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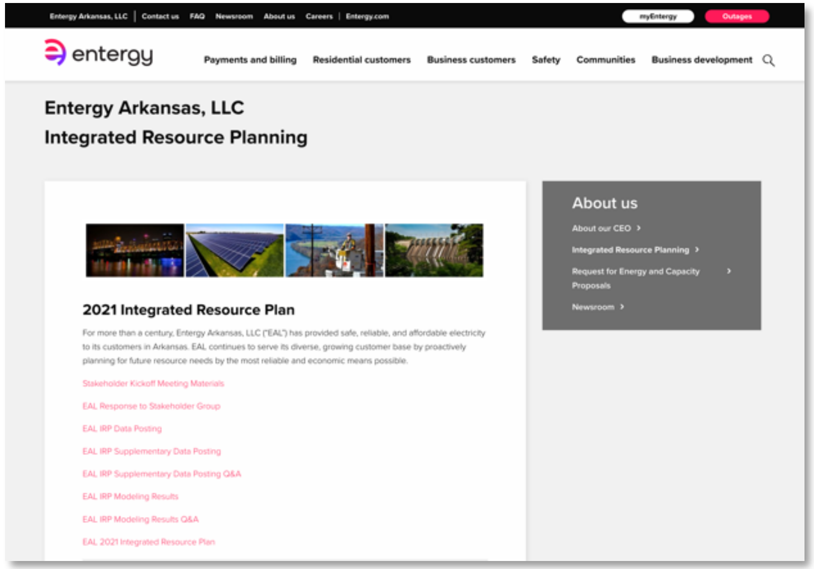
2024 Integrated Resource Plan Stakeholder Kickoff Meeting

January 30, 2024

Welcome and Meeting Guidelines



- EAL is pleased to welcome the IRP Stakeholder Group to kick off the 2024 Integrated Resource Plan ("IRP") process
- Please mute your line to reduce background noise and prevent interruptions
- Q&A Process
  - Questions can be submitted during today's meeting via the WebEx Chat Window or to the EAL IRP inbox at EALIRP@ENTERGY.COM
  - Questions will be gathered during the meeting for a Q&A Session following the presentations
  - Time constraints may limit the number of questions answered during today's meeting; EAL will post written responses to all questions to its IRP website https://www.entergy-arkansas.com/integrated_resource_planning/

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Meeting Agenda

Topic	Presenter
Introduction & Company Overview	Kandice Fielder
Integrated resource planning (“IRP”) overview	
2021 IRP action plan and other recent activities	
EAL planning overview: transmission, energy efficiency and operations	Brad Cullipher, Denice Jeter, John Schwegler
Integrated resource planning process	Sahabia Ahmed
Environmental update	Rick Johnson
Technology assessment	Jonathan Alvis
Load forecast process	Charles John
Aurora modeling overview & Futures	Daniel Boratko
2024 IRP schedule and next steps	Sahabia Ahmed
Stakeholder feedback / Q&A	All

Meeting Objectives

- Discuss EAL’s Integrated Resource Plan
  - Process
  - Input assumptions
  - Preliminary plans & schedule

- Provide information & engage stakeholders

01

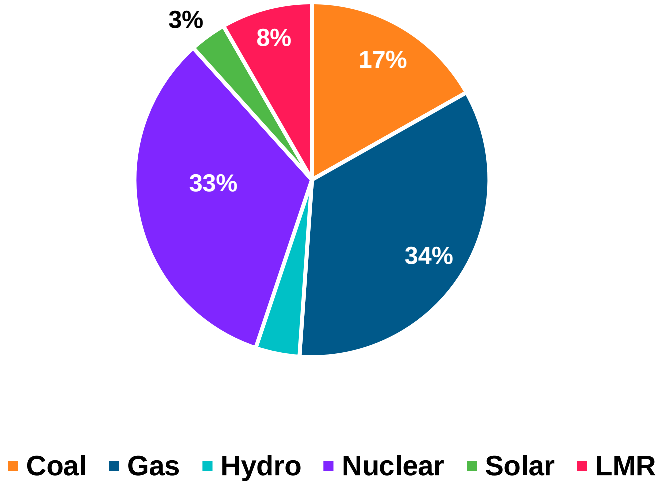
Company Overview

Kandice Fielder

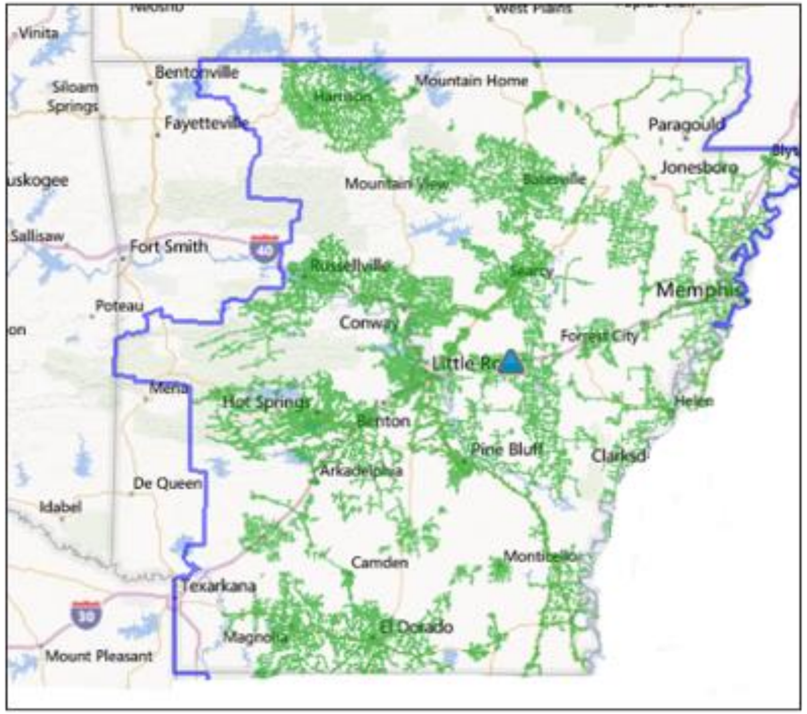
Company Overview

Entergy Arkansas, LLC currently serves 719,158 electric customers across 63 counties in Arkansas

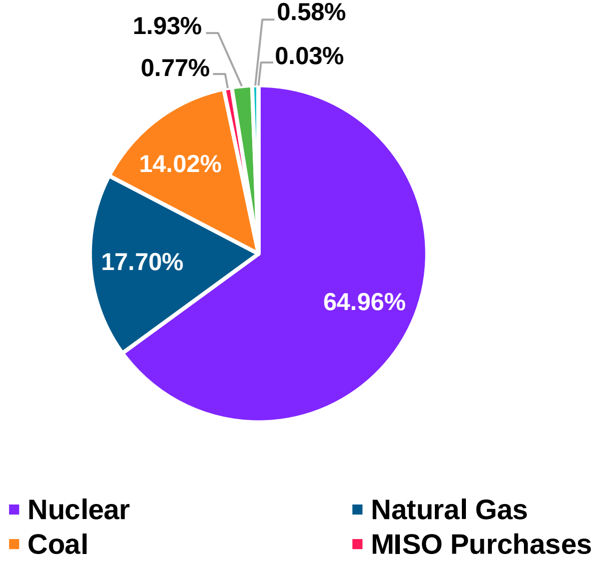
2022 EAL Capacity Mix*



2022 Peak Load: 4,759



2022 EAL Fuel Mix*



Solar % excludes green offering subscription of ~0.07% solar

Transmission Mileage: 4,967
Distribution Mileage: 39,100

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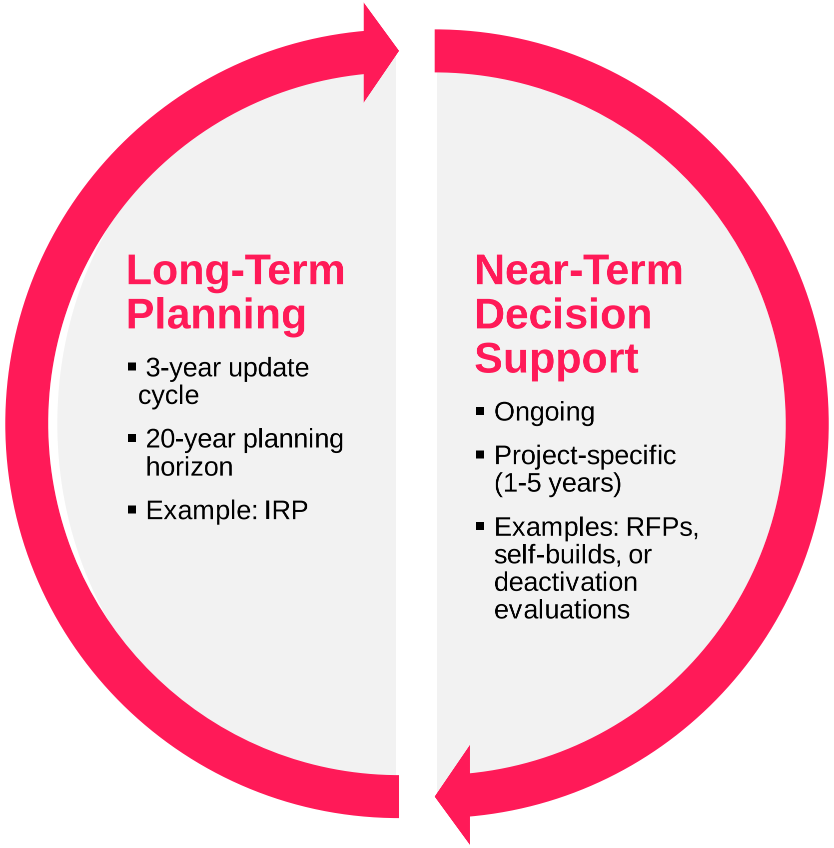
*Energy and capacity that serve EAL's Native Load customers

Integrated Resource Planning ("IRP") Overview

EAL's IRP guides long-term generation decisions

EAL updates its IRP on a three-year cycle, consistent with Section 6.1 of Attachment 1 to APSC Order No. 6 in Docket No. 06-028-R, "Resource Planning Guidelines for Electric Utilities."[1] EAL has begun development of its next Integrated Resource Plan to be filed with the Commission no later than three years from the prior IRP submission, which is October 29, 2024.

- EAL's IRP strategy helps to guide the necessary steps EAL takes today to continue to enhance reliability, affordability, and environmental stewardship for its customers. This approach also provides the flexibility EAL requires to respond and adapt to changing customer needs and expectations.
- Near-term decisions around new generation or deactivation of existing generation are project-specific and are handled on a case-by-case basis.
- The IRP encompasses longer-term trends that inform long-term planning decisions regarding EAL's generation portfolio.



1. http://www.apscservices.info/pdff/06/06-028-r_57_1.pdf

02

2021 IRP Action Plan & Recent Activities

Kandice Fielder

2021 IRP Action Plan

- Complete the acquisitions of Searcy, Walnut Bend, and West Memphis Solar build-own-transfer resources
- Complete the 2021 renewables RFP
- Effectuate the deactivation of Lake Catherine 4 in 2025
- Identify demand-side management opportunities
- Continue participation in EE
- Pursue power resiliency
- Implement sustainable solutions
- Evaluate stakeholder engagement

03

Transmission Planning Overview

Brad Cullipher

Transmission Planning Update

What has changed since the 2021 IRP:

- EAL is still seeing a downward trend in Transmission baseline reliability projects as we continue to remain compliant with the NERC reliability planning standards. There is however an upward trend in generation interconnection projects that come from the MISO GIA/DPP process.
- EAL is also experiencing an increase in Load Growth driven transmission projects compared to previous years.

What hasn’t changed in Transmission Planning:

- EAL is still responsible for planning transmission projects that will meet NERC reliability planning standards and EAL’s local transmission planning criteria.
- Our focus remains on providing cost effective, economic, and reliable transmission service to our customers.
- We use an open and transparent stakeholder process when planning transmission projects which involves stakeholder meetings held by MISO.

Transmission Projects

The MTEP 23 cycle recently concluded with MISO Board approval December 2023. The MTEP 24 cycle kicked off in September 2023. These projects are developed by the Transmission Owners and submitted to MISO the year prior to MISO starting the same MTEP cycle. For example, MTEP 24 projects are created in 2023, submitted by the September 15th MISO deadline in 2023, then discussed in future Subregional Planning Meetings until approval by MISO Board of Directors in December of 2024.

	APPENDIX A		APPENDIX B	
MISO Cycle	Future/in-progress	Est. cost	Studied for future years	Est. cost
MTEP 17	1	~$5.4 M		
MTEP 18	5	~$30.8 M	3*	~$22.7 M
MTEP 19	6	~$65.5 M		
MTEP 20	10	~$91.3 M		
MTEP 22	5	~$149.9 M		
MTEP 23	11	~$123.2 M		
MTEP 24	11	~$120.8 M		

*The MTEP 18 Appendix B projects consist of Enhanced Reliability projects in Little Rock, AR.

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Transmission Planning and the IRP

- Should the 2024 IRP Action Plan guide EAL to pursue and evaluate options for additional generating resources (for example, through an RFP), transmission analysis of the specific resource options will be conducted to model the impact on EAL's Transmission system.
- This reliability analysis will include the current and future planned transmission topology, updated rating information, and future planned Transmission projects submitted and approved in MISO's MTEP Transmission plan.

04

Energy Efficiency Overview

Denice Jeter

2022 Program Overview

2022 Program year recap

2022 Portfolio Summary										
Net energy savings		**Cost**			**Cost-effectiveness**			**Goal achievement**		
Demand MW	Energy MWh	Actual Expenditures	LCFC	Performance incentives	TRC net benefits (NPV)	TRC ratio	PAC ratio	Commission established target % of balance	Actual savings achieved % of balance	% of target achieved (%)
95	292,926	$ 59,151,986	$ -	$5,548,361	$137,308,341	2.94	2.67	1.20%	1.59%	133%

Overall Successful Implementation Year

2022 Highlights:

- 292,926 MWh Net Savings – 133% of APSC Goal
- Achieved Maximum Utility Incentive of $5.55 million
- APSC approval of the PY 2024 Rider EECR rate - Docket No. 07-085-TF – Order #177 on 9/12/2023

2022 Challenges

- Residential portfolio continuing to see post pandemic effects on implementation and could be long lasting.
- EISA Lighting Standards change – New Measure developments as LEDs are discontinued in 2023 for residential use

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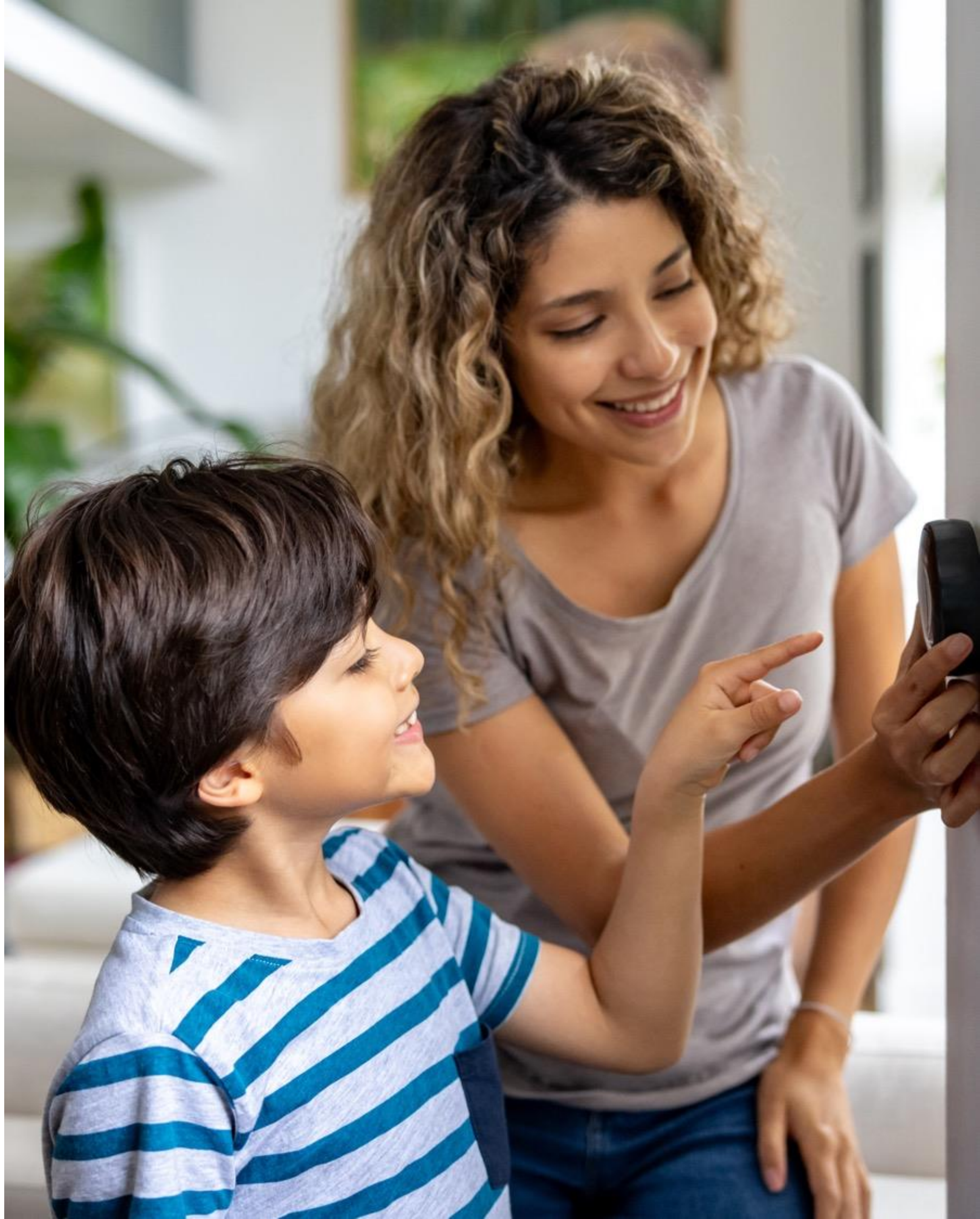
2023-2024 Program Years

Program Year 2023- Estimated

- Exceeded filed goal for the year, with an estimated savings of 288,382 MWh
- Challenges in 2023
  - Increased costs to complete projects (Labor & Materials)
  - US Inflation
  - Supply chain delays
  - Labor challenges
  - LEDs discontinued for residential use
- Program Changes
  - EAL piloted its appliance recycling measure efforts under the Point of Purchase Solutions (POPS) Program in 2023, offering residential customers the ability to recycle fully functional refrigerators and freezers.
- Final 2023 Annual Report and EECR (Energy Efficiency Cost Recovery Rider) will be available and filed **May 1st, 2024**.
- Approval of 2024-2026 program plan – Docket No. 07-085-TF Order No. 187 on 11/9/23.

Program Year 2024- Current

- Currently under the first year of the 2024-2026 Program Plan
- No changes to the current Portfolio – EAL continues to offer all programs previously presented for prior years; additionally adding or removing measures to maintain a cost-effective portfolio.



Future expectations

Program years –2027+

- Statewide EE/DR Potential Study – to inform targets for PY2027 (and forward)
  - GDS (Vendor Selected to Lead Study) is currently requesting data from all Arkansas Utilities through Data Requests and has scheduled individual meetings with each utility.
- IRA/IIJA Efforts – national guidance has been provided; currently awaiting direction from AR State Energy Office
  - The APSC has issued Order No. 1 in Docket 23-094-U to investigate Utility Plans for Maximizing the Opportunities and Benefits provided by the IRA and IIJA.
- Home Energy Rebates Program (HERP) Task Force
  - Planning phase
    - Kickoff Meeting – January 31, 2024 – New Orleans
    - August 2024 Deadline for AR decision on IRA funding

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Appliance & Recycling Stats

2023 - 457 Units - By disposing of the 457 appliances, using the Responsible Appliance Disposal's best environmental practices, you can avoid emitting the equivalent of either of the following:

The annual carbon dioxide emissions from 49 homes' energy use.

-OR-

The carbon dioxide emissions from charging 49,864,725 smartphones.

-OR-

The greenhouse gas emissions avoided by switching 15,536 incandescent light bulbs to LEDs.

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Awards and recognition

EAL Programs continued to receive National Recognition:

Point of Purchase Solutions Program (former Residential Lighting & Appliances) – EPA ENERGY STAR® Partner of the Year Sustained Excellence Award (2022, 2021, 2020, 2019) EPA ENERGY STAR Marketing Partner of the Year (2023)

Entergy Arkansas Low Income Solutions – Alliance to Save Energy Award (2023)

05 Operations Planning Overview

John Schwegler

MISO Membership and Participation

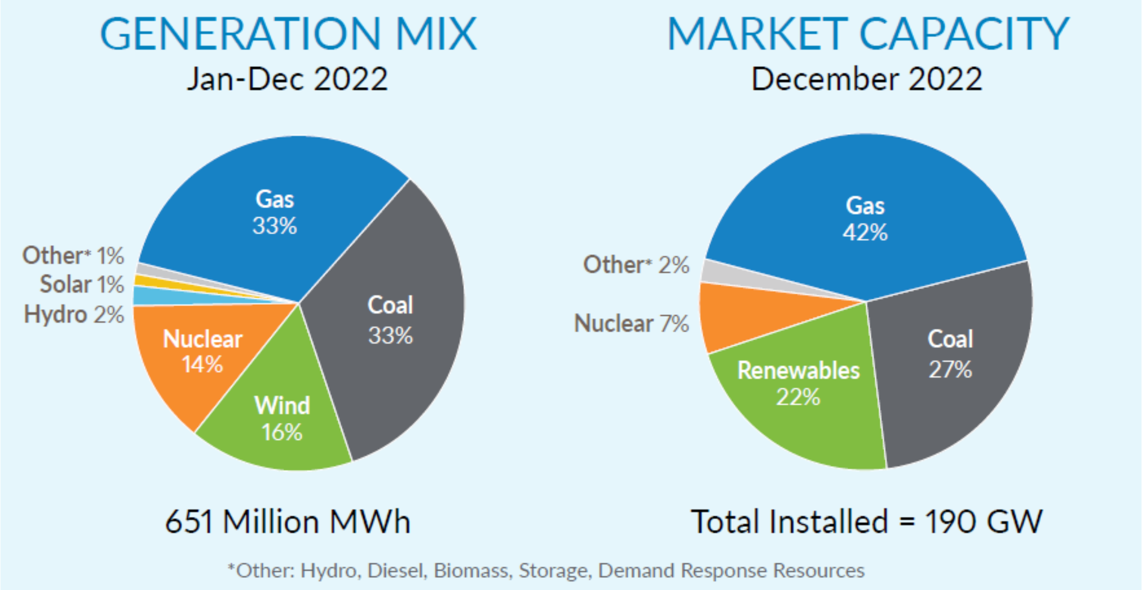
MISO market participation changes

- Seasonal construct & Auction (High level)
  - Planned outage coordination
  - Tariff limitations
  - Local clearing requirements
  - Asset notification times
- LMR capacity requirements
- Hybrid resources requirements

MISO changes in the works

- Co-Located resources vs hybrid
- Updates to the SAC requirements
- Slope demand curve
- Local clearing requirements
- LMR requirements

NOVEMBER 2023



KEY FACTS

Area Served	15 U.S. States and Manitoba, Canada
Population Served	45 Million
Transmission Line	75,000 Miles
Generating Units*	6,800+
Record Demand	127.1 GW 7/20/2011
Wind Peak	24.1 GW 11/30/2022
Solar Peak	3.1 GW 8/16/2023
Members	57 Transmission Owners
	135 Non-transmission Owners
Market Participants	+500
Carbon Reduction	Approximately 32% since 2014

Recent Resource Additions

- Searcy Solar 100 MW Build Own Transfer (“BOT”) COD 01/21/2021
- Walnut Bend Solar 100MW BOT estimated COD 2024
- Driver Solar 250MW BOT estimated COD 2024
- West Memphis Solar 180MW BOT estimated COD 2024
- Flat Fork Solar 200MW PPA approved by APSC
- Forgeview Solar 200MW PPA approved by APSC

EAL Green Offerings

SEPO A
https://www.entergy-arkansas.com/solaroption/

Green Promise
https://renew-arkansas.entergy.com/

Go ZERO
https://renew-arkansas.entergy.com/

Customers can sign up based on sustainability preference with EAL's Green Tariff options.

06

Integrated Resource Planning Process

Sahabia Ahmed

Integrated Resource Planning Process

Each component of the IRP process is critical to create an informative and effective IRP:

An Integrated Resource Plan is a planning process and framework in which the costs and benefits of supply-side and demand-side alternatives are evaluated to develop resource portfolio options that help meet EAL's planning objectives. Results of the IRP are not intended as static plans or pre-determined schedules for resource additions and deactivations.

Planning and design

Building future scenarios, assumptions, and ranges of risk factors

Stakeholder engagement

Sharing information and receiving feedback

Modeling and analysis

Market modeling, EAL portfolio optimization, production cost projections

Conclusions and action plan

Identifying themes and opportunities, establishing a mid-term, actionable plan

Publishing and filing the report

Organizing information, displaying results, and communicating EAL's narrative

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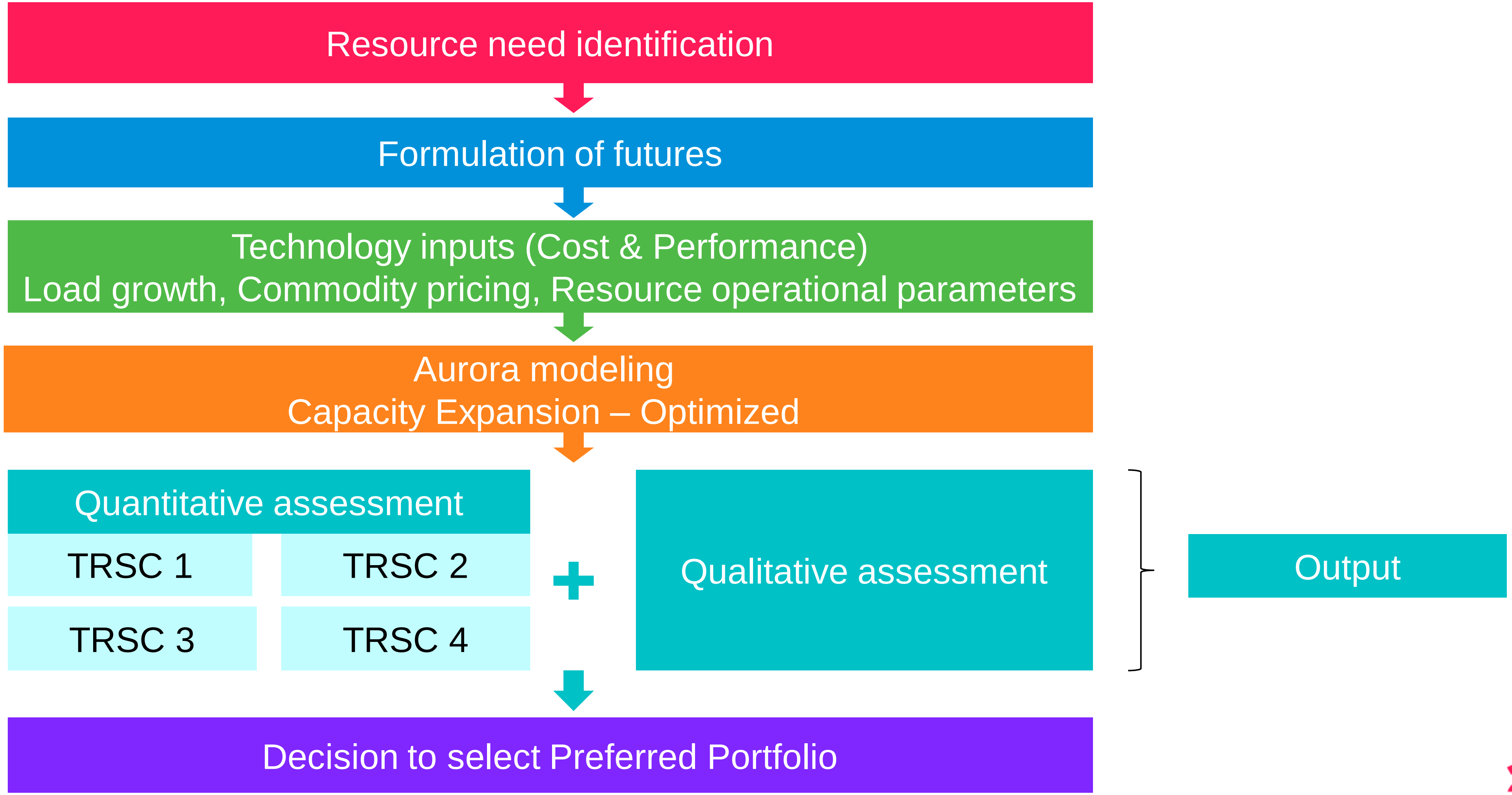
IRP Analytics Flow Chart



TRSC = total relevant supply cost

07

Environmental Update

Rick Johnson

Environmental Update

History of voluntary emission goal setting

Emission performance

Current voluntary goals

Our strategy to achieve net-zero emissions by 2050

Relevant environmental regulations

20+ years of voluntary carbon goals and climate action

2001	2006	2011	2019	**2020**
First U.S. utility to voluntarily set goal to stabilize CO_2 emissions	Intensified goal to reduce CO2 emissions (20% below 2000 levels through 2010)	Extended CO2 reduction commitment through 2020	Introduced new goal to reduce Utility CO2 emission rate by 50% below year - 2000 levels by 2030	Commitment to net-zero emissions by 2050

Exceeded cumulative goal by 8%

Working to achieve

Defining a path

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Interim Climate Goal Structure – 2022 Update

Entergy is adding an interim goal focused on clean energy deployment, while evolving our current emission rate goal to include purchased power. These goals help provide clarity regarding our path to net-zero, and we will continue to evaluate, enhance and evolve our interim goals as our path continues to develop.

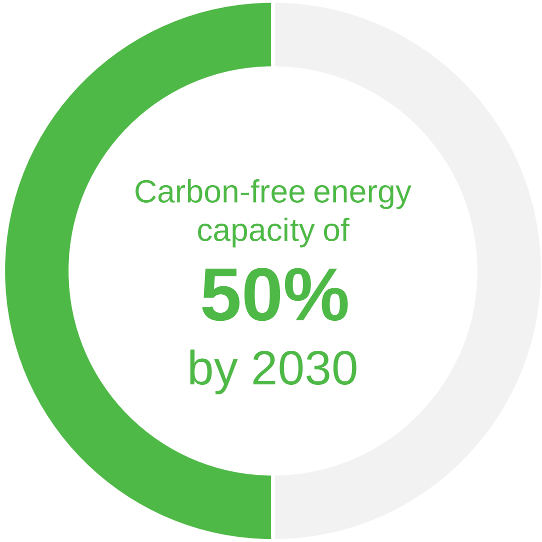
Entergy expects to reach the following interim goals on our path to achieve net-zero emissions by 2050:

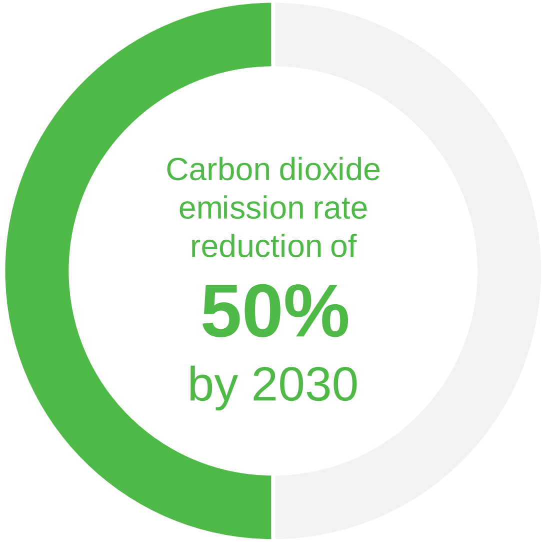
Carbon-free energy capacity of 50% by 2030

- ✓ Includes all nuclear and renewable capacity, both owned and purchased
- ✓ Additional capacity is provided by some accompanying battery storage paired with renewables

Carbon dioxide emission rate reduction of 50% by 2030

- ✓ Includes all generation, both owned and purchased
- ✓ 2000 base year

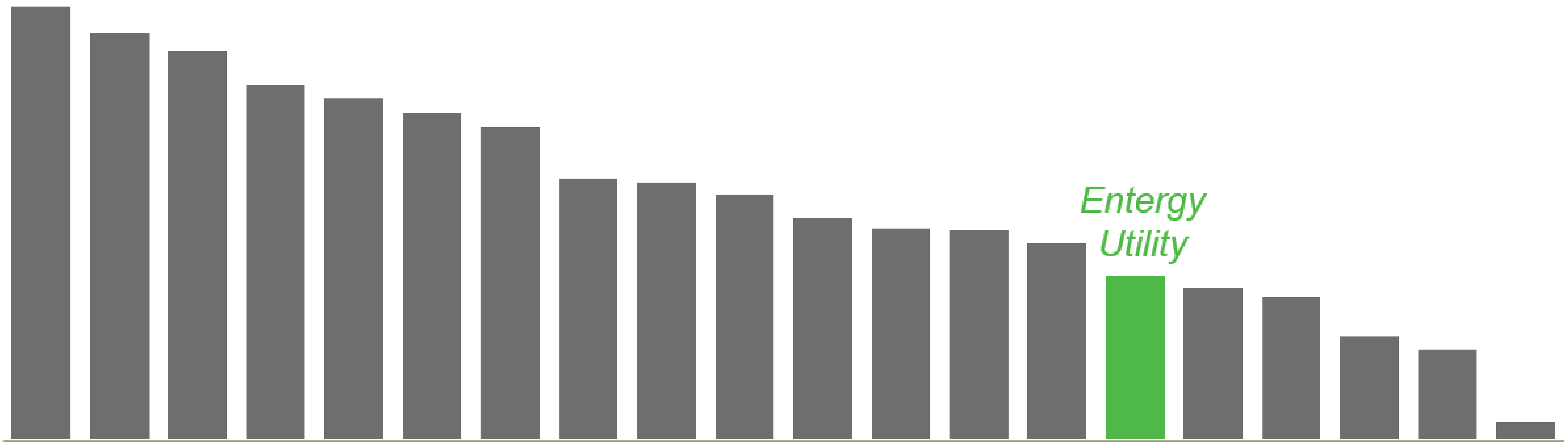




Emission Performance

Among the cleanest large-scale fleets in the U.S.

CO_2 emission rates of top 20 privately- / investor-owned power producers; lbs per MWh



Based on *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, published Nov. 2023 (2021 data)*

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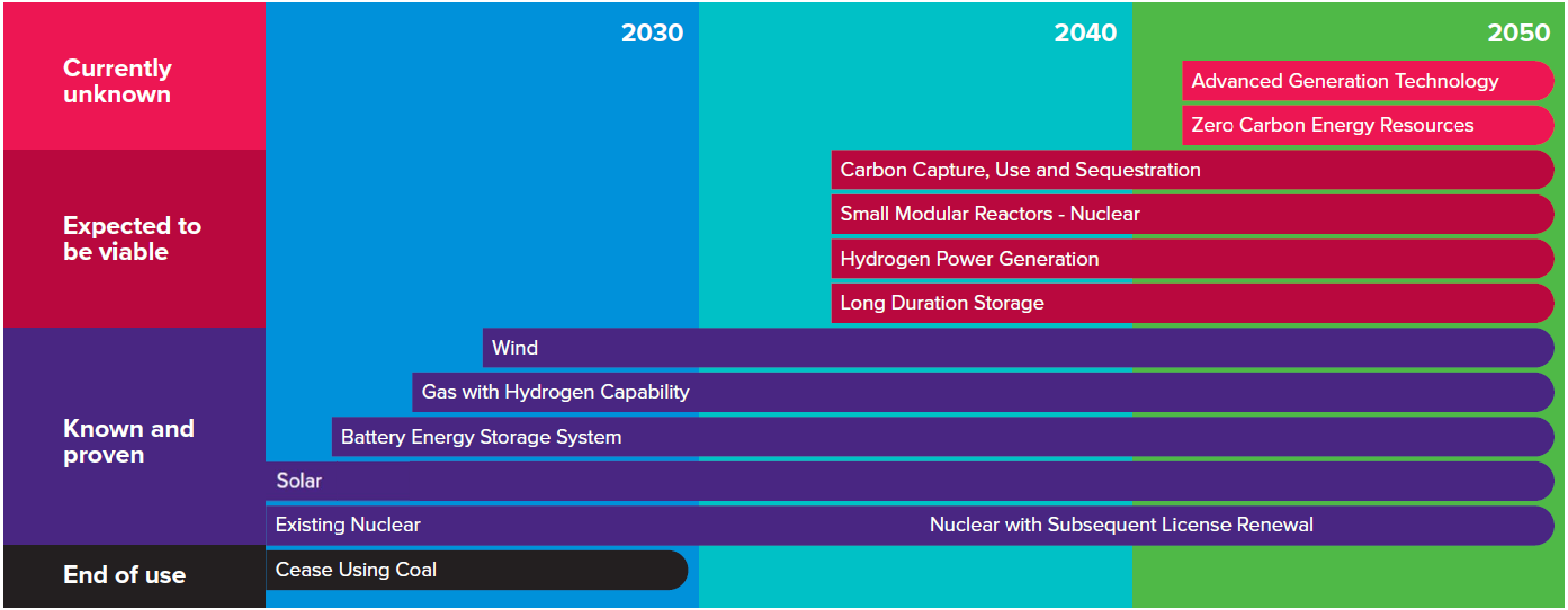
Our strategy to achieve net-zero by 2050

Entergy is committed to achieving net-zero greenhouse gas emissions by 2050 and enabling customers emission reductions across all sectors.

The boundary of our own net-zero commitment is clear and inclusive – all businesses, all applicable greenhouse gases and all scopes of emissions.

Illustrative pathway to net-zero by 2050

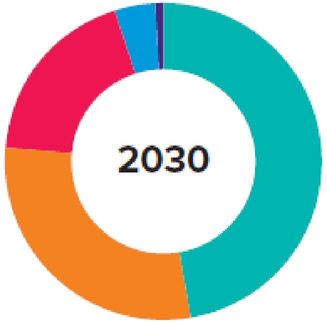
Technology evolution and integration assumptions



Illustrative pathway to net-zero by 2050

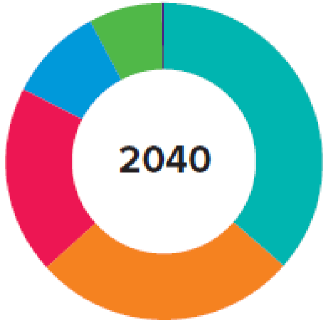
Energy Generation and Capacity Projections

Utility generation mix percentages



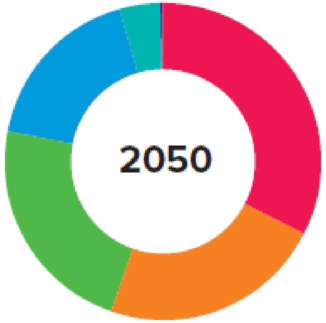
53% Carbon-Free Energy

Gas	47%
Nuclear	29%
Solar	19%
Wind	4%
Hydro	1%



64% Carbon-Free Energy

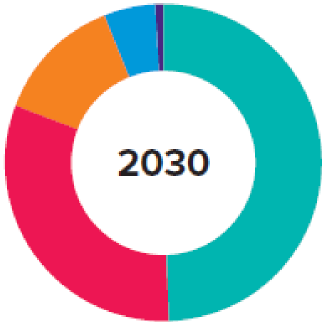
Gas	36%
Nuclear	27%
Solar	19%
Wind	10%
ZCER	8%
Hydro	0.1%



96% Carbon-Free Energy

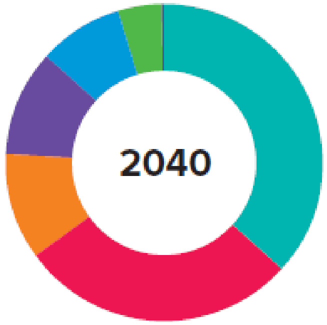
Solar	33%
Nuclear	23%
ZCER	23%
Wind	17%
Gas	4%
Hydro	0.1%

Utility capacity mix percentages



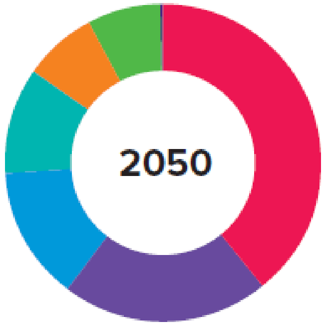
55% Carbon-Free Capacity

Gas	45%
Solar	35%
Nuclear	15%
Wind	5%
Hydro	0.6%



64% Carbon-Free Capacity

Gas	36%
Solar	28%
Nuclear	12%
Battery	11%
Wind	9%
ZCER	3%
Hydro	0.2%



89% Carbon-Free Capacity

Solar	39%
Battery	21%
Wind	13%
Gas	10%
Nuclear	8%
ZCER	8%
Hydro	0.2%

Please note: Numbers may not foot due to rounding.

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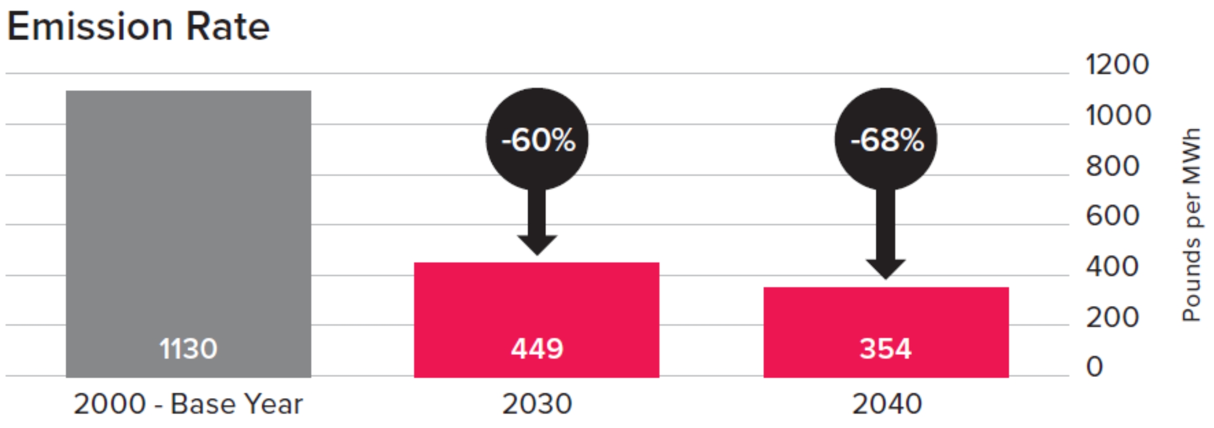
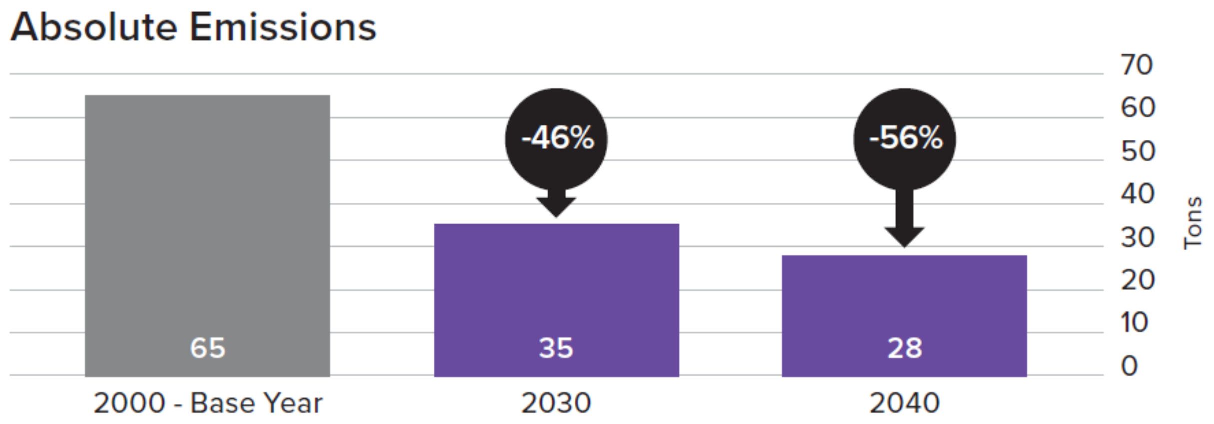
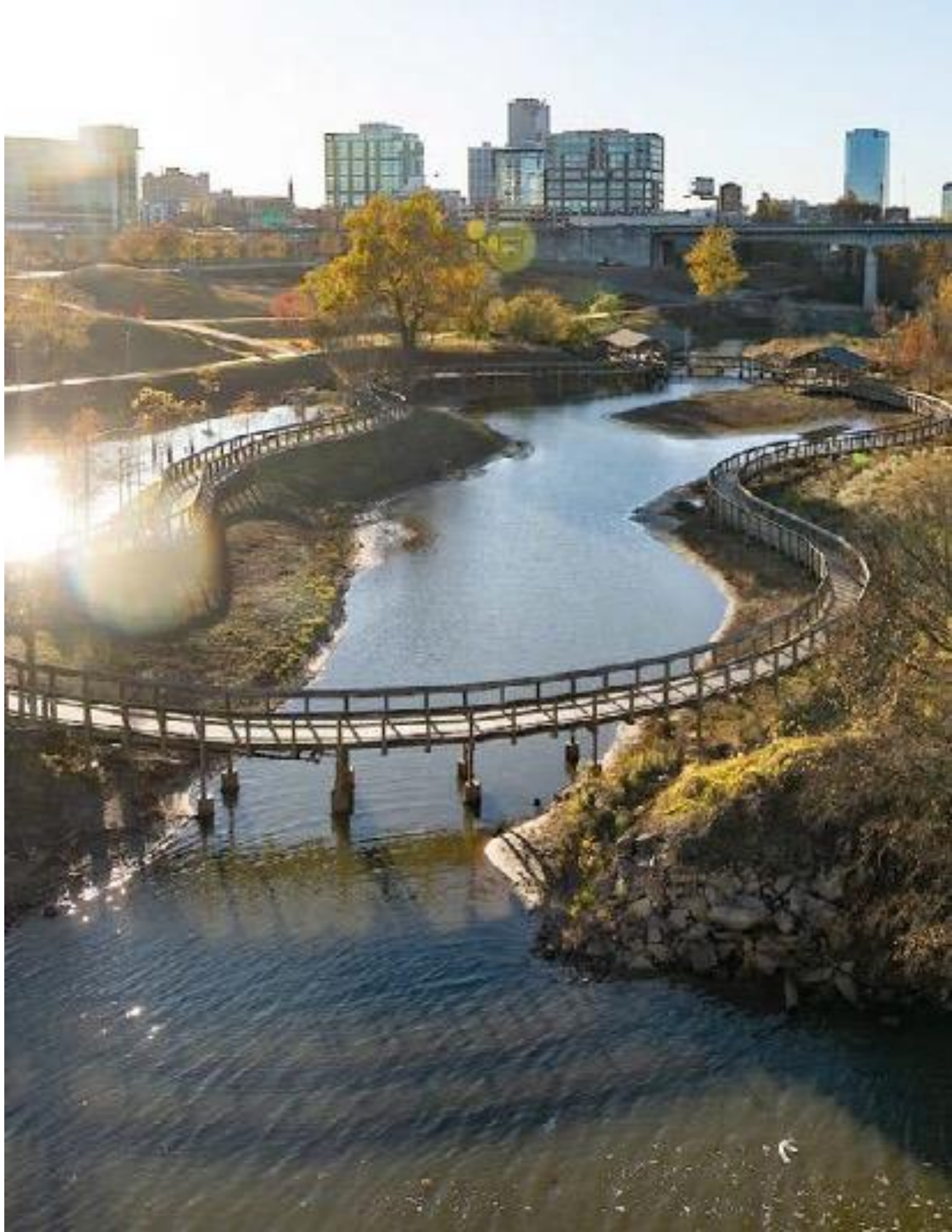
Illustrative pathway to net-zero by 2050

Emission Rate and Absolute Emission Projections







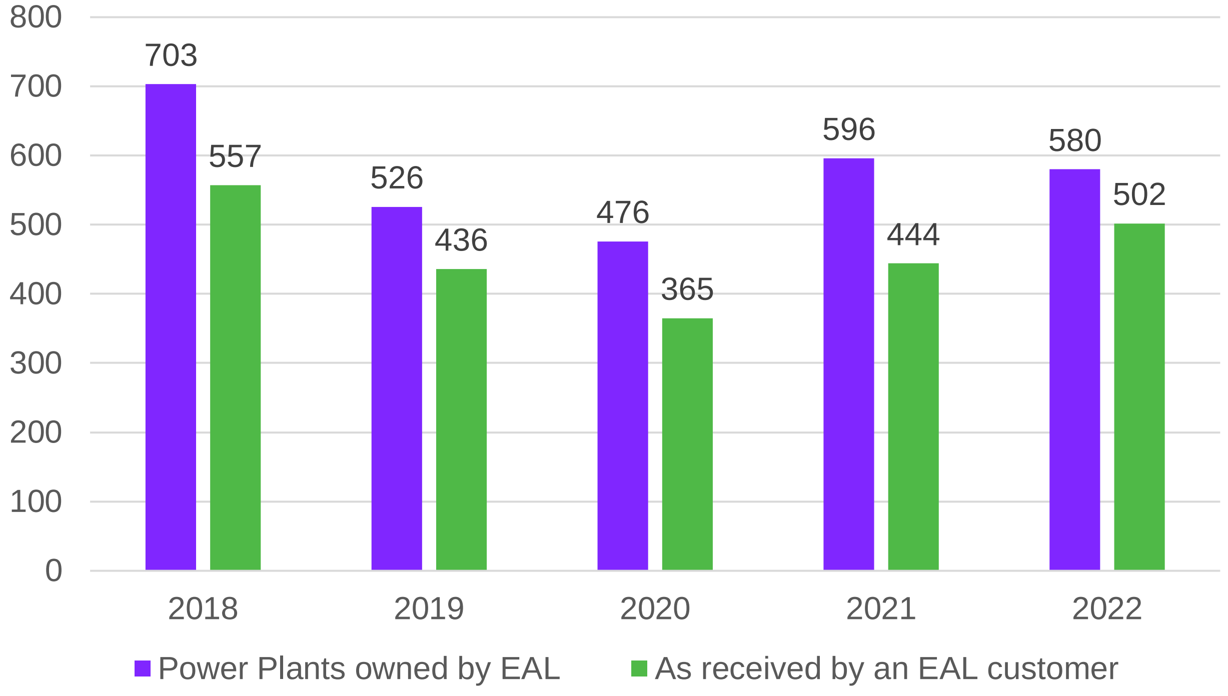
The emission results shown are illustrative and may not represent the actual emission rate of the power delivered to customers. These illustrative results are focused on Entergy's Scope 1 and Scope 3 emissions. From a customer emission accounting perspective, their Scope 2 emission rate will depend on their participation or non-participation in various green tariff and pricing programs.

Entergy Arkansas' Emission Performance

Tracking and working to reduce emissions over time

EAL Emission Rates*

(pounds of CO_2 per megawatt-hour)



- Ceasing to use coal capacity by the end of 2030
- Retiring other older, less-efficient fossil assets as we are able
- Ensuring high performance of carbon-free nuclear assets
- Deploying additional renewable capacity

* - As shown, the emission rate provided above is only for CO2. In its comprehensive greenhouse gas inventory, Entergy does quantify upstream fuel-related emissions, as well as other greenhouse gases (such as methane and nitrous oxide) associated with power generation. See those here [insert link]

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Relevant Environmental Regulations

EPA Regulation	Current Status
Good Neighbor Plan/Cross-State Air Pollution Rule Update	Final – Implementation Stayed by litigation
Effluent Limitation Guideline (ELG) for Steam Electric Power Generation	Proposed – March 2023 Final Expected[1] – April 2024
Mercury and Air Toxics Standard (MATS) Risk and Technology Review	Proposed – April 2023 Final Expected[1] – April 2024
Coal Combustion Residuals – Legacy Surface Impoundments	Proposed – May 2023 Final Expected[1] – April 2024
Regulation of GHG Emissions from New and Existing EGUs under Section 111 of the CAA	Proposed – May 2023 Final Expected[1] – April 2024
Regional Haze Second Planning Period SIP	SIP Finalized by ADE&E and submitted to EPA Region 6 in August 2022 Currently under review by EPA

1. Expected final dates based on Fall 2023 Unified Agenda for US EPA

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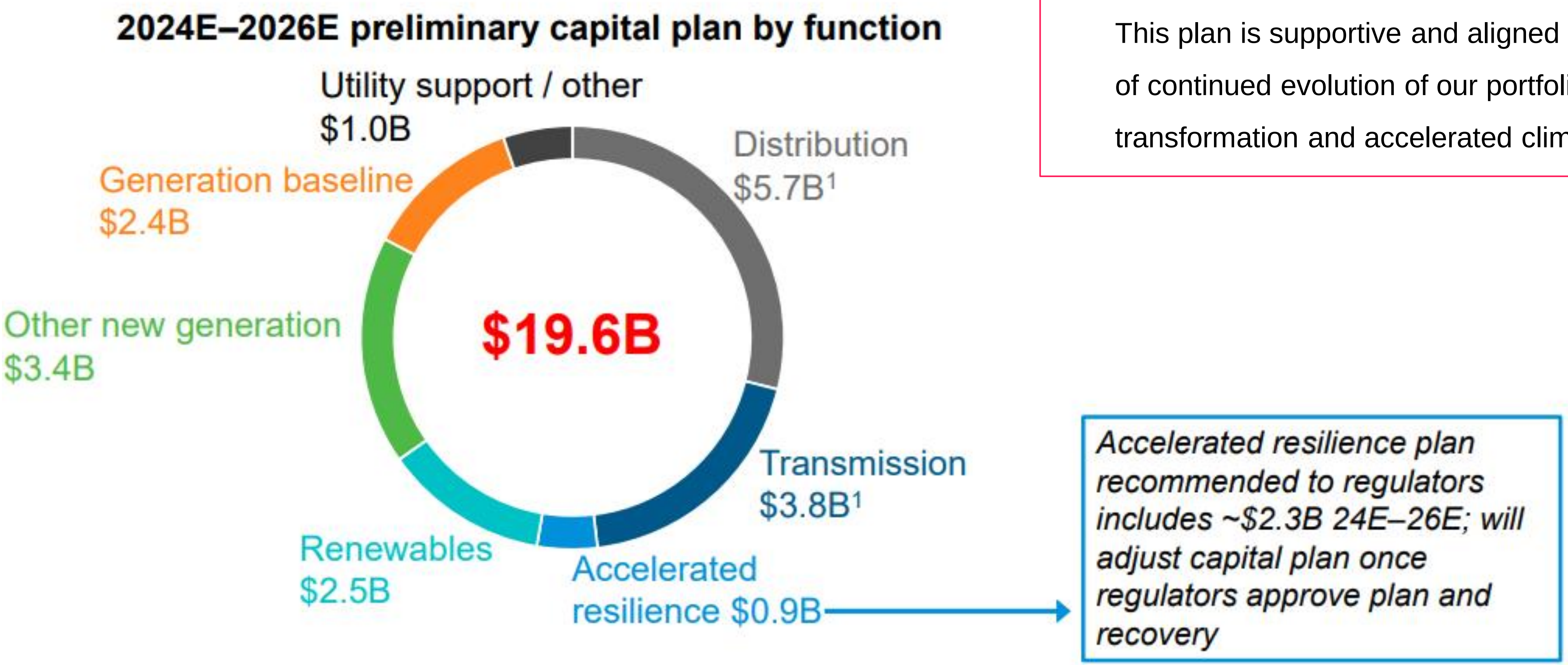
Sustainability Investment

Capital plan supports customer needs

From 2024 to 2026, Entergy's capital plan is to invest $19.6 billion for the benefit of customers. This plan is supportive and aligned with the strategy of continued evolution of our portfolio transformation and accelerated climate resilience.



The graphic above represents the capital plan for all of Entergy's utility operating companies as of November 2023

Calculations may differ due to rounding

1. Excluding accelerated resilience investment

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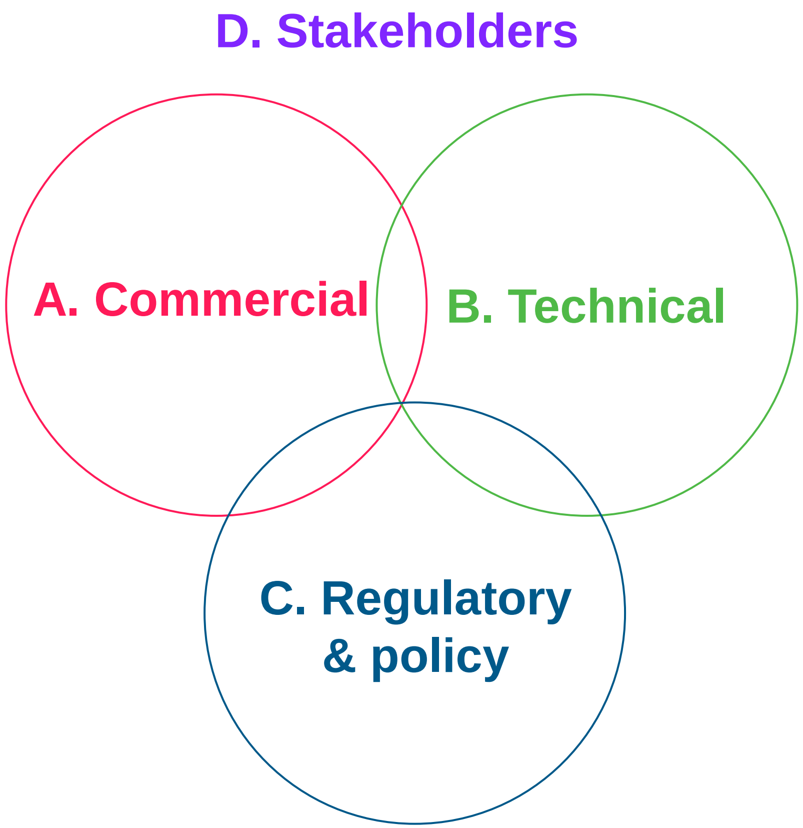
08

Technology Assessment

Jonathan Alvis

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

- **STORAGE (BESS)**
  - Lithium-Ion (4-hr)
- **GAS (H2 capable 30%)**
  - Aeroderivative CT
  - CCGT (1x1 w/DF)
  - CCGT (2x1) w/o DF
  - CCGT 2X1 w/o DF & 1x1 w DF (CCUS)
  - Frame CT
  - RICE
- **NUCLEAR**
  - Small Modular Reactor
- **WIND**
  - On-shore MISO South
  - On-Shore, Off System – SPP HVDC
- **SOLAR**
  - Solar Bifacial
- **HYBRID**
  - Solar & BESS

Technology Screening – IRP Analytics

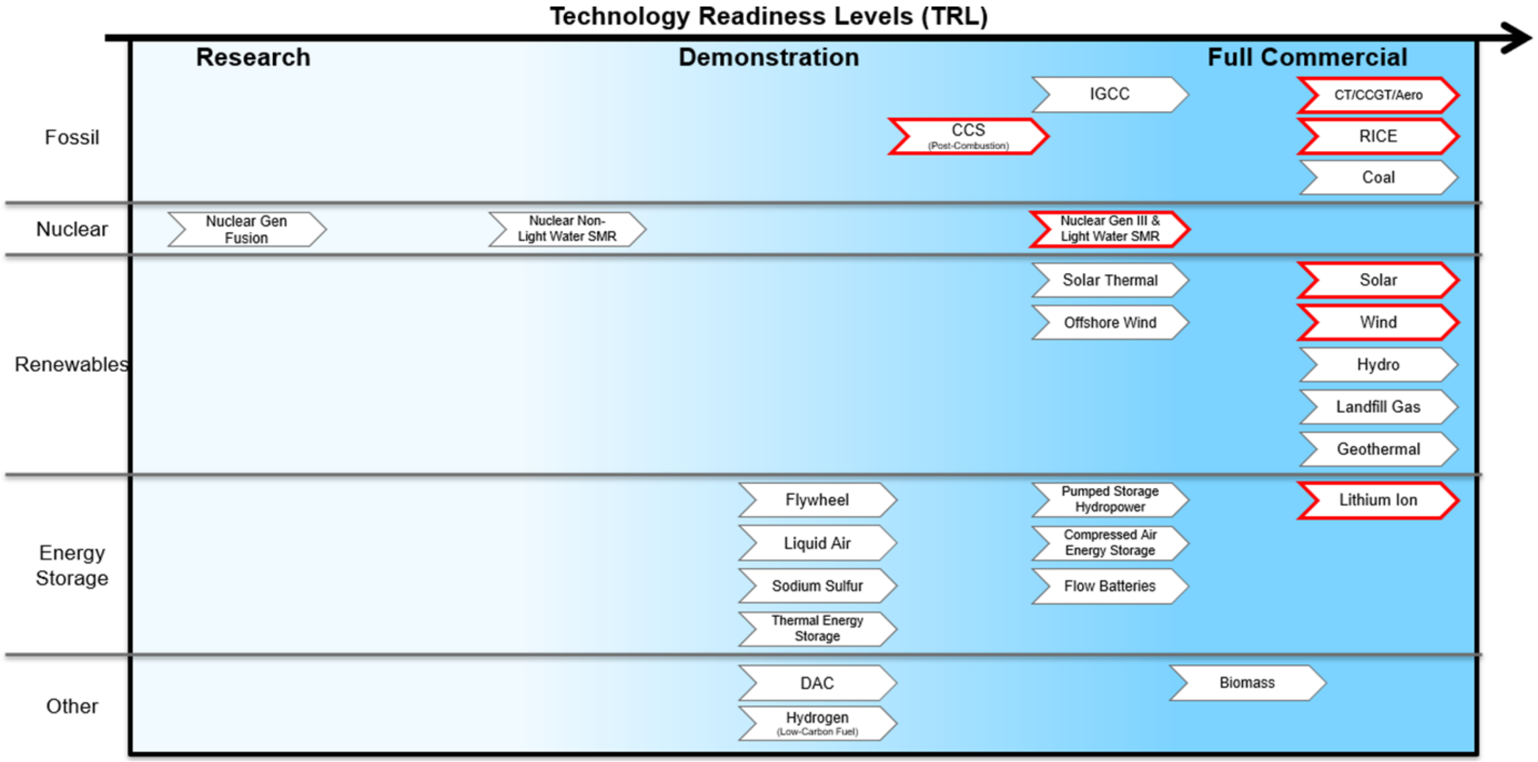
Illustrative

The technology evaluation includes:

Survey supply side resource alternatives

Retain subset of alternatives based on:

- technology maturity
- economics
- reliability
- environmental impact
- geographic feasibility



Indicates supply-side alternatives retained for consideration within the EAL IRP

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Cost: Thermal Resources

Technology	Installed Capital Cost Nominal [2023$/kWac]	Fixed O&M L. Real [2023$/kW-yr.]	Variable O&M L. Real [2023$/MWh]	Levelized Cost of Electricity L. Real [2023$/MWh]
CT	$1,134	$6.76	$8.65	$151
CCGT (1x1) w/ duct firing	$1,296	$12.58	$4.97	$56
CCGT (2x1)	$1,349	$10.90	$5.16	$55
Aeroderivative CT	$3,277	$32.99	$9.39	$156
RICE	$1,998	$34.48	$14.03	$155

Technology	Installed Capital Cost Nominal [2023$/kWac]	Fixed O&M L. Real [2023$/kW-yr.]	Variable O&M L. Real [2023$/MWh]	Levelized Cost of Electricity L. Real [2023$/MWh]
SMR	$9,358	$162.35	$6.75	$138

1. Sources: Sargent & Lundy, Burns & McDonnell, Entergy Capital Projects
2. Excludes transmission interconnection costs
3. The LCOE for natural gas generation resources utilizes a commodity price assumption that will be updated by the time the models are run.
4. Costs for natural gas units identified in October 2023

Performance: Thermal Resources

Technology	Summer Net Maximum Capacity [MW]	Full HHV Summer Heat Rate [Btu/kWh]	Assumed Capacity Factor [%]	Life [Yr.]	H2 Capable (%)
CT	408	9,450	10%	30	30%
CCGT (1x1) w/ duct firing	729	6759	60%	30	30%
CCGT (2x1)	1,216	6,308	60%	30	30%
Aeroderivative-CT	89.9	9,703	30%	30	30%
RICE	129	8,440	20%	30	25%

Technology	Summer Net Maximum Ca pacity [MW]	Assumed Capacit y Factor [%]	Life [Yr.]
SMR	640	92%	30

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.]	Levelized Cost of Electricity L. Real [2023$/MWh]
Utility-Scale Solar	$1,866	$13.10	$63
Hybrid: Solar + BESS	$2,950	$19.02	n/a
On-shore Wind, MISO South	$2,010	$42.63	$58
On-shore, Off-system Wind (SPP)[4]	$1,988	$42.63	$141
Storage (4hr, Li-Ion)[5]	$2,332	$14.79	n/a

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. Includes transmission HVDC costs for a 600 mile line
5. 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	25.7%[1]	30	1.3	0.5% per year
Hybrid: Solar + BESS	100MW 50MW/200MWh	25.7%	30 (Solar) / 20 (BESS)	1.3	0.5% per year (Solar only)
On-shore Wind, MISO South	100 - 200 MW	32.5%[2]	30	n/a	n/a
On-shore, Off-system Wind (SPP)	1000 MW	44%[2]	30	n/a	n/a
Storage (4hr, Li-Ion)	50MW / 200MWh	n/a	20	n/a	Displaced 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: ArcVera, EPRI, Entergy Power Development

Pumped hydro not included in IRP analytics due to wide range of resource costs

Pumped hydro may present interesting opportunity as renewable penetration grows and the need for >10 hour energy storage rises, but site-specific considerations are important

Benefits

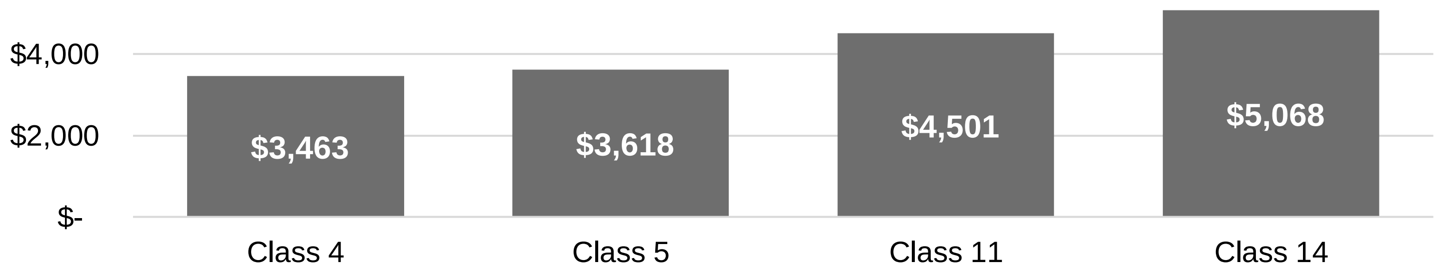
- Can be used for mid to long range storage
- Ability to store large amounts of energy
- Mature technology

Challenges

- Very geographic specific → requires large elevation change and water availability
- Installed capital costs are substantially higher than 4-hour lithium ion and similar to 8-hour lithium ion

Resource costs can vary significantly by location; site specific costs are important to consider

Resource Costs by NREL Class Type*



*Costs include inflation, financing costs, and typical internal project loaders

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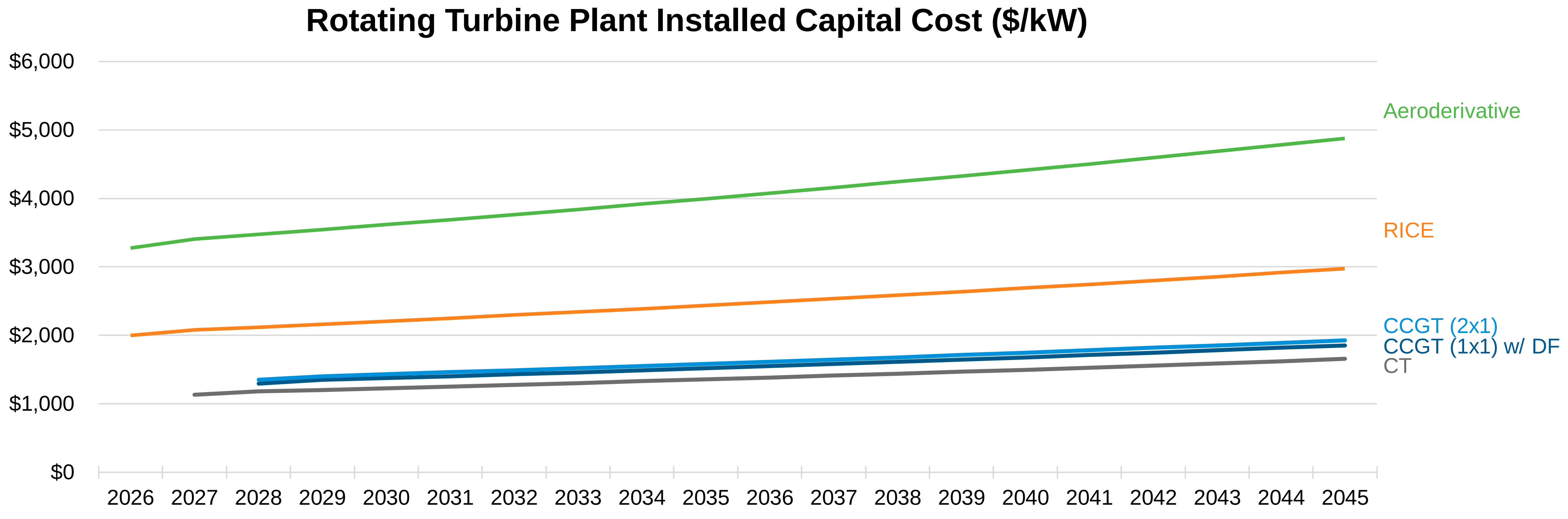
Financial Assumptions

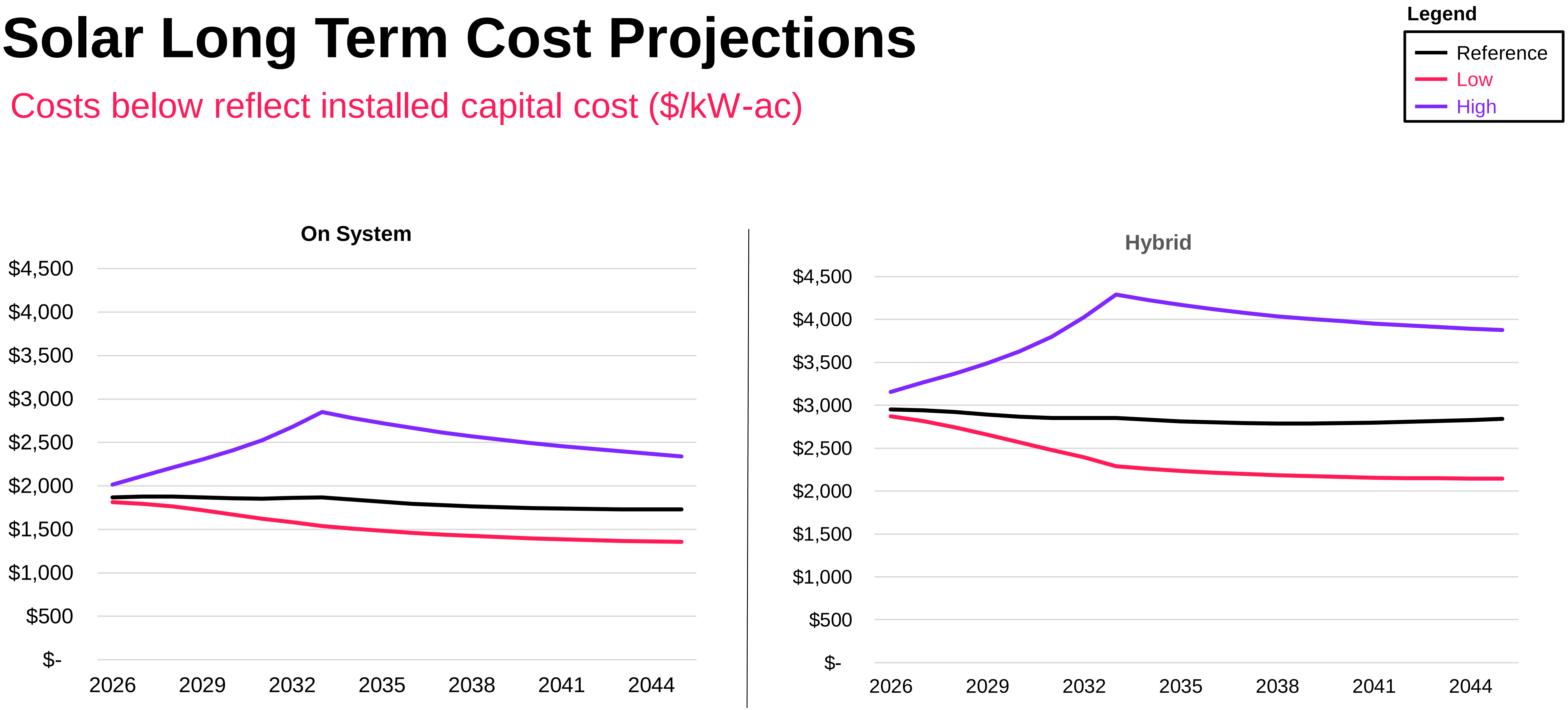
Evaluation Components	
Inflation Rate Assumption	2.0%
Inflation Reduction Act Tax Credits	• Solar and Wind resources: $30/MWh (2026$, assumes full PTC rate) • Storage resources: 30% ITC (assumes full ITC rate) • Tax Credit Phase-out is assumed (100% through 2035, 75% in 2036, 50% in 2037, 0% in 2038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

Rotating Turbine Plant Long-Term Cost Projections



Solar Long Term Cost Projections

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



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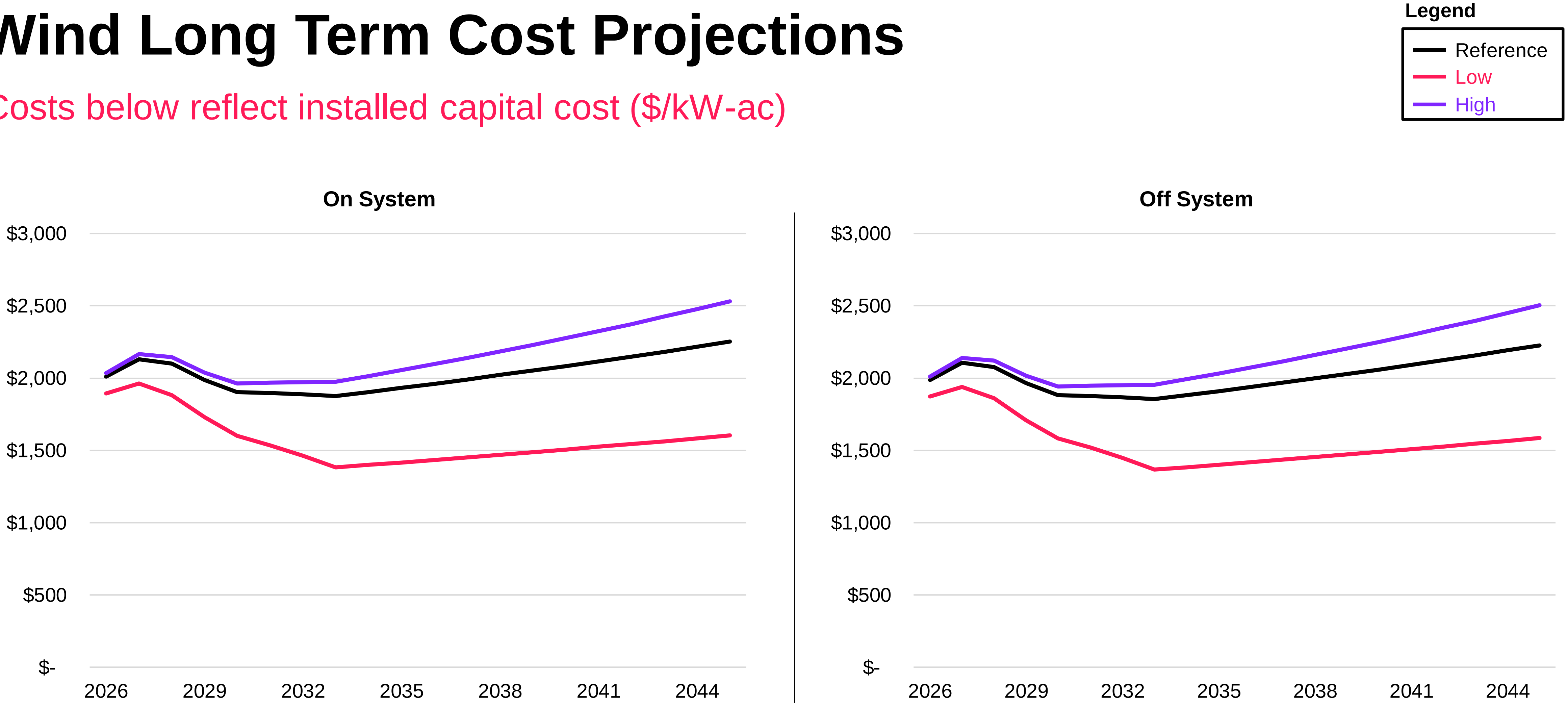
Wind Long Term Cost Projections

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



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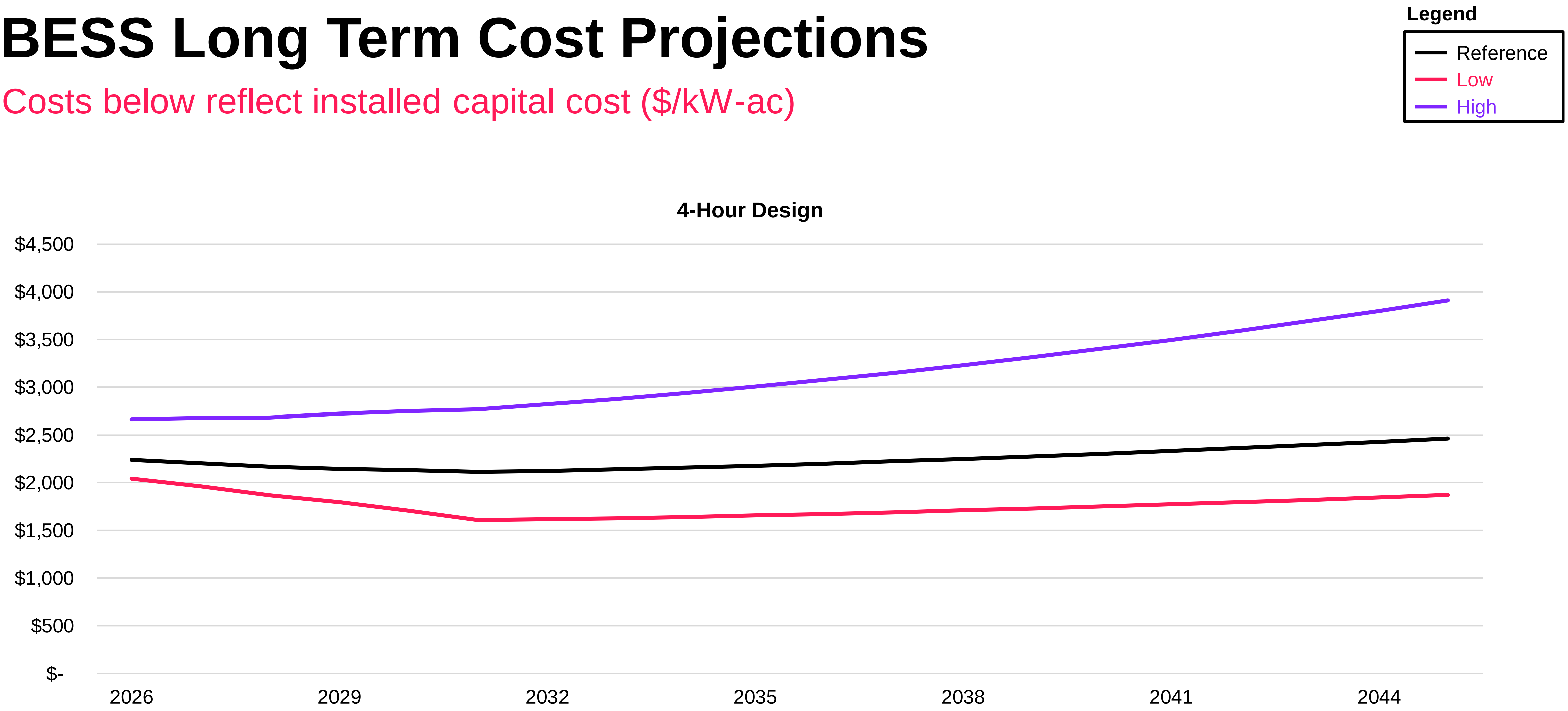
BESS Long Term Cost Projections

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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09

Load Forecast Process

Charles John

Load Forecasts - Process

Entergy Arkansas 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:

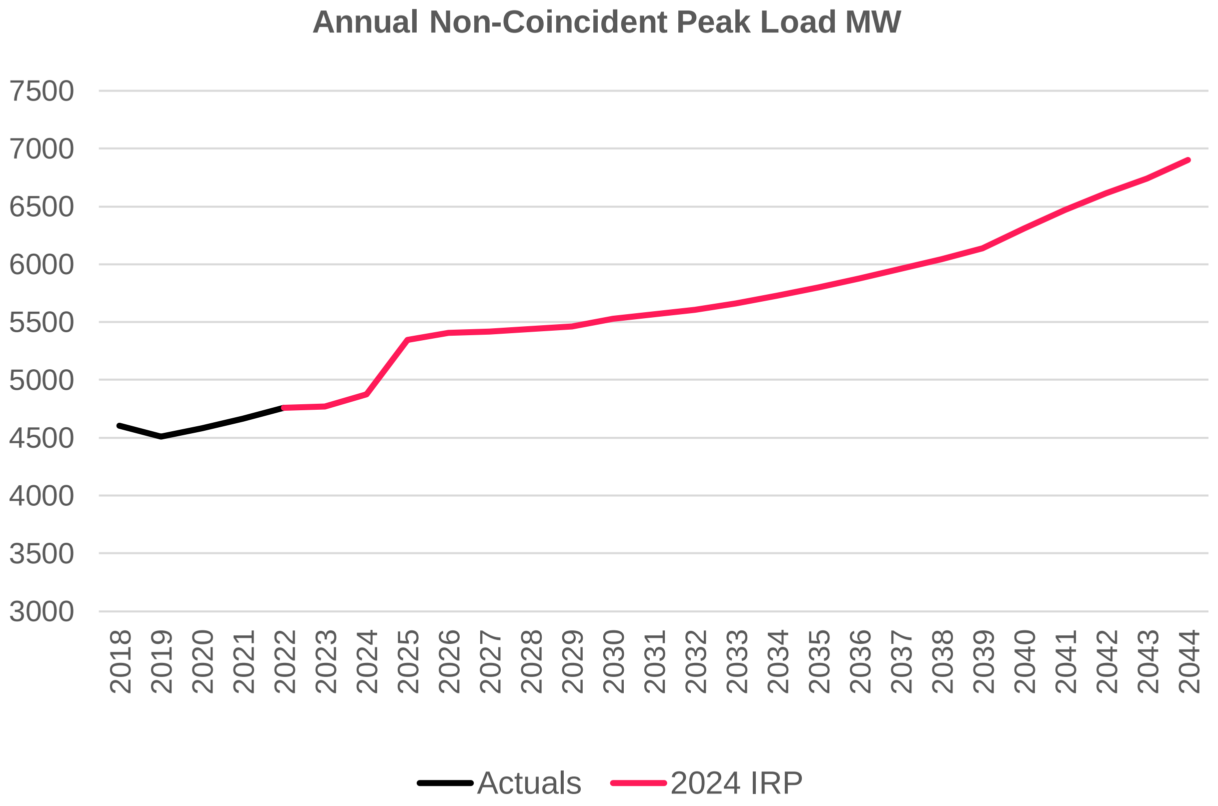
- Historical consumption levels, numbers of customers, temperatures, and estimates of end-use consumption (heating, cooling, other)
- Energy efficiency – organic and company-sponsored
- Future changes in population/households and end-use
- Individual customer information for identified large industrial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

Load Forecasts - Scenario

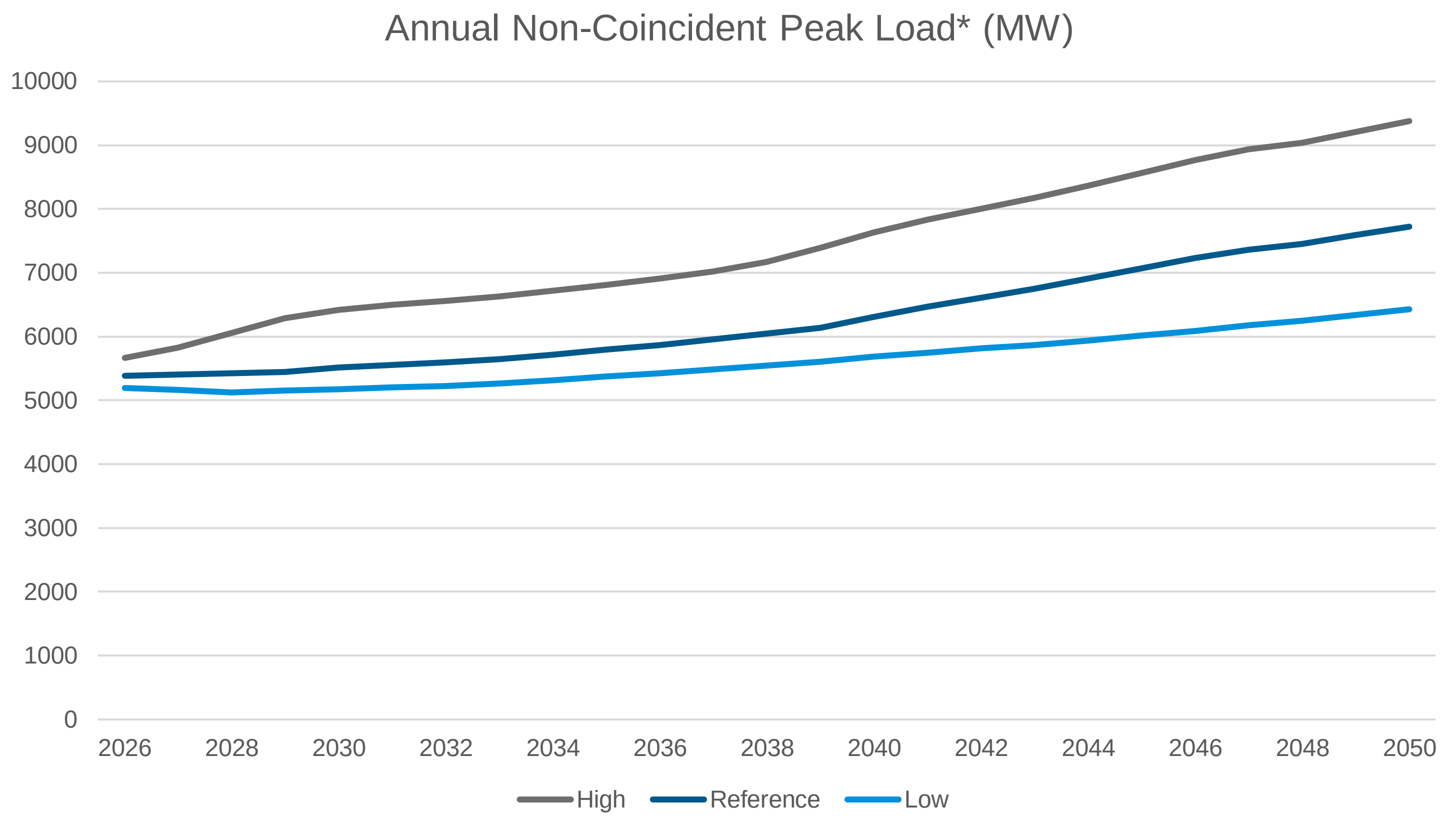
- Entergy Arkansas' reference case forecast serves as the basis for upcoming resource plans, as well as financial budgets.
- Forecast sensitivity scenarios were developed to assess other potential future outcomes.
    - ❖ Low Scenario: decreased residential and commercial growth due to improved energy efficiency, reduced industrial load, and slower EV adoption
    - ❖ High Scenario: increased residential and commercial growth, increases to industrial load, and accelerated EV and Solar adoption



Load Forecasts – Elements and Peaks

- High and low scenarios depart from the reference case based on increasing/decreasing volumetric levers.

	Adjustments to Ref Case by Scenario	
Lever	**Low**	**High**
BTM Solar	Ref	Higher
EVs	Lower	Higher
Building Electrification	Lower	Higher
Energy Efficiency	Higher	Lower
Customer Count (Res & Com)	Lower	Higher
Customer Usage (Industrial)	Lower	Higher



*Includes distribution losses

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10

Futures and AURORA Modeling Overview

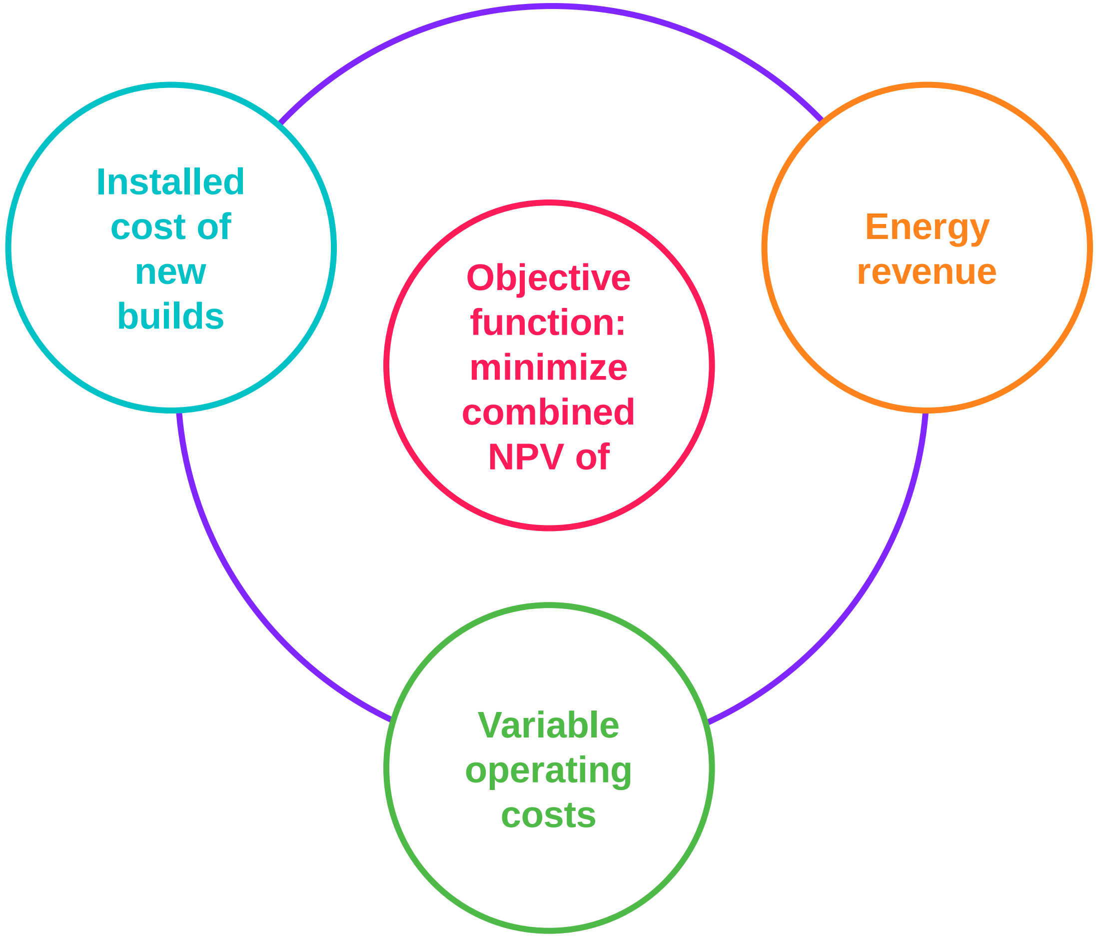
Daniel Boratko

Aurora Capacity Expansion

Aurora capacity expansion is used to find the optimal portfolio additions over the long-term planning horizon given defined input assumptions and constraints (e.g., magnitude of capacity need, capacity credit assumptions, technology cost and performance).

Logic seeks to build the most valuable resources to the system based on the combination of fixed and variable costs as well as energy revenue from the hourly dispatch for the whole simulation period.

Some planning objectives or strategies may contemplate constraints that cannot be modeled in the AURORA Capacity Expansion Model. In such cases, EAL reserves the right to create manual portfolios for evaluation.



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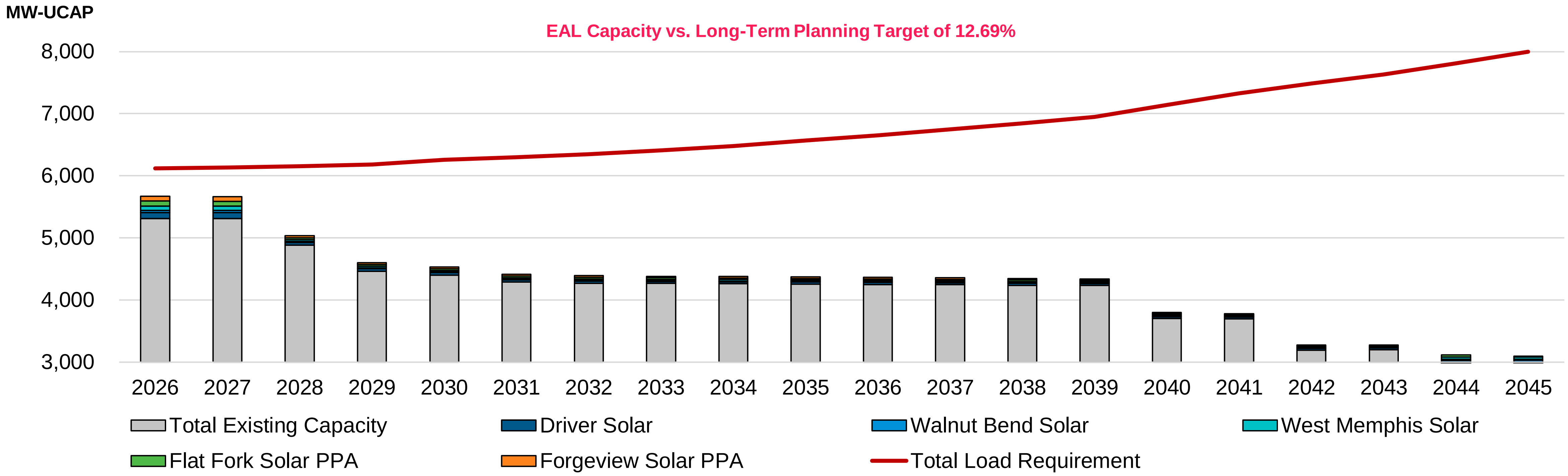
Assessment of Capacity Need

2026-2045



Planning Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Surplus/Deficit	(448)	(469)	(1,121)	(1,583)	(1,721)	(1,887)	(1,951)	(2,028)	(2,104)	(2,198)	(2,289)	(2,389)	(2,499)	(2,607)	(3,348)	(3,548)	(4,210)	(4,357)	(4,700)	(4,898)

1. *Notes:*
- Surplus/Deficit table reflects the average seasonal accredited capacity and a load requirement of the summer MISO coincident peak with a PRM of 12.69%. Existing thermal resource capacity reflects current SAC ratings. Non-thermal capacity reflects estimated average Effective Load Carrying Capability ("ELCC"). Existing and planned non-thermal resource ELCC varies based on market and EAL solar, wind, and battery storage capacity.

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Inputs and Assumptions

Reliability need

- Peak load forecast including sensitivities
- Long-term reserve margin requirements and MISO seasonal reserve margins
- Capacity accreditation for thermal and non-thermal resources

Supply side and demand side resources

- Existing fleet capability
- Resource deactivation assumptions
- Technology Assessment (capital and operating costs, performance)
- Continued use of DSM

Economic and financial

- Capital structure, inflation rate, discount rate
- Fuel and emissions price forecasts (gas, coal, nuclear, NOx, CO_2)
- Federal policy (IRA tax credits, proposed Clean Air Act Section 111 revisions)

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Development of Futures

In order to reasonably account for uncertainty over the planning period, the EAL IRP takes a futures-based approach. In this approach, futures are developed that represent different combinations of assumptions of several variables that reasonably bookend the range of potential market outcomes.

Major areas of uncertainty that are considered:

- Sales and load growth
- Customer usage trends
- Natural gas prices
- Market unit life assumptions
- Federal policy
- Emissions prices
- Renewable generation capital cost
- MISO market reforms

For each future, the AURORA Capacity Expansion Model selects (i.e., outputs) a resource portfolio that is economically optimal for EAL under that set of circumstances.

Economic Evaluation Metric – Total Relevant Supply Cost

Total relevant supply cost results consist of 3 major components:

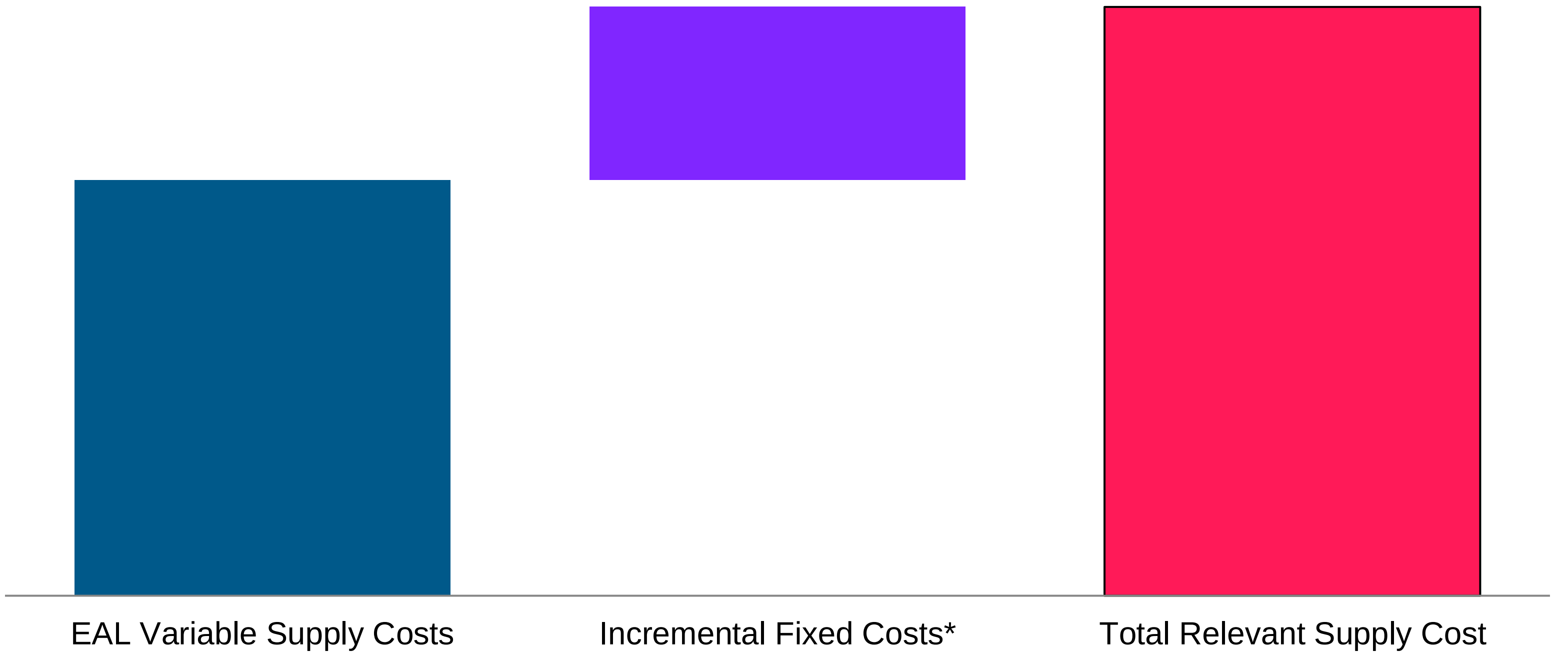
EAL Variable Supply Cost

+ Incremental Fixed Costs[1]

Total Relevant Supply Cost (“TRSC”)

Illustrative

Components of Total Relevant Supply Cost



1. Incremental Fixed Costs include an adjustment for capacity purchases/sales

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IRP Futures

EAL plans to rely on the four futures outlined below to assess supply portfolios across a range of market outcomes.
The Long-Term Capacity Expansion (LTCE) for all futures will be conducted on a summer and winter basis to align with MISO's new seasonal construct.

	Future 1 - Existing Fleet	Future 2A - Business as Usual	Future 2B - CAA 111	Future 3 - Accelerated Change
Peak Load & Energy Growth	• Low	• Reference	• Reference	• High
Natural Gas Prices	• Low	• Reference	• Reference	• High
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 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[1]	• 50 year life	• 45 year life	• NGCC by 2035	• 35 year life
MISO Natural Gas Other Deactivations[1]	• 46 year life	• 36 year life	• Steam gas EGUs by 2030	• 30 year life
Carbon Tax Scenario	• No Cost	• Reference Cost	• Reference Cost	• High Cost
Renewable Capital Cost	• High Cost	• Reference Cost	• Reference Cost	• Low Cost
Narrative	• Lower growth from the residential and industrial sector is forecasted which reduces the need to transition from the existing fleet. • Renewable cost assumed to be high.	• Assumptions aligns 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). • Assumes extension. 45Q through study period	• 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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Risk Assessment

To determine portfolio risk, EAL will consider the performance of the various portfolios as it relates to the following factors:

Market risk	Reviewing relative energy coverage metrics allows EAL to assess the level of exposure to market prices for each portfolio.
Region reliability	Performing a reliability analysis to provide EAL the ability to understand the relative reliability attributes of each portfolio for reasonably balancing regional requirements related to capacity, transmission and reliability.
Modernization of fleet	Understanding the average age of EAL's generation fleet allows EAL to assess the risks of maintaining and operating the portfolio of assets.
Executability	Analyzing the executability of the portfolios allows EAL to evaluate the relative risks associated with procurement of single or multiple resources within the timeframe needed.
Optionality	Considering the relative flexibility of the portfolios to stagger resource additions enables EAL to understand its ability to adjust to various market conditions, such as load changes.
Fuel supply diversity	Assessing the relative fuel supply diversity of each portfolio allows EAL to understand the level of exposure to fuel supply concerns, such as commodity constraints.
Environmental	Analyzing the relative CO_2 emissions impact of each portfolio provides EAL with the ability to understand the risks associated with environmental laws.

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2024 IRP Schedule and Next Steps

Sahabia Ahmed

2024 IRP Stakeholder Timeline

- Stakeholder engagement will be a cornerstone of the 2024 EAL IRP process
- Future Stakeholder meetings and data postings will be communicated via email

Sep 28 2023 – **Information Posting**

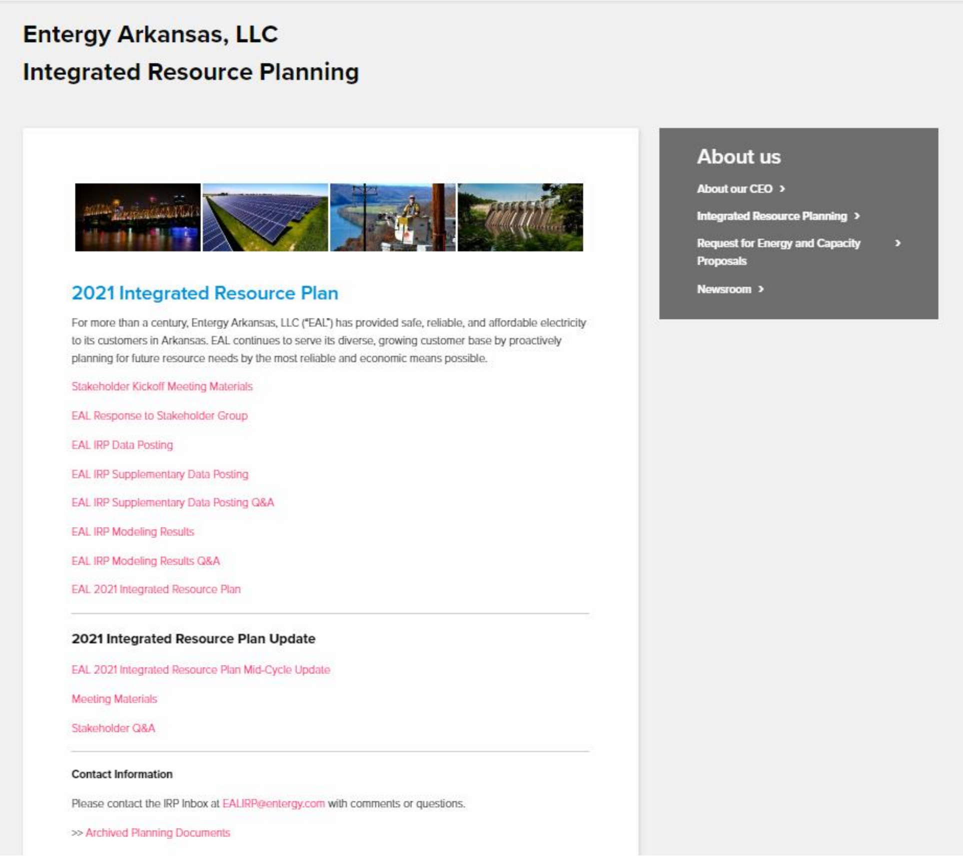
Jan 30 2024 – **Stakeholder Engagement:** Meeting 1

Q3 2024 – **Stakeholder Engagement:** Meeting 2

Oct 2024 – **Filing of EAL's IRP Report and Stakeholder Report**

2024 IRP Website

EAL’s IRP website will serve as a central point of communication and will continue to be updated with IRP materials and responses to Q&As.


Entergy Arkansas, LLC
Integrated Resource Planning

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2021 Integrated Resource Plan

For more than a century, Entergy Arkansas, LLC ("EAL") has provided safe, reliable, and affordable electricity to its customers in Arkansas. EAL continues to serve its diverse, growing customer base by proactively planning for future resource needs by the most reliable and economic means possible.

Stakeholder Kickoff Meeting Materials
EAL Response to Stakeholder Group
EAL IRP Data Posting
EAL IRP Supplementary Data Posting
EAL IRP Supplementary Data Posting Q&A
EAL IRP Modeling Results
EAL IRP Modeling Results Q&A
EAL 2021 Integrated Resource Plan

2021 Integrated Resource Plan Update

EAL 2021 Integrated Resource Plan Mid-Cycle Update
Meeting Materials
Stakeholder Q&A

Contact Information

Please contact the IRP Inbox at EALIRP@entergy.com with comments or questions.

>> Archived Planning Documents

Website Link:

[Entergy Arkansas, LLC Integrated Resource Planning (entergy-arkansas.com)]

IRP inbox:

EALIRP@entergy.com

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Stakeholder Q&A