



Real-Time Co-optimization + Batteries Education

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ERCOT Public

Fall '24

Agenda

- Why is the Real-Time Co-optimization plus Batteries (RTC+B) project so important?
- What does it mean to “co-optimize?”
- What components of the market are changing with Real-Time Co-optimization (RTC)?
- How is this impacting communications between ERCOT and Market Participants?
- What is the “plus Batteries” part of the project?
- What is the timeline for testing and implementation of the project?

Why is the RTC+B project so important?

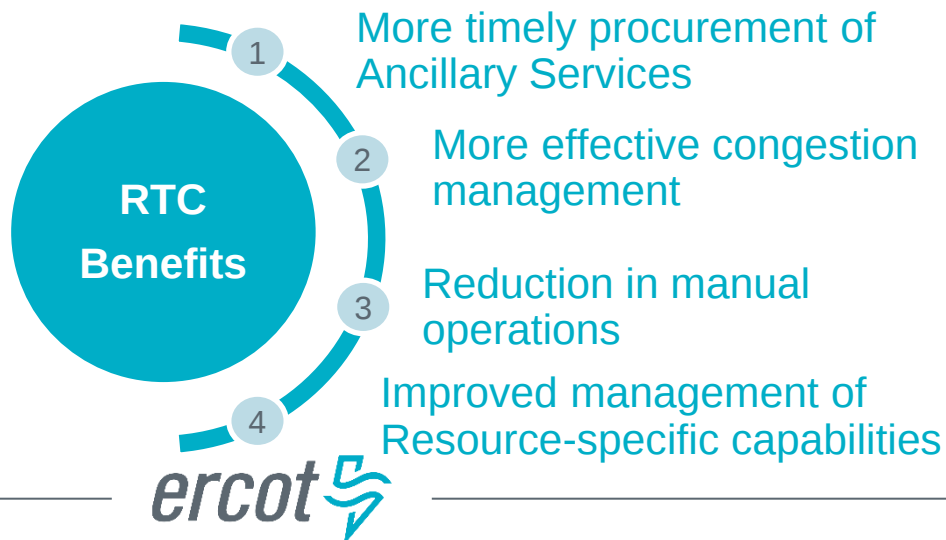


What are the benefits of RTC+B to the market and consumers within the region?

In 2018, the Independent Market Monitor (IMM) for the ERCOT market released a [report](#) that included its evaluation of the impacts of RTC. Studying 2017, their findings included reductions in:

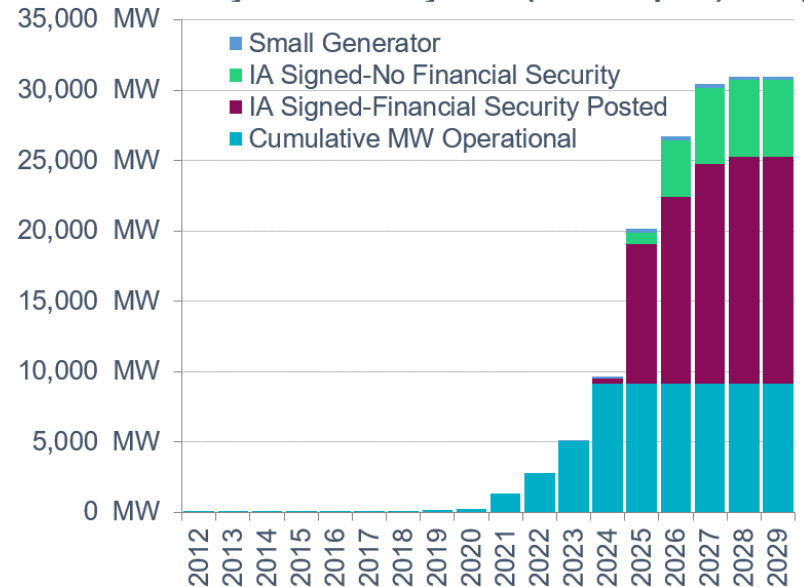
- Energy costs - \$1.6B or approximately \$4/MWh
- Ancillary Service costs - \$155M
- Congestion costs -\$257M

ERCOT also released a [study](#) showing some additional impacts of RTC to supplement the IMM report



Effective integration of batteries is vital

ERCOT Battery Additions by Year (as of Sep 30, 2024)

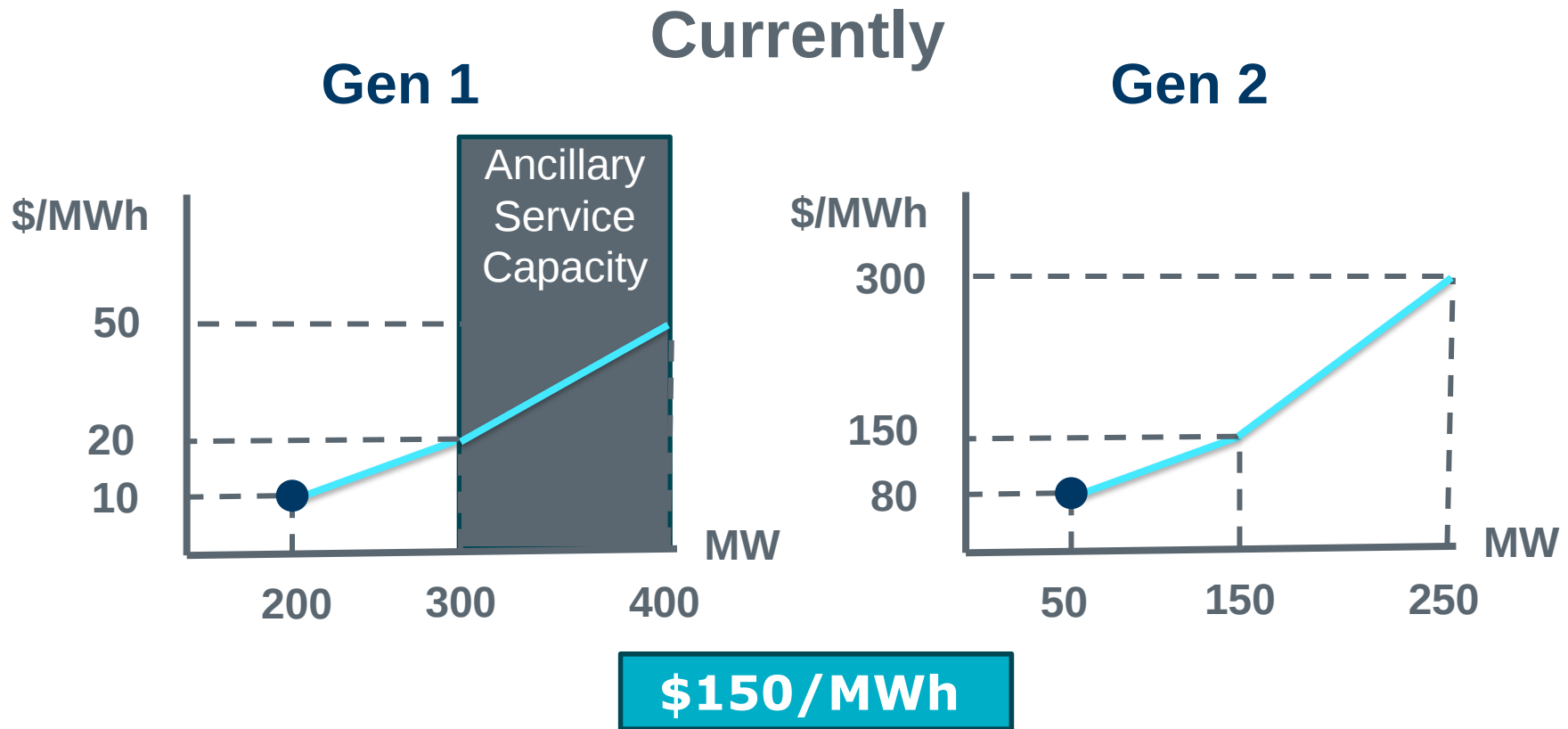


What does it mean to “co-optimize?”



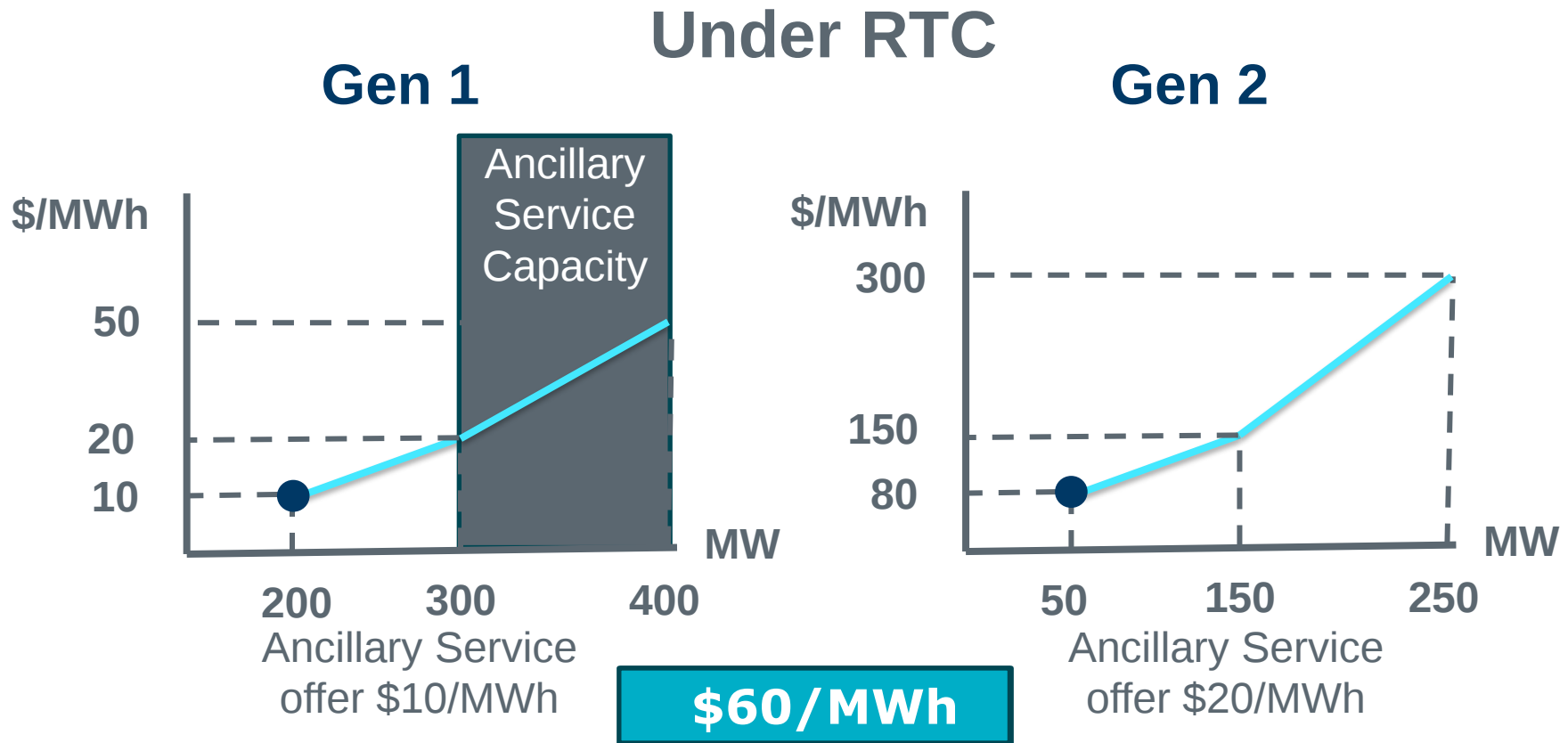
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Under RTC, energy and Ancillary Services are “co-optimized,” but what does it mean to co-optimize?



The placement of Ancillary Services on Resources across the ERCOT System is assumed.

Under RTC, energy and Ancillary Services are “co-optimized,” but what does it mean to co-optimize?

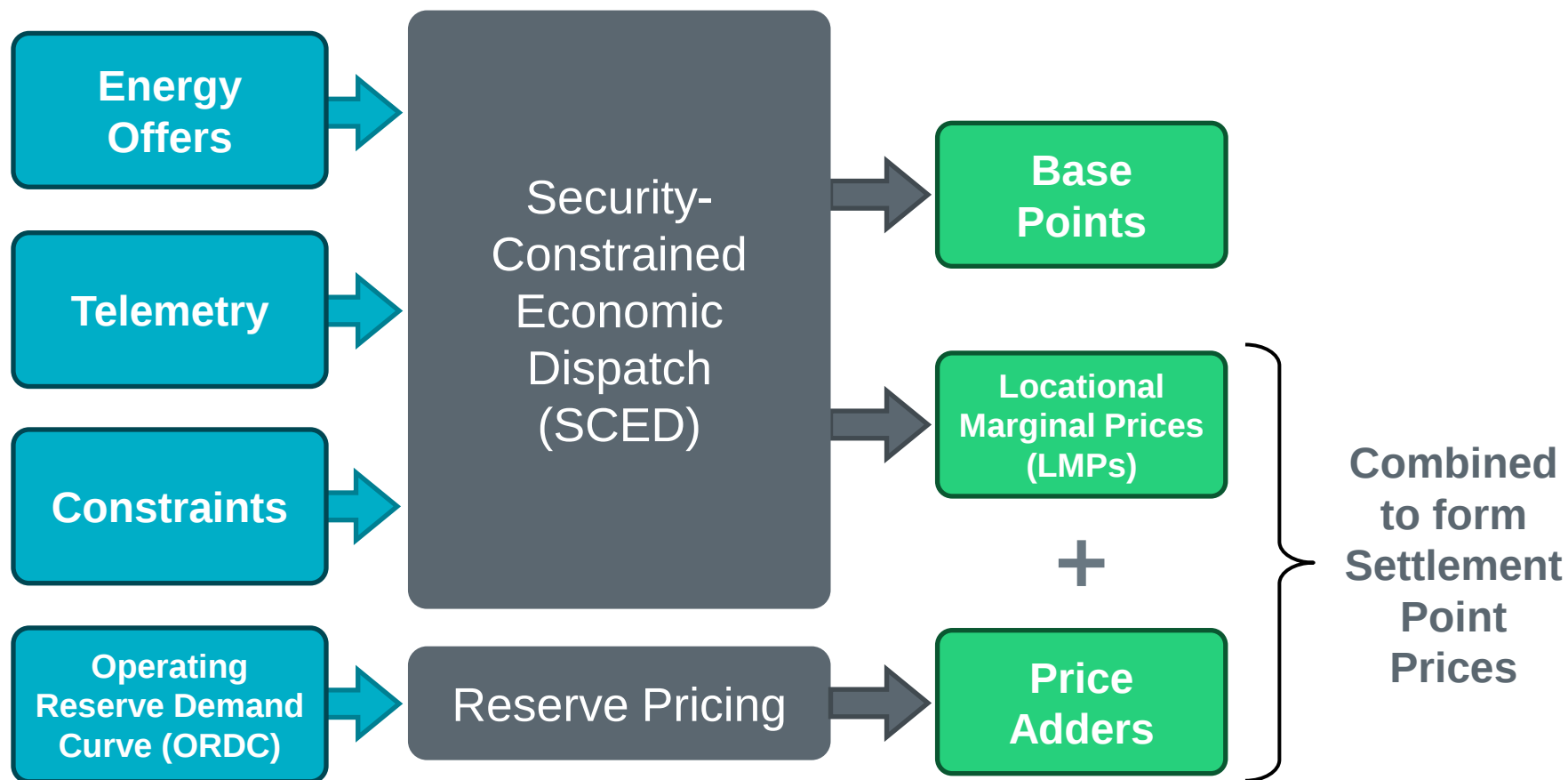


By awarding the Ancillary Services to another Resource, overall costs are reduced.

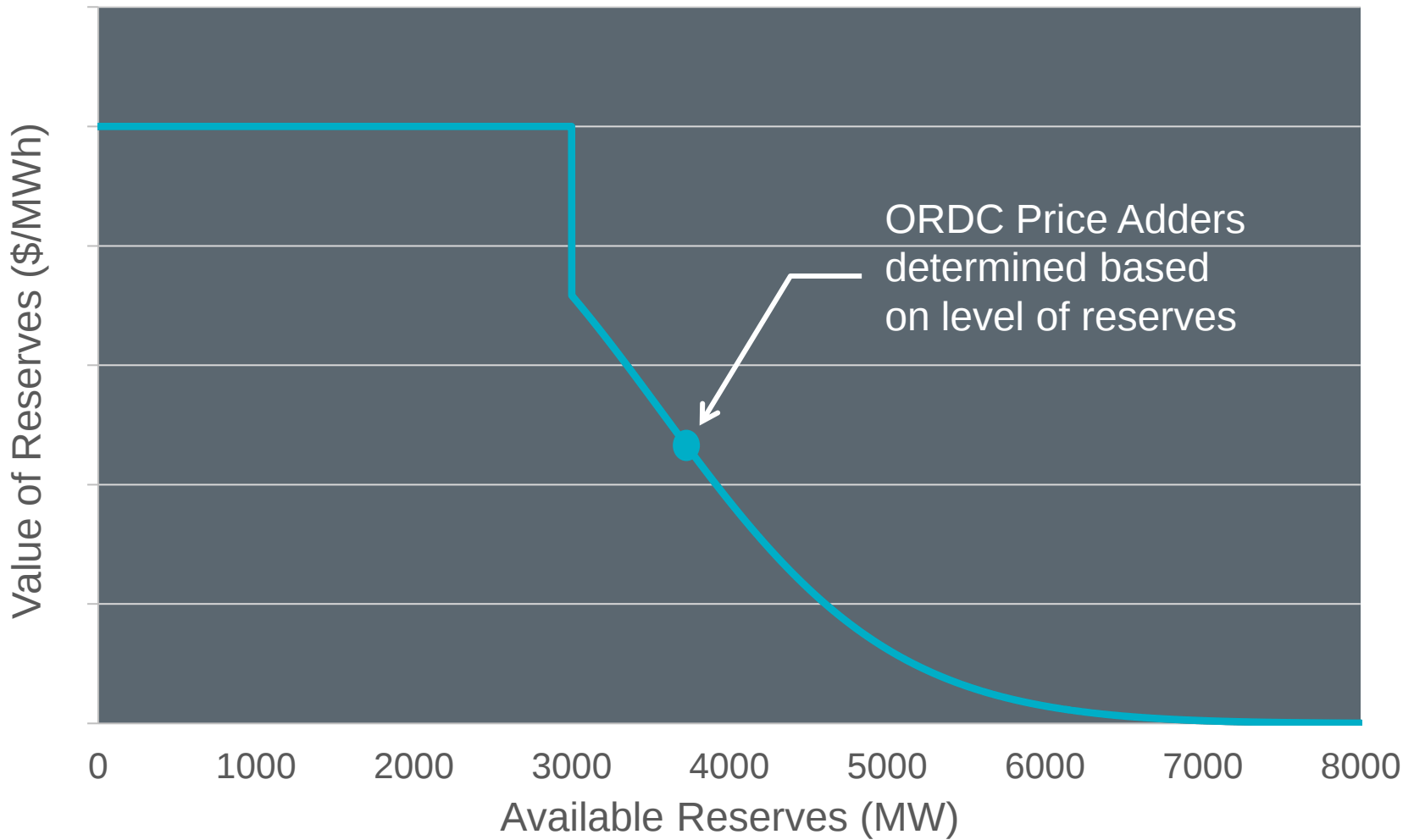
What components of the market are
changing with RTC?

Today's market is designed to reflect scarcity through a process that is outside of the optimization

Currently

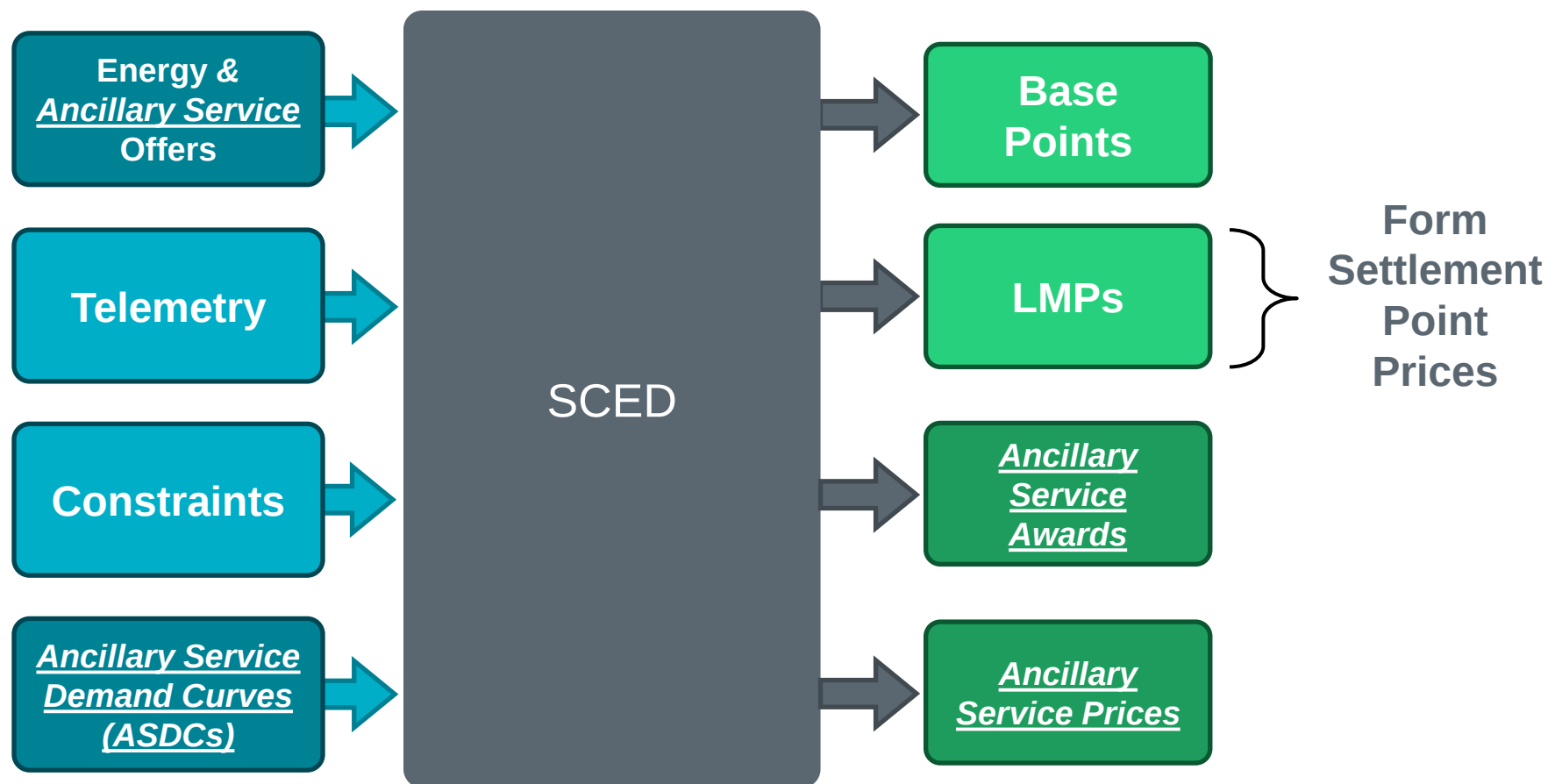


The ORDC sets the value of ERCOT System reserves



RTC is also designed to reflect scarcity, but now it occurs within the optimization

Under RTC



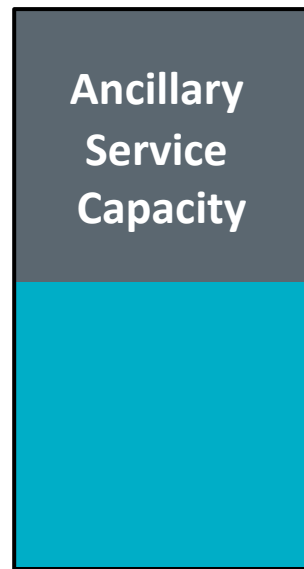
Unlike today's market, the cost of Ancillary Services is factored directly into LMPs

Today, the need for an additional MWh of energy results in the price of energy (i.e., the LMP) going from \$30/MWh to \$50/MWh

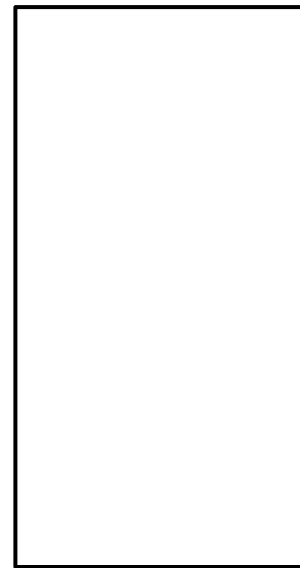
- The next MW would come from Gen 2

Ancillary
Service Offer
= \$10/MWh

Energy Offer
= \$30/MWh



Gen 1



Gen 2

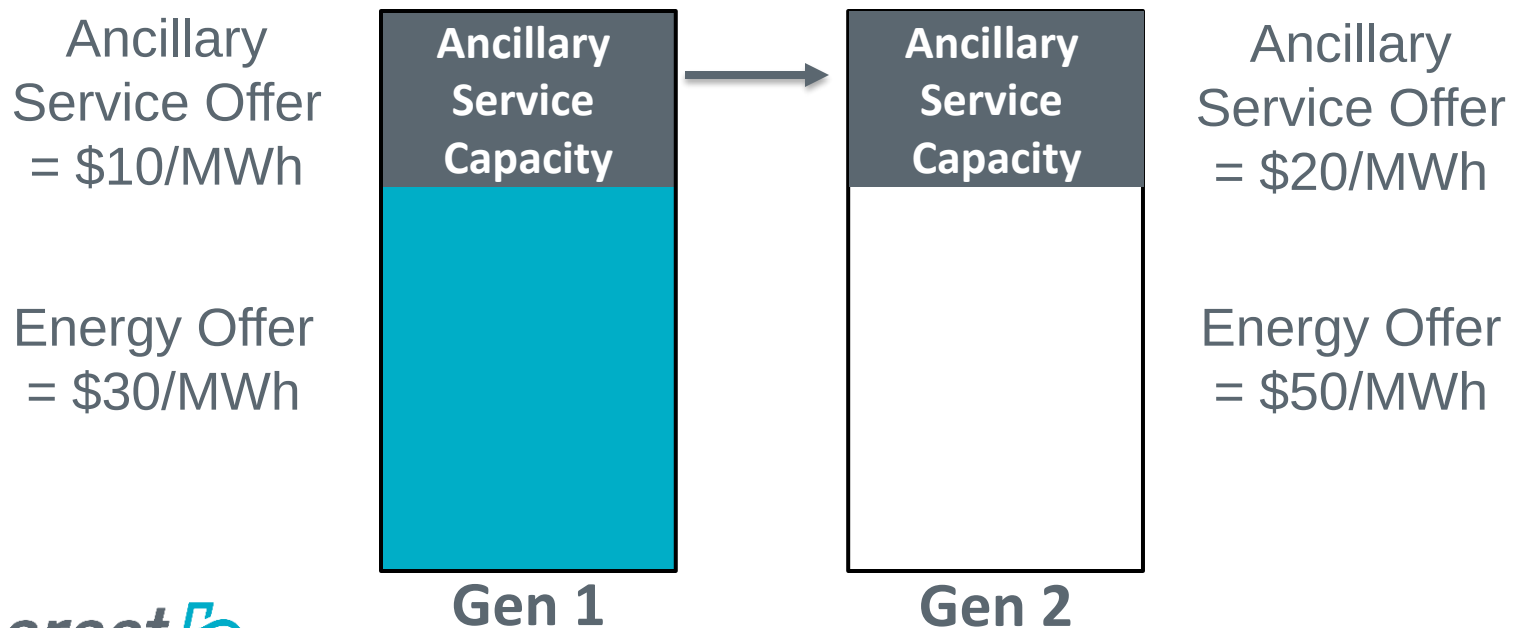
Ancillary
Service Offer
= \$20/MWh

Energy Offer
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Unlike today's market, the cost of Ancillary Services is factored directly into LMPs

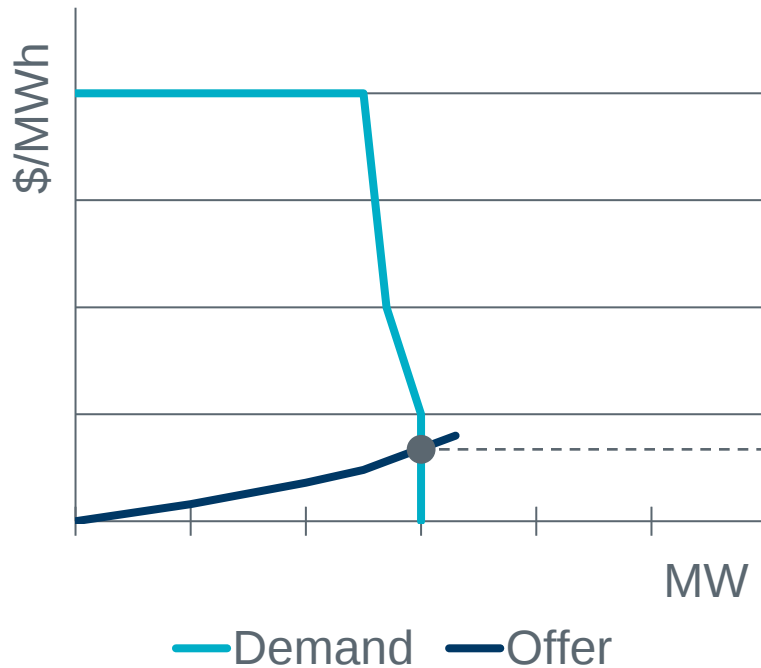
Example: With RTC, Ancillary Services can be reallocated to access cheaper energy from Gen 1. However, this has the effect of increasing Ancillary Services cost.

- This means the LMP goes to \$40/MWh (\$30/MWh for the energy from Gen 1 plus the \$10/MWh of additional Ancillary Service cost)
 - Ancillary Service Price: \$10/MWh → \$20/MWh

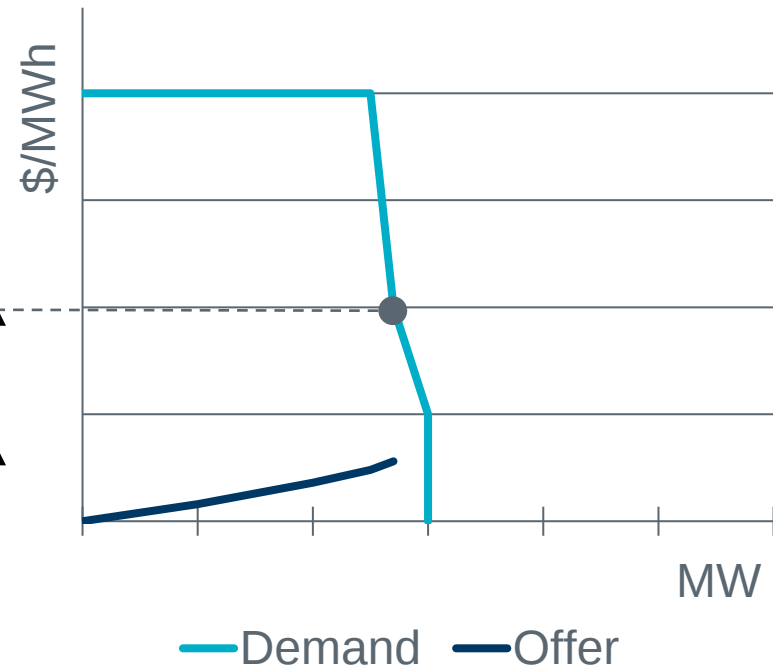


Instead of using the ORDC, under RTC, scarcity pricing and the value of reserves is set by individual ASDCs

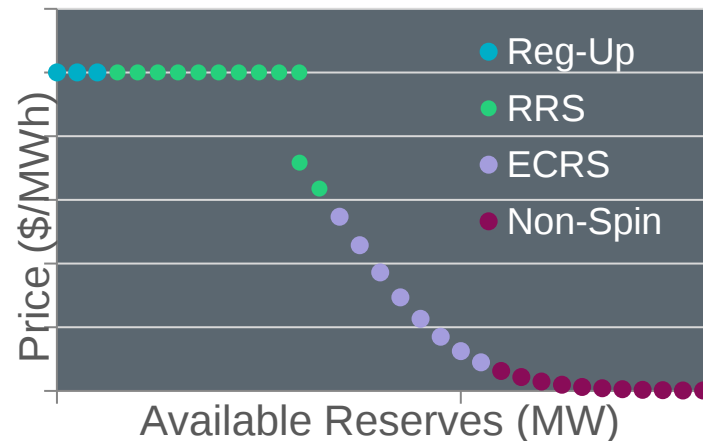
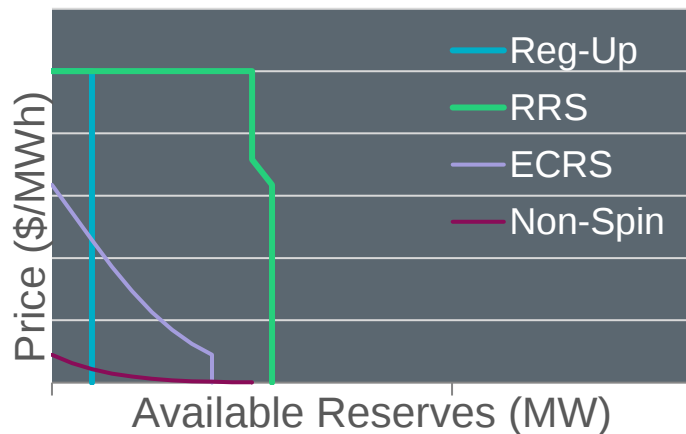
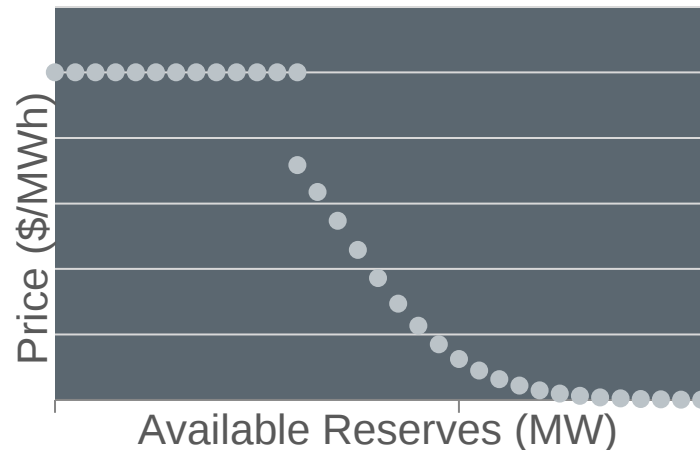
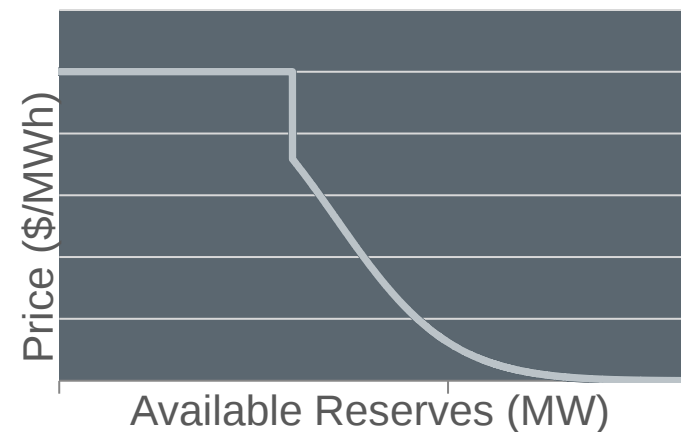
Sufficient remaining capacity and offers



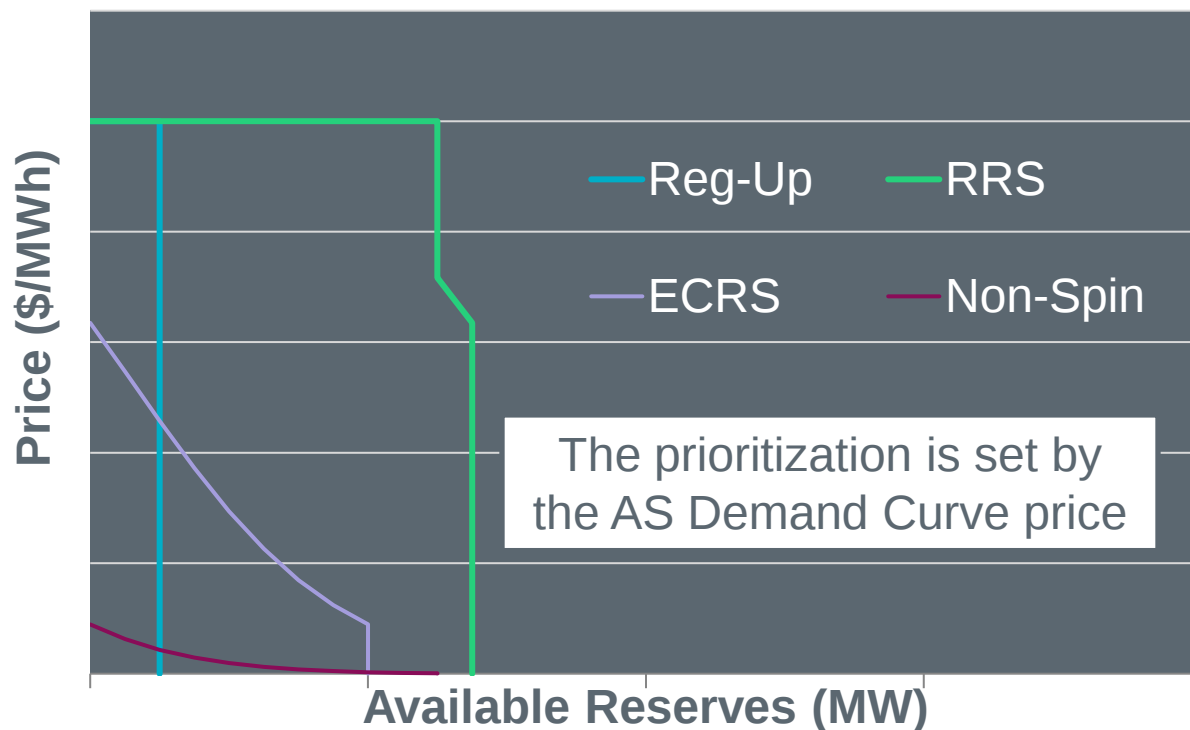
Insufficient remaining capacity or offers



ASDCs will be based on the shape and pricing outcomes of the current ORDC mechanism

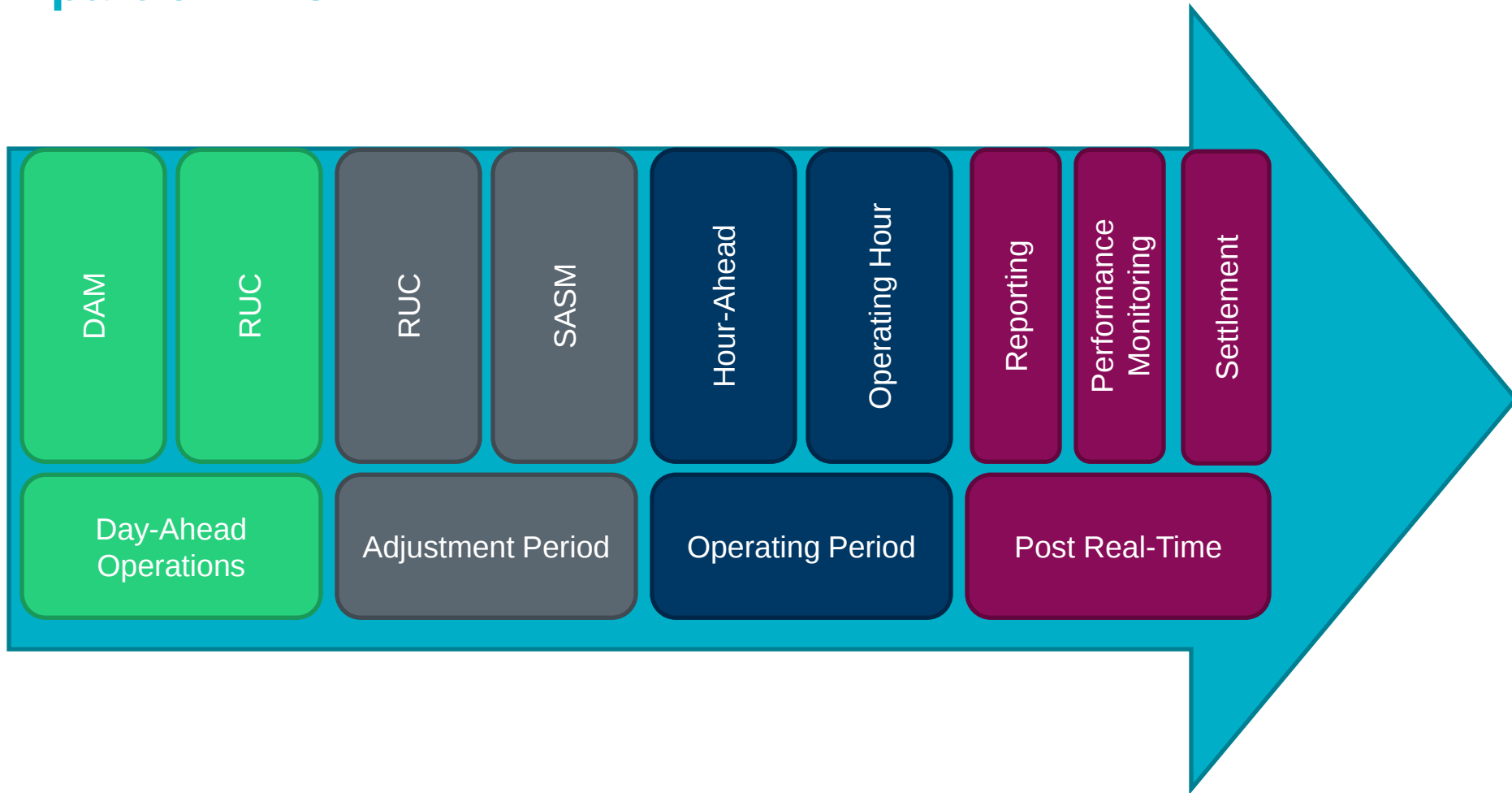


Having individual ASDCs allows RTC to better distinguish and prioritize between various Ancillary Service products

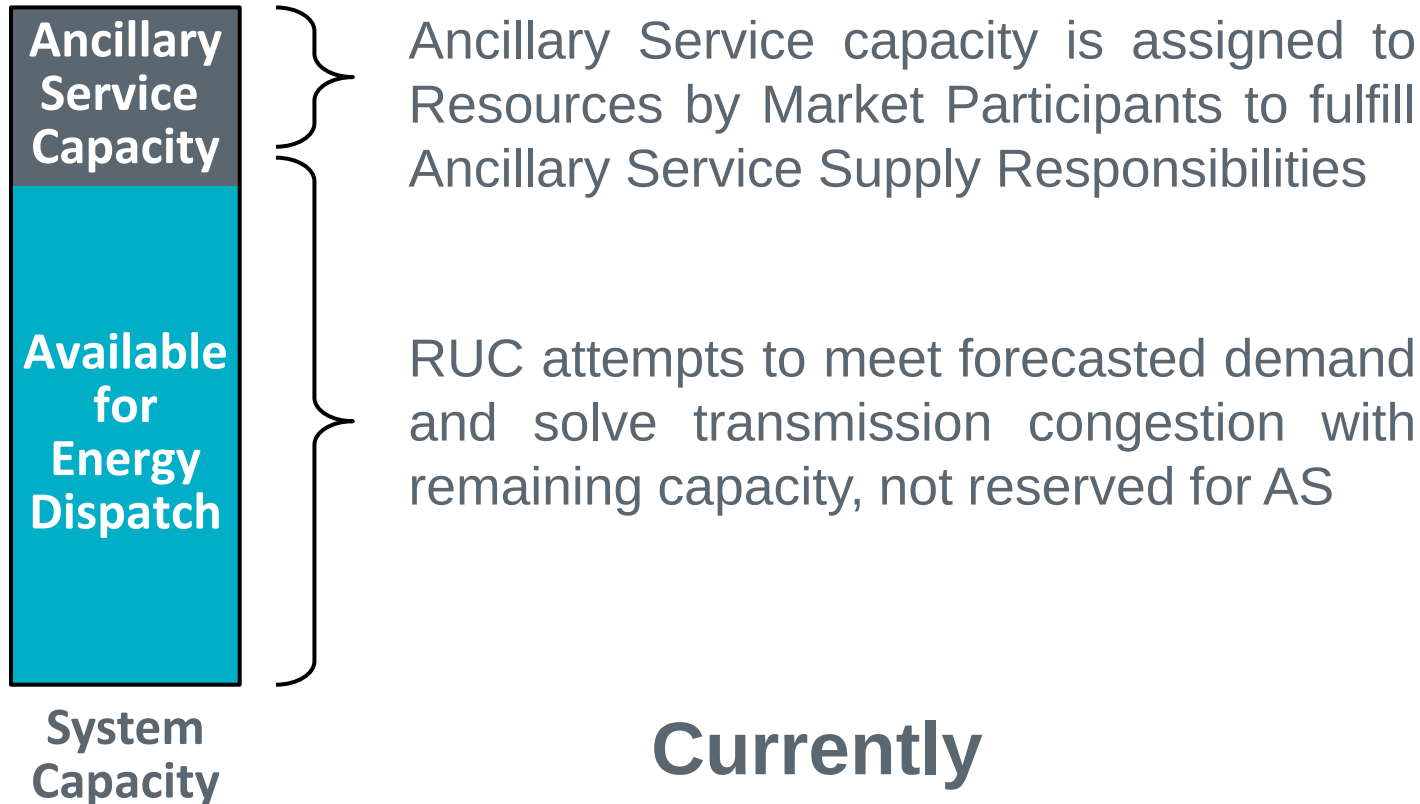


Non-Spinning and ERCOT Contingency Reserve Service (Non-Spin and ECRS) will be exhausted before Regulation Up and Responsive Reserve Service (REGUP and RRS) are exhausted.

While the primary focus is the Real-Time Market, changes to other parts of the wholesale market are also part of RTC



Reliability Unit Commitment (RUC), like Real-Time, currently takes Ancillary Service assignment to individual Resources as a known input



Currently

To better reflect and plan for Real-Time grid conditions with RTC, RUC will also be modified to co-optimize energy and Ancillary Services

Available
for
Energy
Dispatch
or
Ancillary
Services

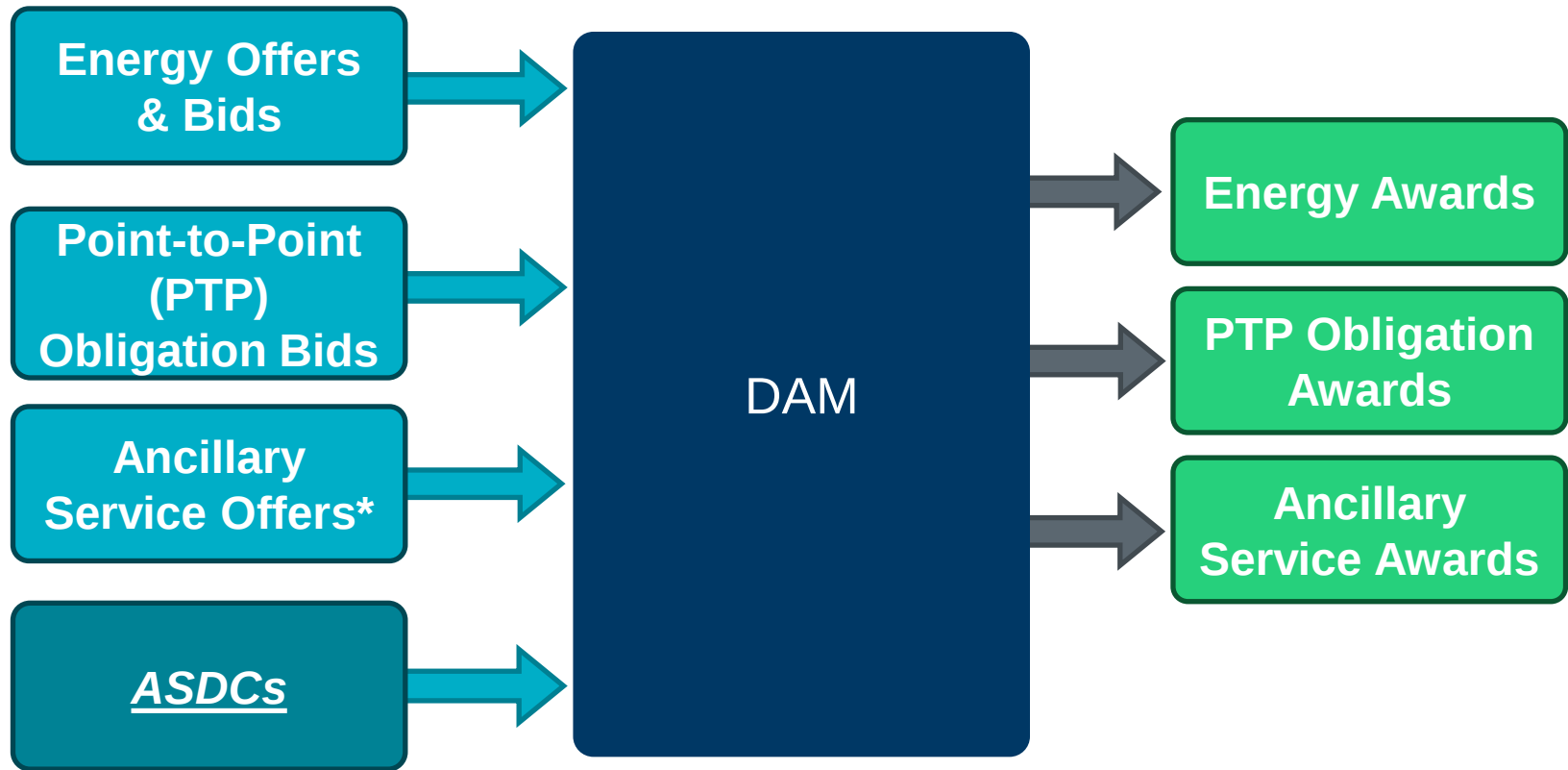
RUC attempts to meet forecasted demand, solve transmission congestion, and meet system Ancillary Service needs using the full capability of Resources planned to be available

System
Capacity

Under RTC



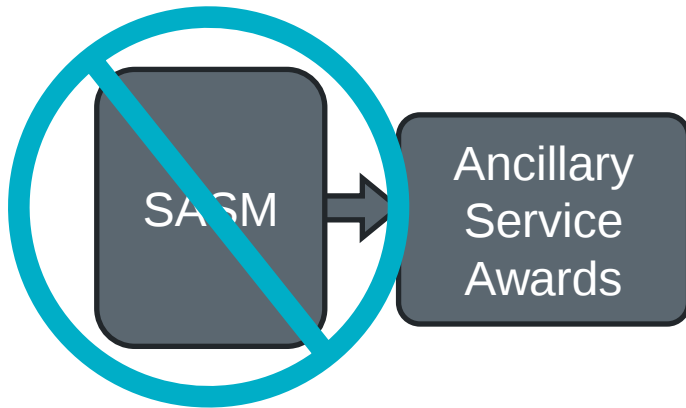
The current Day-Ahead Market (DAM) fundamentally stays the same with the implementation of RTC



** With RTC, “virtual” Ancillary Service Offers will be allowed.*

The current Supplemental Ancillary Services Market (SASM) process will be eliminated with the implementation of RTC

SASM allows ERCOT to fill Ancillary Service gaps that appear after completion of the DAM



1. Failure to provide
2. Infeasible Ancillary Service capacity
3. More Ancillary Service capacity needed
4. Insufficient Ancillary Service offers in the DAM

Under RTC, a co-optimized RUC and the Real-Time Market fulfill this role.

How is this impacting communications between ERCOT and Market Participants?

With RTC, there will be several changes in the data flow between ERCOT and Qualified Scheduling Entities (QSEs)

Currently

Ancillary Service Resource Responsibilities

Ancillary Service-Specific Resource Statuses

Regulation Service Participation Factors/QSE-Level Deployments

Updated Desired Base Points

ORDC Price Adders

Under RTC

Ancillary Service Resource Capabilities & Real-Time Ancillary Service Awards

More General Resource Statuses

Resource-Specific Regulation Deployments

Updated Desired Set Points

Real-Time Ancillary Service Prices



There will also be changes to many reports, extracts, and dashboards

Examples:

New

1. *Ancillary Service Disclosure reports for Real-Time*
2. *Real-Time Ancillary Service prices*
3. *ASDCs*

Going Away

1. *SASM reports*
2. *ORDC reports*
3. *Ancillary Service Supply Responsibility reports and notifications*

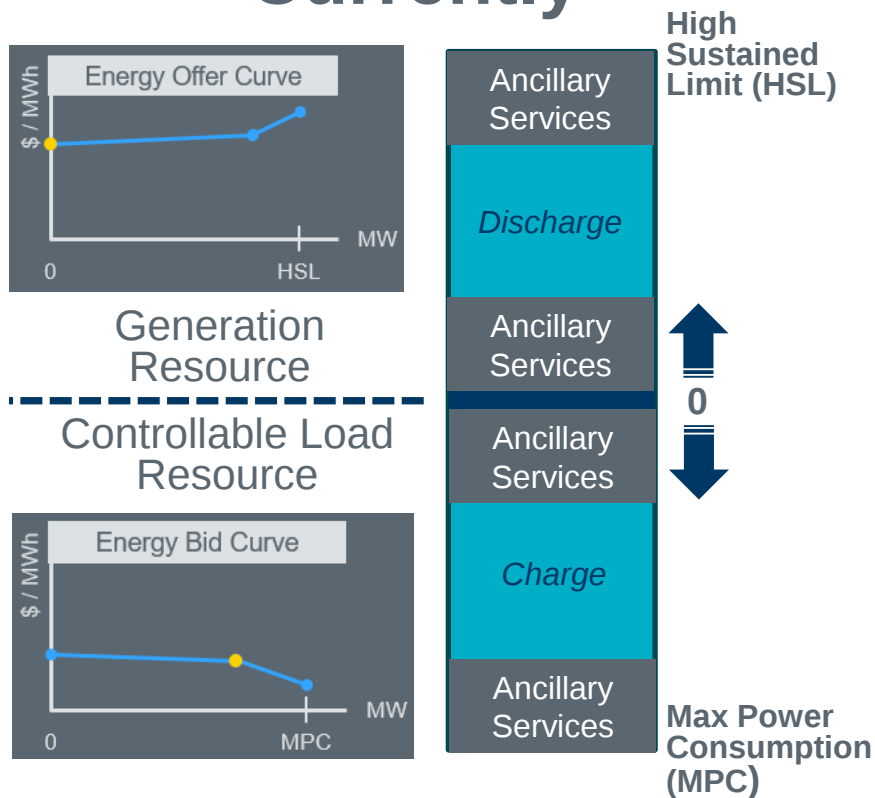
Modified

1. *Other Disclosure reports*
2. *Performance Monitoring reports*
3. *Market submission validation rules*
4. *Short-term system adequacy reports*
5. *Ancillary Service capacity monitor*

What is the “plus Batteries” part of the project?

Energy Storage Resources (ESRs) will now be fully seen as a single device within ERCOT's systems

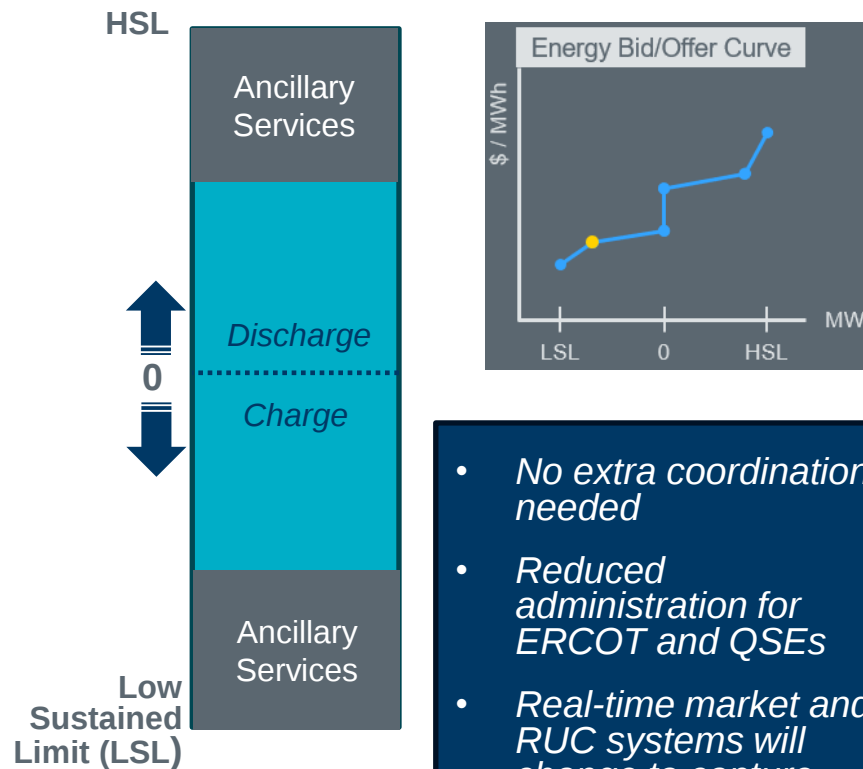
Currently



2 Resources →

- 2 Current Operating Plans
- 2 sets of telemetry
- Submission dependencies

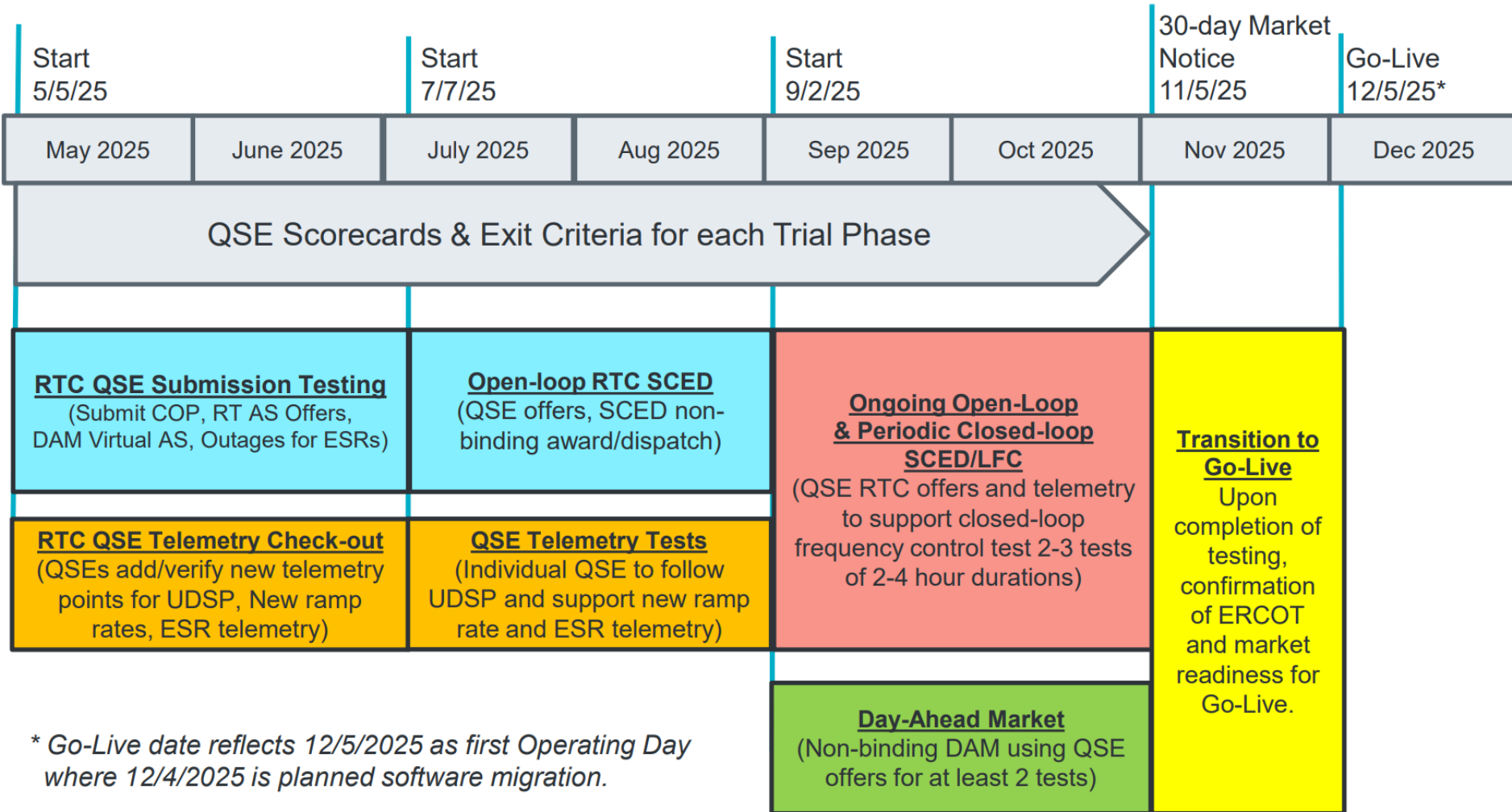
Future



- No extra coordination needed
- Reduced administration for ERCOT and QSEs
- Real-time market and RUC systems will change to capture capabilities and characteristics of ESRs.

What is the timeline for testing and implementation of the project?

There are several testing activities planned for ERCOT and QSEs prior to implementation of the project



* Go-Live date reflects 12/5/2025 as first Operating Day where 12/4/2025 is planned software migration.



Thank You!



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