UNSE RPAC Meeting Minutes – February 25, 2026

Facilitators:

Lauren Briggs (Director of Resource Planning)
Ryan Anderson (Business Development Manager)

Meeting Focus:

- PRM and ELCC Study by E3
- Feedback review & RPAC Portfolios

Key Themes and Topics Discussed:

1. Introductions

2. Stakeholder Representation:
    - TEP/UNSE
        - Resource Planning
        - Business Development
        - Communications
        - Corporate Environmental Services
        - Emerging Technology and Innovation
    - Consultants
        - E3
    - Business advocacy
    - Commercial Customers
        - Fresh Produce Association of the Americas
    - Mining
        - South32
    - Consumer advocacy groups
        - AARP
        - AZ PIRG
        - RUCO
        - River Cities United Way
    - Renewable energy, environmental, and efficiency groups
        - SWEEP
    - Regulatory
        - Arizona Corporation Commission

3. Aurora Modeling License
    - Deadline for notification of a modeling license is March 6th
    - Anticipated License fee is $7000
    - Data Dashboard available with NDA

4. PRM and ELCC Study (Nick Schlag from E3)

    - Resource Adequacy is becoming more complex due to increasing renewable penetration, requiring all-hours-reliability rather than traditional summer peak planning.
    - Recent events (California 2020 evening outages, Texas 2021 winter event) illustrate risks emerging outside typical peak periods.
    - Loss of Load Probability (LOLP) modeling is used as the analytical foundation, simulating the system under a wide range of weather, renewable output, and outage conditions.
    - ELCC measures each resource's reliability contribution, providing a consistent way to compare technologies with different operating characteristics.
        - Solar and storage resources interact, and their combined contribution can exceed their individual values.
    - Marginal ELCC declines as more of any single resource type is added, reflecting saturation effects and shifting reliability risk.
    - PRM is determined through iterative simulation, adjusting "perfect capacity" until the system meets the targeted 0.1 LOLE standard.
        - 18% PRM was calculated using LOLP modeling and required to meet the 0.1 LOLE standard.

5. Feedback Review and RPAC Portfolios:

    - Survey participants identified challenges for utilities, including meeting growing demand sustainably, managing affordability, and reducing carbon emissions.
    - Customers' primary challenges include understanding rate options, how their behavior impacts their bill, and navigating various rate structures.
    - When asked about priorities and portfolios, respondents were split between lowest emissions and least cost. Additional feedback emphasized technology neutral approaches and preparing for customer growth.
    - Respondents recommended focusing on a broad mix of technologies such as solar + storage, virtual power plants, geothermal, nuclear and energy efficiency to meet future reliability and decarbonization goals.

6. Emerging Technologies – Geothermal & Nuclear
    - Enhanced Geothermal Systems (EGS)
        - Uses engineered fracturing to tap heat in non-porous rock, enabling 24/7, carbon-free power.
        - Still emerging high upfront drilling costs, subsurface risk, and limited long-term operational history, though Arizona has strong resource potential and growing state support.
    - Advanced Nuclear / SMRs
        - Provides firm, carbon-free baseload with improved safety and modular designs that could eventually reduce construction complexity.
        - Industry remains at an early stage, with significant cost and deployment risks.

Utilities are monitoring progress but are not planning near-term reliance.

7. Stakeholder Questions:

PRM and ELCC Study

- How does ELCC adjust when you have multiple resource types?
  - ELCC is not static value. It is calculated within the context of the entire portfolio. E3 evaluates resources together so their diversity benefits are captured.
- What assumptions have changed since the last IRP ELCC analysis?
  - Load and resource assumptions have been updated but the core methodology has stayed the same.
  - Separate ELCC calculations for TEP and UNSE rather than a joint system.
- How is Energy Efficiency handled in the RA/ELCC analysis?
  - Energy Efficiency is embedded directly into the load forecast.
- Are externalities considered in this analysis?
  - No, the RA/ELCC study is purely reliability based. Externalities and economics are handled later in the IRP modeling process.
- Is Demand Response part of this study of future planning?
  - DR is not included in this analysis because UNSE does not currently have an active DR program.
- Why not assume a future DR program?
  - Prior DR proposals were disallowed by the ACC. UniSource remains open to DR if future regulatory posture changes or if DR is included in future All-Source RFPs.
- Does DR show diversity benefits with renewables?
  - Yes, in other jurisdictions DR has ELCC behavior similar to 4-hr battery storage.

Feedback Review and RPAC Portfolios

- Are there any middle ground scenarios being analyzed that reflect the value of different resources rather than relying on the three portfolios shown here (slide 31)?
  - Yes, we will complete a total of 7 portfolios. Other portfolios will focus on different resource types such as Pumped Hydro Storage, Nuclear, and a portfolio suggested by an RPAC member.
- How do you plan to represent the high load growth portfolio in the analysis?
  - We are still determining the most appropriate way to model high load growth. Our goal is to use a profile that reflects elevated load relative to UNSE's base forecast while remaining consistent with what would be considered reasonable growth.

Emerging Technologies – Geothermal & Nuclear

- How is the cost of advanced geothermal compared to other emerging clean energy technologies?

    - Advanced geothermal and advanced nuclear currently appear to have similar cost ranges, though both still show wide variability because early projects differ significantly. As more projects are built, cost certainty across all these technologies should improve.
- If the plant equipment at a geothermal facility is similar to what is found at a gas plant, why are geothermal costs so much higher?
    - Even though geothermal plants use equipment that looks similar to gas plants, most of the cost isn't in the hardware, it's in the drilling. Geothermal requires drilling extremely deep wells and developing the underground reservoir, and that drilling work is by far the biggest and most expensive part of the project.
- Has TEP looked at converting former coal sites to enhanced geothermal, similar to how some utilities have done coal-to-gas conversions? Are there pieces of coal plant infrastructure that could be reused for geothermal?
    - Unlike coal or gas plants, geothermal facilities typically don't use steam turbines, they use hot water to heat a separate working fluid in a closed loop. So most of the major plant equipment isn't reusable. You could still reuse things like the interconnection and benefit from a brownfield site, but overall, there's far less carryover compared to a coal-to-gas conversion.

Action Items:

- Next RPAC Meeting: **June 24, 2026 from 10 AM to 12pm MST**.

These notes aim to encapsulate the discussions and outline the next steps for effective collaboration moving forward in the RPAC process.