# PNM 2023-2042 IRP: Modeling for Reliability, Resource Adequacy and Resiliency

**TECHNICAL SESSION #1**

**JUNE 8, 2022**

## DISCLOSURE REGARDING FORWARD LOOKING STATEMENTS

The information provided in this presentation contains scenario planning assumptions to assist in the Integrated Resource Plan public process and should not be considered statements of the company's actual plans. Any assumptions and projections contained in the presentation are subject to a variety of risks, uncertainties and other factors, most of which are beyond the company's control, and many of which could have a significant impact on the company's ultimate conclusions and plans. For further discussion of these and other important factors, please refer to reports filed with the Securities and Exchange Commission. The reports are available online at www.pnmresources.com.

The information in this presentation is based on the best available information at the time of preparation. The company undertakes no obligation to update any forward-looking statement or statements to reflect events or circumstances that occur after the date on which such statement is made or to reflect the occurrence of unanticipated events, except to the extent the events or circumstances constitute material changes in the Integrated Resource Plan that are required to be reported to the New Mexico Public Regulation Commission (NMPRC) pursuant to Rule 17.7.4 New Mexico Administrative Code (NMAC).

# MEETING GROUND RULES

## THE FOCUS OF THE MEETING IS THE DEVELOPMENT OF THE 2023 IRP

01

- Questions and comments are welcome – One Person Speaks at a Time

02

- Reminder; today's presentation is not PNM's plan or a financial forecast, it is an illustration of the IRP process

03

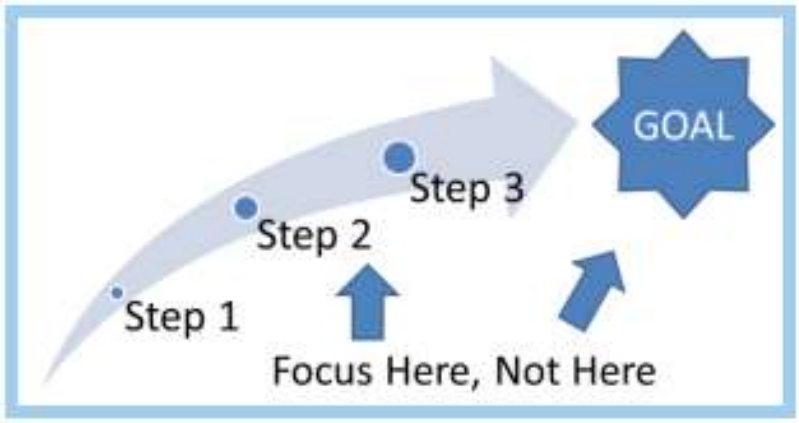
- When asking a question, please speak clearly and slowly as all questions will be logged and labeled with the person and organization responsible for asking the question

04

- These meetings are about the 2023 IRP, questions and comments should relate to this IRP. Any questions or comments related to other regulator proceedings should be directed towards the specific filing.

# TECHNICAL SESSION

## THE FOCUS OF THE MEETING IS THE DEVELOPMENT OF THE 2023 IRP




The technical sessions are about discussing the advantages and disadvantages regarding the application of different technical methodologies within the IRP modeling framework.

We are not here to focus on the results or drive towards a specific result. **We all know where we are going: 100% Carbon Free by 2040. The focus in the IRP development is how do we get there in the best way possible for PNM's customers and New Mexico.**

## TENTATIVE MEETING OUTLINE

- Welcome and Introductions
- Any follow up questions from the previous presentation now that stakeholders have had some additional time with the presentation materials or other questions / updates of topics of interest
  - This could include more information on the presentations to clarify the materials
  - A deeper dive into the studies and how they were performed
  - Etc.
- A quick review of the results and key findings of presentations
- A quick review of the modeling framework utilized in the 2020 IRP
- Open forum for any stakeholder discussion / presentation / examples / kickoff into thoughts on how we incorporate key findings / lessons learned from these studies into the 2023 IRP Development (Some ideas below but not limited to just these ideas, again PNM wants to be one participant of this process, but we want the process to be stakeholder driven/workgroup/workshop like – not a PNM presentation)
  - Different Risk Metrics, what they are, what the capture, how to use them in planning, etc.
  - ELCC Study for the 2023 IRP, methods of analysis, ways to capture synergies of resources, etc.
  - ELCC by risk metrics
  - Setup of the SERVM model for calculating ELCC and how to use the results within EnCompass
  - Baselines for different risk metrics
  - Other questions on Slides 84 and 85 of the 5/25 meeting slides
- Next steps and Near-Term Schedule

## MAY 25TH PRESENTATION FOLLOW UP

Are there…

- Any follow up questions to the materials presented in the last meeting?
- Any additional clarifications that would help before diving into the technical discussion?
- Any additional details about the studies, how they were performed, data used, etc. that would be useful to better inform the technical discussions?

# Resource Adequacy in the Desert Southwest – Key Findings

Key Finding #1: Load growth & resource retirements are creating an urgent need for new resources in the Southwest

Key Finding #2: Utilities' current resource plans have identified sufficient capacity additions to maintain reliability

Key Finding #3: A large share of the region's long-term needs will be met with solar, storage, and other "non-firm" resources

Key Finding #4: Even as solar and storage grow, the region's remaining firm resources will be needed for reliability

Key Finding #5: Substantial reliability risks remain as the region's electricity resource portfolio transitions

**Maintaining reliability will require immediate and sustained action over the next decade**

# Supply Resilience in PNM Planning Key Takeaways

- **Portfolios planned with a reliability standard in mind vary in performance during extreme events**
- **Stress testing candidate portfolios for resilience is important to understand differences in their performance**
- **Winterization helps reduce outages and firm up generation reducing the severity of extreme event impacts**
- **During ice storms, broader southwest dynamics will have significant impact on PNM's ability to avoid outages under extreme events**
  - PNM can weather localized ice storms by relying on external markets, but region-wide events almost certainly lead to outages.
  - Market support is limited in summer and PNM's system can avoid outages during a heat wave unless load reaches 1-in-20 levels or significant level of generation is forced out.
- **PNM should continue to monitor risk profile in winter season. Resource accreditation should continue to match the risk profile PNM is presented with**
- **As PNM increases its storage portfolio, its operational limits and utilization should be understood and considered in resource adequacy modeling**

# PNM RESILIENCY STUDY

## PNM RESOURCE ADEQUACY GOING FORWARD AND KEY QUESTIONS TO ANSWER (SUBSEQUENT MEETINGS)

Traditional systems designed around a LOLE standard (such as 1 day in 10 years) have similar performance if a loss of load event occurred (traditional portfolios did not vary much in the severity of event – EUE)

This study shows that focusing solely on LOLE can lead to portfolios that do vary significantly in the severity of an event if an event occurs.

1. Moving forward, should portfolios be designed to meet both a LOLE and an EUE requirement (Essentially should a decarbonized system should focus on providing the same attributes as a traditional system, just without carbon emissions)?

2. Along with bringing EUE into portfolios evaluations along with LOLE, should portfolios be further stress tested to gauge performance under adverse conditions as done in this study?

3. Finally, should the value of loss of load (which conceptually increase as a function of the duration of loss of load) be compared to the perceived cost of GHG?

# PNM RESILIENCY STUDY

## RESILIENCY STUDY PHASE II SCOPE OF WORK IDEAS, QUESTIONS TO ANSWER, ETC.

Given the limited data of actual events, what other ways do we have to synthesize extreme weather data?

How can we establish a (or what is a reasonable) baseline for portfolio metrics such as EUE?

What alternatives do we have for improving resiliency of the system aside from only utility scale resources?

What is the most cost-effective way of improving both summer and winter resilience?

What would be necessary to assess transmission within this current framework?

Is storage duration critical, or is storage volume more important and what is the cost tradeoff?

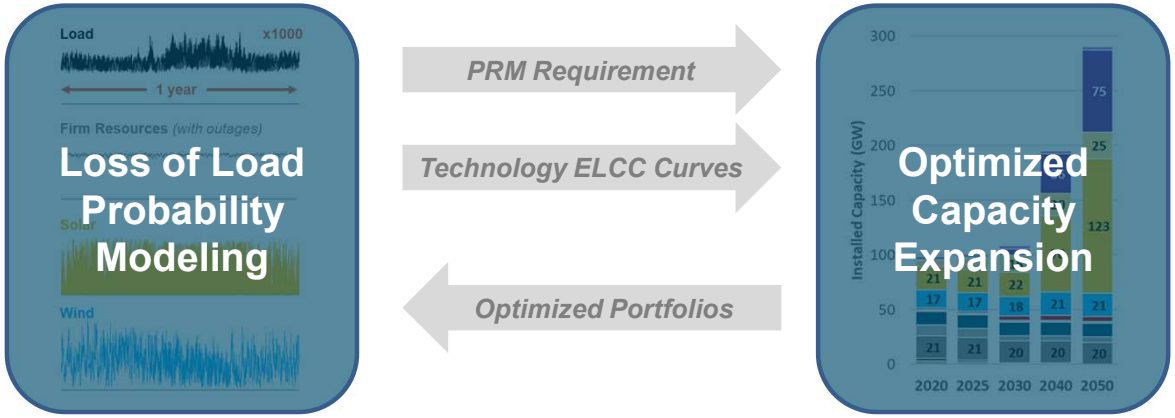
# OPEN FORUM

Stakeholders with ideas, slides/examples to share, etc.

## 2020 IRP MODELING FRAMEWORK

**The 2020 IRP modeling framework paired the EnCompass capacity expansion and production costing model with the SERVM loss-of-load-probability model to generate optimized portfolios that adhered to establish reliability metrics while meeting clean energy goals and minimizing cost.**

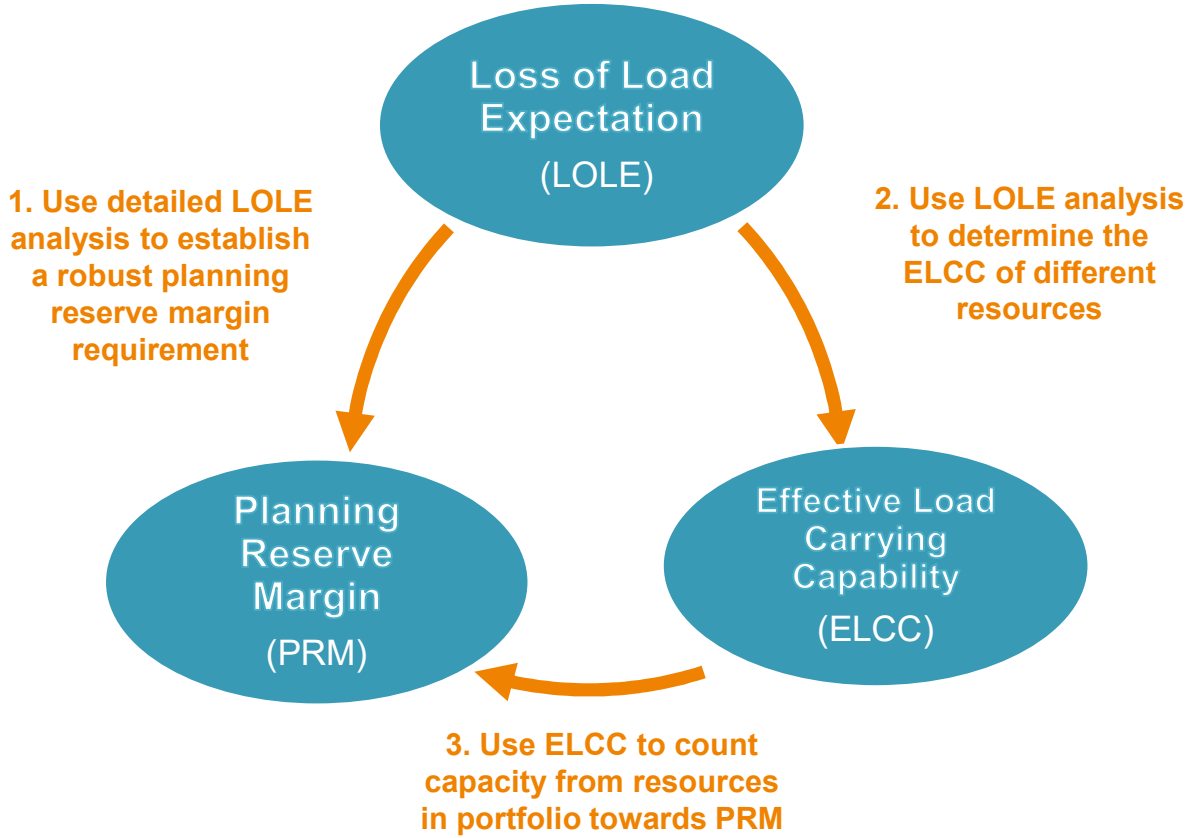
**1** Use LOLP model to quantify PRM requirement and "effective load carrying capability," which measures contribution of each resource-to-resource adequacy across 1000s of years




**3** Use LOLP model to simulate performance of resulting portfolios across wide range of conditions, validating resource adequacy

**2** Use capacity expansion to optimize future portfolios to meet PRM requirement and clean energy goals while minimizing cost

## RESOURCE ADEQUACY MODELING



# OPEN FORUM

Stakeholders with ideas, slides/examples to share, etc.

# THOUGHT PROVOKING QUESTIONS

1. Assuming there is a necessary balance between reliable service, cost, and environmental impacts would your expectation of the reliability of a decarbonized electric grid be: Better reliability, same reliability, reliability allowed to be less.
2. Assuming there is a necessary balance between reliable service, cost, and environmental impact, what do you consider an acceptable increase in cost for a carbon free grid?
3. When decarbonizing the grid, would you support the addition of a "safety net" if necessary to achieve the same level of current grid reliability – that is the installation of emergency peaking natural gas turbines that only run to prevent blackouts?
4. In order to decarbonize the grid, new and emergency technologies will likely have to be used before they have a long history of operating data to fully understand the operational benefits and risks of given technologies. Do you believe it's necessary to incorporate these new technologies in an effort to accelerate the carbon free transition or should PNM rely only on proven technologies?
5. Would a safety net (i.e. resources only run to prevent blackouts) to account for the unknown risks of new and emerging technologies make you more likely to support the use of new and emerging technologies quicker?
6. Would an electric grid with decreased reliability negatively influence a potential use/purchase an electric vehicle?
7. Would an electric grid with decreased reliability negatively influence a potential switch to electric heat in your home?
8. Do you consider hydrogen generated from electrolysis from renewables a part of a carbon free electrical grid?
9. What role do you see nuclear playing in a carbon free electrical grid: increased usage, same level usage, reduced usage?

# 2023 IRP PUBLIC ADVISORY PROCESS

## WE WOULD LIKE TO HEAR FROM YOU

We did not receive any feedback to these questions posted during the last public meeting:

1. What did we do well in the last (2020) IRP and where can we improve?
2. Any additional ideas for technical discussions?
3. What is the proper way to balance reliability, customer cost and accelerating the transition to clean energy?
4. How can we be more collaborative throughout the process with our public stakeholders?

We would also like to hear your ideas on the How we incorporate key takeaways and lessons learned from the Resiliency Study Phase I into the 2023 IRP so we can begin these discussions at our June 8, 2022 meeting.

We would also like to hear your ideas on the Resiliency Study Phase II Scope of Work / Questions to Answer.

# NEAR TERM SCHEDULE

## FUTURE MEETING TIME & LOCATION

**When: June 22, 2022**

**Topic: Public Advisory Steering Mini Session (Energy Efficiency Potential Study SOW) & Technical Session #2 (Modeling for Reliability, Resource Adequacy and Resiliency Continued)**

**Start Time: 9:00 AM**

**Location: Virtual**

**Due to the vast majority of participants for the first two meetings attending virtually, we have decided to make the second technical session a virtual meeting. If there is strong interest to resume in person meetings for future sessions, please email us at IRP@pnm.com. We will continue to notify everyone through the email service list regarding upcoming meeting dates, topics and locations (virtual or in person).**

# NEAR TERM SCHEDULE

## FUTURE MEETING TIME & LOCATION

**When: July 6, 2022**

**Topic: Public Advisory Technical Session #3: Load Forecast Scope of Work / Methodology & Candidate Resource Pricing Methodology**

**Start Time: 9:00 AM**

**Location: Virtual**

**Due to the vast majority of participants for the first two meetings attending virtually, we have decided to make the third technical session a virtual meeting. If there is strong interest to resume in person meetings for future sessions, please email us at IRP@pnm.com. We will continue to notify everyone through the email service list regarding upcoming meeting dates, topics and locations (virtual or in person).**

# NEXT MEETING

We encourage you to send in your thoughts ahead of time to IRP@pnm.com so that we can summarize them and distribute them for the next meeting. Please have your submissions in by June 16, 2022.

## MAKE SURE WE HAVE UP TO DATE CONTACT INFORMATION FOR YOU

www.pnm.com/irp for documents

IRP@pnm.com for e-mails

Register your email on sign-in sheets to receive alerts of upcoming meetings and notices that we have posted to the website.

# Thank you