November 18th, 2022

ELL IRP 2nd Stakeholder Conference

Shawn Allen
Laura Beauchamp
Daniel Boratko
Chad Ladner
Charles DeGeorge
Phong Nguyen
Ryan Jones

Purpose and Agenda

- ☑ **acknowledge stakeholder feedback provided thus far in support of the IRP process,**
- ☑ **provide stakeholders with a summary of the IRP Draft report,**
- ☑ **including ELL's Reference Resource Plan and its proposed Action Plan, and**
- ☑ **afford stakeholders the opportunity to continue to provide comments in support of this process.**

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Stakeholder Engagement

Stakeholder Feedback

ELL received and responded to approximately 70 comments from Staff and Stakeholders

- Comments and responses are included in Appendix A of ELL's Draft IRP
- Some examples include:
  - Deactivation assumptions over the next 10 years have been published publicly
  - Additional context / clarification provided for a multitude of DSM related comments
  - Clarification regarding Transmission's role within an IRP

IRP General Order

ELL has thus far:

- Initiated its 3rd IRP cycle
- Published Data Assumptions
- Conducted its 1st Stakeholder meeting in January of 2022
- Updated its Data Assumptions based, in part, on Stakeholder feedback
- Provided written responses to Stakeholder questions / comments from 1st Stakeholder meeting
- Published its Draft report – including responses to written comments provided by Stakeholders

Ongoing Discussion

ELL continues to welcome feedback to its Draft IRP:

- At the conclusion of this presentation
- In the form of written comments (due January 23, 2023)

ELL intends to file its Final IRP in May of 2023

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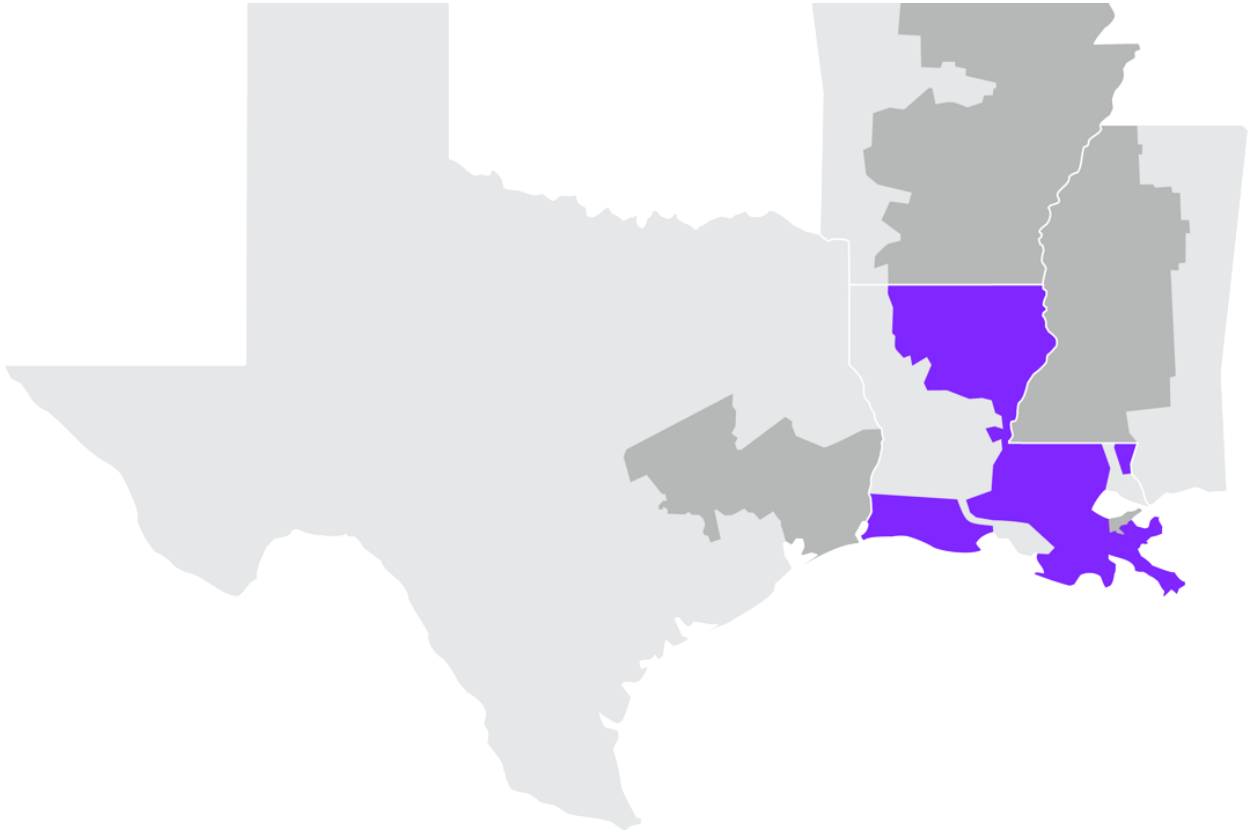
Executive Summary

Laura Beauchamp
Director, Resource Planning & Market Operations
Entergy Louisiana

Entergy Louisiana



Headquarters	Jefferson, LA
Total customers[1] (electric / gas) (‘000)	~1,100 / ~95
Service area miles (sq. mi.)	~30,000
Installed capacity (GW)[2] and ZRCs	~11.8
T&D system miles (sq. mi.)	~38,000
Parishes Served	58/64

1. Indicates retail customers which comprises residential, commercial, industrial and governmental customers, gas customers are a subset of electric customers;
2. Based on ICAP, net of ownership, includes PPAs, includes 279 MW of LMR;

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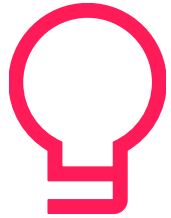
Executing to deliver value to our customers

Key Imperatives for Planning

Meeting customer demands for clean energy solutions

Ensuring reliability and resiliency

Affordability top of mind in all we do



Supplying adequate generating capacity to meet demand

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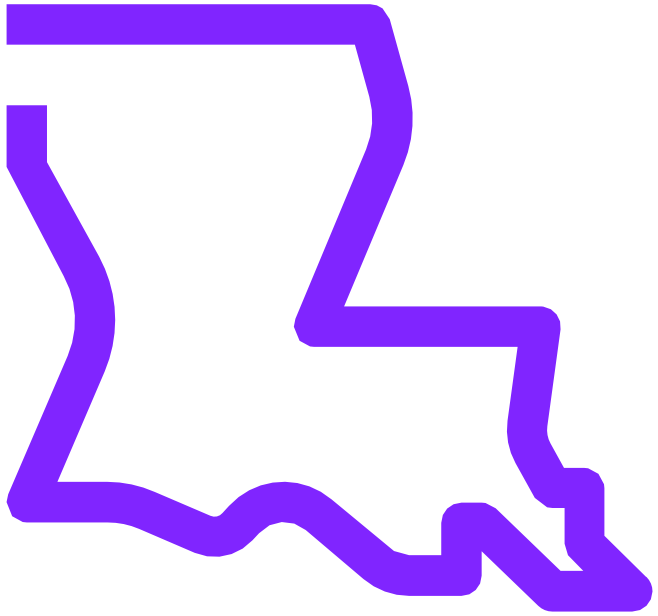
Gulf region remains a premier economic hub

Driving strong growth



Why the Gulf region is attractive

- World-class infrastructure
- Favorable commodity spreads
- Workforce availability
- Access to deep water ports and the Mississippi River

Emerging factors

- Geopolitics and global energy security
- Lower investment risk relative to the rest of the world
- Low- / no-carbon energy infrastructure (CCUS and green / blue H_2)
- Infrastructure Investment and Jobs Act and Inflation Reduction Act

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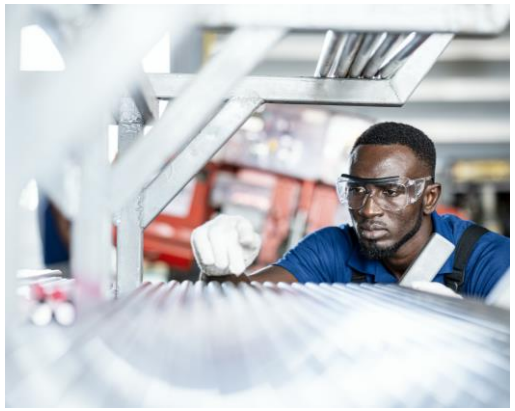
Our customers are demanding clean energy

Decarbonization goals

To meet expectations of their investors



Their customers' expectations

Customers demanding products produced with clean energy

Improving economics

Understanding long-term cost of carbon emissions

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A resilient Louisiana is vital to the economic livelihood of our region's future

Resilience

Storms are increasing in frequency and intensity

Sustainability

Industrial stakeholders require a clean, reliable grid that supports their electrification expansion/growth plans in Louisiana

Resource Adequacy

Physical generation is needed to generate electricity that can be stored and/or transported to customers for consumption

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Recent announcements show commitment to clean energy

Mitsubishi Power and Entergy to Collaborate and Help Decarbonize Utilities in Four States

09/23/2020

Future-focused Companies Will Collaborate on Project Development and Integrated Technology Solutions for Limiting Carbon Emissions

Entergy Louisiana, Entergy New Orleans and Diamond Offshore Wind seek to evaluate offshore wind

09/23/2022

Companies partner on the future development of offshore wind power to serve Louisiana customers

Entergy Louisiana receives approval to purchase 475 MW of solar power, add green tariff option

09/21/2022

Agreement to significantly grow company's renewable resources in the state

Holtec defines $7.4B SMR build plan, inks agreement with Entergy

Mon, Jul 25, 2022, 7:03AM | Nuclear News

Holtec's Advanced Manufacturing Division, in Camden, N.J. (Photo: Holtec)

01

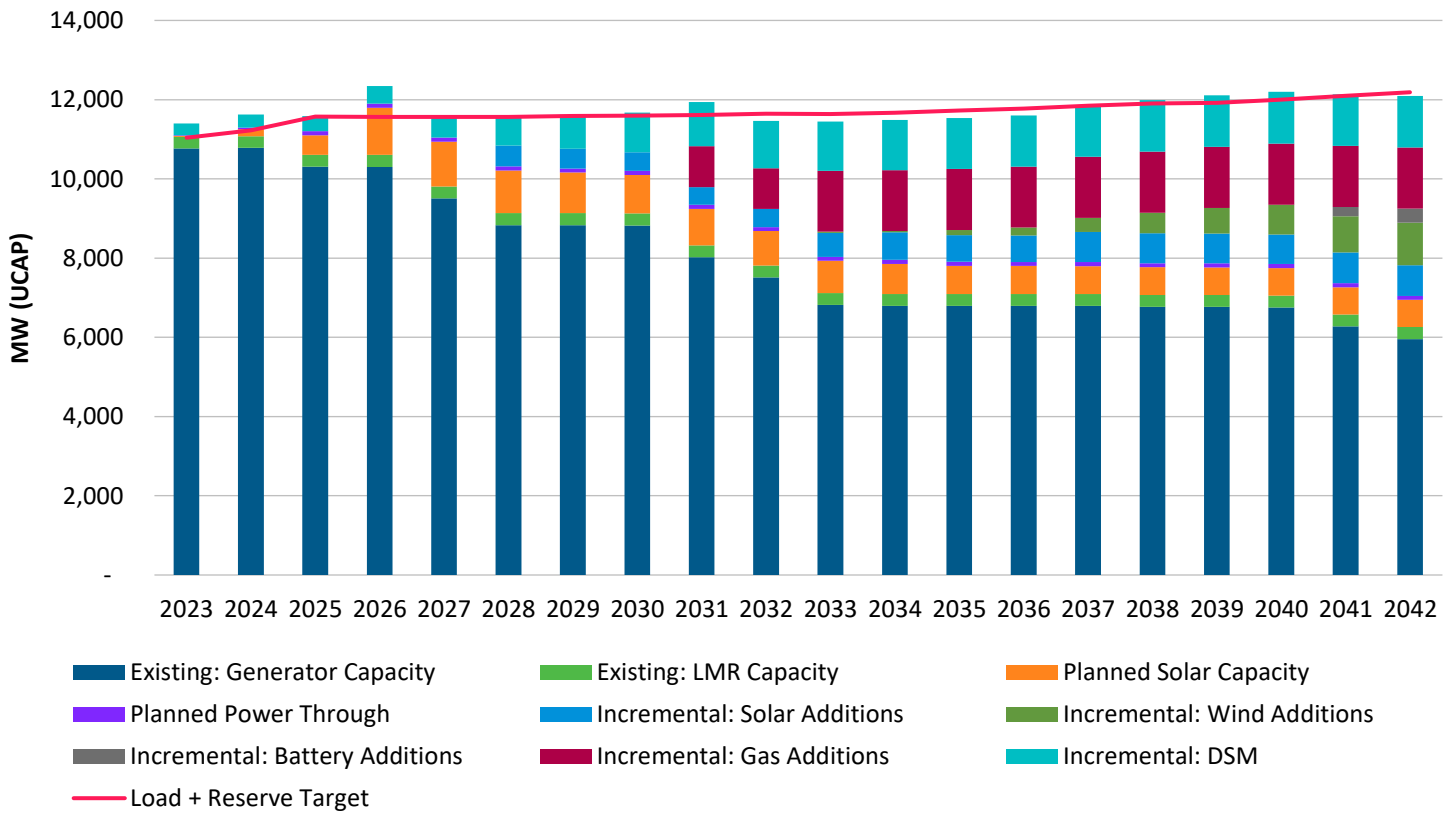
Long-Term Resource Planning

Shawn Allen
Manager, Resource Planning
Entergy Louisiana

ELL 2023 IRP Reference Resource Plan (Optimized Portfolio 1)

Key Assumptions[1]

- Defined by reference load growth and gas price, high DR addition, and ICF POV regarding CO2 price.
- Includes considerable solar additions identified as Planned Solar Capacity
- 9.3 GW of renewable energy
  - 2,700 MW Solar (in addition to Planned Solar Capacity)
  - 450 MW BESS (could be paired with a renewable resource or stand-alone)
  - 6,600 MW On-shore Wind
- 1.6 GW thermal capacity
- 1.3 GW DR programs



1. Resources described in the write up are represented in ICAP, however, resources in the chart are represented in UCAP to align with MISO planning requirements.

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Long-Term Resource Planning

On-Going Long Term Resource Planning

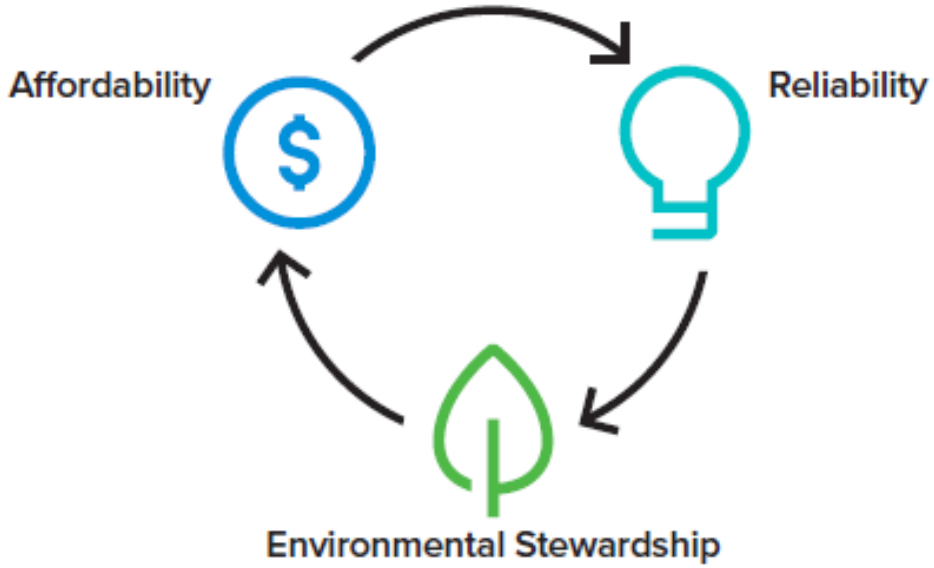
- Long Term Resource Planning is an evergreen process that changes with each process variable modification
- ELL's Draft IRP represents a "snapshot" in time
- This "snapshot" describes ELL's IRP for the 2023-2042 time period
- This analysis recognizes uncertainty and that no outcome contemplated within this analysis provides absolute certainty as to the appropriate path for the utility to take

Resource Planning Objectives

- ELL's resource planning efforts are driven by the fundamental goal to deliver a sustainable resource portfolio that is centered on customer outcomes
- A sustainable portfolio requires careful balance between reliability, affordability, and environmental stewardship

Regulatory Context

- ELL's previous two IRP cycles have concluded with Staff recognizing that ELL has met the Commission's IRP General Order requirements, with no disputed issues requiring further resolution, and recommended that the LPSC acknowledge ELL's Final IRP Report.



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Integrated Resource Planning

Daniel Boratko
Manager, Supply Planning & Analysis
Enterprise Planning Group

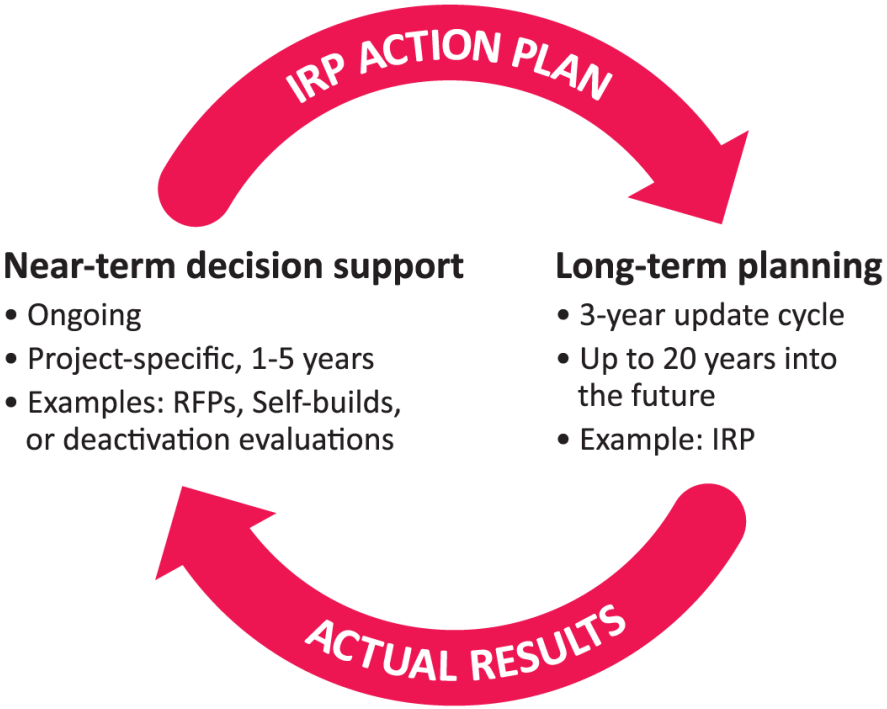
Chad Ladner
Senior Manager, Power Delivery Planning

Integrated Resource Planning Process

On-Going Long Term Resource Planning

- ELL's IRP strategy ensures that the Company is taking the necessary steps today to continue to enhance reliability, affordability, and environmental stewardship for its customers while providing flexibility to respond and adapt to a constantly shifting utility landscape.

- This strategy requires balancing many different variables, including evolution in technology and customer preferences, resource and transmission attributes, MISO resource adequacy requirements, and sustainability goals.



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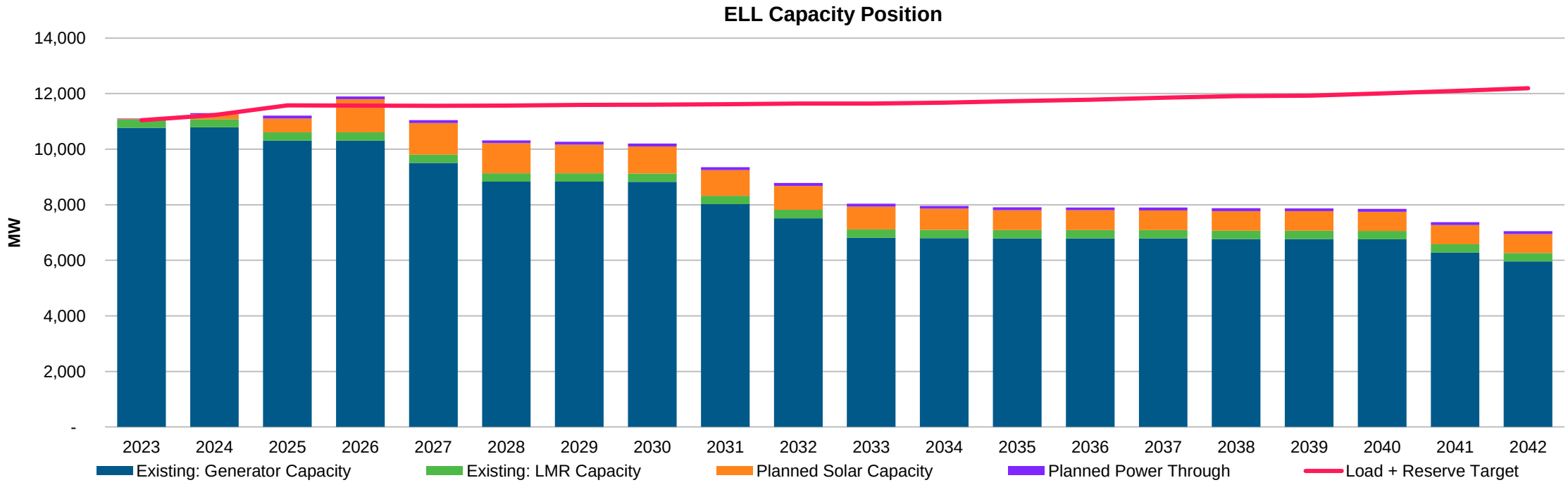
Integrated Resource Planning Process- Continued

On-Going Long Term Resource Planning

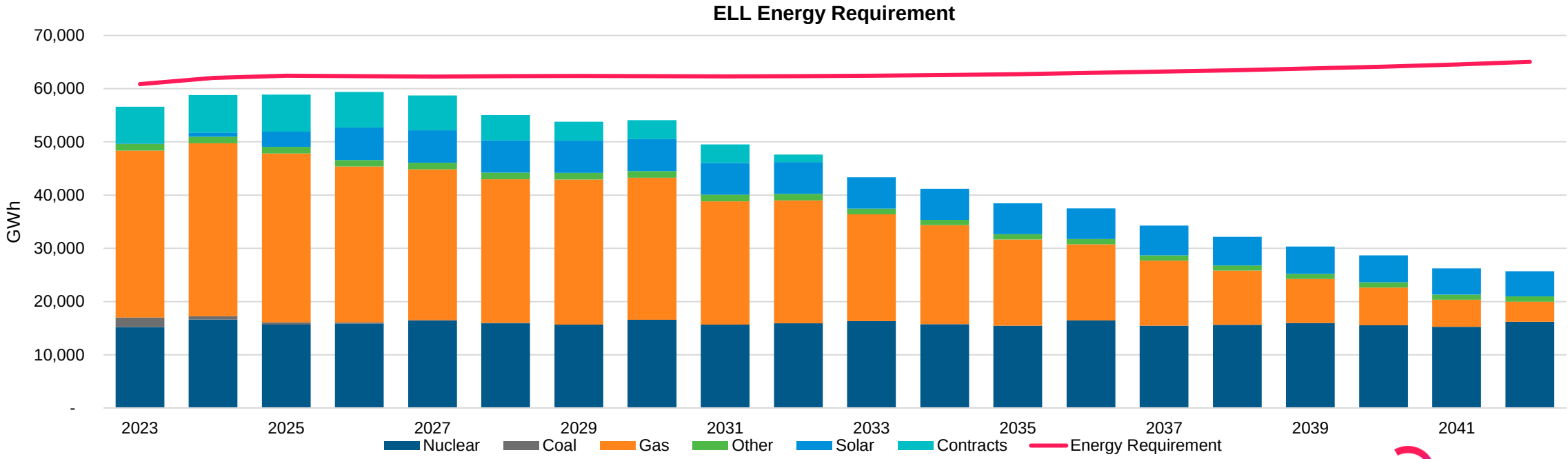
- As a load serving entity (“LSE”) within MISO since 2013, ELL is responsible for planning and maintaining a resource portfolio to reliably meet its customers’ power needs. To this end, ELL must maintain the proper type, location, level of control, and amount of capacity in its portfolio. With respect to the amount of capacity, two considerations are relevant – MISO's near-term resource adequacy requirements and ELL's long-term planning reserve margin target
- IRP capacity expansion modeling does not currently factor in specific constraints representing MISO's seasonal resource adequacy requirements, customer demand for renewable products, location-specific load growth, or carbon intensity / net zero goals



Integrated Resource Planning Process- Continued

On-Going Long Term Resource Planning

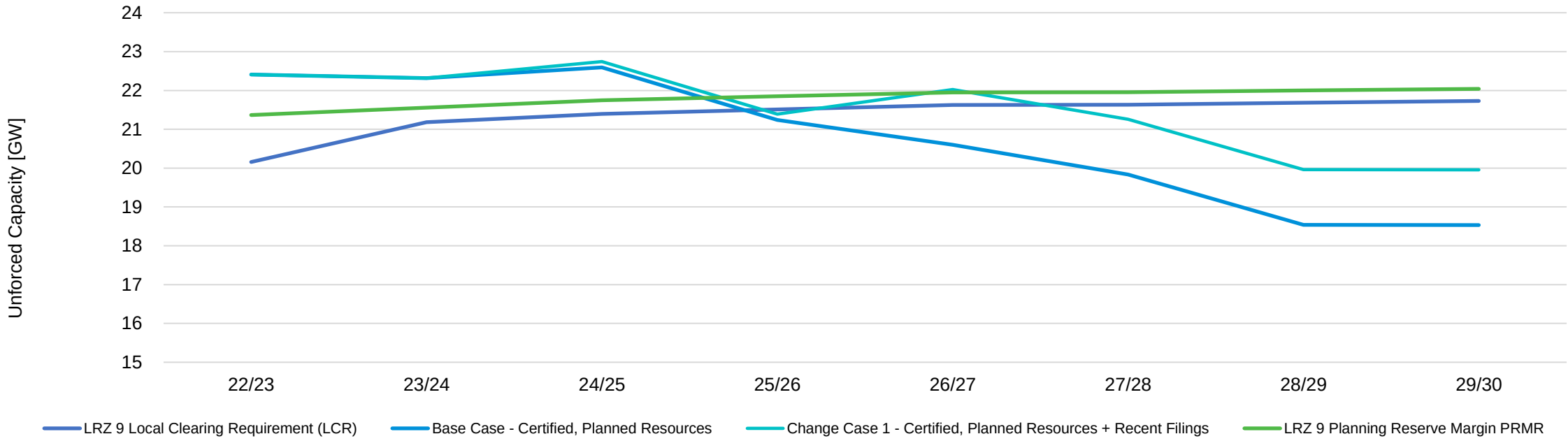
- In addition to addressing long-term capacity requirements, ELL regularly assesses how its generating fleet is expected to align with its long-term energy requirements.
- Based on the current planning model projections and absent any changes to deactivation assumptions, approved resource additions, and renewable resources solicited in ELL's 2021 and 2022 Solar and Renewable RFPs (identified as "Planned Solar Capacity" in Figure 8 above), ELL is expected to fall short of effectively meeting its long-term energy requirements without significantly relying on other Entergy operating companies and the MISO market.
    - The amount of energy produced by owned generation is subject to change based on fuel prices, market conditions, and unit operations.



Integrated Resource Planning Process- Continued

On-Going Long Term Resource Planning

- ELL forecasts that absent planned physical generating resource additions that have not yet been proposed and/or certified by the LPSC, the current LRZ 9 generation surplus above its LCR is expected to erode by the 2025/2026 planning year, largely due to load growth and existing unit deactivations driven by age, economics, contract expirations, and environmental regulations, which, as previously stated, would put the entirety of LRZ 9 at risk of clearing at the CONE prices within future MISO PRAs, significantly increasing costs and jeopardizing future reliability for all within the region.



Integrated Resource Planning Process- Continued

Transmission Planning Overview

- To plan the future transmission system that is:
  - Compliant with NERC reliability standards and local planning guidelines
  - Capable of being operated safely and reliably by operations staff
  - Able to deliver energy economically
  - Supportive of future load growth
- To create value to the company and stakeholders by:
  - Efficient planning
  - Identifying all benefits and risks of proposed projects
  - Striving for optimal solutions for reliability-driven needs
  - Eliminating compliance risk
- In the IRP, Transmission Planning seeks to:
  - Identify system limits or challenges to delivering the resource plan
  - Provide estimated costs to address any transmission needs

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03 Model Inputs and Framework

Charles DeGeorge
Sr. Manager, Energy Market Analytics
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Phong Nguyen
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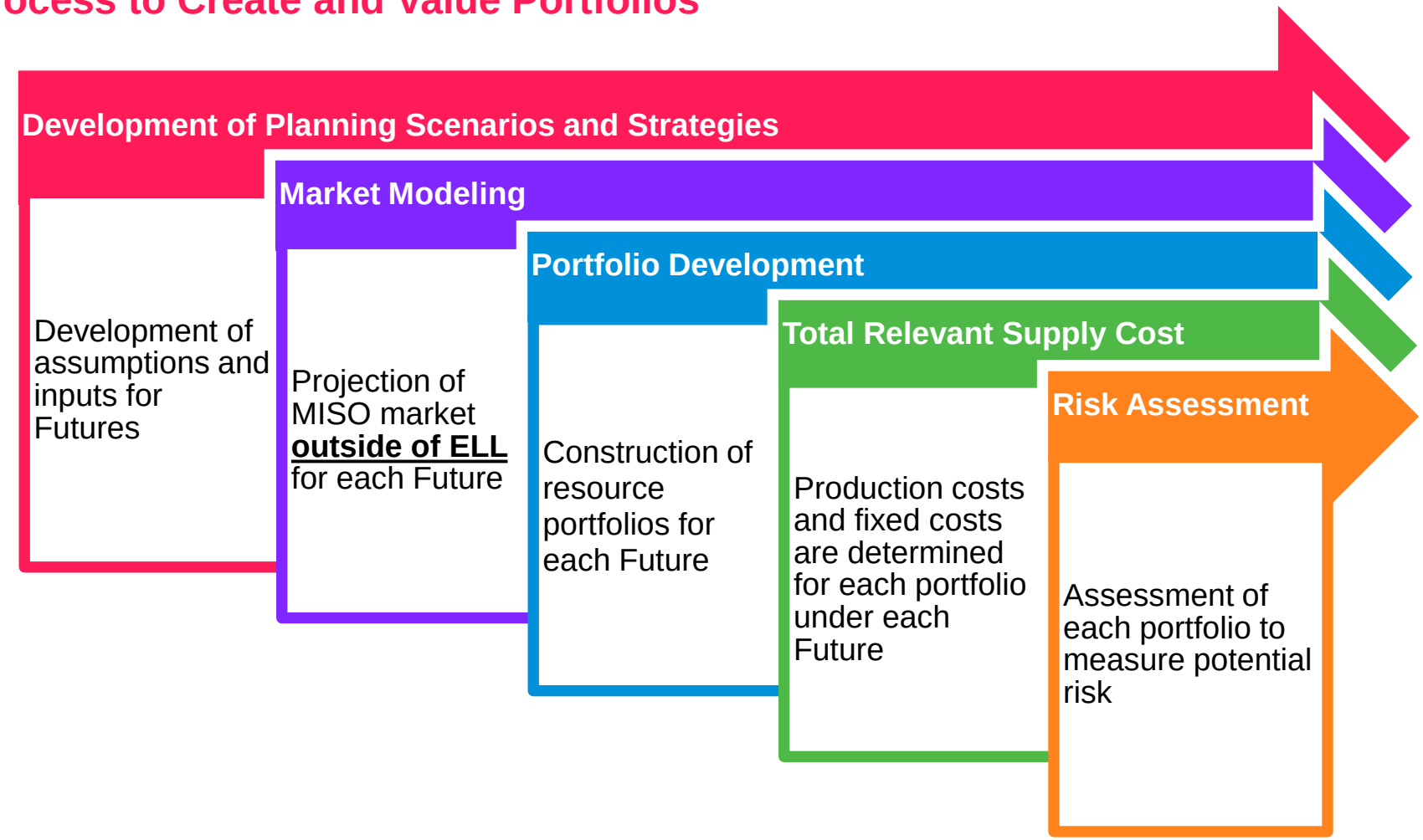
Ryan Jones
Sr. Lead, Regulatory Affairs
Entergy Louisiana

Model Inputs and Assumptions- Continued

Analytic Process to Create and Value Portfolios



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Model Inputs and Assumptions

Future Assumptions

	Future 1	Future 2	Future 3
Peak Load & Energy Growth	Reference	Highest	Between Reference and Highest
Natural Gas Prices	Reference	High	Low
MISO Coal Deactivations[1]	All ETR coal by 2030 All MISO coal aligns with MTEP Future 1 (46 year life)	All ETR coal by 2030 All MISO coal aligns with MTEP Future 3 (30 year life)	All ETR coal by 2030 All MISO coal aligns with MTEP Future 2 (36 year life)
MISO legacy gas deactivations	55 year life	45 year life	50 year life
Carbon tax scenario **ICF 2020 post-election**	ICF Point of View	ICF Legislative Case (High)	ICF 50% Reduction Case (Mid)
ITC/PTC Assumptions	Current methodology[2]	HR 5376	Current Methodology
DSM Potential Study	ELL EE embedded in BP22 Load Forecast + for DR: option to select ICF up to High Case	Option to select ICF DR & EE up to High Case	Option to select ICF DR & EE up to High Case
Allow Future Emitting Resource	Yes	No	Yes

1. Deactivation assumptions will be consistent with current planning assumptions for ELL owned or contracted generation
2. Current Methodology refers to the methodology at the time of assumption finalization for the Technical Conference (January 27th, 2022). This methodology aligned with Solar ITC of 30% in 2023, 26% from 2024-2025, and 10% in 2026. At that time there was no PTC option for wind beginning service during the planning horizon.

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Model Inputs and Assumptions- Continued

Forecasts and Assumptions

Forecast / Assumption	Updated Data Assumptions Posted February 11, 2022	ELL 2023 IRP – Draft Report Posted October 21,2022
Load Forecast and Sensitivities	Slide 8	Figure 20
Deactivation Assumptions and Contract Expirations	Slide 13	Table 3 and Table 4
Solar Capacity Credit	Slide 27	Figure 29
Gas Price Forecast and Sensitivities	Slide 19	Figure 27
CO2 Price Forecast and Sensitivities	Slide 20	Figure 26
DSM Potential	Slide 29	Appendix I: Figure 8 and 9; Figure 19 and 20
Technology Assessment	Slides 32 - 41	Table 11 and Table 12

1. Deactivation assumptions will be consistent with current planning assumptions for ELL owned or contracted generation

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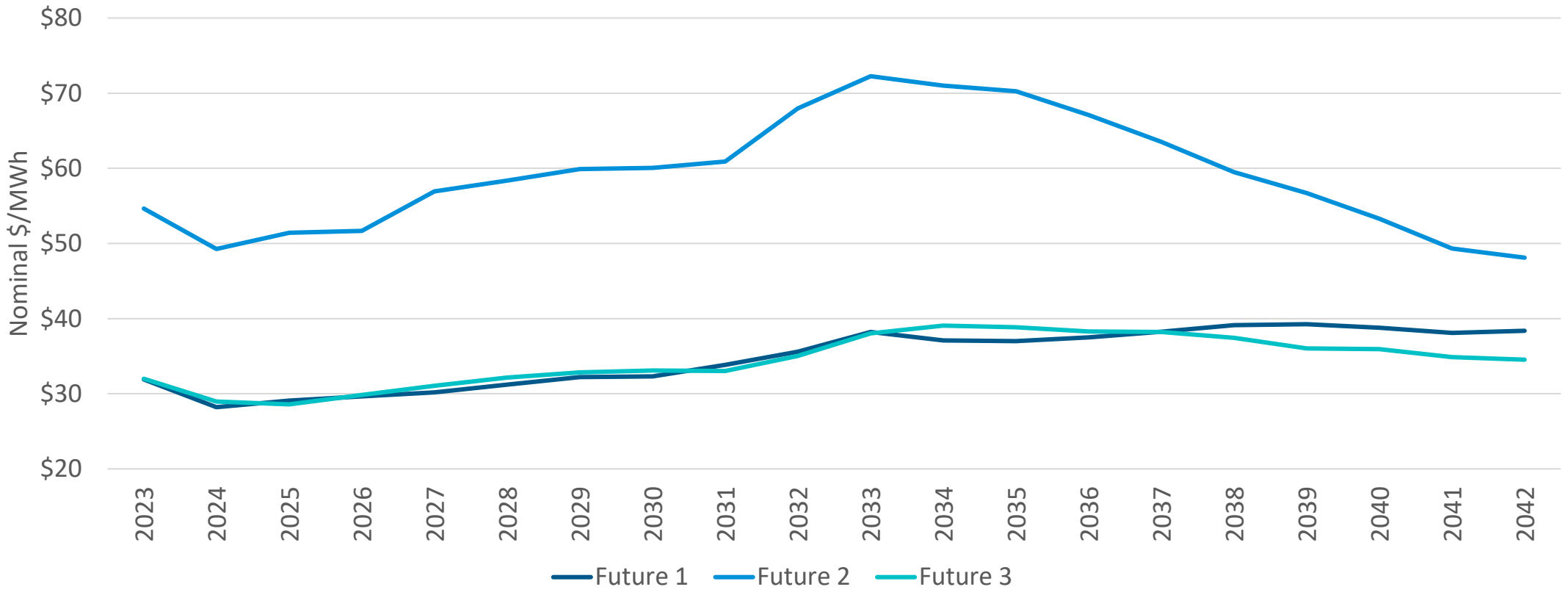
Model Inputs and Assumptions- Continued

MISO Market Excluding ELL Projected Annual LMP



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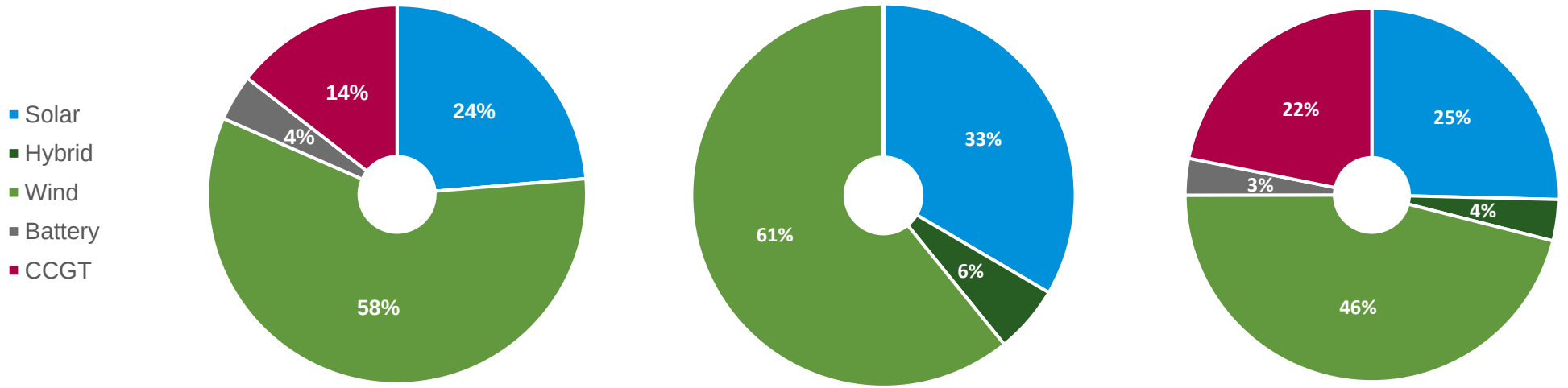
Model Inputs and Assumptions

Optimized Portfolios

2023-42 Installed Capacity (MW)	Portfolio 1	Portfolio 2	Portfolio 3
CCGT	1,580	0	2,635
Solar	2,700	8,800	3,200
Wind	6,600	16,000	5,800
Hybrid	0	1,500	450
Battery	450	0	400
DSM	1,310	1,673	1,673
Total Incremental	12,640	27,973	14,158



Model Inputs and Assumptions

TRSC- Reference Portfolio

Portfolio 1	Cost [$MM, 2022$ NPV]
Variable Supply Cost	$17,963
Resource Additions Fixed Costs	$3,603
DSM Net Fixed Costs	($232)
Capacity Purchases / (Benefit)	($104)
Total Relevant Supply Cost	$21,229

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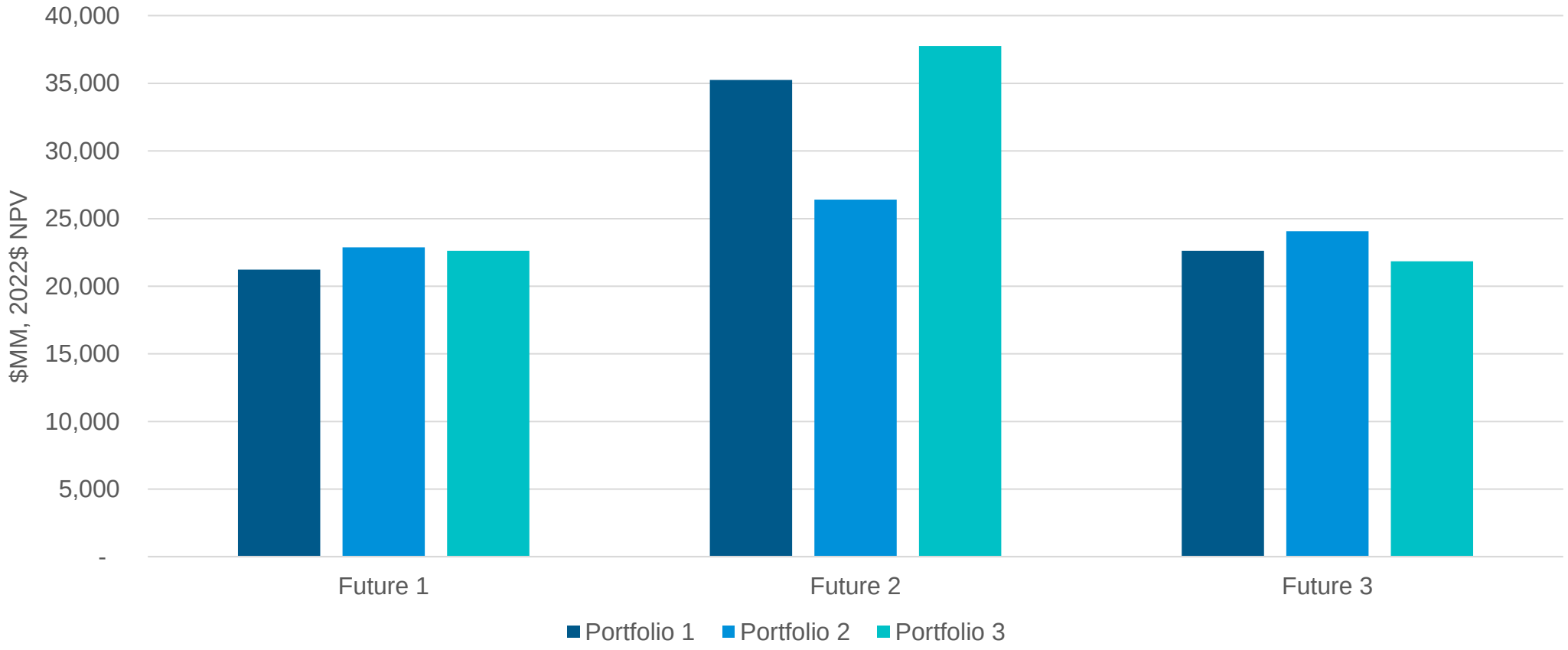
Model Inputs and Assumptions

TRSC- All Portfolio



Model Inputs and Assumptions

Rate Impact- Reference Portfolio

	(A) Fixed Cost [NPV $/kWh]	(B) Fuel Savings [NPV $/kWh]	(A+B=C) TRSC Cost or (Savings) [NPV $/kWh]
Portfolio 1	$0.0047	($0.0032)	$0.0015

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Model Inputs and Assumptions

Rate Impact- All Portfolios

	(A) Fixed Cost [NPV $/kWh]	(B) Fuel Savings [NPV $/kWh]	(A+B=C) TRSC Cost or (Savings) [NPV $/kWh]
Portfolio 1	$0.0034 - $0.0050	($0.0037) - ($0.0024)	($0.0003) - $0.0026
Portfolio 2	$0.0081 - $0.0166	($0.0201) - ($0.0126)	($0.0120) - $0.0040
Portfolio 3	$0.0032 - $0.0047	($0.0039) - ($0.0002)	$0.0008 - $0.0036

04

Action Plan

Laura Beauchamp
Director, Resource Planning & Market Operations
Entergy Louisiana

2023 IRP Action Plan

1

Implement ELL's Solar Portfolio & Geaux Green Tariff (2020 RFP)

2

Complete ELL's Two Outstanding RFPs (2021 & 2022 RFPs)

3

Continue the Issuance of Sizeable and Frequent Renewables RFPs

4

Monitor Cross-State Air Pollution Rule ("CSAPR") Requirements

5

Explore Solving Some of ELL's Energy & Capacity Deficits with Distributed Generation and/or Customer Solutions

6

Continue Participation in Commission Rulemakings Regarding Resource Planning, Reliability and Resource Adequacy

7

Explore Additional Demand Side Management Opportunities

8

Pursue Power Resiliency

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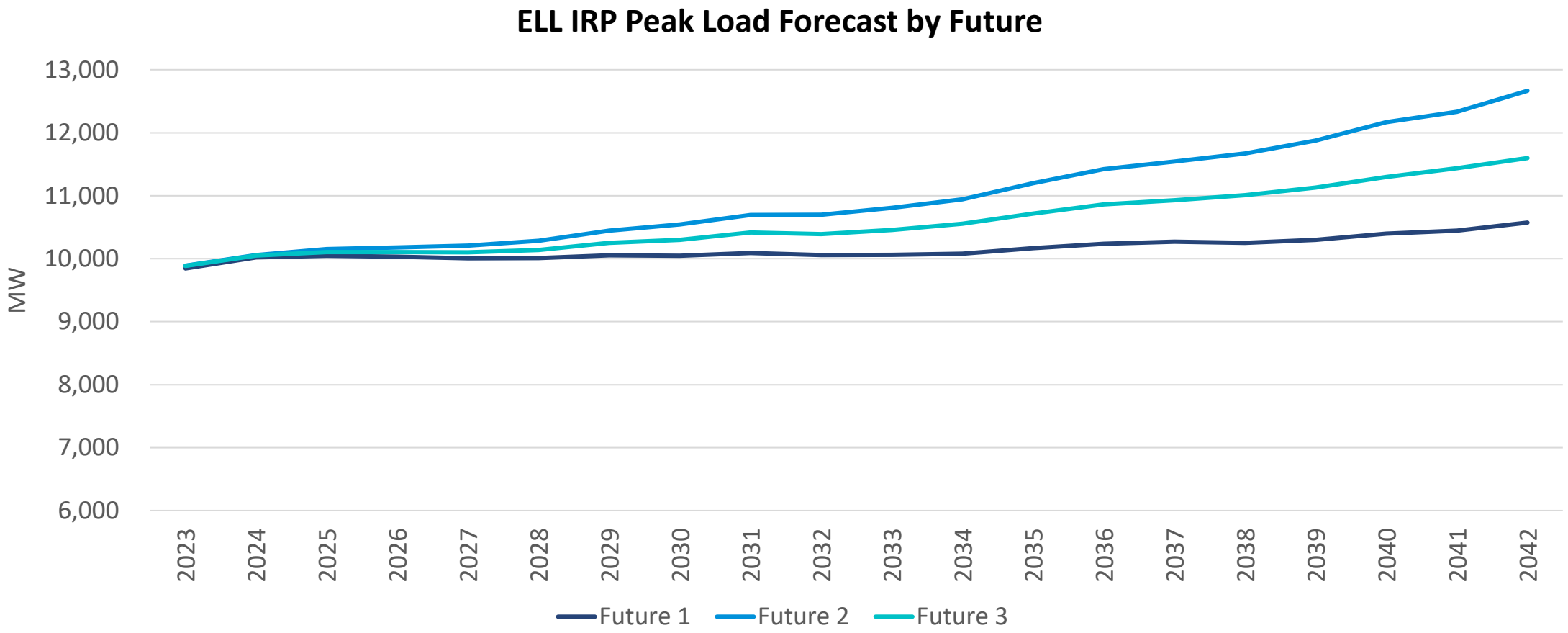
Appendix

Load Forecast and Sensitivities



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Deactivation Assumptions and Contract Expirations

Near Term Deactivations

Near Term (10 Year) Deactivations	Unit	ELL Ownership Share of GVTC [MW]	Deactivation Assumption
Big Cajun 2	3	135	2025
Waterford	2	415	2025
Little Gypsy	2,3	909	2027
Roy Nelson	6	211	2028
White Bluff	1,2	25	2028
Independence	1	7	2030
Ninemile	4	724	2031

Near Term Contract Expirations

Near Term (10 Year) Contract Expirations	MW	Fuel	Expiration Date
Montauk	2	Biomass	2024
Toledo Bend	48	Hydro	2023
Oxy-Taft	471	Natural Gas	2028
Carville	485	Natural Gas	2032

[1] Following the ELL IRP Technical Conference, Sterlington 7A was deactivated. As a result, the resource has been removed from the table. It is important to note that ELL only owns a portion of Big Cajun 2 Unit 3, Roy Nelson Unit 6, White Bluff Units 1 and 2, and Independence Unit 1. The entire GVTC ratings for those respective units are currently 557 MW for Big Cajun 2 Unit 3, 524 MW for Roy Nelson Unit 6, 818 and 823 MW for White Bluff Units 1 and 2, respectively, and 822 MW for Independence Unit 1.

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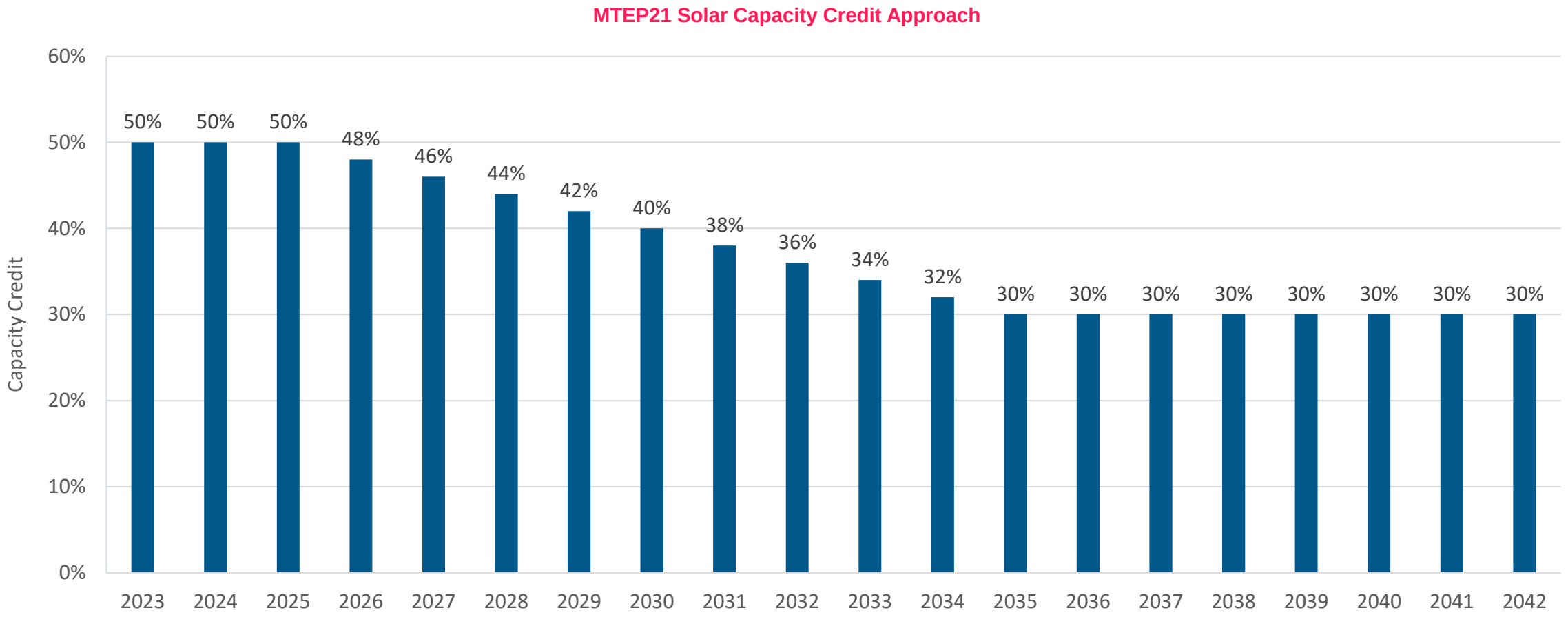
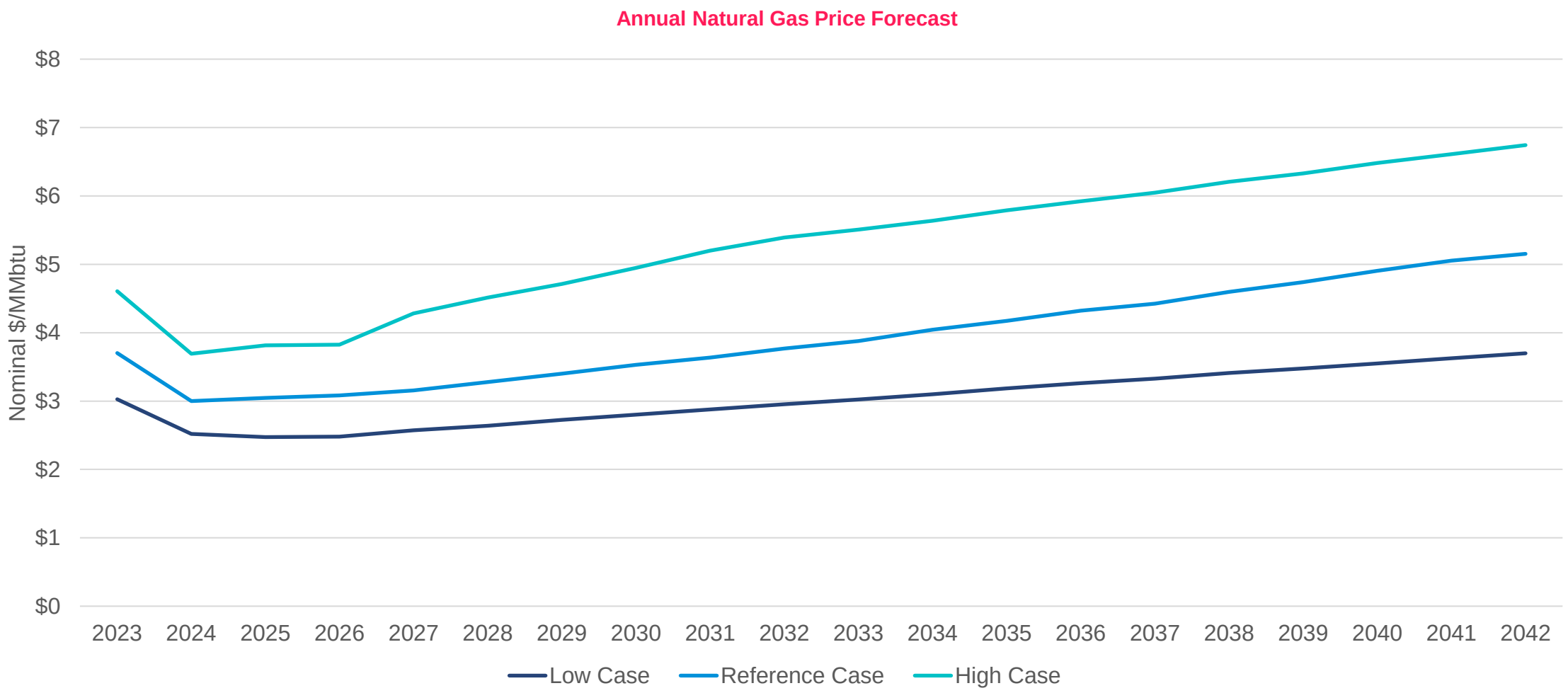
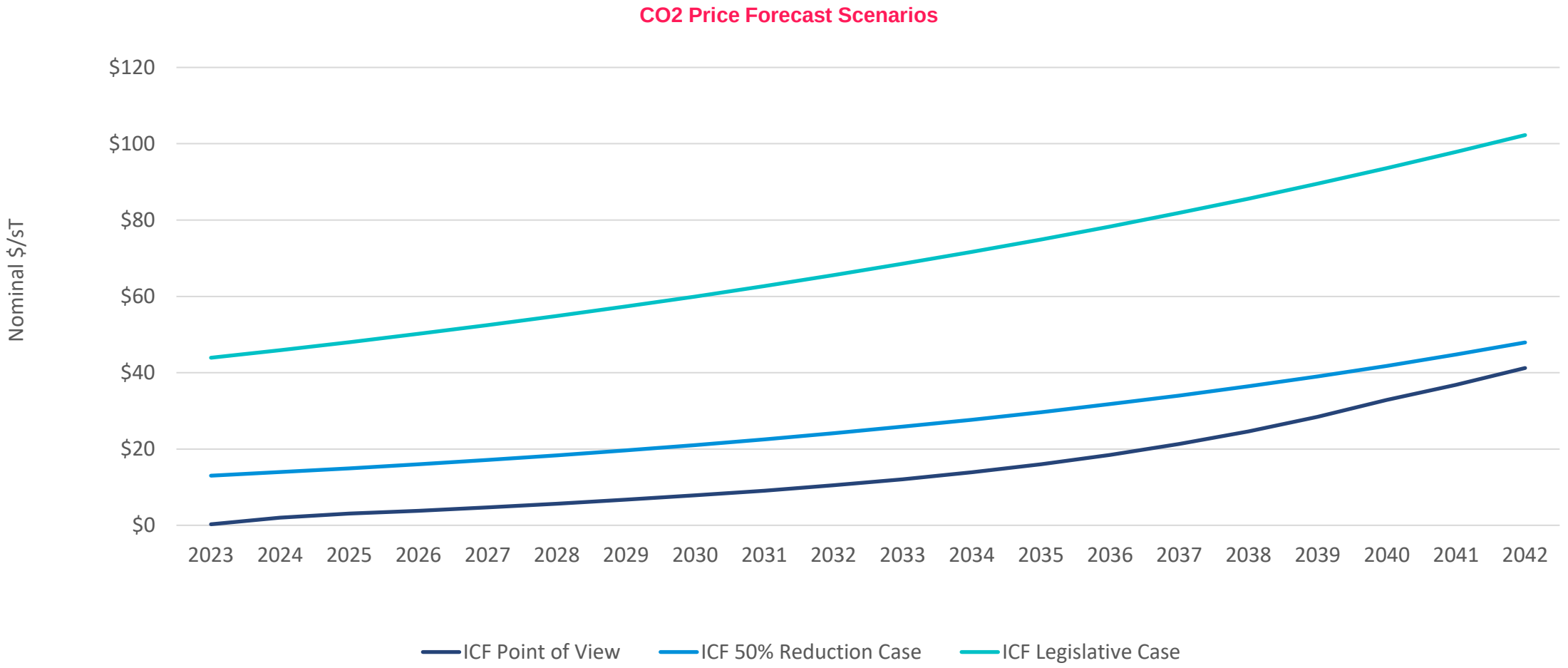
Solar Capacity Credit



Gas Price Forecast and Sensitivities



CO2 Price Forecast and Sensitivities



Energy Efficiency Potential – Residential

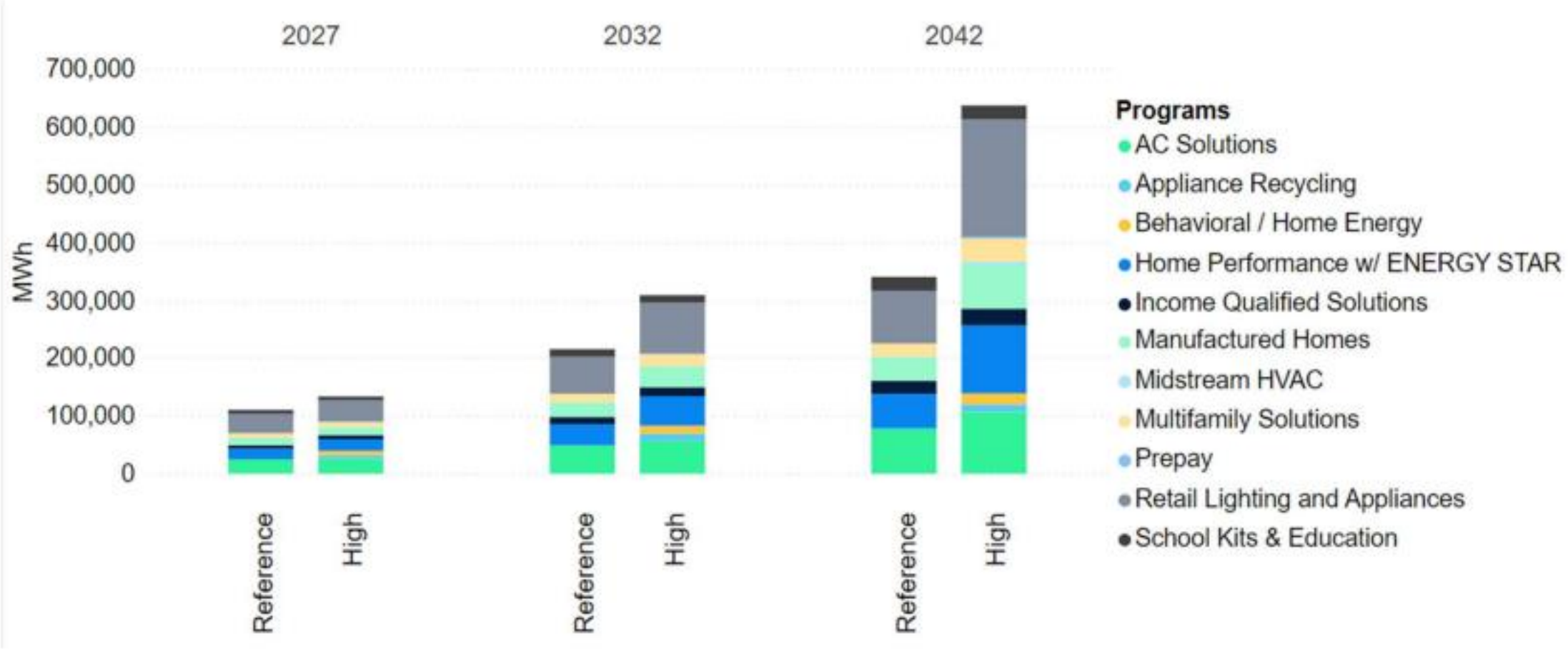


Figure 8: Net Cumulative Residential Savings by Program in 2027, 2032, & 2042

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Energy Efficiency Potential – Non-residential

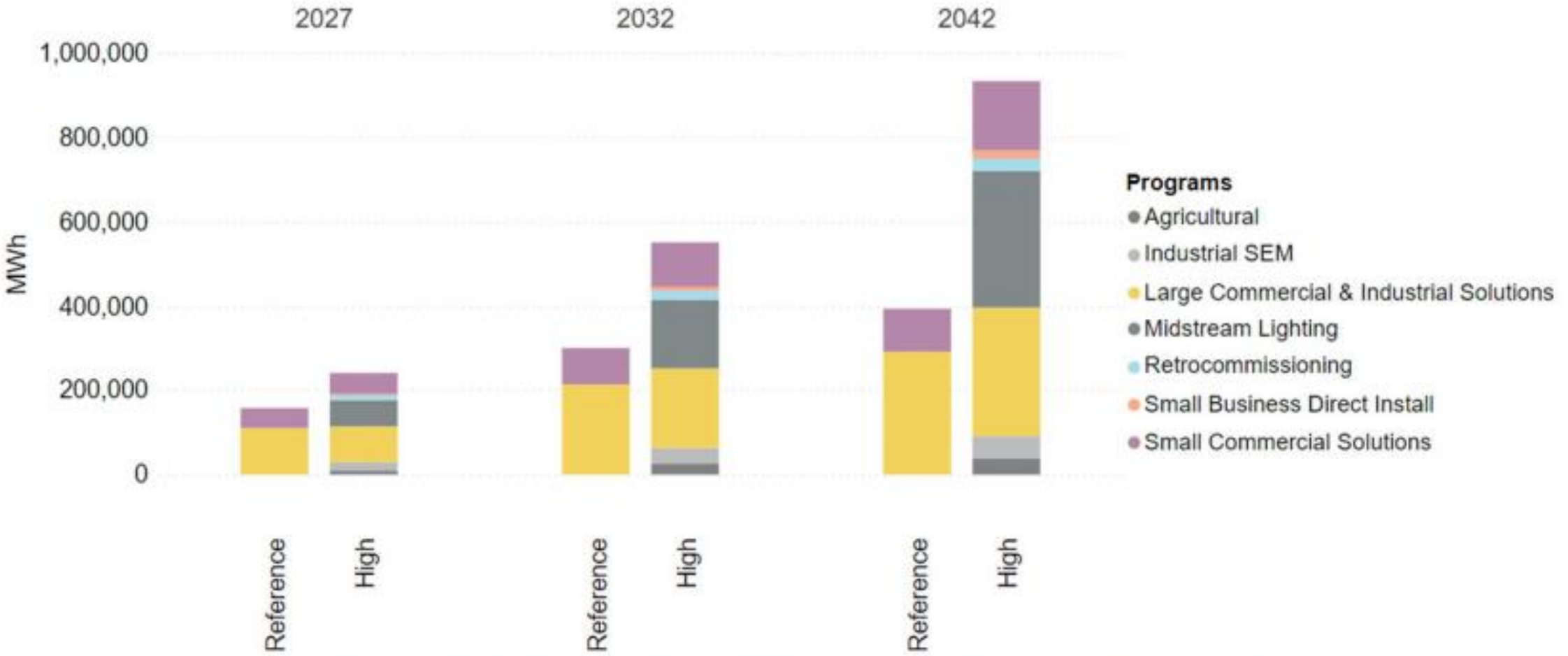

Figure 9: Net Cumulative C&I Savings by Program in 2027, 2032, & 2042

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Demand Response Potential – Residential

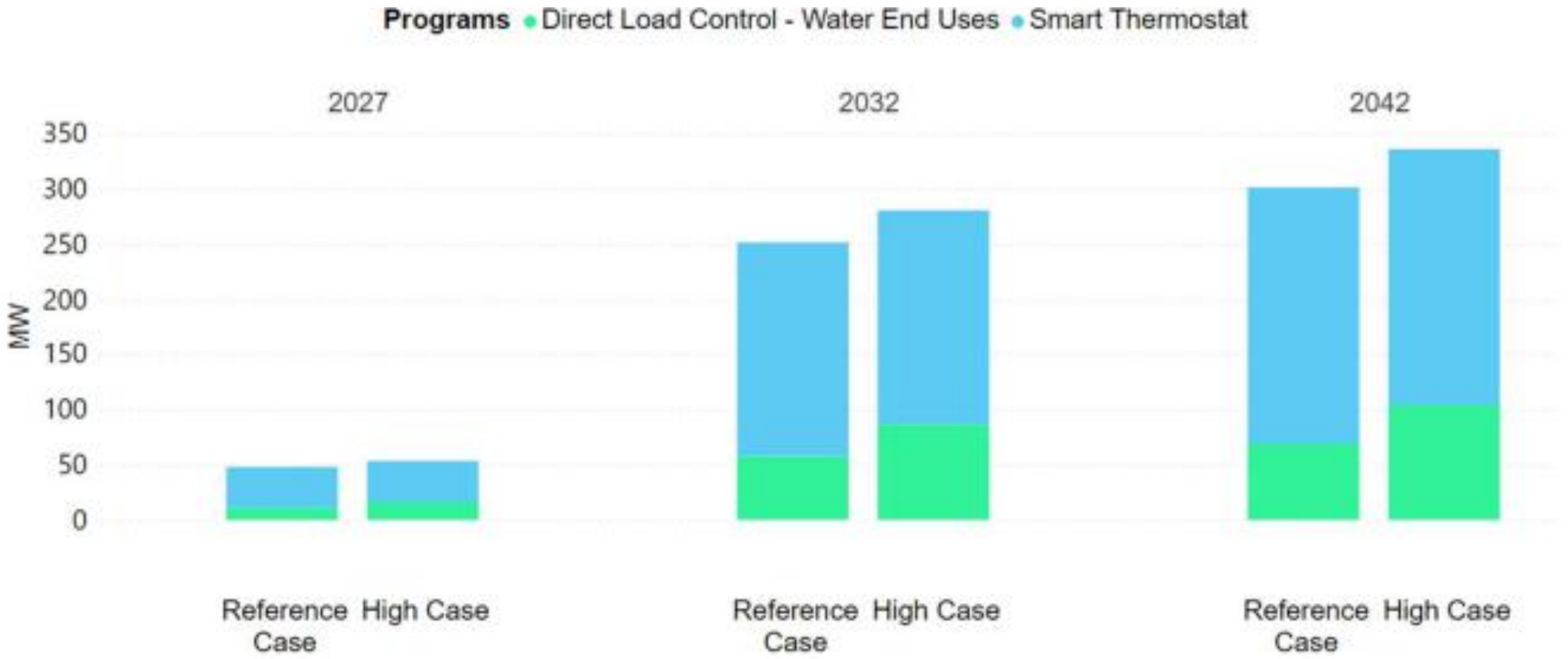

Figure 19: Residential Summer MW Peak Savings for selected years, by Program and Scenario

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Demand Response Potential – Non-residential

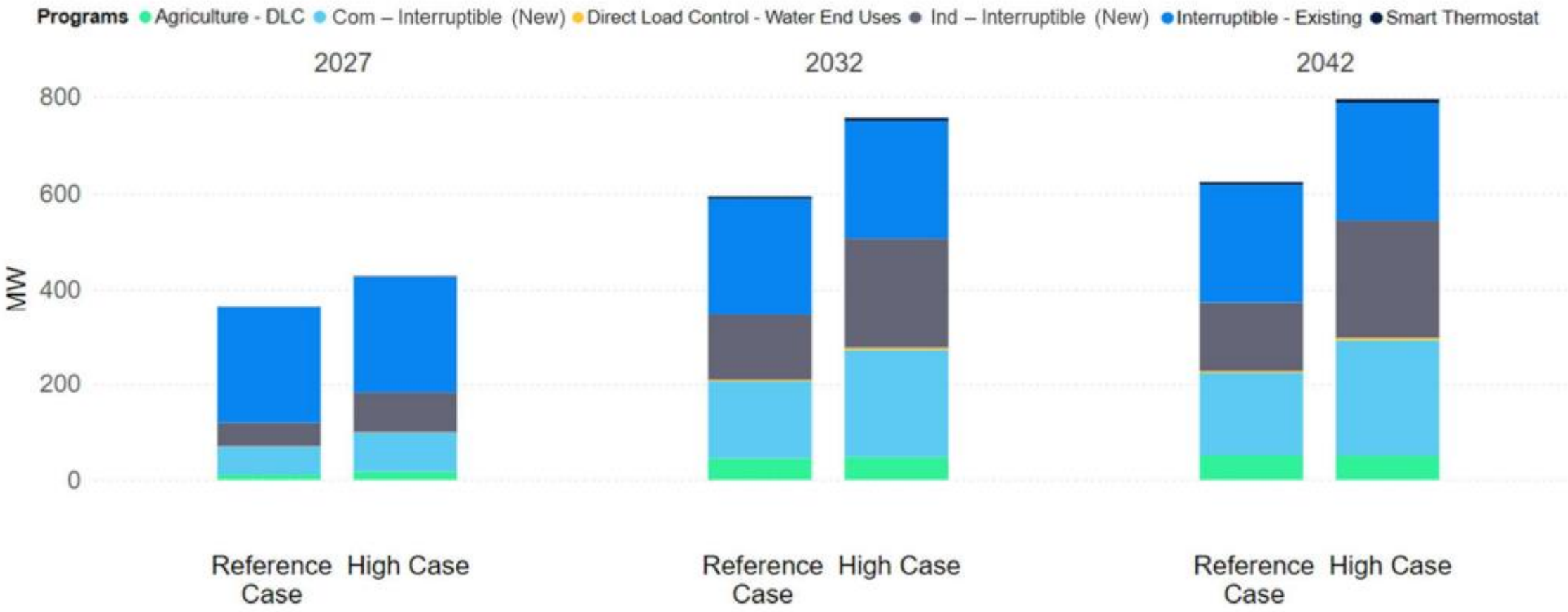

Figure 20: Commercial and Industrial Summer MW Peak Savings for selected years, by Program and Scenario

Technology Assessment

Technology	Net Max Summer Capacity [MW-ac]	Installed Capital Cost [2022$/KW]	Fixed O&M [2022$/KW]	Variable O&M [2022$/MWh]	Full HHV Summer Heat Rate [Btu/kWh]	H2 (%)
CT (M501JAC)	365	$925	$6.66	$14.74	9,165	30%
CCGT (1x1 M501JAC) w/o Duct Firing	525	$1,156	$18.43	$3.47	6,375	30%
CCGT (2x1, M501JAC) w/o Duct Firing	1,055	$894	$12.07	$3.48	6,355	30%
Aero-CT (LMS100PA)	100	$1,438	$6.47	$3.21	9,015	30%
RICE (7x Wartsila 18V50SG)	129	$1,688	$23.35	$8.06	8,464	0%

Technology	Net Max Summer Capacity [MW-ac]	Installed Capital Cost [2022$/KW]	Fixed O&M [2022$/KW-yr.]	Capacity Factor [%]	Useful Life [yr.]
Utility-scale Solar (Single-axis tracking)	100	$1,063	$10.52	26.75% (MISO South)	30
Onshore Wind	200	$1,505	$37.72	36.8% (MISO South)	30
Offshore Wind	600	$3,620	$76.95	38.3% (Gulf of Mexico)	25
BESS (Li-ion, 4hr)	50MW/ 200MWh	$1,171	$13.39	N/A	20
Solar + BESS	100 MW Solar 50 MW/ 200 MWh Battery	$1,612	$10.52	25.6%	30-year Solar 20-year Battery

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