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February 15, 2024

Via Electronic Delivery
Ms. Lora W. Johnson, CMC, LMMC
Clerk of Council
Council of the City of New Orleans
Room 1E09, City Hall
1300 Perdido Street
New Orleans, LA 70112

Re: **2024 TRIENNIAL INTEGRATED RESOURCE PLAN OF ENTERGY NEW ORLEANS, LLC**
Docket No. UD-23-01

Dear Ms. Johnson:

Entergy New Orleans, LLC ("ENO" or the "Company") respectfully submits the Presentation for Technical Meeting #2 in the above referenced Docket. As a result of the remote operations of the Council's office related to COVID-19, ENO submits this filing electronically and will submit the requisite original and number of hard copies once the Council resumes normal operations, or as you or the Council otherwise directs. ENO requests that you file this submission in accordance with Council regulations as modified for the present circumstances.

Should you have any questions regarding the above, I may be reached at (504) 576-4102. Thank you for your assistance with this matter.

Sincerely,

Leslie M. LaCoste

LML/jlc
Enclosures
cc: Official Service List (Public Version *via email)*

February 29, 2024

ENO 2024 IRP
Technical Meeting #2

Docket UD-23-01

Goals and Agenda of Technical Meeting #2

Goals

As described in the Initiating Resolution (R-23-254), the main purpose of this meeting is for ENO, the Advisors, and Intervenors to continue discussions regarding Planning Scenarios and Planning Strategies with a goal towards reaching consensus on the Scenarios and Strategies to be used in developing the 2024 IRP. Scenarios and Strategies are to be finalized by Technical Meeting #3 in early May 2024.

Agenda

1. Further Discussion of ENO Proposed Planning Scenarios and Strategies
   - Discussion of Intervenor Scenario and Strategy (if applicable)
2. BP24 Supply Side Alternatives
   - Technology Costs
3. Inputs and Assumptions (Tech Meeting #1 Follow-ups)
   - Macro-Inputs Workbook (HSPM)
   - Hydrogen POV
   - Load Forecast Discussion
4. Modeling Methodology (Tech Meeting #1 Follow-ups)
   - Energy-based Modeling
   - Stochastic Modeling
5. Timeline and Next Steps

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Proposed Planning Scenarios and Strategies

2024 IRP Proposed Planning Scenarios

	Scenario 1 – Reference	Scenario 2 – Clean Air Act Section 111 Compliance	Scenario 3 – For Stakeholder Consideration
Peak Load & Energy Growth	• Reference	• Reference	• High
Natural Gas Prices	• Reference	• Reference	• High
MISO Coal Deactivations[1]	• All ETR coal by 2030 • All MISO coal aligns with MTEP Future 2 (36 year life)	• All ETR coal by 2030 • All MISO coal by 2030	• All ETR coal by 2030 • All MISO coal aligns with MTEP Future 3 (30 year life)
MISO Natural Gas CC Deactivations	• 45 year life	• NGCC by 2035	• 35 year life
MISO Natural Gas Other Deactivations	• 36 year life	• Steam gas EGUs by 2030	• 30 year life
Carbon Tax Scenario	• Reference Cost	• Reference Cost	• High Cost
Renewable Capital Cost	• Reference Cost	• Reference Cost	• Low Cost
Narrative	• Assumptions align with the 2024 Business Plan case. • Moderate amount of industrial growth forecasted which would drive the need for new development	• Entergy and utilities across MISO deactivate existing units early to be compliant with proposed changes to Clean Air Act Section 111(d) • New resources built would comply with proposed changes to 111(b)	• High energy growth from both industrial and residential sectors forecasted. • Renewable cost assumed to be low due to more efficient supply chain

1. See MISO Futures Report Series 1A for additional detail

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2024 IRP Proposed Planning Strategies

	Strategy 1	Strategy 2	Strategy 3	Strategy 4
Description	Least Cost Planning	But For RCPS	RCPS Compliance	Stakeholder Strategy
Resource Portfolio Criteria and Constraints	Meet long-term Planning Reserve Margin (PRM) target using least-cost resource portfolio of supply and DSM resources	Include a portfolio of DSM programs that meet the Council's stated 2% goal and determine remaining needs	Include a portfolio of DSM programs that meet the Council's stated 2% goal and determine remaining needs in compliance with RCPS policy goals	TBD
Objective	Assess demand- and supply-side alternatives to meet projected capacity needs with a focus on total relevant supply costs.	Design a portfolio that includes a set of potential DSM programs intended to meet the Council's stated 2% goal.	Design a portfolio that includes a set of potential DSM programs intended to meet the Council's stated 2% goal. Excludes new resources that would not be RCPS compliant.	TBD
DSM Input Case	Reference Case	2% Program Case	2% Program Case	TBD
Manual Portfolio	TBD	TBD	TBD	TBD
Sensitivity	TBD	TBD	TBD	TBD

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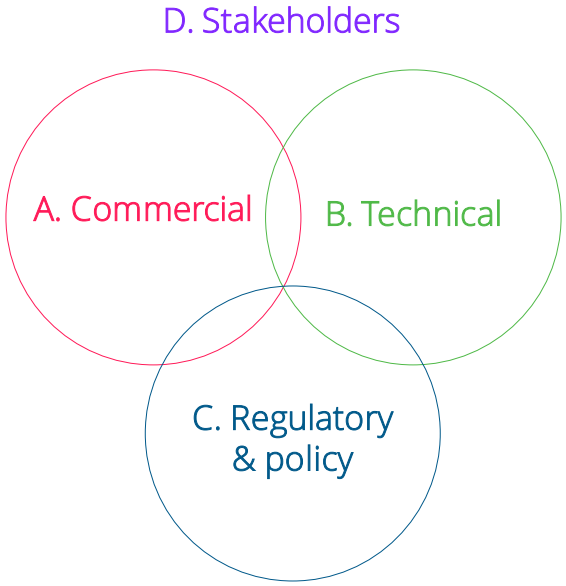
BP24 Supply Side Alternatives

Technology Assessment: Four Lenses

As part of an on-going process, Entergy evaluates existing, new and emerging technologies to meet supply- side resource needs



A. Commercial
What are a technology's cost and market indicators?

B. Technical
What are the operational, environmental, and internal capability factors associated with a specific technology?

C. Regulatory & policy
How do regulatory bodies and federal + state policies encourage or disincentivize deployment?

D. Stakeholders
How does the technology deliver on the needs and expectations of our four key stakeholders? Customers, Communities, Employees, and Shareholders

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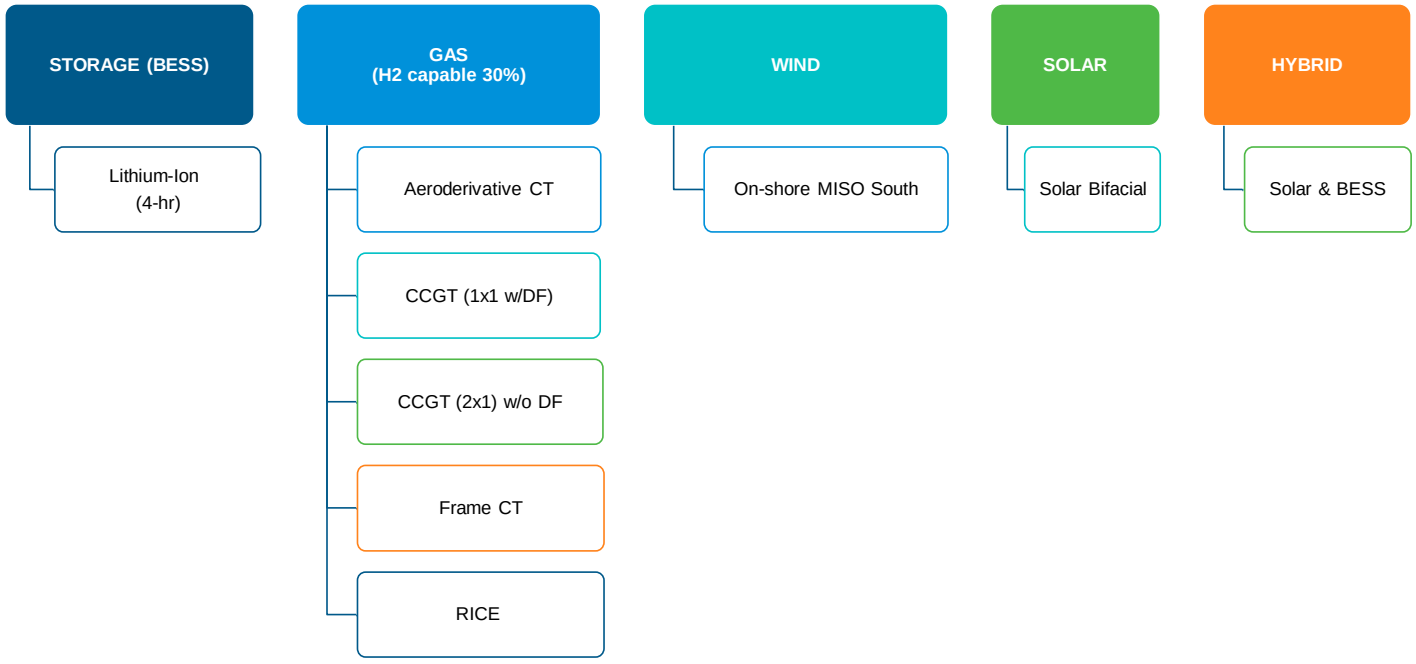
Identified Supply-Side Resource Alternatives



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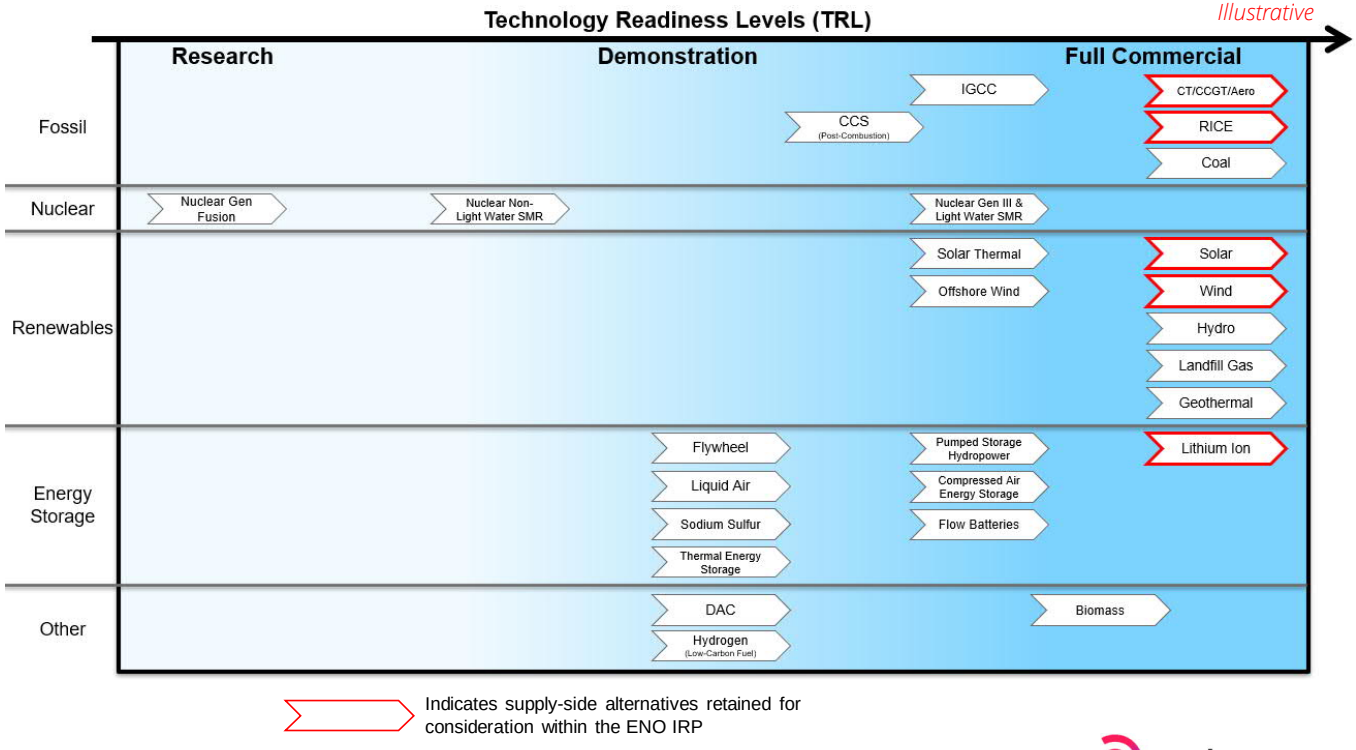
Illustrative Supply-Side Resource Alternatives

The technology evaluation includes:

- Survey supply side resource alternatives
- Retain subset of alternatives based on:
  - technology maturity
  - economics
  - reliability
  - environmental impact
  - geographic feasibility



Cost: Thermal Resources

Technology	Installed Capital Cost Nominal [2023$/kWac]	Fixed O&M L. Real [2023$/kW-yr.]	Variable O&M L. Real [2023$/MWh]
CT	$1,134	$6.76	$8.65
CCGT (1x1) w/ duct firing	$1,296	$12.58	$4.97
CCGT (2x1)	$1,349	$10.90	$5.16
Aeroderivative CT	$3,277	$32.99	$9.39
RICE	$1,998	$34.48	$14.03

1. Sources: Sargent & Lundy, Burns & McDonnell, NREL, EPRI, and Entergy Capital Projects
2. Excludes transmission interconnection costs

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Performance: Thermal Resources

Technology	Summer Net Maximum Capacity [MW]	Full HHV Summer Heat Rate [Btu/kWh]	Life [Yr.]	H2 Capable (%)
CT	408	9,450	30	30%
CCGT (1x1) w/ duct firing	729	6759	30	30%
CCGT (2x1)	1,216	6,308	30	30%
Aeroderivative-CT	89.9	9,703	30	30%
RICE	129	8,440	30	25%

Sources: Sargent & Lundy, Entergy Capital Projects

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Cost: Renewable and Storage Resources

Technology	Installed Capital Cost Nominal [2023$/kWac]	Fixed O&M L. Real [2023$/kW-yr.]
Utility-Scale Solar	$1,866	$13.10
Hybrid: Solar + BESS	$2,950	$19.02
On-shore Wind, MISO South	$2,010	$42.63
Storage (4hr, Li-Ion)[4]	$2,332	$14.79

1. Sources: S&P Global, Wood Mackenzie, EPRI, NREL, Entergy Power Development
2. There are no variable costs assumed to be incurred
3. Excludes transmission interconnection costs
4. BESS Installed Capital Cost includes 10% initial oversizing in year 1 to account for Depth of Discharge (DoD), followed by an additional 10% augmentation every five years (year 6, 11, and 16). This corresponds to a degradation rate of 2% of BESS capacity per year.

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Performance: Renewable and Storage Resources

Technology	Max Summer Capacity [MW-ac]	Assumed Capacity Factor [%]	Life [Yr.]	DC:AC Ratio [%]	Degradation [%]
Utility-Scale Solar	100MW	24.8%[1]	30	1.3	0.5% per year
Hybrid: Solar + BESS	100MW 50MW/200MWh	24.8%	30 (Solar) / 20 (BESS)	1.3	0.5% per year (Solar only)
On-shore Wind, MISO South	100 - 200 MW	30.9%[2]	30	n/a	n/a
Storage (4hr, Li-Ion)	50MW / 200MWh	n/a	20	n/a	Degradation negated by Augmentation

1.Solar resources assume a 0.3% improvement in capacity factor in each subsequent year installed. Therefore, the capacity factor for solar resources installed in the second year of the outlook improve from 25.68% to 25.75%.
2.Wind resources assume a 0.1% improvement in capacity factor in each subsequent year installed.
3. Hybrid resources will be modeled in Aurora as stand-alone solar with the option to add a coupled storage at a discounted cost

Sources: EPRI, Entergy Power Development

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Financial Assumptions

Evaluation Components	
Long Term Inflation Rate Assumption	2.0%
Inflation Reduction Act Tax Credits	•Solar and Wind resources: $30/MWh (2026$, assumes full PTC rate) •Storage resources: 30% ITC (assumes full ITC rate) •Tax Credit Phase-out is assumed (100% through 2035, 75% in 2036, 50% in 2037, 0% in 2038 and beyond)

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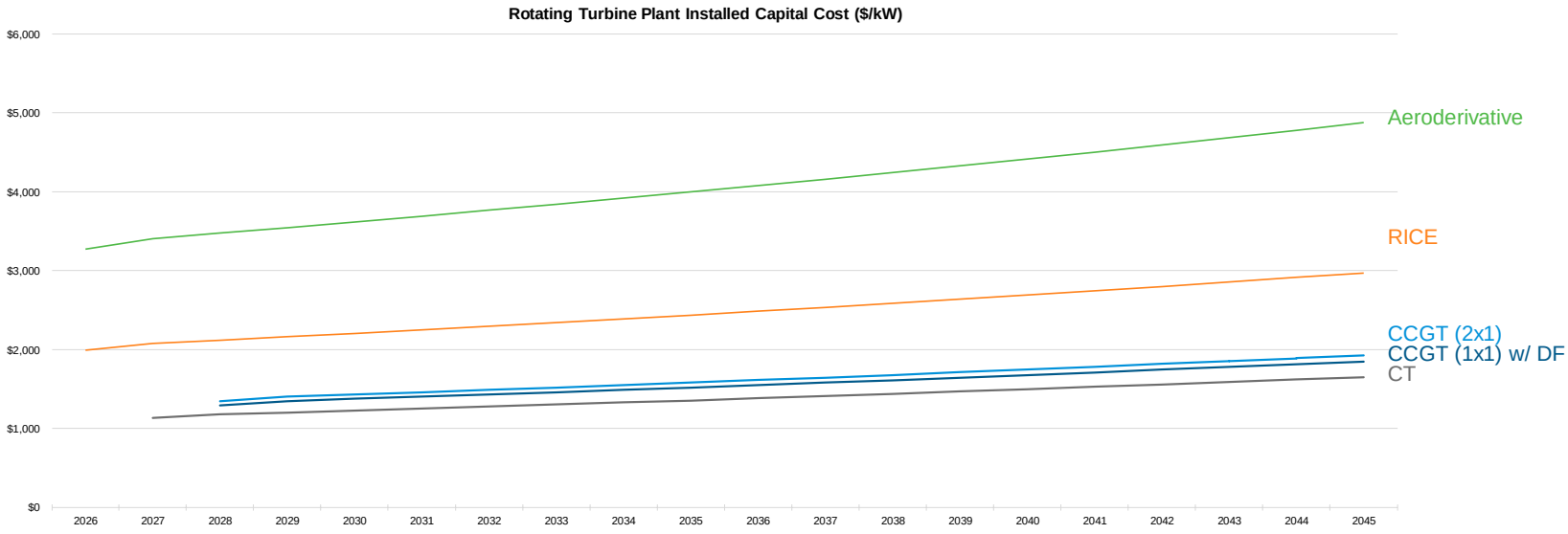
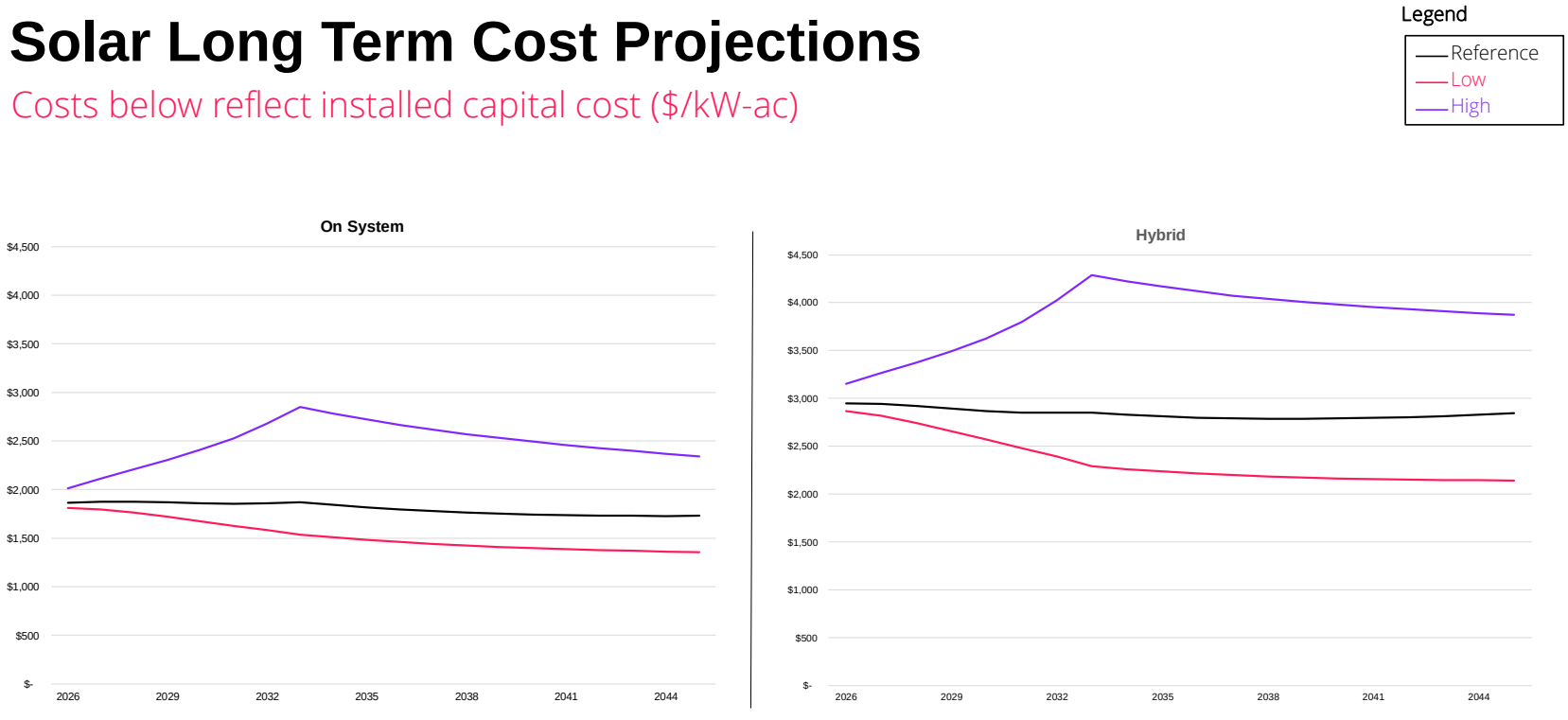
Rotating Turbine Plant Long-Term Cost Projections



Solar Long Term Cost Projections

Costs below reflect installed capital cost ($/kW-ac)



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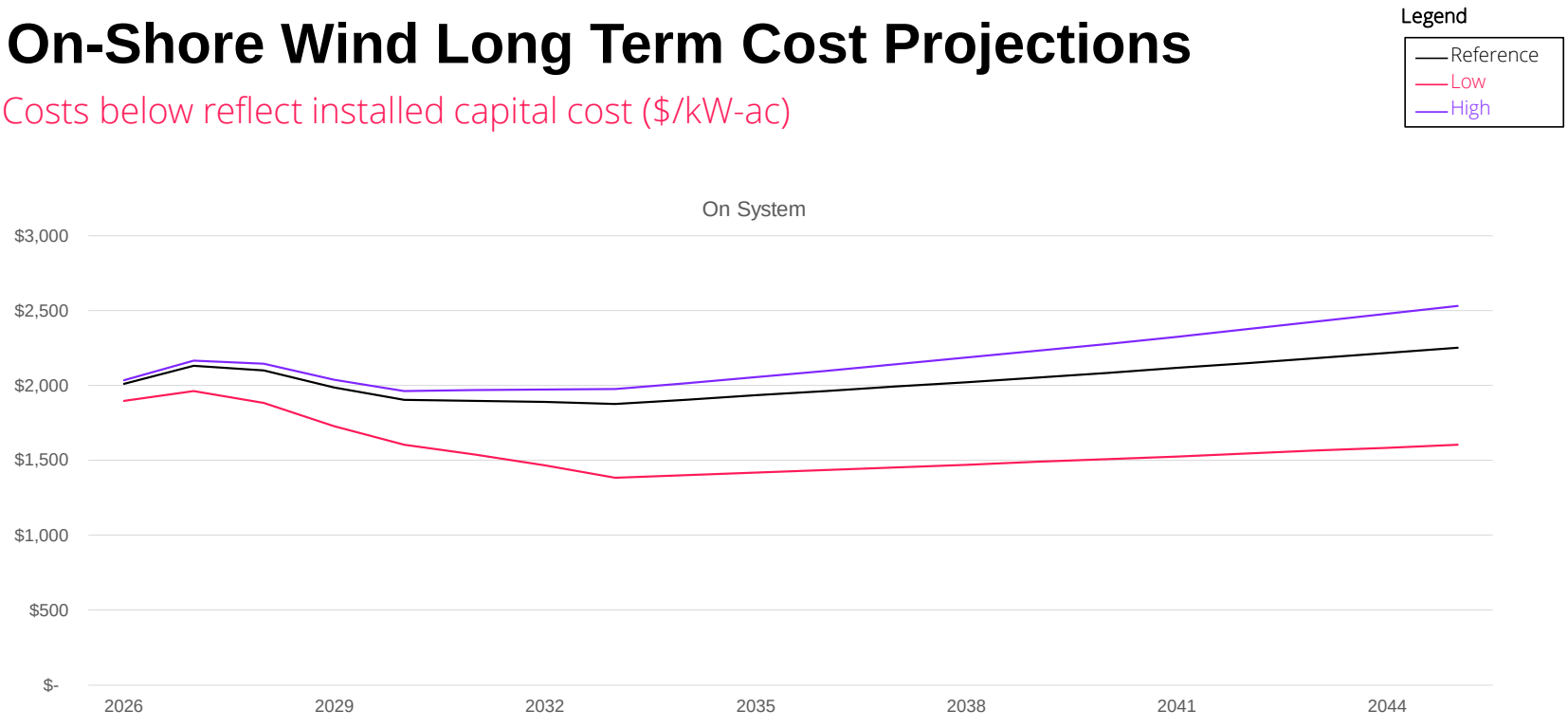
On-Shore Wind Long Term Cost Projections

Costs below reflect installed capital cost ($/kW-ac)



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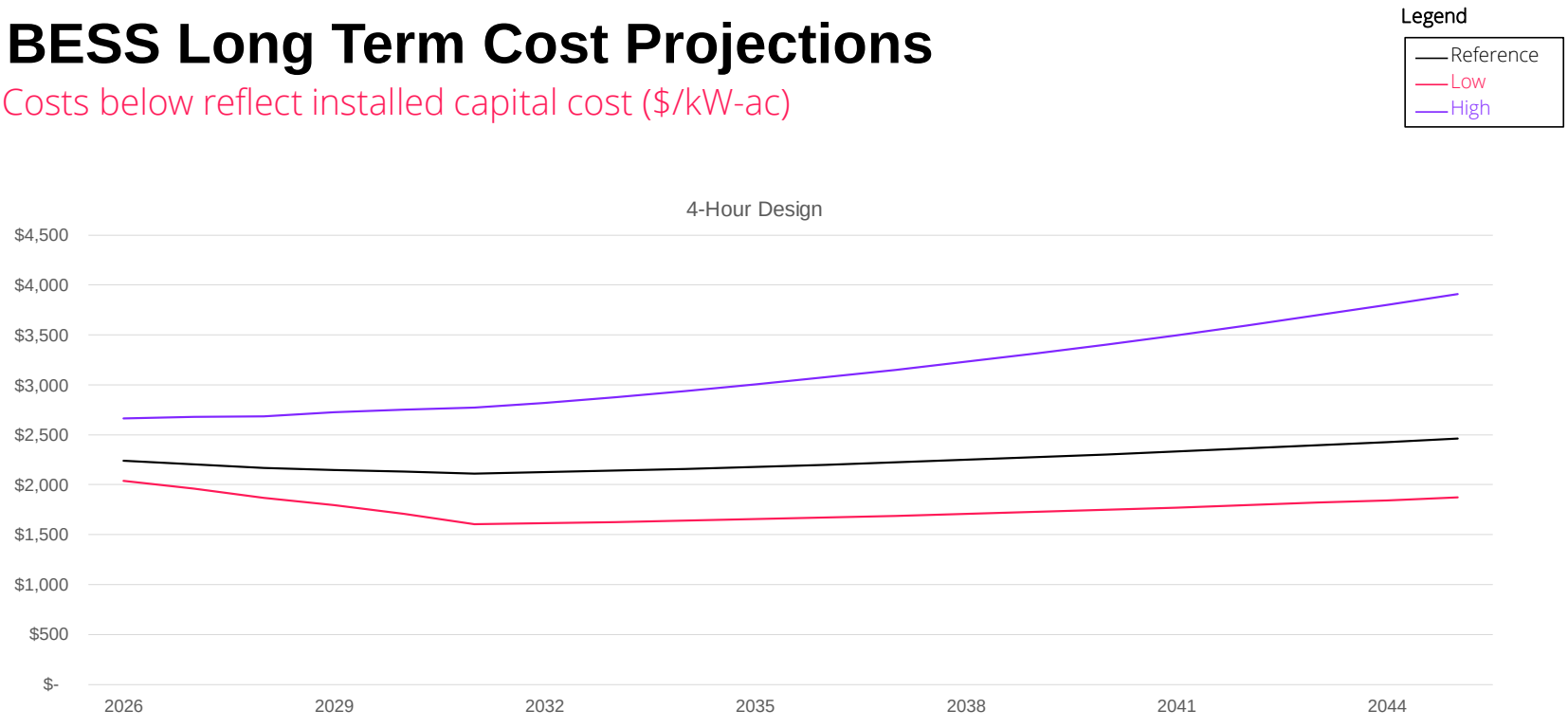
BESS Long Term Cost Projections

Costs below reflect installed capital cost ($/kW-ac)



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Transmission Interconnection Adders

Excluding Transmission Network Upgrades

New POI Cost

Project Size (MW)	Cost ($ millions)	Description
X<399 MW	15	(115,138,161 kV) = POI substation (3 breaker ring) + t-line adjustments (cut-ins) + remote end work (line panels)
399≤X≤799	20	(230 kV) = POI substation (3 breaker ring) + t-line adjustments (cut-ins) + remote end work (line panels)
X>799	50	(500 kV) = POI substation (3 breaker ring) + t-line adjustments (cut-ins) + remote end work (line panels)

Brownfield POI Cost

Project Size (MW)	Cost ($ millions)	Description
X<399 MW	5	(115,138,161 kV) = POI Add node to existing substation
399≤X≤799	7	(230 kV) = POI Add node to existing substation
X>799	10	(500 kV) = POI Add node to existing substation

Generation Interconnection cost:

- Cost required for collector station and power conversion equipment. Includes electrical infrastructure from generation unit to Transmission Point of Interconnection (“POI”).

Transmission Interconnection cost:

- Cost required for Transmission to build POI substation, transmission line work, and remote end coordination.
- **Excludes:**
  - Network Resource Interconnection Service (NRIS)
  - External Resource Interconnection Service (ERIS)
  - Interconnection Service (IS) = NRIS + NRIS Local + ERIS
  - Off-system upgrades

- All interconnection cost will be project specific and are generalized for ease of estimating purposes. This chart covers many typical options and is meant to be used as guidance.

Example Use:

- NEW POI Solar Facility
  100MW Solar New Build – New POI @ 230kV
  + $20M for Transmission Interconnection Cost. ($200/kW)
- New POI Natural Gas Facility
  1,216 MW CCGT – New POI @ 230kV
  3 Interconnections @ 230kV (2 CTG + 1STG)
  + $34M (20+7+7) for Transmission Interconnection Cost. ($28/kW)

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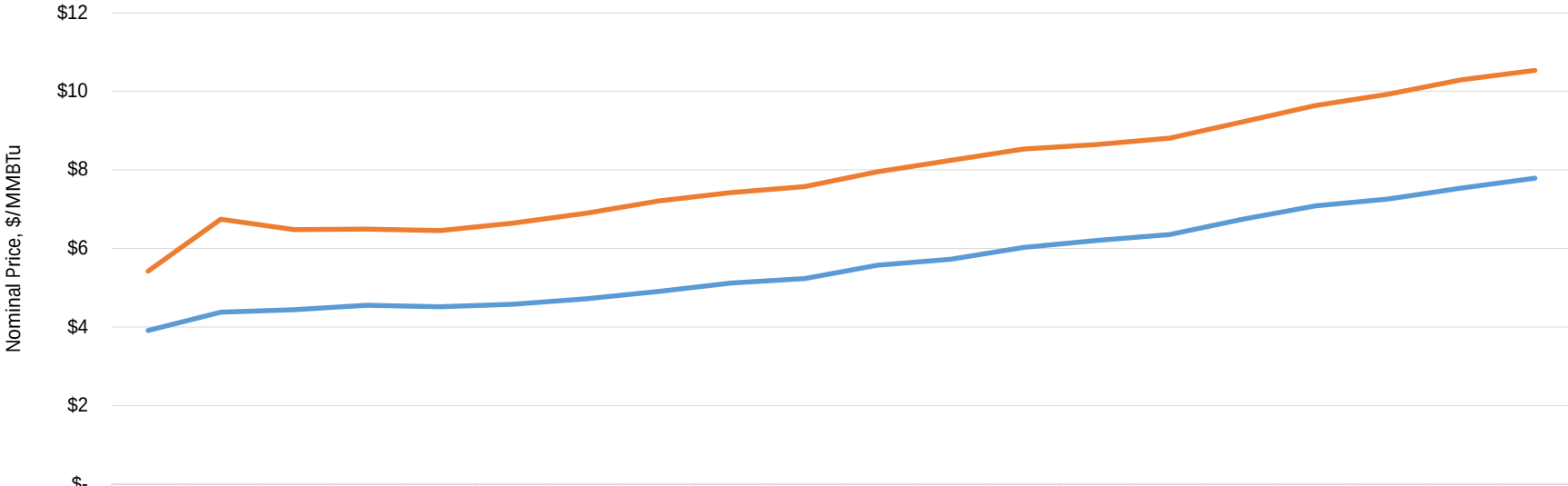
Inputs and Assumptions

Henry Hub Gas Price Forecast



	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Reference	$3.92	$4.38	$4.43	$4.55	$4.51	$4.57	$4.71	$4.90	$5.11	$5.23	$5.57	$5.72	$6.03	$6.20	$6.35	$6.75	$7.09	$7.26	$7.54	$7.79
High	$5.43	$6.74	$6.48	$6.48	$6.45	$6.64	$6.89	$7.21	$7.42	$7.57	$7.95	$8.23	$8.52	$8.65	$8.81	$9.22	$9.64	$9.93	$10.28	$10.54

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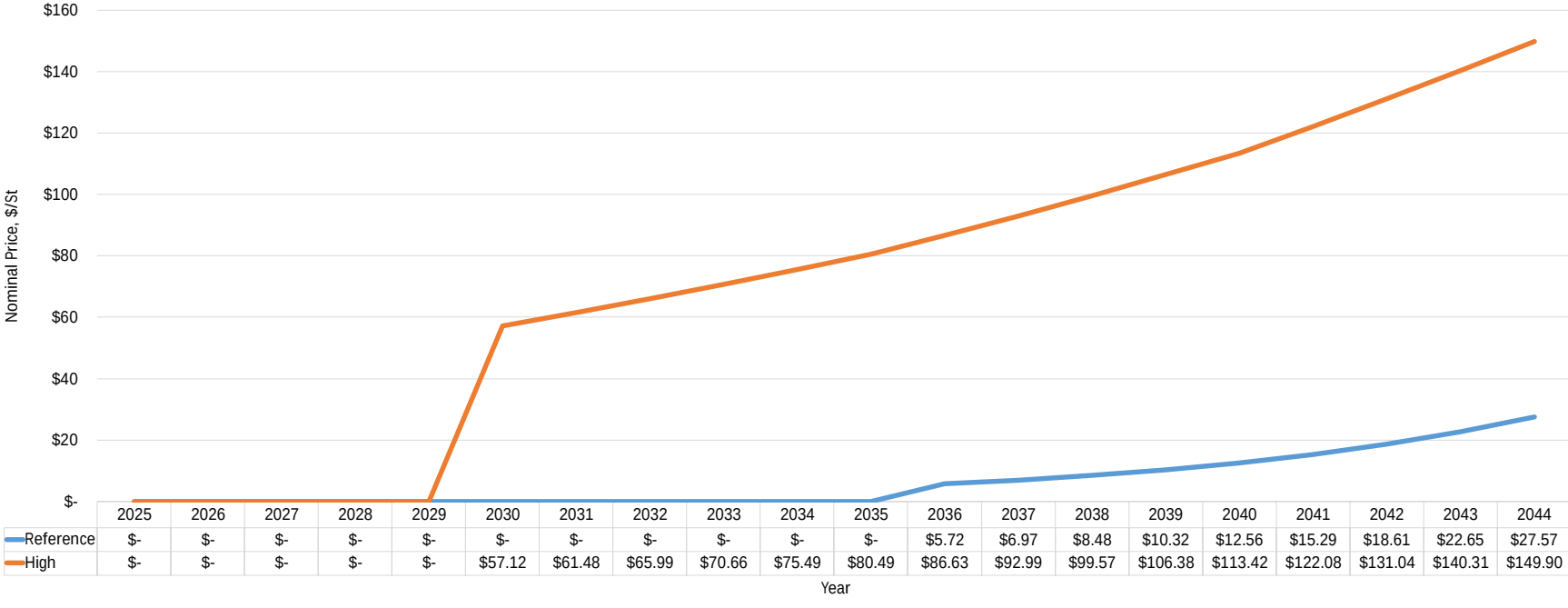
CO2 Price Forecast



	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Reference	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-	$5.72	$6.97	$8.48	$10.32	$12.56	$15.29	$18.61	$22.65	$27.57
High	$-	$-	$-	$-	$-	$57.12	$61.48	$65.99	$70.66	$75.49	$80.49	$86.63	$92.99	$99.57	$106.38	$113.42	$122.08	$131.04	$140.31	$149.90

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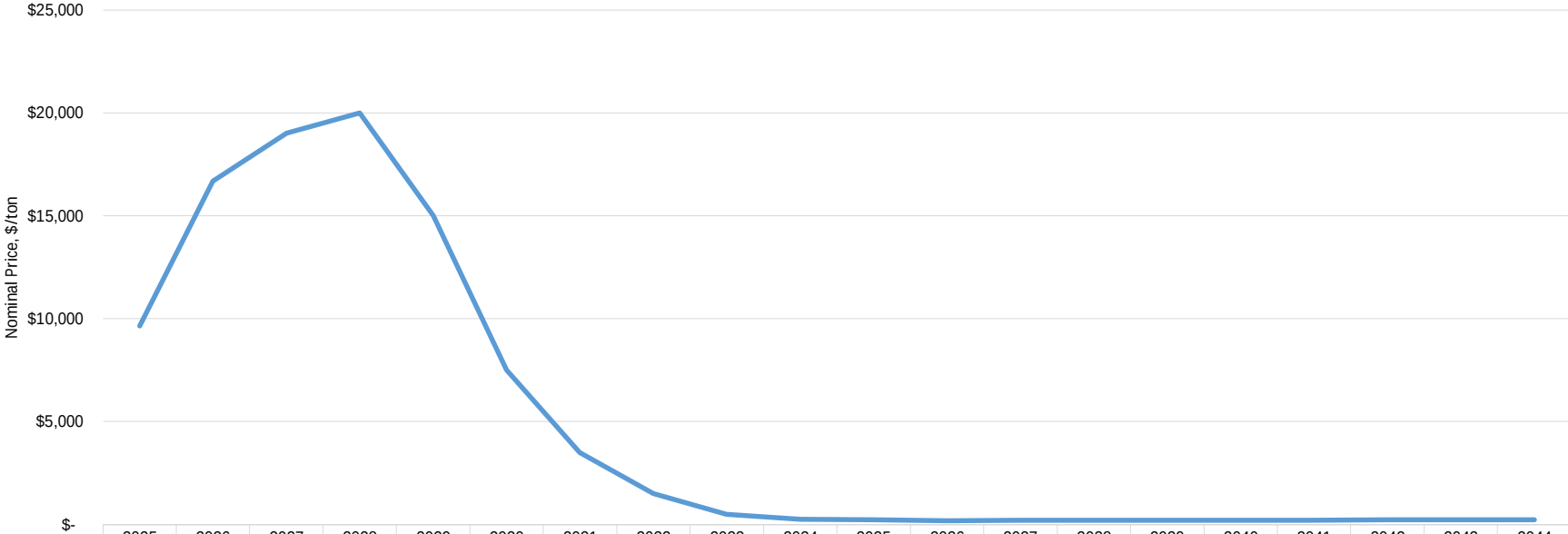
Louisiana Seasonal NOX Price



	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Price	$9,643	$16,682	$19,000	$20,000	$15,000	$7,500	$3,500	$1,500	$500	$250	$225	$200	$204	$208	$212	$216	$221	$225	$230	$234

1. NOx is only applied in summer months

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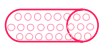
Hydrogen focus: create optionality in near term, infrastructure grown in long term

Hydrogen utilization in the power generation sector has near term items that can be addressed to preserve optionality while long term challenges are addressed.

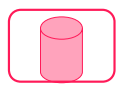
Near term focus: Entergy is incorporating **design considerations that do not prevent hydrogen optionality** in the future if market considerations and infrastructure align

Long term challenges facing the industry that need to be addressed for large scale consumption by the power generation sector **include:**



Pipelines

- 100% burning power gen consumption is beyond what can be supported with today's pipeline infrastructure
- New 2x1 CCGTs could consume well over 1,000 tonnes / day of hydrogen at 100% capacity factor & 100% H2 burn



Storage

- Cavern storage is needed
- Storage addresses reliability and load following needs for power generation

Production

- Growth of electrolysis production is needed
- Hydrogen pathway in the EPA Clean Air Act Section 111 proposal limited to green hydrogen given the lifecycle emissions requirements

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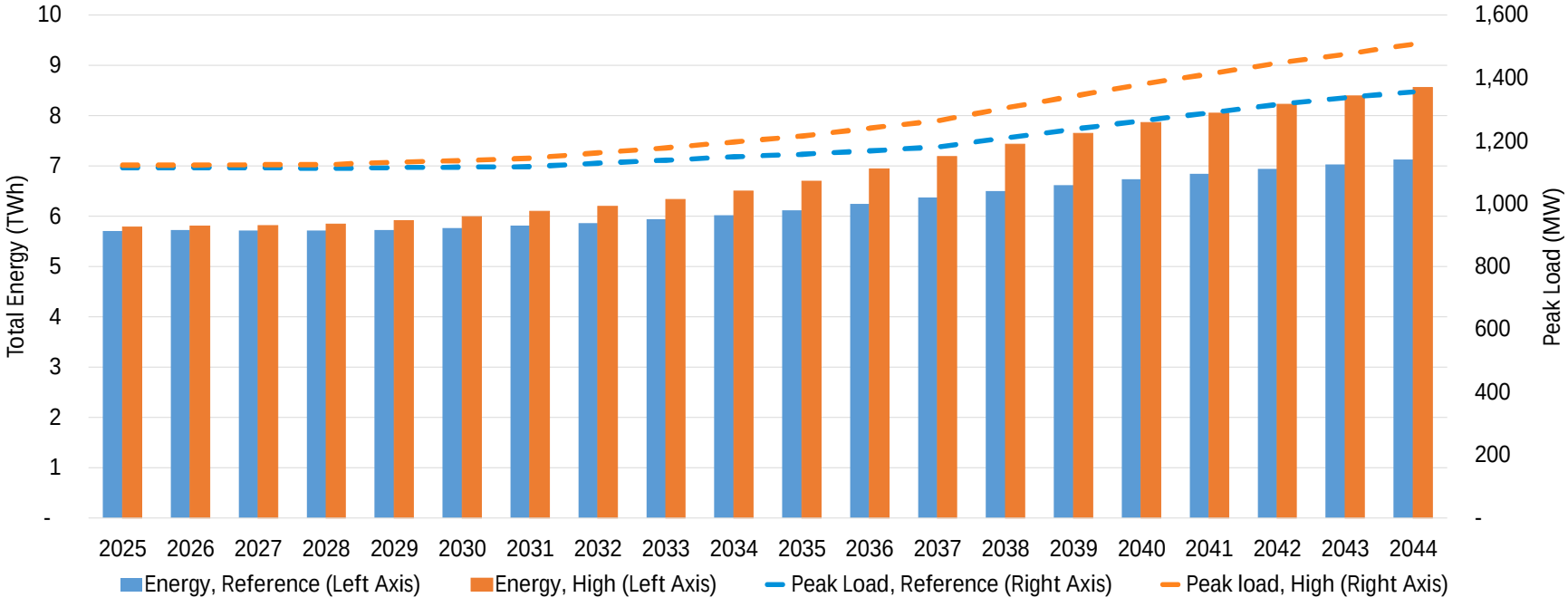
ENO Peak Load & Energy Forecast



1. Peak Load is Non-Coincident

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ENO Load Forecast – Process

Entergy New Orleans develops electricity consumption forecasts through 2050.

The forecasts are developed using statistical models and a bottom-up approach by class – Residential, Commercial, Industrial, and Governmental – to estimate the total electricity consumption volumes. The volumes are developed considering several elements including:

- Historical consumption levels, numbers of customers, temperatures, and estimates of end-use consumption (heating, cooling, other)
- Energy efficiency – organic and company-sponsored
- Future changes in population/households and end-use Individual customer information for identified large industrial customers

Adjustments are made to reflect other expectations including future levels of EV adoption, building or process electrification, and behind-the-meter solar adoption.

Monthly consumption volumes are used to estimate peak loads and allocated across hourly profiles.

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ENO Load Forecast Levers

	Item	Load Forecast: Reference Case	Load Forecast: Low Growth Sensitivity	Load Forecast: High Growth Sensitivity
Traits	**Policy and Other Traits**		Decreased Res/Com growth due to: Slower EV adoption, Higher levels of EE Reduced industrial load	Increased Res/Com growth due to: Higher building electrification, Accelerated EV and Solar adoption, Increases in industrial load
Expectations	**Peaks**	Reference (BP24)	Lower	Higher
	Energy	Reference (BP24)	Lower	Higher
Inputs	**BTM Solar**	Reference (BP24)	Reference	Higher
	Electric Vehicles (EVs)	Reference (BP24)	Lower	Higher
	Electrification	Reference (BP24)	Lower	Higher
	Organic EE and OpCo DSM	Reference (BP24)	Higher	Lower
	Customer Growth (Res & Com)	Reference (BP24)	Lower	Higher
	Refinery Utilization (Trends opposite EVs)	Reference (BP24)	Higher (opposite of EVs)	Lower (opposite of EVs)

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04 Modeling Methodology

Methodology Slide

Previous IRP Process

Step 1

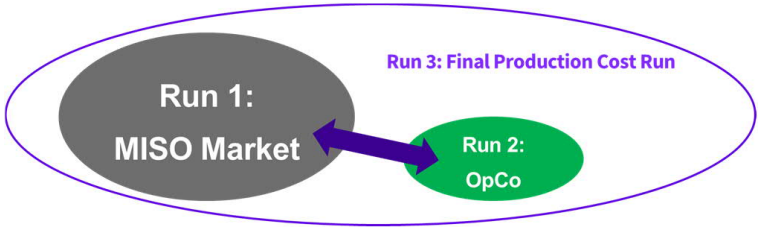
- Run MISO Market Long Term Capacity Expansion (LTCE)

Step 2

- LMP from Step 1 used to create pricing for a single Market Resource to represent a market transaction point for OpCo LTCE

Step 3

- MISO and OpCo capacity expansion result combined for final production cost run



New IRP Process

Step 1

- LTCE run for both MISO Market and OpCo simultaneously
- No separate production cost run needed
- Seasonal capacity expansion construct

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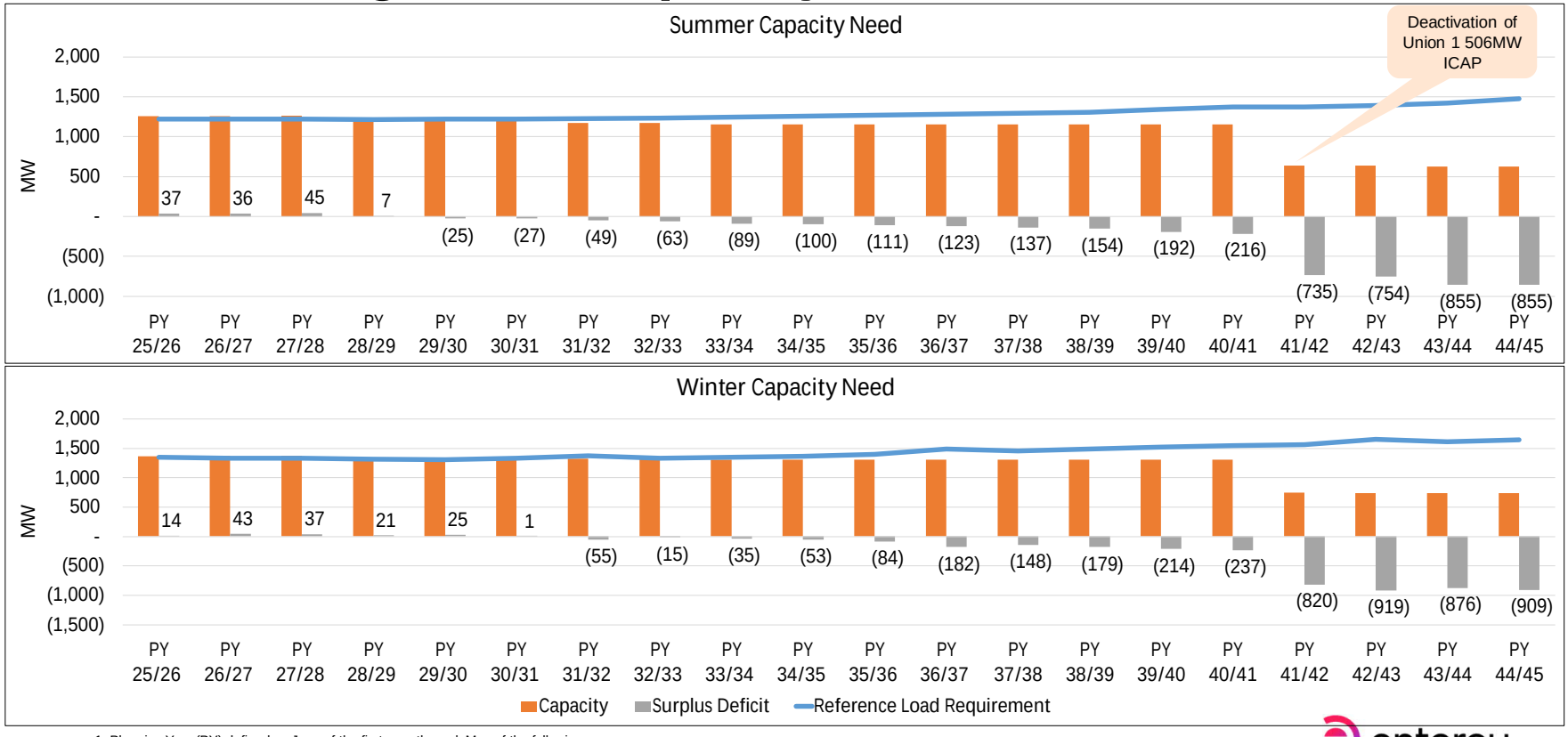
ENO's Long-Term Capacity Need



1. Planning Year (PY) defined as June of the first year through May of the following year
2. Reserve Margin for summer and winter seasons are 7.4% and 25.5% respectively
3. Capability based on BP24 SAC and includes owned resources, affiliate PPAs, third party PPAs, LMRs, and the two planned resources 2025 ENO Solar & Sherwood Battery

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Energy-Based Modeling

The Aurora capacity expansion function allows the user to input target reserve margins as well as maximum and minimum reserve margins to provide the software flexibility to choose the most economic resources (considering energy revenue) without over constraining the solution to precisely meet the target reserve margin.

ENOL proposes to use this flexibility to improve ‘energy-based modeling’ while still maintaining target reserve margins (as contemplated by the 2024 IRP Initiating Resolution), based on MISO’s summer and winter PRMs.

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Stochastic Modeling

- In the prior IRP, stochastic analysis was performed on four portfolios:
  - Scenario 1, Strategy 1
  - Scenario 1, Strategy 2
  - Manual Portfolio 1a
  - Manual Portfolio 3a

- The analysis developed additional CO_2 and natural gas price inputs to inform 400 additional production cost simulations for each portfolio, producing a distribution of total relevant supply cost for each portfolio

- ENO proposes a similar method for the current IRP cycle, with potential tweaks to improve simulation time without affecting robustness of results
  - Subset of portfolios subject to stochastic analysis to be determined

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05 Timeline

Timeline

Event	Current Deadline	Status
Public Meeting #1	August 23, 2023	✓
Technical Meeting #1	November 9, 2023	✓
DSM Potential Studies Due	February 1, 2024	✓
Mardi Gras	February 13, 2024	✓
Stakeholders provide their Scenario and Strategy	Before Technical Meeting 2	
Technical Meeting #2—Discuss Final ENO and Stakeholder Scenarios and Strategies	February 29, 2024	
Deadline for Council policies to be included in optimization	April 15, 2024	
Technical Meeting #3—Finalize Strategies and DSM Input Case Assignments; DSM input files for modeling due; initial Scorecard discussion	May 1-May 14, 2024	
Technical Meeting #4—Downselection of Portfolios for Cross Testing; finalize Scorecard; initial discussion of Energy Smart budgets and goals	September 23-October 4, 2024	
2024 IRP Report filed	**December 13, 2024**	
Public Meeting #2 (ENO & SPO Present)	January 21-31, 2025	
Public Meeting #3 (Council receives public comment)	February 18-28, 2025	
Technical Meeting #5—Energy Smart PY16-18 programs and implementation plan	February 18-28, 2025	
Mardi Gras	March 4, 2025	
Intervenor Comments on Final IRP	March 10, 2025	
ENO Reply Comments	April 28, 2025	
Advisor Report	June 2, 2025	
Energy Smart Implementation Plan Filing for PY 16-18	June 16, 2025	

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CERTIFICATE OF SERVICE
UD-23-01

I hereby certify that I have served the required number of copies of the foregoing pleading upon all other known parties of this proceeding individually and/or through their attorney of record or other duly designated individual.

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