
Indiana Michigan Power: **2021 Integrated Resource Plan** ***Public Stakeholder Meeting #4***

November 30, 2021

Presented via GoToWebinar (register here) → <https://attendee.gotowebinar.com/register/4716544662590273296>

BOUNDLESS ENERGYSM

WELCOME AND SAFETY MOMENT

Andrew Williamson | I&M Director Regulatory Services

Festival of Fire Safe Lights

Some lights are only for indoor or outdoor use; **Use the appropriate lights**

Make sure lights have the logo of a recognized safety standards agency such as **CSA** or **ULC**

Read the manufacturer's instructions for the number and types of light strands that can be strung together safely

Replace any string of lights with worn or broken cords or loose bulb connections

Always **turn off indoor decorative lights** before leaving home or going to bed

MEETING GUIDELINES AND AGENDA

Jay Boggs | Siemens PTI

Agenda



| Time | | |
|------------|-------------------------------|---|
| 9:30 a.m. | WELCOME AND SAFETY MOMENT | Andrew Williamson, I&M Director Regulatory Services |
| 9:35 a.m. | MEETING GUIDELINES AND AGENDA | Jay Boggs, Siemens PTI |
| 9:40 a.m. | RECAP OF PREVIOUS MEETINGS | Jay Boggs, Siemens PTI |
| 10:00 a.m. | PORTFOLIO ANALYSIS | Michael Korschek, Siemens PTI |
| 10:30 a.m. | BREAK | |
| 10:45 a.m. | BALANCED SCORECARD | Art Holland, Siemens PTI |
| 11:30 a.m. | METRICS DEEPDIVE | Peter Berini, Siemens PTI |
| 12:15 p.m. | LUNCH | |
| 1:00 p.m. | PATH TO PREFERRED PORTFOLIO | I&M Management |
| 1:30 p.m. | PREFERRED PORTFOLIO | Art Holland, Siemens PTI |
| 2:00 p.m. | CLOSING DISCUSSION | Andrew Williamson, I&M Director Regulatory Services |
| 2:30 p.m. | ADJOURN | |

Questions and Feedback

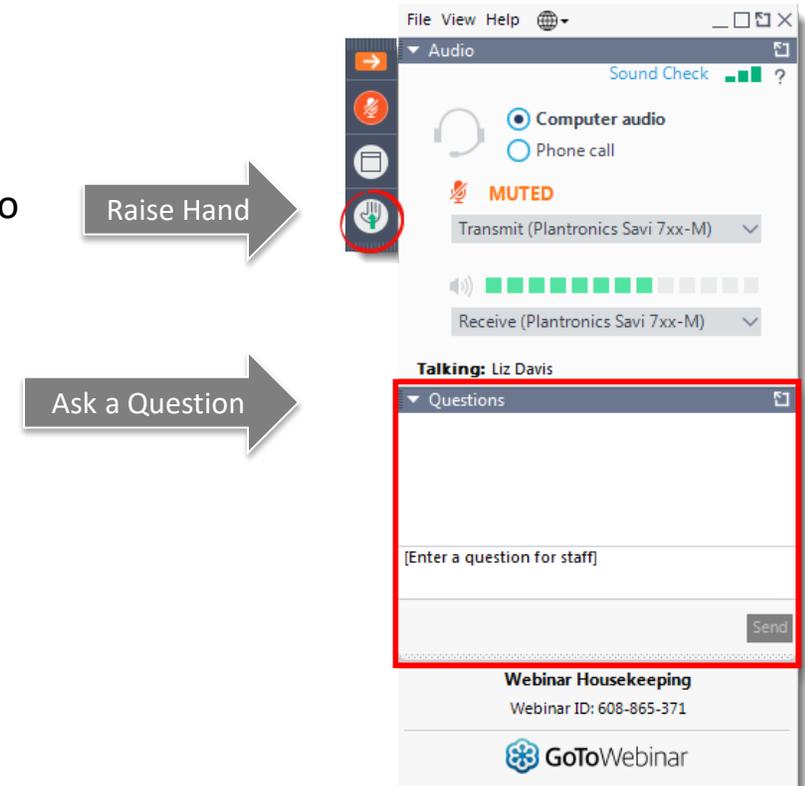
One purpose of today’s presentation is to explain the IRP process and collect feedback from stakeholders. Stakeholder feedback will be posted on the I&M website IRP portal and will be considered as part of the Final IRP.

If you have a question about the IRP process during this presentation:

- Type your question in the Questions area of the GoToWebinar panel
- During the feedback and discussion portions of the presentations, please raise your hand via the GoToMeeting tool to be recognized. We plan to hear from all who wish to be heard and address all questions
- Any questions that cannot be answered during the call will be addressed and posted on the website above

If you would like to make a comment or ask a question about the IRP process after the presentation has concluded:

- Please send an email to I&MIRP@aep.com
- Stay informed about future events by visiting the I&M IRP Portal located at www.indianamichiganpower.com/info/projects/IntegratedResourcePlan



Guidelines



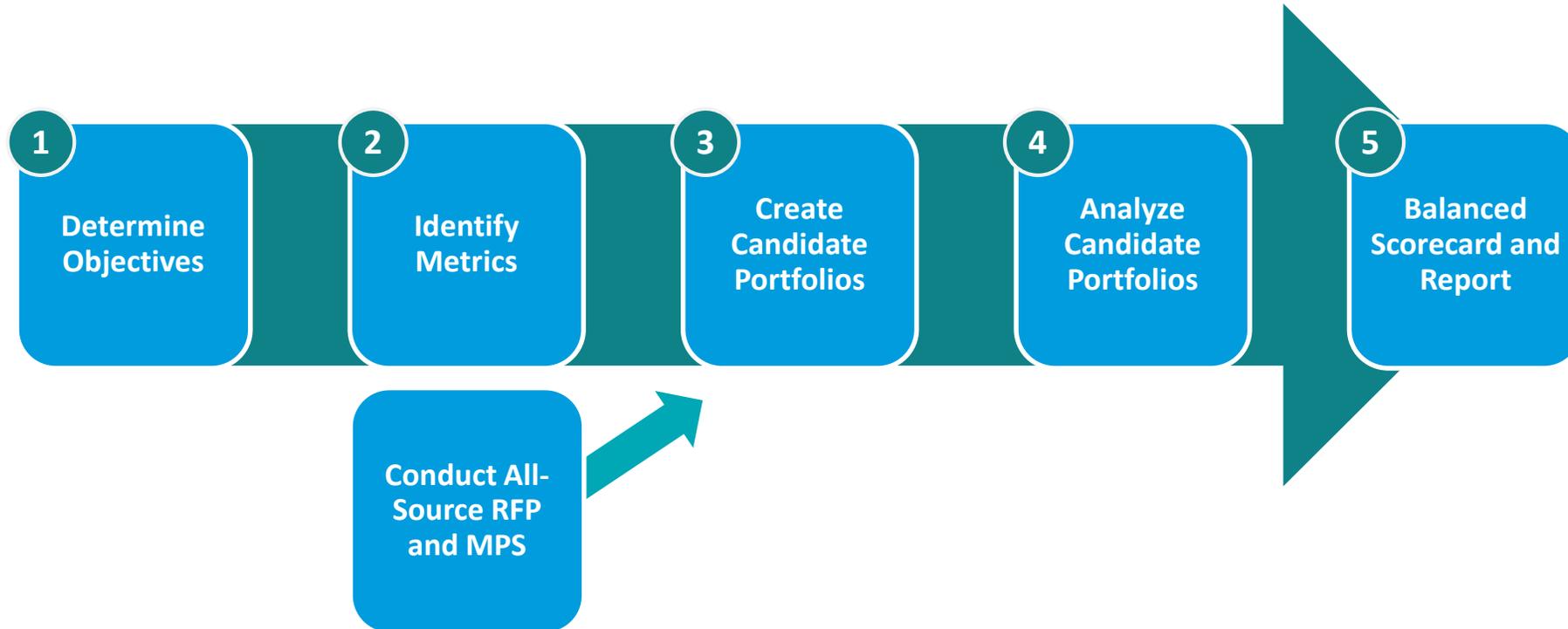
1. Due to the number of participants scheduled to join today’s meeting, all will be in a “listen-only” mode by default.
2. Please enter questions at any time into the GoToWebinar portal. This is the best to way to ensure your question is answered. We will attempt to answer all questions during the session, time permitting.
3. Time has been allotted during the session to answer questions related to the materials presented. Unanswered questions will be addressed after the presentation and posted in accordance with the Questions and Feedback slide.
4. At the end of the presentation, we will open-up the floor for “clarifying questions,” thoughts, ideas, and suggestions.
5. Please provide your feedback or any additional questions on the Stakeholder Meeting #4 presentation **within ten business days of the conclusion of this meeting.**

Peter Berini, Siemens PTI

RECAP OF THE PREVIOUS STAKEHOLDER MEETINGS

2021 IRP Process and Current State

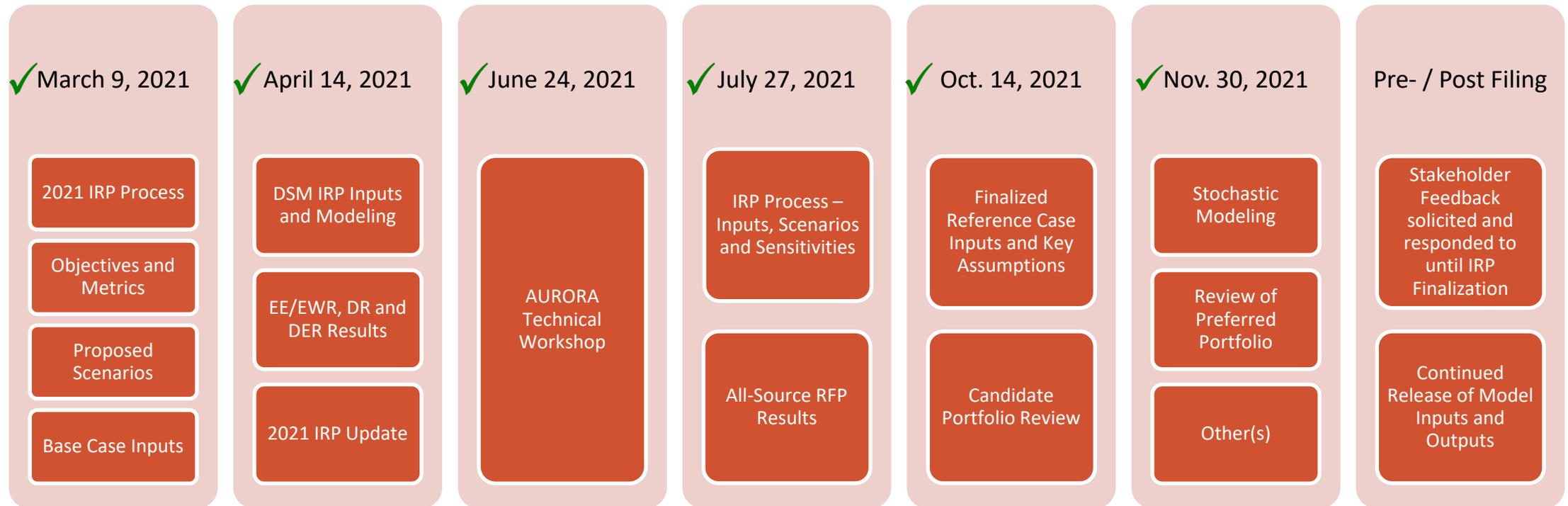
Siemens PTI: Approach to Integrated Resource Plan Modeling



Stakeholder Timelines and Engagement



I&M established a stakeholder engagement process to encourage questions, make suggestions and provide data. As part of the IRP process, I&M has now conducted a total of five IRP Workshops and one Technical AURORA Workshop.



Michael Korschek, Siemens PTI

STEP 4: ANALYZE CANDIDATE PORTFOLIOS

Probabilistic Framework Applied to Candidate Portfolios



Candidate Portfolios were subjected to Probabilistic Simulations (stochastic risk analysis) to measure performance across many future scenarios. The stochastic process produces hundreds of internally consistent simulations that can provide a more realistic understanding of the potential variation in future states of the world.

Probabilistic Modeling is the basis for Step 4: Analyze Candidate Portfolios and informs the Step 5: Balanced Scorecard and Report

Advantages

- Exhaustive potential futures can be analyzed
- Uses impartial statistical rules and correlations

Disadvantages

- Link between statistical realizations and the real world can be difficult to understand

| Market Driver | Varied Stochastically |
|-----------------------------|-----------------------|
| Load | ✓ |
| Natural Gas Prices | ✓ |
| Coal Prices | ✓ |
| CO2 Prices | ✓ |
| Capital Costs for New Entry | ✓ |

Stochastic Portfolio Results Inform Scorecard Metrics



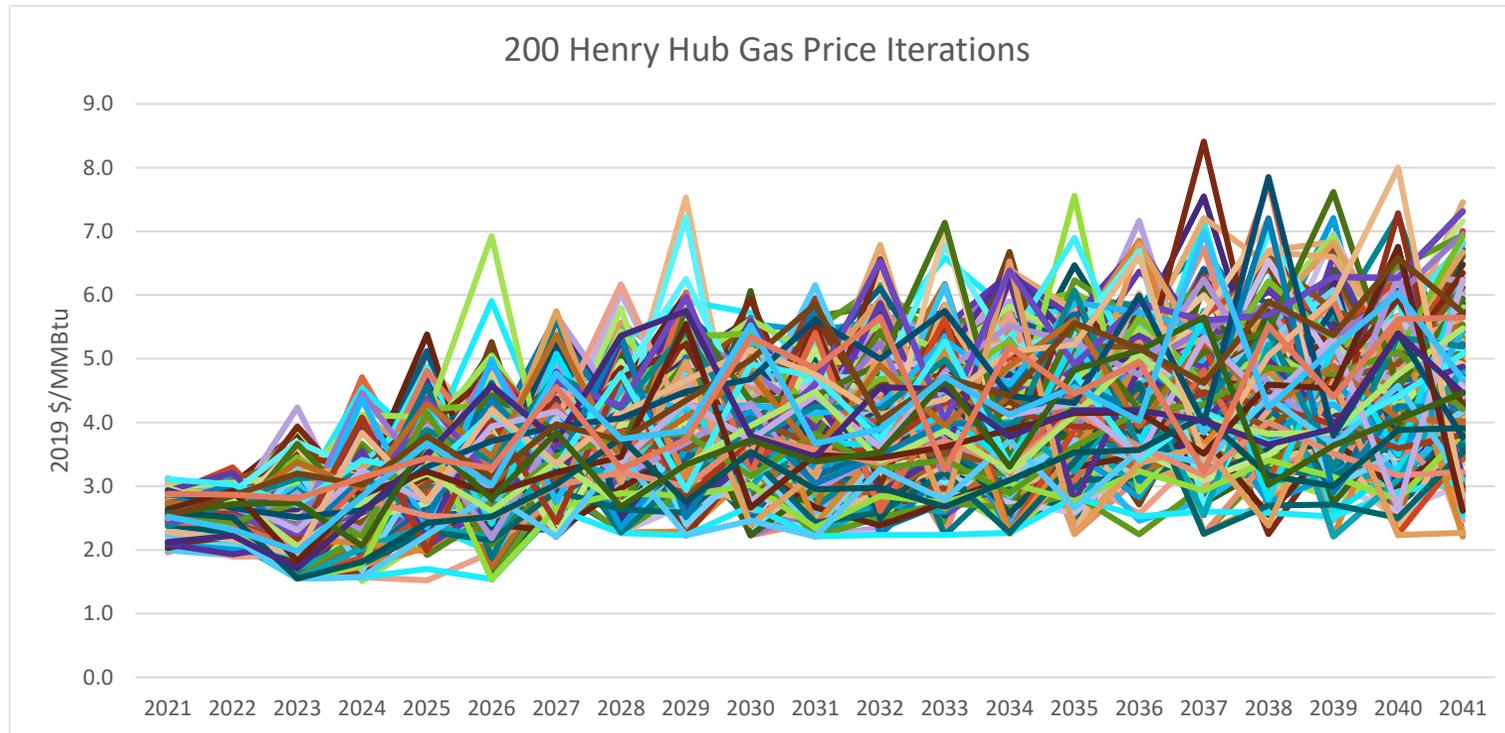
In measuring each portfolio’s performance across 200 iterations, we can quantify each of the measures associated with IRP objectives. This provides a direct comparison of portfolio performance that will be summarized in the Balanced Scorecard.

| IRP Objectives | Proposed IRP Metric | Unit |
|---------------------------------|--|------|
| Affordability | 20-Year NPV Cost to Serve Load | \$ |
| | 10-Year NPV Cost to Serve Load | \$ |
| Rate Stability | 95th percentile value of NPV Cost to Serve Load | \$ |
| | CAGR of Rate Increase (2025-2029) | % |
| Sustainability Impact | CO2e Emissions | Tons |
| Market Risk Minimization | Purchases as a % of Demand (2041) | % |
| | Sales as a % of Demand (2041) | % |
| Reliability | Reserve Margin above Forecasted Pool Requirement | % |
| Resource Diversity ¹ | Number of Unique Fuel Types | # |
| | Number of Unique Generators | # |

¹Resource Diversity fuel type metric is driven by Step 3 results and are not varied stochastically for the I&M portfolio.

Probabilistic Modeling Approach for Henry Hub

The probabilistic modeling framework works to measure risk from 200 potential future paths for each stochastic variable. By running each portfolio through 200 iterations, each portfolio's performance and risk profile can be quantified across a wide range of potential futures.



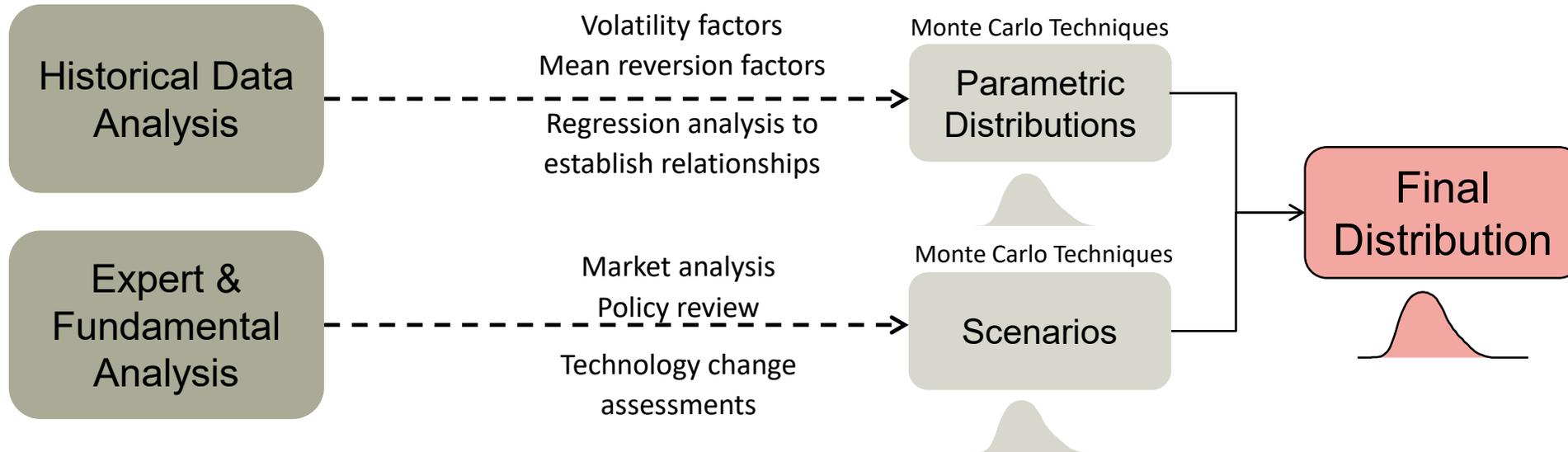
Probabilistic Variables and Drivers for Stochastic Inputs

Each stochastic input category has several components. Siemens identified the most salient market drivers for each category and build distributions around them. These distributions are based on multiple factors for each category as outlined below.

| Load | Natural Gas | Coal | CO2 | Capital Cost |
|--|---|--|--|--|
| <ul style="list-style-type: none">• Peak Load• Average Load• Driver Variables:<ul style="list-style-type: none">• EV and Solar DG• Weather• GDP/ Personal Income• EIA view on low, mid & high cases | <ul style="list-style-type: none">• Henry Hub• Modeling based on:<ul style="list-style-type: none">• Historical Volatility• Historical Mean Reversion• Historical Correlation• EIA view on low, mid & high cases | <ul style="list-style-type: none">• ILB• PRB• CAPP• NAPP• Modeling based on:<ul style="list-style-type: none">• Historical Volatility• Historical Mean Reversion• Historical Correlation• EIA view on low, mid & high cases | <ul style="list-style-type: none">• National CO2 price• Modeling based on:<ul style="list-style-type: none">• Expert view on low, mid & high cases | <ul style="list-style-type: none">• Relevant technologies included• Modeling based on:<ul style="list-style-type: none">• EIA view on low, mid & high cases• All Source RFP Results• RFP Results |

Probabilistic Modeling Approach for Stochastic Inputs

The below graphics illustrates the technical steps taken generate a full distribution for each stochastic input. This process blends historical performance and relationships coupled with market expertise to generate a distribution that reflect historical behavior and expected future performance.

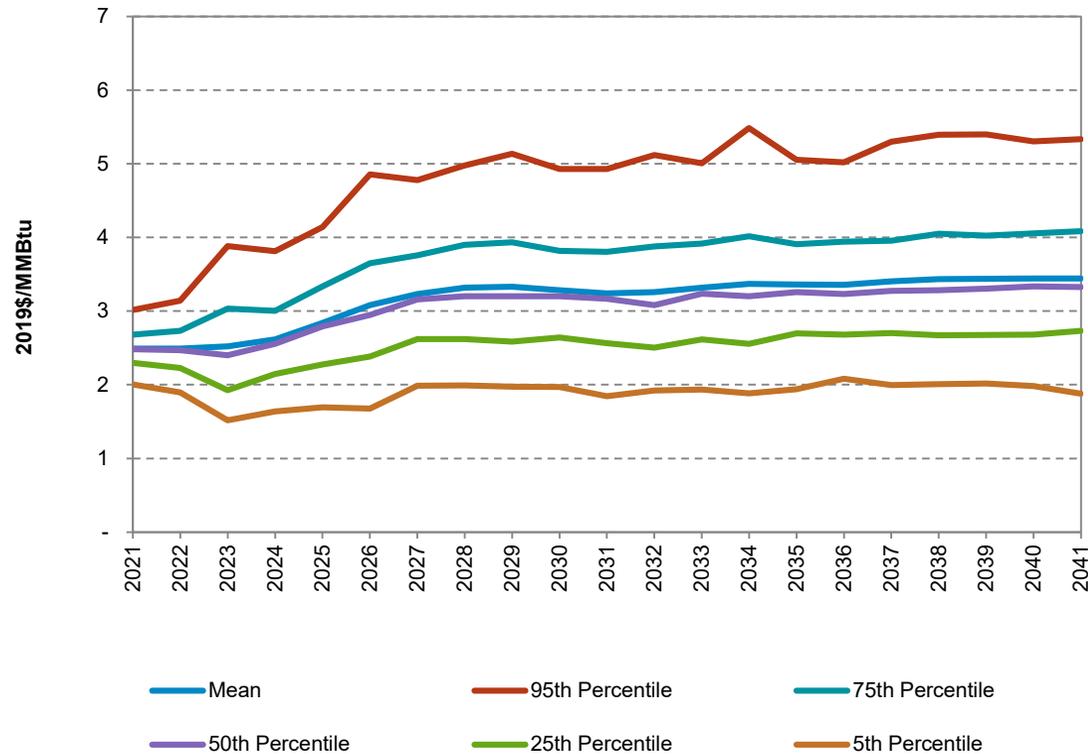


Candidate Portfolio Stochastic Inputs

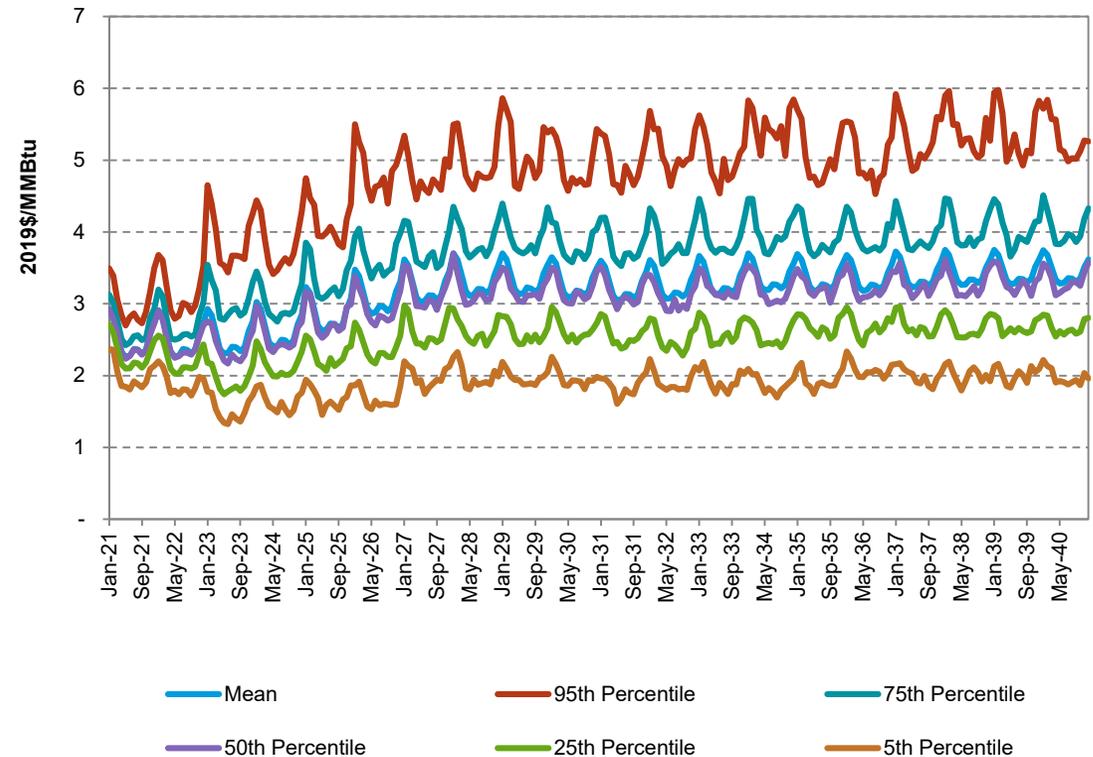
Gas Prices (2019\$/MMBtu)



Henry Hub, Annual



Henry Hub, Monthly

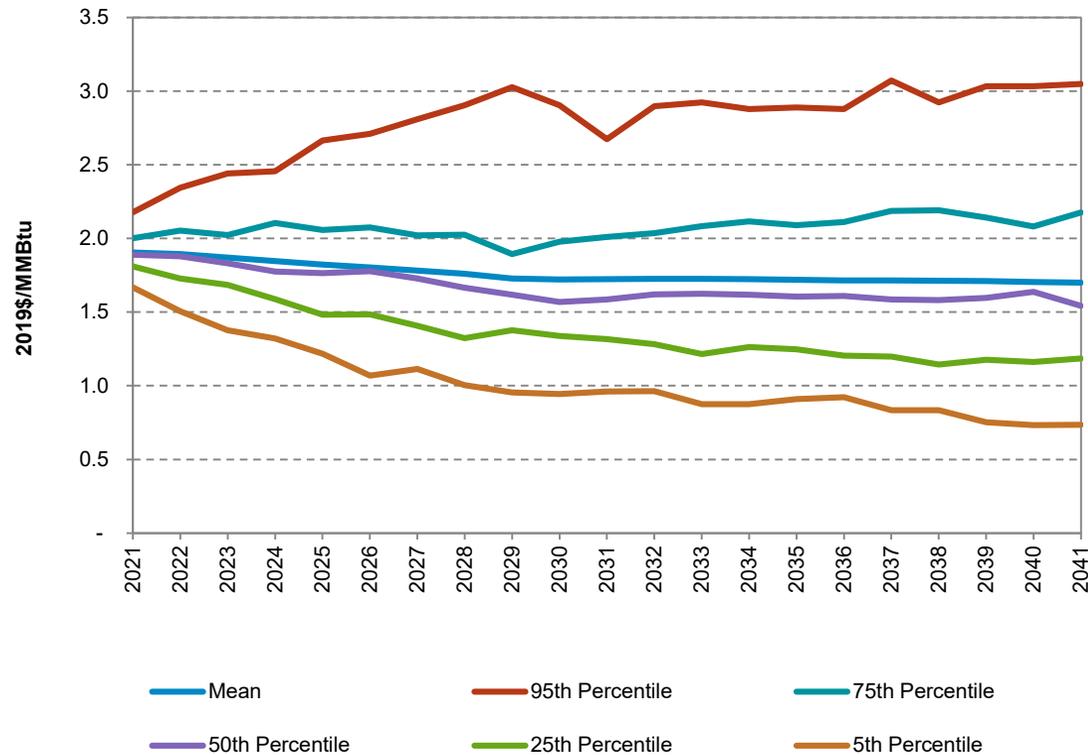


Candidate Portfolio Stochastic Inputs

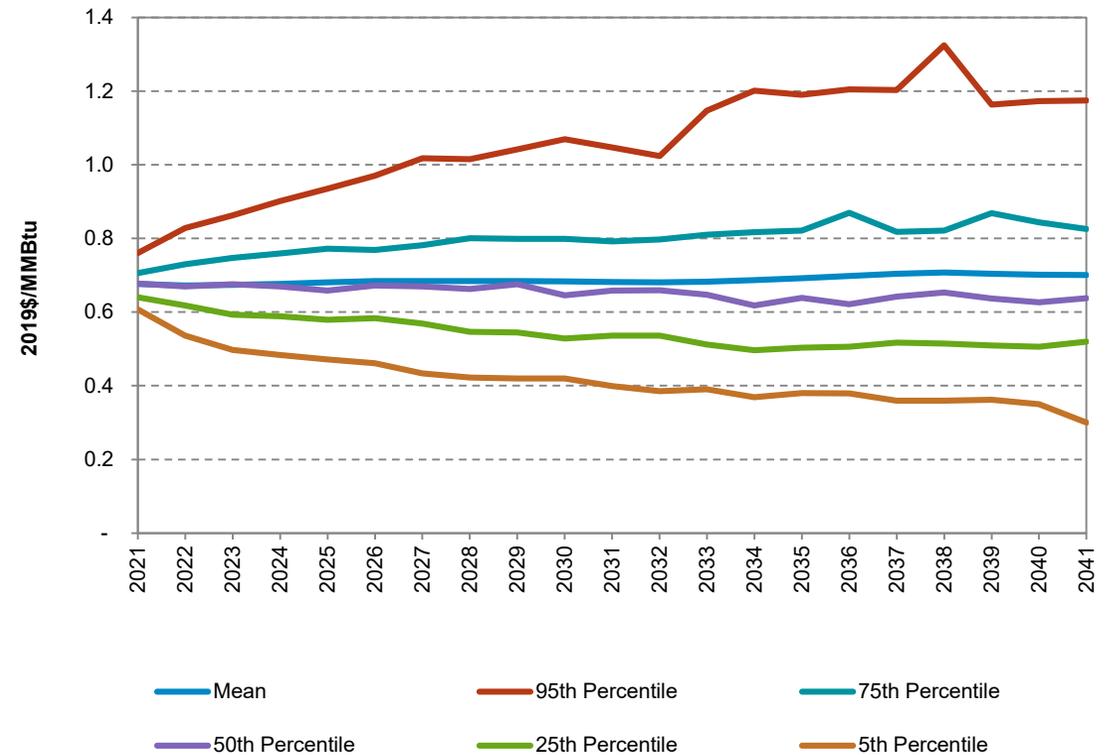
Coal Prices (2019\$/MMBtu)



Illinois Basin (ILB)



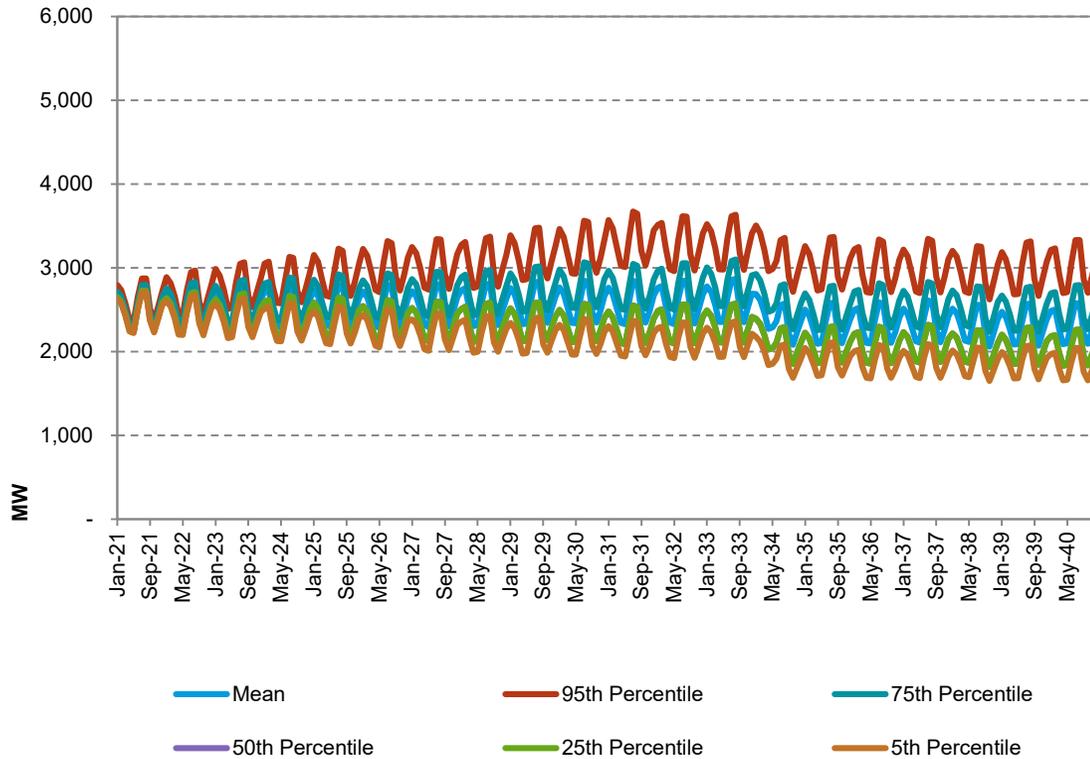
Powder River Basin (PRB)



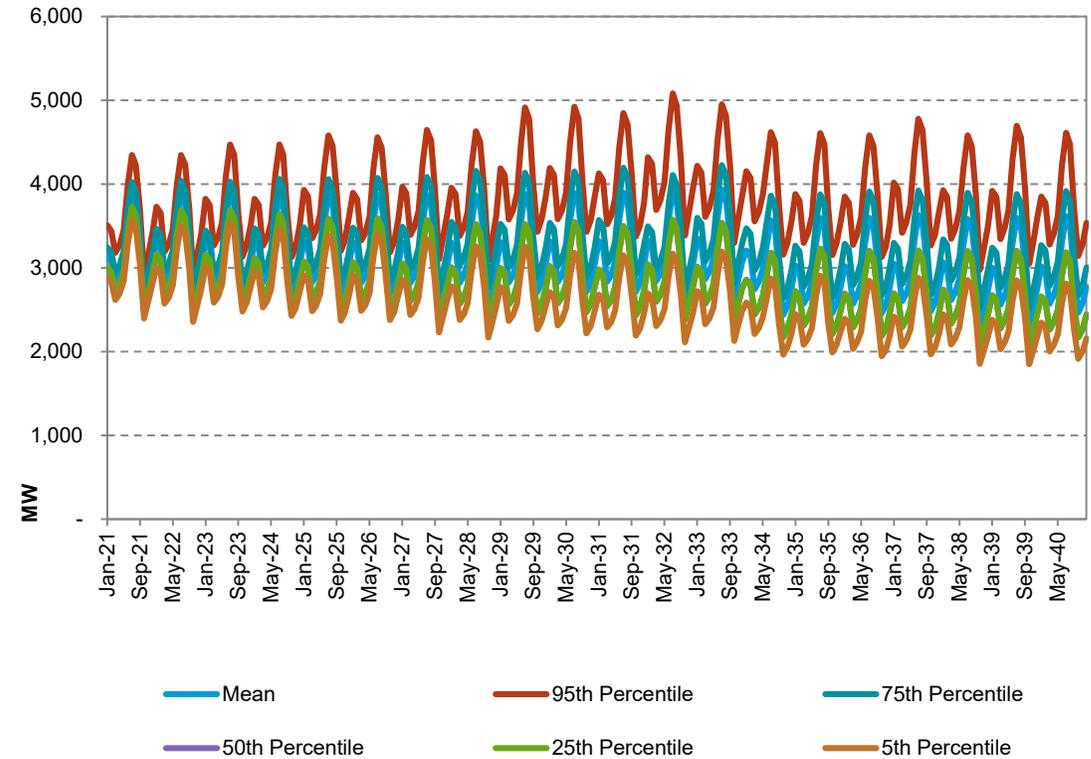
Candidate Portfolio Stochastic Inputs

Energy Demand (MW)

Average Load



Peak Load

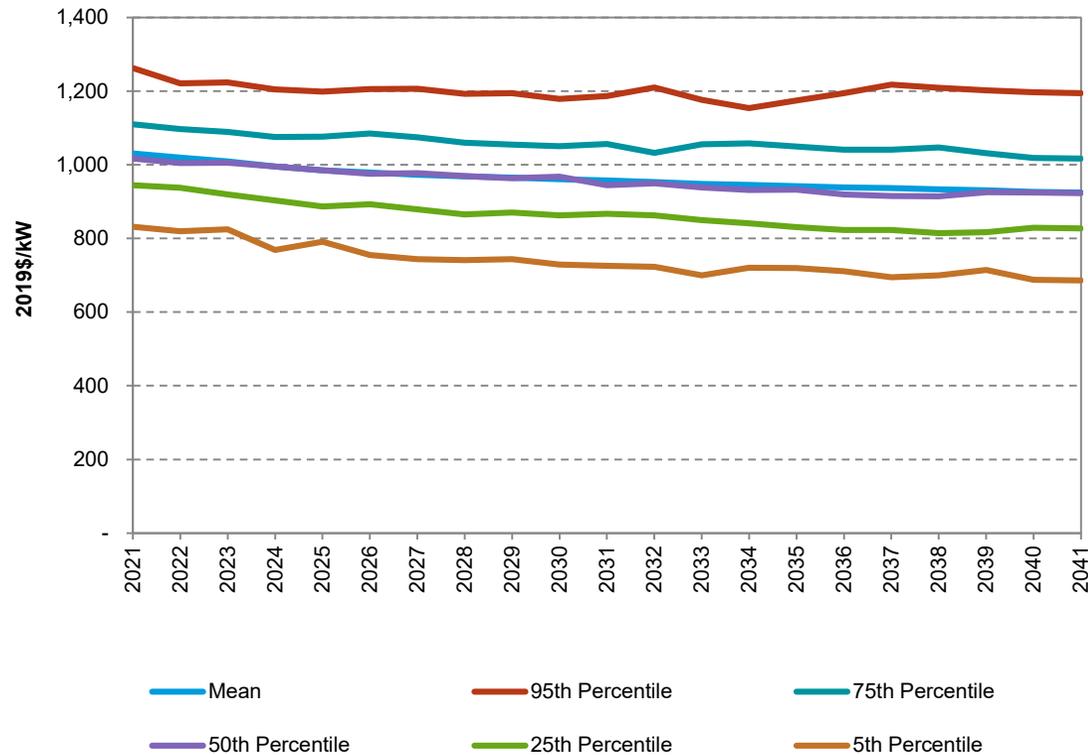


Candidate Portfolio Stochastic Inputs

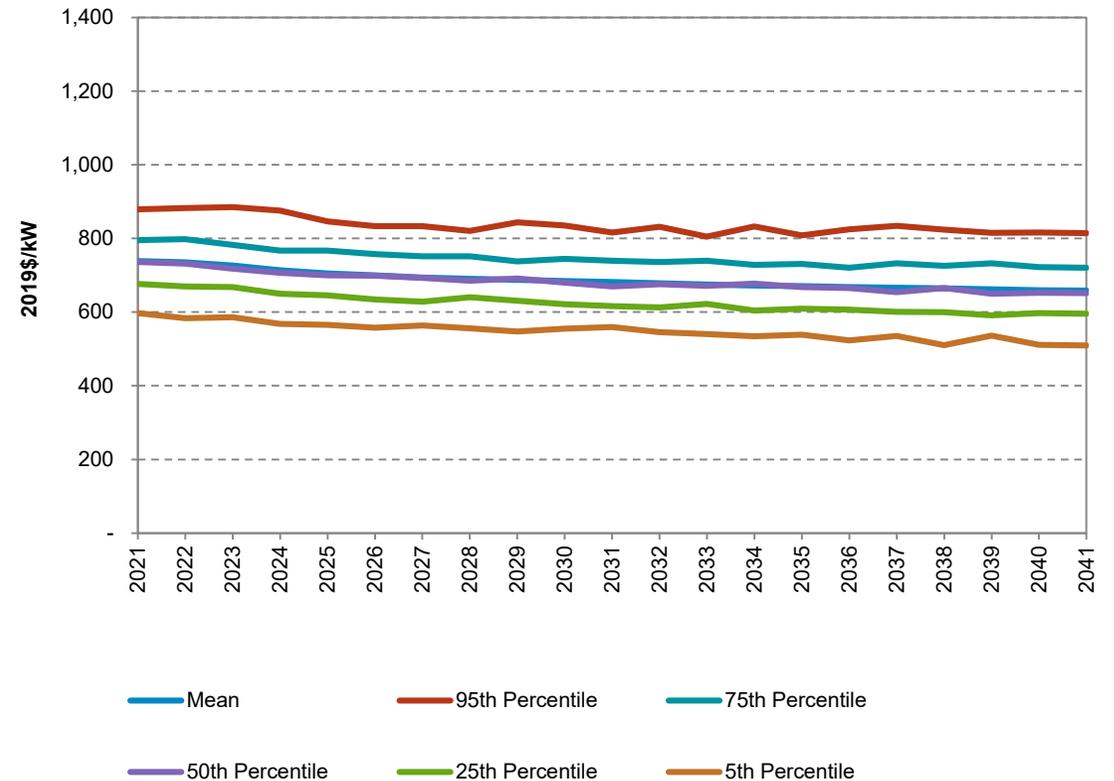
Capital Costs (2019\$/kW)



Advanced 2x1 Combined Cycle



Simple frame Combustion Turbine

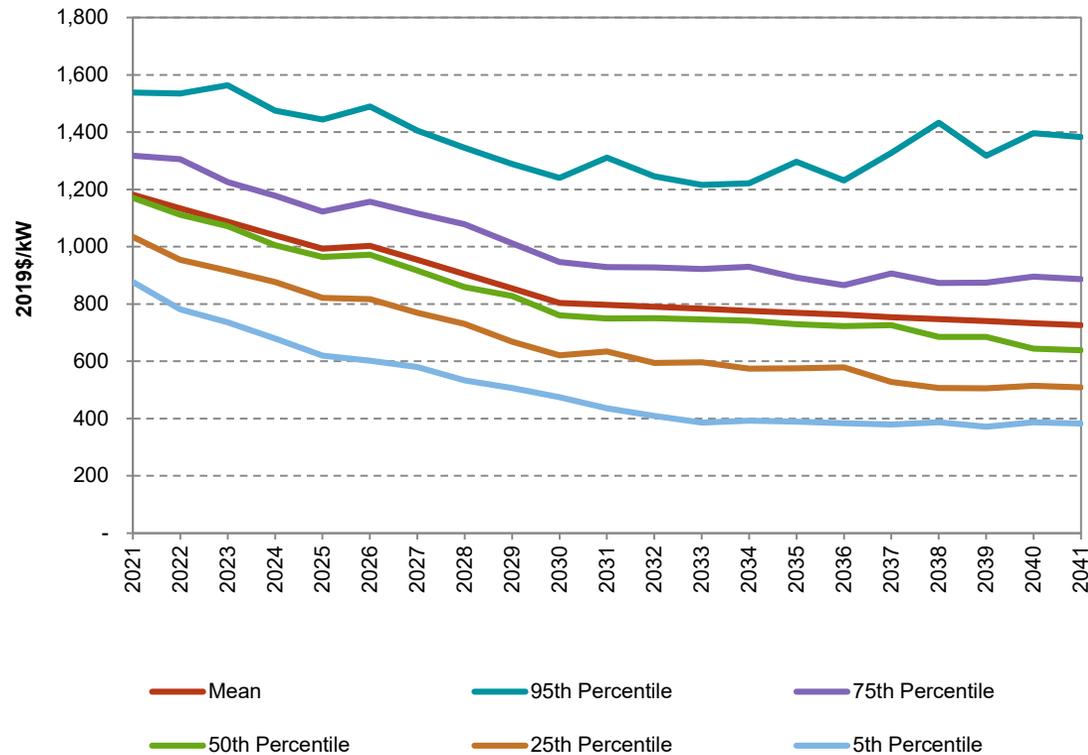


Candidate Portfolio Stochastic Inputs

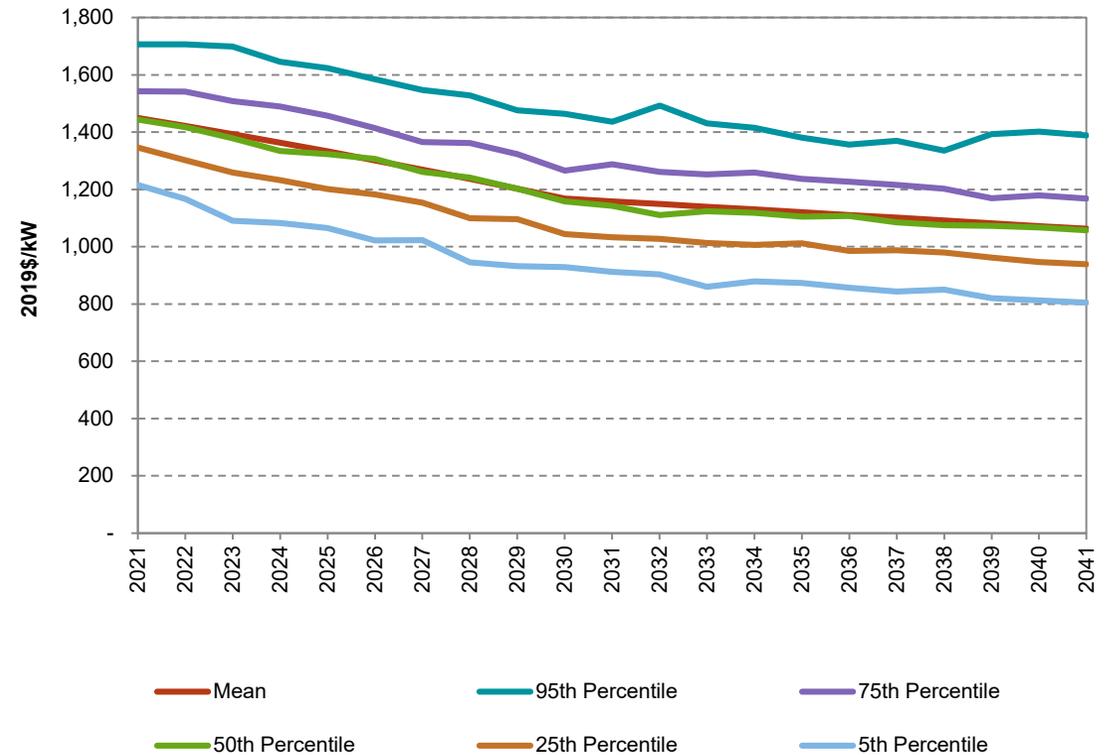
Capital Costs (2019\$/kW)



Solar PV – Tracking

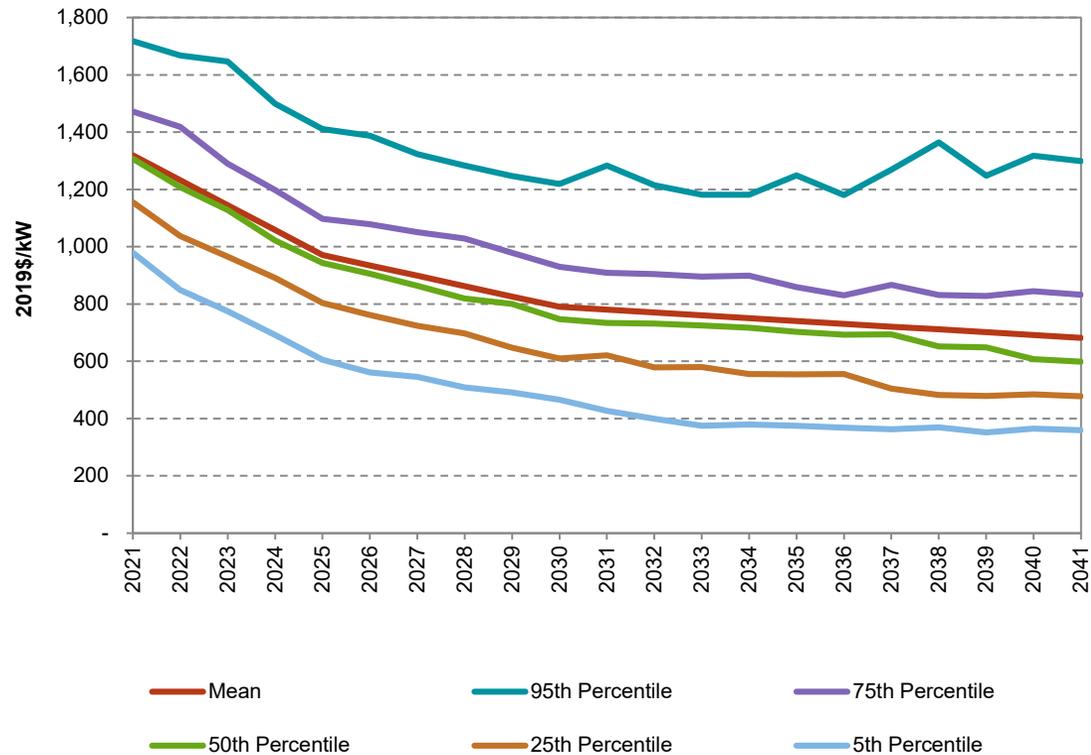


Onshore Wind



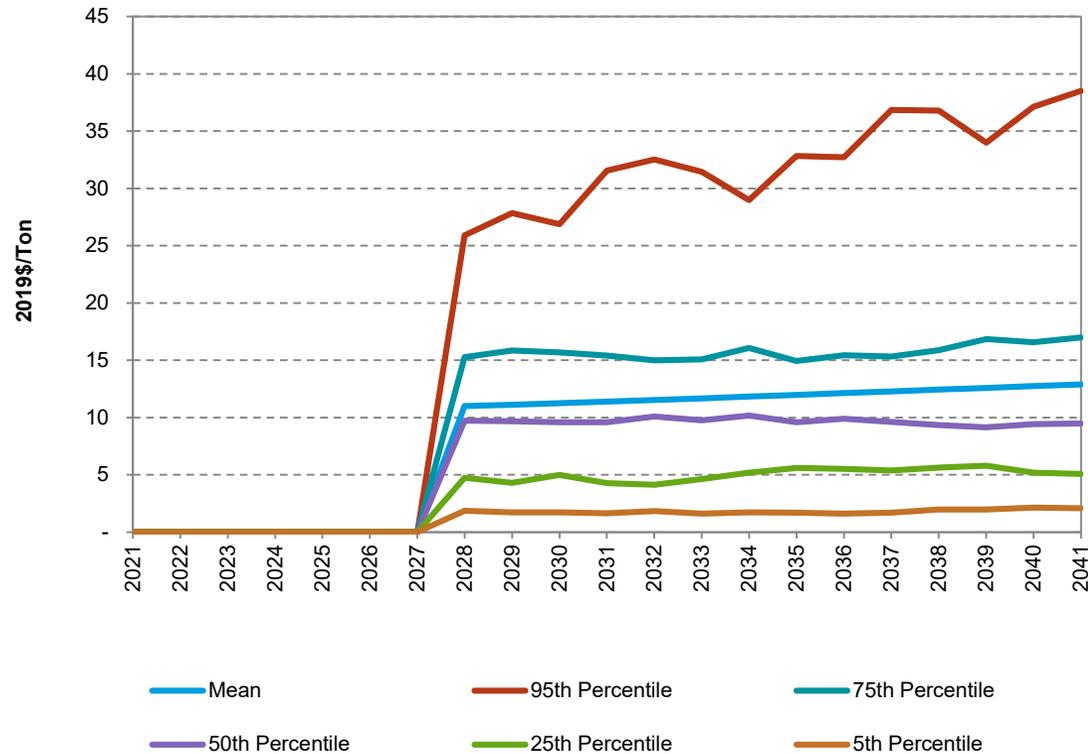
Candidate Portfolio Stochastic Inputs Capital Costs (2019\$/kW)

Batteries – Li-ion



Candidate Portfolio Stochastic Inputs Environmental Costs (2019\$/ton)

National CO2



FEEDBACK AND DISCUSSION

Art Holland , Siemens PTI

BALANCED SCORECARD

Balanced Scorecard Illustrative



Detailed portfolio results will be included for each Candidate Portfolio in the report write-up filed with the Commission. The Candidate Portfolios will be summarized in terms of each Objective and Metric through the balanced scorecard. In addition to the balanced scorecard, time-series information for portfolios will also be included in the report write-up.

Balanced Scorecard (Illustrative)

| Candidate Portfolios | Affordability | | Rate Stability | | | Sustainability | Market Risk Minimization | Reliability | Resource Diversity | | | |
|----------------------|-------------------------------|------------------------------|--|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|-------------------------------|
| | 20-Year NPV CTSL ² | 10-Year NPV CTS ² | 95th Percentile Value of NPV CTSL ² | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) | # of Unique Fuel Types (2041) |
| Reference Case | | | | | | | | | | | | |
| Portfolio #1 | | | | | | | | | | | | |
| ... | | | | | | | | | | | | |
| ... | | | | | | | | | | | | |
| ... | | | | | | | | | | | | |
| Portfolio #n | | | | | | | | | | | | |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

Portfolios Summary

Portfolio Names and Descriptions



| Portfolio Name, Revised | Description |
|----------------------------------|---|
| Reference Case (Original) | Rockport Unit 1 (2028) Rockport Unit 2 (2024) and Cook (2034, 2037) |
| Rockport 1 2024 | Rockport Unit 1 Early Retirement (2024) |
| Rockport 1 2025 | Rockport Unit 1 Early Retirement (2025) |
| Rockport 1 2026 | Rockport Unit 1 Early Retirement (2026) |
| Cook 2050+ | Cook Unit 1 and Unit 2 License Extensions (beyond 2034 and 2037) |
| Cook 2050+ and No Gas | Cook Unit 1 and Unit 2 License Extensions and No Conventional Gas |
| Expanded Build Limits | Expanded Cumulative Build Limits on Renewable Energy and Storage |
| Reference' ("Prime") | Reference Case (Original) with an Import and Export Limit at ~30% of I&M Load |
| Rapid Technology Advancement | 35% Reduction in Renewable, Storage and EE Costs |
| Enhanced Regulation | Increased Environmental Regulations Leading to High Gas, Coal and CO2 Prices |
| Rockport 1 2024 N2G | Rockport Unit 1 Early Retirement (2024) Replacing SEA with Net to Gross EE Bundle Savings |
| Rockport 1 2026 N2G | Rockport Unit 1 Early Retirement (2026) Replacing SEA with Net to Gross EE Bundle Savings |
| Rapid Technology Advancement N2G | Rapid Technology Advancement (RTA) Replacing SEA with Net to Gross EE Bundle Savings |

Balanced Scorecard Reference and Scenario Portfolios



| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|---------------------------|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 74.8% | 17.5% | 8.9% | 8.6% |

| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|---|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Rapid Technology Advancement ³ | \$7.50 B | \$4.26 B | \$8.81 B | 94.2% | 3.2% | 53.7% | 5.1% |
| Enhanced Regulation ³ | \$7.49 B | \$4.16 B | \$8.81 B | 94.1% | 3.2% | 54.0% | 4.0% |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

³ Rapid Technology Advancement affordability metrics are based on Reference Case capital costs

- Reference and Scenario Portfolios are based on broad economic and environmental variations as a technique to develop optimized portfolios for further testing (“states of the world”)

Balanced Scorecard Reference and Company Portfolios



| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|---------------------------|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 74.8% | 17.5% | 8.9% | 8.6% |

| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|------------------------------------|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Cook 2050+ ³ | \$6.20 B | \$4.29 B | \$7.50 B | 97.9% | 1.0% | 49.2% | 7.5% |
| Cook 2050+ and No Gas ³ | \$6.54 B | \$4.42 B | \$7.87 B | 99.4% | 1.1% | 46.3% | 1.6% |
| Reference' | \$6.98 B | \$4.06 B | \$8.26 B | 75.4% | 16.1% | 10.0% | 2.5% |
| Expanded Build Limits ⁴ | \$7.93 B | \$4.57 B | \$9.23 B | 80.1% | 8.6% | 21.8% | 3.2% |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

³ The Cook portfolios include an assumption for relicensing cost but no estimate for capital expenditure required for equipment life extension

⁴ The Expanded Build Limits portfolio was conducted as a test and does not represent a reasonable portfolio option

- The Company Portfolios represent I&M strategic options and/or tests of certain analysis inputs
- The Reference' Portfolio contains an import and export limit of ~30% of I&M Load in response to stakeholder feedback. The Reference' portfolio has a low cost to serve load when compared to other Candidate Portfolios
- Cook life extension portfolios (Cook 2050+ and Cook 2050+ and No Gas) test the cost and performance benefits of Cook life extension
- Cook portfolios include an assumption for relicensing cost but no estimate for CapEx required for equipment life extension
- The Cook portfolios add valuable strategic insights into near-term resource additions

Balanced Scorecard

Reference and Regulatory Required Portfolios



| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|---------------------------|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 74.8% | 17.5% | 8.9% | 8.6% |

| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|----------------------------------|-------------------------------|-------------------------------|---|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|
| Rockport 1 2024 | \$7.32 B | \$4.31 B | \$8.60 B | 75.0% | 17.0% | 8.8% | 5.8% |
| Rockport 1 2025 | \$7.49 B | \$4.39 B | \$8.76 B | 76.6% | 15.2% | 12.3% | 6.3% |
| Rockport 1 2026 | \$7.27 B | \$4.28 B | \$8.54 B | 75.0% | 17.0% | 8.8% | 1.2% |
| Rockport 1 2024 N2G | \$7.44 B | \$4.38 B | \$8.72 B | 75.7% | 15.4% | 10.1% | 7.0% |
| Rockport 1 2026 N2G | \$7.26 B | \$4.29 B | \$8.54 B | 75.8% | 15.3% | 10.2% | 1.7% |
| Rapid Technology Advancement N2G | \$7.28 B | \$4.19 B | \$8.85 B | 93.3% | 4.9% | 44.2% | 1.4% |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

- Several portfolios were included to meet certain regulatory requirements
- Rockport 1 2026 identified as slightly lower cost alternative to the Reference Case (Original)

Balanced Scorecard

Reference and Candidate Portfolios Initial Screening



| Portfolio Name, Revised | Action | Rational |
|------------------------------------|----------|---|
| Reference Case (Original) | Refined | Retain for comparison |
| Rockport 1 2024 | Inform | Evaluate Early Rockport Retirement, Minimal Lead Time for New Resources |
| Rockport 1 2025 | Inform | Evaluate Early Rockport Retirement, Minimal Lead Time for New Resources |
| Rockport 1 2026 | Maintain | Evaluate Early Rockport Retirement |
| Cook 2050+ ¹ | Maintain | Optionality to Maintain Nuclear Resources, Sustainability Goals |
| Cook 2050+ and No Gas ¹ | Maintain | Optionality to Maintain Nuclear Resources, Sustainability Goals |
| Expanded Build Limits | Inform | Evaluate Build Limits, High Exports and Costs |
| Reference' | Maintain | Manage Export Limits |
| Rapid Technology Advancement | Maintain | Scenario Results |
| Enhanced Regulation | Maintain | Scenario Results |
| Rockport 1 2024 N2G | Inform | Evaluate Alternative Treatment of Energy Efficiency Resources |
| Rockport 1 2026 N2G | Inform | Evaluate Alternative Treatment of Energy Efficiency Resources |
| Rapid Technology Advancement N2G | Inform | Evaluate Alternative Treatment of Energy Efficiency Resources |

¹The Cook portfolios include an assumption for relicensing cost but no estimate for CapEx required for equipment life extension

Balanced Scorecard Reference and Focused Portfolios



| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO ₂ e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|---------------------------|-------------------------------|-------------------------------|---|--|-----------------------------------|-------------------------------|------------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 74.8% | 17.5% | 8.9% | 8.6% |

| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTSL ² | 95th Percentile 20-Year NPV CTSL ² | % Reduction of CO ₂ e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) |
|------------------------------------|-------------------------------|-------------------------------|---|--|-----------------------------------|-------------------------------|------------------------------------|
| Cook 2050+ ³ | \$6.20 B | \$4.29 B | \$7.50 B | 97.9% | 1.0% | 49.2% | 7.5% |
| Cook 2050+ and No Gas ³ | \$6.54 B | \$4.42 B | \$7.87 B | 99.4% | 1.1% | 46.3% | 1.6% |
| Reference' | \$6.98 B | \$4.06 B | \$8.26 B | 75.4% | 16.1% | 10.0% | 2.5% |
| Rapid Technology Advancement | \$7.50 B | \$4.26 B | \$8.81 B | 94.2% | 3.2% | 53.7% | 5.1% |
| Enhanced Regulation | \$7.49 B | \$4.16 B | \$8.81 B | 94.1% | 3.2% | 54.0% | 4.0% |
| Rockport 1 2026 | \$7.27 B | \$4.28 B | \$8.54 B | 75.0% | 17.0% | 8.8% | 1.2% |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

³ The Cook portfolios include an assumption for relicensing cost but no estimate for capital expenditure required for equipment life extension

- In addition to the Reference Case, Siemens PTI and I&M focused the IRP analysis on a select list of candidate portfolios
- The Reference' portfolio was optimized in much the same manner as the original Reference Case with an added limitation on spot market imports and exports (purchases and sales) as a risk mitigation strategy

OVEC ANALYSIS



Per IURC Rockport 2 Settlement (Cause 45546) and MI IRP settlement (Case No. U-20591):
Modeled a scenario where the Preferred Plan was optimized without OVEC units after 2030

Analysis evaluated two termination alternatives

1. Only I&M exited contract
2. All owners exited contract

Analysis results showed continued operation of the OVEC units is cost-beneficial to rate payers

- Under alternative 1, estimated costs to I&M customers would increase by ~\$102M NPV
- Under alternative 2, estimated costs to I&M customers would increase by ~\$28M NPV

FEEDBACK AND DISCUSSION

Peter Berini, Siemens PTI

METRICS DEEPDIVE

Affordability

20- and 10-Year NPV of the Cost to Serve Load

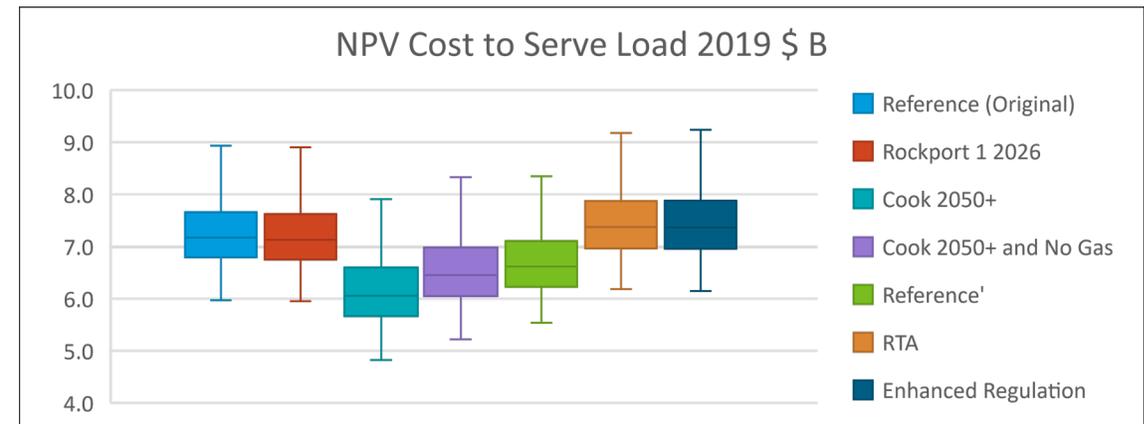


Affordability Objective

For the affordability objective, the metrics used are the 20- and 10-year Net Present Value Cost to Serve Load

- The NPV Cost to Serve Load (CTSL) is a measure of all generation related costs associated with the portfolio of assets over time
- Generation related costs include capital, O&M, fuel, related transmission costs, spot market energy purchases, and capacity purchases
- The Cook 2050+ Portfolios provide valuable strategic insights into near-term resource additions and cost estimates for the asset life extension

| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL |
|------------------------------|------------------|------------------|
| Reference Case | \$7.30 B | \$4.28 B |
| Cook 2050+ | \$6.20 B | \$4.29 B |
| Cook 2050+ and No Gas | \$6.54 B | \$4.42 B |
| Reference' | \$6.98 B | \$4.06 B |
| Rapid Technology Advancement | \$7.50 B | \$4.26 B |
| Enhanced Regulation | \$7.49 B | \$4.16 B |
| Rockport 1 2026 | \$7.27 B | \$4.28 B |



Rate Stability

95th Percentile NPV of the Cost to Serve Load

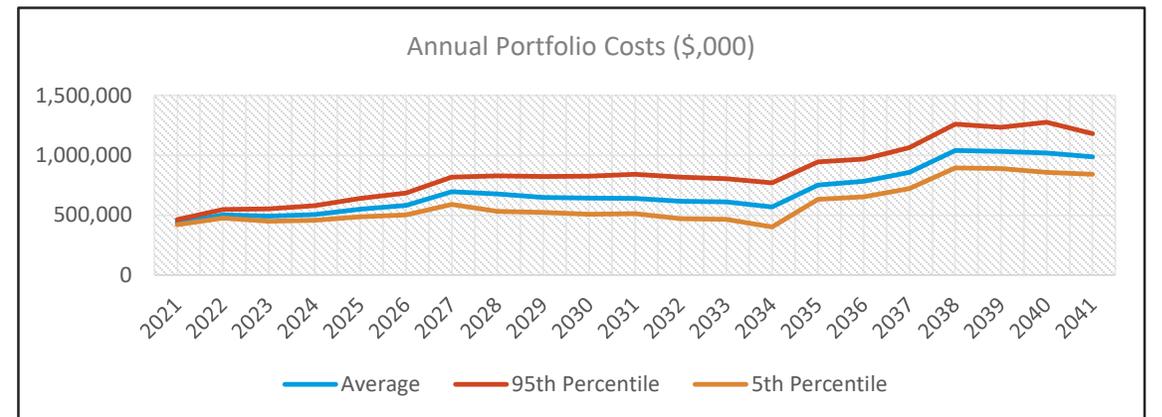


Rate Stability Objective (1/2)

For the rate stability objective, the metrics used are the 95th Percentile NPV of the Cost to Serve Load and A 5-year Compound Annual Growth Rate of the Net Retail Rate Impact

- As part of the probabilistic modeling approach, once each portfolio was subjected to 200 iterations of Aurora, a distribution was created of the NPV Cost to Serve Load portfolio costs
- The 95th percentile (approximately two standard deviations above the mean value) is a commonly used benchmark to demonstrate upper threshold of cost risk under widely varying market circumstances
- The upside risk, measured as the distance between the expected (Mean) and the 95th percentile
- Excluding the Cook portfolios, the Reference' is the lowest value for the 95th Percentile NPV Cost to Serve Load

| Portfolio | 95th Percentile NPV CTSL | Difference Between Mean and 95 th Percentile |
|------------------------------|--------------------------|---|
| Reference Case | \$8.55 B | 17.1% |
| Cook 2050+ | \$7.50 B | 21.0% |
| Cook 2050+ and No Gas | \$7.87 B | 20.4% |
| Reference' | \$8.26 B | 18.3% |
| Rapid Technology Advancement | \$8.81 B | 17.5% |
| Enhanced Regulation | \$8.81 B | 17.6% |
| Rockport 1 2026 | \$8.54 B | 17.5% |



Rate Stability

5 Year Net Rate Increase CAGR (2025-2029)



Rate Stability Objective (2/2)

For the rate stability objective, the metrics used are the 95th Percentile NPV of the Cost to Serve Load and a 5-yr the Compound Annual Growth Rate (CAGR) of the Net Retail Rate Impact

- 95th Percentile metric illustrates cost risks when exposed to volatility in various key drivers. The Enhanced Regulation and RTA portfolios exhibit the greatest cost risk
- The 5-yr CAGR metric provides near term insight to customer affordability and rate impacts of the resource additions in the Preferred Plan. I&M prepared a traditional, non-levelized, calculation of the annual cost of service and the change in revenue requirement for the period of 2025-2029 when new resources are added

| Portfolio | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 |
|------------------------------|---|---------------------------------|
| Reference Case | 1.50% | \$5.69 B |
| Cook 2050+ | 0.50% | \$4.82 B |
| Cook 2050+ and No Gas | 1.50% | \$5.40 B |
| Reference' | 1.30% | \$5.52 B |
| Rapid Technology Advancement | 1.50% | \$5.69 B |
| Enhanced Regulation | 1.50% | \$5.69 B |
| Rockport 1 2026 | 1.10% | \$5.36 B |

Sustainability

CO2e Emissions

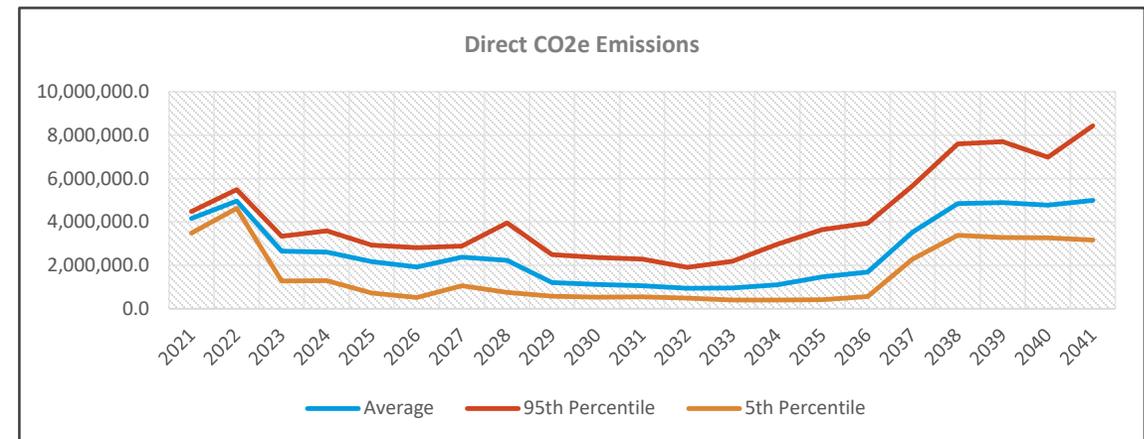


Sustainability Objective

For the sustainability impact objective, the metric estimated direct GHG emissions of each generation type, measured in tons of carbon dioxide equivalent (CO2e)

- All the portfolios result in a substantial reduction of direct CO2e emissions as measured by the mean of the stochastics
- The emission profile distributions for all P-Bands except the P-95, maintain an 80% reduction from 2005 levels throughout the forecast
- The Cook 2050+ and No Gas portfolio reaches significant reductions due to the selection of resources
- Emissions reductions are similar for portfolios through 2034 with divergences occurring with the introduction of Gas CCs in select portfolios

| Portfolio | % Reduction of CO2e (2005-2041) |
|------------------------------|---------------------------------|
| Reference Case | 74.8% |
| Cook 2050+ | 97.9% |
| Cook 2050+ and No Gas | 99.4% |
| Reference' | 75.4% |
| Rapid Technology Advancement | 94.2% |
| Enhanced Regulation | 94.1% |
| Rockport 1 2026 | 75.0% |



Market Risk Minimization

Spot Energy Purchases as a % of Generation

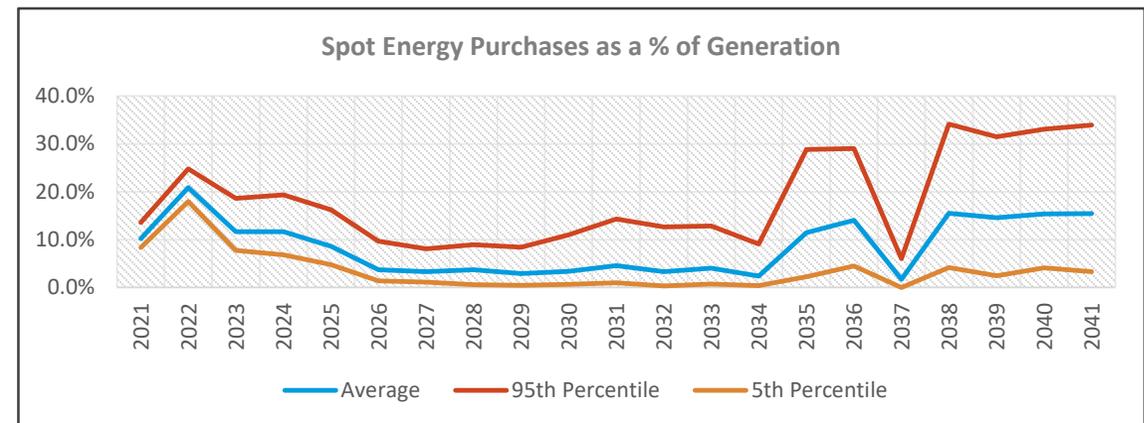


Market Risk Minimization Objective (1/2)

For the market risk minimization objective, the metrics used are the average annual energy sales and the average annual energy purchases, each divided by the average annual generation and expressed as a percentage

- The metrics show the reliance on market sales and/or purchases by the resulting portfolios
- The Spot Energy Purchases as a % of Generation for all portfolios represent a management spot market exposure. The Reference Case and the Reference' result in a higher amount of spot energy purchases
- The large spikes observed in 2034 and 2037 in the graph to the right represent timing nuances between capacity retirement dates and energy retirement dates and are meant to align I&M capacity planning with the PJM capacity planning period

| Portfolio | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) |
|------------------------------|-----------------------------------|-------------------------------|
| Reference Case | 17.5% | 8.9% |
| Cook 2050+ | 1.0% | 49.2% |
| Cook 2050+ and No Gas | 1.1% | 46.3% |
| Reference' | 16.1% | 10.0% |
| Rapid Technology Advancement | 3.2% | 53.7% |
| Enhanced Regulation | 3.2% | 54.0% |
| Rockport 1 2026 | 17.0% | 8.8% |



Market Risk Minimization

Spot Energy Sales as a % of Generation

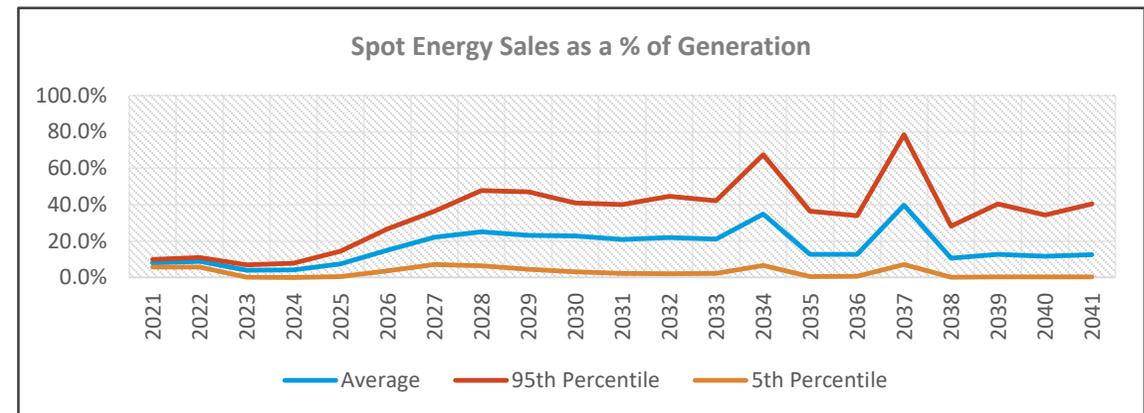


Market Risk Minimization Objective (2/2)

For the market risk minimization objective, the metrics used are the average annual energy sales and the average annual energy purchases, each divided by the average annual generation and expressed as a percentage.

- The metrics show the reliance on market sales and/or purchases by the resulting portfolios
- Sales as a % of Demand are much lower in the Reference Case and in the Reference' portfolio
- The Cook Sensitivities and the Scenarios represent a large number of sales that may expose I&M to high levels of market risk through an over reliance on the spot market
- The large spikes observed in 2034 and 2037 in the graph to the right represent timing nuances between Capacity Retirement Dates and Energy Retirement dates and are meant to align I&M capacity planning with the PJM Capacity planning period

| Portfolio | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) |
|------------------------------|-----------------------------------|-------------------------------|
| Reference Case | 17.5% | 8.9% |
| Cook 2050+ | 1.0% | 49.2% |
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| Rapid Technology Advancement | 3.2% | 53.7% |
| Enhanced Regulation | 3.2% | 54.0% |
| Rockport 1 2026 | 17.0% | 8.8% |



Reliability and Resource Diversity

Reserve Margin above PJM Forecasted Pool Requirement

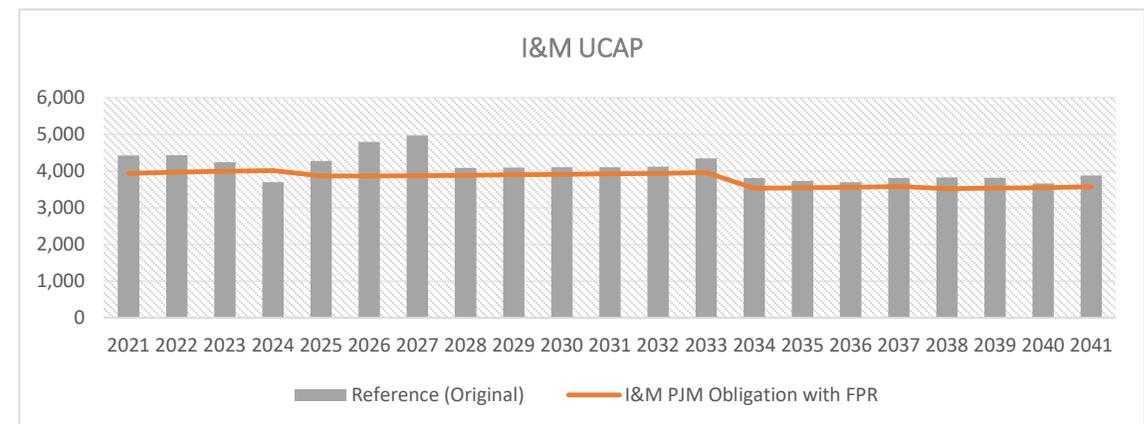


Reliability and Resource Diversity Objective

For the reliability and resource diversity objective, the metrics used are the % above (below) I&M's PJM Reserve Margin Obligation (2041), Fuel Mix, and the Number of Unique Generators.

- Reliability: As new technologies are deployed and older base load units retired, there is more of a reliance on intermittent resources (i.e., renewable energy) to provide energy and capacity needs
- The analysis includes the PJM Capacity Obligation, Reserve Margin and PJM's Guidance on Effective Load Carrying Capability (ELCC) for intermittent resource capacity analysis
- Diversity: Resource generation fuel type is spread among several technologies. Firm generating assets to be developed with the opportunity to spread sites across a network of locations, limiting the impact of a single site outage
- Standard sizing for new technologies include Gas Peaker (250 MW), Gas CC 2x1 (1070 MW), Hybrid Resource (100 MW / 20 MW), Li-ion Storage (50 MW), Wind (200 MW) and Solar (50 MW). In addition, portfolios receive credit for Nuclear, EE and DR resource types

| Portfolio (2041) | Reserve Margin | # of Fuel Types | # of Unique Generators |
|------------------------------|----------------|-----------------|------------------------|
| Reference Case | 8.6% | 8 | 59 |
| Cook 2050+ | 7.5% | 8 | 55 |
| Cook 2050+ and No Gas | 1.6% | 8 | 68 |
| Reference' | 2.5% | 8 | 61 |
| Rapid Technology Advancement | 5.1% | 8 | 101 |
| Enhanced Regulation | 4.0% | 8 | 100 |
| Rockport 1 2026 | 1.2% | 8 | 58 |



Balanced Scorecard Reference and Focused Portfolios



| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
|------------------------------------|-------------------------------|------------------------------|--|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 17.1% | 1.50% | \$5.69 B | 74.8% | 17.5% | 8.9% | 8.6% | 59 |
| Portfolio | 20-Year NPV CTSL ² | 10-Year NPV CTS ² | 95th Percentile Value of NPV CTSL ² | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
| Cook 2050+ ³ | \$6.20 B | \$4.29 B | \$7.50 B | 21.0% | 0.50% | \$4.82 B | 97.9% | 1.0% | 49.2% | 7.5% | 55 |
| Cook 2050+ and No Gas ³ | \$6.54 B | \$4.42 B | \$7.87 B | 20.4% | 1.50% | \$5.40 B | 99.4% | 1.1% | 46.3% | 1.6% | 68 |
| Reference ⁴ | \$6.98 B | \$4.06 B | \$8.26 B | 18.3% | 1.30% | \$5.52 B | 75.4% | 16.1% | 10.0% | 2.5% | 61 |
| Rapid Technology Adv. | \$7.50 B | \$4.26 B | \$8.81 B | 17.5% | 1.50% | \$5.69 B | 94.2% | 3.2% | 53.7% | 5.1% | 101 |
| Enhanced Regulation | \$7.49 B | \$4.16 B | \$8.81 B | 17.6% | 1.50% | \$5.69 B | 94.1% | 3.2% | 54.0% | 4.0% | 100 |
| Rockport 1 2026 | \$7.27 B | \$4.28 B | \$8.54 B | 17.5% | 1.10% | \$5.36 B | 75.0% | 17.0% | 8.8% | 1.2% | 58 |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

³ The Cook portfolios include an assumption for relicensing cost but no estimate for capital expenditure required for equipment life extension

⁴ The number of unique fuel types (2041), an additional diversity metric, is equal to eight for each portfolio above. In order to maintain adequate sizing, the metric has been removed from the above table

- Siemens PTI and I&M focused the IRP analysis on a select list of candidate portfolios

FEEDBACK AND DISCUSSION

I&M Management

PATH TO THE PREFERRED PORTFOLIO

Path to the Preferred Portfolio



In order to address concerns around Capital Intensity, Reserve Margin Length and Energy Position Length the IRP Team examined the Reference and the Reference' portfolio in further detail.

| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
|---------------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
| Reference Case (Original) | \$7.30 B | \$4.28 B | \$8.55 B | 17.1% | 1.50% | \$5.69 B | 74.8% | 17.5% | 8.9% | 8.6% | 59 |
| Reference' | \$6.98 B | \$4.06 B | \$8.26 B | 18.3% | 1.30% | \$5.52 B | 75.4% | 16.1% | 10.0% | 2.5% | 61 |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

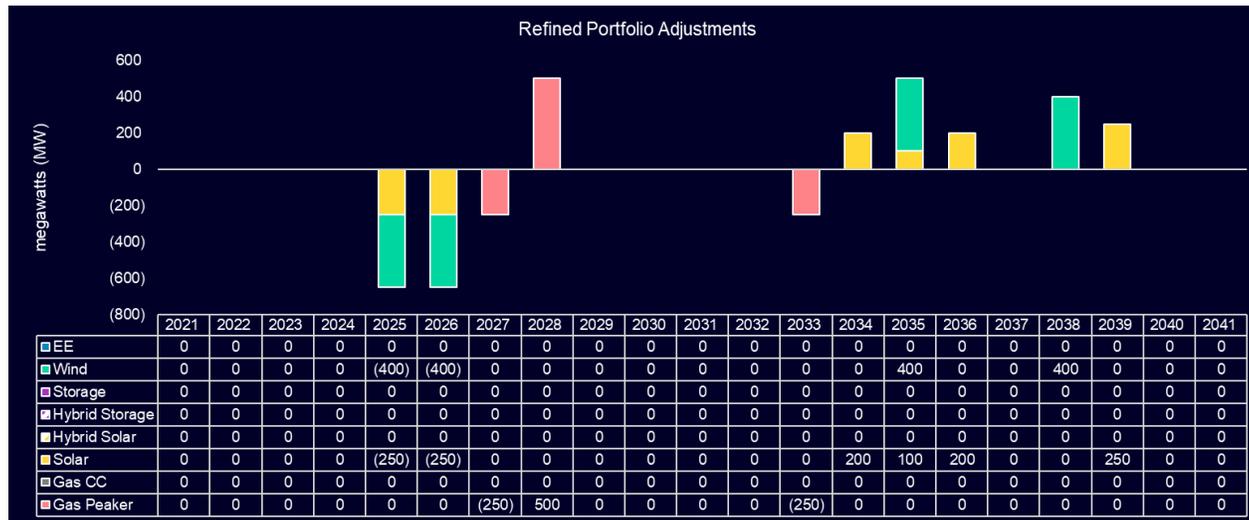
³ The number of unique fuel types (2041), an additional diversity metric, is equal to eight for each portfolio above. In order to maintain adequate sizing, the metric has been removed from the above table

- The Reference' portfolio is similar to the Reference Case portfolio with added limitations on spot market purchases and sales as a risk mitigation strategy.
- The Company also recognizes the positive attributes associated with the Cook 2050+ scenarios and evaluated opportunities to preserve optionality around future decision making on the potential Cook license extension.

Reference' Adjustments to Arrive at Preferred Portfolio

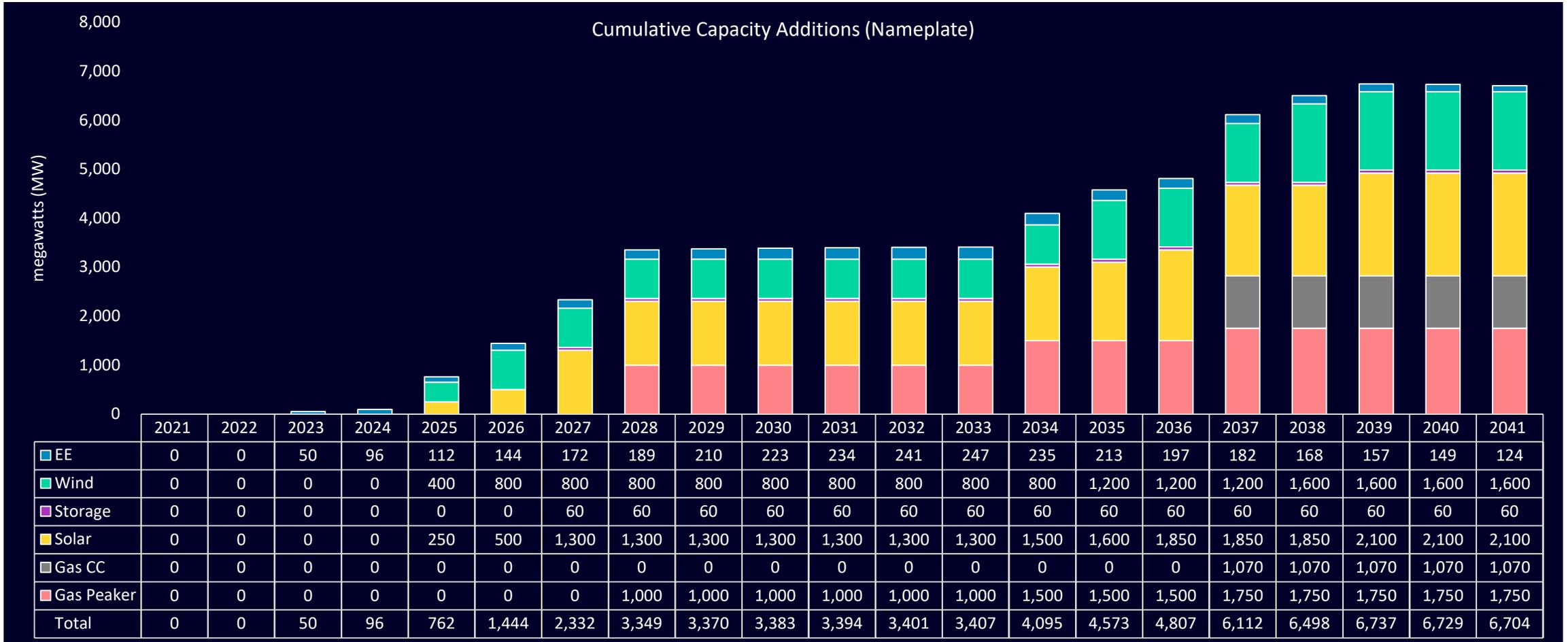


| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
|------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
| Reference' | \$6.98 B | \$4.06 B | \$8.26 B | 18.3% | 1.30% | \$5.52 B | 75.4% | 16.1% | 10.0% | 2.5% | 61 |



- The Reference' Portfolio was further refined to arrive at a Preferred Portfolio that balances long- and short-term resource decisions and preserves the option to relicense Cook
- Adjustments to Reference' Portfolio included:
 - 50% Renewable builds reduction 2025-2026
 - To be shifted out to later years for cook extension flexibility
 - 2027 and 2033 Gas Peaker Additions moved to 2028 for a total of 1000 MW Peaker capacity to be added in 2028 (same plan total)
 - Total of 250 MW additional solar capacity in outer years to contribute to energy need after assumed cook retirement in this plan
 - Short Term Market Purchase still expected in 2024 (~314 MW)

Preferred Portfolio Cumulative Capacity Expansion



Balanced Scorecard

Reference and Focused Portfolios



| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
|---------------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
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|------------------------------------|-------------------------------|------------------------------|--|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
| Cook 2050+ ³ | \$6.20 B | \$4.29 B | \$7.50 B | 21.0% | 0.50% | \$4.82 B | 97.9% | 1.0% | 49.2% | 7.5% | 55 |
| Cook 2050+ and No Gas ³ | \$6.54 B | \$4.42 B | \$7.87 B | 20.4% | 1.50% | \$5.40 B | 99.4% | 1.1% | 46.3% | 1.6% | 68 |
| Reference ⁴ | \$6.98 B | \$4.06 B | \$8.26 B | 18.3% | 1.30% | \$5.52 B | 75.4% | 16.1% | 10.0% | 2.5% | 61 |
| Rapid Technology Adv. | \$7.50 B | \$4.26 B | \$8.81 B | 17.5% | 1.50% | \$5.69 B | 94.2% | 3.2% | 53.7% | 5.1% | 101 |
| Enhanced Regulation | \$7.49 B | \$4.16 B | \$8.81 B | 17.6% | 1.50% | \$5.69 B | 94.1% | 3.2% | 54.0% | 4.0% | 100 |
| Rockport 1 2026 | \$7.27 B | \$4.28 B | \$8.54 B | 17.5% | 1.10% | \$5.36 B | 75.0% | 17.0% | 8.8% | 1.2% | 58 |

| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin ¹ (2041) | # of Unique Generators (2041) |
|---------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|------------------------------------|-------------------------------|
| Preferred Portfolio | \$6.82 B | \$3.89 B | \$8.15 B | 19.6% | 1.40% | \$3.83 B | 75.2% | 15.4% | 11.6% | 4.7% | 66 |

¹ Reserve Margin (2041) is a measure of I&M's capacity position above the required Forecast Pool Reserve (FPR) obligation to PJM

² Cost to Serve Load (CTSL)

³ The Cook portfolios include an assumption for relicensing cost but no estimate for capital expenditure required for equipment life extension

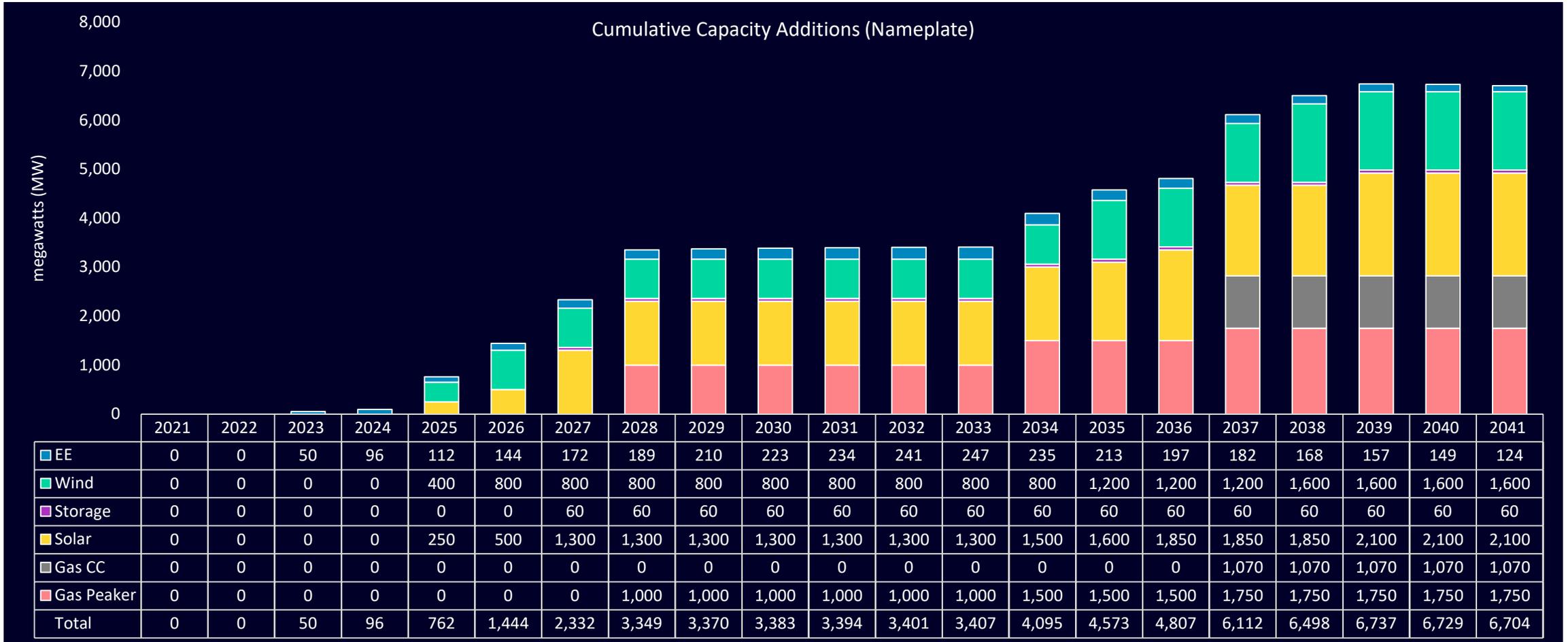
⁴ The number of unique fuel types (2041), an additional diversity metric, is equal to eight for each portfolio above. In order to maintain adequate sizing, the metric has been removed from the above table

FEEDBACK AND DISCUSSION

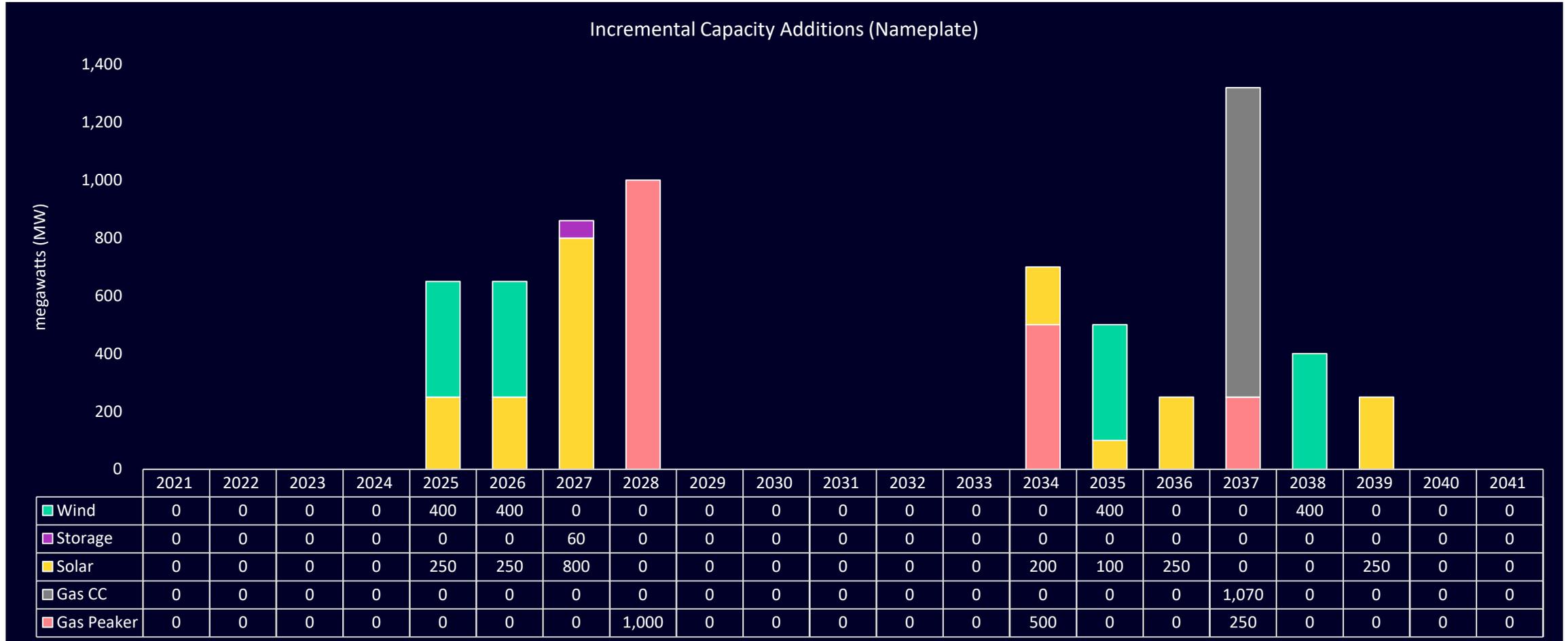
Art Holland, Siemens PTI

PREFERRED PORTFOLIO

Preferred Portfolio Cumulative Capacity Expansion



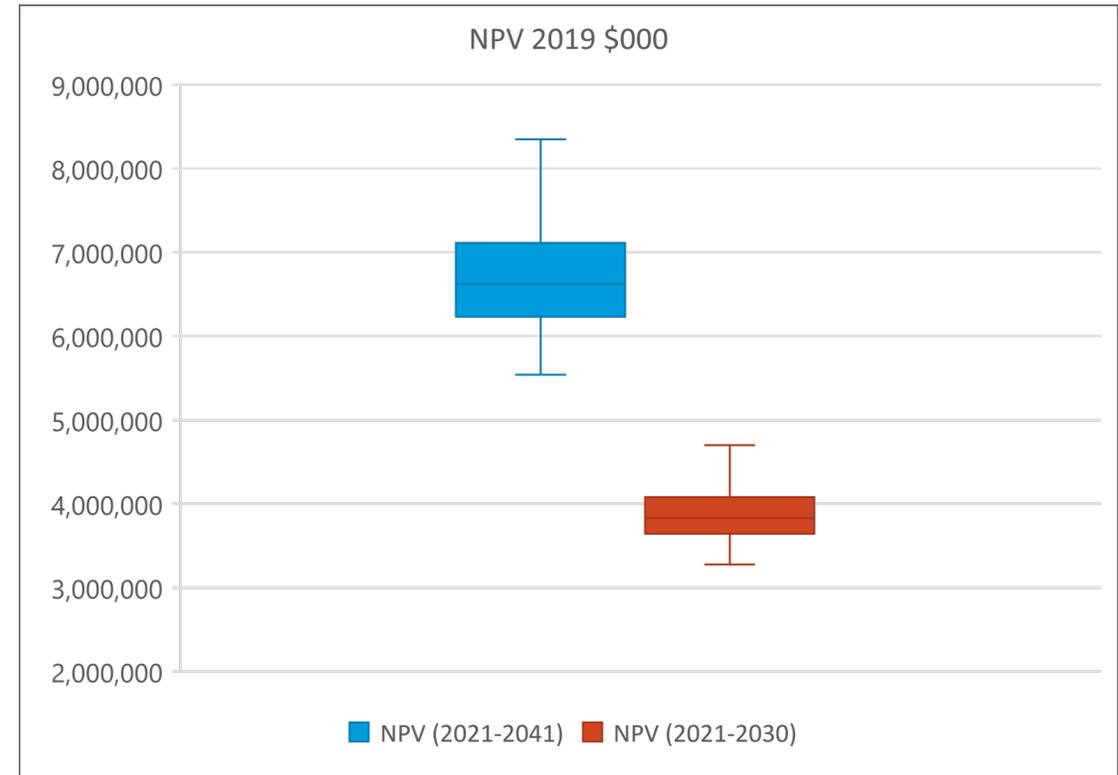
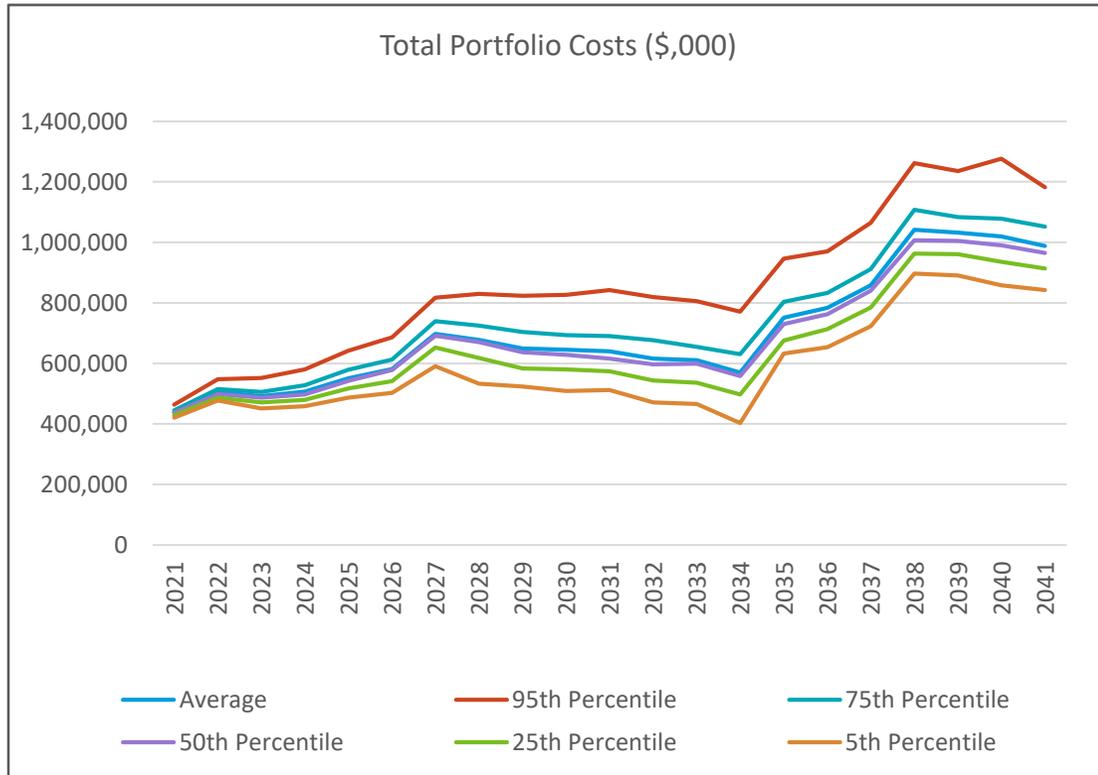
Preferred Portfolio Incremental Capacity Expansion



Preferred Portfolio Affordability Objectives



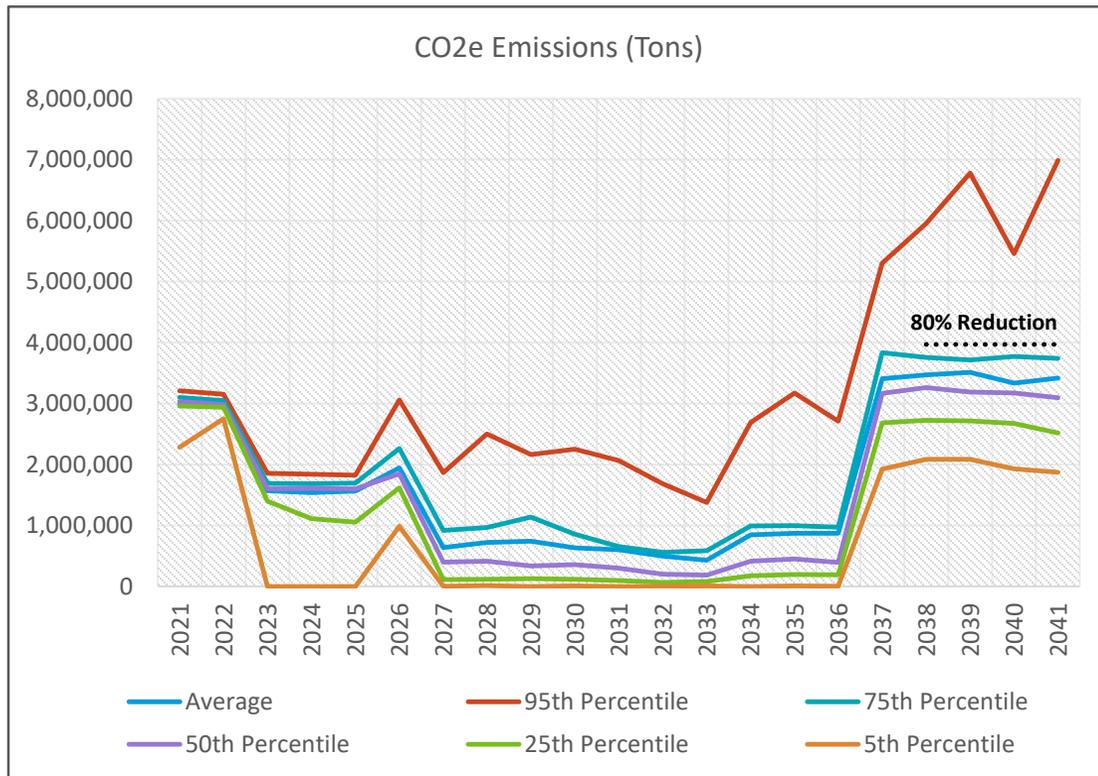
| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin (2041) | # of Unique Generators (2041) |
|---------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|-----------------------|-------------------------------|
| Preferred Portfolio | \$6.82 B | \$3.89 B | \$8.15 B | 19.6% | 1.40% | \$3.83 B | 75.2% | 15.4% | 11.6% | 4.7% | 66 |



Preferred Portfolio Sustainability Objectives



| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin (2041) | # of Unique Generators (2041) |
|---------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|-----------------------|-------------------------------|
| Preferred Portfolio | \$6.82 B | \$3.89 B | \$8.15 B | 19.6% | 1.40% | \$3.83 B | 75.2% | 15.4% | 11.6% | 4.7% | 66 |



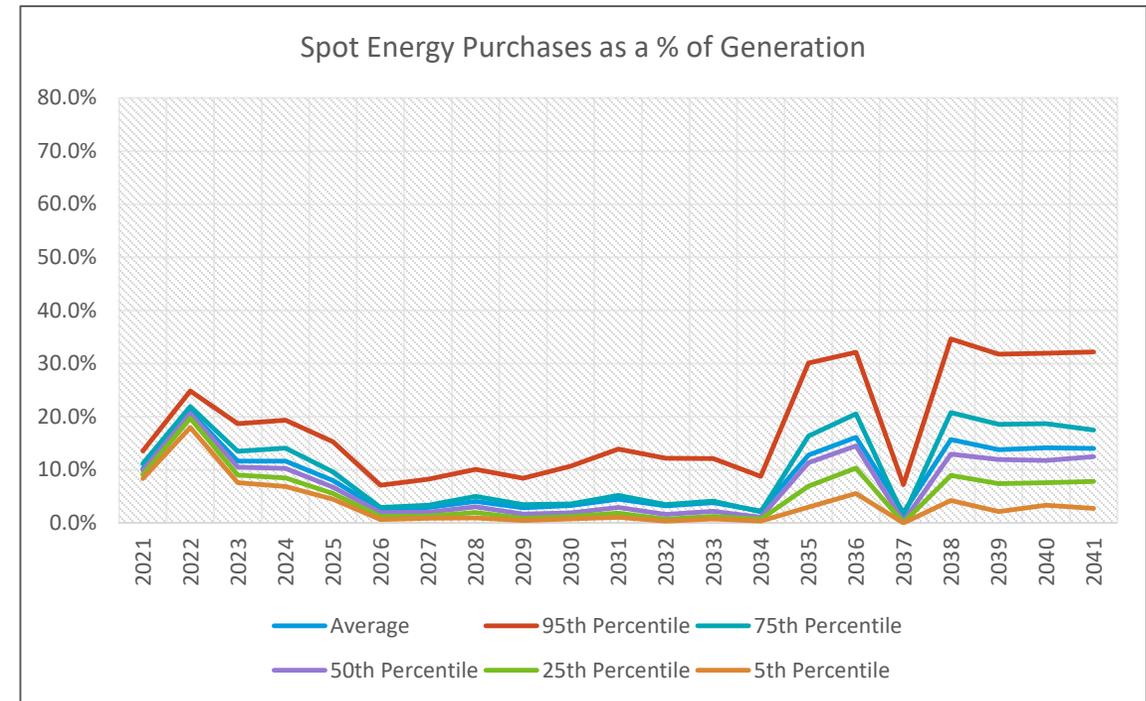
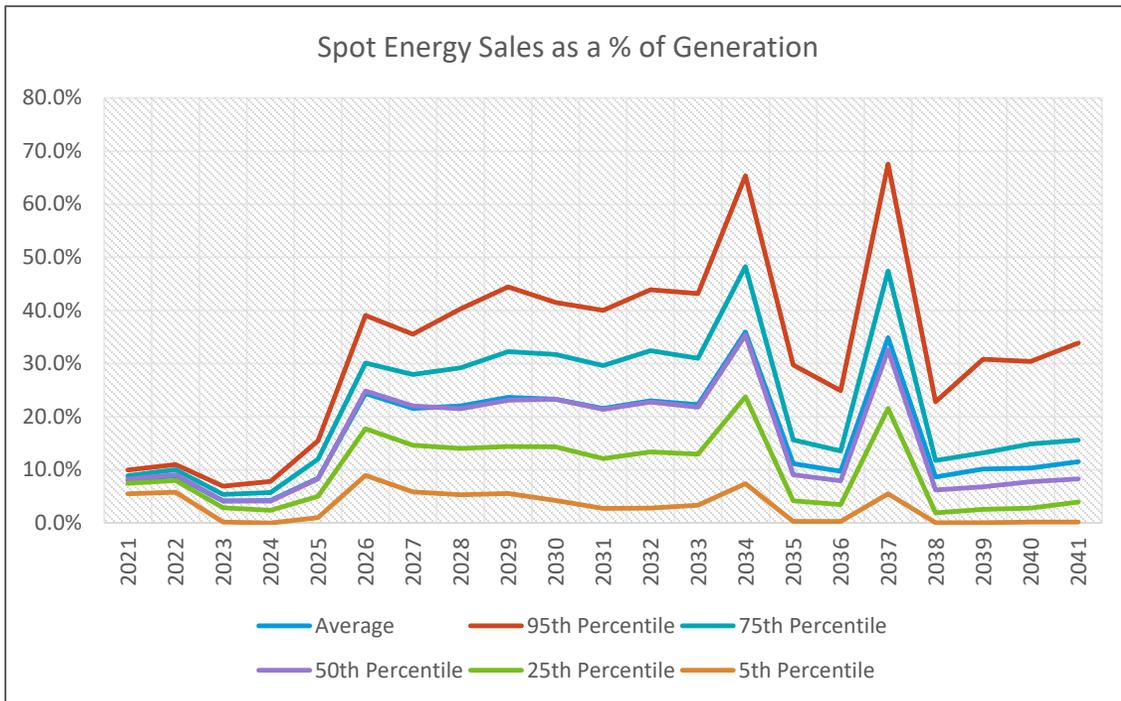
- CO₂e Emissions escalate in 2037 as a result of a CC unit addition to replace capacity and energy from Cook retirement.
- The Company will continue to monitor alternative technologies and solutions, including Hydrogen.

Preferred Portfolio

Market Risk Minimization Objectives



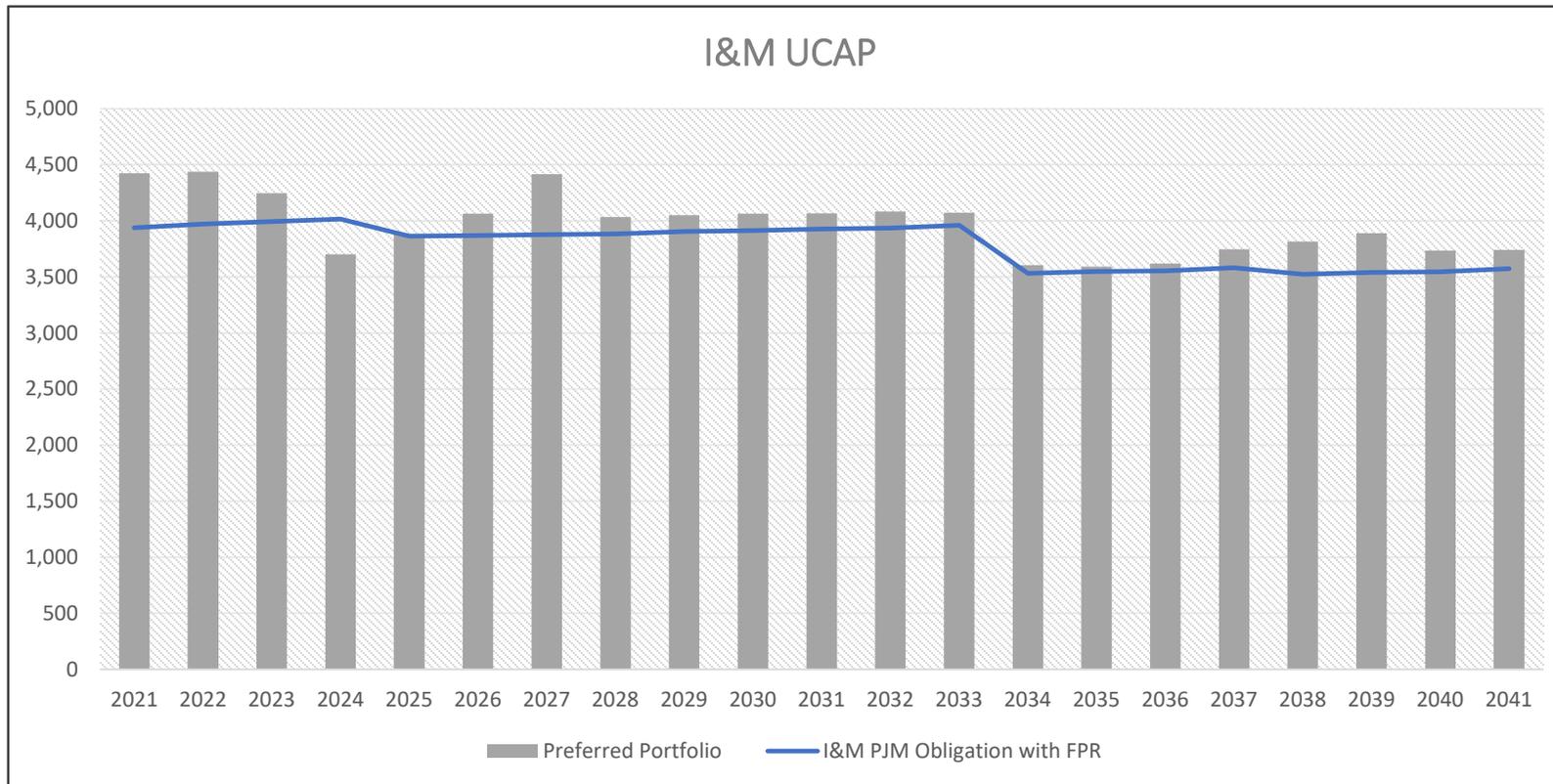
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|---------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|-----------------------|-------------------------------|
| Preferred Portfolio | \$6.82 B | \$3.89 B | \$8.15 B | 19.6% | 1.40% | \$3.83 B | 75.2% | 15.4% | 11.6% | 4.7% | 66 |



Preferred Portfolio Reliability Objectives



| Portfolio | 20-Year NPV CTSL | 10-Year NPV CTSL | 95th Percentile Value of NPV CTSL | Difference Btw. Mean and 95th Percentile | 5 Year Net Rate Increase CAGR (2025-2029) | Capital Investment Through 2028 | % Reduction of CO2e (2005-2041) | Purchases as a % of Demand (2041) | Sales as a % of Demand (2041) | Reserve Margin (2041) | # of Unique Generators (2041) |
|---------------------|------------------|------------------|-----------------------------------|--|---|---------------------------------|---------------------------------|-----------------------------------|-------------------------------|-----------------------|-------------------------------|
| Preferred Portfolio | \$6.82 B | \$3.89 B | \$8.15 B | 19.6% | 1.40% | \$3.83 B | 75.2% | 15.4% | 11.6% | 4.7% | 66 |



CLOSING DISCUSSION

Andrew Williamson | I&M Director Regulatory Services

Definitions



| Term | Definition |
|-------------------------------|--|
| AURORAxmp | Electric modeling forecasting and analysis software. Used for capacity expansion, chronological dispatch, and stochastic functions |
| Condition | A unique combination of a Scenario and a Sensitivity that is used to inform Candidate Portfolio development |
| Deterministic Modeling | Simulated dispatch of a portfolio in a pre-determined future |
| Renewable Portfolio Standards | Renewable Portfolio Standards (RPS) are policies designed to increase the use of renewable energy sources for electricity generation |
| Portfolio | A group of resources to meet customer load |
| Preferred Portfolio | The portfolio that management determines will perform the best, with consideration for cost, risk, reliability, and sustainability |
| Probabilistic modeling | Simulate dispatch of portfolios for several randomly generated potential future states |
| Reference Scenario | The most expected future scenario that is designed to include a current consensus view of key drivers in power and fuel markets (reference case, consensus case) |
| Scenario | Potential future State-of-the-World designed to test portfolio performance in key risk areas important to management and stakeholders alike |
| Sensitivity Analysis | Analysis to determine the impact of early retirements and other inputs portfolios are most sensitive to |

Data Release Schedule



Modeling Files

- Reference Case modeling inputs (November 18, 2021)
- Scenario modeling inputs (November 29, 2021)
- Probabilistic modeling inputs (November 29, 2021)
- Reference Case modeling files (confidential – available January 2022)
- Scenario modeling files (confidential – available January 2022)