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BROWNSVILLE PUBLIC UTILITIES BOARD

Integrated Resource Plan Workshop #2

JANUARY 15, 2025

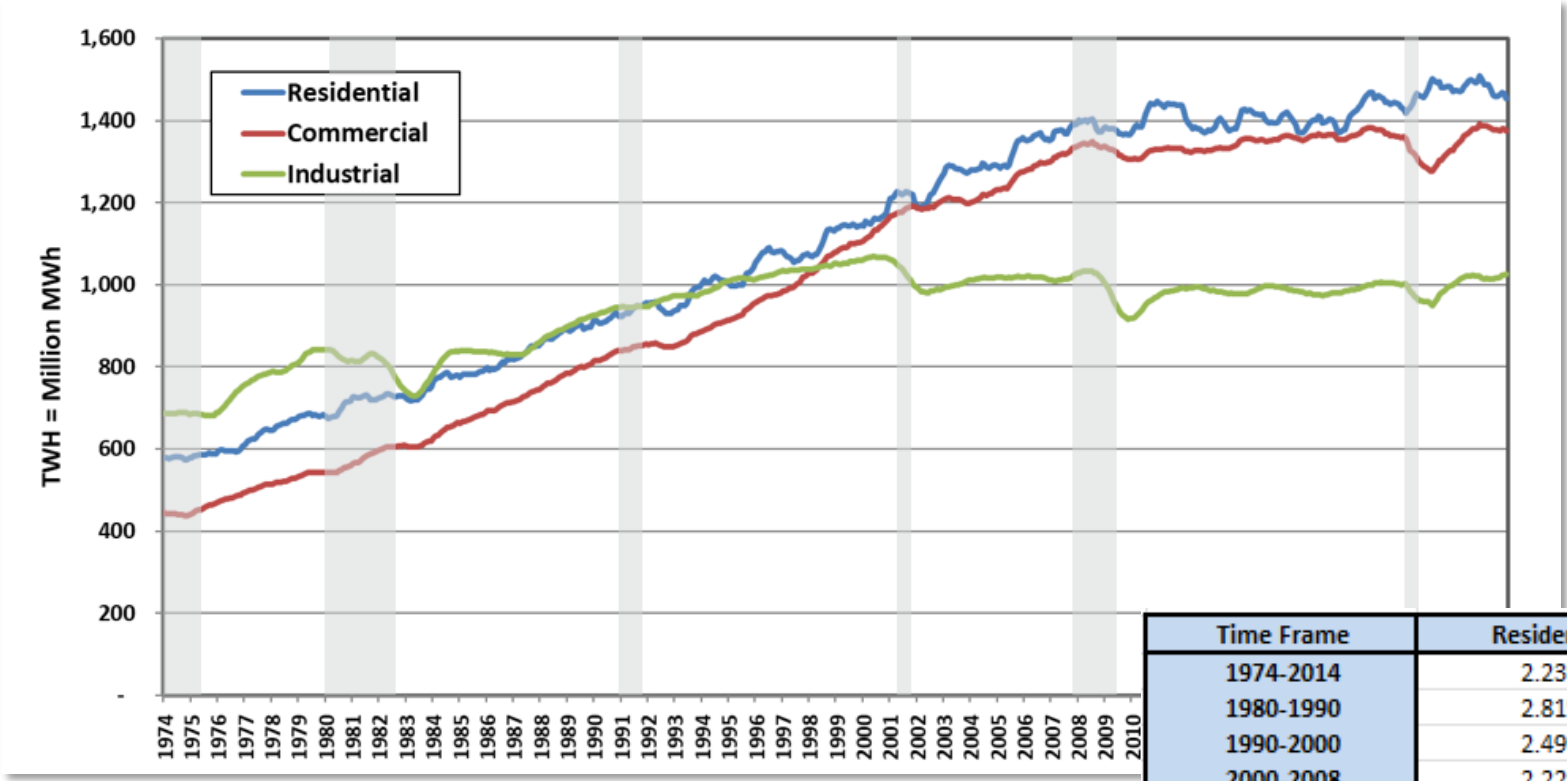
Agenda

- Recap 12/18/2024 BPUB Board & PUBCAP Meeting (10 minutes)
- Introduction to IRP variables and assumptions (50 minutes)
  - Load forecast
  - Energy and Fuel prices
  - Resource options evaluated
- Evaluation Matrix Exercise (120 minutes)
  - Review typical IRP Evaluation Criteria
  - Select non-price evaluation criteria and define
  - Develop non-price evaluation criteria weightings

Workshop #1 – Recap

- ✓Introduction to Integrated Resource Planning
- ✓Megatrends
- ✓Workshop Plan
- ✓Key Tasks of Integrated Resource Plan
- ✓Load Forecast
- ✓Base Case
- ✓Scenarios
- ✓Project Schedule

U.S. Electric Sales



Computed as 12 month moving sum of monthly class sales
Data updated through December 2023

Industry Issues:

- Slow growth since 2010 due to energy efficiency gains.
- Recent accelerations attributed to (1) post-Covid impact, (2) electrification and (3) electric vehicles.
- Pressure from potential large customer additions and data center inquires.

Time Frame	Residential	Commercial	Industrial	Total
1974-2014	2.23%	2.77%	0.94%	1.96%
1980-1990	2.81%	3.93%	1.36%	2.56%
1990-2000	2.49%	3.23%	1.46%	2.37%
2000-2008	2.22%	2.29%	-0.27%	1.49%
2009-2019	0.38%	0.20%	-0.17%	0.16%
2020-2023	0.43%	0.25%	0.37%	0.34%

IRP Forecast

Forecast Objective: To understand potential demand scenarios based on key uncertainty drivers.

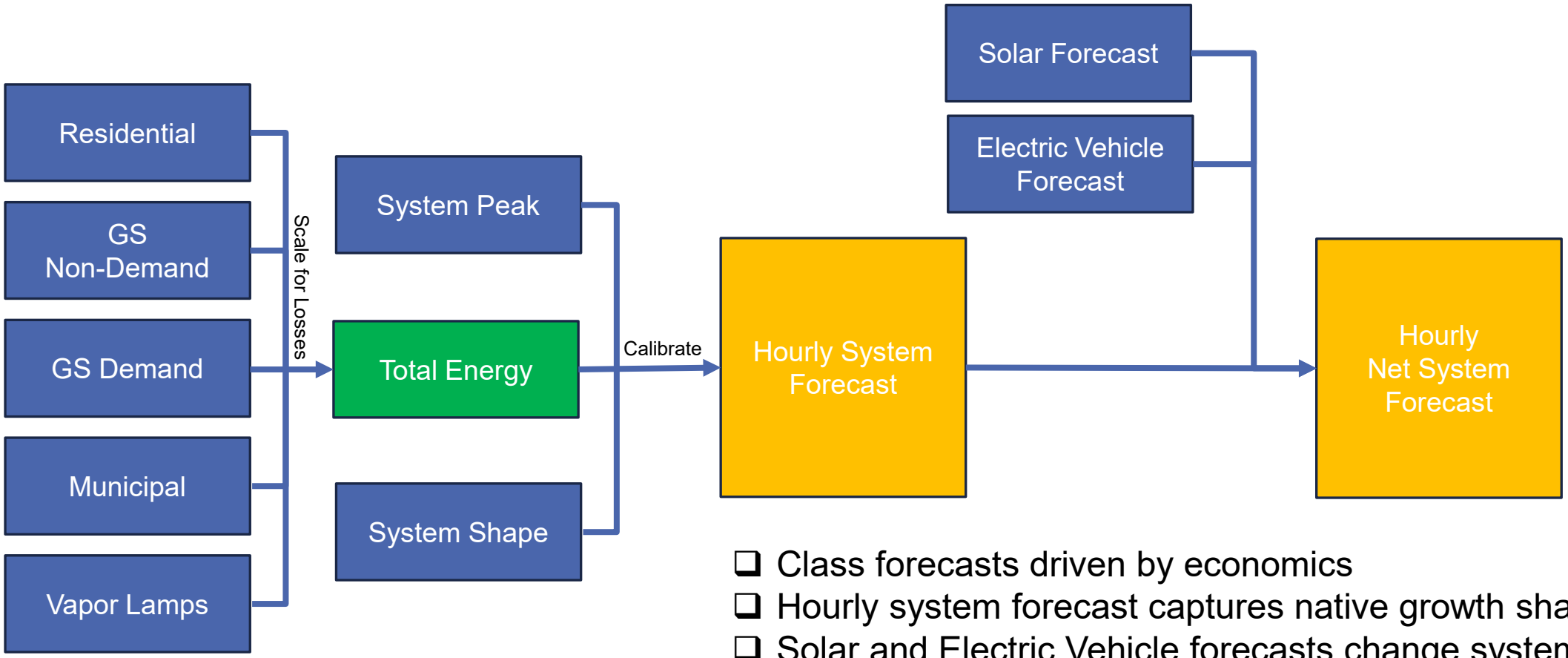
Key Assumptions:

- Woods & Poole's 2024 Forecast for Cameron County.
- 20-Year Normal Weather.
- Electric Vehicle and Behind-the-Meter Solar forecasts based on EIA forecasted growth.
- Includes nationally adopted energy efficiency codes and standards.
- Excludes large customer additions.

Scenarios:

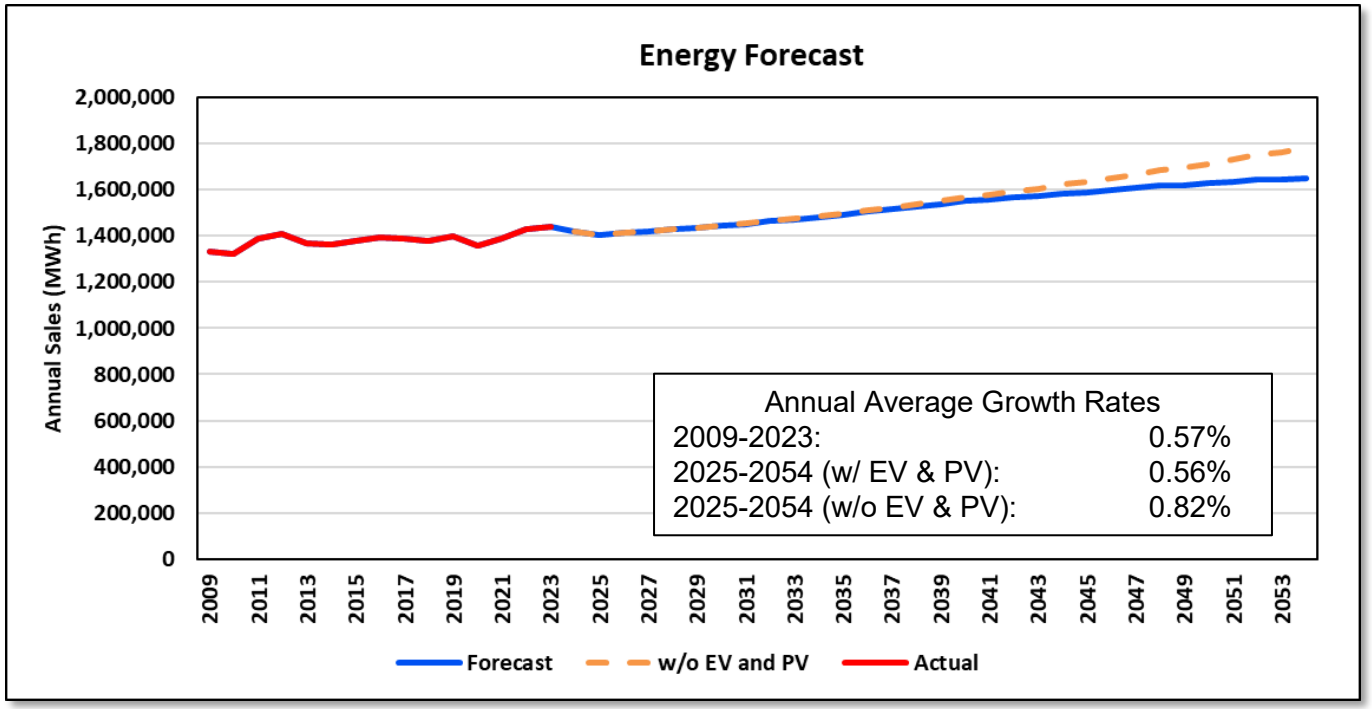
- Base Case (Native growth)
- Base Case / Extreme Weather
- Base Case / Mild Weather
- High Economic Case / Normal Weather
- Low Economic Case / Normal Weather
- Base Case / Normal Weather / Large Customer

Forecast Method



- ❑ Class forecasts driven by economics
- ❑ Hourly system forecast captures native growth shape
- ❑ Solar and Electric Vehicle forecasts change system shape

Base Case Forecast Result



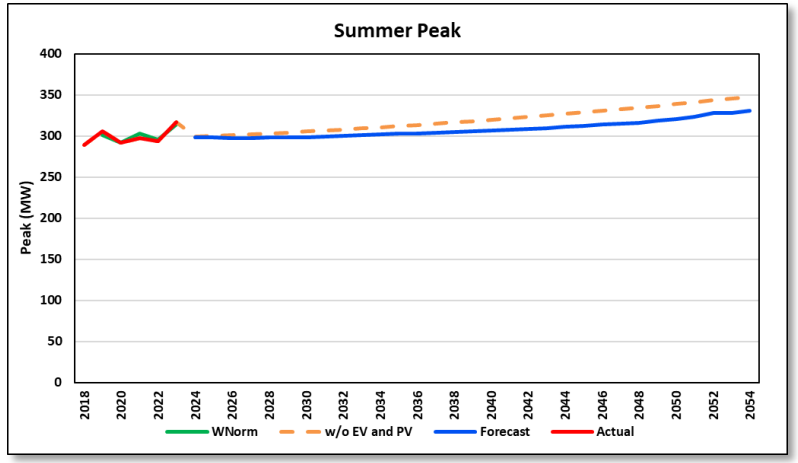
Energy Summary (MWh)			
	Actual	Energy w/EV&PV	Energy wo EV&PV
2010	1,323,277		
2015	1,379,800		
2020	1,359,231		
2023	1,437,405		
2025		1,405,322	1,404,060
2030		1,443,243	1,445,402
2035		1,492,510	1,498,165
2040		1,550,354	1,566,436
2045		1,589,706	1,634,828
2050		1,627,855	1,713,218
2055		1,654,092	1,798,593

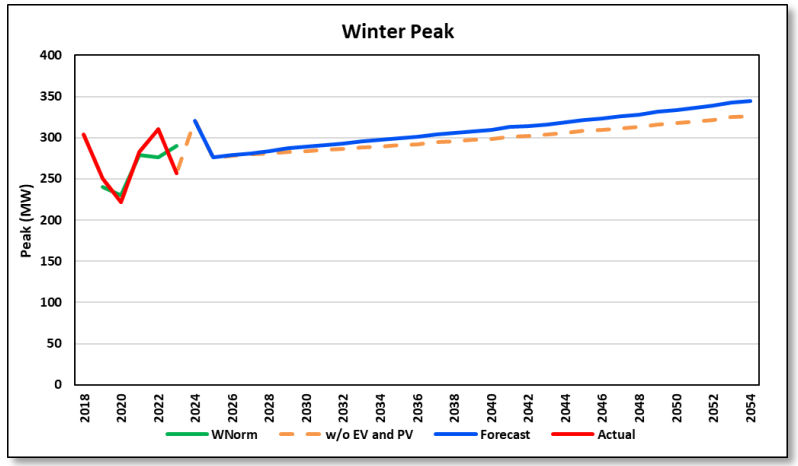
- ✓ Forecast without new EV and PV is consistent with economic forecast.

Economic Forecast	2009-2023	2025-2054
Households:	1.09%	0.88%
Employment:	1.82%	1.28%
GDP	2.41%	1.45%
Income	2.47%	2.70%
Govt Employment	-0.51%	0.47%

- ✓ PV additions are greater than EV additions and lower the final forecast.

Base Case Peak Forecast





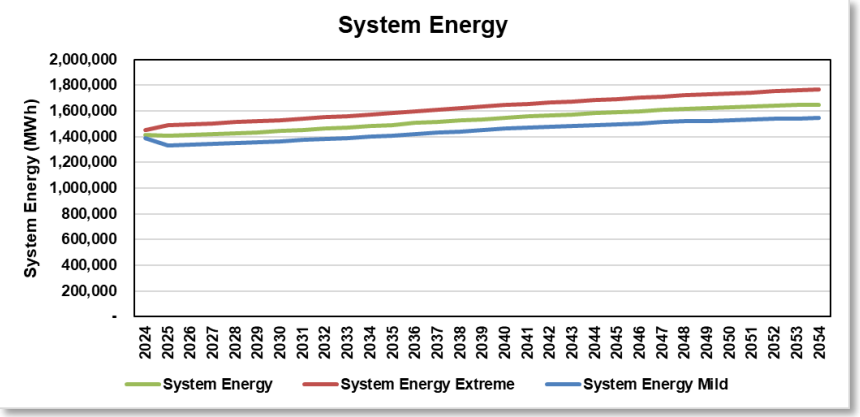
Peak Summary (MW)				
	Sum w/EV & PV	Sum w/o EV & PV	Win w/EV & PV	Win w/o EV & PV
2020	292	292	222	222
2023	317	317	257	257
2025	298	300	298	275
2030	299	305	299	284
2035	299	312	299	291
2040	307	320	310	299
2045	312	329	321	329
2050	321	339	333	317
2055	334	350	347	329

- ✓ Sales (Energy forecast) drives peak growth.
- ✓ PV increases reduce summer peak.
- ✓ EV increased increase winter peak.
- ✓ System transitions from summer peaking to winter peaking in 2027 due to EV and PV additions.

Annual Average Growth Rates

	Summer	Winter
2025-2054 (w/ EV & PV):	0.36%	0.76%
2025-2054 (w/o EV & PV):	0.51%	0.59%

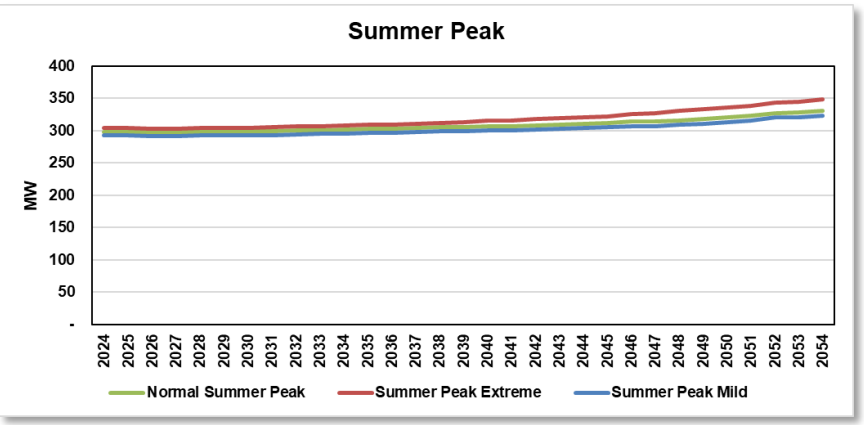
Weather Scenarios

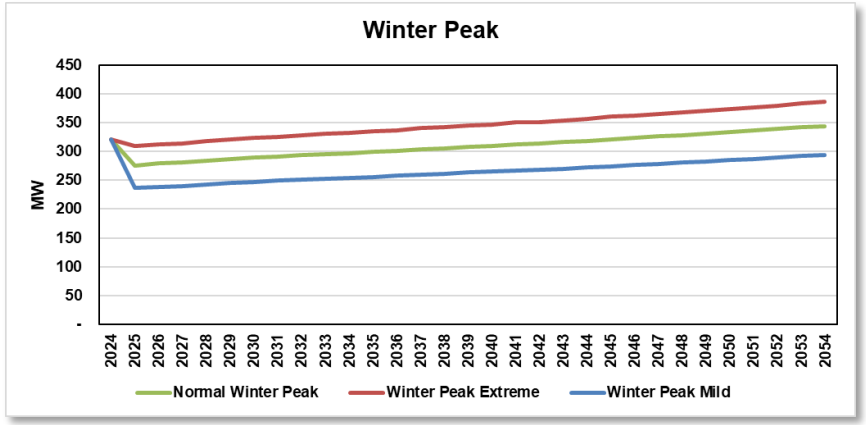


Weather Scenario Definition

Weather scenarios represent a 1-in-10 chance of occurring based on historical weather occurrences.

	Normal	Extreme	Mild
Annual CDD65	4,259	4,617	3,896
Annual HDD65	494	716	305
Summer Peak	86.9º	89.0º	85.0º
Winter Peak	41.9º	37.0º	48.0º



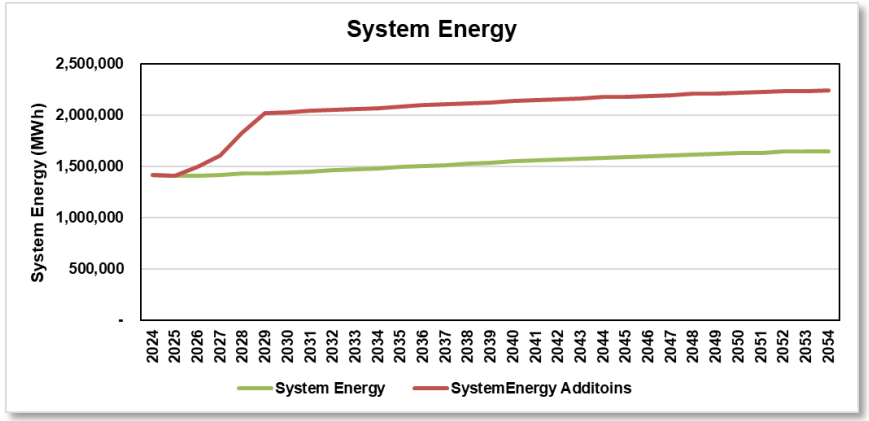


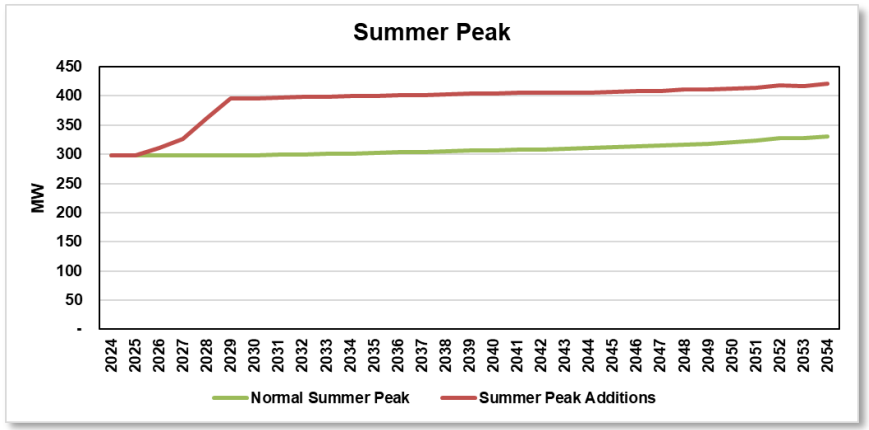
Energy Summary (MWh)	Base	Extreme	Mild
2025	1,405,322	1,487,909	1,331,215
2030	1,443,243	1,529,709	1,365,733
2035	1,492,510	1,583,711	1,410,734
2040	1,550,354	1,665,486	1,477,122
2045	1,589,706	1,692,703	1,497,211
2050	1,627,855	1,737,412	1,529,403
2055	1,654,092	1,770,686	1,549,250

Summer Peak (MW)	Base	Extreme	Mild
2025	298	304	293
2030	299	305	293
2035	302	309	296
2040	307	315	300
2045	312	322	305
2050	321	336	313
2055	334	351	326

Winter Peak (MW)	Base	Extreme	Mild
2025	276	309	237
2030	289	323	247
2035	299	335	256
2040	310	347	265
2045	321	360	274
2050	333	373	285
2055	347	389	297

Large Customer Scenario

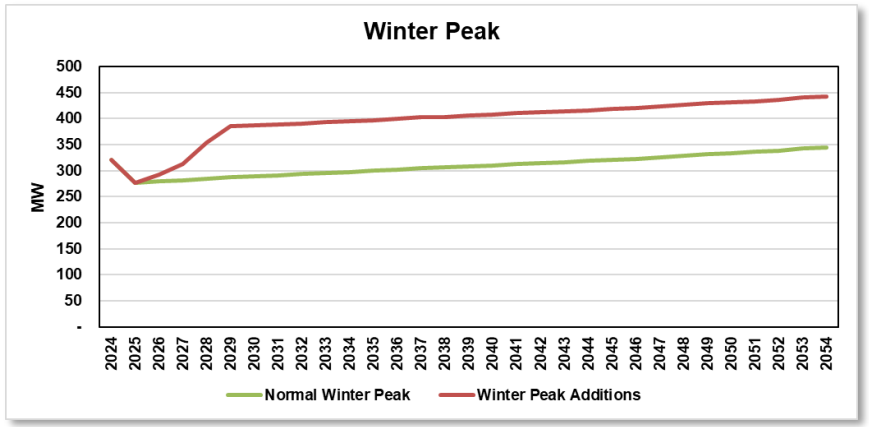




Scenario Definition

Size, timing, and probably based on BPUB staff evaluation.

Customer	Size (MW)	Year	Probability
Customer 1	5.0	2025	100%
Customer 2	20.0	2025-2026	80%
Customer 3	4.5	2026	10%
Customer 4	30.0	2027	60%
Customer 5	190.0	2028	10%
Customer 6	132.0	2026-2028	30%

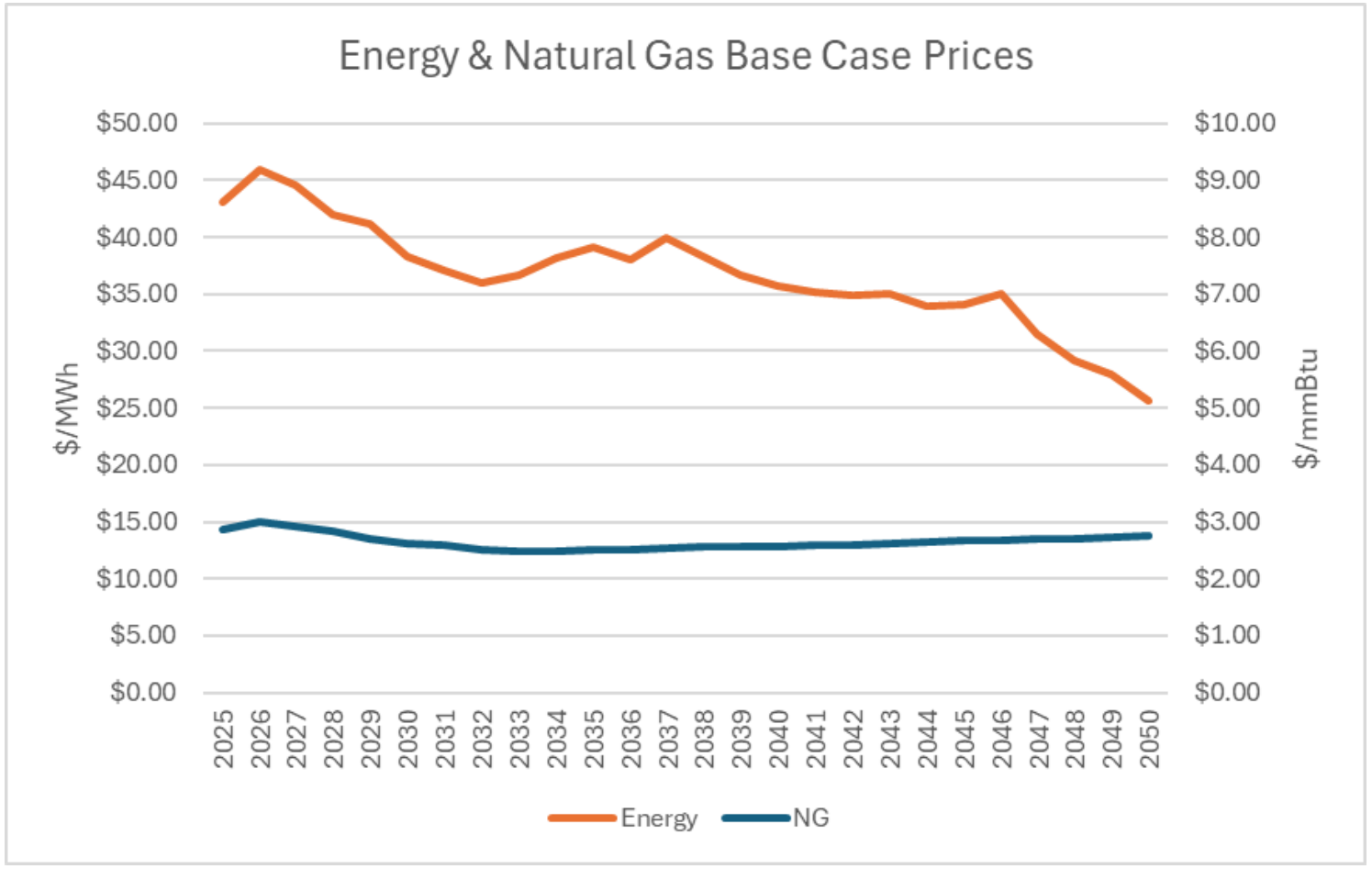


Energy Summary (MWh)	Base	Large Additions
2025	1,405,322	1,411,497
2030	1,443,243	2,030,776
2035	1,492,510	2,080,043
2040	1,550,354	2,153,757
2045	1,589,706	2,177,239
2050	1,627,855	2,215,388
2055	1,654,092	2,241,625

Summer Peak (MW)	Base	Large Additions
2025	298	309
2030	299	396
2035	302	400
2040	307	405
2045	312	407
2050	321	413
2055	334	423

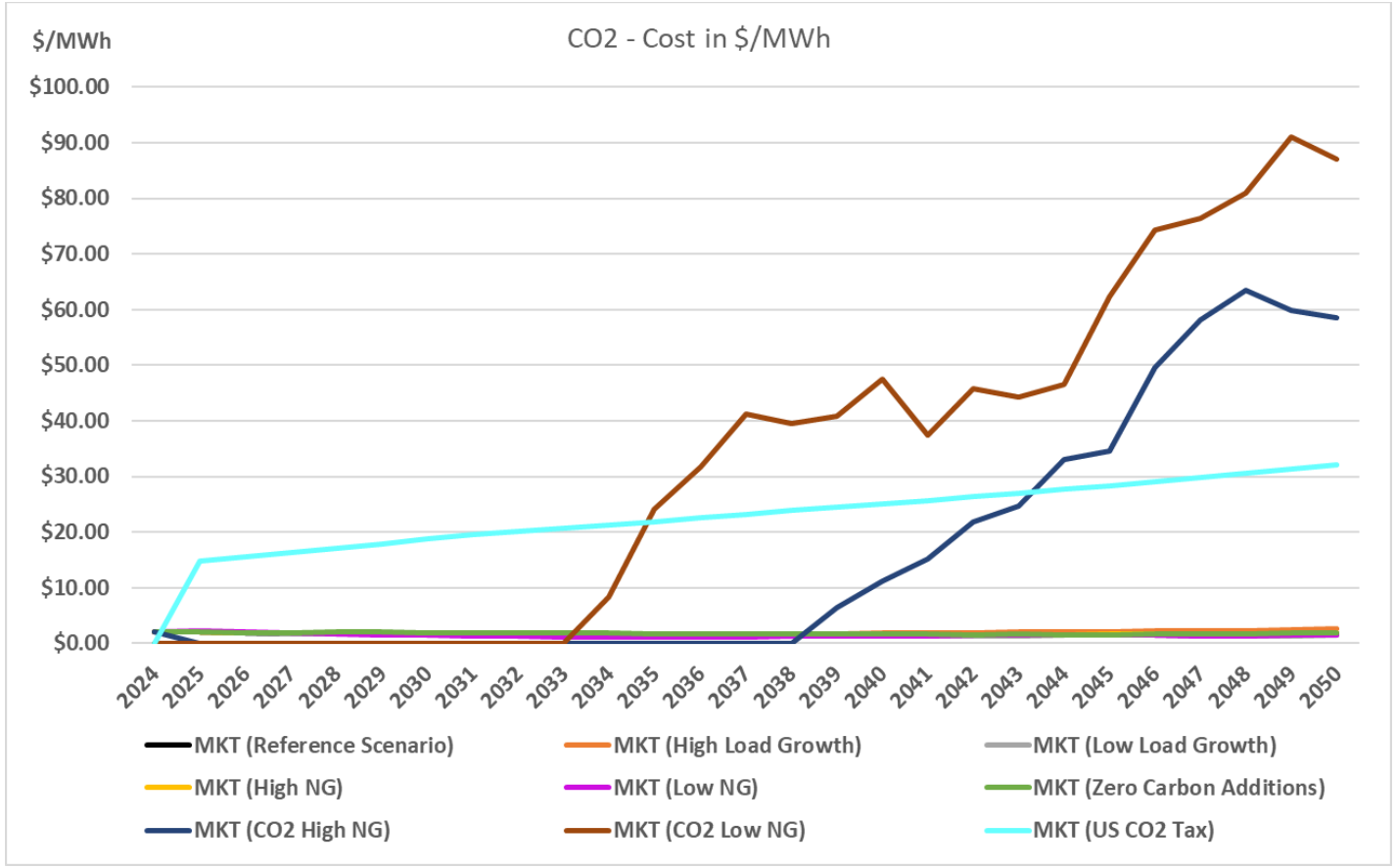
Winter Peak (MW)	Base	Large Additions
2025	276	309
2030	289	387
2035	299	397
2040	310	408
2045	321	419
2050	333	431
2055	347	445

Energy & Fuel Price Inputs Base Case



Real $2022

CO2 Prices



Real $2022

Resource Options Evaluated

- Reciprocating Internal Combustion Engine (RICE)
- Combustion Turbine – Aeroderivative
- Combined Cycle - Aeroderivative
- Combustion Turbine – Frame
- Battery Energy Storage (BESS)
- Wind – Onshore
- Solar PV – Tracking
- Solar PV – BESS Co-located
- DSM/EE

Evaluation Matrix and Decision Model

The goal of the evaluation matrix is to define and rank each resource plan option based on its ability to best meet the criteria important to BPUB and its customers. The typical evaluation criteria include:

- Environmental
- Reliability and Resiliency
- Social and Economic
- Technical and Operational
- Risk and Uncertainty Cost
- Policy and Regulatory
- Customer Impact/Cost

Today, we will be determining specifically which key considerations of the above are most important to BPUB and its customers as well as provide input on ranking their importance.

Questions and Next Steps

- Questions?
- Workshop # 3 - February 26, 2025 (3 Hour Meeting)