

Market Changes and Energy Storage

June 5, 2024

Similan Consulting

- Quarterly Alberta Power Price Forecast
- Market analytics and financial modelling services
- Broker renewable PPAs and provide commercial advisory services

Interim Market Mitigation

Regulations

Market Power Mitigation Regulation

- Sets a “secondary offer cap” on energy offers from generators with more than 5% offer control after a net revenue threshold is met by a “reference generating unit”
- The secondary offer cap is set at the greater of \$125 or 25 times the daily gas price.

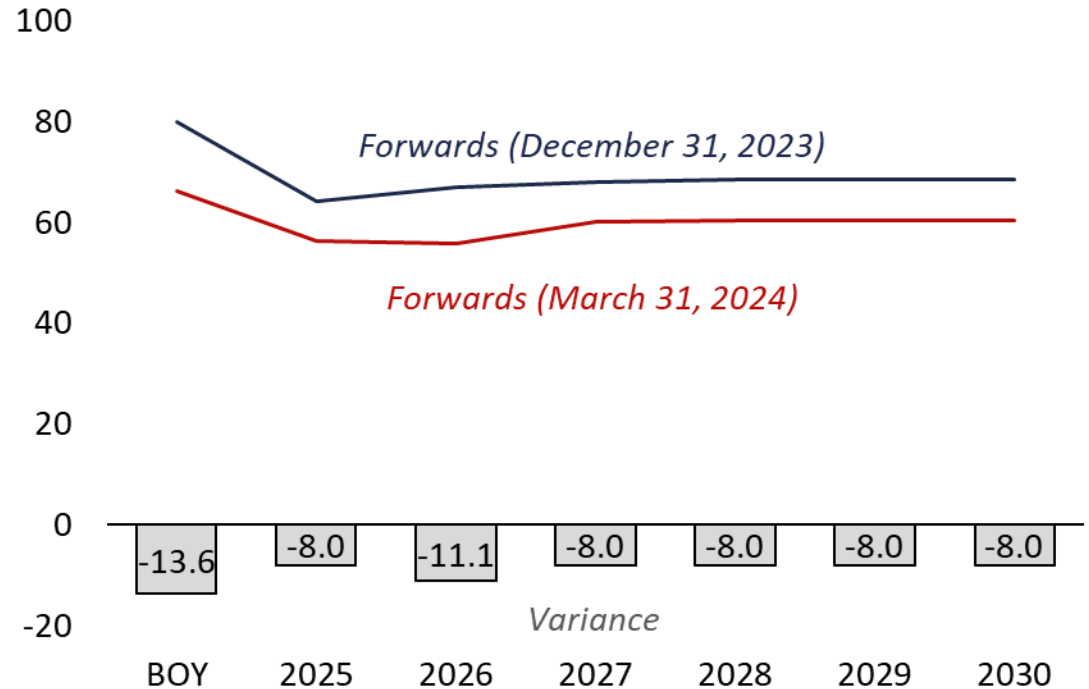
Supply Cushion Regulation

- Addresses physical withholding of long lead time assets
- Enables the AESO to direct long lead time assets online if the projected supply cushion for the next day is less than 932 MW (2 x Most Severe Single Contingency)

Long lead time assets: generating units that require more than 1-hour to synchronize

Alberta Forward Prices

Alberta Forwards (\$/MWh)



Source: NRGStream and Similan analysis

Restructured Energy Market – Our Take

Market Operations

- Day Ahead Unit Commitment
- Security Constrained Economic Dispatch

Market Pricing Framework

- Day Ahead and Real Time Balancing Market
- Scarcity Pricing (ORDC)
- Negative Pricing
- Co-optimization Energy and AS

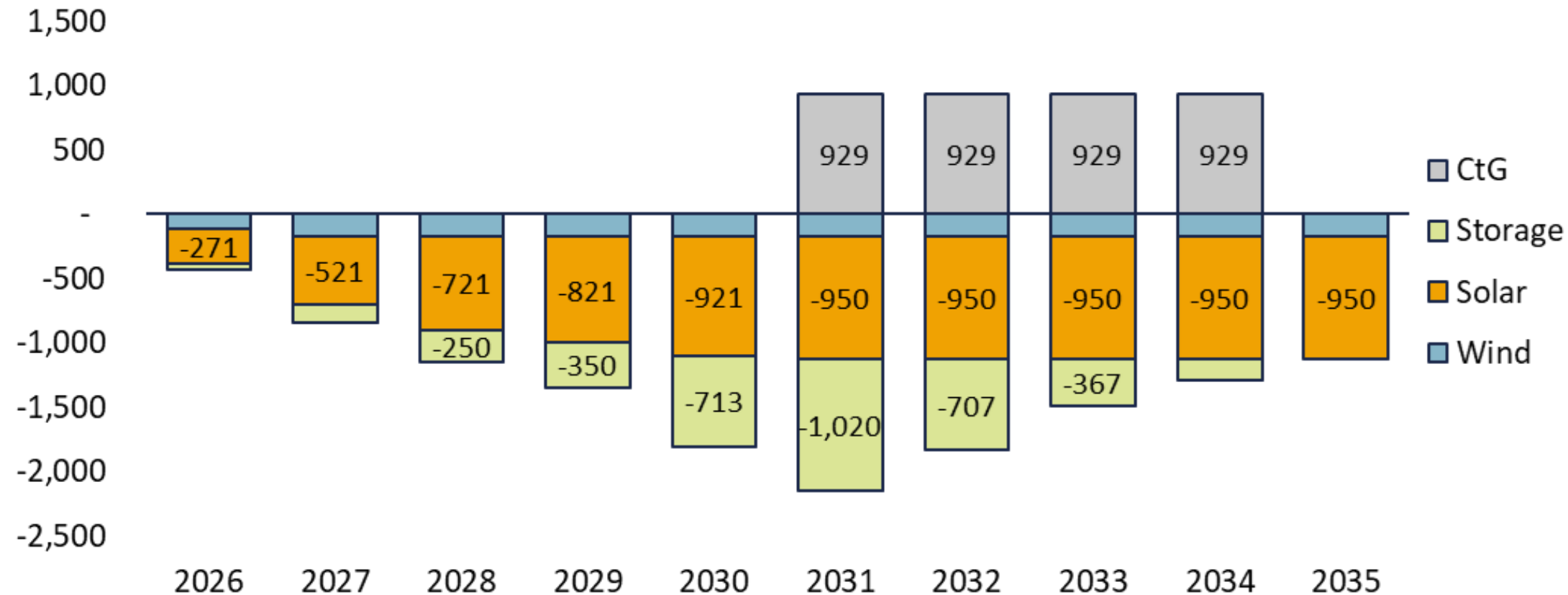
Evolving supply mix drives the need for new rules to enhance market operations

Do the incremental economic benefits outweigh the costs of investment uncertainty?

Deferred Investment

Market design uncertainty drives investment deferrals. Wait and see approach to new investment

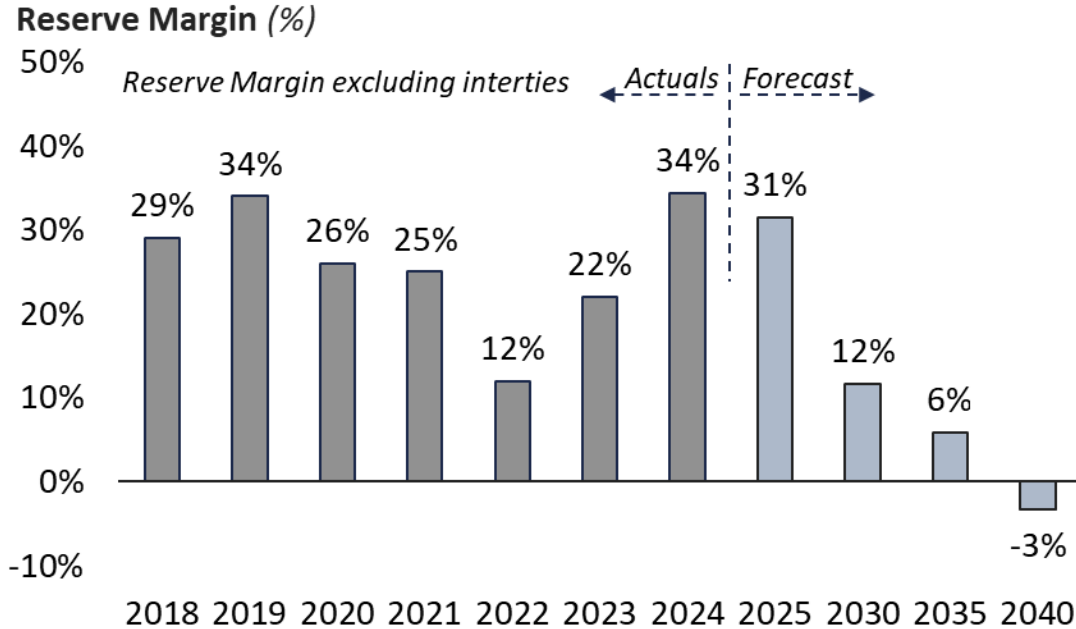
Capacity (MW)



Source: Similan Q2 2024 Forecast

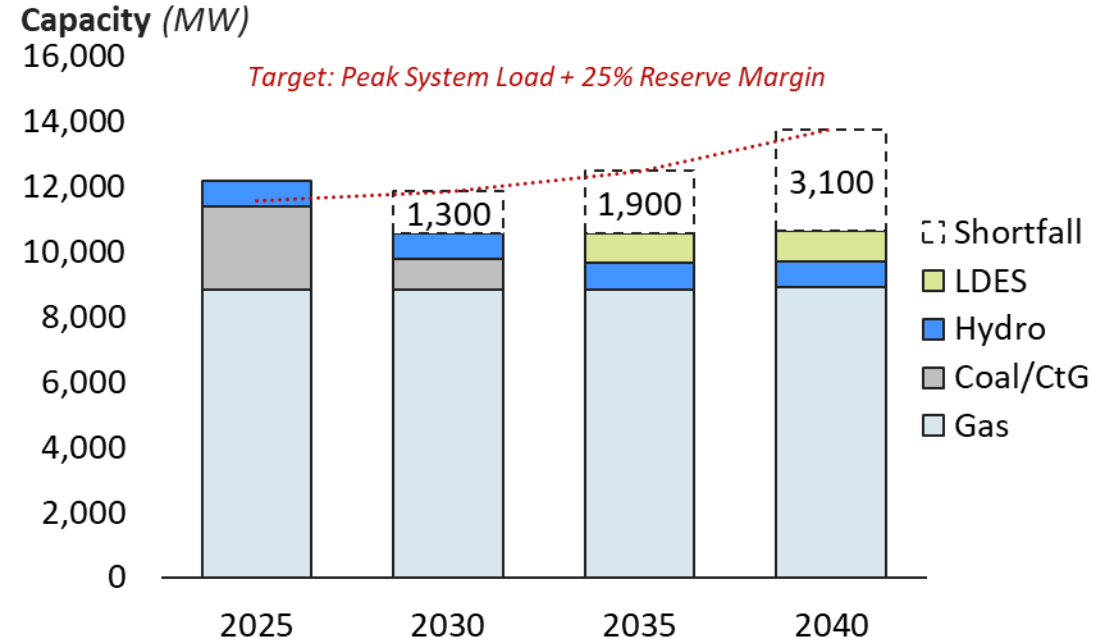
New Investment Required by 2030

Reserve Margin Forecast



Source: AESO Long Term Adequacy Report, AESO 2024 LTO, and Similan Analysis

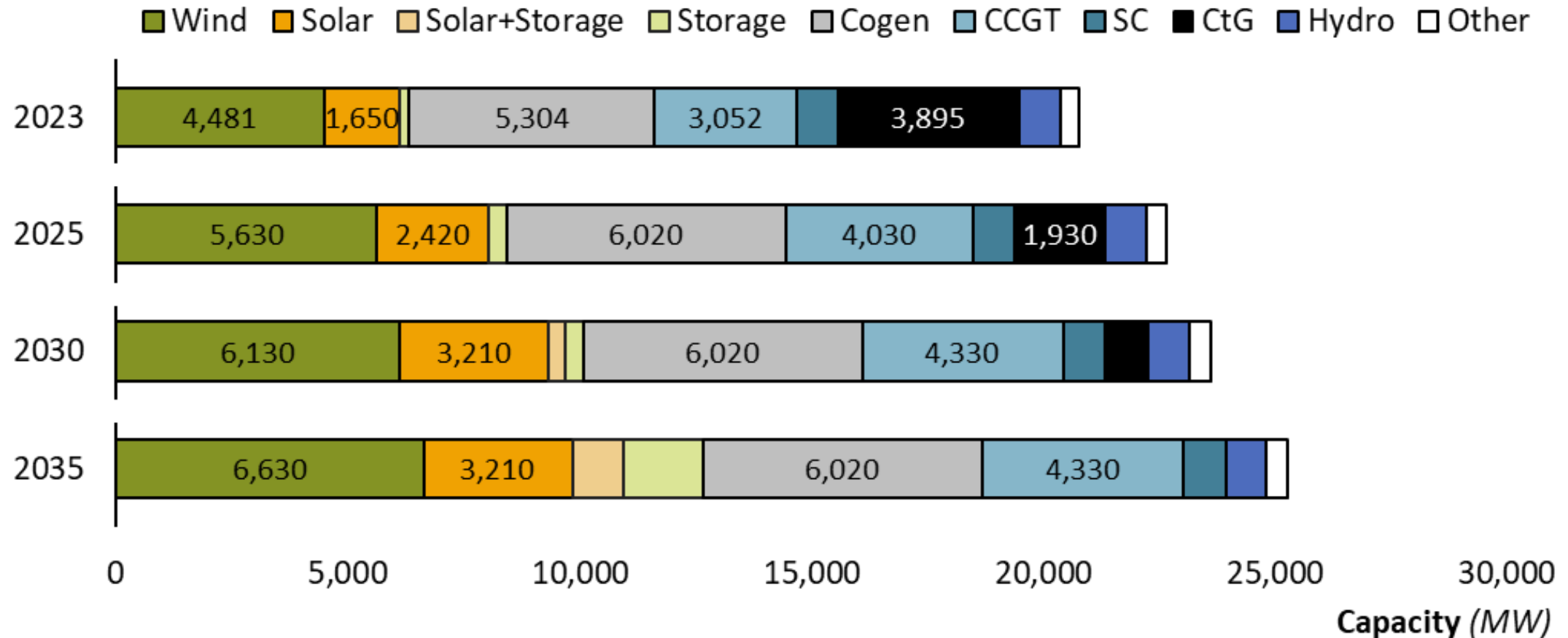
Target Reserve Margin and Capacity Shortfall



Source: AESO May 2024 Long Term Adequacy Report, and Similan Analysis

Supply Mix Outlook

We forecast nearly 3,000 MW of storage (stand-alone and paired with solar) by 2035

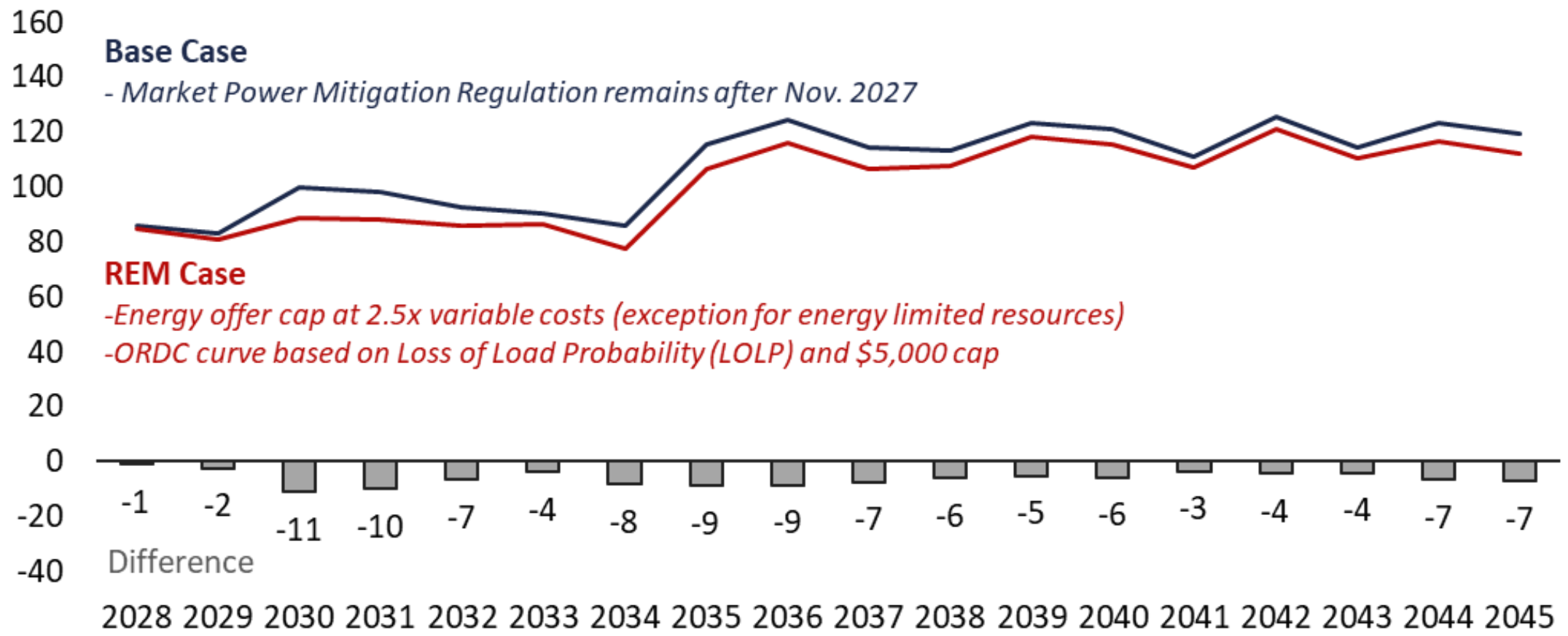


Source: Similan Q2 2024 Forecast

Impact of REM

REM lowers pool prices by \$10/MWh between 2030 and 2045

Pool Price (\$/MWh)

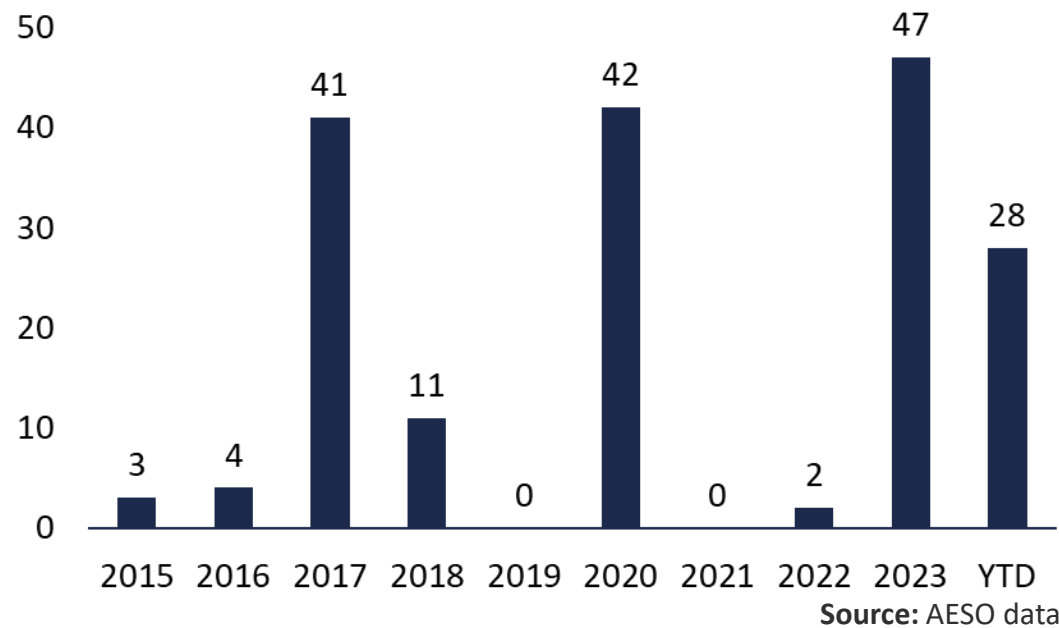


Source: Similan Q2 2024 Forecast

Supply Surplus

Zero Dollar Hours Actuals

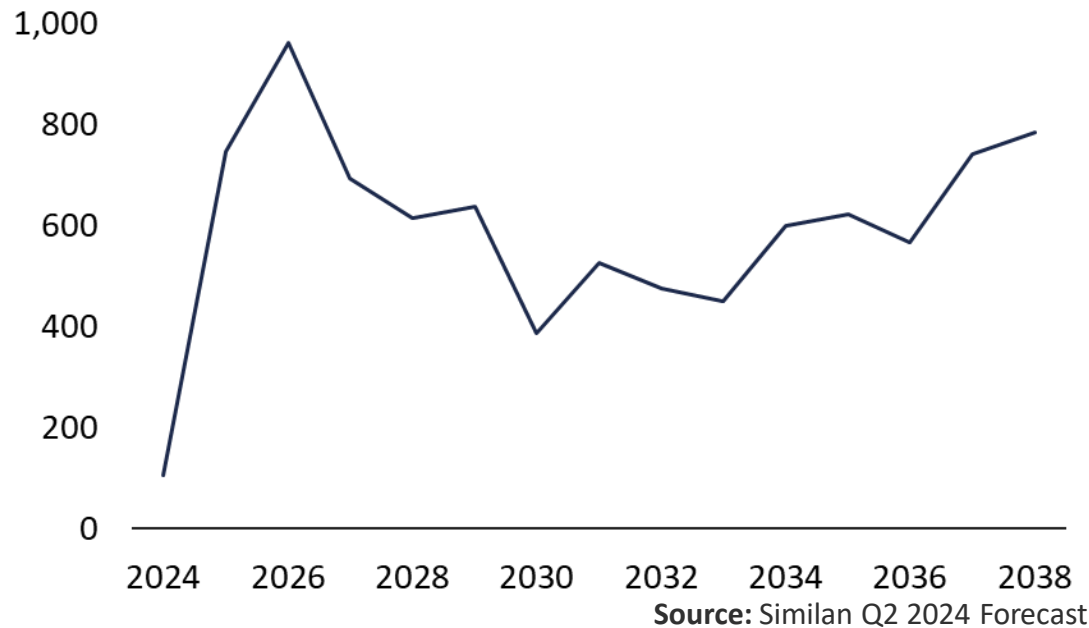
(Zero Dollar Hours)



95 hours year-to-date (Jan 1st to May 31st) included zero-dollar SMPs

Supply Surplus Forecast

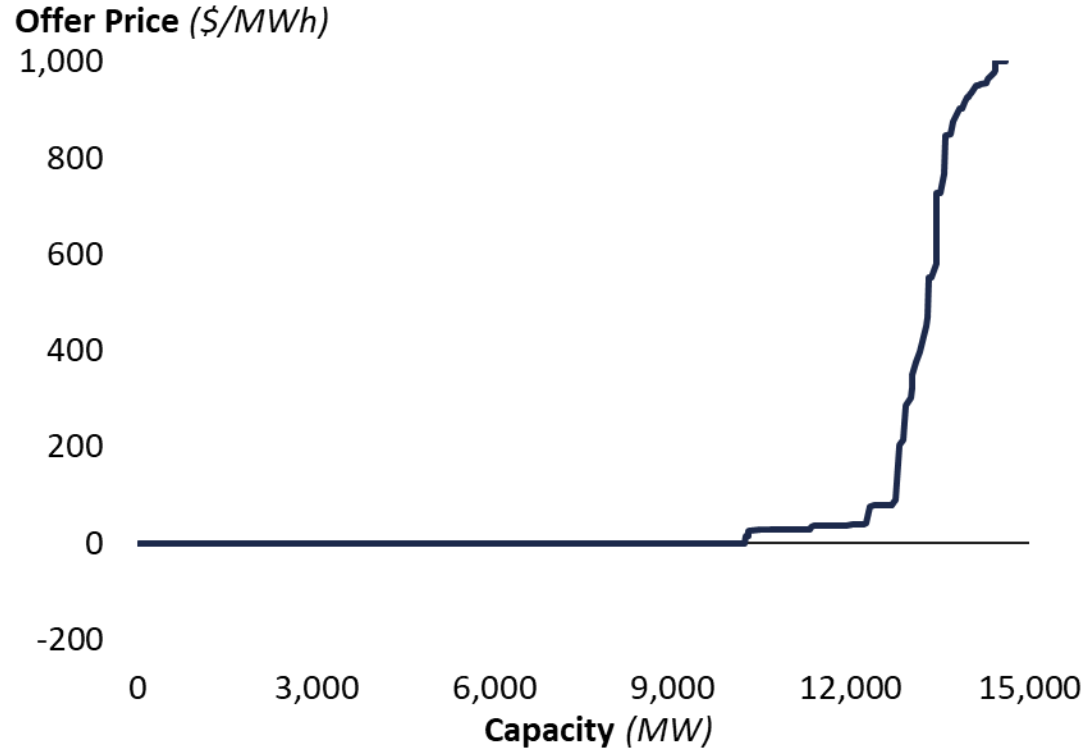
(Supply Surplus Hours)



We expect supply surplus 5% of hours

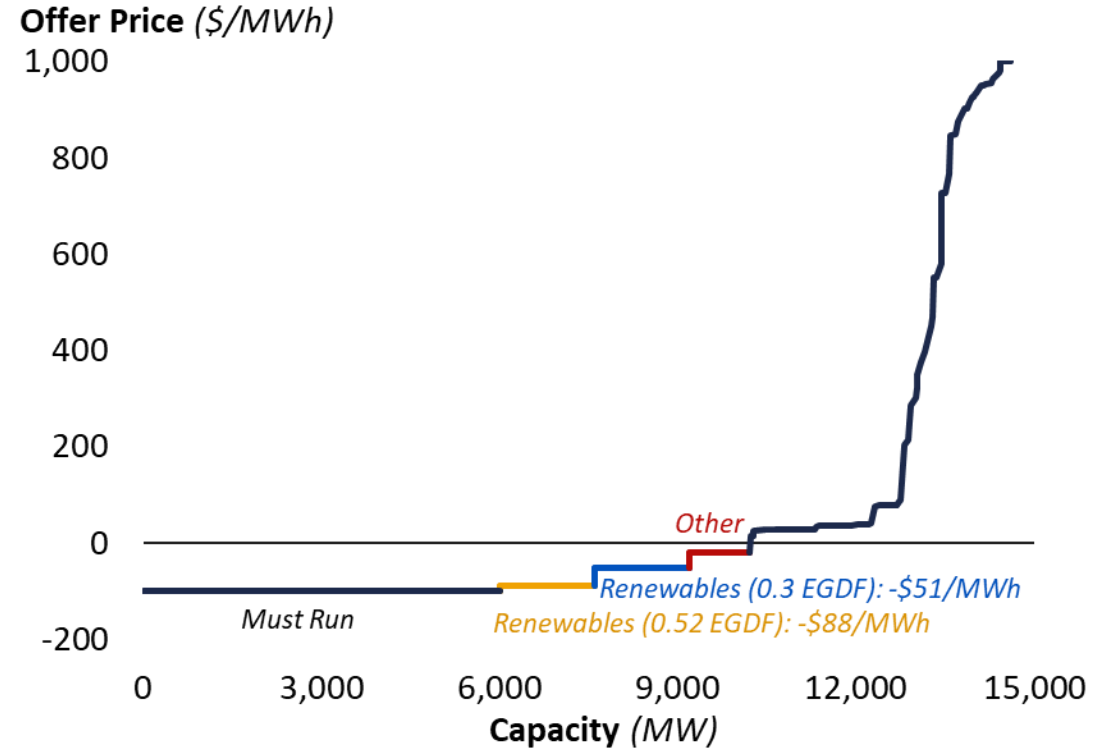
Negative Pricing – 2030 Example

Merit Order – Current Market Design



Source: Similan Q2 2024 Forecast and analysis

Merit Order – EOM with Negative Pricing



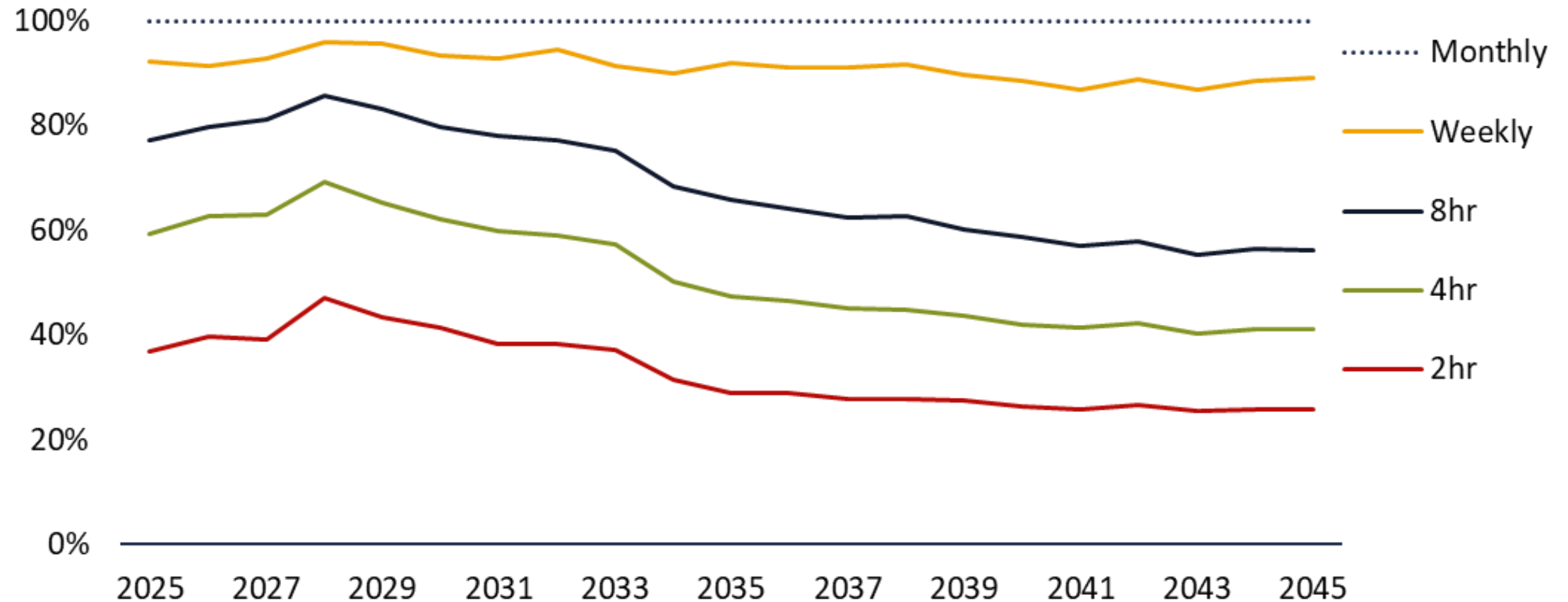
Source: Similan Q2 2024 Forecast and analysis

No anchor to zero-dollar offers (and prices)
Supply Surplus events likely clear below zero dollars with a negative price floor
Value of renewable attributes will drive negative price levels

Energy Arbitrage Capture vs. Storage Duration

The percentage of energy arbitrage available captured by shorter durations declines over the forecast period

Energy Arbitrage Capture (%)



Source: Similan Q2 2024 Forecast and analysis

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