing cycle. Each successive IRP is an update on existing loads, supply-side resource adjustments, demand-side programs, transmission upgrades, and portfolio cost-effectiveness. At the current time, the IOUs have transmission infrastructure to handle current loads and modest load growth in the short-term period of the action plans, which go 3-4 years out from IRP acceptance. Reliability indices for the New Mexico-based IOUs, which reflect overall system performance, reflect “better than the national average” performance.¹⁶ The existing infrastructure is described in the IRPs. Many agreements are noted for sharing lines and power and current construction projects are summarized.

As expected, the information provided in an IRP becomes vague as the utility goes deeper into its 20-year planning period. The planning period is defined as 20 years at 17.7.3.7K NMAC, but the IRP rule does not state anything further about what topics are to be planned out to that future date. The two primary provisions of the IRP rule addressing transmission do not include projection of the future transmission needs of each utility. IRPs are limited as tools to support statewide transmission planning, as they do not address 10- and 20-year planning horizons.

RETA STUDY APPROACH

The RETA Transmission Study involved a multi-step analysis over an approximate

¹⁶ Grid Modernization Roadmap Baseline Report of New Mexico’s Electricity Sector, August 2020.

10-year timeframe, 2020-2032, and identified transmission needs to support growth in renewable electricity generation. Achieving the NM ETA targets was evaluated. This is quite different from the IRP process. The RETA transmission study focused on specific siting of renewables and transmission, with three “collector plans” presented to deliver electricity to in-state and export markets. The collector plans represent scenarios of centralized and distributed siting of utility-scale solar and wind developments around the state. The collector plans were described for the specific infrastructure upgrades needed and corridors for probable routes were mapped.

The economic development activity was estimated for construction and maintenance for transmission and renewables. The NM ETA target, from a statewide perspective, would be met in 2030. The study’s authors conclude that renewable generation capacity could grow to 11,000 MW and would result in an estimated eleven billion dollars-worth of investments by project developers. An additional 900-1300 miles of new transmission lines and equipment is needed to support this growth.

TRANSMISSION IMPLICATIONS WITHIN IRPS

Public Service Company of New Mexico (PNM)

PNM has a significant amount of transmission infrastructure to deliver power from its generation assets to customers in load centers throughout New Mexico. There are also many agreements with other utilities that afford PNM flexibility in sharing generation, both receiving and providing. PNM’s 2017 IRP states that existing transmission infrastructure will be adequate through 2027 to meet current loads and resources.¹⁷ Forecasts of generation and peak demand, with the generation additions and retirements identified, are provided through that time in providing the most cost-effective portfolio, as required by the IRP.

In the near term, PNM recommends that additional transmission needs should be studied for:

- replacement resources for planned coal power plant retirements, and
- new wind farm developments, from Grady to Clines Corners.

For a long-term forecast out to 2036, the PNM IRP is not specific. Potential new transmission projects are noted, but no timing is provided within the IRP’s 20-year timeframe. It is assumed that the new transmission would be needed 2027-2036, due to the above adequacy statement. New transmission would probably be needed for possible new generation resources being considered by PNM:

- 80 MW in southern New Mexico;
- 40 MW near Belen;
- 80 MW at San Juan Generating Station.

There are also several merchant transmission lines being developed for interconnection of merchant wind farm developments. These include the Mora line (115 kV), Western Spirit line (345 kV), and the Verde line (345 kW). Interconnections completed since 2017 serve two wind farms: Broadview in eastern New Mexico and El Cabo near Clines Corners. These and several other merchant transmission lines (Centennial West, Lucky Corridor, Southline, and SunZia) are identified.

¹⁷ PNM, 2017. PNM 2017-2036 Integrated Resource Plan.

As related to transmission planning, the PNM 2017 IRP provides the following:

- Near-term action plan, 2017-2021, as required for IRPs, in which transmission is deemed adequate;
- Mid-term load and demand projections to cover a 10-year timeframe, 2017-2026, in which transmission is deemed adequate; and
- Long-term statements assumed to cover the remainder of the 20-year timeframe, 2017-2036, in which transmission needs are to be met with merchant transmission, recently implemented or in planning stages.

Loads and demand are projected over 20 years with a range of low-to-high growth scenarios. No complementary long-term transmission conceptual plan is provided to meet these scenarios. PNM could have provided load and renewables generation projections through 2036 in its IRP to show that higher Renewable Portfolio Standard rates could be met, to replace coal power plant retirements in 2022 and 2031 (the Energy Transition Act was not enacted until 2019). The forecasting and projected transmission information provided in the PNM 2017 IRP is satisfactory for 10-year planning; however, is limited for 20-year transmission planning.

The map of potential new merchant transmission lines correlates well with the RETA Study and RETA's familiarity with current developments in transmission.¹⁸ The RETA Study provided three "collector plans" under varying scenarios of central or distributed renewables development.¹⁹ Most of the transmission lines identified by PNM as needing enhancements are also shown in the RETA collector plans.

El Paso Electric (EPE)

EPE's 2018 IRP (amended 2019) has discussion of existing transmission and transmission under construction. No specific discussion of 10-year or 20-year transmission planning is provided in the IRP document, but other documents and processes are mentioned. The IRP notes that EPE produces a 10-year Transmission Expansion Plan every year in accordance with Attachment K of EPE's Open Access Transmission Tariff ("EPE OATT").

Correlation between EPE's transmission plans and results of the RETA Study are left to a future analysis.

Southwestern Public Service (SPS)

SPS's 2018 IRP includes discussion of existing transmission and transmission under construction. No specific discussion of 10-year or 20-year transmission planning is provided in the IRP document, but other documents and processes are mentioned. The SPS transmission system is analyzed in the Southwest Power Pool (SPP) 2017 Integrated Transmission Planning (ITP) Near-Term Assessment. This is provided in Appendix B of the SPS 2018 IRP; however, this document was not available online or by request to

¹⁸ PNM, 2017. See Figure 20 on page 74, PNM 2017-2036 Integrated Resource Plan.

¹⁹ RETA, 2020. See Exhibits 54-56, pages 76-80.

SPS representatives at the time of this writing. It appears that this assessment is more applicable to short-term action and does not address 10-year or 20-year transmission planning horizons.

The ITP produces a 10-year transmission expansion plan each year, combining near-term, 10-year, and North American Electric Reliability Council (NERC) transmission planning assessments into one study. The 20-year assessment is performed once every five years, unless otherwise directed by the SPP board of directors. The ITP process works in parallel with the NERC TPL-001-4 compliance process.²⁰

Existing transmission capabilities are described in terms of import rights from generating resources and utilities outside of SPS service territory, to points on the SPS-managed grid. This appears to provide flexibility for SPS to shift load and share electricity. Agreements are maintained with many utilities to gain a total of 1,655 MW of transmission flow capability.

SPS appears satisfied with its current transmission infrastructure, being able to handle anticipated changes to occur during the short-term action plan period. Transmission and interconnection projects are noted to be in construction. A list of current projects is provided in Appendix C of the SPS 2018 IRP; however, this document was not available online or by request to SPS representatives at the time of this writing.

Correlation between SPS's transmission plans and results of the RETA Study are left to a future analysis.

²⁰ SPP Integrated Transmission Planning at <https://www.spp.org/engineering/transmission-planning/integrated-transmission-planning/>.