TEP RPAC Meeting Minutes – December 9, 2025

Facilitators:

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Meeting Purpose:

Continue the RPAC process leading to the 2026 Integrated Resource Plan.

Meeting Focus:

- Load Forecasting Methodology
- Long-Term Capacity Expansion (LTCE) Inputs

Key Themes and Topics Discussed:

1. Introductions

2. Stakeholder Representation:
    - TEP
        - Resource Planning
        - Business Development
        - Communications
        - Corporate Environmental Services
        - Pricing/Customer Analytics/Rates
    - Business advocacy/Civic groups
        - Arizona Solar Energy Industry Association
        - Tucson Young Professionals
    - Consultants
        - Siemens
    - Education
        - University of Arizona
    - Local government
        - City of Tucson
        - Pima County
    - Military
        - Davis-Monthan AFB
    - Nonprofit social services groups
        - Interfaith Community Services
    - Renewable energy and Environmental groups
        - Sierra Club
        - SWEEP
        - The Nature Conservancy

3. Load Forecasting:

- Presentation focused on updated demand projections for TEP's service territory.
- Discussion on factors influencing load growth, including economic development and large customer projects.
- Methodology included ARIMAX time series forecasting models using population, demographics, weather, and economic data.
- Separate forecasts for demand-side management (DSM), distributed generation (DG), and electric vehicle adoption layered on top of base forecasts.
- Large customer forecasts include case-by-case assessment of new industrial and data center loads.
- Weather analysis with temperatures trending above historic averages.

4. Long-Term Capacity Expansion Inputs:
    - Review of key inputs for capacity expansion modeling.
    - Inputs include natural gas price forecasts, load growth assumptions, and technology cost trajectories.
    - Consideration of resource mix options to meet reliability and sustainability goals.
    - Discussion on constraints such as transmission limits and regulatory requirements.

5. Levelized Cost of Energy (LCOE):
    - Analysis of cost metrics for different technologies (renewable, storage, conventional generation).
    - Comparison of LCOE assumptions with industry benchmarks.
    - Highlighted importance of accurate LCOE in portfolio optimization.
    - LCOE projections impacted by expiration of tax credits (e.g., solar/wind PTC ends after 2027).

6. Power Price Outlook:
    - Presentation on projected wholesale power prices and market trends.
    - Discussion on supply volatility and its implications for procurement strategies.
    - Consideration of how price outlooks inform IRP modeling and risk management.
    - Hourly pricing trends with solar hours seeing price drops and non-solar peak hours remaining high until the late 2030s.

7. Stakeholder Feedback Themes:
    - Engagement: Interest in load forecasting assumptions and how they influence portfolio modeling.
    - Inputs: LCOE metrics and their role in resource planning; LTCE assumptions; power prices.
    - Portfolio Development: Modeling approaches and trade-offs.
    - Key challenges: Complexity of portfolio modeling while balancing cost, reliability, and sustainability; maintaining accuracy and uncertainty considerations in resource planning; aligning diverse priorities into portfolios.

8. Stakeholder Questions:

Portfolio Modeling

- How are large customer loads (e.g., data centers) reflected in the forecast?
    - Scenarios are modeled with sensitivity ranges and due diligence considerations before inclusion in the IRP. Data centers and mining operations are assessed on a case-by-case basis. Inclusion occurs only when projects reach high certainty (contracts, financial commitments).
    - Additionally, Siemens uses monthly updates to integrate large load additions into WECC-wide models.
- What climate datasets inform forward-looking weather normalization?
    - Historical weather data plus scenario stress tests. The current approach uses trend-adjusted 10-year averages for near-term accuracy. There is a need for sensitivity analysis on temperature variance and extreme weather scenarios. The cross-referencing of federal data with commercial sources was suggested due to data gaps and political changes. Any forward projections are currently under review.
- Why are DG and DSM impacts removed from the base forecast?
    - This is done to calculate true usage per customer before layering in DG and DSM adjustments. TEP tracks DSM measures within their respective programs but cannot fully account for non-program efficiency actions. The goal is to understand incremental load from new customers without masking by DG or DSM impacts.
- How does household income factor into usage per customer?
    - Higher income statistically correlates with higher energy usage. Economic variables like housing starts and income are integrated into TEP models.
- How are hyperscale data centers and AI loads handled in planning?
    - These customers are only included after due diligence and financial security (e.g., letters of credit, contracts) are obtained. TEP currently uses special contracts and cost-assignment principles for such customers.
- What is the outlook for natural gas and turbine availability?
    - Gas prices are expected to rise mid-term due to LNG exports and data center demand. The Siemens' forecast shows LNG exports doubling by 2030 resulting in a tightening supply-demand balance. Turbine lead times are 5-7 years for large units. There are some concerns about a potential 'bubble' in combustion turbine procurement, similar to the early 2000s.

Levelized Cost of New Resources

- How will power prices and resource costs evolve?
    - Expectations are for a near-term increase driven by gas prices and firm capacity needs with a long-term decline as clean energy adoption grows.

Battery storage is expected to narrow price gaps in later years. The projections for hourly price shapes show persistent evening peaks (5-8 p.m.) despite solar penetration.

- What is the impact of ITC and PTC expiration on resource costs?
    - The LCOE for renewables rises after ITC/PTC expiration post-2027. This will drive the front-loading of solar and wind projects and hydrogen incentives will also be removed. Developers are likely to safe-harbor projects to capture remaining benefits. Siemens expects the cost competitiveness of renewables to decline mid-term.
- Why are turbine lead times so long (5-7 years)?
    - The high demand from data centers and limited manufacturing capacity for large combustion turbine units are impacting these timeframes. Large OEMs (GE, Siemens, Mitsubishi) are backlogged with smaller turbine providers also facing delays.
- What are the main drivers of capital cost increases?
    - These increases reflect data center-driven demand for gas turbines and supply chain constraints along with tariffs.

Power Price Outlook

- Why is there a dip in gas price projections around 2033?
    - LNG export growth plateaus after 2033 and production ramps up to meet demand thereby reducing price pressure. Future LNG capacity could change if geopolitical or market conditions shift.
    - The current forecast includes only approved and under-construction projects.
- Does the gas price forecast include pipeline or turbine costs?
    - No, it reflects commodity prices only (i.e., Henry Hub).

Action Items:

- Complete load forecasting analysis and finalize LCOE inputs and share in future RPAC meeting.
- Review resource technology issues with stakeholders.

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