

GWP 2024 Integrated Resource Plan

Stakeholder Technical Advisory Group meeting 4

August 9, 2023



Agenda

- + Understanding what initial results of scenario modeling look like (40 min)
 - + Presentation from Ascend Analytics (15 min)
 - + Q&A (20 min)
- + Understanding the inputs and assumptions informing scenario modeling (55 min)
 - + Presentation from Ascend Analytics (20 min) and Strategen (5 min)
 - + Q&A (30 min)
- + Break (5 min)
- + Full-group discussion on community-preferred scenarios (75 min)
- + Brainstorming for Saturday's townhall (10 min)

Objectives for this meeting

- + Help STAG members understand what results of the modeling process look like
- + Discuss modeling inputs and assumptions
- + Agree on further detail of STAG's scenarios
 - + Coalesce around two visions for STAG scenarios, with as many details as possible
- + Brainstorm an approach for Saturday's townhall

We have a lot to get through tonight!

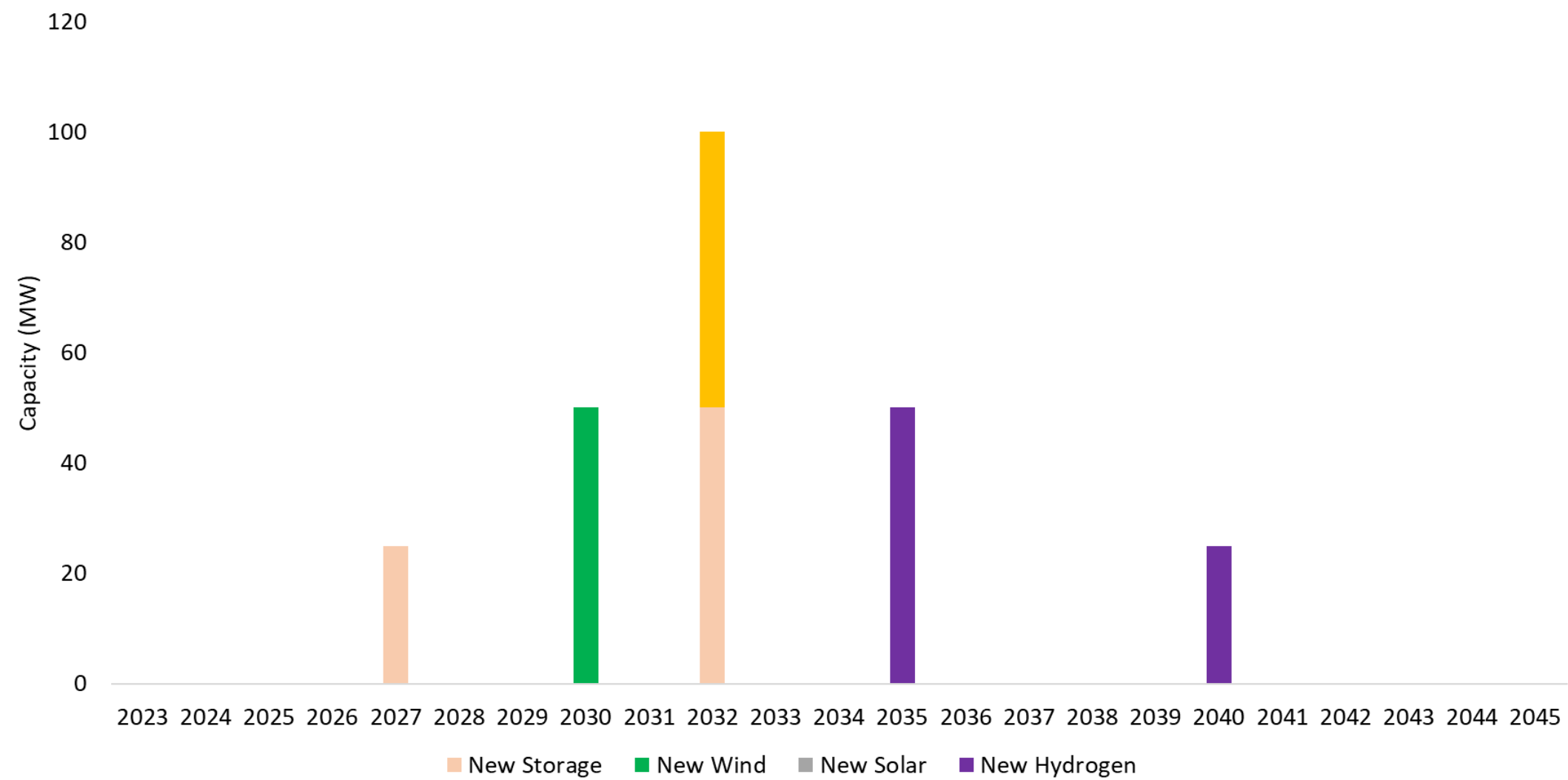
- + It's really important that we have enough time to discuss and align (at a high level) on STAG scenario 2 tonight, so we can take what we come up with to Saturday's townhall.
- + We ask that everyone stay focused on the topic at hand so we can get through the agenda on time.
 - + If you have questions that we would be able to circle back to you on at a later date, please write these down and we'll address them with you offline.
- + We may need to move along from fruitful discussions for the sake of time but can circle back to these conversations at future meetings.



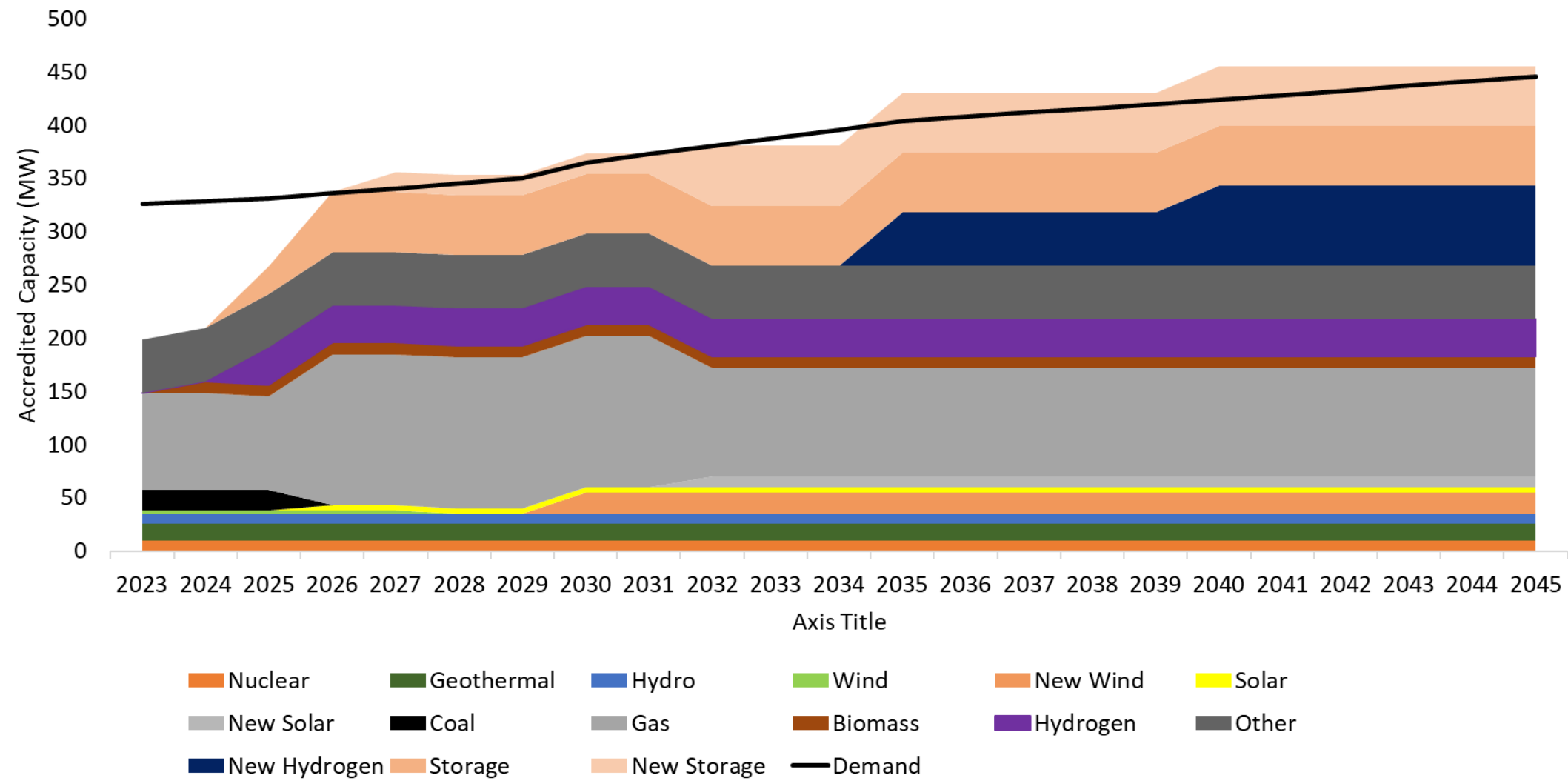
Example Model Outputs

(Note for illustrative purposes only)

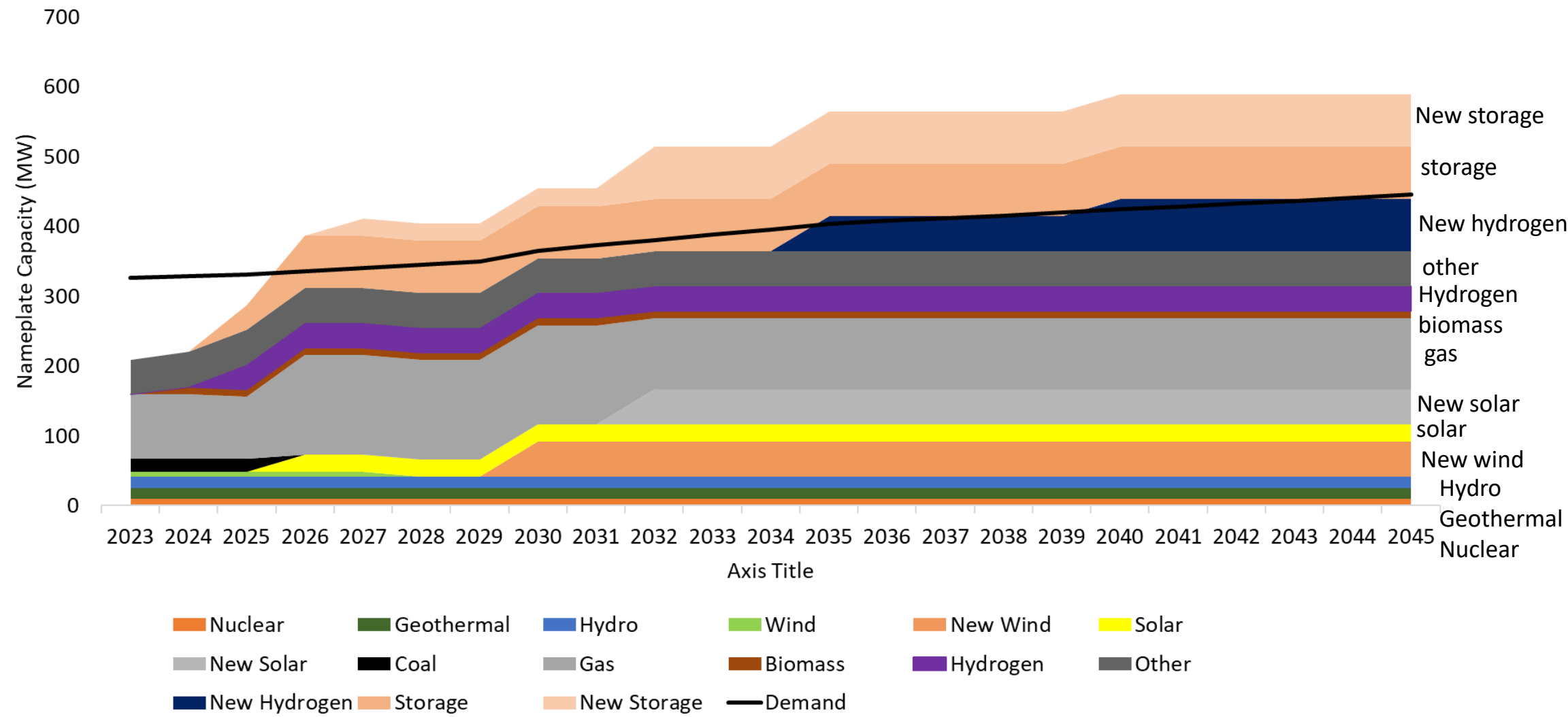
New Resource Builds



Accredited Capacity



Nameplate Capacity



Q&A (20 min)

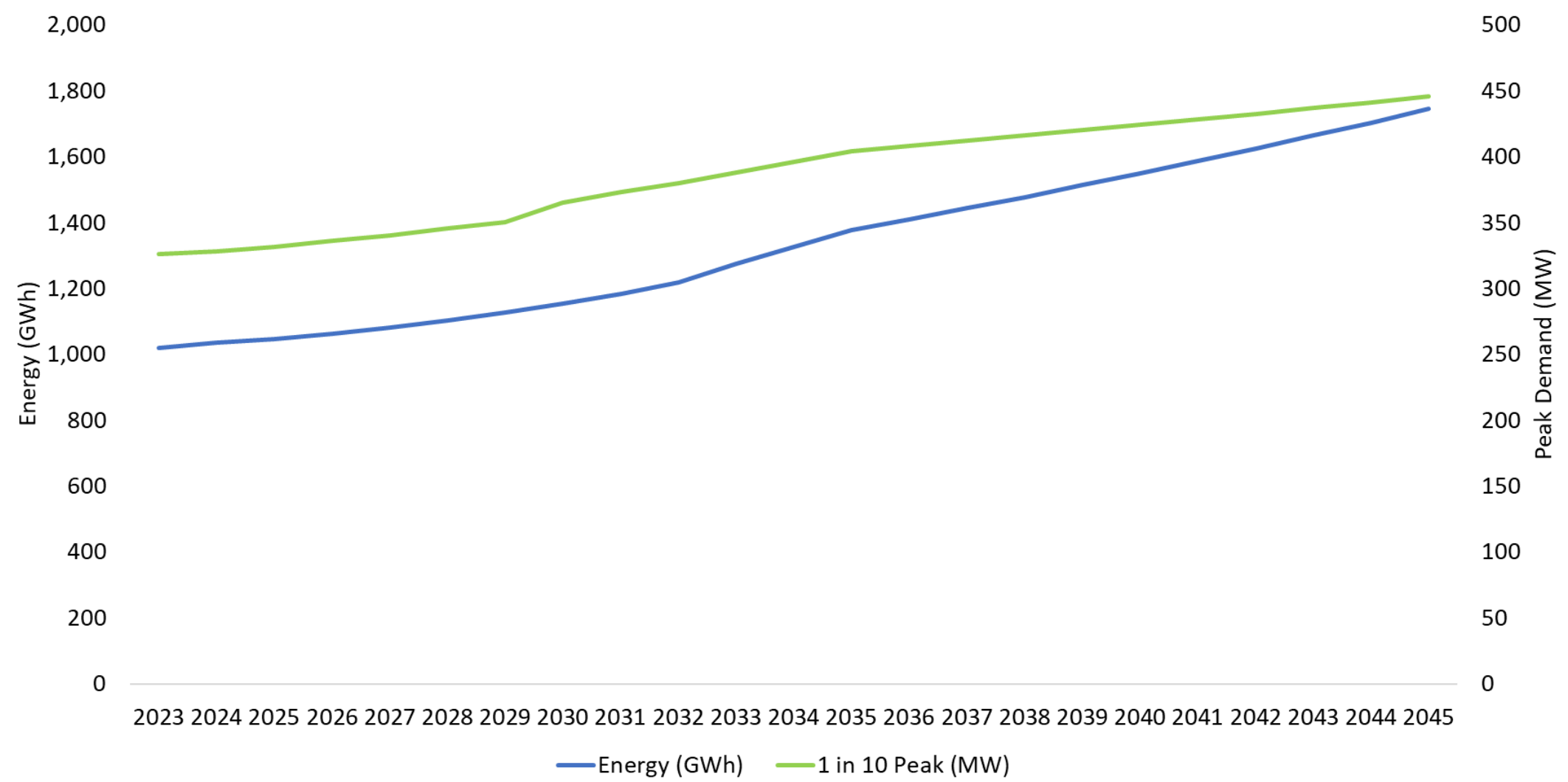


Load Forecast

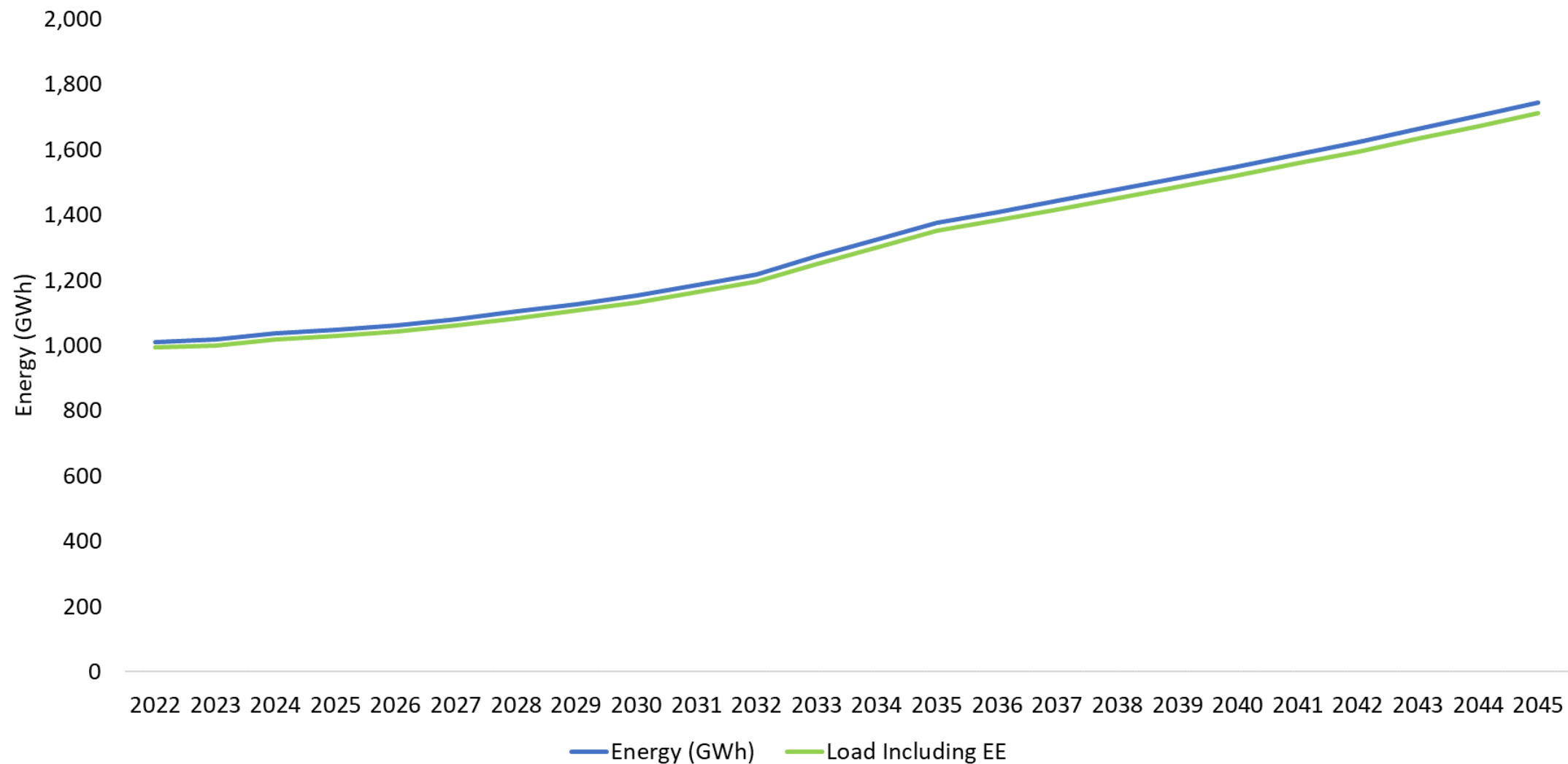
Load Forecast

- The base load forecast uses the CEC planning forecast
 - Base load forecast is adjusted based on the GWP goal of 1.8% EE savings each year
- Peak load uses the CEC 1 in 10 peak load forecast

Base Load Forecast

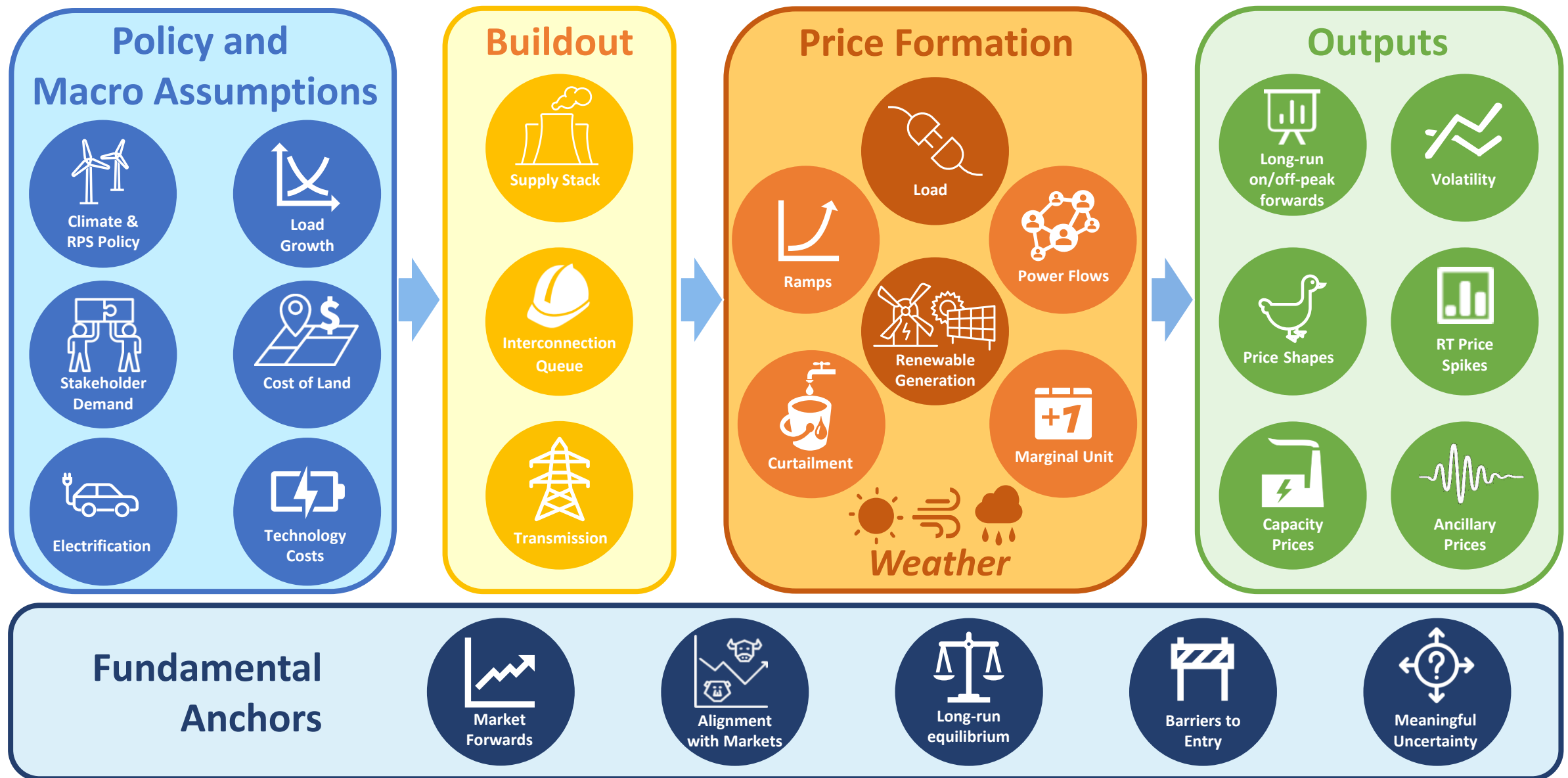


Base Load Forecast + EE and Electrification



Price Forecasts

Ascend Analytics Fundamental Forecasting Framework



Some forecasting questions to ponder (beyond the economics)...

- **The ESG Trajectory:**

- What percentage of **major** companies will be pursuing 100% clean energy by 2030 due to ESG goals, shareholder pressure, and/or efforts to attract young workers?
 - What about 24x7 clean energy?
- What percentage of utilities and municipal utilities will be pursuing 100% clean energy by 2030 due to ESG goals or stakeholder pressure?

- **The Policy Trajectory:**

- Will any states loosen or fail to meet their clean energy targets?
- How many states are likely to tighten their clean energy mandates?
- How many states are likely to adopt 100% clean energy mandates?
- How will financiers and state regulatory commissions view stranded asset risks for thermal generation?



*A forecast should be based on the **FUTURE** of policy and demand, not the present*

Resource Cost Forecasting

- Forecasting the cost of new resources considers public forecasts such as the National Renewable Energy Laboratory Annual Technology Baseline (ATB)
 - ATB provides a common view of new costs
 - ATB considers the cost to build new resources, not the offtake structure to procure the resource
- Near term resource costs are anchored to current costs to procure new resources
 - Ascend works with utilities across California on resource procurement which provides an understanding of where current costs are

Assumptions around distributed energy resources (DERs)

+ Energy efficiency:

- + GWP will be assuming historical performance on energy efficiency (roughly 1.8% of retail sales).
 - + This figure was estimated by a prior analysis to be the near-maximum EE gains in GWP's system and is roughly what the utility achieves on an annual basis.

+ Demand response:

- + GWP will be assuming roughly historical performance on demand response gains (~3.5 MW reduced over 4 years).
 - + This figure comes from the success of the Franklin demand response program, which the city is running through next year via a third party that runs DR programs across the country.
 - + That program initially targeted 10 MW of demand response, but to date has only achieved 2.8 MW.

+ Customer solar:

- + GWP is refining its customer solar estimates but anticipates assuming growth in line with roughly doubling total MW over the next 10 years. This would be ~52 MW total.

Assumptions on local land availability for utility-owned resources

- + Glendale has limited available land for resource development.
 - + Local nuclear and geothermal are not options for this reason.
- + Grayson units 1-8 land availability:
 - + This land is being converted to host the Wartsila natural gas-powered internal combustion engines and new utility-scale batteries.
- + GWP has goals on utility-scale resources it plans to develop in the city (City Solar).
 - + It is targeting 4 MW of utility-owned solar by the end of 2025 and 10 MW by 2030.
 - + The sites that are solar-ready now under Phase 1 are: Brand Landfill, Sports Complex, GCC lot 34, Central Library, UOC Parking Lot, and the Perkins building.
- + Scholl Canyon landfill:
 - + A decision is currently pending on the type of cover and any time necessary for the landfill to settle prior to new development.
 - + For this reason, Scholl is not included as a site for the Phase 1 solar goal (above). But Scholl could potentially provide 5 MW by 2030.

Social cost of carbon analysis

- + All scenarios will be run with the California Air Resources Board price on carbon, given that GWP will have to pay that cost when dispatching any carbon-emitting resource.
- + A 'social cost of carbon' (SCC) sensitivity analysis will also be run on all scenarios to see how the portfolio would behave if a higher price of carbon were placed on the resources in that portfolio.
 - + The SCC sensitivity wouldn't necessarily impact the resources that are part of the portfolio, but it would change how frequently carbon-emitting resources would be called upon.
 - + Ex. In a given scenario that considers only the CARB carbon price, the Wartsila natural gas engines might run at 5% of their total capacity. After applying the SCC sensitivity to the portfolio, those units might only run at 2% because they'd be uneconomical to run more.
- + A source for the SCC hasn't yet been decided.
 - + EPA is currently updating its SCC but had suggested \$190/ton. This value hasn't been finalized by the agency.

Q&A (30 min)



Scenario discussions

- + Scenario 1:
 - + Have high-level vision and high-level assumptions agreed upon.
 - + Will need to align on specific assumptions (e.g., specific MW deployment levels for certain resources).
 - + We have some suggestions on this, but we won't delve deeply into them today.
 - + We can return to these assumptions at the meeting on 8/23.
- + Scenario 2:
 - + There are multiple potential directions to take for scenario 2, which we need to align on today.
 - + We need to leave today's meeting with a high-level vision for scenario 2 to present at Saturday's townhall.

STAG scenario 1: Local resources, achieving City goals

- + **Overall goal of scenario:** To examine the maximum impact of local resources in Glendale's portfolio (including customer-sited resources) and model the achievement of all of Glendale's clean energy goals.
- + **Timing:** 100% clean energy by 2035.
- + **Assumptions:**
 - + Glendale achieves City Council goal of 10% of customers with solar and storage by 2027.
 - + Glendale achieves 100 MW of DER goal.
- + Glendale achieves reach code of new electrification, with accompanying solar and EV charging installations.
- + Glendale experiences higher-than-anticipated electrification.
- + Glendale maximizes local resource development with high assumptions around utility-owned solar and storage potential.
- + **Resource details:**
 - + No resources are excluded.

What would it look like to have 10% of GWP customers adopt solar?

- + 10% of all customers adopting solar would mean solar on **8,900** rooftops.
 - + **2,700** rooftops currently have solar in Glendale.
- + 10% of Glendale's single-family homes already do have solar.
 - + Glendale has 24,000 single family homes. Roughly 2,500 of these have solar.
 - + The average installation size for single family homes is **6 kW**.
- + There are 54,000 households in Glendale that aren't fully capable of installing solar.
 - + 45,000 multifamily homes. 9,000 condos.
- + The amount of MW that achieving the 10% goal can generate will depend where those solar installations are placed.
 - + Single family homes have lower solar capacity than commercial and industrial facilities.
- + Achieving the 10% goal will require launching new programs to expand access to solar for customers who haven't traditionally been able to opt in.

Potential assumptions on STAG scenario 1

- + Energy efficiency:

- + GWP is assuming 1.8% of retail sales per year.
- + STAG could target 2% of retail sales per year.

- + Demand response:

- + GWP is anticipating achieving ~3.5 MW of demand response over a 4-year period.
- + STAG could target 10 MW by 2028 (assumes achieving the target of the Franklin DR project).

- + Customer solar + storage:

- + GWP is anticipating ~52 MW of customer solar.
- + STAG is targeting 100 MW of DERs total, including customer solar + storage.

STAG scenario 2 ideas – based on member survey

- + **Overall goal of scenario:** To be determined!
- + **Timing:** 90% clean energy by 2035, 100% by 2042 was most popular (9 people).
- + **Assumptions of interest:**
 - + A majority of the group is interested in testing either middle-ground or similar assumptions to scenario 1 on customer and local resources.
 - + Most interest in the same assumptions on utility-scale solar and storage potential (7 people).
 - + Glendale experiences higher-than-anticipated electrification (10 people).
- + Long-duration energy storage drops in cost and becomes commercially available quicker than anticipated (10 people).
- + **Resource exclusions of interest:**
 - + No new natural gas in Glendale (7 people).
 - + Early retirement of fossil resources in Glendale (8 people).
- + **Options to leave behind:**
 - + Ambitious assumptions on green H2 (4 opposed, 6 neutral).
 - + Ambitious assumptions on small modular nuclear (6 opposed, 2 neutral).

Potential 'visions' for scenario 2

- + **Vision 1:** High customer participation and high utility-owned resource potential, with a middle-ground clean energy timeline.
 - + Same assumptions as scenario 1, with timeframe as central difference.
- + **Vision 2:** Moderately high customer participation and utility-owned resource potential, with a middle-ground clean energy timeline.
 - + Middle-ground assumptions between Ascend/GWP baseline and scenario 1. Essentially softening the goals and timeline.
- + **Vision 3:** Phase out fossil resource (e.g., final Grayson unit) a few years sooner than anticipated and replace it with a long-duration energy storage project.
 - + Assume ambitious LDES gains.
 - + Any assumptions could apply here – same as scenario 1, middle-ground, or baseline.

Preparing for Saturday's townhall

- + Do STAG members have any suggestions for how to present what we've discussed at the townhall this week?
- + Any other items that you think are important to get community feedback or input on?