Indiana Michigan Power Company

# INDIANA IRP
# STAKEHOLDER MEETING #4

March 5, 2025

INDIANA MICHIGAN POWER℠

An AEP Company

# Welcome & Introductions

## I&M Leadership Team

David Lucas | Vice President, Regulatory and Finance
Andrew Williamson | Director, Regulatory Services
Ed Locigno | Regulatory Analysis & Case Manager
Regiana Sistevaris | Manager, Regulatory Services
Jon Walter | Regulatory Innovations Manager
Austin DeNeff| Regulatory Consultant Senior

## 1898 & Co.

Brian Despard| Senior Project Manager

## I&M Load Forecasting

Trenton Feasel | Manager, Economic Forecasting

## I&M Resource Planning

Kayla Zellers | Director, Resource Planning
Mohamed Abukaram | Director, Resource Planning
Mark Sklar-Chik | Staff Analyst, Resource Planning

## I&M Infrastructure Development

Tim Gaul | Director, Regulated Infrastructure Development
Justin Dehan | Manager, Regulated Infrastructure Development

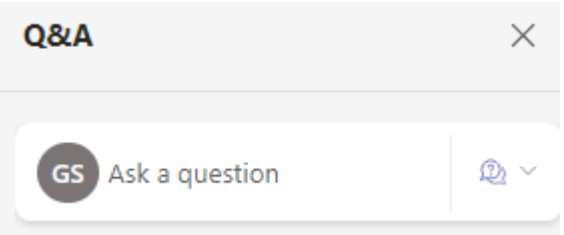
# Agenda

| Time (EST) | Agenda Topic | Lead |
|---|---|---|
| *1:00-1:05* | **Welcome & Introductions** | **Andrew Williamson**<br>**Kayla Zellers**<br>**Brian Despard** |
| *1:05-1:15* | **IRP Framework and Journey to Preferred Portfolio** | **Kayla Zellers** |
| *1:15-1:30* | **Candidate Portfolio Review** | **Kayla Zellers** |
| *1:30-1:45* | **Risk Analysis** | **Mohamed Abukaram** |
| *1:45-2:00* | **Preferred Portfolio** | **Andrew Williamson** |
| *2:00-2:15* | **Results Comparison and Portfolio Performance Indicators** | **Kayla Zellers**<br>**Mohamed Abukaram** |
| *2:15-2:30* | **Short-Term Action Plan** | **Andrew Williamson** |
| *2:30-3:00* | **Open Discussion**<br>• Feedback From Stakeholders | **Andrew Williamson** |

# Participation

- Participants joining today's meeting will be in a "listen-only" mode. Please use the "Raise" function to be recognized and unmuted.
- During the presentation, please enter questions at any time into the Teams Q&A feature. Questions will be addressed after each section. At the end of the presentation, we will open up the floor for additional questions, thoughts, ideas, and suggestions.
- All questions and answers will be logged and provided on the IRP website. Any questions not answered during the meeting will be answered after the meeting and provided in the Q&A log posted to the IRP website.
- Questions, thoughts, ideas, and suggestion related to Stakeholder Meeting 4 can be provided to I&MIRP@aep.com following this meeting.


Click the Q&A feature at the top of the Teams screen

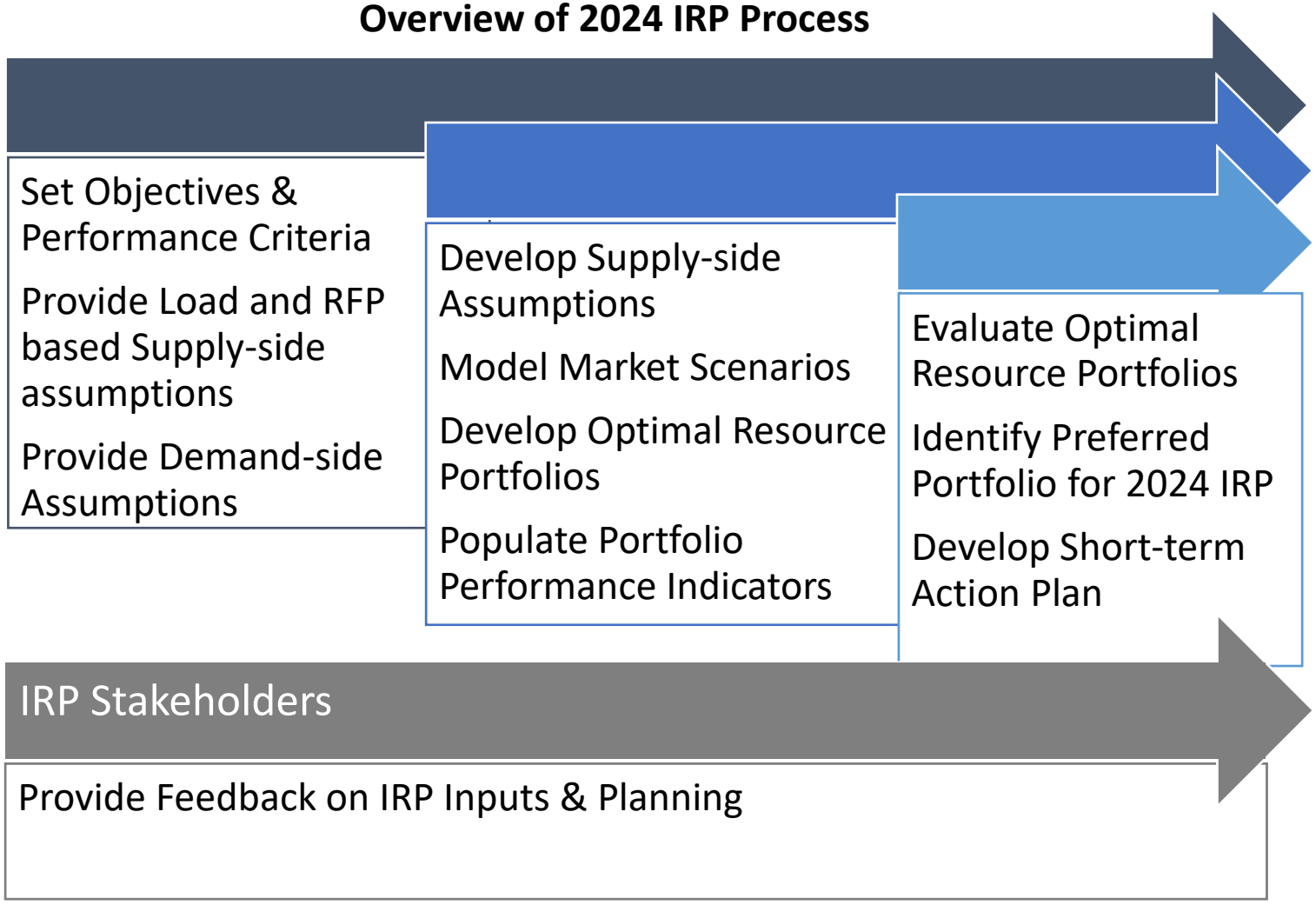


# Guidelines

- Please focus questions, thoughts, ideas, and suggestions to the IRP process and the content being discussed in this meeting. Time will be taken during this meeting to respond to questions.
- Please respect other participants and their views by not addressing other participants directly and not commenting on the views expressed by others.
- This meeting will not be recorded or transcribed.
- Any further questions or comments can be provided to I&MIRP@aep.com.

# 2024 IRP Process

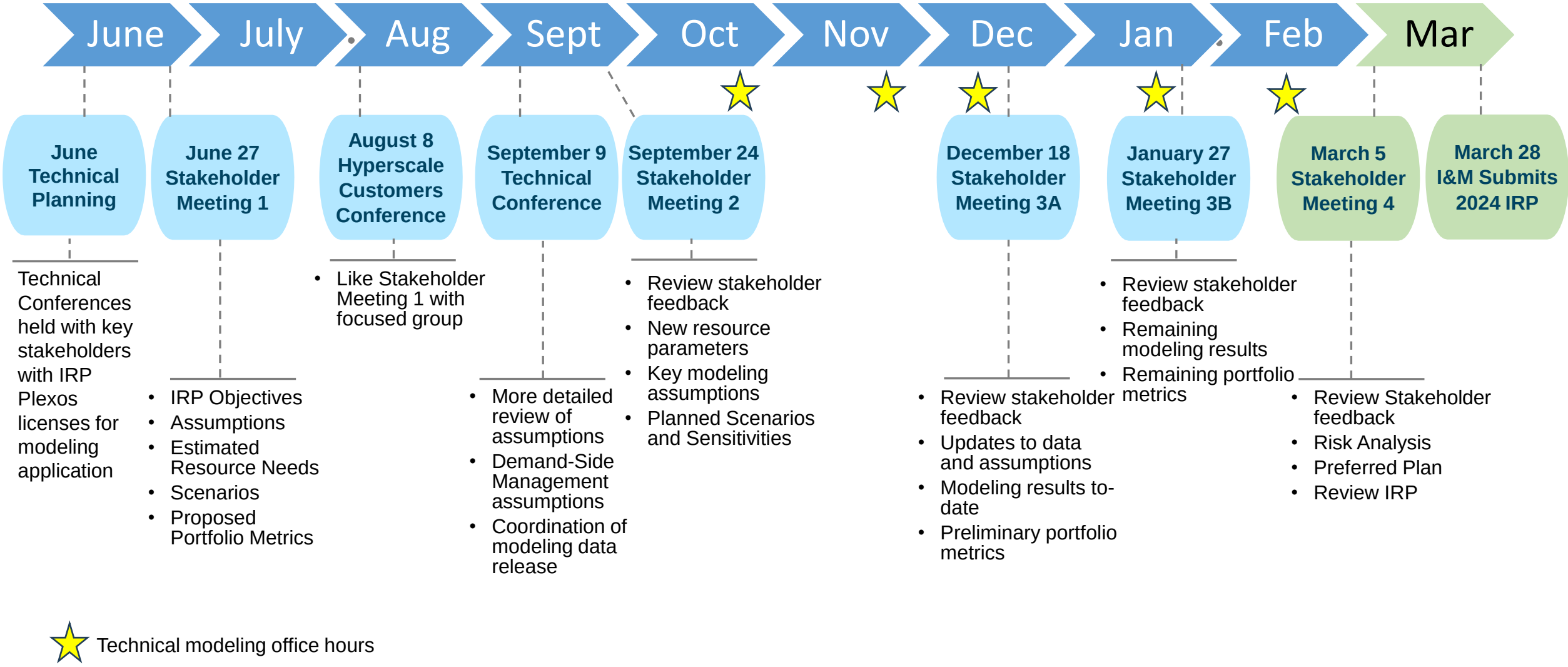
## Overview of 2024 IRP Process




## 2024 IRP Analysis Steps

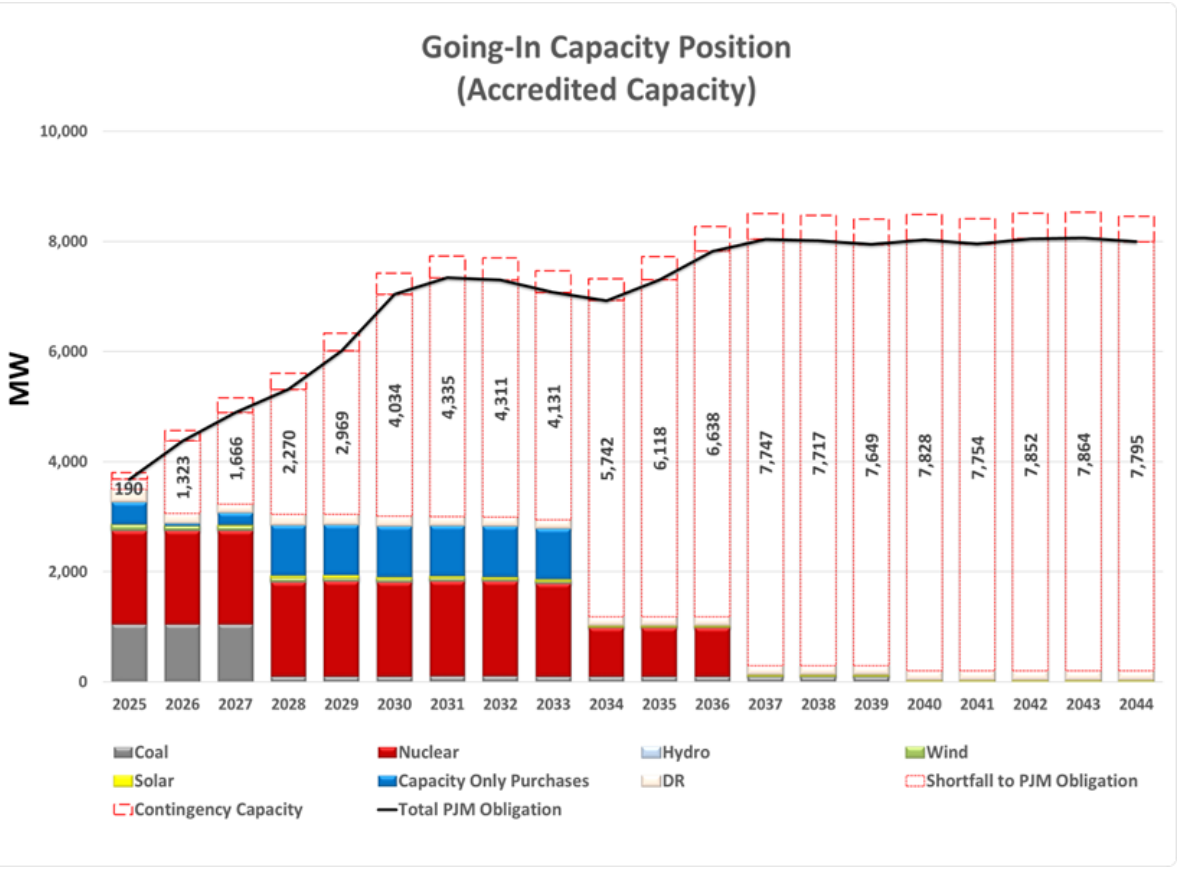
1. Define IRP Objectives Aligned to Customer Needs
2. Collect Modeling Inputs and Key Assumptions
3. Define and Optimize Resource Portfolios under multiple market scenarios, load, and technology cost cases and sensitivities
4. Perform Scenario-Based Risk Analysis on I&M Candidate Portfolios
5. Compare Results & Identify the Preferred Portfolio

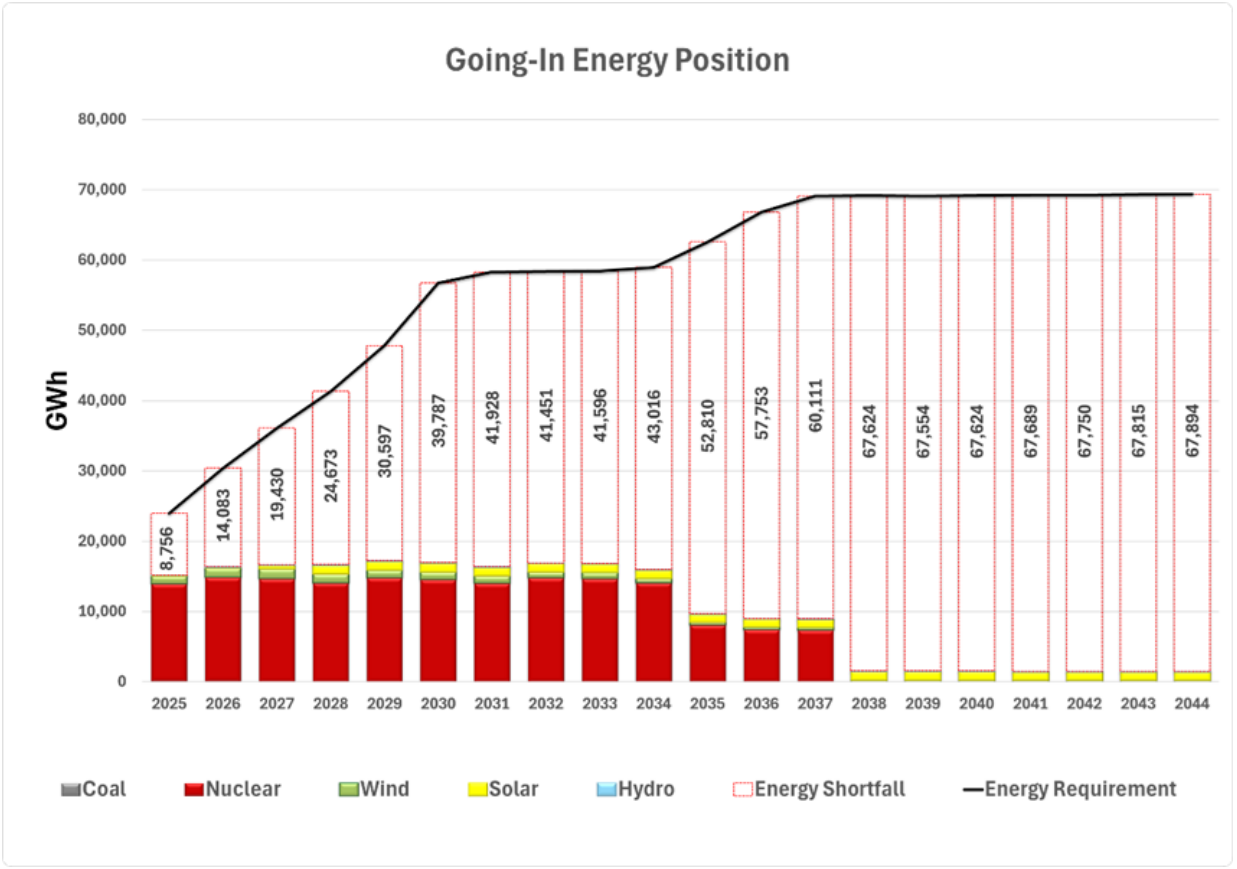
# Stakeholder Engagement Timeline




Technical modeling office hours

# Capacity and Energy Needs Assessment



# Portfolios Modeled

| Scenario | Stakeholder Meeting 3A or 3B |
|---|---|
| Base Reference | 3A |
| High Economic Growth | 3A |
| Low Economic Growth | 3A |
| Enhanced Environmental Regulations (EER) | 3A |

| Sensitivities | Stakeholder Meeting 3A or 3B |
|---|---|
| Base under EPA Section 111(b)(d) Requirements | 3A |
| Low Carbon: Transition to Objective | 3A |
| Low Carbon: Expanded Build Limits | 3A |
| Base with High IN Load | 3B |
| Base with Low IN Load | 3B |
| Rockport Unit 1 Retires 2025 | 3B |
| Rockport Unit 1 Retires 2026 | 3B |
| Exit OVEC ICPA in 2030 | 3B |
| High Technology Cost | 3B |
| Expanded Wind Availability (Base) | 3B |
| Expanded Wind Availability (EER) | 3B |

# Candidate Portfolio Selection

| Pillar | Affordability | | | Reliability | | | Reliability/ Resiliency | Grid Stability Resiliency | Environmental Sustainability | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Performance Indicators and Metrics*** | ***Short Term*** *7-yr Rate CAGR* Power Supply $/MWh | ***Long Term*** *Supply Portfolio NPVRR Power Supply Costs* | ***Portfolio Resilience:*** *High Minus Low Scenario Range, Portfolio NPVRR* | ***Energy Market Risk*** *Purchases* | ***Energy Market Risk*** *Sales* | ***Planning Reserves*** *% Reserve Margin* | ***Resource Diversity*** | ***Fleet Resiliency:*** *Dispatchable Capacity* | ***Emissions Analysis:*** *% Change from 2005 Baseline* | | |
| Year Ref. | 2024-2031 | 2025-2044 | 2025-2044 | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 2034 \| 2044 | | |
| Units | % | $B | $B | NPV of Market Purchases & MWhs % of Total Demand | NPV of Market Sales & MWhs % of Total Demand | Average of Annual PRM % | Portfolio Index Percent Change from 2025 | Dispatchable Nameplate MW/ % of Company Peak Demand | % Change $CO_2$ | % Change NOx | % Change $SO_2$ |
| **Base Reference** | -0.5% | $32.0 | [to be developed] | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.7%<br>20 Years: -3.4% | Capacity: 31% \| 19%<br>Energy: 173% \| 139% | 10 Years: 90%<br>20 Years: 97% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Low Carbon: Transition** | 1.3% | $39.9 | [to be developed] | 10 Years: $2.7B (27%)<br>20 Years: $4.1B (20%) | 10 Years: $0.2B (1.6%)<br>20 Years: $1.7B (7.7%) | 10 Years: 2.0%<br>20 Years: 0.5% | Capacity: 53% \| 54%<br>Energy: 302% \| 304% | 10 Years: 91%<br>20 Years: 95% | 2034: -65%<br>2044: -65% | 2034: -96%<br>2044: -96% | 2034: -100%<br>2044: -100% |
| **Expanded Wind Availability (EER)** | 0.5% | $32.8 | [to be developed] | 10 Years: $3.1B (31%)<br>20 Years: $5.4B (27%) | 10 Years: $0.5B (3.5%)<br>20 Years: $1.3B (5.2%) | 10 Years: 5.1%<br>20 Years: -0.6% | Capacity: 31% \| 34%<br>Energy: 296% \| 318% | 10 Years: 92%<br>20 Years: 92% | 2034: -56%<br>2044: -55% | 2034: -95%<br>2044: -95% | 2034: -100%<br>2044: -100% |

**Base Reference**

Functions as comparison point for other Candidate Portfolios

**Low Carbon: Transition**

Resource Diversity ✓

Environmental Sustainability ✓

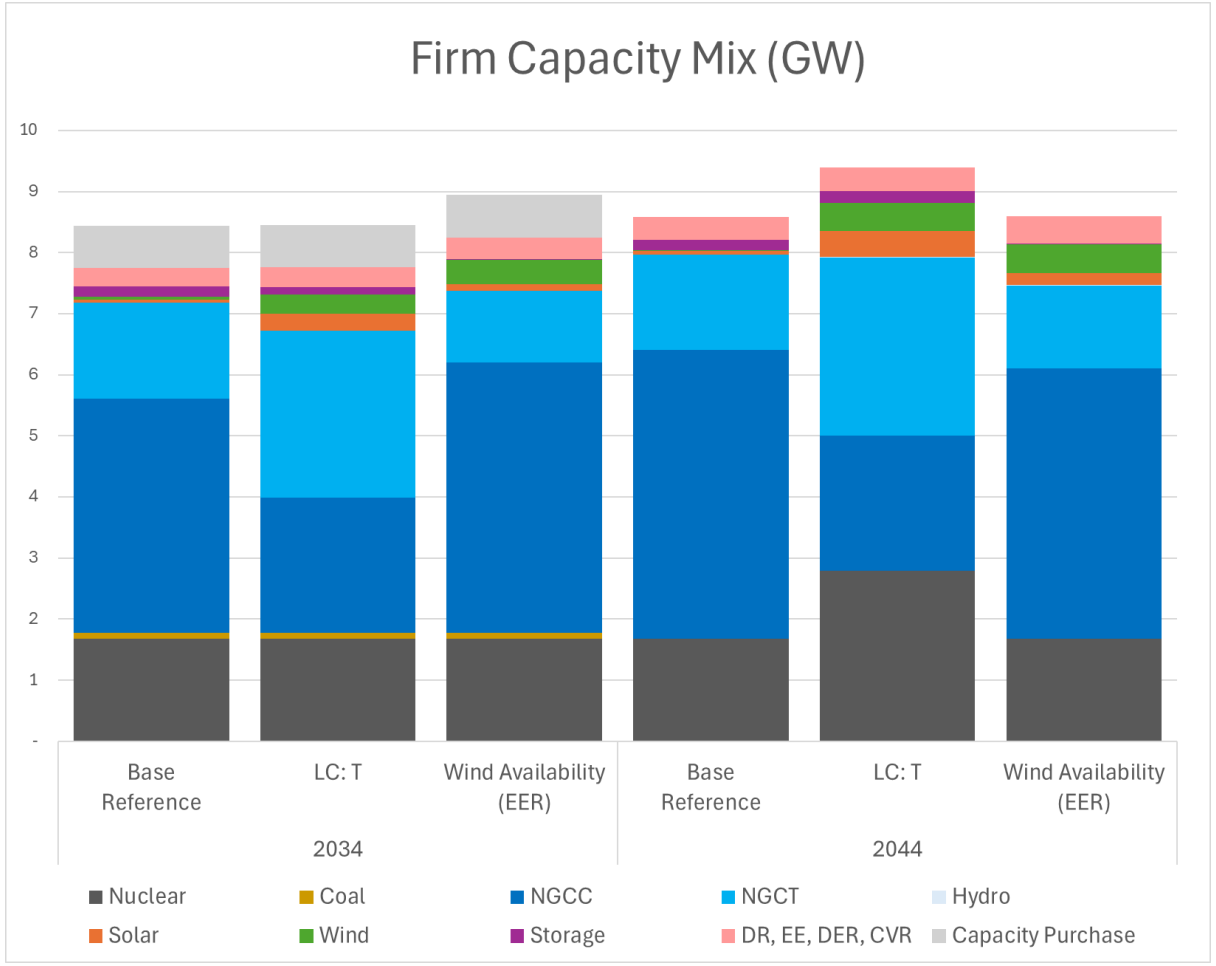
**Expanded Wind Availability (EER)**

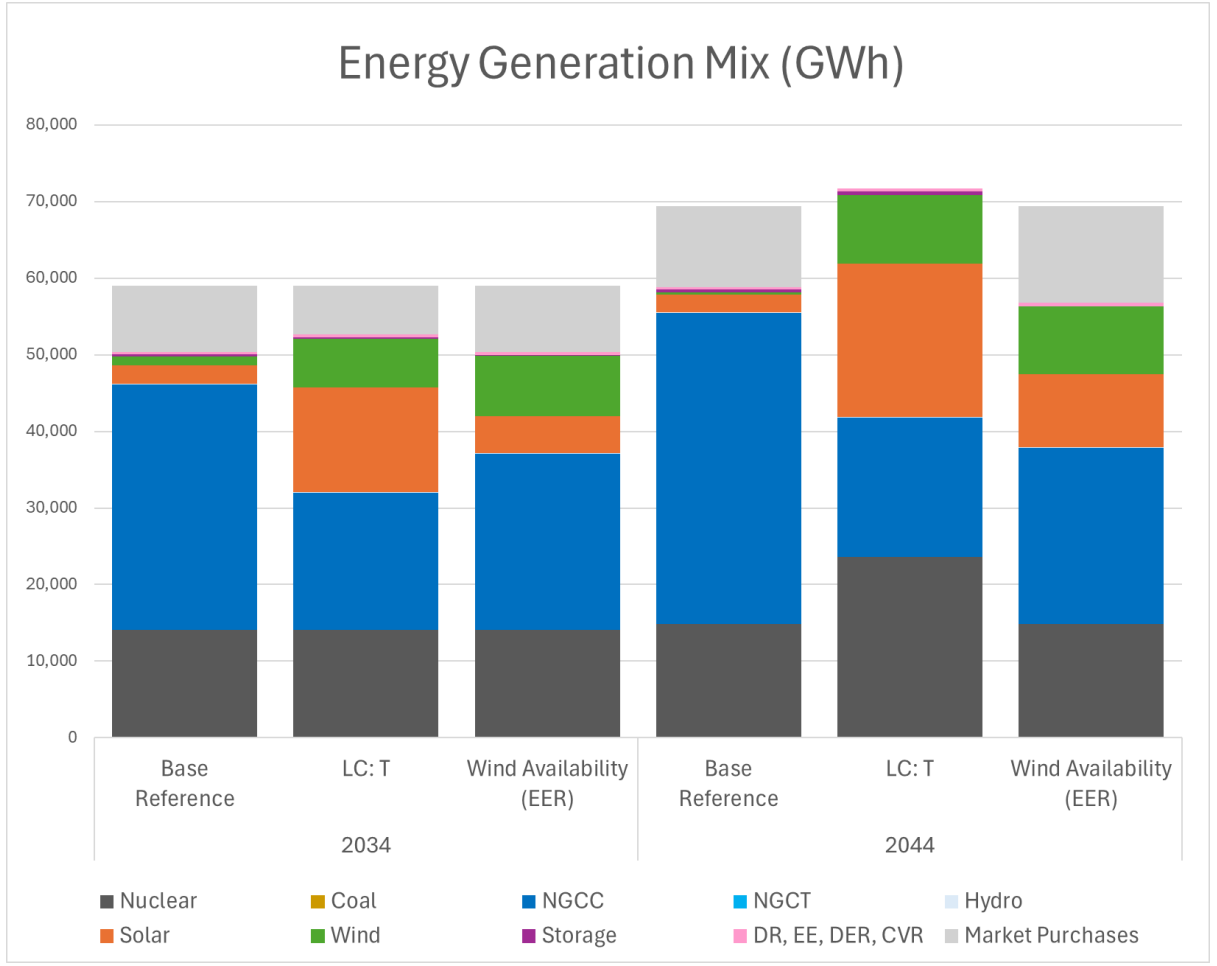
Affordability ✓

Resource Diversity ✓

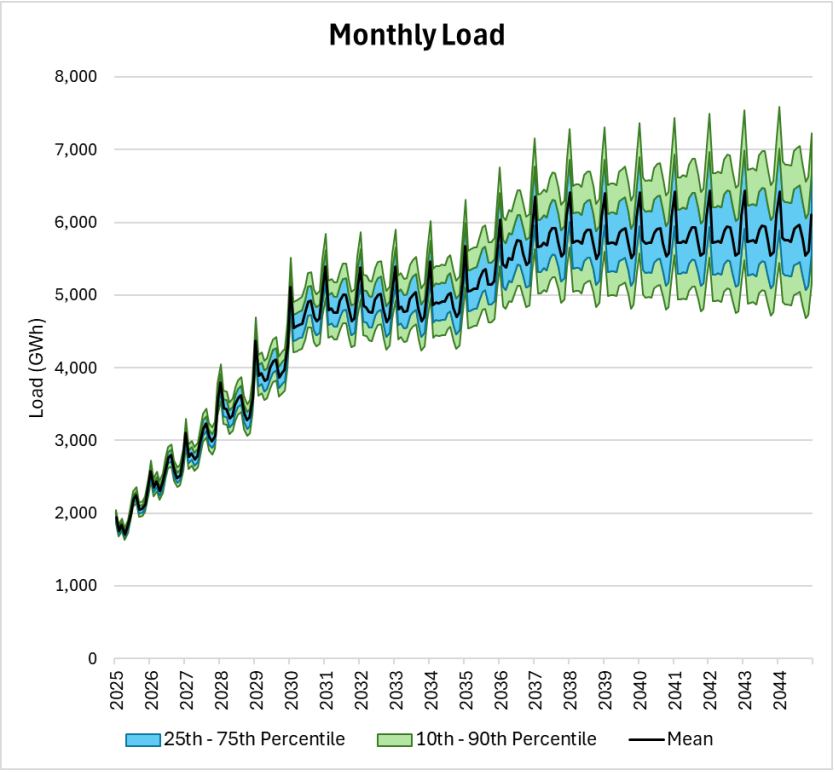
Environmental Sustainability ✓

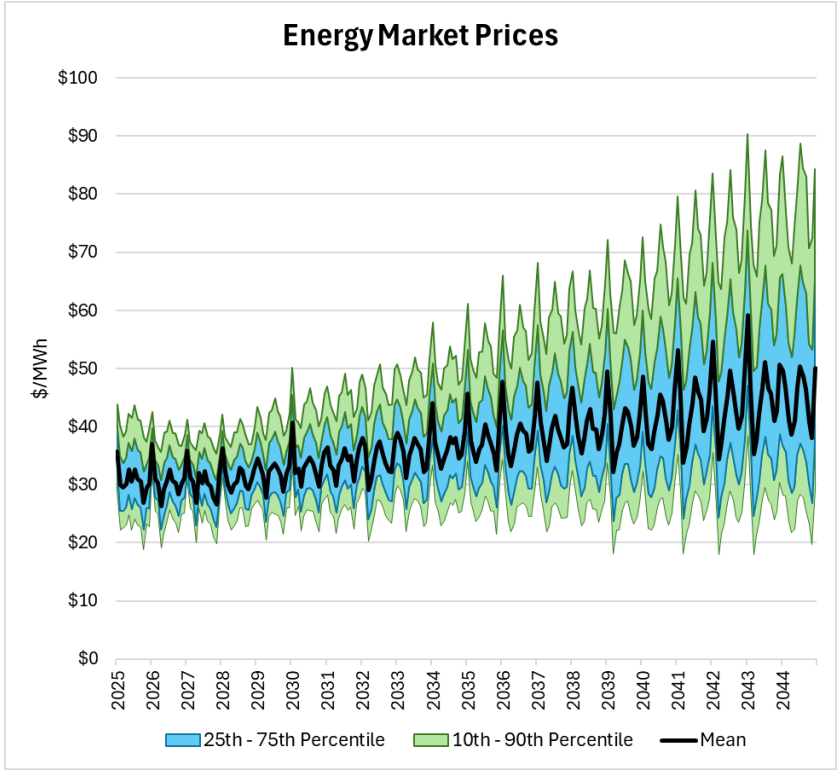
# Candidate Portfolio Comparison

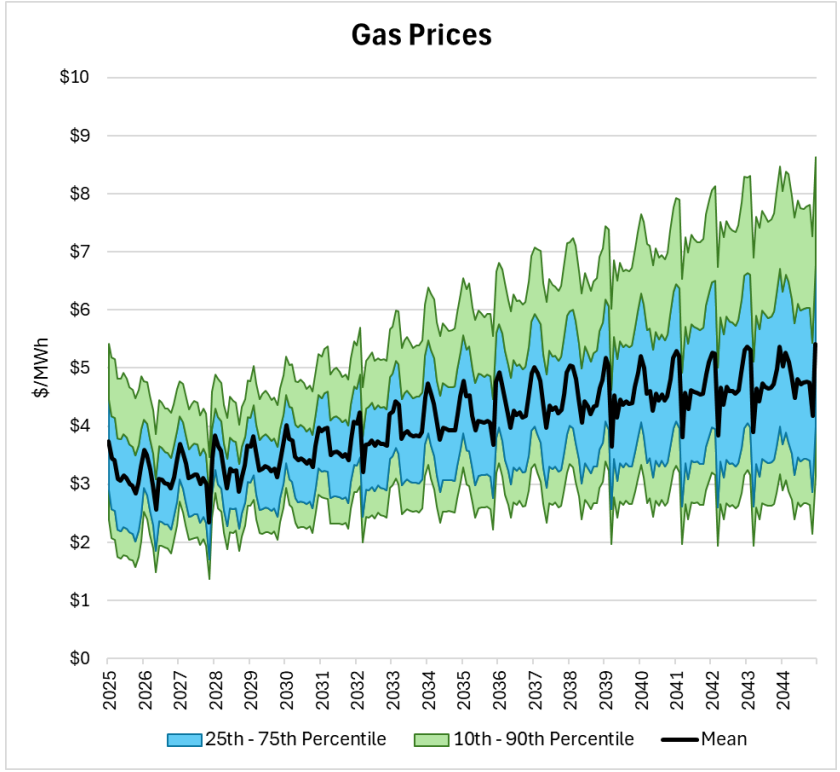


# Risk Analysis Method and Assumptions



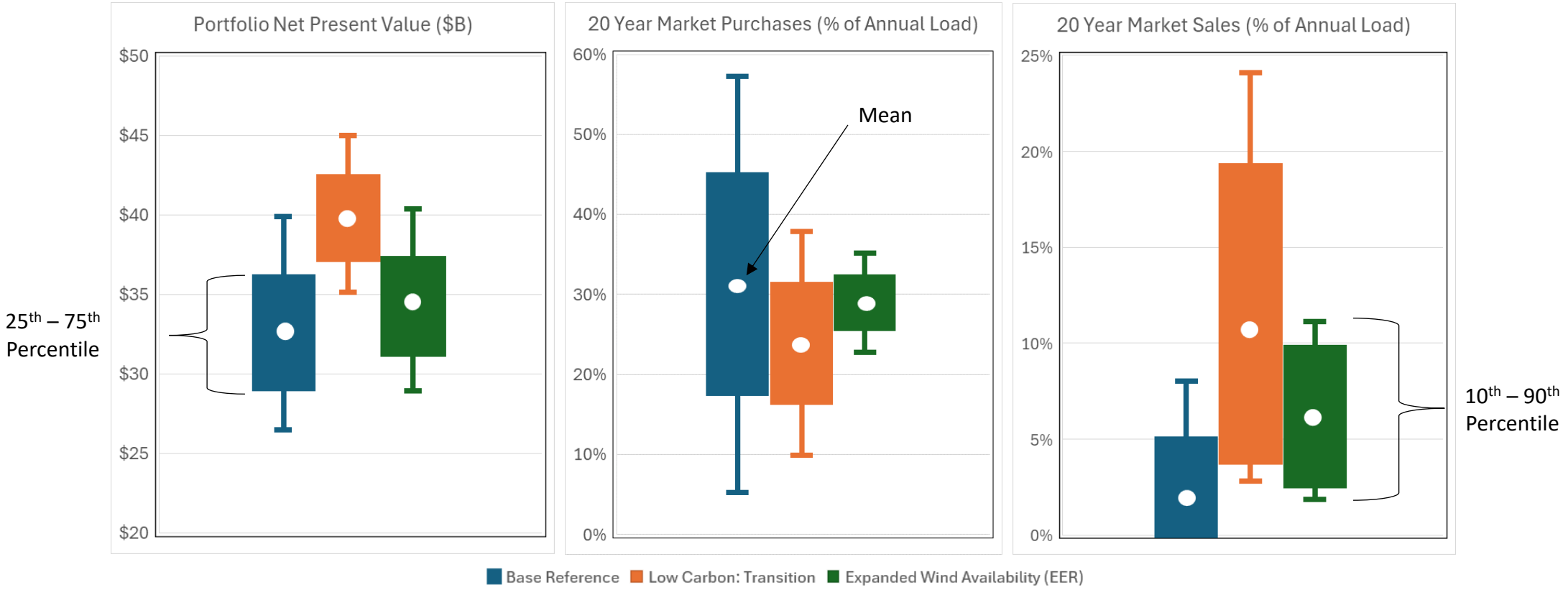

Methodology:

- Introduced uncertainty through Monte Carlo simulation with 100 correlated samples for load, market prices, and gas prices.
- Applied appropriate probability distributions and covariance structures to capture uncertainties and interdependencies among load, market prices, and gas prices.

Observations

- Monthly load and market price uncertainty increases significantly in the later half of the planning horizon.
- Gas prices exhibit moderate growth with periodic fluctuations. However, uncertainty increases after 2035, reflecting greater price unpredictability in the long term.

# Risk Analysis Results




Expanded Wind Availability (EER) and Base Reference case have similar variability. The Low Carbon: Transition case has the least amount of variability but highest average net present value.

Expanded Wind Availability (EER) has the lowest variability due to the gas capacity factor assumption which restricts gas generation during favorable economic conditions.

Low Carbon: Transition has the highest variability due to higher amounts of renewable resources and unrestricted gas capacity factors.

# Preferred Portfolio Development

- Based on modifications to the Expanded Wind Availability Enhanced Environmental Regulations (EER) portfolio
- Supports a balanced consideration of Indiana's Five Pillars of energy policy
  - Positions I&M for compliance with existing and future GHG regulations based on current and proposed rules
  - Leverages a mix of resource types to support reliability and stability, while increasing resource diversity and expanding I&M's renewable and clean energy portfolio
- Reflects up to date market conditions and resource availability based on 2024 RFP
- Includes strategy to leverage cost savings opportunities associated with redevelopment of the Rockport site to include combustion turbines and SMR technologies
  - Rockport CTs reflect estimated cost reductions of ~15% associated with reuse of interconnect and existing facilities while leveraging favorable equipment pricing associated with AEP multi-unit supply chain opportunities
  - Rockport SMRs reflect estimated cost reductions of ~30% associated with reuse of interconnect and existing facilities, energy community bonus ITCs, federal grants, customer participation, and leveraging fast follower savings opportunities
- Selects Cook Subsequent License Renewal maintaining Cook as a foundation of I&M’s future generation portfolio

# Preferred Portfolio

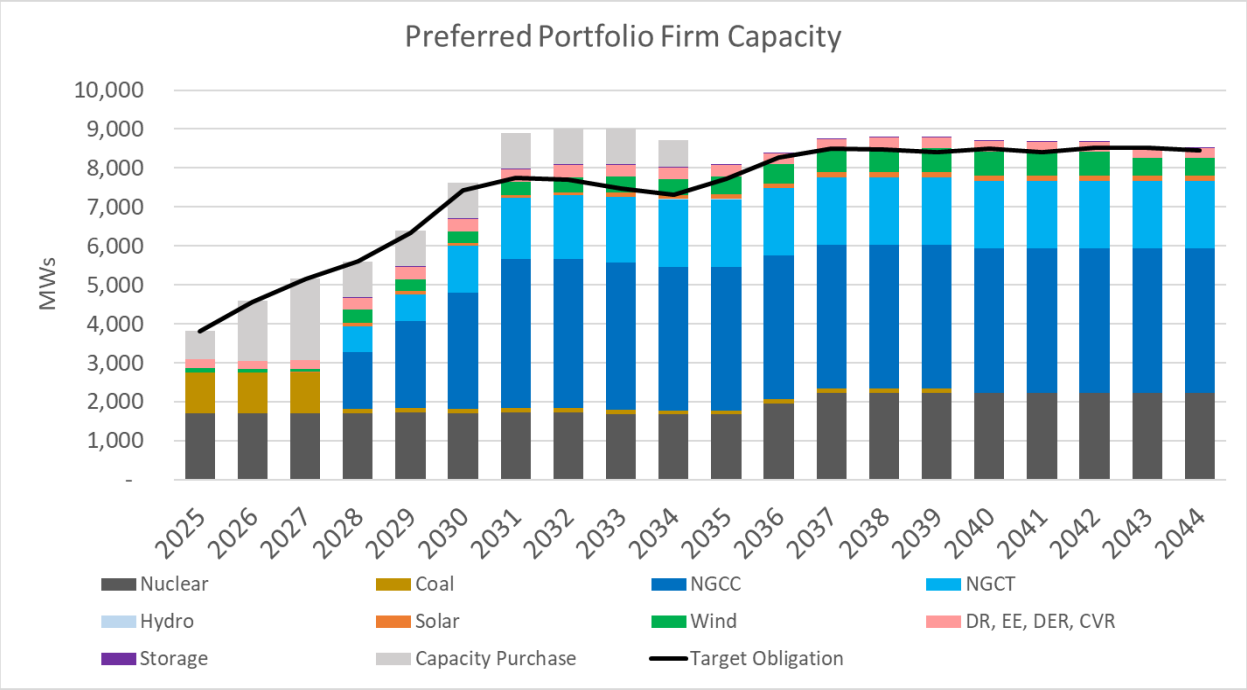
| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT* | Existing CT | Nuclear** | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 1,875 |
| 2028 | 1,000 | 599 | 50 | 0 | 1,800 | 0 | 1,000 | 0 | 92 | 0 |
| 2029 | 1,000 | 596 | 50 | 0 | 2,700 | 0 | 1,000 | 0 | 116 | 0 |
| 2030 | 1,000 | 593 | 50 | 0 | 3,600 | 690 | 1,000 | 0 | 132 | 0 |
| 2031 | 1,400 | 590 | 50 | 0 | 4,500 | 690 | 1,500 | 0 | 148 | 0 |
| 2032 | 1,800 | 886 | 50 | 0 | 4,500 | 690 | 1,500 | 0 | 144 | 0 |
| 2033 | 2,200 | 1,480 | 50 | 0 | 4,500 | 690 | 1,500 | 0 | 138 | 0 |
| 2034 | 2,600 | 2,071 | 50 | 0 | 4,500 | 690 | 1,500 | 0 | 134 | 0 |
| 2035 | 3,000 | 2,210 | 50 | 0 | 4,500 | 690 | 1,500 | 888 | 134 | 0 |
| 2036 | 3,200 | 2,199 | 50 | 0 | 4,500 | 690 | 1,500 | 1,188 | 131 | 0 |
| 2037 | 3,600 | 2,636 | 50 | 0 | 4,500 | 690 | 1,500 | 1,488 | 128 | 0 |
| 2038 | 4,000 | 2,623 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 125 | 0 |
| 2039 | 4,000 | 2,609 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 122 | 0 |
| 2040 | 4,000 | 2,596 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 119 | 0 |
| 2041 | 4,000 | 2,582 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 111 | 0 |
| 2042 | 4,000 | 2,569 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 105 | 0 |
| 2043 | 3,000 | 2,555 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 99 | 0 |
| 2044 | 3,000 | 2,542 | 50 | 0 | 4,500 | 690 | 1,500 | 2,480 | 94 | 0 |

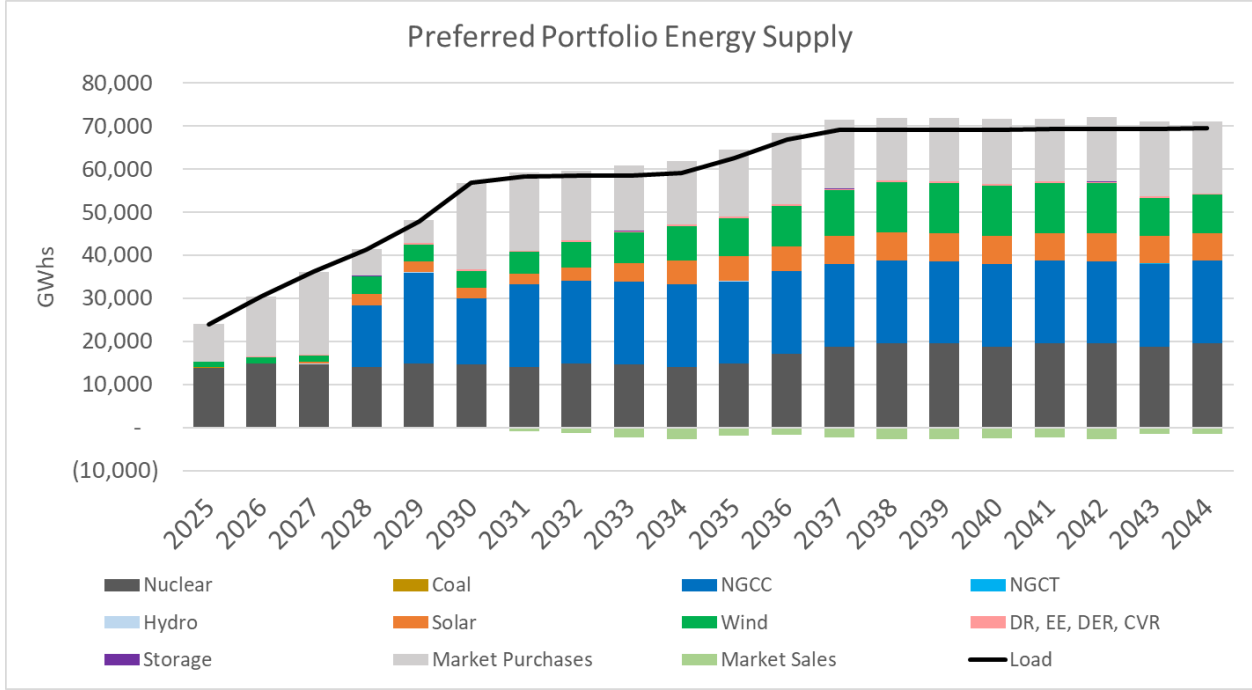
**Observations:**

- Diverse mix of wind, solar, storage, existing CC's and CT's are selected in the first year available to meet the capacity and energy obligation
- Substantial wind, solar, existing CC's, and existing CT's selected over the planning horizon
- Cook SLR selected in 2035 and 2038
- Leverages Rockport redevelopment opportunities with new CT selected in 2030 and 300 MW of SMR's selected in both 2036 and 2037. These resources reduce the need for existing CC's compared to the Expanded Wind Availability (EER) portfolio, adding new capacity to PJM's and I&M's system
- Elkhart and Mottville Hydro relicensing selected in 2030 and 2033, respectively

*The 690 MW New CTs selected in 2030 are assumed to be located at the Rockport site
** Nuclear includes Cook SLR and SMRs. SMRs are assumed to be located at the Rockport site

# Preferred Portfolio

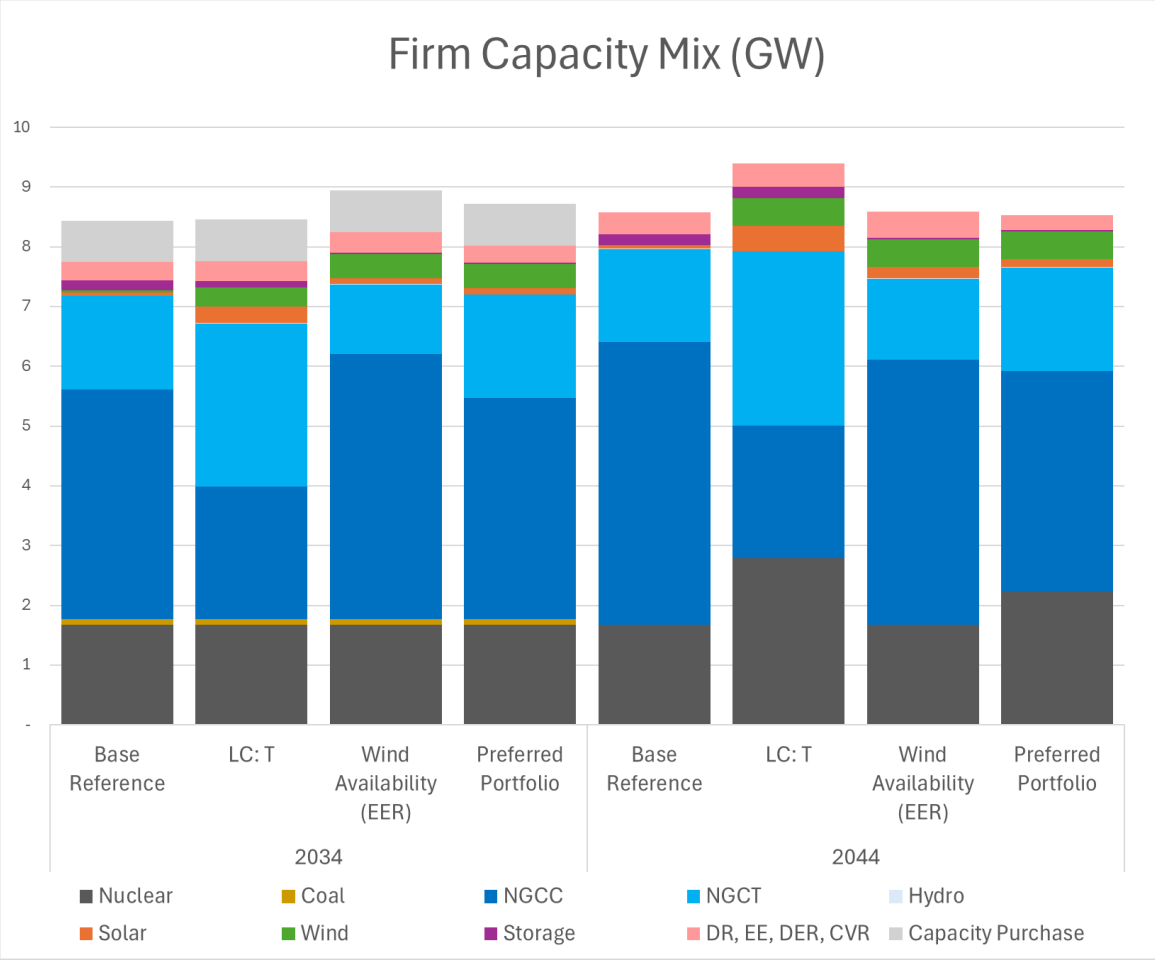


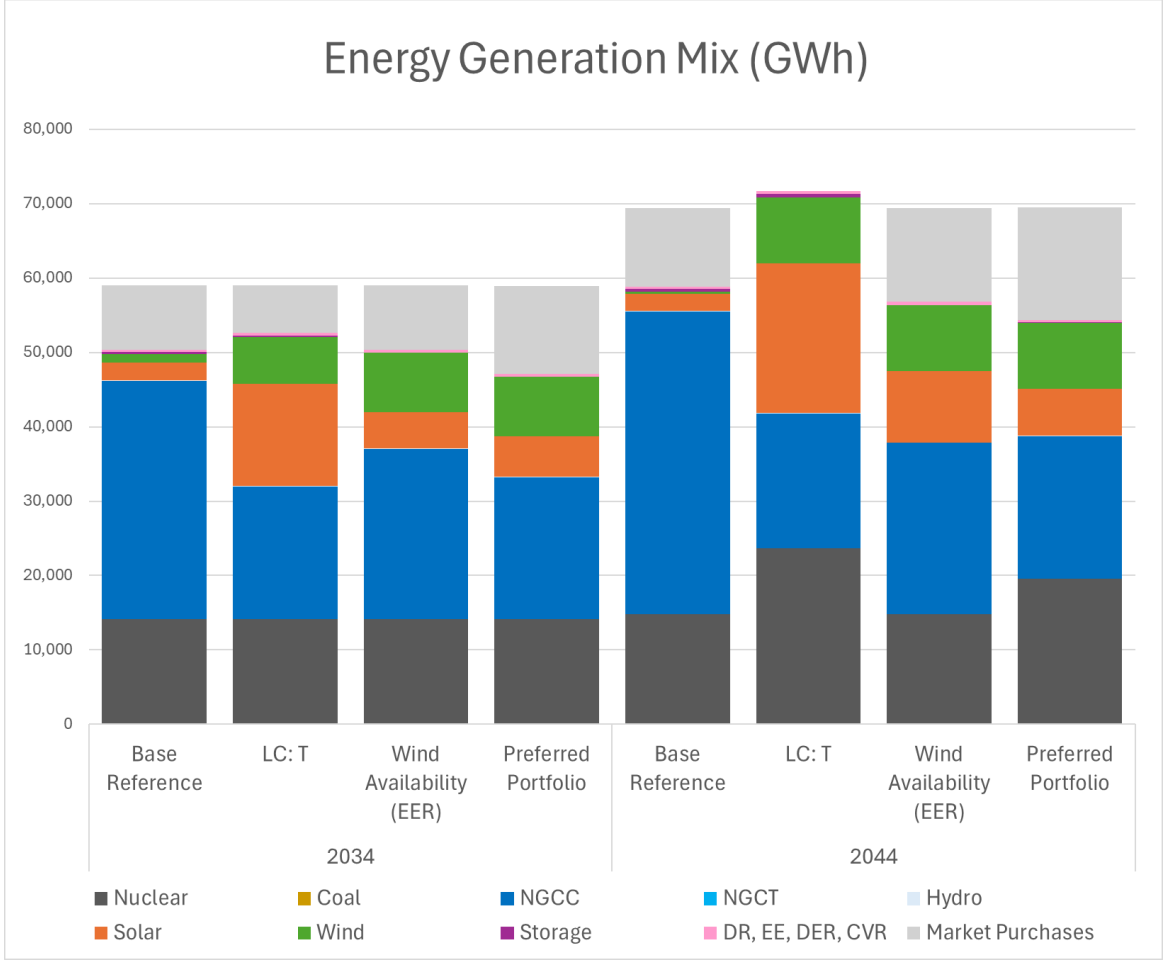




**Observations:**

- Expands I&M's wind and solar capacity and energy supply
- Rockport CT's, SMR's, Cook, and other natural gas resources with higher accreditation values support most of I&M's capacity obligation
- Capacity factor limitations associated with EPA Section 111(b)(d) compliance begin in 2030 and result in more energy contributions from other resources
- Capacity additions in 2031-2034 built to provide necessary energy supply and prepare for load increases that occur from 2034-2037
- Renewable resource additions result in higher market energy sales starting in 2031

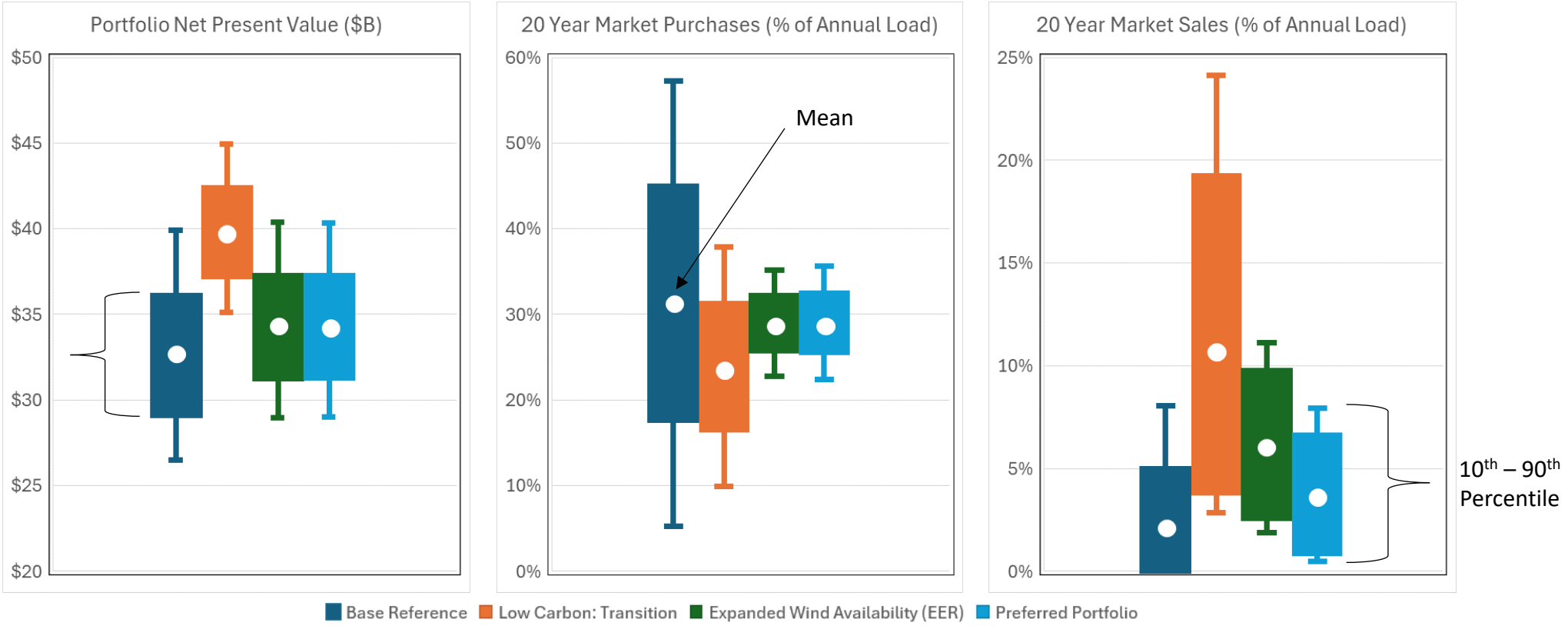
# Results Summary Comparison



# Preferred Portfolio Risk Analysis Results

25th – 75th Percentile




10th – 90th Percentile

Preferred Portfolio variability for net present value is similar to the Expanded Wind Availability (EER) but slightly less. The Preferred Portfolio has less variability in market sales risk and lower average market sales compared to the Expanded Wind Availability (EER).

# Portfolio Performance Indicators

| Pillar | Affordability | | | Environmental Sustainability | | |
|---|---|---|---|---|---|---|
| ***Performance Indicators and Metrics*** | ***Short Term*** *7-yr Rate CAGR* Power Supply $/MWh | ***Long Term*** *Supply Portfolio NPVRR Power Supply Costs* | ***Portfolio Resilience:*** *High Minus Low Scenario Range, Portfolio NPVRR* | ***Emissions Analysis:*** *% Change from 2005 Baseline* | | |
| Year Ref. | 2024-2031 | 2025-2044 | 2025-2044 | 2034 \| 2044 | | |
| Units | % | $B | $B | % Change $CO_2$ | % Change NOx | % Change $SO_2$ |
| **Base Reference** | -0.5% | $32.0 | $13.4 | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Low Carbon: Transition** | 1.3% | $39.9 | $9.8 | 2034: -65%<br>2044: -65% | 2034: -96%<br>2044: -96% | 2034: -100%<br>2044: -100% |
| **Expanded Wind Availability (EER)** | 0.5% | $32.8 | $11.4 | 2034: -56%<br>2044: -55% | 2034: -95%<br>2044: -95% | 2034: -100%<br>2044: -100% |
| **Preferred Portfolio** | 0.4% | $33.1 | $11.4 | 2034: -63%<br>2044: -63% | 2034: -96%<br>2044: -96% | 2034: -100%<br>2044: -100% |

# Portfolio Performance Indicators

| Pillar | Reliability | | | Reliability/ Resiliency | Grid Stability Resiliency |
|---|---|---|---|---|---|
| ***Performance Indicators and Metrics*** | ***Energy Market Risk*** *Purchases* | ***Energy Market Risk*** *Sales* | ***Planning Reserves*** *% Reserve Margin* | ***Resource Diversity*** | ***Fleet Resiliency:*** *Dispatchable Capacity* |
| Year Ref. | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years |
| Units | NPV of Market Purchases & MWhs % of Total Demand | NPV of Market Sales & MWhs % of Total Demand | Average of Annual PRM % | Portfolio Index Percent Change from 2025 | Dispatchable Nameplate MW/ % of Company Peak Demand |
| **Base Reference** | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.7%<br>20 Years: -3.4% | Capacity: 31% \| 19%<br>Energy: 173% \| 139% | 10 Years: 90%<br>20 Years: 97% |
| **Low Carbon: Transition** | 10 Years: $2.7B (27%)<br>20 Years: $4.1B (20%) | 10 Years: $0.2B (1.6%)<br>20 Years: $1.7B (7.7%) | 10 Years: 2.0%<br>20 Years: 0.5% | Capacity: 53% \| 54%<br>Energy: 302% \| 304% | 10 Years: 91%<br>20 Years: 95% |
| **Expanded Wind Availability (EER)** | 10 Years: $3.1B (31%)<br>20 Years: $5.4B (27%) | 10 Years: $0.5B (3.5%)<br>20 Years: $1.3B (5.2%) | 10 Years: 5.1%<br>20 Years: -0.6% | Capacity: 31% \| 34%<br>Energy: 296% \| 318% | 10 Years: 92%<br>20 Years: 92% |
| **Preferred Portfolio** | 10 Years: $3.1B (31%)<br>20 Years: $5.3B (27%) | 10 Years: $0.2B (1.3%)<br>20 Years: $0.5B (2.3%) | 10 Years: 4.2%<br>20 Years: -0.6% | Capacity: 39% \| 35%<br>Energy: 299% \| 299% | 10 Years: 91%<br>20 Years: 93% |

# Short Term Action Plan

| | |
|---|---|
| DSM Programs | Continue the planning and regulatory actions necessary to implement additional cost-effective DSM programs in Indiana consistent with this IRP that identified the potential for increased levels of cost-effective EE. |
| Near Term Capacity Needs | Obtain the capacity needed for PJM Planning Years 2026/2027 through 2027/2028 through Short Term market and bilateral purchases. |
| 2024 RFP | Complete selection of resources from the 2024 RFP. Seek approval of resources consistent with the Preferred Portfolio mix of resources. |
| Rockport CT | Complete competitive procurement process, seek reuse of transmission interconnection and request approval of resource with the commission. |
| Rockport SMR | Initiate early site permit process and continue to evaluate and pursue project development options. |
| Future RFPs | Continue to evaluate the need to issue future generation RFPs to fill the capacity and energy needs, as necessary. |
| Cook SLR | Take the appropriate steps to implement the Cook subsequent license renewal, as supported by the IRP modeling results and Preferred Portfolio. |
| Hydro Relicensing | Take the appropriate steps to finalize the evaluation of the Elkhart and Mottville Hydro operating license renewal opportunity reflected in the Preferred Portfolio. |
| Adjust for the Future | Adjust this action plan and future IRPs to reflect changing circumstances, as necessary. |

# Closing Remarks and Discussion

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# Portfolio Resource Plans

Appendix

# Base Reference Case Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 1,875 |
| 2028 | 200 | 599 | 450 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 0 |
| 2029 | 200 | 596 | 450 | 0 | 2,700 | 0 | 1,000 | 0 | 100 | 0 |
| 2030 | 200 | 593 | 450 | 0 | 3,600 | 0 | 1,500 | 0 | 97 | 0 |
| 2031 | 200 | 590 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 96 | 0 |
| 2032 | 200 | 587 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 115 | 0 |
| 2033 | 200 | 584 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 131 | 0 |
| 2034 | 200 | 581 | 450 | 1,030 | 3,600 | 0 | 2,000 | 0 | 144 | 0 |
| 2035 | 200 | 578 | 450 | 1,030 | 3,600 | 0 | 2,000 | 888 | 156 | 0 |
| 2036 | 200 | 575 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 169 | 0 |
| 2037 | 200 | 572 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 177 | 0 |
| 2038 | 200 | 569 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 185 | 0 |
| 2039 | 200 | 566 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 193 | 0 |
| 2040 | 200 | 563 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 201 | 0 |
| 2041 | 200 | 560 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 206 | 0 |
| 2042 | 200 | 557 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 211 | 0 |
| 2043 | 0 | 554 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 213 | 0 |
| 2044 | 0 | 551 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 220 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering all base modeling parameters and assumptions; establishes the point of reference for other scenarios and sensitivities

**Observations through 2030:**

- Short Term Capacity purchases until new resources become available in 2028
- Solar, wind, storage, and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- DR, EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- New CC built in 2034 and 2036 to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038



*Nuclear includes Cook SLR

# Enhanced Environmental Regulations Case Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 1,875 |
| 2028 | 200 | 1,496 | 350 | 0 | 1,800 | 0 | 1,000 | 0 | 88 | 0 |
| 2029 | 200 | 1,489 | 350 | 0 | 2,700 | 0 | 1,000 | 0 | 112 | 0 |
| 2030 | 200 | 1,481 | 350 | 0 | 3,600 | 0 | 1,500 | 0 | 127 | 0 |
| 2031 | 600 | 1,474 | 350 | 0 | 5,400 | 0 | 1,500 | 0 | 142 | 0 |
| 2032 | 1,000 | 2,065 | 350 | 0 | 5,400 | 0 | 1,500 | 0 | 158 | 0 |
| 2033 | 1,400 | 2,653 | 350 | 0 | 5,400 | 0 | 1,500 | 0 | 169 | 0 |
| 2034 | 1,800 | 3,238 | 350 | 0 | 5,400 | 0 | 1,500 | 0 | 178 | 0 |
| 2035 | 2,200 | 3,371 | 350 | 0 | 5,400 | 0 | 1,500 | 888 | 190 | 0 |
| 2036 | 2,600 | 3,952 | 350 | 0 | 5,400 | 0 | 1,500 | 888 | 201 | 0 |
| 2037 | 3,000 | 4,530 | 350 | 0 | 5,400 | 0 | 1,500 | 888 | 208 | 0 |
| 2038 | 3,200 | 4,507 | 350 | 0 | 5,400 | 0 | 1,500 | 1,880 | 215 | 0 |
| 2039 | 3,200 | 4,484 | 350 | 0 | 5,400 | 0 | 1,500 | 1,880 | 220 | 0 |
| 2040 | 3,200 | 4,461 | 350 | 0 | 5,400 | 0 | 1,500 | 1,880 | 224 | 0 |
| 2041 | 3,200 | 4,437 | 350 | 0 | 5,400 | 0 | 1,500 | 1,880 | 227 | 0 |
| 2042 | 3,200 | 4,414 | 350 | 0 | 5,400 | 230 | 1,500 | 1,880 | 230 | 0 |
| 2043 | 3,000 | 4,114 | 350 | 0 | 5,400 | 230 | 1,500 | 1,880 | 232 | 0 |
| 2044 | 3,000 | 4,092 | 350 | 0 | 5,400 | 230 | 1,500 | 1,880 | 233 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering implementation of EPA Section 111(b)(d) greenhouse gas rules and associated market commodity price impacts

**Observations through 2030:**

- Solar, wind, storage, and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Additional solar resources selected due to limited capacity factors on thermal resources
- DR, EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- Substantially more wind and solar selected than reference scenario
- Additional existing CC's selected to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038
- Additional EE selected compared to reference scenario

*Nuclear includes Cook SLR

# Base Under EPA Section 111(b)(d) Sensitivity

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 1,875 |
| 2028 | 200 | 1,047 | 400 | 0 | 1,800 | 0 | 1,000 | 0 | 90 | 0 |
| 2029 | 200 | 1,042 | 400 | 0 | 2,700 | 0 | 1,000 | 0 | 114 | 0 |
| 2030 | 200 | 1,037 | 400 | 0 | 3,600 | 0 | 1,500 | 0 | 130 | 0 |
| 2031 | 600 | 1,481 | 400 | 0 | 5,400 | 0 | 1,500 | 0 | 146 | 0 |
| 2032 | 1,000 | 2,072 | 400 | 0 | 5,400 | 0 | 1,500 | 0 | 162 | 0 |
| 2033 | 1,400 | 2,660 | 400 | 0 | 5,400 | 0 | 1,500 | 0 | 173 | 0 |
| 2034 | 1,800 | 3,245 | 400 | 0 | 5,400 | 0 | 1,500 | 0 | 182 | 0 |
| 2035 | 2,200 | 3,527 | 400 | 0 | 5,400 | 0 | 1,500 | 888 | 194 | 0 |
| 2036 | 2,600 | 4,108 | 400 | 0 | 5,400 | 0 | 1,500 | 888 | 204 | 0 |
| 2037 | 3,000 | 4,685 | 400 | 0 | 5,400 | 0 | 1,500 | 888 | 212 | 0 |
| 2038 | 3,000 | 4,661 | 400 | 0 | 5,400 | 0 | 1,500 | 1,880 | 218 | 0 |
| 2039 | 3,000 | 4,637 | 400 | 0 | 5,400 | 0 | 1,500 | 1,880 | 223 | 0 |
| 2040 | 3,000 | 4,613 | 400 | 0 | 5,400 | 0 | 1,500 | 1,880 | 228 | 0 |
| 2041 | 3,000 | 4,589 | 400 | 0 | 5,400 | 0 | 1,500 | 1,880 | 231 | 0 |
| 2042 | 3,000 | 4,565 | 400 | 0 | 5,400 | 230 | 1,500 | 1,880 | 233 | 0 |
| 2043 | 2,800 | 4,541 | 400 | 0 | 5,400 | 230 | 1,500 | 1,880 | 235 | 0 |
| 2044 | 2,800 | 4,517 | 400 | 0 | 5,400 | 230 | 1,500 | 1,880 | 236 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering implementation of EPA Section 111(b)(d) greenhouse gas rules and base modeling parameters and assumptions

**Observations through 2030:**

- Solar, wind, storage, and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Additional solar resources selected due to limited capacity factors on thermal resources
- DR, EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- Substantially more wind and solar selected than reference scenario
- Additional existing CC's selected to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038
- Additional EE selected compared to reference scenario

*Nuclear includes Cook SLR

# Low Carbon Sensitivity: Transition to Objective

| Year | Nameplate MW | | | | | | | | Accredited MW | | Objective Achievement (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity | |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 | 100% |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1,500 | 100% |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 1,875 | 95% |
| 2028 | 200 | 1,796 | 300 | 0 | 1,800 | 0 | 1,000 | 0 | 92 | 0 | 92% |
| 2029 | 400 | 2,235 | 300 | 0 | 1,800 | 0 | 2,000 | 0 | 111 | 0 | 79% |
| 2030 | 400 | 2,224 | 300 | 0 | 2,700 | 0 | 2,500 | 0 | 121 | 0 | 60% |
| 2031 | 800 | 2,662 | 300 | 0 | 2,700 | 0 | 3,500 | 0 | 131 | 0 | 62% |
| 2032 | 1,200 | 3,845 | 300 | 0 | 2,700 | 0 | 3,500 | 0 | 149 | 0 | 72% |
| 2033 | 1,600 | 5,023 | 300 | 0 | 2,700 | 0 | 3,500 | 0 | 162 | 0 | 81% |
| 2034 | 2,000 | 6,194 | 300 | 0 | 2,700 | 0 | 3,500 | 0 | 173 | 0 | 82% |
| 2035 | 2,600 | 7,360 | 300 | 0 | 2,700 | 0 | 3,500 | 888 | 185 | 0 | 85% |
| 2036 | 3,200 | 8,968 | 450 | 0 | 2,700 | 230 | 3,500 | 888 | 197 | 0 | 87% |
| 2037 | 3,400 | 10,269 | 500 | 0 | 2,700 | 230 | 3,500 | 1,488 | 205 | 0 | 96% |
| 2038 | 3,400 | 10,217 | 500 | 0 | 2,700 | 230 | 3,500 | 2,780 | 211 | 0 | 100% |
| 2039 | 3,400 | 10,164 | 500 | 0 | 2,700 | 230 | 3,500 | 2,780 | 217 | 0 | 100% |
| 2040 | 3,400 | 10,261 | 500 | 0 | 2,700 | 230 | 3,500 | 2,780 | 223 | 0 | 100% |
| 2041 | 3,400 | 10,208 | 500 | 0 | 2,700 | 230 | 3,500 | 2,780 | 227 | 0 | 100% |
| 2042 | 3,400 | 10,155 | 500 | 0 | 2,700 | 230 | 3,500 | 2,780 | 230 | 0 | 100% |
| 2043 | 3,200 | 9,548 | 500 | 0 | 2,700 | 230 | 3,500 | 3,080 | 233 | 0 | 100% |
| 2044 | 3,000 | 9,359 | 500 | 0 | 2,700 | 230 | 3,500 | 3,080 | 235 | 0 | 100% |

**Purpose of Scenario:**

- Evaluating the most economical solution to achieve the Low Carbon Objective as quickly as possible given the base assumptions for wind and solar build limits

**Observations through 2030:**

- Wind and solar selected near build limits
- Selecting CT's and CC's to meet remaining capacity and energy needs
- DR, EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- SMR selected in 2037, increasing to 1,200MW by 2043
- Substantially more solar and wind selected to meet the carbon-free objective
- Additional CT's selected to meet capacity obligation
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR and SMR

# Low Carbon Sensitivity: Expanded Build Limits

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 1,900 |
| 2028 | 1,200 | 1,347 | 0 | 0 | 1,800 | 0 | 1,000 | 0 | 56 | 0 |
| 2029 | 1,800 | 3,285 | 0 | 0 | 1,800 | 0 | 2,000 | 0 | 69 | 0 |
| 2030 | 3,400 | 5,513 | 300 | 0 | 1,800 | 0 | 3,000 | 0 | 80 | 0 |
| 2031 | 5,000 | 5,485 | 300 | 0 | 1,800 | 0 | 4,000 | 0 | 90 | 0 |
| 2032 | 5,000 | 5,457 | 300 | 0 | 1,800 | 0 | 4,000 | 0 | 108 | 0 |
| 2033 | 5,000 | 5,430 | 300 | 0 | 1,800 | 0 | 4,000 | 0 | 122 | 0 |
| 2034 | 5,000 | 5,701 | 300 | 0 | 1,800 | 0 | 4,000 | 0 | 134 | 0 |
| 2035 | 5,400 | 7,019 | 300 | 0 | 1,800 | 0 | 4,000 | 888 | 147 | 0 |
| 2036 | 6,200 | 8,030 | 300 | 0 | 1,800 | 230 | 4,000 | 888 | 158 | 0 |
| 2037 | 6,200 | 8,438 | 300 | 0 | 1,800 | 230 | 4,000 | 1,188 | 167 | 0 |
| 2038 | 6,200 | 8,394 | 300 | 0 | 1,800 | 230 | 4,000 | 2,180 | 175 | 0 |
| 2039 | 6,200 | 8,351 | 300 | 0 | 1,800 | 230 | 4,000 | 2,180 | 182 | 0 |
| 2040 | 6,200 | 8,457 | 350 | 0 | 1,800 | 230 | 4,000 | 2,180 | 187 | 0 |
| 2041 | 6,200 | 8,412 | 350 | 0 | 1,800 | 230 | 4,000 | 2,180 | 192 | 0 |
| 2042 | 6,200 | 8,368 | 350 | 0 | 1,800 | 230 | 4,000 | 2,180 | 195 | 0 |
| 2043 | 5,000 | 8,047 | 350 | 0 | 1,800 | 230 | 4,000 | 2,780 | 198 | 0 |
| 2044 | 4,600 | 8,222 | 350 | 0 | 1,800 | 230 | 4,000 | 2,780 | 200 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to achieve the Low Carbon Objective starting 2028 with increased wind and solar build limits

**Observations through 2030:**

- Substantial expansion in build limits for wind and solar required to meet the carbon-free objective
- Selecting all available existing CT's by 2030 to meet capacity obligation
- Substantially fewer existing CC's selected compared to reference scenario
- EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- SMR selected in 2037 when first made available and again in 2043
- Substantially more solar and wind selected to meet the carbon-free objective
- Additional CT's selected to meet capacity obligation
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR and SMR

# High Case Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage** | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 350 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 1,650 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 2,000 |
| 2028 | 200 | 1,796 | 451 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 200 |
| 2029 | 200 | 1,787 | 451 | 0 | 2,700 | 0 | 2,000 | 0 | 119 | 0 |
| 2030 | 200 | 1,778 | 454 | 0 | 2,700 | 0 | 3,000 | 0 | 135 | 0 |
| 2031 | 600 | 1,769 | 454 | 0 | 3,600 | 0 | 3,500 | 0 | 151 | 0 |
| 2032 | 1,000 | 1,760 | 454 | 0 | 3,600 | 0 | 3,500 | 0 | 167 | 0 |
| 2033 | 1,400 | 1,751 | 454 | 0 | 3,600 | 0 | 3,500 | 0 | 179 | 0 |
| 2034 | 1,800 | 1,891 | 454 | 1,030 | 3,600 | 0 | 3,500 | 0 | 188 | 0 |
| 2035 | 2,000 | 2,480 | 454 | 1,030 | 3,600 | 0 | 3,500 | 888 | 201 | 0 |
| 2036 | 2,400 | 3,066 | 454 | 1,030 | 3,600 | 0 | 3,500 | 888 | 212 | 0 |
| 2037 | 2,800 | 3,648 | 454 | 1,030 | 3,600 | 0 | 3,500 | 888 | 220 | 0 |
| 2038 | 3,200 | 3,630 | 454 | 1,030 | 3,600 | 0 | 3,500 | 1,880 | 226 | 0 |
| 2039 | 3,200 | 3,611 | 454 | 1,030 | 3,600 | 0 | 3,500 | 1,880 | 231 | 0 |
| 2040 | 3,200 | 3,592 | 454 | 1,030 | 3,600 | 0 | 3,500 | 1,880 | 236 | 0 |
| 2041 | 3,200 | 3,573 | 454 | 1,030 | 3,600 | 0 | 3,500 | 1,880 | 239 | 0 |
| 2042 | 3,200 | 3,555 | 454 | 1,030 | 3,600 | 230 | 3,500 | 1,880 | 242 | 0 |
| 2043 | 3,000 | 2,982 | 454 | 1,030 | 3,600 | 230 | 3,500 | 1,880 | 245 | 0 |
| 2044 | 3,000 | 3,266 | 454 | 1,030 | 3,600 | 230 | 3,500 | 1,880 | 246 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering all high economic forecast modeling parameters and assumptions

**Observations through 2030:**

- Solar, wind, storage, and gas resources selected in 2028; significantly more solar than reference scenario
- Selected all available existing CT's by 2030 and existing CC's were selected to meet energy needs
- DR, EE, DER, CVR increase as the load and energy increase with the HSL

**Observations for 2031+:**

- Significantly more wind is selected compared to the reference scenario
- Fewer new CC's selected compared to the reference scenario due to the additional wind and solar selected
- Additional existing CT's selected compared to the reference scenario to meet capacity obligation
- Cook SLR selected in 2035 and 2038
- Additional EE selected compared to reference scenario

*Nuclear includes Cook SLR

** Storage includes Distribution-Sited Storage resources

# Low Case Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 75 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 1,275 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 1,525 |
| 2028 | 200 | 0 | 0 | 0 | 1,800 | 0 | 1,000 | 0 | 79 | 0 |
| 2029 | 200 | 0 | 0 | 0 | 2,700 | 0 | 1,000 | 0 | 90 | 0 |
| 2030 | 200 | 0 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 94 | 0 |
| 2031 | 200 | 0 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 98 | 0 |
| 2032 | 200 | 0 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 97 | 0 |
| 2033 | 200 | 0 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 94 | 0 |
| 2034 | 200 | 0 | 0 | 1,030 | 3,600 | 0 | 1,500 | 0 | 92 | 0 |
| 2035 | 200 | 0 | 0 | 1,030 | 3,600 | 0 | 1,500 | 888 | 91 | 0 |
| 2036 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 888 | 88 | 0 |
| 2037 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 888 | 85 | 0 |
| 2038 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 82 | 0 |
| 2039 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 79 | 0 |
| 2040 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 78 | 0 |
| 2041 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 70 | 0 |
| 2042 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 64 | 0 |
| 2043 | 0 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 57 | 0 |
| 2044 | 200 | 0 | 0 | 2,060 | 3,600 | 0 | 1,500 | 1,880 | 56 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering all low economic forecast modeling parameters and assumptions

**Observations through 2030:**

- Wind and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Fewer DR, EE, DER, CVR are selected compared to reference scenario

**Observations for 2031+:**

- New CC built in 2034 and 2036 to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Fewer existing CT's selected compared to reference scenario due to lower capacity obligation
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR

# Expanded Wind Availability (Base) Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 1,875 |
| 2028 | 1,200 | 150 | 0 | 0 | 1,800 | 0 | 1,000 | 0 | 92 | 0 |
| 2029 | 1,200 | 149 | 0 | 0 | 2,700 | 0 | 1,000 | 0 | 110 | 0 |
| 2030 | 1,200 | 148 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 120 | 0 |
| 2031 | 1,200 | 147 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 129 | 0 |
| 2032 | 1,200 | 147 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 146 | 0 |
| 2033 | 1,200 | 146 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 158 | 0 |
| 2034 | 1,200 | 145 | 0 | 1,030 | 3,600 | 0 | 2,000 | 0 | 168 | 0 |
| 2035 | 1,200 | 144 | 0 | 1,030 | 3,600 | 0 | 2,000 | 888 | 180 | 0 |
| 2036 | 1,200 | 144 | 0 | 2,060 | 3,600 | 0 | 2,000 | 888 | 191 | 0 |
| 2037 | 1,200 | 143 | 0 | 2,060 | 3,600 | 0 | 2,000 | 888 | 199 | 0 |
| 2038 | 1,200 | 142 | 0 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 206 | 0 |
| 2039 | 1,200 | 141 | 0 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 212 | 0 |
| 2040 | 1,200 | 141 | 0 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 217 | 0 |
| 2041 | 1,200 | 140 | 0 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 221 | 0 |
| 2042 | 1,200 | 139 | 0 | 2,060 | 3,600 | 230 | 2,000 | 1,880 | 225 | 0 |
| 2043 | 0 | 0 | 0 | 2,060 | 3,600 | 230 | 2,000 | 1,880 | 227 | 0 |
| 2044 | 0 | 0 | 0 | 2,060 | 3,600 | 230 | 2,000 | 1,880 | 229 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering all base modeling parameters and additional wind availability through 2030

**Observations through 2030:**

- Additional wind selected by the model reduces solar and storage resources compared to the reference scenario
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation similar to the reference scenario

**Observations for 2031+:**

- New CC built in 2034 and 2036 to meet the load growth in the same period and the expiration of existing capacity purchase agreements similar to the reference scenario
- New CT built in 2042 compared to the reference scenario to meet capacity obligation
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR

# Expanded Wind Availability (EER) Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 1,875 |
| 2028 | 1,000 | 599 | 50 | 0 | 1,800 | 0 | 1,000 | 0 | 90 | 0 |
| 2029 | 1,000 | 596 | 50 | 0 | 2,700 | 0 | 1,000 | 0 | 113 | 0 |
| 2030 | 1,000 | 593 | 50 | 0 | 3,600 | 0 | 1,500 | 0 | 129 | 0 |
| 2031 | 1,400 | 590 | 50 | 0 | 5,400 | 0 | 1,500 | 0 | 143 | 0 |
| 2032 | 1,800 | 587 | 50 | 0 | 5,400 | 0 | 1,500 | 0 | 166 | 0 |
| 2033 | 2,200 | 1,182 | 50 | 0 | 5,400 | 0 | 1,500 | 0 | 182 | 0 |
| 2034 | 2,600 | 1,775 | 50 | 0 | 5,400 | 0 | 1,500 | 0 | 196 | 0 |
| 2035 | 2,800 | 2,364 | 50 | 0 | 5,400 | 0 | 1,500 | 888 | 212 | 0 |
| 2036 | 3,200 | 2,951 | 50 | 0 | 5,400 | 0 | 1,500 | 888 | 228 | 0 |
| 2037 | 3,600 | 3,534 | 50 | 0 | 5,400 | 0 | 1,500 | 888 | 240 | 0 |
| 2038 | 4,000 | 3,815 | 50 | 0 | 5,400 | 0 | 1,500 | 1,880 | 251 | 0 |
| 2039 | 4,000 | 3,796 | 50 | 0 | 5,400 | 0 | 1,500 | 1,880 | 260 | 0 |
| 2040 | 4,000 | 3,776 | 50 | 0 | 5,400 | 0 | 1,500 | 1,880 | 269 | 0 |
| 2041 | 4,000 | 3,757 | 50 | 0 | 5,400 | 0 | 1,500 | 1,880 | 276 | 0 |
| 2042 | 4,000 | 3,737 | 50 | 0 | 5,400 | 0 | 1,500 | 1,880 | 281 | 0 |
| 2043 | 3,000 | 4,167 | 50 | 0 | 5,400 | 230 | 1,500 | 1,880 | 286 | 0 |
| 2044 | 3,000 | 4,145 | 50 | 0 | 5,400 | 230 | 1,500 | 1,880 | 290 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering implementation of EPA Section 111(b)(d) greenhouse gas rules and associated market commodity price impacts with the expansion of wind availability through 2030

**Observations through 2030:**

- Additional wind selected by the model reduces solar and storage resources compared to the EER scenario
- All available existing CC's by 2030 and existing CT's were selected to meet capacity obligation

**Observations for 2031+:**

- Similar to the EER scenario, substantial wind, solar, and existing CC's selected to meet the load growth and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR

# Base with High Load Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage** | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 350 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 1,650 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 2,000 |
| 2028 | 200 | 1,796 | 451 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 200 |
| 2029 | 200 | 1,787 | 451 | 0 | 2,700 | 0 | 1,500 | 0 | 100 | 0 |
| 2030 | 200 | 1,778 | 451 | 0 | 3,600 | 0 | 2,000 | 0 | 97 | 0 |
| 2031 | 600 | 1,769 | 451 | 0 | 3,600 | 0 | 3,000 | 0 | 96 | 0 |
| 2032 | 600 | 1,760 | 451 | 0 | 3,600 | 0 | 3,000 | 0 | 95 | 0 |
| 2033 | 600 | 1,751 | 451 | 0 | 3,600 | 0 | 3,000 | 0 | 91 | 0 |
| 2034 | 600 | 1,742 | 451 | 1,030 | 3,600 | 0 | 3,000 | 0 | 88 | 0 |
| 2035 | 600 | 1,733 | 451 | 1,030 | 3,600 | 0 | 3,000 | 888 | 86 | 0 |
| 2036 | 600 | 1,724 | 451 | 2,060 | 3,600 | 0 | 3,000 | 888 | 84 | 0 |
| 2037 | 1,000 | 1,715 | 451 | 2,060 | 3,600 | 0 | 3,000 | 888 | 80 | 0 |
| 2038 | 1,200 | 1,706 | 451 | 2,060 | 3,600 | 0 | 3,000 | 1,880 | 76 | 0 |
| 2039 | 1,200 | 1,697 | 451 | 2,060 | 3,600 | 0 | 3,000 | 1,880 | 75 | 0 |
| 2040 | 1,200 | 1,688 | 451 | 2,060 | 3,600 | 0 | 3,000 | 1,880 | 74 | 0 |
| 2041 | 1,200 | 1,679 | 451 | 2,060 | 3,600 | 0 | 3,000 | 1,880 | 68 | 0 |
| 2042 | 1,200 | 1,670 | 451 | 2,060 | 3,600 | 230 | 3,000 | 1,880 | 62 | 0 |
| 2043 | 1,000 | 1,107 | 451 | 2,060 | 3,600 | 460 | 3,000 | 1,880 | 56 | 0 |
| 2044 | 1,000 | 1,251 | 451 | 2,060 | 3,600 | 460 | 3,000 | 1,880 | 55 | 0 |

*Nuclear includes Cook SLR
** Storage includes Distribution-Sited Storage resources

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions with High Load forecast scenario

**Observations through 2030:**

- Solar, wind, storage, and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Increased Short Term Capacity purchased compared to reference scenario due to increased Capacity Obligation due to higher load
- Additional solar and CT resources selected by 2030 in response to higher load compared to reference scenario

**Observations for 2031+:**

- More wind and CT's are selected compared to the reference scenario
- New CC built in 2034 and 2036 to meet the load growth in the same period and the expiration of existing capacity purchase agreements similar to the reference scenario
- Cook SLR selected in 2035 and 2038

# Base with Low Load Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 75 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 1,275 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 1,525 |
| 2028 | 200 | 0 | 0 | 0 | 1,800 | 0 | 1,000 | 0 | 79 | 0 |
| 2029 | 200 | 0 | 0 | 0 | 2,700 | 0 | 1,000 | 0 | 97 | 0 |
| 2030 | 200 | 0 | 0 | 0 | 3,600 | 0 | 1,500 | 0 | 106 | 0 |
| 2031 | 600 | 0 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 115 | 0 |
| 2032 | 600 | 0 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 111 | 0 |
| 2033 | 800 | 0 | 0 | 0 | 3,600 | 0 | 2,000 | 0 | 105 | 0 |
| 2034 | 800 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 0 | 100 | 0 |
| 2035 | 800 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 888 | 99 | 0 |
| 2036 | 800 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 888 | 96 | 0 |
| 2037 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 888 | 92 | 0 |
| 2038 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 87 | 0 |
| 2039 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 84 | 0 |
| 2040 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 81 | 0 |
| 2041 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 73 | 0 |
| 2042 | 1,200 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 65 | 0 |
| 2043 | 1,000 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 58 | 0 |
| 2044 | 1,000 | 0 | 0 | 1,030 | 3,600 | 0 | 2,000 | 1,880 | 53 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions with Low Load forecast scenario

**Observations through 2030:**

- Wind and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Unlike the reference scenario, less short term capacity and no solar or storage are selected

**Observations for 2031+:**

- New CC built in 2034 and additional wind resources built to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR

# High Technology Cost Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 1,875 |
| 2028 | 200 | 599 | 450 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 0 |
| 2029 | 200 | 596 | 450 | 0 | 2,700 | 0 | 1,000 | 0 | 100 | 0 |
| 2030 | 200 | 593 | 450 | 0 | 3,600 | 0 | 1,500 | 0 | 97 | 0 |
| 2031 | 200 | 590 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 96 | 0 |
| 2032 | 200 | 587 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 115 | 0 |
| 2033 | 200 | 584 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 131 | 0 |
| 2034 | 200 | 581 | 450 | 1,030 | 3,600 | 0 | 2,000 | 0 | 144 | 0 |
| 2035 | 200 | 578 | 450 | 1,030 | 3,600 | 0 | 2,000 | 888 | 156 | 0 |
| 2036 | 200 | 575 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 169 | 0 |
| 2037 | 200 | 572 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 177 | 0 |
| 2038 | 200 | 569 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 185 | 0 |
| 2039 | 200 | 566 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 193 | 0 |
| 2040 | 200 | 563 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 201 | 0 |
| 2041 | 200 | 560 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 207 | 0 |
| 2042 | 200 | 557 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 211 | 0 |
| 2043 | 0 | 554 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 213 | 0 |
| 2044 | 0 | 551 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 220 | 0 |

**Purpose of Scenario:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions with increased resource installed costs

**Observations through 2030:**

- Resources selected are identical to the reference case starting in 2025 and for the remainder of the planning horizon
- Solar, wind, storage, and gas resources selected in 2028 to meet the capacity and energy obligations are not impacted by the higher cost assumptions
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation

**Observations for 2031+:**

- New CC built in 2034 and 2036 to meet the capacity and energy obligations are not impacted by the higher cost assumptions
- Cook SLR selected in 2035 and 2038

# Rockport Unit 1 Retires 2025 Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1,250 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 2,425 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 2,825 |
| 2028 | 200 | 599 | 450 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 0 |
| 2029 | 200 | 596 | 450 | 0 | 2,700 | 0 | 1,000 | 0 | 100 | 0 |
| 2030 | 200 | 593 | 450 | 0 | 3,600 | 0 | 1,500 | 0 | 97 | 0 |
| 2031 | 200 | 590 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 96 | 0 |
| 2032 | 200 | 587 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 115 | 0 |
| 2033 | 200 | 584 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 131 | 0 |
| 2034 | 200 | 581 | 450 | 1,030 | 3,600 | 0 | 2,000 | 0 | 144 | 0 |
| 2035 | 200 | 578 | 450 | 1,030 | 3,600 | 0 | 2,000 | 888 | 156 | 0 |
| 2036 | 200 | 575 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 169 | 0 |
| 2037 | 200 | 572 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 177 | 0 |
| 2038 | 200 | 569 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 185 | 0 |
| 2039 | 200 | 566 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 193 | 0 |
| 2040 | 200 | 563 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 201 | 0 |
| 2041 | 200 | 560 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 207 | 0 |
| 2042 | 200 | 557 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 211 | 0 |
| 2043 | 0 | 554 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 213 | 0 |
| 2044 | 0 | 551 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 220 | 0 |

**Purpose of Scenario**:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions of Rockport retiring 5/31/2025

**Observations through Planning Horizon:**

- Additional Short Term Capacity purchases compared to the reference case until new resources become available in 2028
- Resources selected are identical to the reference case starting in 2028 and for the remainder of the planning horizon

*Nuclear includes Cook SLR
** Required per Cause No. 45546

# Rockport Unit 1 Retires 2026 Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 2,425 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 2,825 |
| 2028 | 200 | 599 | 450 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 0 |
| 2029 | 200 | 596 | 450 | 0 | 2,700 | 0 | 1,000 | 0 | 100 | 0 |
| 2030 | 200 | 593 | 450 | 0 | 3,600 | 0 | 1,500 | 0 | 97 | 0 |
| 2031 | 200 | 590 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 96 | 0 |
| 2032 | 200 | 587 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 115 | 0 |
| 2033 | 200 | 584 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 131 | 0 |
| 2034 | 200 | 581 | 450 | 1,030 | 3,600 | 0 | 2,000 | 0 | 144 | 0 |
| 2035 | 200 | 578 | 450 | 1,030 | 3,600 | 0 | 2,000 | 888 | 156 | 0 |
| 2036 | 200 | 575 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 169 | 0 |
| 2037 | 200 | 572 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 177 | 0 |
| 2038 | 200 | 569 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 185 | 0 |
| 2039 | 200 | 566 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 193 | 0 |
| 2040 | 200 | 563 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 201 | 0 |
| 2041 | 200 | 560 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 207 | 0 |
| 2042 | 200 | 557 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 211 | 0 |
| 2043 | 0 | 554 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 213 | 0 |
| 2044 | 0 | 551 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 220 | 0 |

**Purpose of Scenario**:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions of Rockport retiring 5/31/2026

**Observations through Planning Horizon:**

- Additional Short Term Capacity purchases compared to the reference case until new resources become available in 2028
- Resources selected are identical to the reference case starting in 2028 and for the remainder of the planning horizon

*Nuclear includes Cook SLR
** Required per Cause No. 45546

# Exit OVEC ICPA in 2030 Portfolio

| Year | Nameplate MW | | | | | | | | Accredited MW | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | New CC | Existing CC | New CT | Existing CT | Nuclear* | DR, EE, DER, CVR | Short Term Capacity |
| 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 325 |
| 2026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 1,500 |
| 2027 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 1,875 |
| 2028 | 200 | 599 | 450 | 0 | 1,800 | 0 | 1,000 | 0 | 94 | 0 |
| 2029 | 200 | 596 | 450 | 0 | 1,800 | 0 | 2,000 | 0 | 119 | 0 |
| 2030 | 200 | 593 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 135 | 0 |
| 2031 | 200 | 590 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 151 | 0 |
| 2032 | 200 | 587 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 173 | 0 |
| 2033 | 200 | 584 | 450 | 0 | 3,600 | 0 | 2,000 | 0 | 190 | 0 |
| 2034 | 200 | 581 | 450 | 1,030 | 3,600 | 0 | 2,000 | 0 | 204 | 0 |
| 2035 | 200 | 578 | 450 | 1,030 | 3,600 | 0 | 2,000 | 888 | 221 | 0 |
| 2036 | 200 | 575 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 237 | 0 |
| 2037 | 200 | 572 | 450 | 2,060 | 3,600 | 0 | 2,000 | 888 | 250 | 0 |
| 2038 | 200 | 569 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 261 | 0 |
| 2039 | 200 | 566 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 270 | 0 |
| 2040 | 200 | 563 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 279 | 0 |
| 2041 | 200 | 560 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 286 | 0 |
| 2042 | 200 | 557 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 292 | 0 |
| 2043 | 0 | 554 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 298 | 0 |
| 2044 | 0 | 551 | 450 | 2,060 | 3,600 | 0 | 2,000 | 1,880 | 302 | 0 |

**Purpose of Scenario**:**

- Evaluating the most economical solution to meet capacity and energy needs considering base modeling parameters and assumptions of the termination of operation of the Ohio Valley Electric Corporation (OVEC) units under the Intercompany Power Agreement (ICPA) by the end of 2030

**Observations through 2030:**

- Resources selected are substantially similar to the reference case for 2028+
- Solar, wind, storage, and gas resources selected in 2028 in response to load growth by 2030
- Selected all available existing CC's by 2030 and existing CT's were selected to meet capacity obligation
- Additional DR, EE, DER, CVR selected compared to reference scenario

**Observations for 2031+:**

- New CC built in 2034 and 2036 to meet the load growth in the same period and the expiration of existing capacity purchase agreements
- Cook SLR selected in 2035 and 2038

*Nuclear includes Cook SLR

** Required per Cause No. 45546. The ICPA does not have any provision for early termination by one or more of the Sponsoring Companies.

# Results Summary Comparison and Portfolio Performance Indicators

Appendix

# Results Summary Comparison

| Portfolio | 2034 Nameplate Capacity Additions (MW) | | | | | | | | 2044 Nameplate Capacity Additions (MW) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | NGCT | NGCC | Nuclear* | DR, EE, DER, CVR** | **Total Additions** | Wind | Solar | Storage | NGCT | NGCC | Nuclear* | DR, EE, DER, CVR** | **Total Additions** |
| **Preferred Portfolio** | 2,600 | 2,071 | 50 | 2,190 | 4,500 | 0 | 134 | **11,545** | 3,000 | 2,542 | 50 | 2,190 | 4,500 | 2,480 | 94 | **14,856** |
| **Base Reference** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 144 | **8,005** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 220 | **10,761** |
| **Enhanced Environmental Regulations** | 1,800 | 3,238 | 350 | 1,500 | 5,400 | 0 | 178 | **12,466** | 3,000 | 4,092 | 350 | 1,730 | 5,400 | 1,880 | 233 | **16,685** |
| **Base Under EPA Section 111(b)(d)** | 1,800 | 3,245 | 400 | 1,500 | 5,400 | 0 | 182 | **12,527** | 2,800 | 4,517 | 400 | 1,730 | 5,400 | 1,880 | 236 | **16,963** |
| **Low Carbon: Transition** | 2,000 | 6,194 | 300 | 3,500 | 2,700 | 0 | 173 | **14,867** | 3,000 | 9,359 | 500 | 3,730 | 2,700 | 3,080 | 235 | **22,604** |
| **Low Carbon: Expanded Build Limits** | 5,000 | 5,701 | 300 | 4,000 | 1,800 | 0 | 134 | **16,935** | 4,600 | 8,222 | 350 | 4,230 | 1,800 | 2780 | 200 | **22,182** |
| **High Growth** | 1,800 | 1,891 | 454 | 3,500 | 4,630 | 0 | 188 | **12,463** | 3,000 | 3,266 | 450 | 3,730 | 4,630 | 1,880 | 246 | **17,202** |
| **Low Growth** | 200 | 0 | 0 | 1,500 | 4,630 | 0 | 92 | **6,422** | 200 | 0 | 0 | 1,500 | 5,660 | 1,880 | 56 | **9,296** |

*Nuclear includes Cook SLR and SMR
**DR, EE, DER, CVR values are accredited

# Results Summary Comparison

| Portfolio | 2034 Nameplate Capacity Additions (MW) | | | | | | | | 2044 Nameplate Capacity Additions (MW) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wind | Solar | Storage | NGCT | NGCC | Nuclear* | DR, EE, DER, CVR** | **Total Additions** | Wind | Solar | Storage | NGCT | NGCC | Nuclear* | DR, EE, DER, CVR** | **Total Additions** |
| **Base Reference** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 144 | **8,005** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 220 | **10,761** |
| **Expanded Wind Availability (Base)** | 1,200 | 145 | 0 | 2,000 | 4,630 | 0 | 168 | **8,143** | 0 | 0 | 0 | 2,230 | 5,660 | 1,880 | 229 | **9,999** |
| **Expanded Wind Availability (EER)** | 2,600 | 1,775 | 50 | 1,500 | 5,400 | 0 | 196 | **11,521** | 3,000 | 4,145 | 50 | 1,730 | 5,400 | 1,880 | 290 | **16,495** |
| **Base with High Load** | 600 | 1,742 | 451 | 3,000 | 4,630 | 0 | 88 | **10,511** | 1,000 | 1,251 | 451 | 3,460 | 5,660 | 1,880 | 55 | **13,757** |
| **Base with Low Load** | 800 | 0 | 0 | 2,000 | 4,630 | 0 | 100 | **7,530** | 1,000 | 0 | 0 | 2,000 | 4,630 | 1,880 | 53 | **9,563** |
| **High Technology Cost** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 144 | **8,005** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 220 | **10,761** |
| **Rockport Unit 1 Retires 2025** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 144 | **8,005** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 220 | **10,761** |
| **Rockport Unit 1 Retires 2026** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 144 | **8,005** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 220 | **10,761** |
| **Exit OVEC ICPA in 2030** | 200 | 581 | 450 | 2,000 | 4,630 | 0 | 204 | **8,065** | 0 | 551 | 450 | 2,000 | 5,660 | 1,880 | 302 | **10,843** |

*Nuclear includes Cook SLR and SMR
**DR, EE, DER, CVR values are accredited

# Portfolio Performance Indicators

| IURC Pillar | IRP Objective | Performance Indicator | Metric Description |
|---|---|---|---|
| Reliability | Maintain capacity reserve margin and the consideration of reliance on the market for the benefit of customers. | Energy Market Exposure – Purchases | NPV of market purchases and average volume exposure of market purchases (Costs and MWhs % of Internal Load) over 10 and 20 years. Lower values are better. |
| | | Energy Market Exposure – Sales | NPV of market sales and average volume exposure of market sales (Revenues and MWhs % of Internal Load) over 10 and 20 years. Lower values are better. |
| | | Planning Reserves | Average Target Reserve Margin over 10 and 20 years. Closest value to the % Target. |
| Affordability | Maintain focus on power supply cost and risks to customers | Net Present Value Revenue Requirement (NPVRR) | Portfolio 30yr NPVRR (power supply costs). Lower values are better. |
| | | Near-Term Power Supply Cost Impacts (CAGR) | 7-year CAGR of Annual Power Supply Cost. Lower values are better. |
| | | Portfolio Resilience | Range of Portfolio NPVRR (power supply costs) dispatched across all Scenarios. Lower values are better. |
| Resiliency | Maintain diversity of resources and fleet dispatchability | Resource Diversity | Percent change in Diversity Index inclusive of Capacity and Energy Diversity in years 2034 and 2044. Higher values are better. |
| (Grid) Stability | Maintain fleet of flexible and dispatchable resources | Fleet Resiliency | Average % dispatchable capacity of company peak load over 10 and 20 years. Higher values are better. |
| Environmental Sustainability | Maintain focus on portfolio environmental sustainability benefits and compliance costs | Emissions Change | $CO_2$, NOx, $SO_2$ emissions change compared to 2005 levels in years 2034 and 2044. Higher values are better. |
| | | Net Present Value Revenue Requirement (NPVRR) | Considered under Affordability Pillar above |

# Portfolio Performance Indicators

| Pillar | Affordability | | | Reliability | | | Reliability/ Resiliency | Grid Stability Resiliency | Environmental Sustainability | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Performance Indicators and Metrics*** | ***Short Term*** *7-yr Rate CAGR* Power Supply $/MWh | ***Long Term*** *Supply Portfolio NPVRR Power Supply Costs* | ***Portfolio Resilience:*** *High Minus Low Scenario Range, Portfolio NPVRR* | ***Energy Market Risk*** *Purchases* | ***Energy Market Risk*** *Sales* | ***Planning Reserves*** *% Reserve Margin* | ***Resource Diversity*** | ***Fleet Resiliency:*** *Dispatchable Capacity* | ***Emissions Analysis:*** *% Change from 2005 Baseline* | | |
| Year Ref. | 2024-2031 | 2025-2044 | 2025-2044 | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 2034 \| 2044 | | |
| Units | % | $B | $B | NPV of Market Purchases & MWhs % of Total Demand | NPV of Market Sales & MWhs % of Total Demand | Average of Annual PRM % | Portfolio Index Percent Change from 2025 | Dispatchable Nameplate MW/ % of Company Peak Demand | % Change $CO_2$ | % Change NOx | % Change $SO_2$ |
| **Preferred Portfolio** | 0.4% | $33.1 | $11.4 | 10 Years: $3.1B (31%)<br>20 Years: $5.3B (27%) | 10 Years: $0.2B (1.3%)<br>20 Years: $0.5B (2.3%) | 10 Years: 4.2%<br>20 Years: -0.6% | Capacity: 39% \| 35%<br>Energy: 299% \| 299% | 10 Years: 91%<br>20 Years: 93% | 2034: -63%<br>2044: -63% | 2034: -96%<br>2044: -96% | 2034: -100%<br>2044: -100% |
| **Base Reference** | -0.5% | $32.0 | $13.4 | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.7%<br>20 Years: -3.4% | Capacity: 31% \| 19%<br>Energy: 173% \| 139% | 10 Years: 90%<br>20 Years: 97% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Enhanced Environmental Regulations** | 0.7% | $33.2 | N/A | 10 Years: $3.1B (31%)<br>20 Years: $5.5B (28%) | 10 Years: $0.6B (4.2%)<br>20 Years: $1.4B (5.7%) | 10 Years: 5.3%<br>20 Years: -0.3% | Capacity: 35% \| 37%<br>Energy: 306% \| 325% | 10 Years: 95%<br>20 Years: 95% | 2034: -56%<br>2044: -55% | 2034: -95%<br>2044: -95% | 2034: -100%<br>2044: -100% |
| **Base Under EPA Section 111(b)(d)** | 0.7% | $33.3 | N/A | 10 Years: $3.1B (31%)<br>20 Years: $5.5B (28%) | 10 Years: $0.5B (4.0%)<br>20 Years: $1.4B (5.7%) | 10 Years: 5.5%<br>20 Years: -0.2% | Capacity: 36% \| 38%<br>Energy: 281% \| 299% | 10 Years: 96%<br>20 Years: 96% | 2034: -56%<br>2044: -55% | 2034: -95%<br>2044: -95% | 2034: -100%<br>2044: -100% |
| **Low Carbon: Expanded Build Limits** | 4.5% | $41.4 | N/A | 10 Years: $2.1B (22%)<br>20 Years: $3.6B (18%) | 10 Years: $0.4B (3.6%)<br>20 Years: $1.4B (6.0%) | 10 Years: 4.5%<br>20 Years: -0.8% | Capacity: 56% \| 52%<br>Energy: 317% \| 311% | 10 Years: 87%<br>20 Years: 88% | 2034: -77%<br>2044: -77% | 2034: -97%<br>2044: -97% | 2034: -100%<br>2044: -100% |
| **Low Carbon: Transition** | 1.3% | $39.9 | $9.8 | 10 Years: $2.7B (27%)<br>20 Years: $4.1B (20%) | 10 Years: $0.2B (1.6%)<br>20 Years: $1.7B (7.7%) | 10 Years: 2.0%<br>20 Years: 0.5% | Capacity: 53% \| 54%<br>Energy: 302% \| 304% | 10 Years: 91%<br>20 Years: 95% | 2034: -65%<br>2044: -65% | 2034: -96%<br>2044: -96% | 2034: -100%<br>2044: -100% |
| **High Growth** | 1.6% | $39.3 | N/A | 10 Years: $4.0B (30%)<br>20 Years: $6.6B (23%) | 10 Years: $0.1B (0.5%)<br>20 Years: $0.3B (0.9%) | 10 Years: 3.9%<br>20 Years: -0.7% | Capacity: 41% \| 43%<br>Energy: 71% \| 79% | 10 Years: 96%<br>20 Years: 97% | 2034: -46%<br>2044: -34% | 2034: -95%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Low Growth** | -2.3% | $25.7 | N/A | 10 Years: $1.8B (24%)<br>20 Years: $2.5B (19%) | 10 Years: $0.0B (0.3%)<br>20 Years: $0.2B (1.9%) | 10 Years: -0.3%<br>20 Years: -1.5% | Capacity: 18% \| 5%<br>Energy: 161% \| 154% | 10 Years: 89%<br>20 Years: 97% | 2034: -35%<br>2044: -35% | 2034: -93%<br>2044: -94% | 2034: -100%<br>2044: -100% |
| **Expanded Wind Availability (Base)** | -0.5% | $31.8 | N/A | 10 Years: $2.4B (25%)<br>20 Years: $3.9B (20%) | 10 Years: $0.0B (0.2%)<br>20 Years: $0.1B (0.6%) | 10 Years: -0.6%<br>20 Years: -3.4% | Capacity: 28% \| 12%<br>Energy: 188% \| 114% | 10 Years: 86%<br>20 Years: 93% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Expanded Wind Availability (EER)** | 0.5% | $32.8 | $11.4 | 10 Years: $3.1B (31%)<br>20 Years: $5.4B (27%) | 10 Years: $0.5B (3.5%)<br>20 Years: $1.3B (5.2%) | 10 Years: 5.1%<br>20 Years: -0.6% | Capacity: 31% \| 34%<br>Energy: 296% \| 318% | 10 Years: 92%<br>20 Years: 92% | 2034: -56%<br>2044: -55% | 2034: -95%<br>2044: -95% | 2034: -100%<br>2044: -100% |

# Portfolio Performance Indicators

| Pillar | Affordability | | | Reliability | | | Reliability/ Resiliency | Grid Stability Resiliency | Environmental Sustainability | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Performance Indicators and Metrics*** | ***Short Term*** *7-yr Rate CAGR* Power Supply $/MWh | ***Long Term*** *Supply Portfolio NPVRR Power Supply Costs* | ***Portfolio Resilience:*** *High Minus Low Scenario Range, Portfolio NPVRR* | ***Energy Market Risk*** *Purchases* | ***Energy Market Risk*** *Sales* | ***Planning Reserves*** *% Reserve Margin* | ***Resource Diversity*** | ***Fleet Resiliency:*** *Dispatchable Capacity* | ***Emissions Analysis:*** *% Change from 2005 Baseline* | | |
| Year Ref. | 2024-2031 | 2025-2044 | 2025-2044 | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 10 years \| 20 years | 2034 \| 2044 | | |
| Units | % | $B | $B | NPV of Market Purchases & MWhs % of Total Demand | NPV of Market Sales & MWhs % of Total Demand | Average of Annual PRM % | Portfolio Index Percent Change from 2025 | Dispatchable Nameplate MW/ % of Company Peak Demand | % Change $CO_2$ | % Change NOx | % Change $SO_2$ |
| **Base with High Load** | -0.1% | $34.9 | N/A | 10 Years: $2.8B (28%)<br>20 Years: $4.9B (23%) | 10 Years: $0.0B (0.3%)<br>20 Years: $0.1B (0.3%) | 10 Years: 0.8%<br>20 Years: -2.6% | Capacity: 34% \| 25%<br>Energy: 208% \| 189% | 10 Years: 92%<br>20 Years: 98% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Base with Low Load** | -0.7% | $28.3 | N/A | 10 Years: $2.1B (24%)<br>20 Years: $3.6B (20%) | 10 Years: $0.1B (0.5%)<br>20 Years: $0.1B (0.7%) | 10 Years: 2.3%<br>20 Years: -1.9% | Capacity: 24% \| 19%<br>Energy: 170% \| 172% | 10 Years: 92%<br>20 Years: 96% | 2034: -39%<br>2044: -39% | 2034: -94%<br>2044: -94% | 2034: -100%<br>2044: -100% |
| **High Technology Costs** | 0.7% | $34.8 | N/A | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.7%<br>20 Years: -3.4% | Capacity: 31% \| 19%<br>Energy: 173% \| 139% | 10 Years: 90%<br>20 Years: 97% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Rockport Unit 1 Retires 2025** | -0.5% | $32.6 | N/A | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.7%<br>20 Years: -3.4% | Capacity: 80% \| 64%<br>Energy: 183% \| 148% | 10 Years: 84%<br>20 Years: 95% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Rockport Unit 1 Retires 2026** | -0.5% | $32.4 | N/A | 10 Years: $2.6B (27%)<br>20 Years: $4.3B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.6%<br>20 Years: -3.4% | Capacity: 31% \| 19%<br>Energy: 173% \| 139% | 10 Years: 86%<br>20 Years: 95% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |
| **Exit OVEC ICPA in 2030** | -0.4% | $32.1 | N/A | 10 Years: $2.8B (28%)<br>20 Years: $4.4B (22%) | 10 Years: $0.0B (0.1%)<br>20 Years: $0.1B (0.3%) | 10 Years: -0.6%<br>20 Years: -3.2% | Capacity: 27% \| 21%<br>Energy: 177% \| 142% | 10 Years: 90%<br>20 Years: 97% | 2034: -39%<br>2044: -24% | 2034: -94%<br>2044: -93% | 2034: -100%<br>2044: -100% |

# Affordability

The Affordability indicators compare the cost to customers under Base Case market scenario conditions over the short- and long-term and the Portfolio cost range when evaluated across the different market scenarios.

| Performance Indicator | Metric | Description |
|---|---|---|
| Near-term | 7-year Power Supply Cost CAGR under the Base Case (2024-2031) | • I&M measures and considers the expected Compound Annual Growth Rate ("CAGR") of expected power supply costs for the years 2024-2031 as the metric for the short-term performance indicator<br>• A lower number is better, indicating slower growth in power supply costs |
| Long-term | Portfolio NPVRR under the Base Case (2025-2044) | • I&M measures and considers the growth in Net Present Value Revenue Requirement (power supply costs) over 20 years as the long-term metric<br>• NPVRR represents total long-term cost paid by I&M related to power supply. This includes plant O&M costs, fuel costs, environmental costs, net purchases and sales of energy and capacity, property and income taxes, and the return on capital<br>• A lower number is better, indicating lower costs to supply customers with power |
| Portfolio Resilience | High Minus Low Scenario Range 20-yr NPVRR (2025-2044) | • I&M measures and considers the range of 20-yr NPVRR reported by each portfolio across all PJM market scenarios. This metric reports the difference between the highest and lowest cost scenarios reported by the candidate portfolio on an NPVRR<br>• A lower number is better, indicating a tighter grouping of expected customer costs across a wide range of long-term market conditions |

# Reliability

The Reliability indicators compare the amount of excess reserves and the reliance on market resources to serve customers across candidate portfolios.

| Performance Indicator | Metric | Description |
|---|---|---|
| Planning Reserves | Reserve Margin % | • I&M measures and considers the average amount of firm capacity in each candidate portfolio over 10 and 20 years<br>• A higher number is better, indicating more reserves are available to meet PJM requirements |
| Energy Market Risk | Portfolio Cost Range of market purchases, MWhs as % of internal Load | • I&M measures and considers the reliance of each candidate portfolio on market purchases to balance seasonal generation with customer load<br>• The metric reports the NPV of the cost of market purchases and the average MWhs as a % of internal load over 10 and 20 years<br>• A lower number indicates less reliance on the market to meet customer needs |
| | Portfolio Revenue Range of market sales, MWhs as % of internal Load | • I&M measures and considers the reliance of each candidate portfolio on market sales to balance seasonal generation with customer load<br>• The metric reports the NPV of the cost of market sales and the average MWhs as a % of internal load over 10 and 20 years<br>• A lower number indicates less reliance on the market to meet customer needs |

# Resiliency

The Resiliency indicators compare the amount of dispatchable capacity in the fleet and the technology diversity for capacity and energy of the Indiana generating mix across candidate portfolios.

| Performance Indicator | Metric | Description |
|---|---|---|
| Resource Diversity | Percent Change of the Capacity and Energy Diversity Index in 2034 and 2044 | • I&M measures and considers the capacity and energy diversity of new technologies added to its portfolio when comparing candidate portfolios<br>• The metric will use the Shannon-Weiner Index to measure the number of different technologies and their respective contribution to the portfolio totals for both capacity and energy diversity for each Portfolio. A percent change from 2025 is calculated in year 2034 and 2044<br>• A higher number is better. A portfolio that includes diverse resources for both capacity and energy delivery mitigates customers' performance risk when conditions for that technology are unfavorable |
| Fleet Resiliency | Nameplate MW of dispatchable units in 2034 and 2044 | • I&M measures and considers the average amount of dispatchable units added to the portfolio over 10 and 20 years<br>• The metric for this indicator is the average of total Nameplate MW of dispatchable units as a percent of company peak demand<br>• A higher number is better, indicating greater ability to ramp generation up or down to react to market conditions and follow load |

# (Grid) Stability

The Grid Stability indicator compares the amount of dispatchable capacity in the fleet, and the technology diversity of the Indiana generating mix across candidate portfolios.

| Performance Indicator | Metric | Description |
|---|---|---|
| Fleet Resiliency | Nameplate MW of dispatchable units in 2034 and 2044 | • I&M measures and considers the average amount of dispatchable units added to the portfolio over 10 and 20 years<br>• The metric for this indicator is the average of total Nameplate MW of dispatchable units as a percent of company peak demand<br>• A higher number is better, indicating greater ability to ramp generation up or down to react to market conditions and follow load |

# Sustainability

I&M also considered a Sustainability indicator to compare portfolio performance towards meeting corporate sustainability targets.

| Performance Indicator | Metric | Description |
|---|---|---|
| $CO_2$, NOx, $SO_2$, Emissions | 2034 & 2044 % Change from 2005 Baseline | • I&M measures and considers the total amount of expected $CO_2$, NOx and $SO_2$ emissions of each candidate portfolio.<br>• This metric compares the forecasted emissions of candidate portfolios in 2034 and 2044 under Reference Case market conditions with actual historical emissions from the year 2005.<br>• A higher number indicates greater levels of emissions reductions have been achieved and customers are less exposed to potential future $CO_2$ costs. |