Integrated Resource Plan:
Statement of Need Table of Contents
Working group suggestions for Public Service New Mexico - May 31, 2023

Table of Contents

1. Introduction

The PNM Integrated Resource Plan 2023 [IRP-2023] [provides/brings] the [best/furthest] long range path for building out the strongest, most reliable electrical power delivery system for our customers over the next 20 years as we can envision [in 2023/now]. The IRP report begins with the current status of PNM’s system, and shows how available resources and technologies can bring improvements. Simultaneously we recognize that changes are occurring in most every sector of the environment in which we operate. These will require ongoing re-evaluation and modifications to the 2023 IRP plan that will be incorporated in future triennial PNM IRPs.

Meeting our clean energy goals and preserving system reliability while providing for the growing needs of our customers in an affordable manner will require the addition of significant amounts of new generation capacity over the next twenty years. We anticipate that over the seventeen years between today and 2040, the likely amount of new installed generation capacity will total between 4,000 to 5,000 MW or more. This amount of new capacity is significantly greater than the amount that exists today, implying that the achievement of our goals will require continuous and significant evolution of our portfolio.

2. Vision and Goals
   a. The identification of a set of resources and a sequencing of those resource deployments that conforms to the regulations and policies of the State of New Mexico, reliably serves all customers at an equitable cost that encourages consumer electrification efforts and that is resilient in the face of physical, cyber and environmental disruptions.
   b. Regulatory Environment and Requirements
i. Legal requirements and standards in planning horizon
ii. Known and expected rules

c. Goals
   i. Reliability and Resiliency: Utility’s Obligation to Serve
      1. Minimum Reserve Requirements
      2. Reliability Standards
      3. Swift recovery from climate or cyber disruption
   ii. Public Interest and Equity
      1. Responsibilities to Ratepayers and Shareholders
         a. Affordability
         b. Availability to Underserved Communities
         c. Climate Justice for individuals and communities impacted by plant retirements or local pollution
      2. Social and Environmental Costs
         a. Costs of Energy to Consumers
         b. Climate Change Impacts
         c. End of Life (Recycling/disposal)
   iii. Consumer Education
   4. NIMBY

3. Current and Expected System Conditions
   a. Timeline
      i. Urgency (What is driving the urgency?)
   b. Load Forecast
      i. Electrification Impact
   c. Baseline System
      i. Forecasted Retirements
      ii. Transmission Constraints
      iii. Distribution System Constraints

4. Identified Decision Points and Pathways
   a. “Getting to Zero” Carbon
      i. Motivations
         1. Regulations & Policy
            a. ETA (2019)
            b. EPA - evolving
   b. Making “no regrets” decisions
      i. Minimizing investment risk
         1. Stranded assets
         2. Loss of public trust
      ii. Maximizing investment opportunity
         1. First to market w/ long term solutions
         2. Public trust and sentiment
iii. Value of money vs future human life opportunities

5. Resources

a. Candidate Resources
   i. Renewable generation
      1. Solar incl Community Solar
      2. Wind
      3. Geothermal
   ii. No new gas of any type
   iii. Energy Storage
      1. Short duration (up to 10 hr)
         a. Lithium-ion battery etc. see below charts

2. Inter-day & Multi-day/week Long Duration Energy Storage (LDES) - see charts below

3. Seasonal Shifting
   a. Pumped-hydro storage, thermal energy storage, etc

4. Not for electric
Storage technologies can be segmented based on their duration of dispatch with LDES filling the Inter-day to Multi-day / week role

CODEIFYING THE TECHNOLOGY

1. Short duration: Durations up to 10 hours
2. Inter-day LDES: Sometimes called “diurnal”
3. Multi-day / week LDES: Commonly called “seasonal”
4. Seasonal shifting: Typically secured in “interim” or “baseline” at the second or third discharge as a concentrated storage fuel

There are numerous technologies within Long Duration Storage

- Potential New Resources
  - Adoption of new technologies
  - High Penetration of Distributed/Customer-owned Generation
  - Firming Plans
  - Energy efficiency and demand-response
  - Cost-effective repowering or upgrading of existing fossil resources to minimize risk of stranded investment or delayed decarbonization

- [System Needs]

- Preferred Portfolio
  - [results of PNM modeling]
  - Potential pilot projects
  - [PNM conclusions]

DETERMINATION OF THE RESOURCE PORTFOLIO:
A. To identify the most cost-effective resource portfolio, utilities shall evaluate all supply-side resources, energy storage, and demand-side resource options on a consistent and comparable basis, taking into consideration risk and uncertainty, including but not limited to financial, competitive, operational, fuel supply, price volatility, downstream impacts on transmission and distribution investments, extreme-weather events, and anticipated environmental regulation costs.

B. The utility shall evaluate the cost of each resource through its projected life with a life-cycle or similar analysis.

C. The utility shall consider and describe ways to mitigate ratepayer risk.

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

1. load management or modification and energy efficiency requirements;
2. renewable energy portfolio requirements;
3. existing and anticipated environmental laws and regulations, and, if determined by the commission, the standardized cost of carbon emissions;
4. fuel diversity;
5. susceptibility to fuel interdependencies;
6. transmission or distribution constraints; and
7. system reliability and planning reserve margin requirements.

E. Alternative portfolios. In addition to the detailed description of what the utility determines to be the most cost-effective resource portfolio, the utility shall develop alternative portfolios by altering risk assumptions and other parameters developed by the utility.