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RPAC Meeting #5: IRP Preliminary Portfolio Review

June 24, 2026

Agenda

1. Opening/Introductions
2. Looking Ahead
3. Customer Energy Optimization Programs
4. IRP Preliminary Base Case Results
5. Wrap-Up

Introductions

- Your name
- Who you represent

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Looking Ahead

Looking Ahead

- APS has filed an extension request with the ACC. While this has not yet been approved, Staff has included the following dates in a proposed order:

IRP Process Step	Current Deadline	Proposed Deadline
IRP submission	August 3, 2026	October 30, 2026
Stakeholder comments due	October 30, 2026	February 10, 2027
Response to stakeholder comments	February 26, 2027	June 10, 2027
Staff Assessment and Proposed Order	May 31, 2027	September 13, 2027

- See uesaz.com/rpac for links to the ACC's IRP docket
- See azcc.gov > Meetings & Cases > Make a Public Comment in a Docket if you would like to file stakeholder comments
- UNSE plans to hold another RPAC meeting in September to review portfolio results

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Customer Energy Optimization Programs

Where grid and customer needs align.

Customer Energy Optimization Programs

Energy Efficiency

Programs to reduce energy use

- Rebates for HVAC upgrades or tune-ups for single family, multi-family and business customers.
- Rebates for products that help reduce energy use.
- Incentives for construction of new high energy efficient single family and manufactured homes.
- Discounted, desert-adaptive shade trees for homes and local businesses.
- Custom energy efficiency projects for schools and local businesses.
- Low-income energy efficiency programs.

Demand Response

Programs to reduce or manage peak demand

- Smart Rewards – Thermostat adjustments by 1 to 3 degrees to reduce energy use during peak periods.
- Storage Rewards - Residential battery discharge during identified grid opportunities.
- Commercial Demand Response – medium and large commercial customer load reduction through automated or manual actions. Program in re-design and relaunching end of 2025.

Transportation Electrification

Programs to manage load

- Residential managed charging for daily off-peak charging.
- Residential and commercial incentives for installation of EV charging stations.
- Fleet electrification advisory services
- Electric school bus vehicle-to-grid pilot.

Innovation, Education and Outreach

- Pilot programs to text new technologies or implementation pathways that help customers manage energy use.
- Community workshops to inform customers of energy efficiency actions and available programs.
- School educational workshops to educate students on energy safety and energy efficiency.

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Market Potential Study

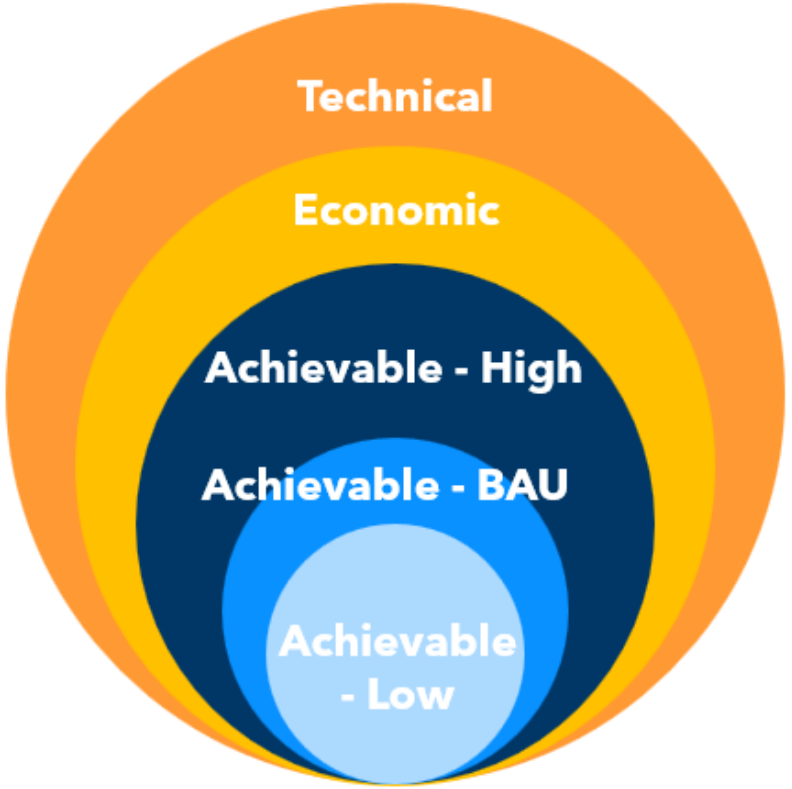
What is a Market Potential Study?

"A **quantitative assessment** of the total opportunity (i.e., potential) for **adoption** of a defined set of **clean energy technologies** in a **particular area** over a **specific time period** (subject to certain **conditions or constraints**)"

Results are typically reported in a few key categories:

Technical: the theoretical limit
Economic: the cost-effective limit
Achievable: accounts for real-world factors

Achievable scenarios: the program limits



Study Parameters

Study Period: 2026-2040

Geography: TEP & UNSE territories

Fuels: Electricity (energy and peak demand)

Study Components:

Scenarios Studied

Business As Usual

Emulates TEP/UNSE's **incentive levels** to simulate business as usual (includes existing and complementary measures).

Business As Usual – Reduced Spending

Emulates decreased DSM efforts, primarily through **decreased incentives** below the levels in the BAU scenario.

Business As Usual – Enhanced Spending

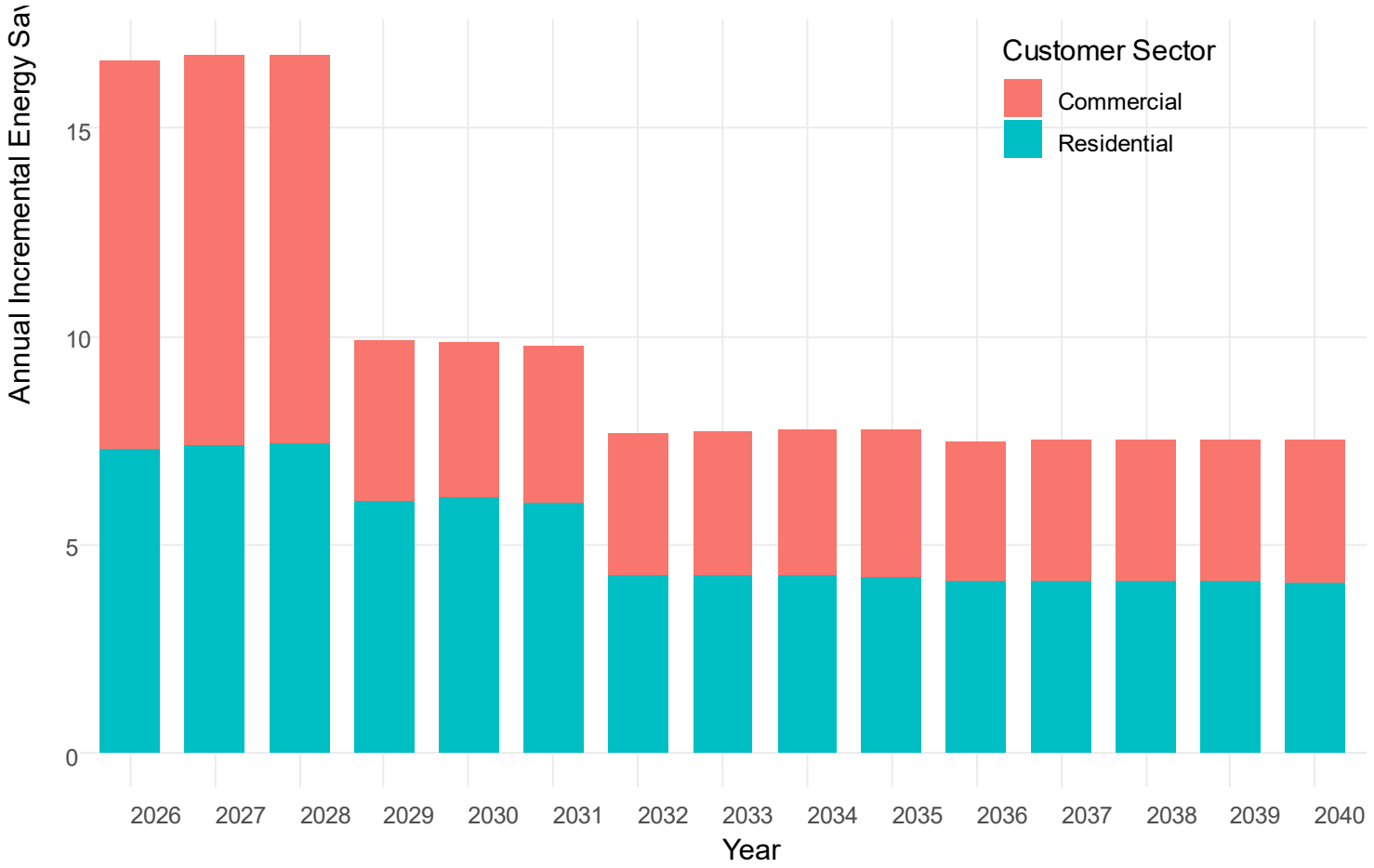
Emulates increased DSM efforts, through **increased enabling activities** and **increased incentives** above the BAU scenario.

New Measures Considered in the Study

Low potential in our service territories.

New Measures Included in Study	Segment
Variable Speed Drive (VSD) Pool Pump Calibration	Residential
Window Shade Screens	Residential + Commercial
Combined Direct/Indirect Evaporative Cooling	Residential
New Measures Not Included in Study	**Segment**
Cool Roofs	Residential + Commercial
Storm Shutters	Residential
Deeply Buried Ducts	Residential
Combined Direct/Indirect Evaporative Cooling	Commercial

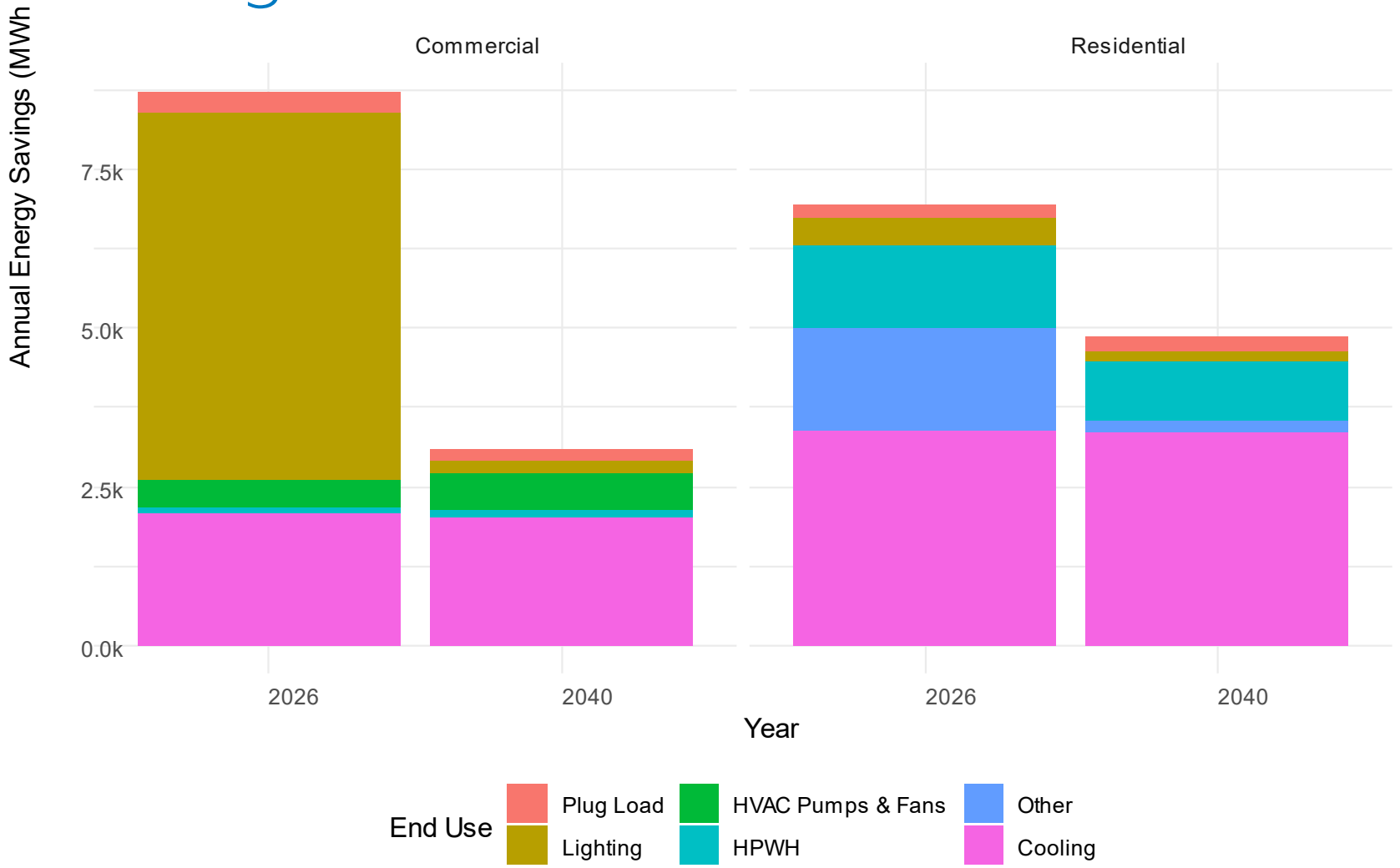
L-T Trends – Annual Incremental Savings - UNSE



- Expand adoption of high-efficiency HVAC systems, heat pumps, smart thermostats, and building envelope improvements such as air sealing, duct sealing, insulation, and weatherization measures that reduce cooling demand.
- Continue expanding participation in multifamily housing, manufactured housing, and low-to-moderate income customer segments.
- Evaluate additional delivery models that improve customer participation while reducing administrative complexity.

BAU Scenario

Drivers of Savings - UNSE



BAU Scenario

Top EE Measures 2026 - UNSE

- The overall **list of top measures is very similar for UNSE and TEP**
- **Some measures move up for UNSE relative to TEP**, including New Home Construction in the Residential Sector and dual-enthalpy economizer controls and retro-commissioning / strategic energy management for Commercial
- For UNSE and TEP, **home energy reports are top residential measure**
  - This opportunity is already well incorporated into programs
  - HERs have a 1-year measure life, so the impact on the energy system is muted relative to longer-lived measures

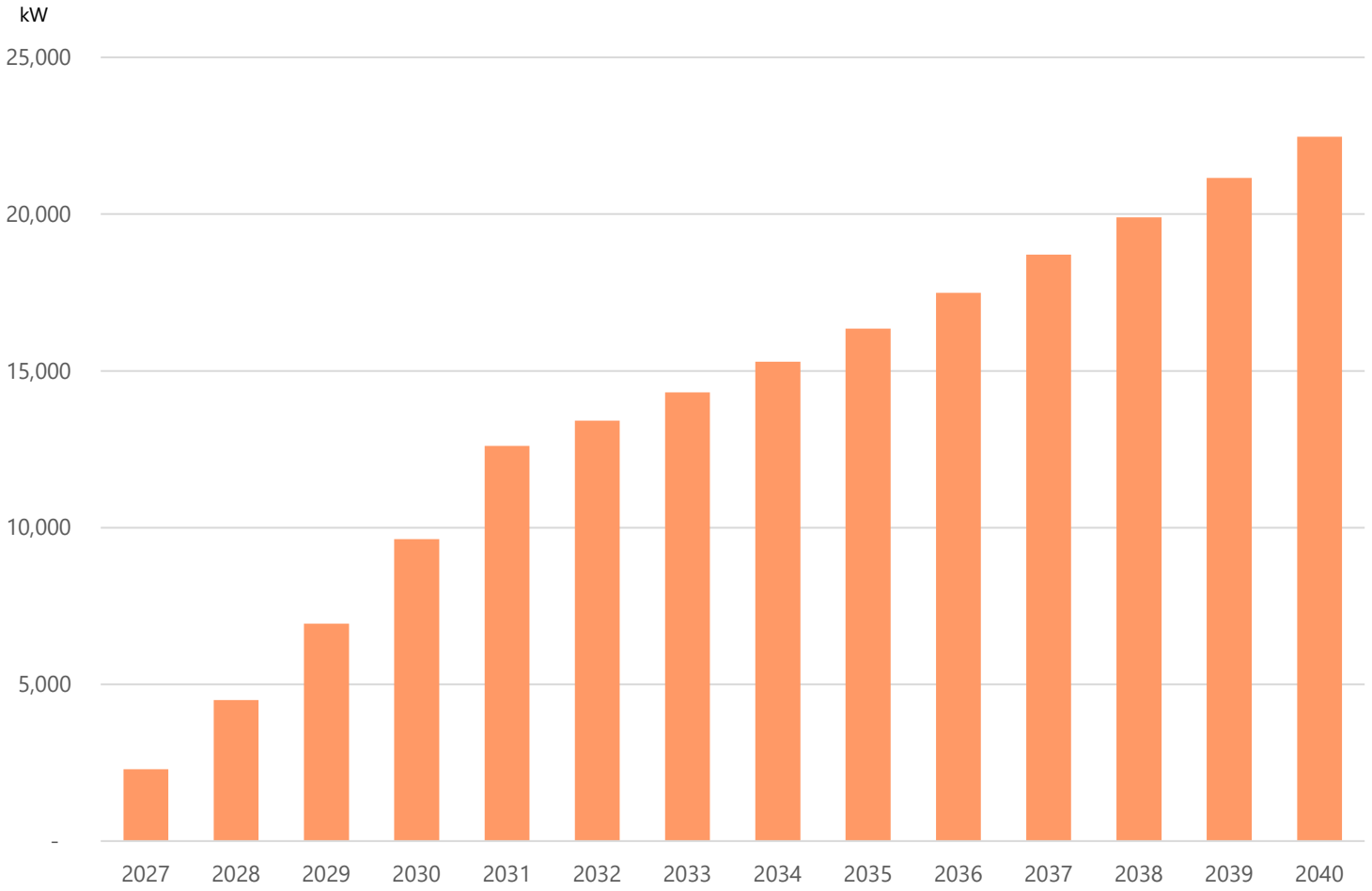
Residential EE	Commercial EE
Home Energy Report	LED Linear Luminaire
New Home Construction	LED High Bay
Heat Pump Water Heater (HPWH)	Thermostat Wi-Fi
Central Air Conditioning (CAC)	Dual Enthalpy Economizer Controls
Central Air Conditioning Tune Up	LED Parking Garage (Exterior)
Air Source Heat Pump (ASHP)	Unitary Air Conditioner
Low Flow Shower Head	HVAC Variable Frequency Drive - Fan
Air Source Heat Pump (ASHP) Tune Up	Air Conditioner Tune-up
Efficient Windows	Retro-commissioning Strategic Energy Manager (RCx SEM)
Night Light	LED Pole Mounted (Exterior)

Note: Top 10 measures sorted and arranged by savings under BAU scenario.

Electric Energy Savings Key Takeaways

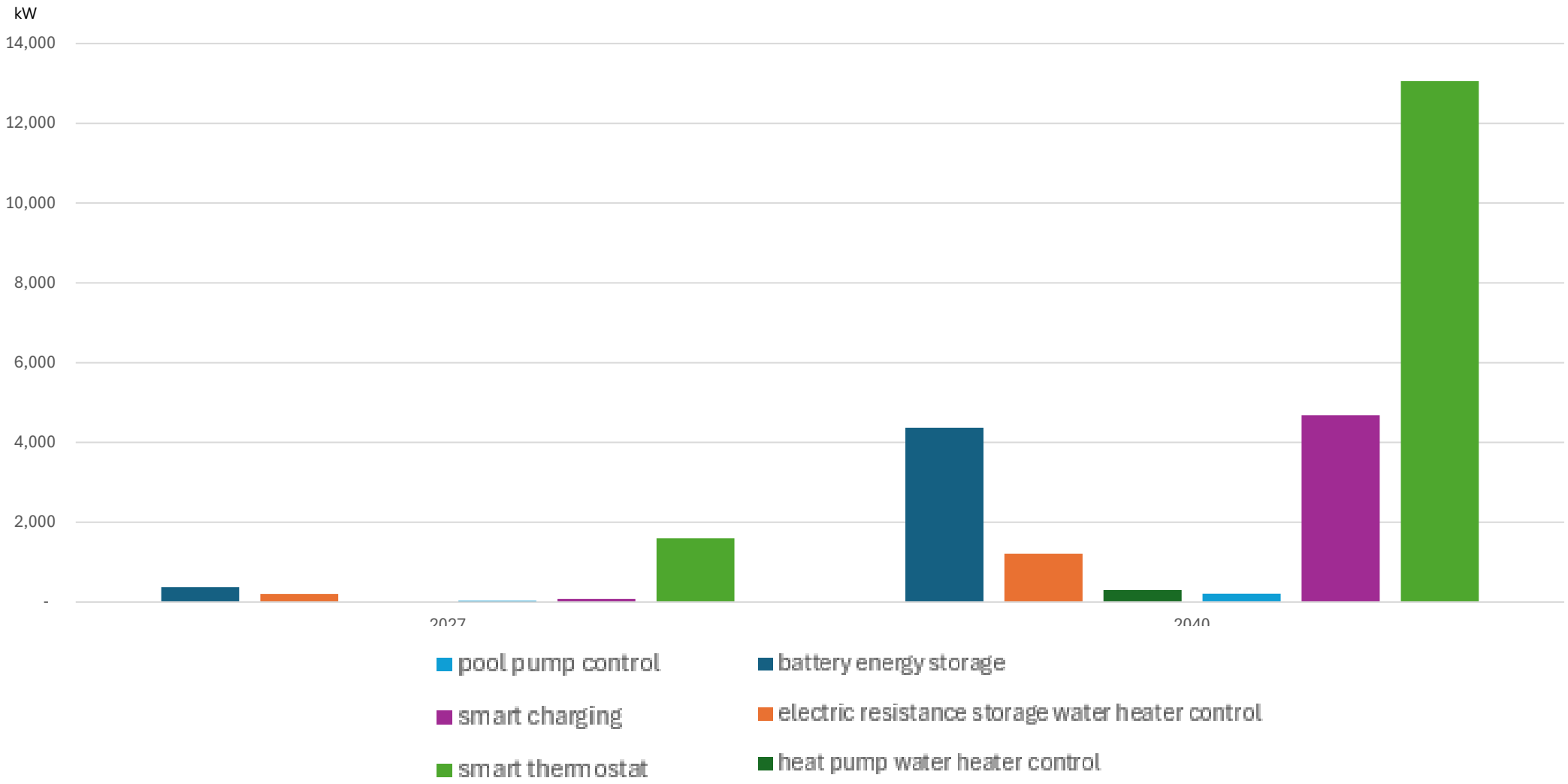
- The combined impact of efficiency and distributed generation adoption can have a notable impact on future electricity consumption
- Top-line energy efficiency trends are dominated by the loss of residential lighting savings, as well as some adjustments to past offerings such as UNSE ramping down behavioral and kit programs
- C&I lighting opportunities are expected to roll off within the next few years, along with some other measures such as residential heat pump water heaters (HPWHs)
  - Declines in potential in later years also driven by exhaustion of discretionary measures like tune-ups which could potentially be spread over more years, or benefit from repeat participation
- New opportunities are available, but will require program adjustments and sustained support to build market capacity and tap into available savings
- Areas for growth include HVAC, Envelope, and Hot Water end uses

Demand Savings DR – UNSE (BAU)



- Launch demand response programs similar to Smart Rewards, Energy Storage Reward and Smart Charge.
- Evaluate additional flexible load opportunities to support a future Virtual Power Plant strategy.
- Explore opportunities for business participation in flexible load programs.

Drivers of Demand Savings - UNSE



Top DR Measures – UNSE

- **Demand response potential is diverse**
- Residential sector opportunities are present across a range of device types, including **controllable HVAC equipment, batteries, water heaters, and EVs**
- Commercial opportunities include batteries and controllable HVAC, as well as **specific program types targeting larger loads**, which are well-established practices in the commercial DR space.

Residential DR	Commercial DR
Wi-Fi Thermostat, AC System, BYOD	Automatic Curtailment
Battery Energy Storage with Solar, BYOD	Manual Curtailment
Smart Switch, Resistance Storage Water Heater, Control, Direct Install	Interruptible Load
EV Managed Charging, BYOD	Wi-Fi Thermostat, BYOD
Pool Pump Control, Direct Install	Thermal Storage, BYOD
Smart Switch, Heat Pump Water Heater, Control, Direct Install	Smart Switch, Resistance Storage Water Heater, Control, Direct Install
Battery Energy Storage Standalone, BYOD	Battery Energy Storage with Solar, BYOD
-	Battery Energy Storage Standalone, BYOD

Note: Top 8 measures sorted and arranged by savings under BAU+ scenario.

Demand Response Key Takeaways

- Though historically limited, demand response opportunities are available for both TEP and UNSE. Consistent offerings and sustained support will be required to unlock this value.

- With long-term support, demand response programs shift or curtail load during high demand periods.

- Linking DR programs with robust energy efficiency programs supports continued participation and program growth.

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Questions?

Break - 10 minutes

2026 IRP Preliminary Base Case Results

Key Terms

Black Mountain Expansion Project

- The addition of four new aero-derivative combustion turbines (CTs)

Planning Reserve Margin (PRM)

- The amount of resource capacity needed above peak load to ensure reliability

Long-term Capacity Expansion model (LTCE)

- Software that will calculate the lowest-cost resource mix to meet given criteria and constraints

Production Cost model (PCM)

- Software that will dispatch the modeled resources to meet load and calculate system costs

Effective Load Carrying Capability (ELCC)

- The amount of capacity each resource can be expected to provide to meet peak load

Sensitivity

- Modeling results from running the PCM on a different set of parameters (change in market or fuel pricing, etc)

Natural Gas Combined Cycle (NGCC)

- A type of gas power plant that utilizes both gas and steam turbines to increase efficiency

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Changes since the 2023 IRP

- New solar and storage resource: Dandelion Solar
  - UNSE recently signed a PPA for a 140 MW solar plus 4-hour battery facility
  - Projected in-service date is 2028
- Combustion turbine in-service date
  - Black Mountain Expansion is estimated in service in 2030
- New load
  - Industrial load is main driver – existing and new customer requests
- Rising inflation
  - Increases both capital and O&M costs
- Reduction in tax credits
  - Increases in capital costs for certain resource types
- Environmental regulations
  - Requires additional sensitivities

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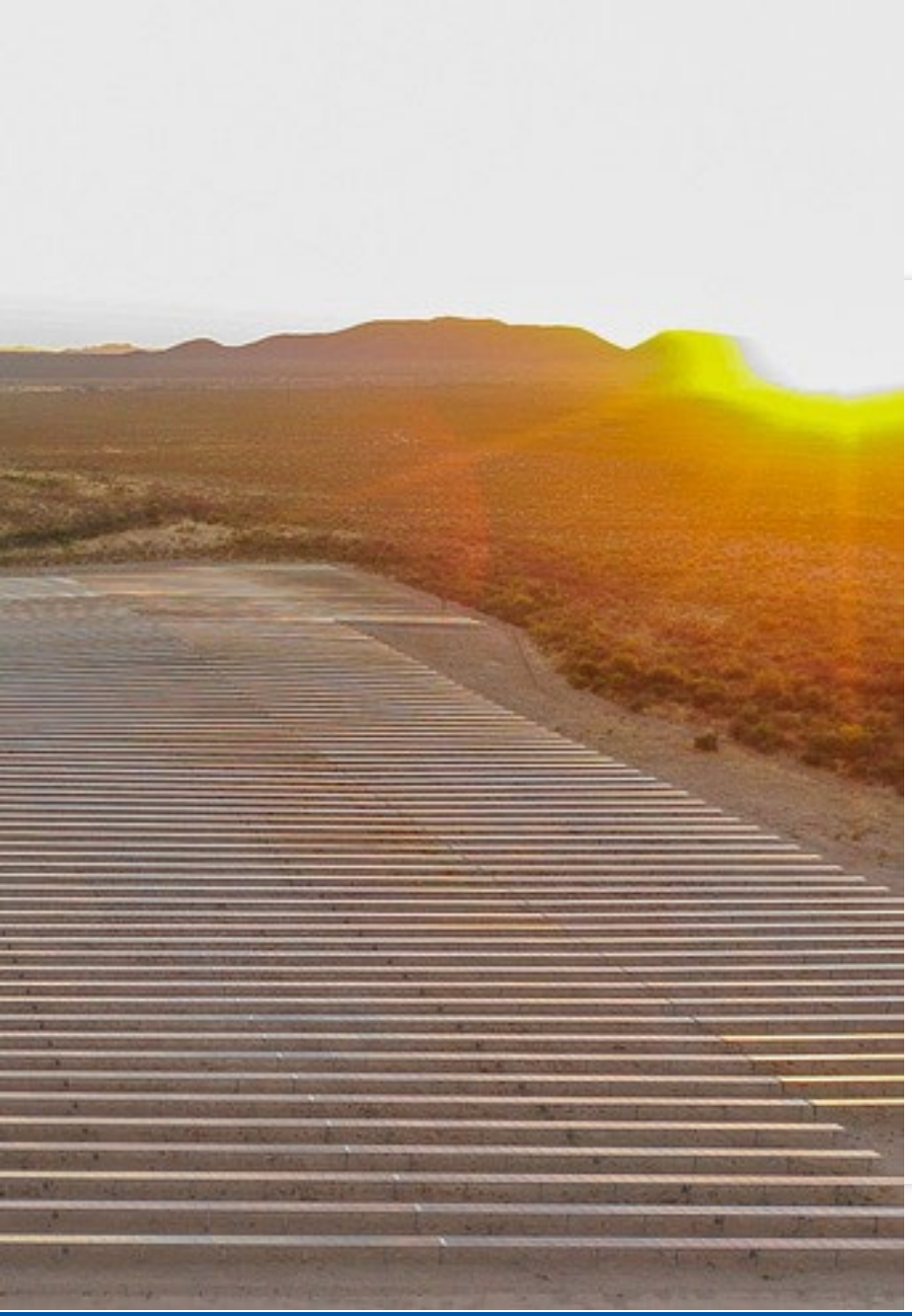


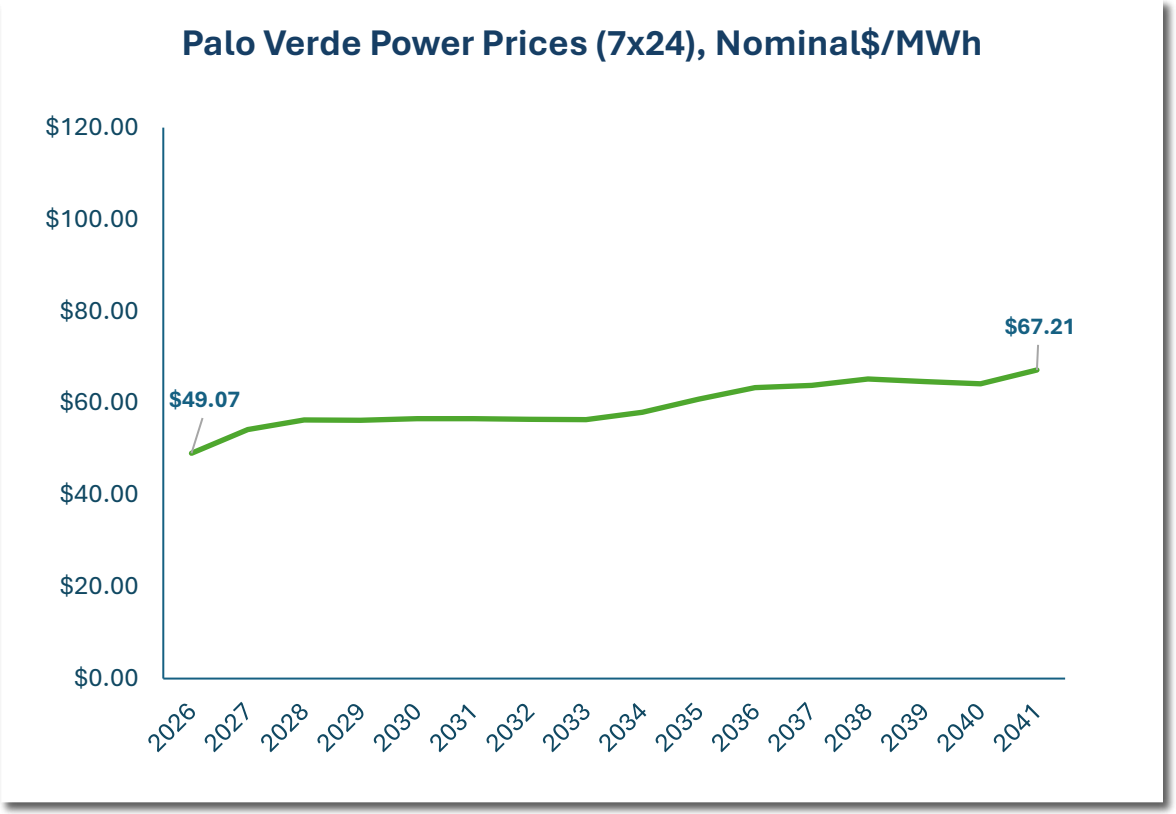
Modeling improvements since 2023

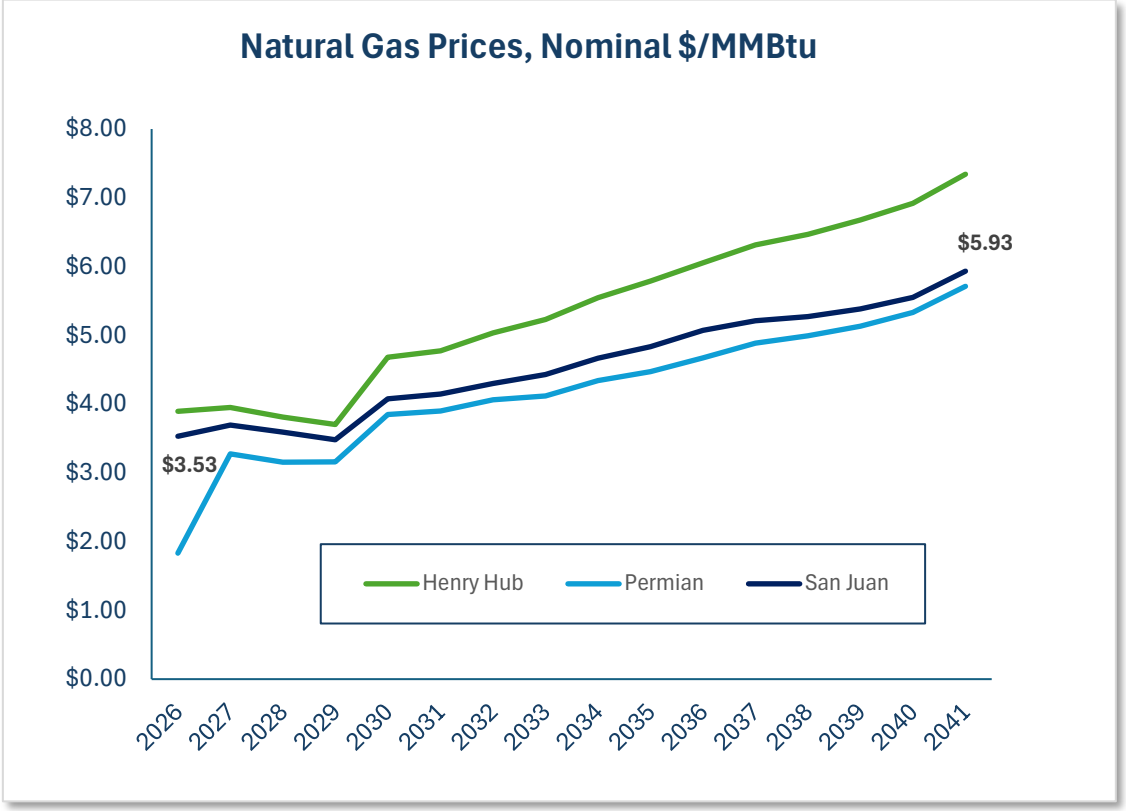
- Modeling Optimization
  - TEP/UNSE retained Siemens PTI to assist with the setup of LTCE in Aurora
- Resource Adequacy (RA) Parameters Update
  - TEP/UNSE retained E3 to update and expand on their 2022 RA study
  - The PRM was updated from 16.5% to 18%
  - E3 performed new ELCC analysis, accounting for updated load and resources forecasts and determining new capacity accreditation values
- Inclusion of Demand Response as a resource
  - Aurora will now select when to dispatch Demand Response

2026 IRP Portfolios

#	Name	Description
P01	Technology Neutral Base Case	• A least-cost, technology neutral portfolio required by the ACC.
P02	Clean Energy Buildout	• A portfolio that only allows the LTCE to chose carbon-free resources (solar, wind, storage, pumped hydro, nuclear).
P03	High Load Factor Customer Growth	• A least-cost, technology agnostic portfolio that adds 150 MW of high load factor customers to the base forecast beginning in 2030.
P04	High Load Factor Customer Growth - Clean Energy Buildout	• A portfolio that adds 150 MW of high load factor customers to the base forecast beginning in 2030 and only allows the LTCE to select carbon-free resources.
P05	Pumped Hydro	• A portfolio that adds 25 MW of pumped hydro storage in 2033.
P06	Geothermal	• A portfolio that adds 25 MW of geothermal generation in 2034. Included due to interest by the RPAC.
P07	Nuclear	• A portfolio that adds 25 MW of nuclear generation in 2038.

Forward Wholesale Power & Natural Gas Market Prices





IRP Assumptions:

- Near-term prices are derived from monthly S&P Global Platts Forward curves.
- Long-term prices reflect a blended forward and fundamental outlook based on Wood Mackenzie 2025 North America Power Market Outlook (moderated case).

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Tax credits – One Big Beautiful Bill Act (OBBBA)

Provision	Inflation Reduction Act (IRA)	OBBBA enacted by President Trump (4 July 2025)
Sections 48E and 45Y tax credit (TC) schedule	• 100% through 2033, 75% in 2034, 50% in 2035, 0% in 2036 and onwards.	• 100% by 2026, 0% by 2027 for solar and wind. • 100% by 2033, 75% by 2034, 50% by 2035 and 0% by 2036 for other technologies including storage.
Requirements to obtain full TC value	• Tax credit value depends on start-of-construction date. • Investment Tax Credit (ITC): a project has four years to be placed in service.	• Beginning-of-construction* (BOC) 2025: Placed-in-service (PIS) by 2029, no FEOC requirement. • BOC H1 2026: PIS by 2030, a 4-year safe harbor, subject to FEOC requirements. • BOC H2 2026: PIS by 2027, no safe harbor, subject to FEOC requirements.
Transferability	• In place throughout the ITC schedule.	• Maintained for sections 48E and 45Y credits. • Preserved for section 45X manufacturing credits.

*** To establish beginning-of-construction, one of two tests must be satisfied: 1) Physical work test: the taxpayer must perform substantial physical work on equipment that is an integral part of the facility. Applies to all projects >1.5 MW_{ac}. 2) The 5% safe harbor test: the taxpayer must pay or incur at least 5% of the total cost of the facility and, for accrual-based taxpayers, take delivery of such components or expect to take delivery within 3.5 months of executing the binding written contract. This option is only applicable to smaller project <1.5 MW_{ac}.**

Source: Wood Mackenzie, Power Market Outlook

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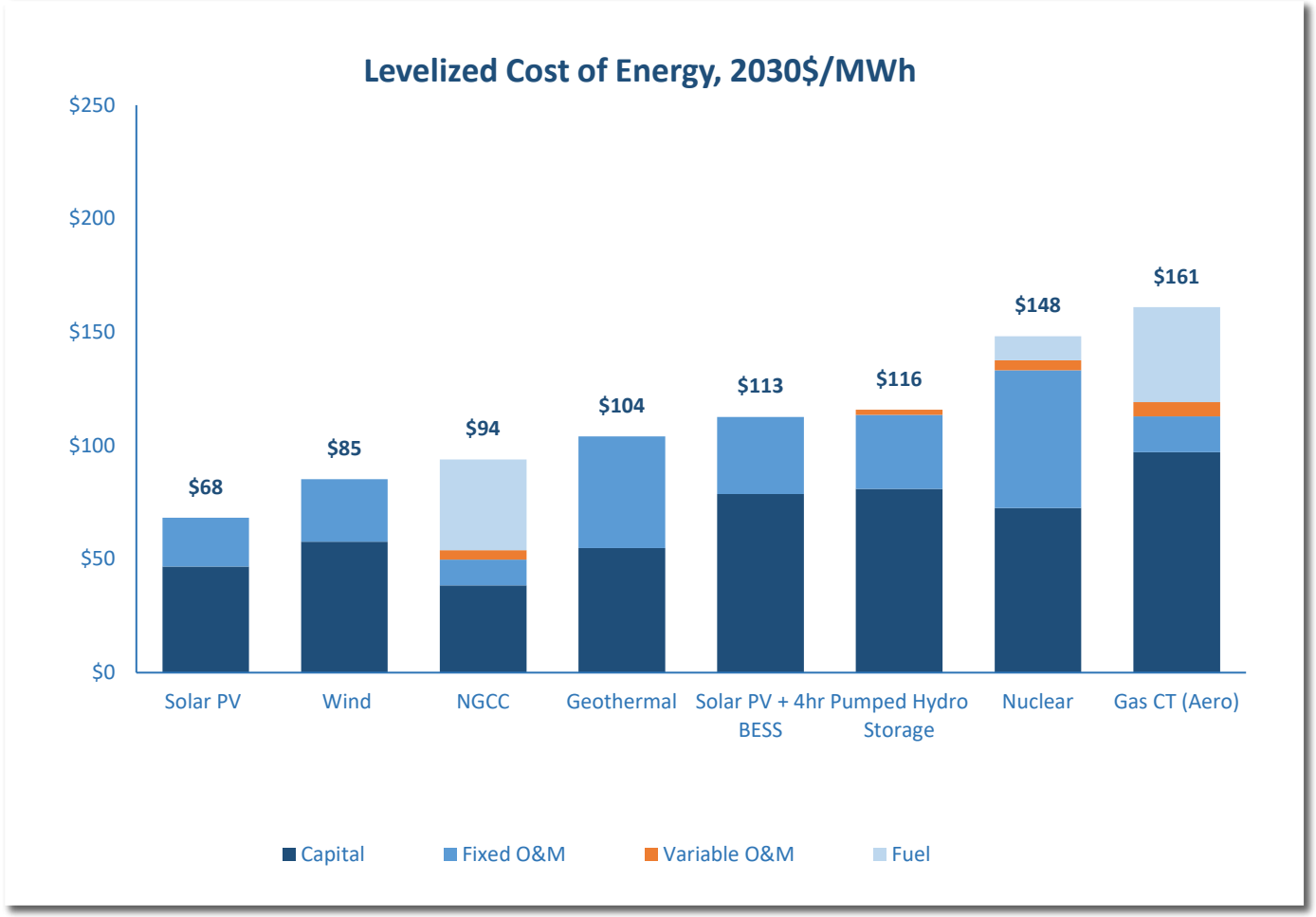
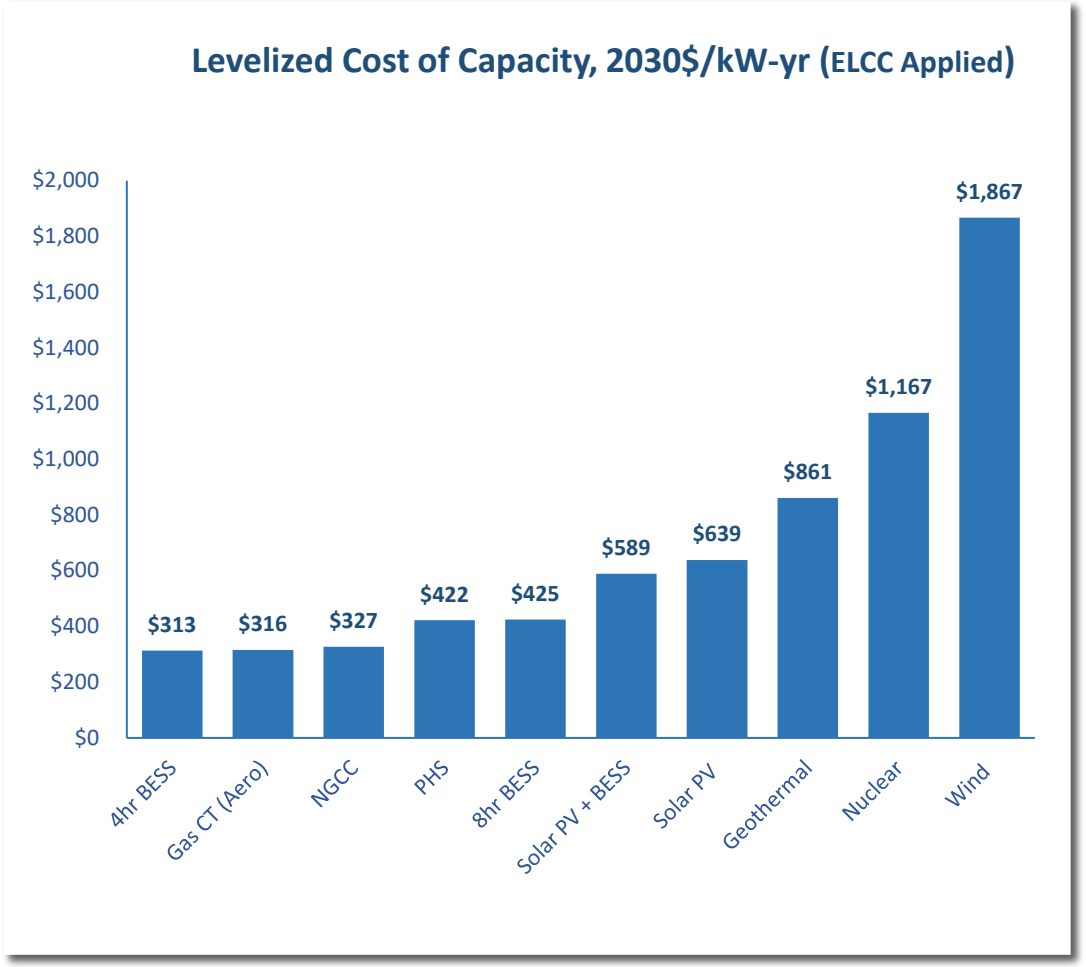
Levelized Cost of New Resources





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LTCE Constraints

	Planning Reserve Margin
Model Constraints	**18.0%**

	Nameplate Capacity (MW)	Annual Max (MW)	Overall Max (MW)
Resource Constraints			
NGCC	25	200	400
Combustion Turbine	25	200	400
Solar	25	150	500
Hybrid Solar	25	150	500
Hybrid Storage (4hr)	25	150	500
Storage (4hr)	25	150	500
Storage (8hr)	25	50	125
Storage (10hr)	25	50	125
Wind	25	150	500
Pumped Hydro Storage (10hr)	25	25	50
Geothermal	25	25	50
Nuclear SMR	25	25	50
Nuclear PWR	25	25	50

NGCC: Natural Gas Combined Cycle
SMR: Small Modular Reactors
PWR: Pressurized Water Reactor

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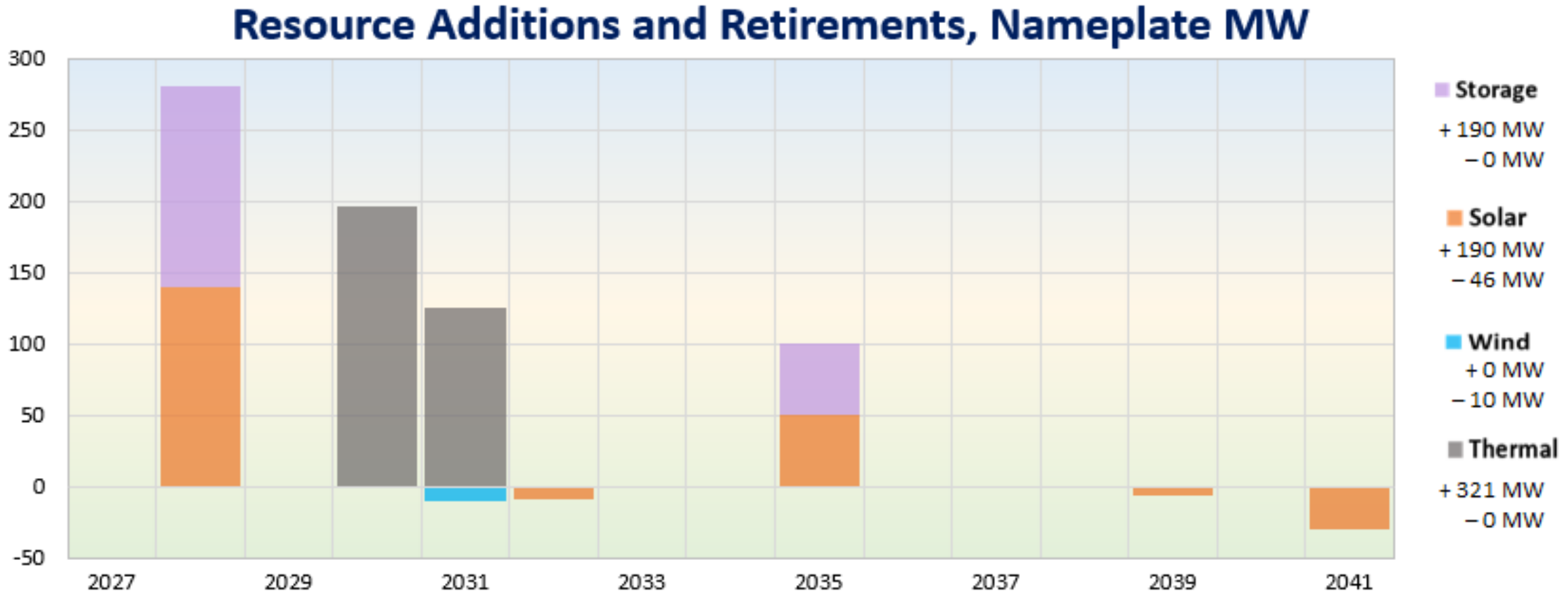
P01 – Technology Neutral



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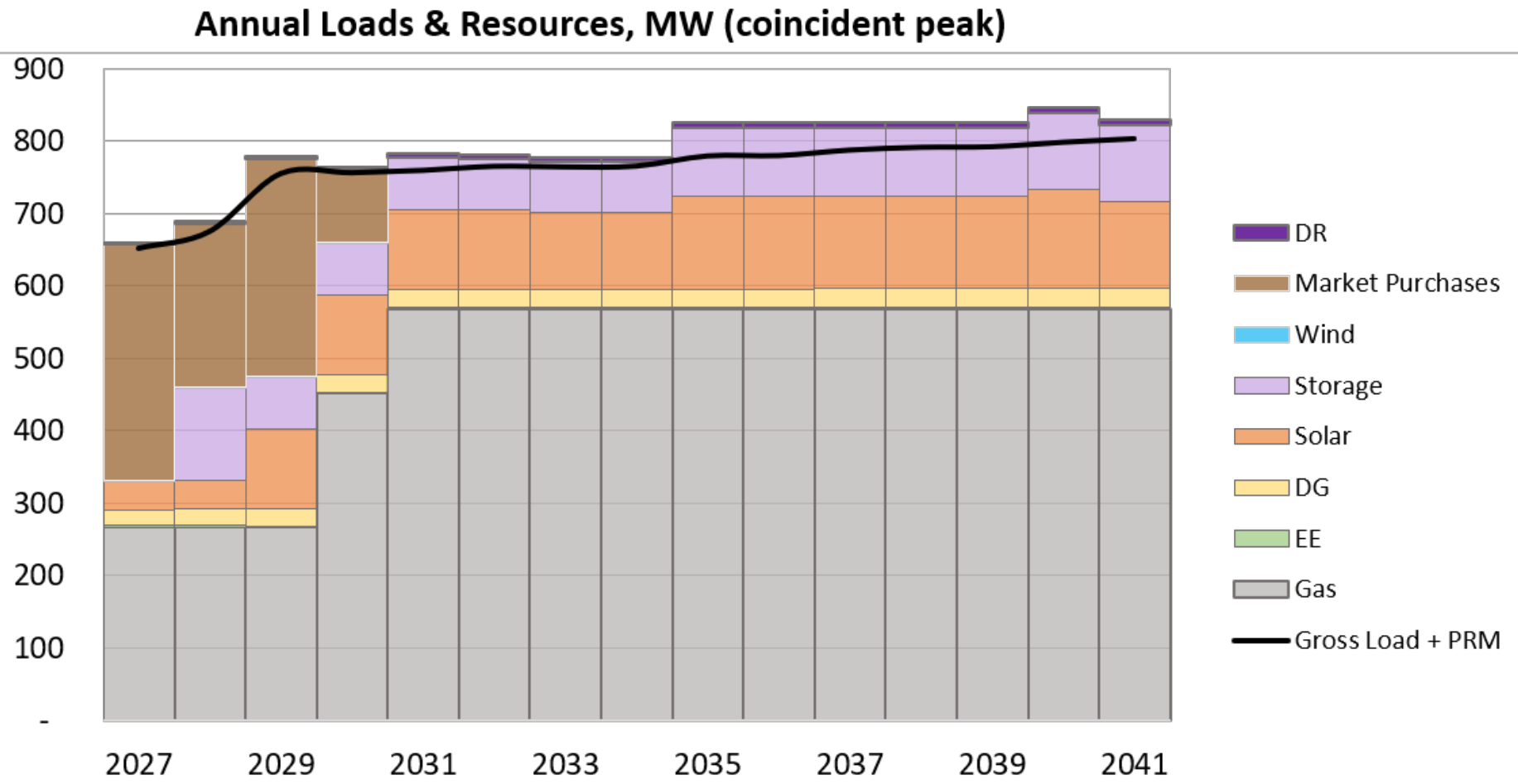
P01 – Technology Neutral



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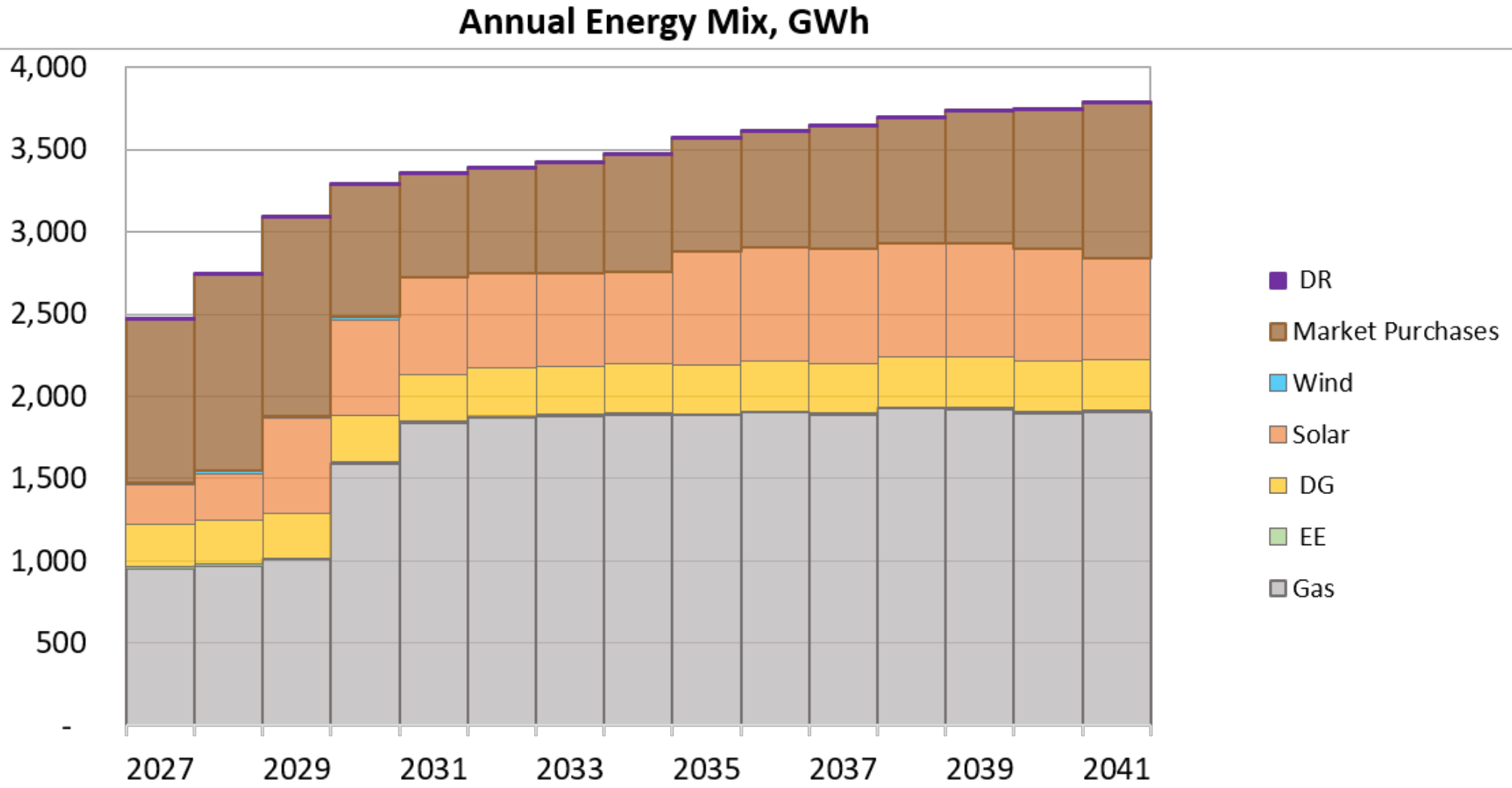
P01 – Technology Neutral



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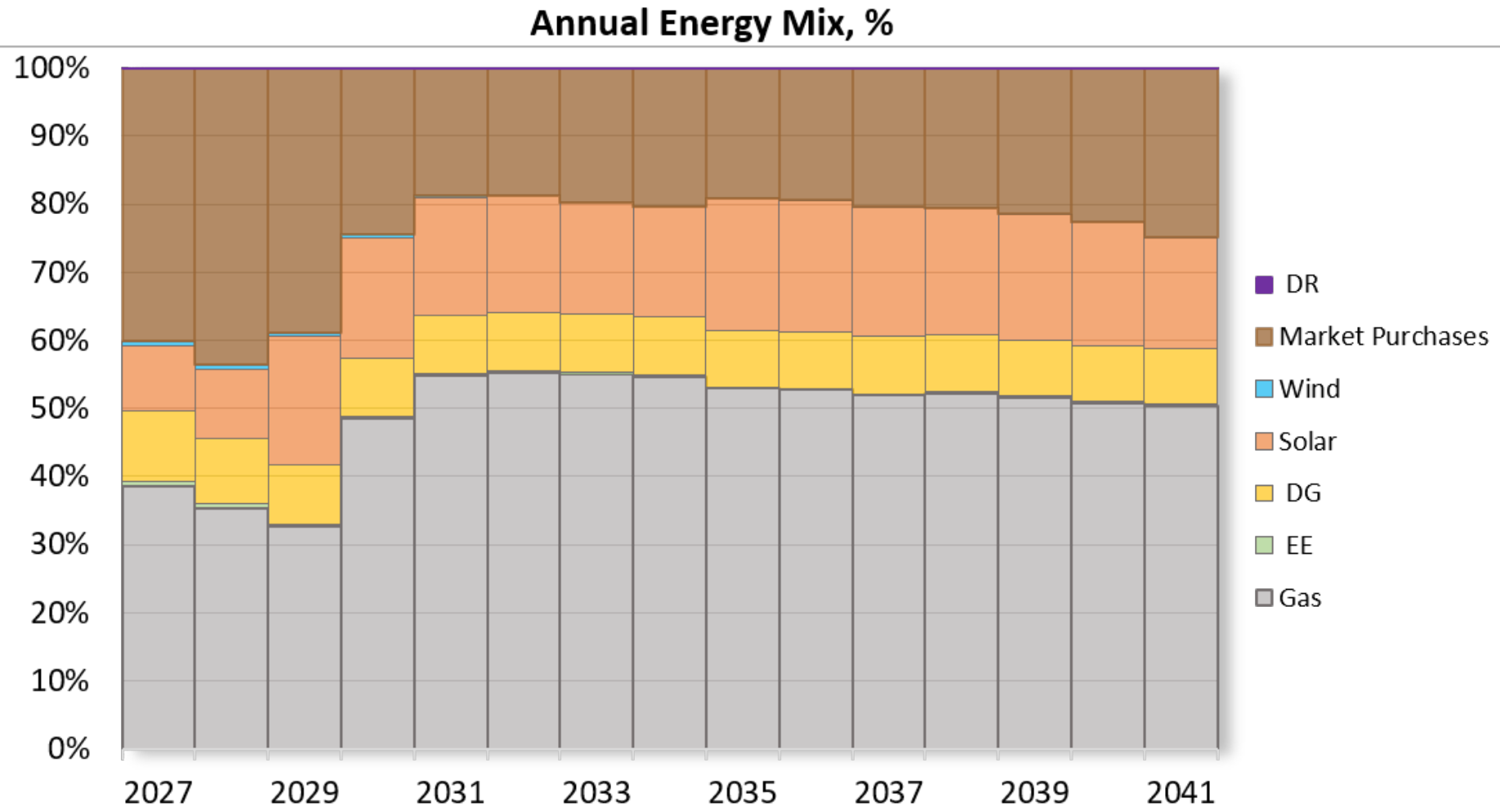
P01 – Technology Neutral



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Thank you!