SUMMARY OF JULY 27, 2022, TECHNICAL SESSION #4

On July 27, 2022, PNM held the fourth in the series of technical sessions for stakeholders devoted to discussing the advantages and disadvantages regarding the application of different technical methodologies within the modeling framework for the 2023 Integrated Resource Plan (IRP). PNM staff and a representative of the firm CDG Engineers, Inc. (CDG) presented a host of modeling updates using the EnCompass software that will be incorporated into the upcoming results.

This presentation on modeling focused on PNM's continuing improvements and performance testing as well as updating the modeling of energy efficiency bundles. CDG presented an overview of long duration storage featuring technologies that would move beyond the lithium-ion battery storage featured in the 2020 IRP to include pumped storage and hydrogen storage.

MEETING ATTENDEES

Director of Integrated Resource Planning Nick Phillips and the presenters welcomed questions and feedback on the framework and storage options from the 40 stakeholders attending the virtual session. Participants, not including PNM staff, included members of the public and representatives from the following organizations: Brubaker & Associates, CSolPower, Form Energy, Grid Strategies, InterWest Energy Alliance, New Mexico State University, New Mexico Public Regulation Commission (NMPRC), New Mexico Renewable Energy Transmission Authority (NM RETA), and Sandia National Laboratories.

Meeting slides can be found here.

Stakeholders raised the following questions.

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STAKEHOLDER QUESTIONS/COMMENTS

Stakeholder	Question/Comment	Categories
NM RETA:	Once the record peak is final, will PNM be breaking down the generation source contributions that were used to meet the peak: For example, what came from San Juan? What came from natural gas generation? What came from solar? What came from wind?	**General**
Member of the Public:	How would increased distributed generation, especially if it has some backup storage of its own, be factored into the modeling?	**Load & Energy Efficiency Forecasting**
NMPRC:	Slide 31 shows that if you had, say, a 100 megawatt 4-hour battery storage system, you could dispatch it for 50 megawatts for 8 hours. Would that have any effect on the life of the batteries themselves, or are there any concerns along those lines?	**Modeling**
Sandia National Laboratories:	Is anyone recovering the H2O after hydrogen compulsion at utility scales?	**Modeling**
NMPRC:	Would anyone from PNM like to comment on whether the source of hydrogen matters for meeting RPS requirements—whether the current RPS requirements or lifecycle are purely at the point of degeneration, or how and if that is a part of the overall IRP analysis, especially in the longer timeframe?	**Modeling**
NMPRC:	Can PNM comment on whether the source of hydrogen matters for meeting	**Modeling**

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	RPS requirements—whether the current RPS requirements or lifecycle are purely at the point of degeneration, or how and if that is a part of the overall IRP analysis, especially in the longer timeframe?	
Brubaker & Associates/NM RETA:	For the most expensive energy efficiency bundle, maybe it would make sense to model that and multiple bundles if the EE (energy efficiency) products are different**.**	**Modeling**
CSolPower:	What's the readiness technology level for burning hydrogen?	**Modeling**
CSolPower:	What is the proposed percentage of hydrogen to natural gas for the combustion turbines?	**Modeling**
InterWest Energy Alliance:	What did the results look like with higher medium import assumptions rather than low import assumptions (Slide 30)?	**Modeling**
Sandia National Laboratories:	[Looking at] the payback and generation plots (Slide 28), I was just curious about the terminology payback first generation. It sounds like difficult math: if you're getting more than you're putting in.	**Modeling**
CSolPower:	Considering that to even consider hydrogen—the power generation industry is energy intensive—is dangerous and takes away from an easily decarbonized electric grid. How do you justify this analysis?	**Modeling**

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Member of the Public:	Following up on the question about water availability, broadly, how much activity is being seen on promoting evaporation reductions of systems that have been used in other parts of the world, such as the ancient canal system from the Middle East, and also in Peru, where aqua like structures run underground? This is just clearly an issue beyond the IRP, but I'm putting it on the record here.	**Modeling**
Sandia National Laboratories:	What is the minimum duration requirement that was built into the assumptions for LDES [Long Duration Energy Storage] technologies?	**Modeling**
NM RETA:	Are the capital costs of the specific storage technologies a viable parameter in the modeling? Or is the storage cost model a generic unit cost?	**Modeling**
New Mexico State University:	Could you be specific about what parameters from this PHS (Pumped Hydro Storage) analysis would feed back into EnCompass capacity expansion models?	**Modeling**
NM RETA:	What is the renewable contribution to total generation assumed in 2035? When this scenario is run, where are you at in your ETA ramp?	**Modeling**
InterWest Energy Alliance:	How feasible is pumped storage in the desert Southwest and New Mexico? How much water is consumed through evaporation? What are the assumptions about water availability during summer peak? What about monsoon failure?	**Modeling**

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CSolPower:	When you assume the renewable energy drought, did you assume less need?	**Modeling**
CSolPower:	What is it going to take for PNM to include thermal storage?	**Modeling**
Sandia National Laboratories:	[Based on Slide 15], it seems pretty safe to assume that those lower cost energy efficiency bundles are going to be selected by the capacity expansion plan. So, I don't see the harm in free solving the model and saying, if the energy efficiency bundle costs less than $35, less than $25 a megawatt hour, just force it in and don't spend the computational power to figure out what should be obvious.	**Modeling**
Sandia National Laboratories:	Are these results using the zonal model, or are you assuming a copper sheet model? Adding the nodal model and assessing/comparing computational tradeoffs with commitment constraints may be interesting to evaluate.	**Modeling**
InterWest Energy Alliance:	Some consumer advocates acknowledge that this is a heavy lift for software programs. And yet, we know that huge computers exist in the world. Could you simply resolve that and do this really complicated multivariable modeling by investing a lot more money in your software? I realize that there are real constraints to the money you want to spend but if you spent more, what could you do? What's really possible out there?	**Modeling**
Form Energy:	Can you talk a little bit about the temporal granularity using the capacity expansion component of the modeling**?**	**Modeling**

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NM RETA:	Has the recent decision in the Supreme Court of the United States regarding EPA air quality program and implementation affected requirements for PNM CO2, as used for IRP purposes?	**Modeling**
Sandia National Laboratories:	Please give an example of what might be considered generic resource options.	**Modeling**
NM RETA:	Does the energy market input include future PNM membership in an RTO (Regional Transmission Organization) in the later years of the 2023 IRP?	**Reliability, Resilience & Resource Adequacy**
Form Energy:	Will there be a more in-depth discussion of the first step discussed in this process? That is, the ELCC (Expected Load Carrying Capability) and PRM calculation methodology and SERVM (Strategic Energy & Risk Valuation Model)?	**Reliability, Resilience & Resource Adequacy**
InterWest Energy Alliance/Grid Strategies:	Does ignoring generator minimums by using partial instead of full commitment for the capacity expansion miss some of the value storage provided by charging during periods when generators are at a minimum?	**Modeling**

All IRP questions and answers can be found here.

The latest future meeting schedule can be found here.

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