

**El Paso Electric Company  
2025 New Mexico Integrated Resource Plan**

**Stakeholder Engagement Workshop 2  
February 25, 2025**

# Welcome

## 2025 El Paso Electric Company Integrated Resource Plan Public Participation Workshop 2

### Agenda:

- Welcome
- Safe Harbor
- Overview
- Energy and Demand Forecasting Presentation (30 min)
- Planning Reserve Margin and Capacity Accreditation (30 min)
- Resource Options & Technologies Presentation (30 min)
- Capacity Expansion Modeling (30 min)

# Safe Harbor

Certain matters discussed in this Integrated Resource Plan ("IRP") facilitated stakeholder process presentation other than statements of historical information are "forward-looking statements" made pursuant to the safe harbor provisions of the Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended.

Forward-looking statements often include words like we "believe", "anticipate", "target", "project", "expect", "predict", "pro forma", "estimate", "intend", "will", "is designed to", "plan" and words of similar meaning, or are indicated by the Company's discussion of strategies or trends. Forward-looking statements describe the Company's future plans, objectives, expectations or goals and include, but are not limited to, statements regarding [anticipated future generation costs, resource need, customer growth rates, rate structure, fuel costs, purchased power pricing]. Such statements are subject to a variety of risks, uncertainties and other factors, most of which are beyond El Paso Electric Company's ("EPE" or the "Company") control, and many of which could have a significant impact on the Company's operations, results of operations, and financial condition, and could cause actual results to differ materially from those anticipated.. Any such forward-looking statement is qualified by reference to these risks and factors. EPE cautions that these risks and factors are not exclusive.

Although the Company believes that the expectations reflected in such forward-looking statements are reasonable, no assurances can be given that these expectations will prove to be correct. Forward-looking statements by their nature that could substantial risks and uncertainties that could significantly impact expected results, and actual future results could differ materially from those described in such statements. Management cautions against putting undue reliance on forward-looking statements or projecting any future assumptions based on such statements. Forward-looking statements speak only as of the date of this IRP facilitated stakeholder process presentation, and EPE does not undertake to update any forward-looking statement contained herein, except to the extent the events or circumstances constitute material changes in this IRP that are required to be reported to the New Mexico Public Regulation Commission ("NMPRC" or "Commission") pursuant to its IRP Rule, 17.7.3 New Mexico Administrative Code.

# Overview



# IRP Statement of Need

## 17.7.3.10

### STATEMENT OF NEED:

- A. The statement of need is a description and explanation of the amount and the types of new resources, including the technical characteristics of any proposed new resources, to be procured, expressed in terms of energy or capacity, necessary to reliably meet an identified level of electricity demand in the planning horizon and to effect state policies.
- B. The statement of need shall not solely be based on projections of peak load. The need may be attributed to, but not limited by, incremental load growth, renewable energy customer programs, or replacement of existing resources, and may be defined in terms of meeting net capacity, providing reliability reserves, securing flexible resources, securing demand-side resources, securing renewable energy, expanding or modifying transmission or distribution grids, or securing energy storage as required to comply with resource requirements established by statute or commission decisions.

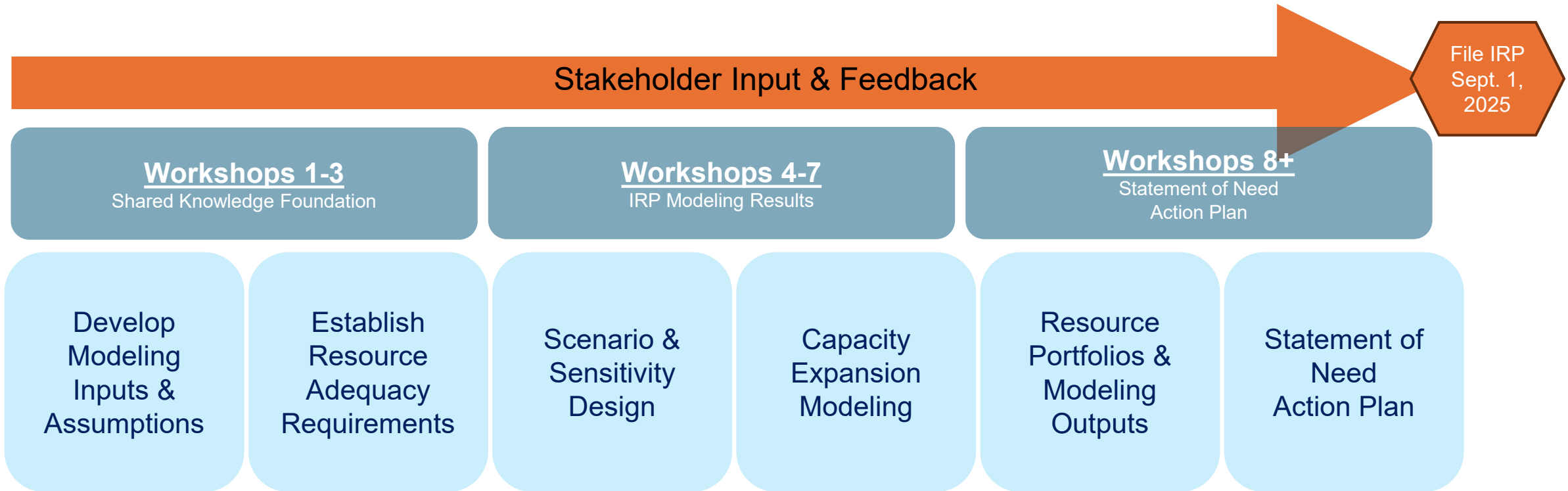
# IRP Action Plan

17.7.3.11

## ACTION PLAN:

- A. The utility's action plan shall:
- (1) detail the specific actions the utility shall take to implement the IRP spanning a three-year period following the filing of the utility's IRP;
  - (2) detail the specific actions the utility shall take to develop any resource solicitations or contracting activities to fulfill the statement of need as accepted by the commission; and
  - (3) include a status report of the specific actions contained in the previous action plan.

# IRP Overview



# Typical Modeling Outputs

Typical Modeling Outputs include:

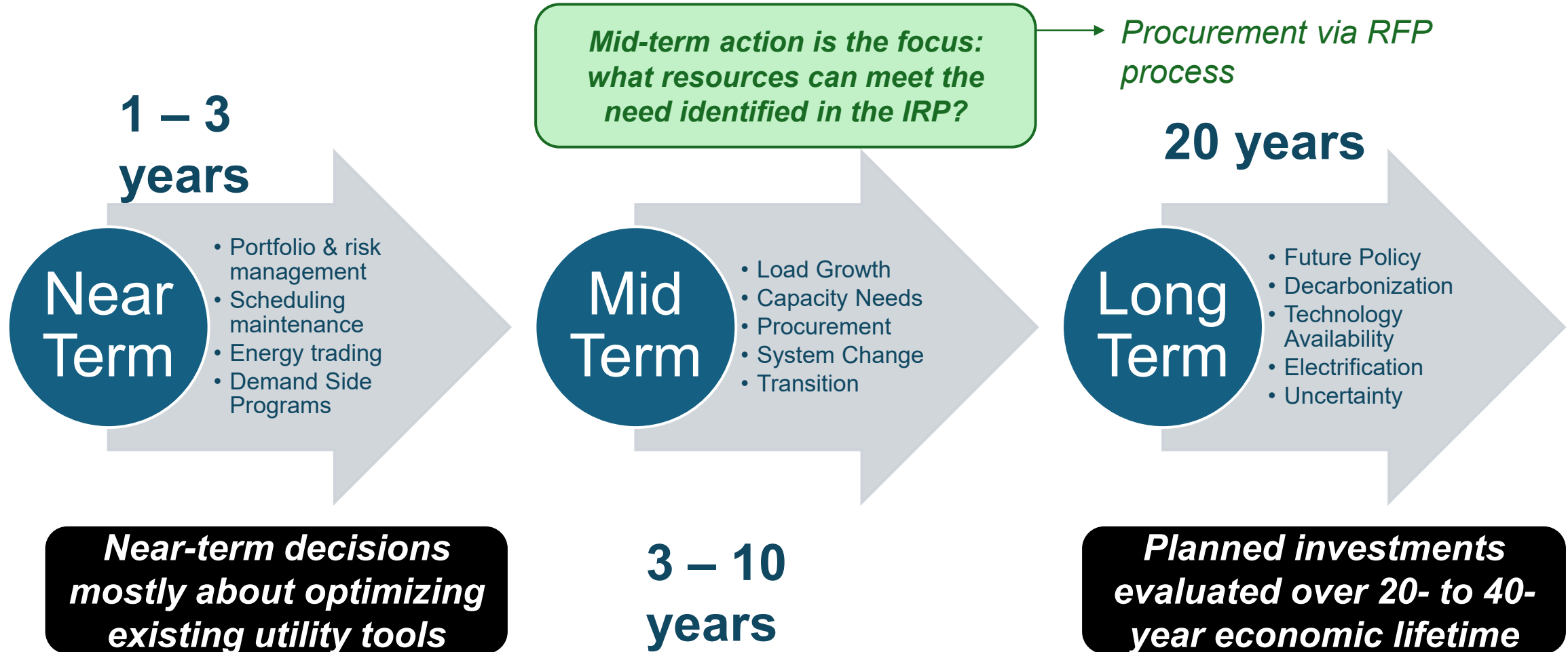
- Amount and the types of new resources
- Annual Capacity and Energy Mix
- Carbon and Other Emissions
- Renewable Energy Generation (RECs)
- System costs including fuel, purchased purchase costs, VOM

**Final recommendations,  
builds, costs, emissions**

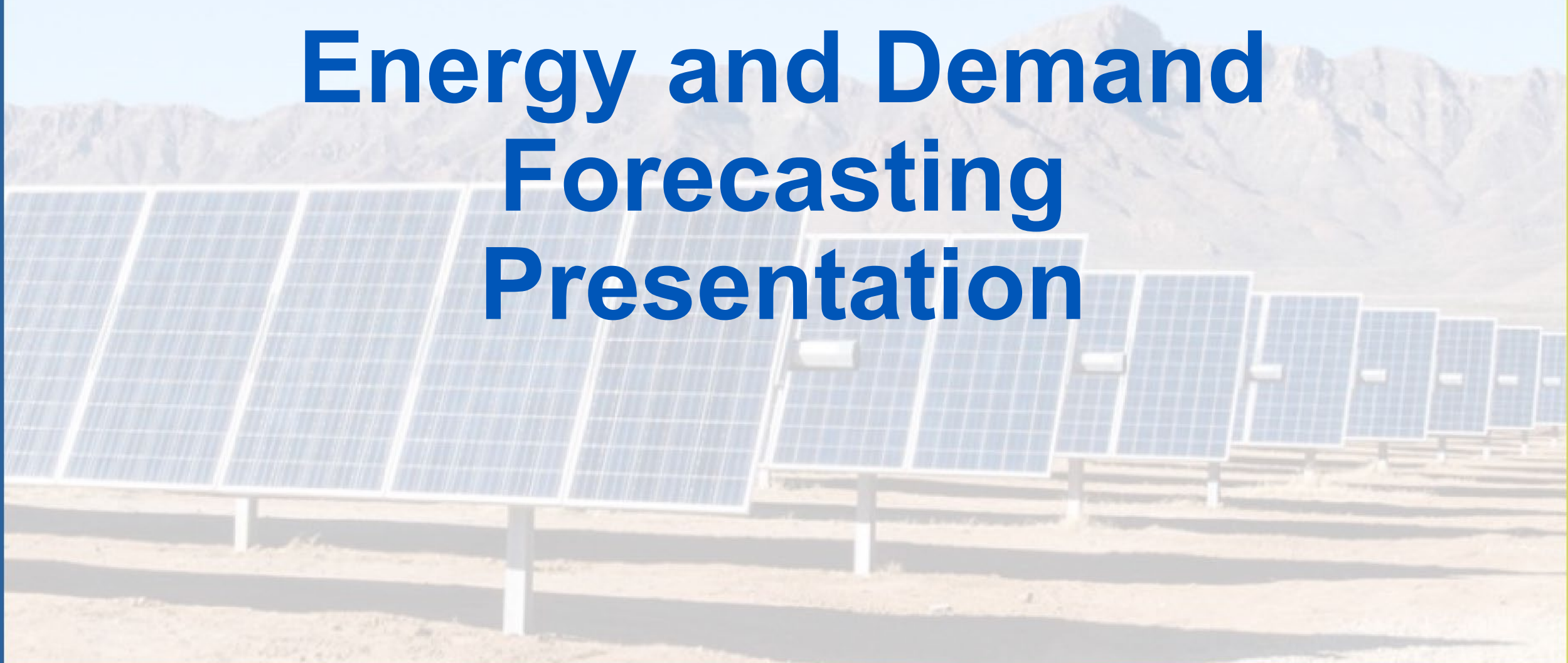




# IRP Goal: Determine the least-cost / low-regrets resource portfolio investments that are robust to long-term risks



# Energy and Demand Forecasting Presentation



# EPE's Long-Term Forecast

The Long-Term forecast is a monthly forecast with a 20-year horizon. The energy and peak load forecasts are used to determine how much generation and transmission is needed in the future. Electric utilities need to have adequate capacity available at all times. The long-term forecast is made up of:

- Billed Energy Sales Forecasts
- Billed Demand Forecasts
- Native System Energy Forecast
- Native System Demand Forecast
- Customer Forecasts

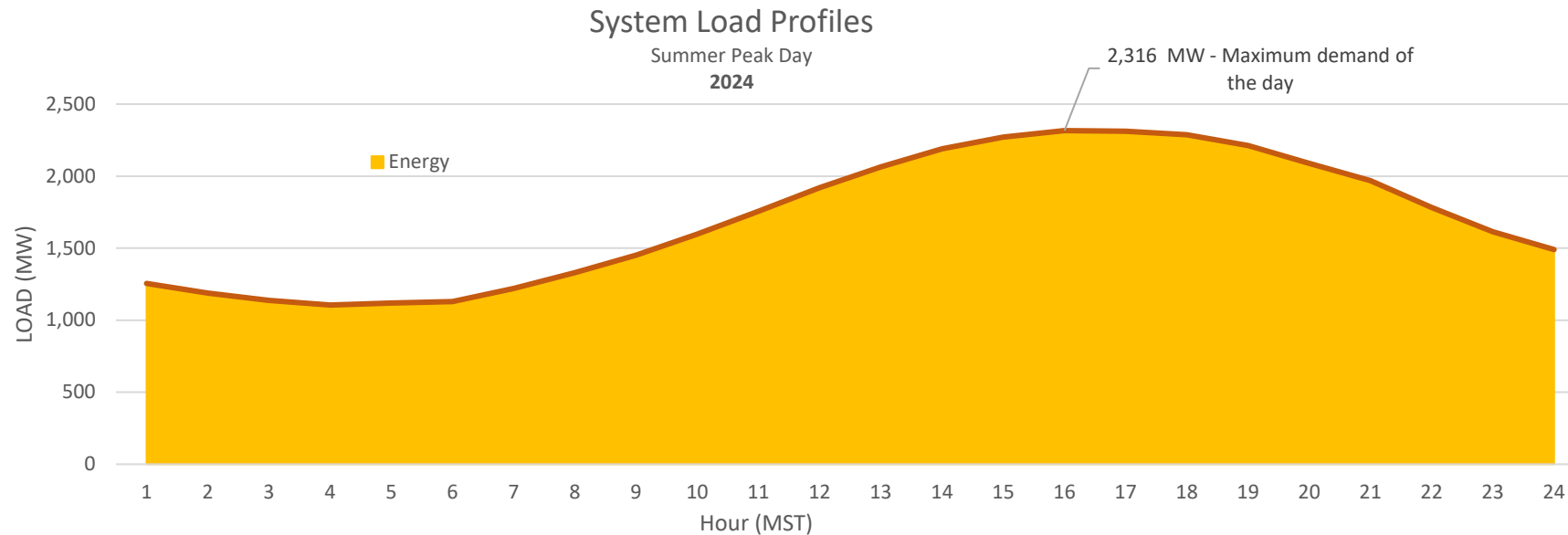
The forecast includes extreme weather scenarios as well as probabilistic upper and lower bands.

# Out of Model Adjustments

- DG Forecasts
- EV Forecasts
  - Light-duty, medium-duty, heavy-duty, bus forecast
- EE Forecast
- Expected Large Load Customers

# Understanding Essential Terms

- Billed Energy Sales: Electricity sold directly to customers (measured in MWH)
- Native Energy: Energy that is generated to meet customer consumption, energy consumption plus losses (measured in MWH)
- Native Peak Demand: Highest rate of usage for the year (measured in MW)
- Load Factor: A measure of how efficiently electrical energy is used



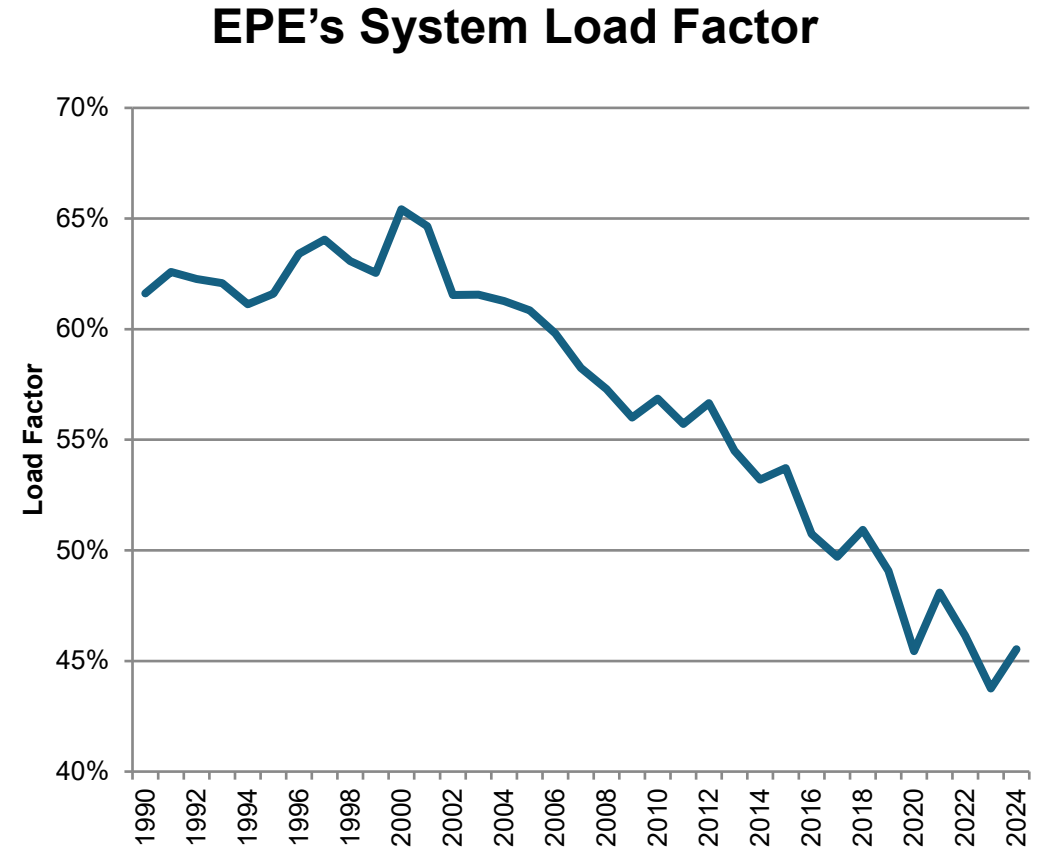
# Historical Growth Rates

- In the past 10-years, Native System Peak grew 3 times faster than native energy
  - The number of residential customers relative to large commercial customers has been increasing
  - Use per customer has been declining
  - Increased saturation of refrigerated air conditioning
  - Increase in adoption rate customer-owned roof-top solar

	Native Energy	Native System Peak	Number of Customers
10-year CAGR	1.19%	2.75%	1.60%
20-year CAGR	1.29%	2.80%	1.75%

# System Load Factor

- The system load factor has been declining since 2000. It has gone from 0.654 in 2000 to 0.438 in 2023
- The 2024 load factor was 0.455
- The 2024 forecast, a three-year load factor of 0.459 is used to forecast peak demand



# Factors Affecting the System Load Factor

Factors contributing to a declining system load factor:

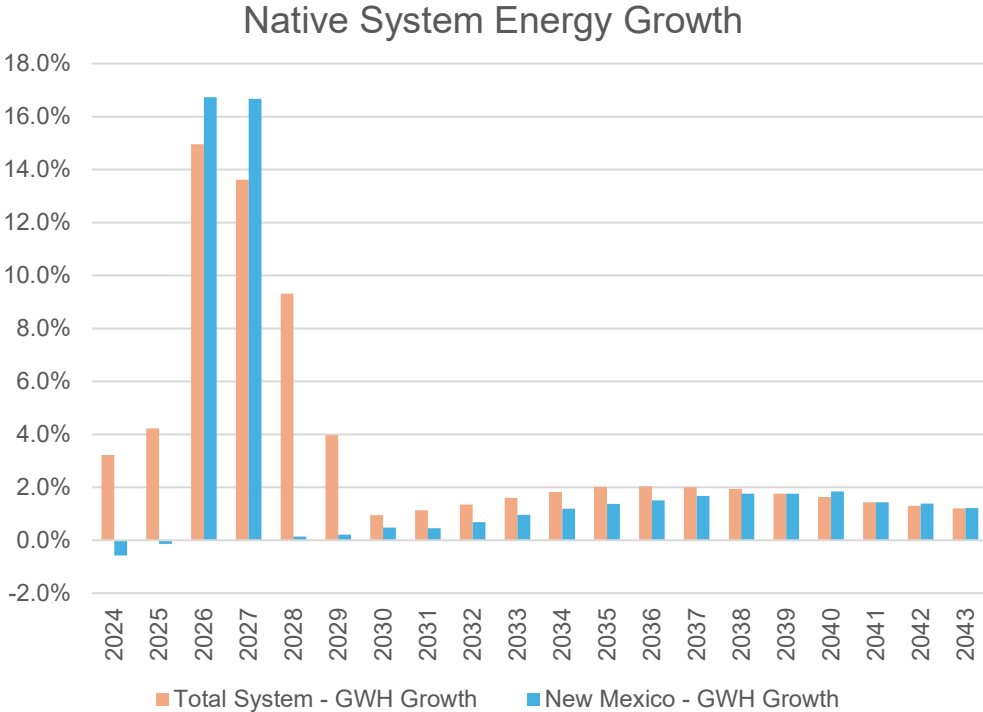
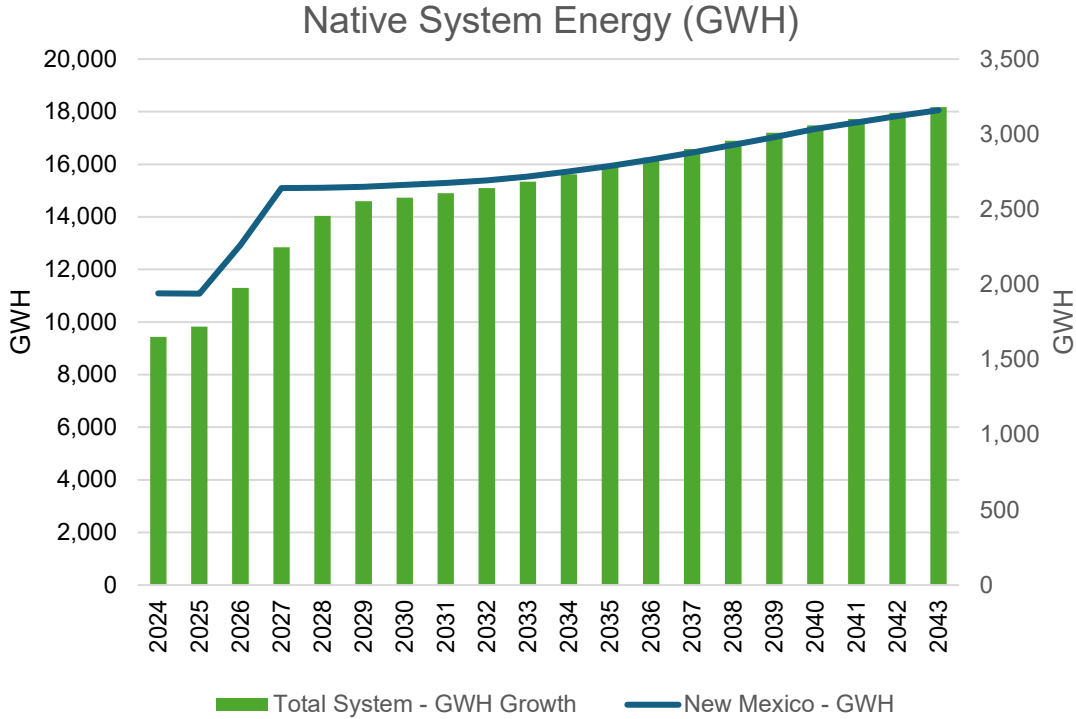
- Increasing share of residential sales
- Loss of manufacturing load
- Increasing saturation rate for refrigerated air conditioning
- Warming Climate Trends
- Increases in Energy Efficiency
- Increases in the number of customer-owned solar
- Factors contributing to an increase in the system load factor:
  - Electric Vehicles
  - TOD/TVR rates
  - Large Load Customers/Data Center Customers



# Looking Ahead

- EPE expects to see demand rise at an unprecedented rate
  - Decarbonization of transportation – Electric Vehicles
    - A single light-duty EV can consume an average of half of a residential customers consumption and can create demand spike between 1.2 to 19.2 kW per vehicle
    - A single medium-duty EV can consume the equivalent of 2 residential customers; can create demand spike as high as 180 kW per vehicle
    - A single heavy-duty EV can consume the equivalent of 14 residential customers, can create demand spikes as high as 2 MW per vehicle
    - A single Electric Bus can consume an average of 5 residential customers, and can create demand spikes as high as 450 MW per vehicle
  - AI revolution – Data Centers
    - Small data centers – 1 to 5 MW electricity demand
    - Hyperscale data centers – 20 MW to 1 GW electricity demand
      - Over 52,000 light-duty EVs using a level 2 charger
      - Over 833,000 light-duty EVs using a level 1 charger
      - Over 333,000 residential customers
    - EPE has receive 108 formal request exceeding 500 kW in New Mexico
    - Since 2023, EPE has responded to 26 prospective customers (ranging in size from 10 MW to over 1 GW)
- Challenges
  - Load growth requires more resources
  - Due to supply chain issues and other delays, EPE needs to be more proactive than ever

# Forecasted Native Energy



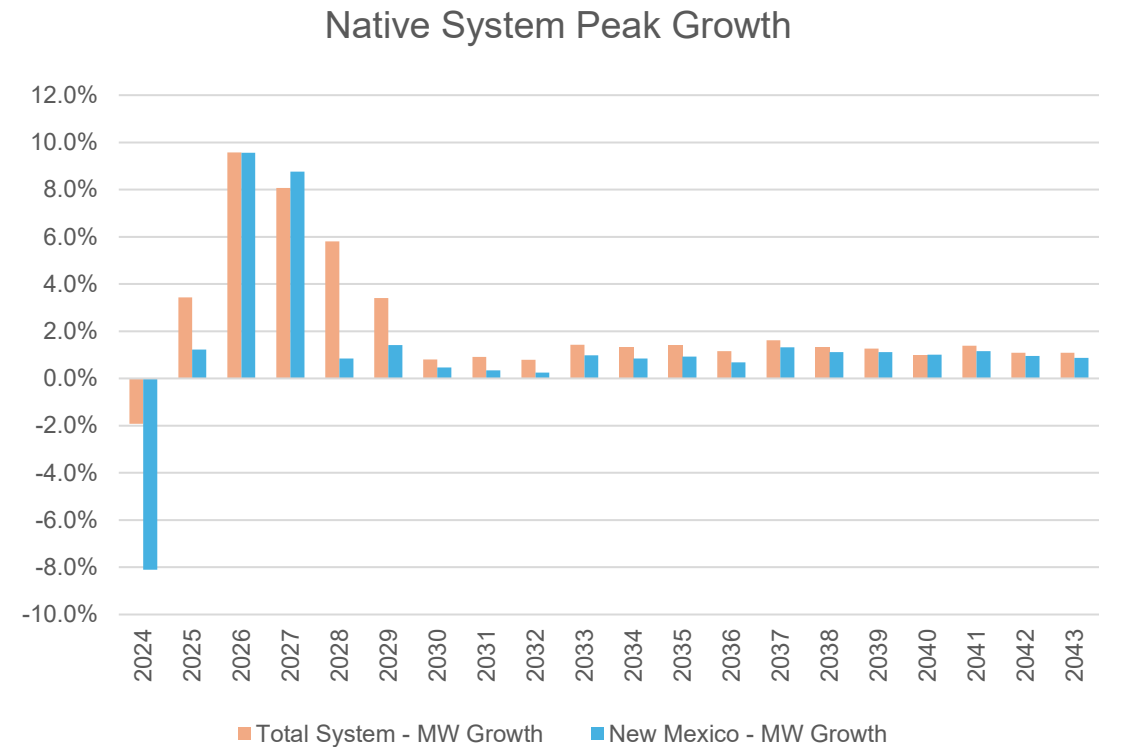
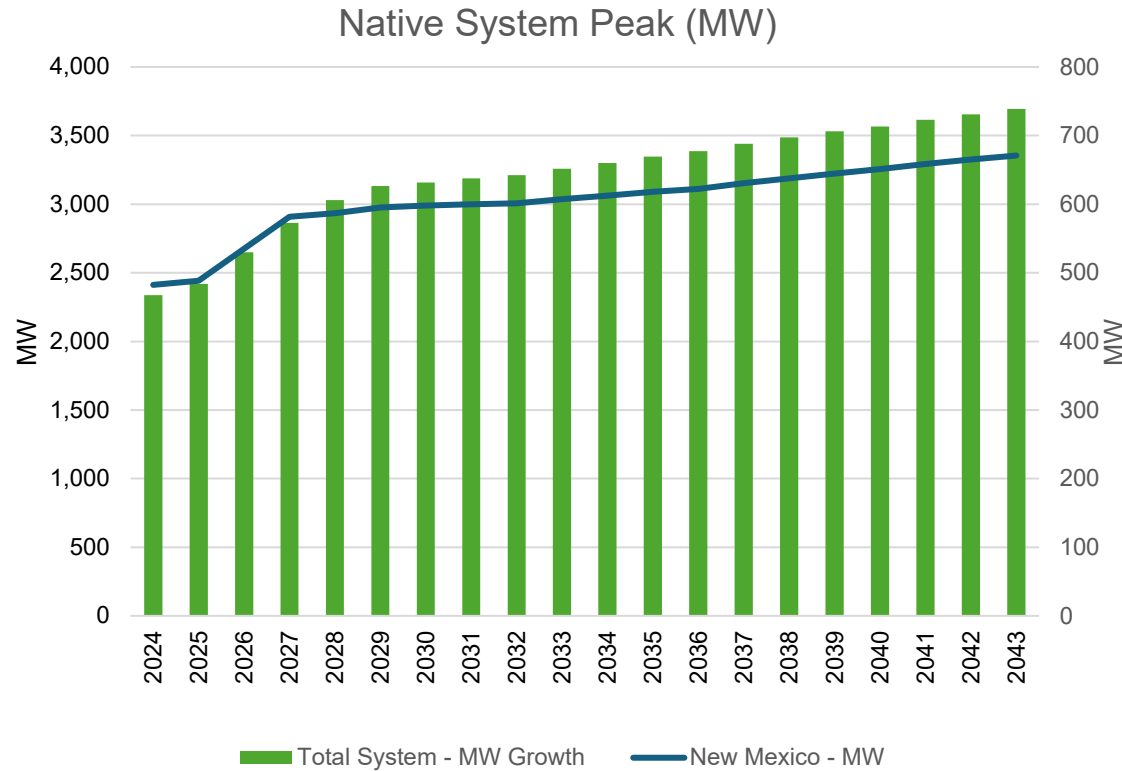
**Total System**

	CAGR	GWH
10 years	5.32%	114
20 years	3.50%	127

**New Mexico**

	CAGR	GWH
10 years	3.36%	77
20 years	2.43%	60

# Forecasted System Peak



## Total System

	CAGR	MW
10 years	5.32%	87
20 years	3.50%	66

## New Mexico

	CAGR	MW
10 years	1.47%	8
20 years	1.23%	7



# Planning Reserve Margin and Capacity Accreditation

## EPE's Loss of Load Probability Study

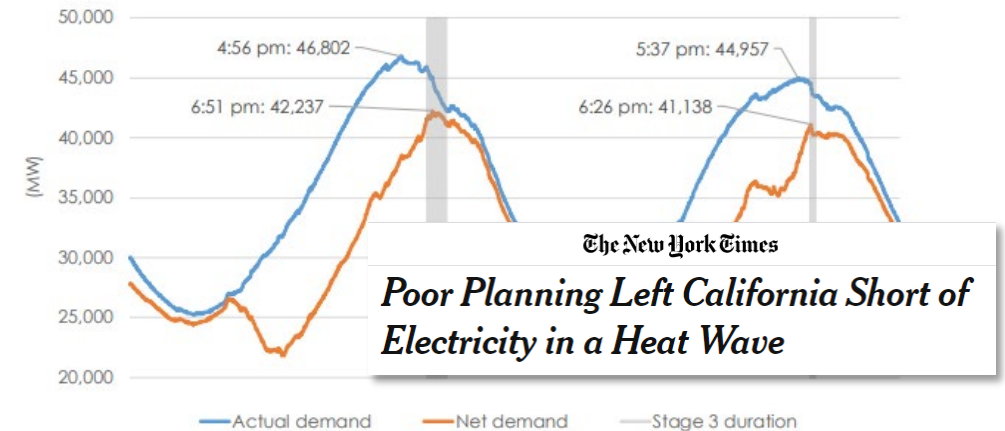
- EPE retained Energy and Environmental Economics (E3) to perform detailed resource adequacy modeling, called Loss of Load Probability (LOLP) analysis to determine:
  - **EPE's planning reserve margin (PRM) requirement**
  - **Effective load carrying capacity (ELCC) value for existing, planned, and candidate resource types**
- LOLP represents the probability that the available generation capacity will be insufficient to meet the system load at any given time

# Planning Reserve Margin

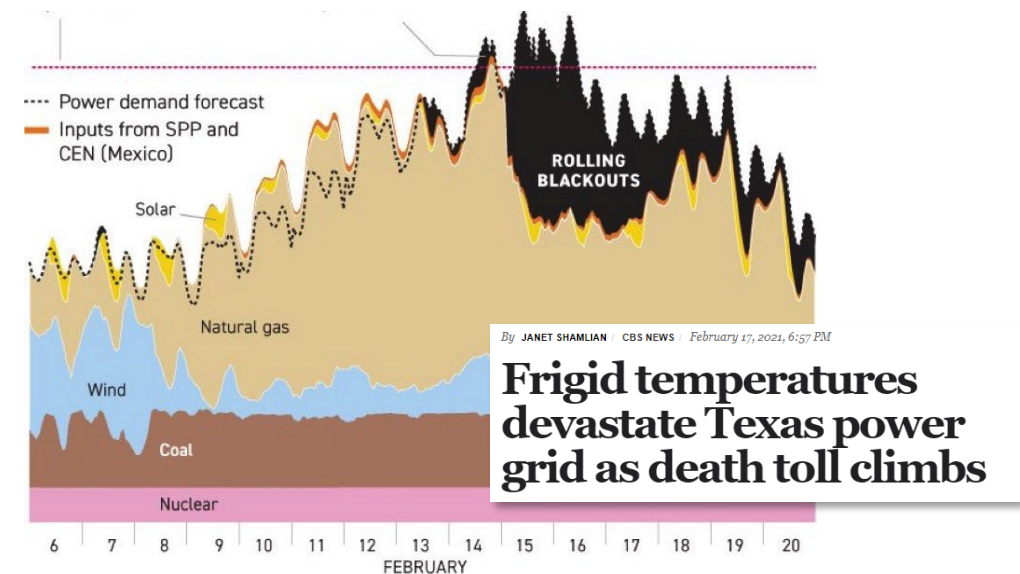
- Planning Reserve Margin (PRM) quantifies the amount of additional capacity required to maintain system reliability
- Utilities carry planning reserves as a contingency to ensure reliable service at all times even during unforeseen circumstances, such as unexpected demand increases or power generation outages
- This PRM represents a minimum amount of additional resource capacity beyond EPE's peak demand that the utility must maintain to ensure resource adequacy
  - It is expressed as a percentage of coincident system peak demand
- EPE's PRM requirement is 9% through 2029, rising to 11% in 2030

# Planning for resource adequacy is increasing in complexity

- Transition towards renewables and storage introduces new sources of complexity in resource adequacy planning
  - The concept of planning exclusively for “peak” demand is quickly becoming obsolete
  - Frameworks for resource adequacy must be modernized to consider conditions across all hours of the year
- Reliable electricity supply is essential to our day-to-day lives at home and at work – and will become increasingly important
  - Meeting cooling and heating demands under more frequent extreme weather events is may be a matter of life or death
  - Economy-wide decarbonization goals will drive electrification of transportation and buildings, making the electric industry the keystone of future energy economy



Graph source: <http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>

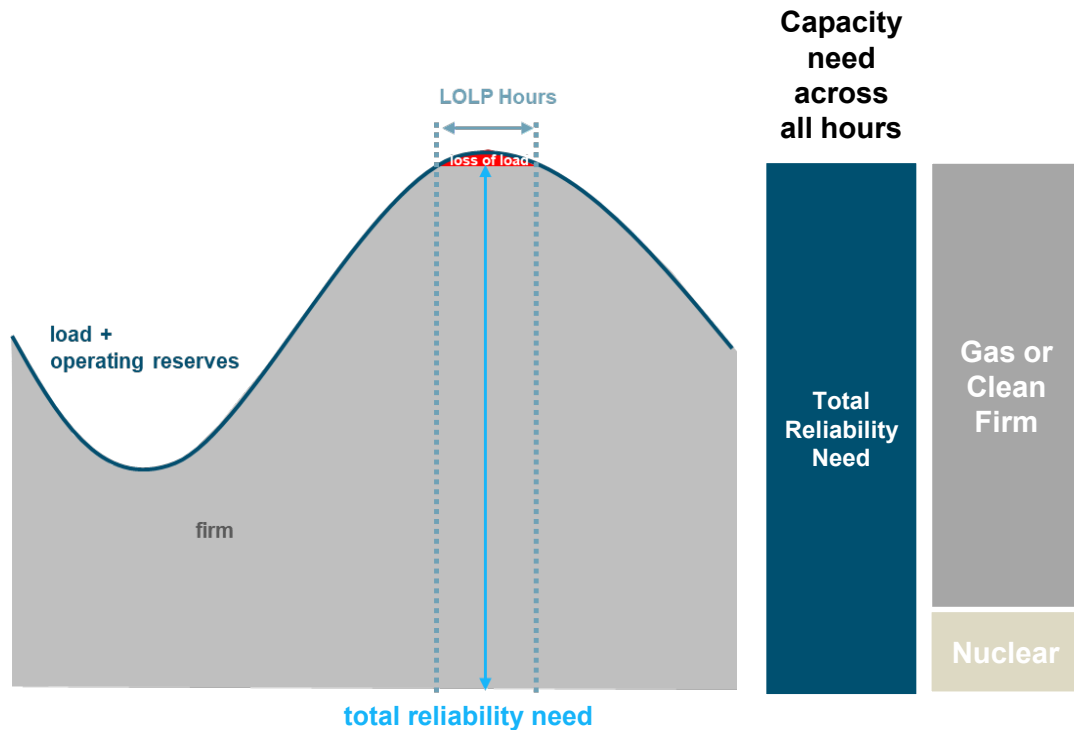


Graph source: <https://twitter.com/bcshaffer/status/1364635609214586882>

# Capacity need and resource capacity contribution are increasingly shaped by the resource portfolio

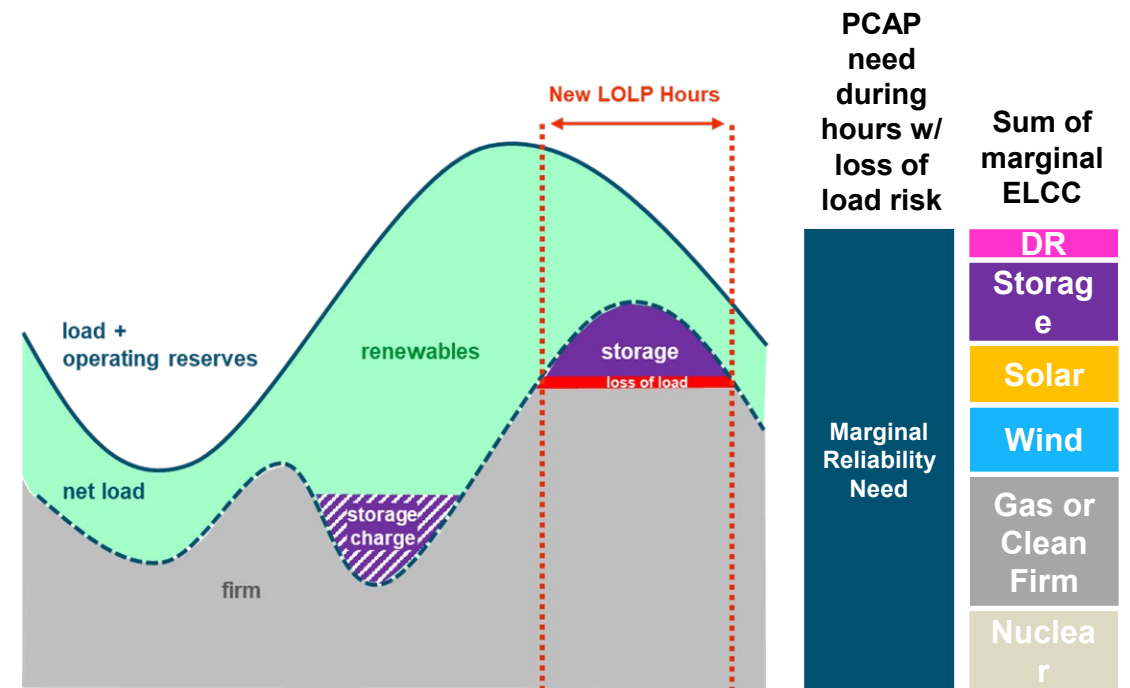
## Conventional System

- Need is based on peak load
- Capacity is accredited based on nameplate capacity
- Capacity accreditation is independent of the resource portfolio



## Modern System with High Renewable Penetration

- Need is based on “net peak”
- Capacity is accredited based on ELCC
- Capacity accreditation is dependent on the resource portfolio





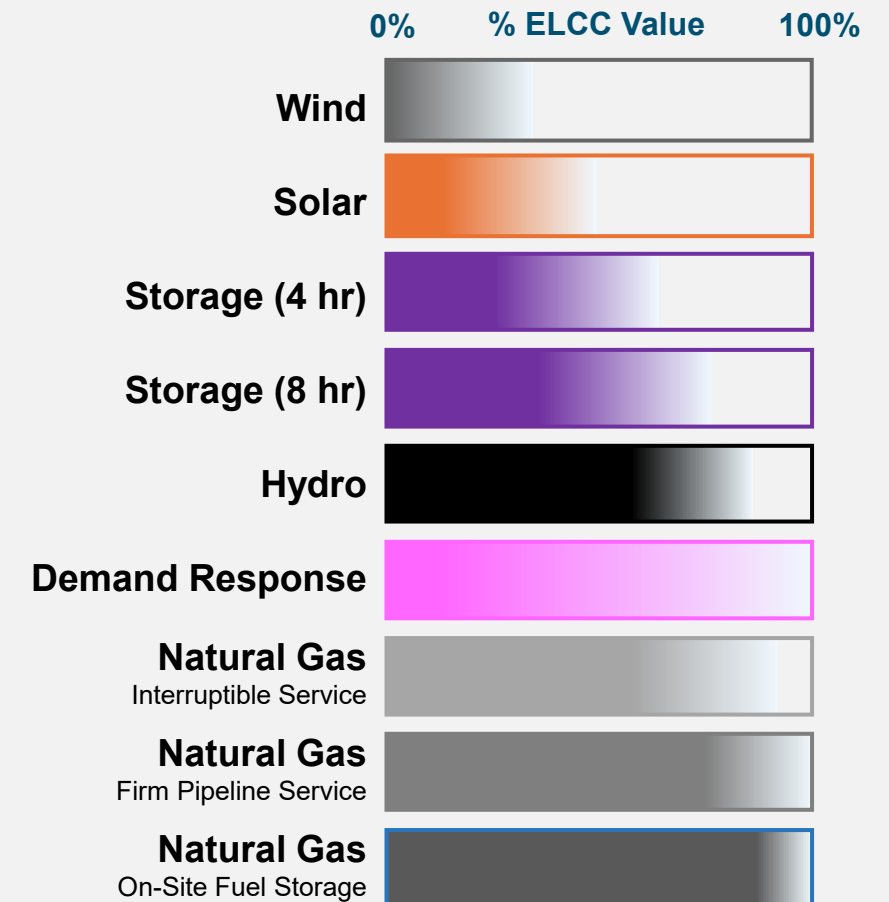
## What is ELCC?

- Effective Load Carrying Capability (ELCC) is a measure of a resource's reliable capacity during periods when the grid is most likely to experience electricity shortfalls (i.e., potential loss-of-load events).
- ELCCs are expressed as a share of the resource's installed capacity, with higher percentages reflecting more consistently available resources
- ELCCs are especially important as the energy grid incorporates more variable, intermittent renewable generation to understand the reliable capacity that these resources can contribute
- ELCC allows EPE to better understand the amount of capacity that can be delivered and plan effectively in utilizing its generation portfolio to maintain system reliability

# No resource is “perfect” – ELCC can and should be applied to all resources

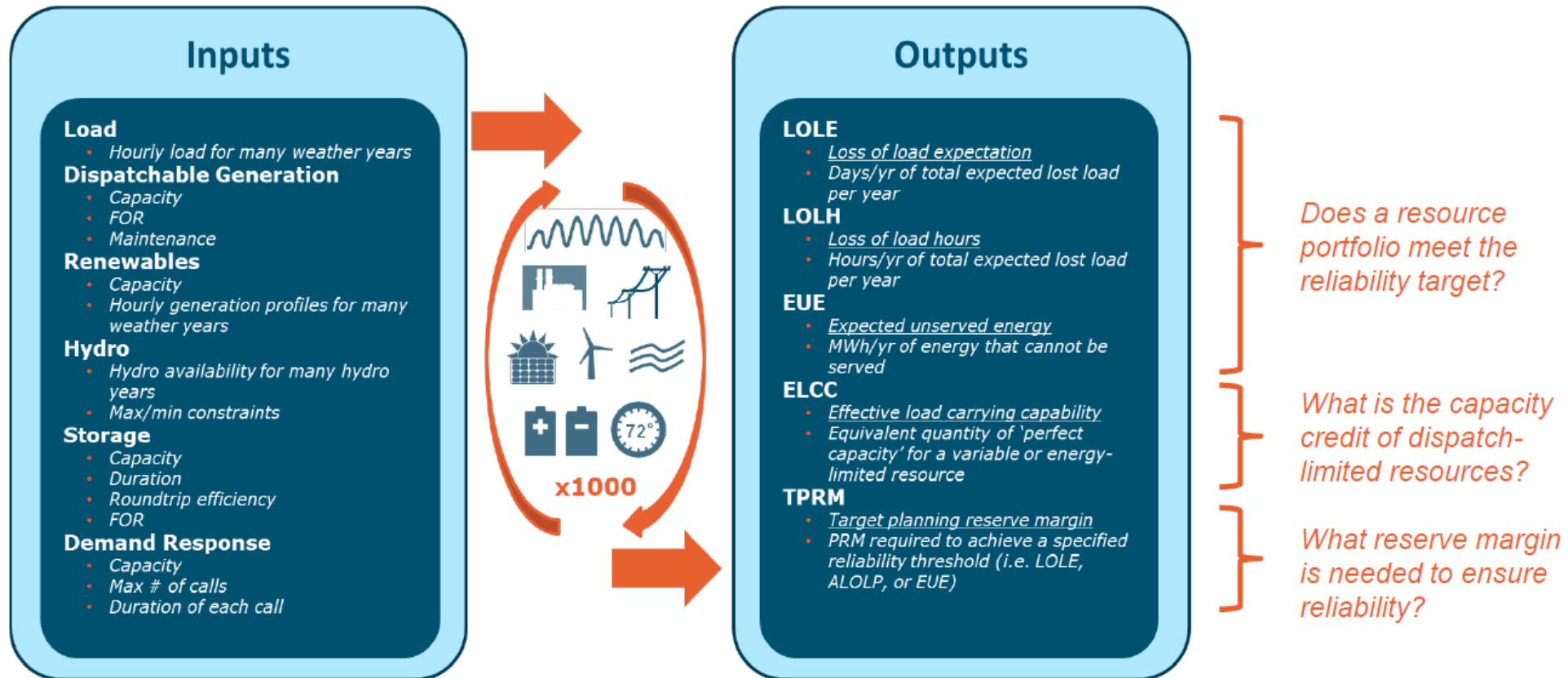
- Marginal ELCC creates level playing field by measuring all resources against perfect capacity
- Can account for all factors that can limit availability:
  - Hourly variability in output
  - Duration and/or use limitations
  - Seasonal temperature derates
  - Energy availability
  - Fuel availability
  - Temperature-related outage rates
  - Correlated outage risk, *especially under extreme conditions*
- Use Perfect Capacity (PCAP) accounting as opposed to ICAP or UCAP
  - Allocate need based on load during high-risk hours

## Illustrative ELCC Values Across Technologies



# E3's LOLP Model Inputs and Outputs

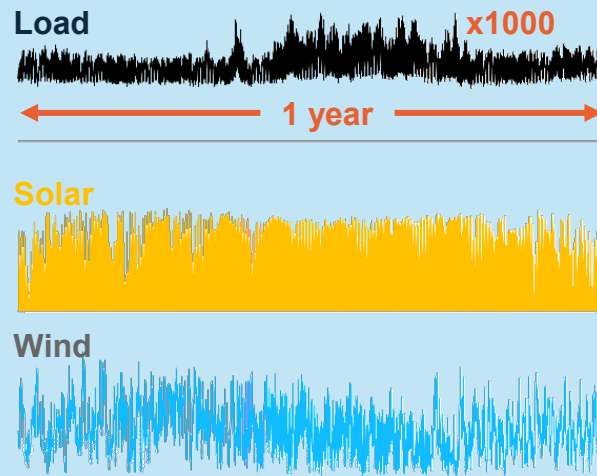
- E3's LOLP model studies EPE's overall system and determines various output used in capacity expansion modeling



# Overview of LOLP analysis for Need Determination and Resource Accreditation

Develop a representation of the loads and resources of an electric system in a loss of load probability model

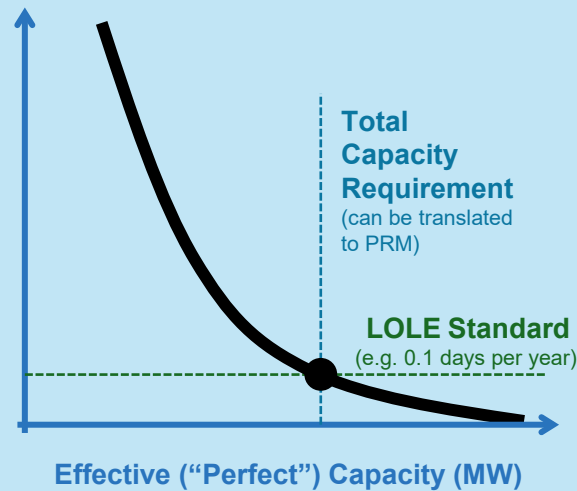
LOLP modeling allows a utility to evaluate resource adequacy across all hours of the year under a broad range of weather conditions, producing statistical measures of the risk of loss of load



Identify the amount of perfect capacity needed to achieve the desired level of reliability

Factors that impact the amount of perfect capacity needed include load & weather variability, operating reserve needs

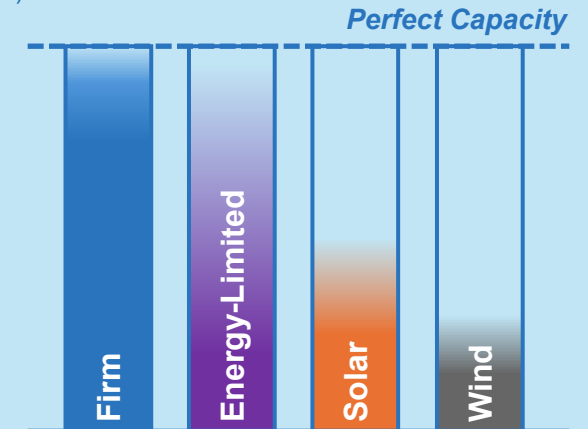
Loss of Load Expectation  
(days per year)



Calculate capacity contributions of different resources using effective load carrying capability

ELCC measures a resource's contribution to the system's needs relative to perfect capacity, accounting for its limitations and constraints

Marginal Effective Load Carrying Capability  
(%)



## Resource Strategy Key Questions

- What is the total effective capacity the system needs to meet EPE's reliability standard?
- How can intermittent resources (e.g., solar) and limited duration resources (e.g., storage) contribute to EPE's total capacity requirement?
- How does the reliability contribution of intermittent and limited duration resources change as penetration increases?
- How do different resources play a role in meeting reliability? (e.g., Time of generation vs peak load, weather, etc.)
- Which resources are economic to add to the system over the planning horizon?
- What is the role of firm generating capacity in ensuring resource adequacy?

# Resource Options & Technologies



# Existing EPE Conventional Generation

Conventional Generation	Jurisdiction	Fuel	Type	Net Summer	COD Year	Planned Retirement Year	Current Age
Rio Grande 6	System	Gas	Conv. Steamer	43	1957	Inactive Reserve	68
Rio Grande 7	System	Gas	Conv. Steamer	43	1958	Inactive Reserve	67
Rio Grande 8	System	Gas	Conv. Steamer	139	1972	2033	53
Rio Grande 9	System	Gas	CT	88	2013	2058	12
Newman 1	System	Gas	Conv. Steamer	73	1960	Inactive Reserve	65
Newman 2	System	Gas	Conv. Steamer	61	1963	2027	62
Newman 3	System	Gas	Conv. Steamer	90	1966	2031	59
Newman 4	System	Gas	2x1 CC	220	1975	2031	50
Newman 5	System	Gas	2x1 CC	227	2009	2061	16
Newman 6	Texas	Gas	CT	228	2023	2063	2
Copper	System	Gas	CT	63	1980	2030	45
Montana 1	System	Gas	CT	88	2015	2060	10
Montana 2	System	Gas	CT	88	2015	2060	10
Montana 3	System	Gas	CT	88	2016	2061	9
Montana 4	System	Gas	CT	88	2016	2061	9
Palo Verde 1	System	Nuclear	Steam	207	1986	2045	39
Palo Verde 2	System	Nuclear	Steam	208	1986	2046	39
Palo Verde 3	System	Nuclear	Steam	207	1988	2047	37

# Existing EPE Renewable Resources

Renewable Generation	Jurisdiction	Allocation	Ownership	Nameplate	COD Year	Planned Retirement Year
Camino Real Land Fill (Methane)	System	System	QF	2	2008	2028
Small Scale Solar (14-64 kW)	TX/NM	TX/NM	EPE	0.24	2009-13	2031-35
Hatch (Solar)	NM	NM	PPA	5	2011	2036
Roadrunner (Solar)	NM	NM	PPA	20	2011	2031
Chaparral (Solar)	NM	NM	PPA	10	2012	2037
Airport (Solar)	NM	NM	PPA	12	2012	2037
Macho Springs (Solar)	System	System	PPA	50	2014	2034
Newman (Solar)	TX	TX/Community	PPA	10	2014	2044
Texas Community Solar	TX	Community	EPE	3	2017	2047
Holloman (Solar)	NM	Dedicated	EPE	5	2018	2048
NMSU(Solar/Storage)	NM	Dedicated	EPE	3/1	2022	2052
Buena Vista (Solar/Storage)	System	System	PPA	100/50	2023	2043
Buena Vista 2 (Solar)	NM	NM	PPA	20	2023	2043



# Planned EPE Resource Additions (2025-2029)

Resource	Jurisdiction	Fuel	Ownership	Nameplate	COD Year	Planned Retirement Year	Allocation
Carne (Solar/Storage)	NM	Solar/Battery	PPA	130/65	2025	2045	NM
Felina (Solar)	TX	Solar	EPE	100	2025	2045	TX
Milagro (Solar/Storage)	TX	Solar	PPA	150/75	2025	2045	TX
NM ST (Solar/Storage)	NM	Solar/Battery	PPA	50/50	2026	2046	NM
TX ST (Solar/Storage)	TX	Solar/Battery	PPA	100/100	2026	2046	TX
TX BV (Solar/Storage)	TX	Solar/Battery	PPA	100/100	2027	2047	TX
TX RF (Solar/Storage)	TX	Solar/Battery	PPA	250/250	2028	2048	TX
TX AO (Storage)	TX	Battery	PPA	150	2029	2049	TX
TX DW (Solar/Storage)	TX	Solar/Battery	PPA	150/75	2028	2048	TX
TX NB (Solar/Storage)	TX	Solar/Battery	EPE	100/100	2027	2047	TX
Customer Dedicated Facilities	NM/TX	Solar	EPE	40	2025/2026	2055/2056	NM/TX


# 2025 ISP Potential Resource Options

## Existing Commercially Available Resources:




### Intermittent Resources

- Solar 
- Wind 



### Firm Resources

- Geothermal 
- Battery 4 & 8 hour (Li-ion)
- Gas Combustion Turbine (CT)
- Gas Combined Cycle (CC)

### Supply-Side Alternatives

- Distributed Energy Resources (DER) 
- Demand Response (DR) 
- Load Management & Energy Efficiency 
- Imports

## Emerging Resources to be Explored

- Long Duration Energy Storage (LDES)
- Carbon-Free Thermal – New/Retrofit Gas-to-Hydrogen Turbines and Gas with Carbon Capture and Storage (CCS) 
- Nuclear - modular nuclear possible option upon Palo Verde retirement but not prior to 2045 

 Carbon-Free Resource

# Resource Technologies

## SOLAR – PHOTOVOLTAIC (PV)

- Converts sunlight into electricity
- Sunlight is absorbed within the panels, causing electrons to move through the material and generating an electric current
- Renewable resource, clean energy
- Range of capacity factors for solar PV: 30%-35%
- Solar production aligns well with EPE gross system summer peak
- Currently eligible for the Incentive Tax Credit (ITC) and Production Tax Credit (PTC) – Inflation Reduction Act of 2022



*Buena Vista Solar Facility. Source: KFOX*

# Resource Technologies

## BATTERY ENERGY STORAGE SYSTEM (BESS)

- Energy storage technology that uses a group of batteries in the grid to store electrical energy
- Provide firm and dispatchable capacity but limited in duration and state of charge
- Can charge when energy prices are low and discharge when energy prices are high (energy arbitrage)
- Currently eligible for the Incentive Tax Credit (ITC) – Inflation Reduction Act of 2022



NextEra Energy battery storage. Source: EPE

# Resource Technologies

## WIND

- Converts the wind energy into electricity
- Wind turbine comprised of three-blade wind turbine generators aggregated to produce hundreds of MWs
- Intermittent resource
- Range of capacity factors for wind: 40%-55%
- Moderate capacity accreditation due to noncoincidental peak generation profiles
- Currently eligible for the Incentive Tax Credit (ITC) and Production Tax Credit (PTC)

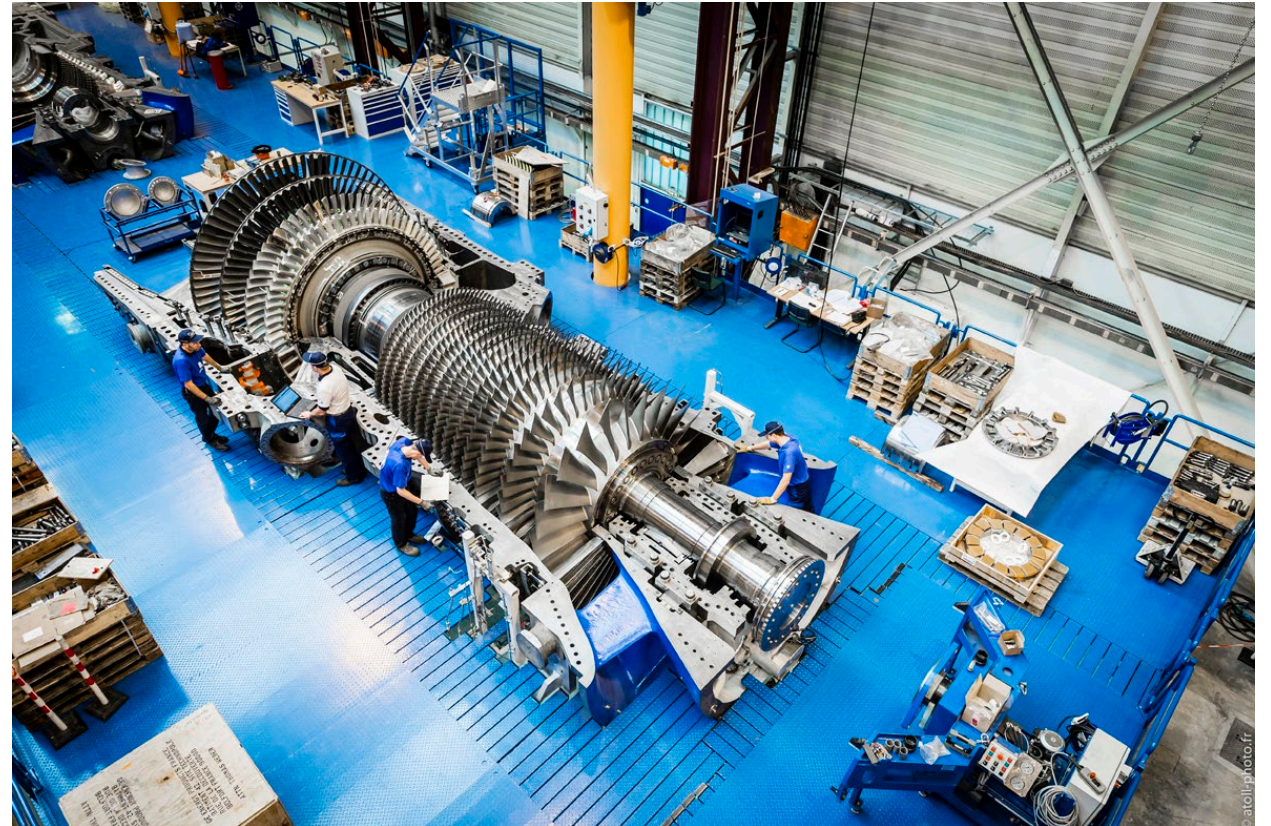


Source: Cielo Wind

# Resource Technologies

## THERMAL RESOURCES

- Converts fuel into electricity
- Fuel is injected into a turbine to produce power. Different types of generators can use byproducts such as steam to power a secondary turbine generator
- Conventional resource
- Range of capacity factors for thermal generation: 5%-60%



# Resource Technologies

## GEOTHERMAL

- Converts underground heat into electricity
- Uses dry steam, flash steam, and/or binary cycle power stations to create steam to power generators
- Sustainable, renewable resource
- Range of capacity factors for geothermal: 90%-95%
- Currently eligible for the Incentive Tax Credit (ITC) - Inflation Reduction Act of 2022



# Load Management and Demand Response

- Load Management (LM) and Demand Response (DR) programs aim to reduce system load during peak-demand (or low-supply) periods by incentivizing customers to reduce demand in certain hours
- LM/DR programs require the utility to engage and enroll customers, and with sufficient participation can offer peak demand reductions
- Ultimately the peak-demand reductions of these programs can help to reduce the need for new resource (e.g., generation) investments
- LM/DR programs typically include limits on the times that load-duration events can occur, the duration of each event, and the frequency/number of events

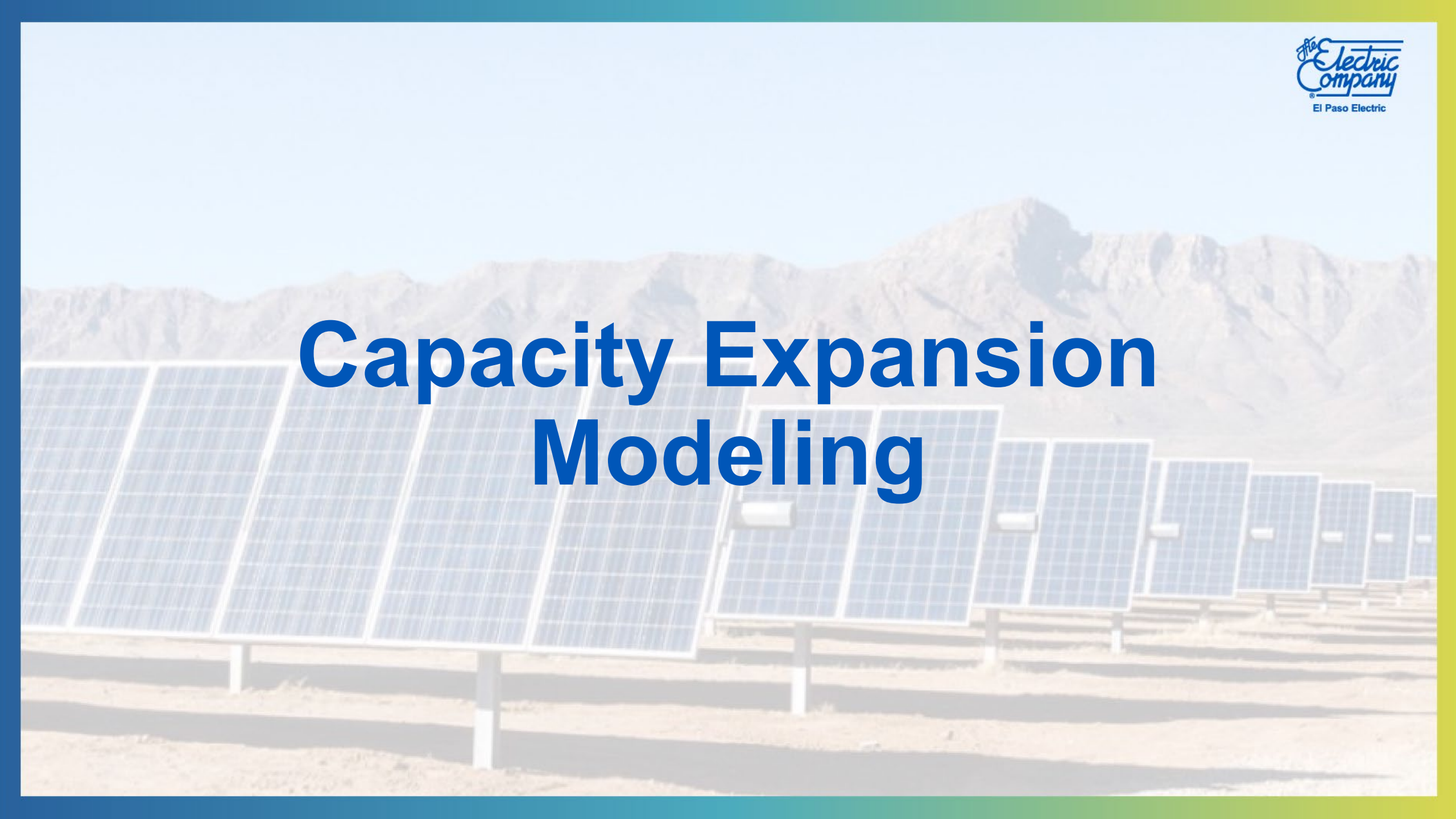


# Future Resource Portfolio

## A future resource portfolio may include....

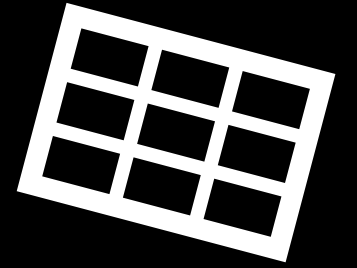
- Greater integration of renewable and storage resources
- As renewable penetration increases, wind and solar resources may be curtailed when production exceeds loads
- Greater use of battery storage to shift renewable output from low load periods to higher load periods
- Leverage synergies of solar, wind, and dispatchable renewables such as geothermal
- Battery storage can charge using excess renewable generation to reduce curtailments
- Cost-effective dispatchable resources will be required to maintain system reliability
- Utilize LM/DR and energy efficiency to balance resource to load profiles
- Selective use of firm conventional gas to ensure reliability (gas is required in New Mexico to maintain system reliability)



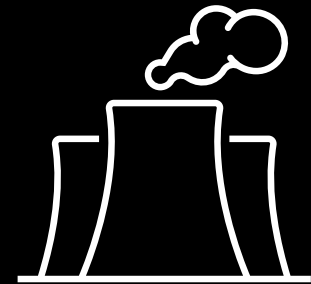
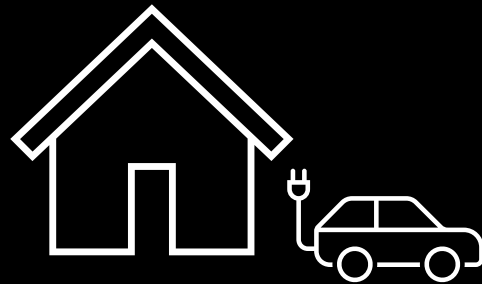
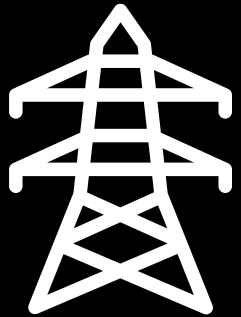


# Capacity Expansion Modeling

# Capacity Expansion Modeling

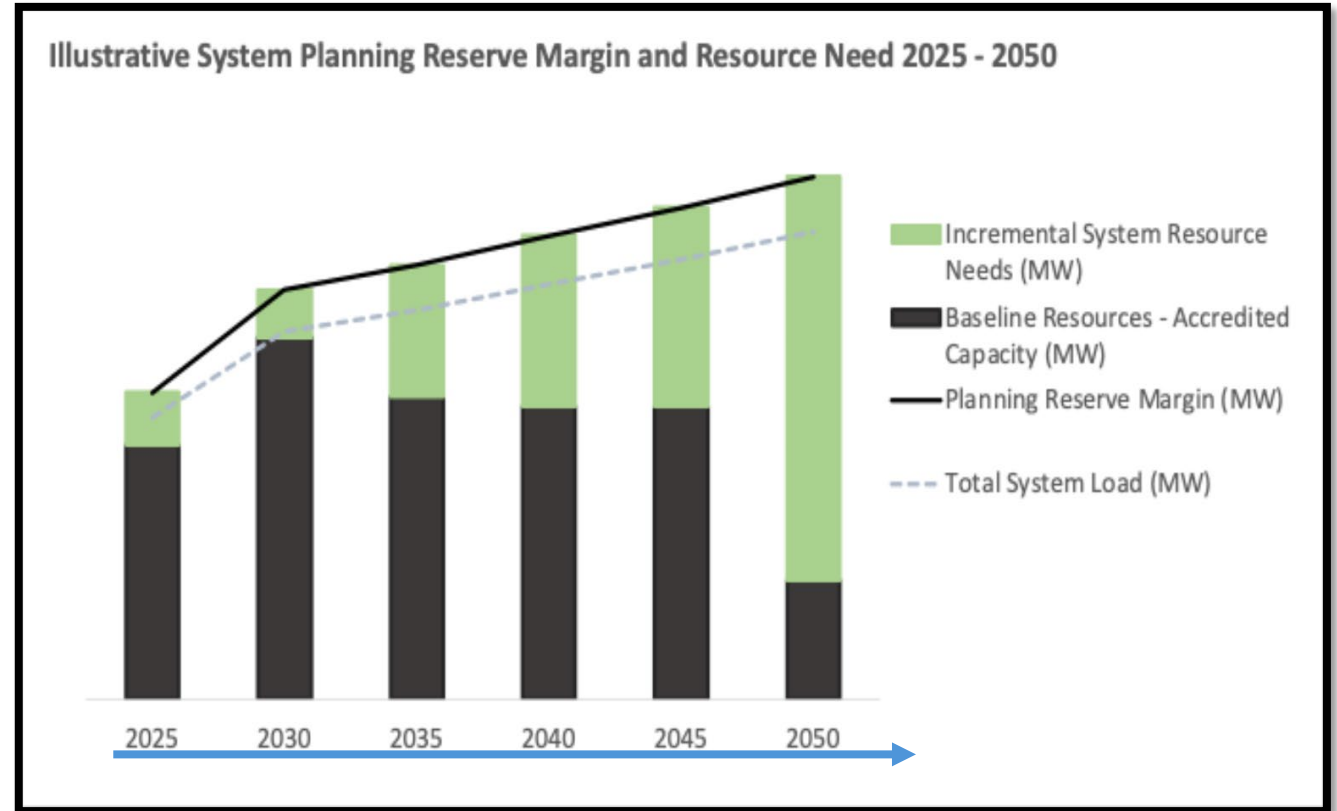


EPE will perform capacity expansion modeling in PLEXOS LT, an electricity model that identifies the least-cost, long-term combination of generation (and transmission) investments subject to reliability, policy, and operational constraints.



# Capacity Expansion Planning: Key Questions

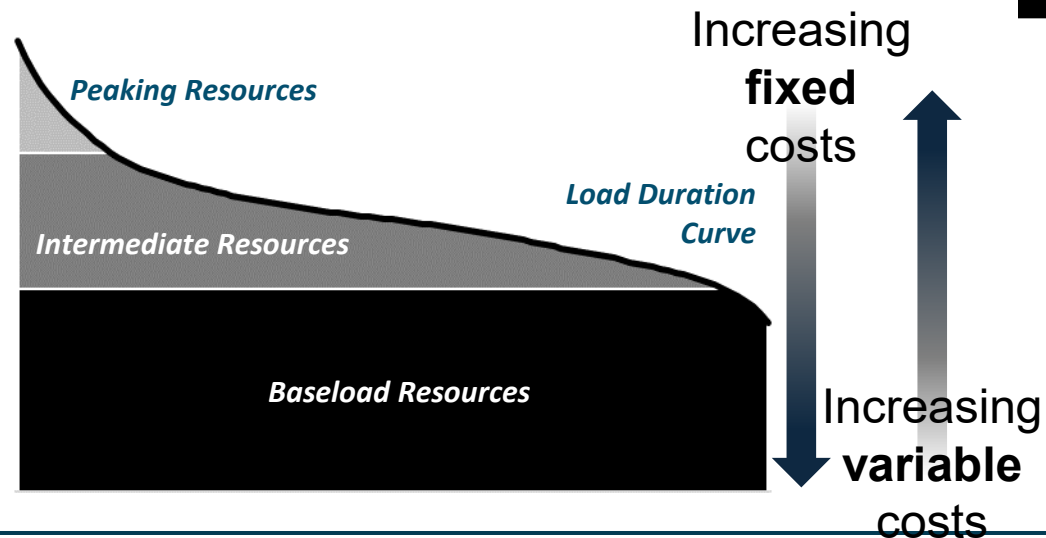
- What is the least-cost resource portfolio to reliability serve EPE's customer while meeting policy requirements (e.g., clean energy requirements)?
  - What are the optimal resources added to the system over the planning horizon?
  - How can EPE meet the New Mexico Energy Transition Act requirements most cost effectively?
  - What is the role of firm generating capacity in ensuring resource adequacy?
- With continued load growth and generation retirement, EPE will need to add new resources, to continue to serve its customers.
  - **Baseline Resources:** existing and planned resources assumed to remain in service throughout analysis
  - **Incremental Resource Needs:** new resource investments optimized by capacity expansion to minimize cost while meeting reliability and policy goals



# Evolving Planning Paradigm: Operations

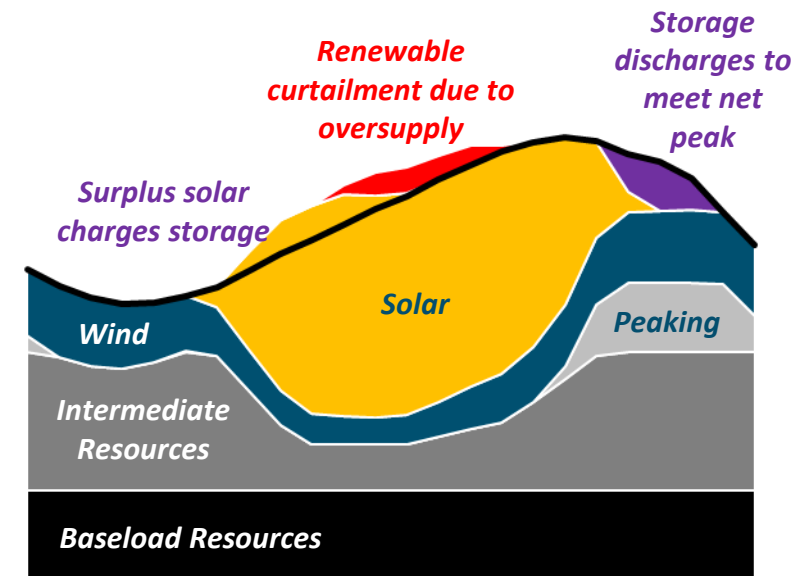
## Old Paradigm (Illustrative)

- + Heuristic approaches provide a reasonable means of evaluating resource needs and investment options
- + Tradeoff between capital-intensive resources with low operating costs and low capital resources with high operating costs



## New Paradigm (Illustrative)

- + Understanding system dispatch at increasingly granular timescales becomes necessary to evaluate investments
- + Chronological simulation needed to capture constraints on operational flexibility



# Drivers of Capacity Expansion Planning Complexity

- + **Reliability:** the consistent and stable provision of power is of paramount importance, and systems must effectively integrate diverse resources while ensuring sufficient reliability
- + **Policy:** increasing preferences for renewable & low-carbon resources have forced new criteria into decision making
- + **Technology:** innovation has brought new technologies to market, expanding the menu of options with a diverse set of capabilities
- + **Economics:** major changes in costs of technologies and fuels have upset conventional heuristics and approaches

**Firm Resources**  
*limited by outages & temperature derates*



Nuclear



Fossil



Geothermal

**Energy-Limited Resources**  
*constrained by limited energy supplies*



Hydro



Storage



Demand Response

**Variable Resources**  
*limited by changing hourly profiles*

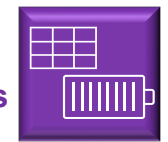


Solar



Wind

Distributed Energy Resources



Demand Response



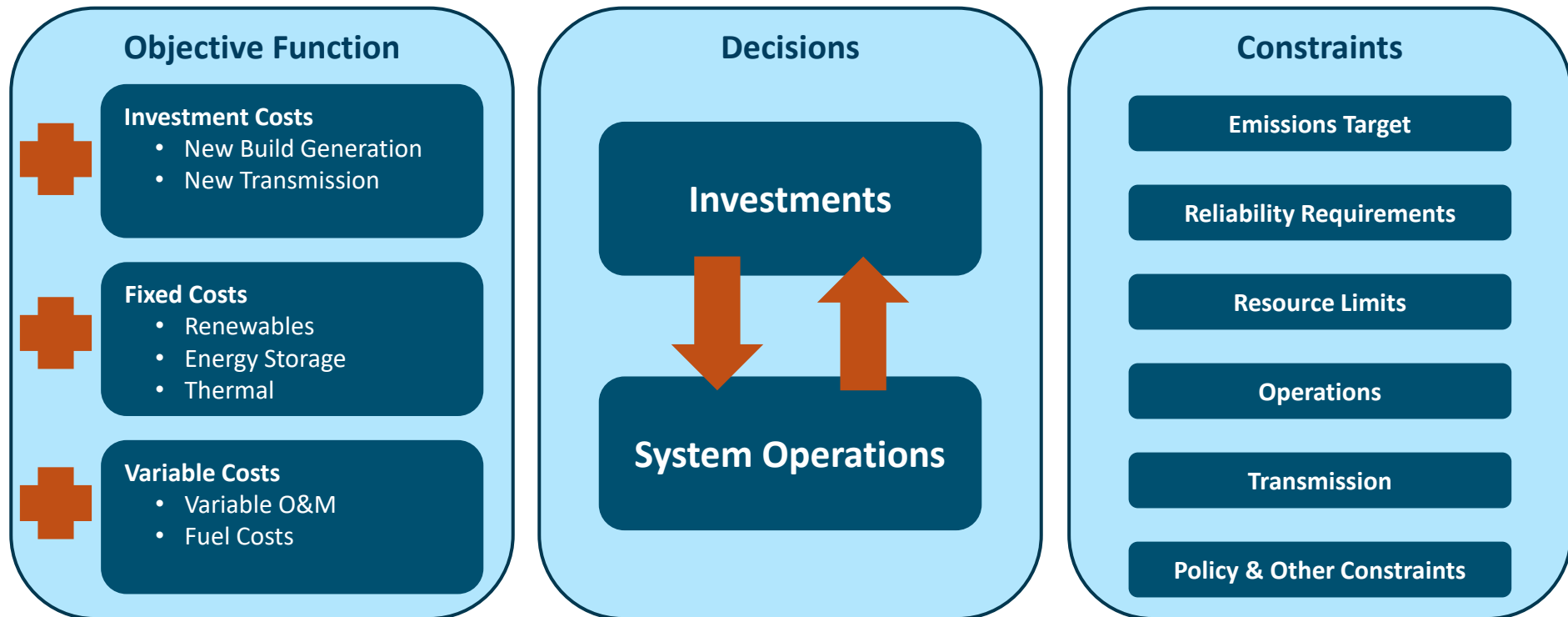
Demand-Side Resources



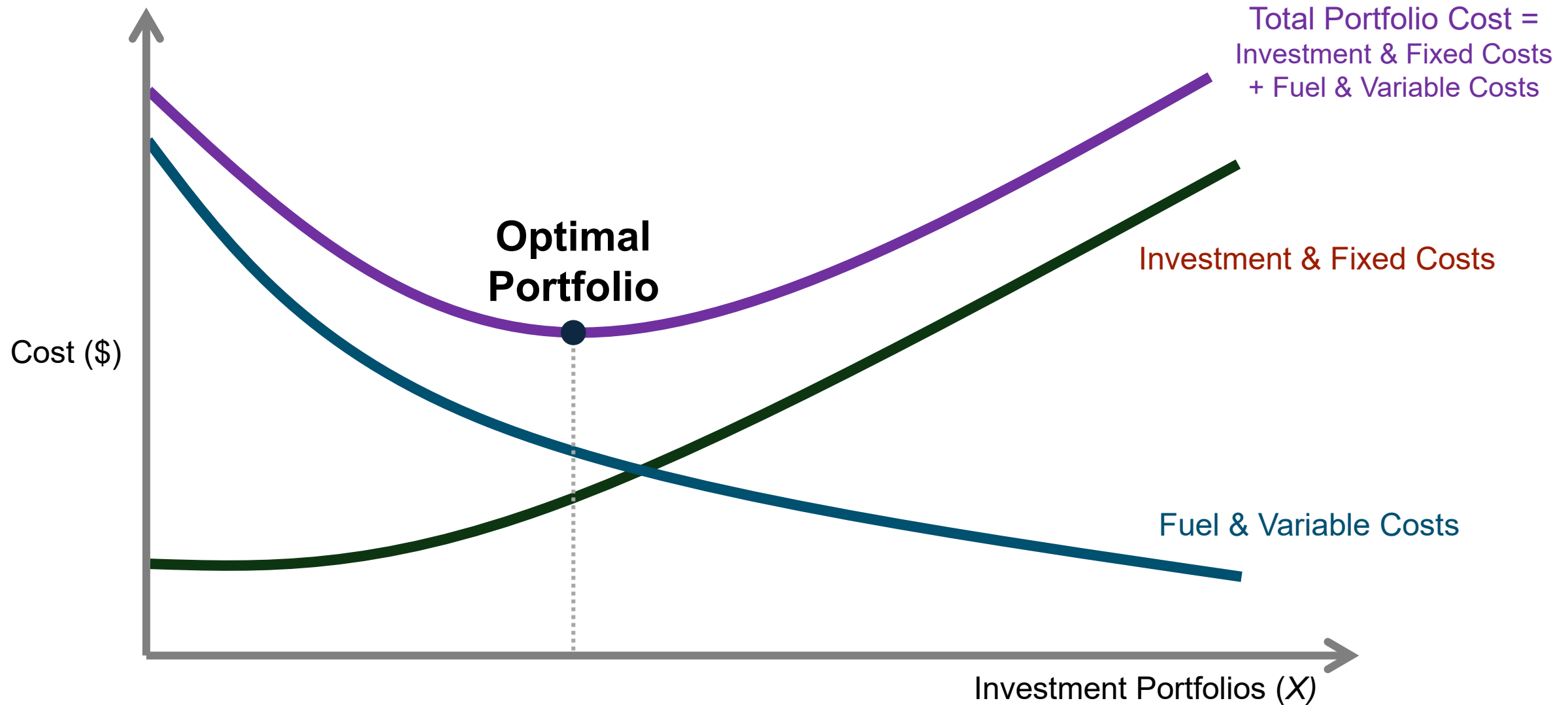
...and more

# Capacity Expansion Model and Formulation

- EPE will perform capacity expansion modeling in PLEXOS LT, an electricity model that identifies the least-cost, long-term combination of generation (and transmission) investments subject to reliability, policy, and operational constraints.
- PLEXOS LT considers investment, fixed, and operation costs to simultaneously optimize long-term capacity expansion and operation decisions.



# The Optimal Portfolio Minimizes Total Portfolio Costs





# Summary

- Capacity expansion modeling informs future resource decisions
  - Optimal portfolios minimize cost while achieving clean energy targets and maintaining reliability
- Every electricity system is different, and the results from the current EPE IRP will differ from past studies
  - Load and resource characteristics vary from system to system

