



# Day-Ahead Market Overview

## Session 1

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# The Purpose of These Sessions

To educate stakeholders on the features of the current day-ahead market, setting a foundation for the extended day-ahead market (EDAM) stakeholder process.

# Agenda

## Today

### Introduction

Purpose of this overview  
Agenda for these sessions

### The goal of the day-ahead market

### Important inputs for the day-ahead market

### What does the market do?

## Next Week

### Pricing

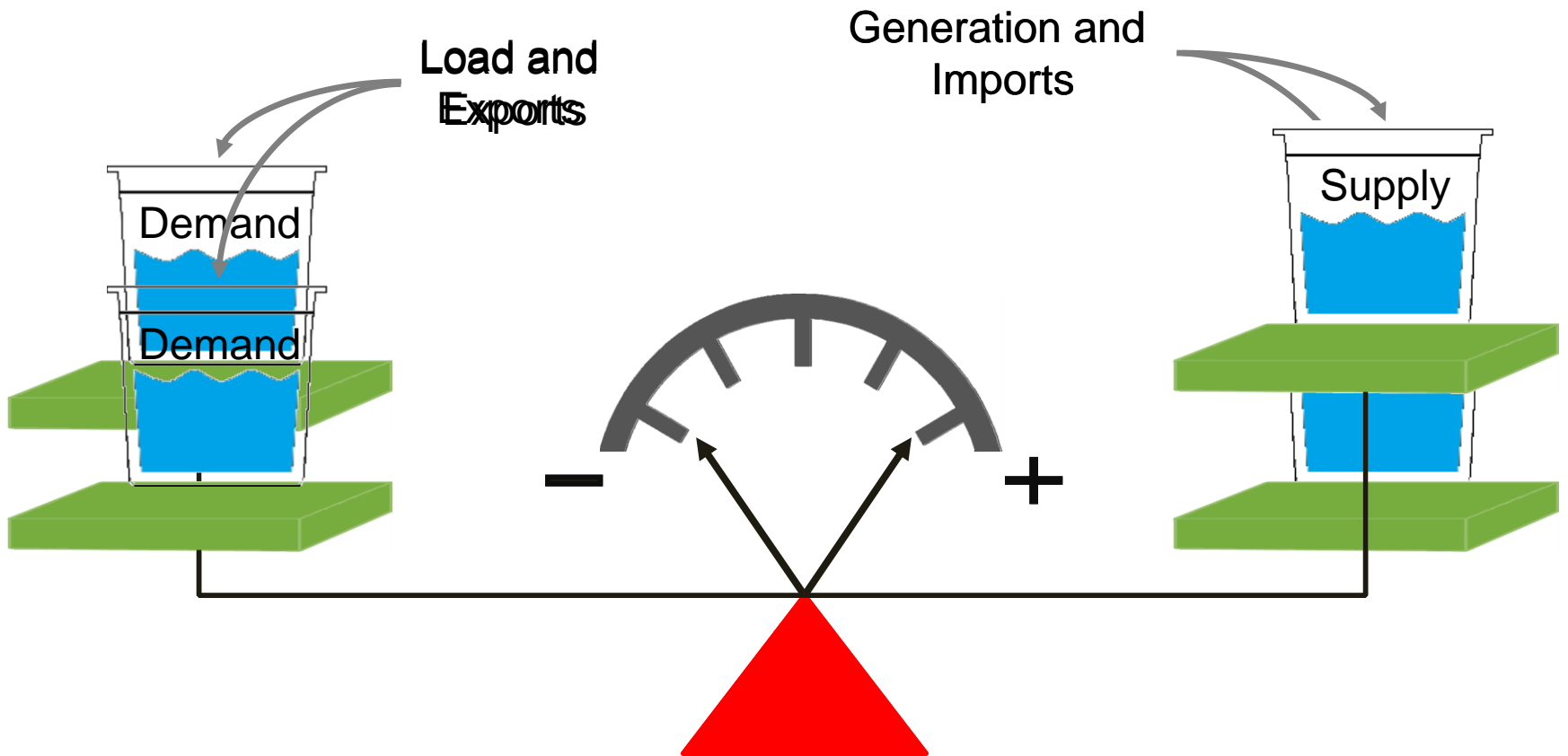
### Financial products

Congestion Revenue Rights  
Convergence Bidding

### What comes from the market? How is it useful?

### Upcoming Initiatives

# The balancing of supply and demand



The ISO is a nonprofit, public benefit corporation

## Our responsibilities are to...

**Drive innovation**

**Facilitate infrastructure  
planning**

**Provide market  
transparency**

**Maintain grid  
reliability**

**Run the  
Market**

**Support state and  
federal policy goals**

Coordinate the bulk  
electric power system

# Grid operator and market operator

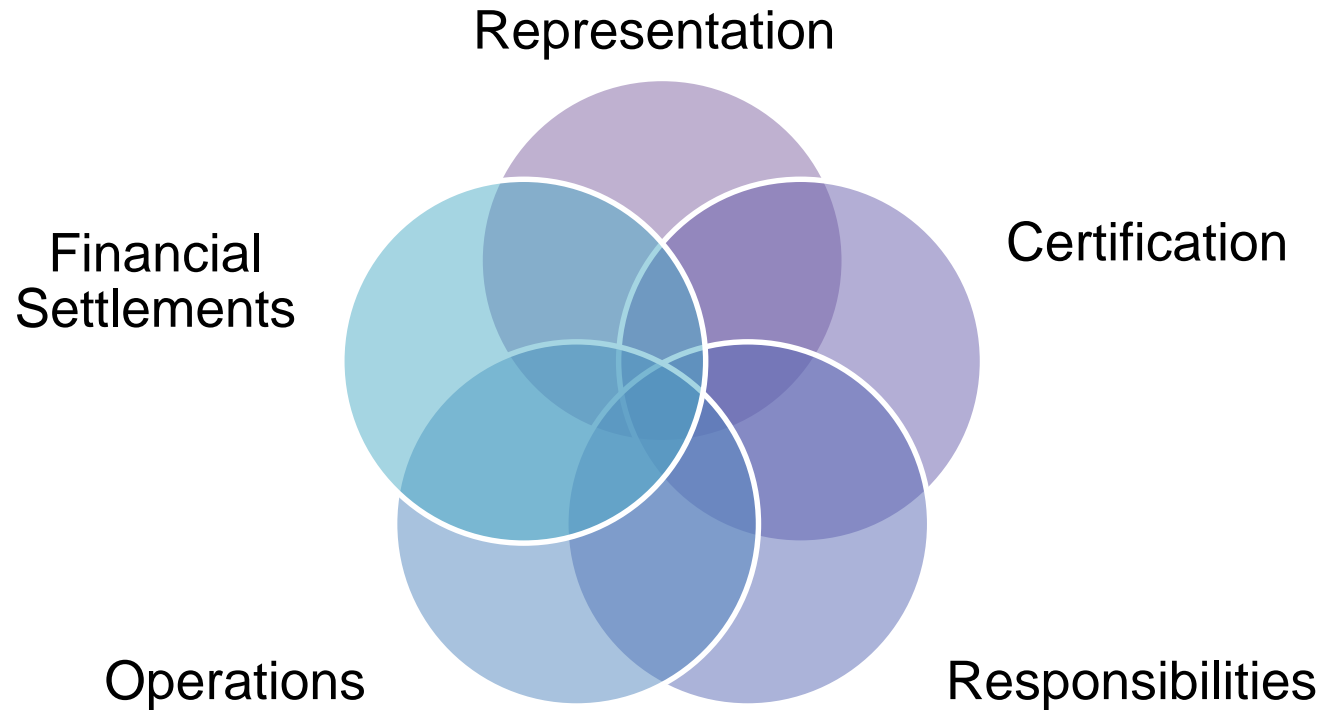
## A grid operator maintains reliability by:

- Balancing supply and demand
- Operating transmission system within limits
- Ensuring grid is secure in case of a contingency event
- Orchestrating restoration in case of a system outage

## A market operator supports reliability by providing:

- A larger operational footprint
- Cost minimization to balance supply and demand
- Non-discriminatory grid access to supply and demand
- Price transparency reflective of system conditions
- Compensation for grid services

# Scheduling Coordinators are entities that are authorized to transact business with the ISO



# Break for Questions



# WHAT DOES THE DAY-AHEAD MARKET DO?

A full day's operations are covered by two markets

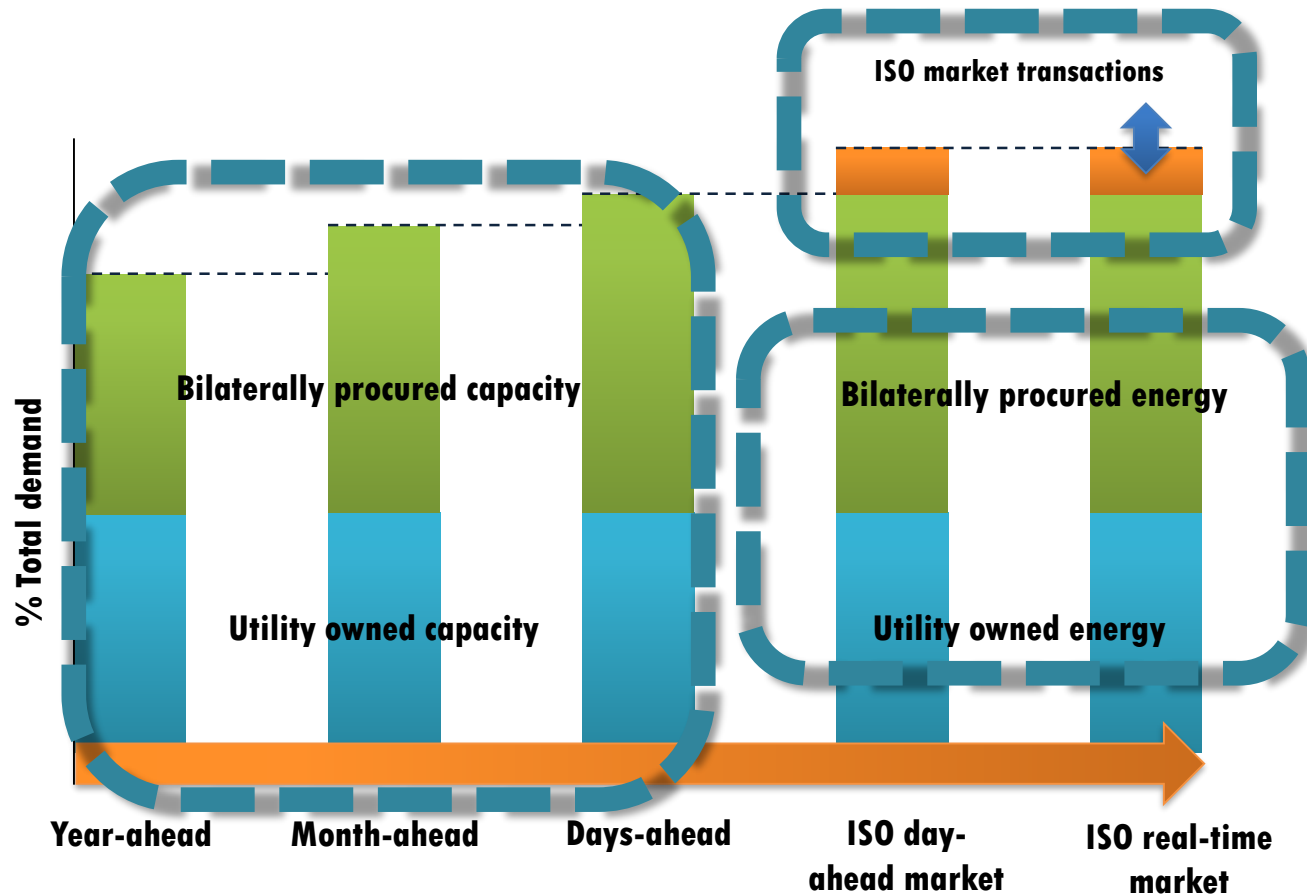
**Day-ahead  
market**

**Real-time  
market**

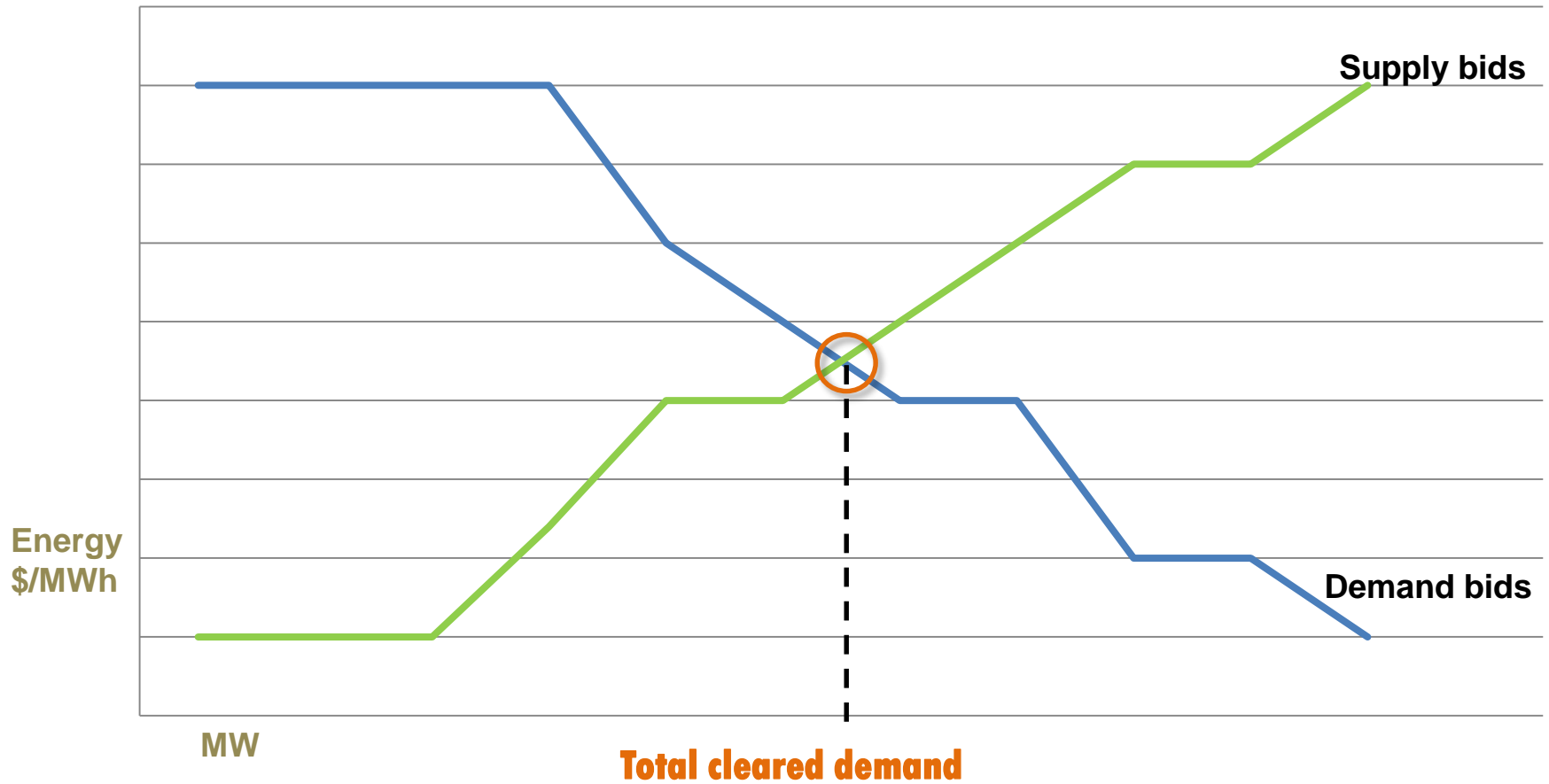
Day-ahead markets procure resources to meet reliability needs

**Assurance, a day in advance, that there are adequate resources available and deliverable in real-time**

# Utilities line up most of their supply needs in advance of the operating day



The day-ahead market clears the supply against the demand for each hour of the day.

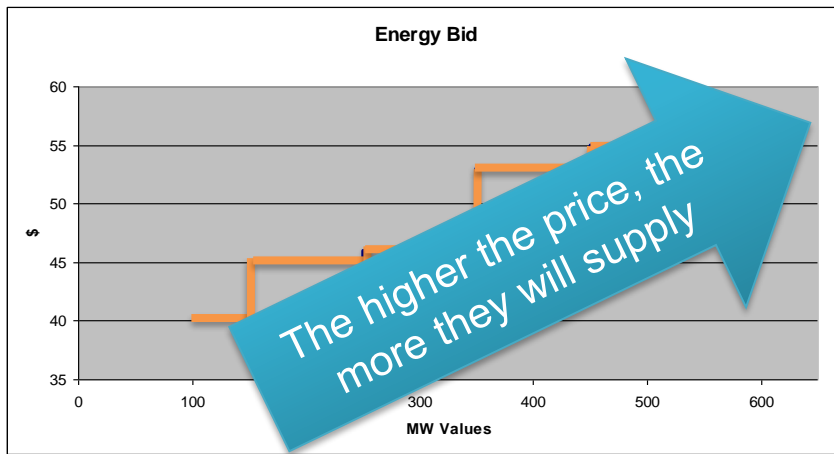


# Break for Questions

# ECONOMIC BIDS AND SELF SCHEDULES

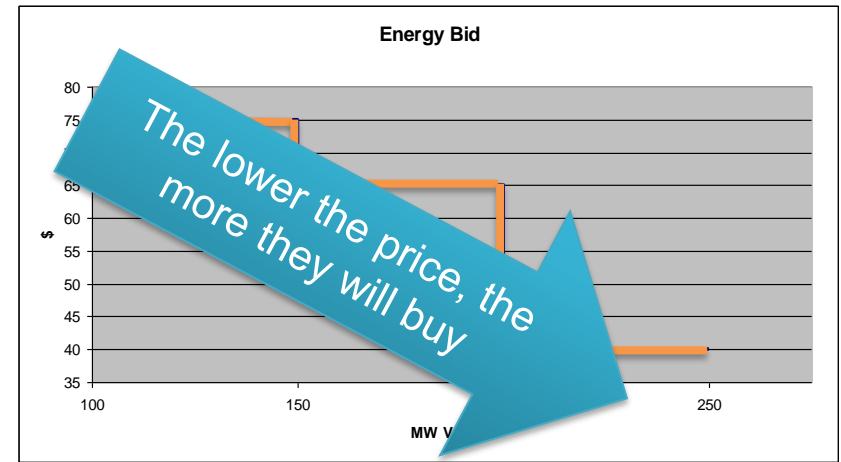
# Energy bids provide an economic signal indicating a participant's willingness to supply or purchase energy

## SUPPLY BID



**generators and imports**

## DEMAND BID



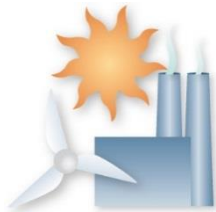
**loads and exports**



# Self schedules are also known as “price takers”

## SUPPLY SELF SCHEDULE

Informs the ISO that the SC is willing to run its generator regardless of the price

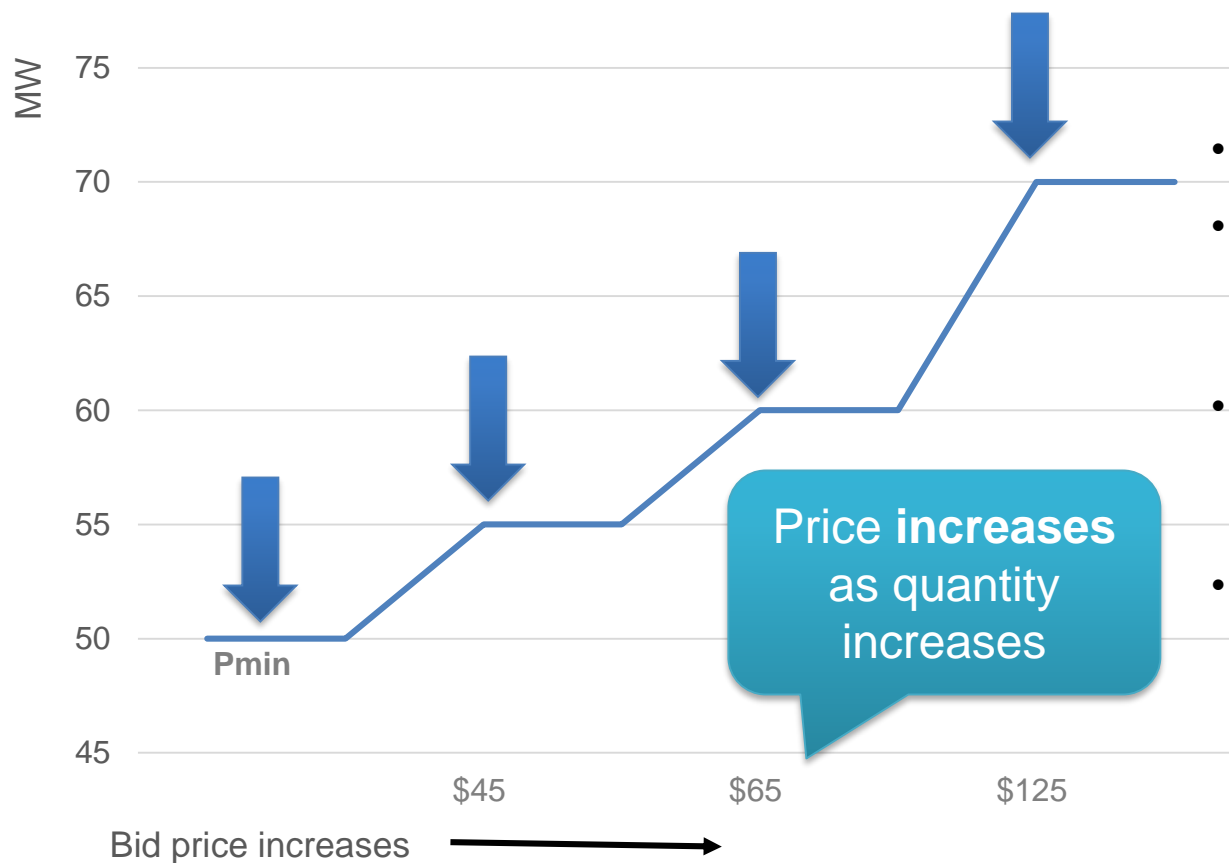


## DEMAND SELF SCHEDULE

Informs the ISO that the SC is willing to buy a certain quantity of supply, regardless of the price, to serve its load



# Supply Bid



- The Pmin is 50 MW
- If the price is least \$45 I am willing to provide 5 more MWs (from 50 MW to 55 MW)
- If price is at least \$65 I am willing to provide 5 more MW (55 MW to 60 MW)
- If the price is at least \$125 I am willing to provide 10 more MW (60 MW to 70 MW)

Import bids work the same way, however the bid begins at 0 MW.

# Demand or Export Bid

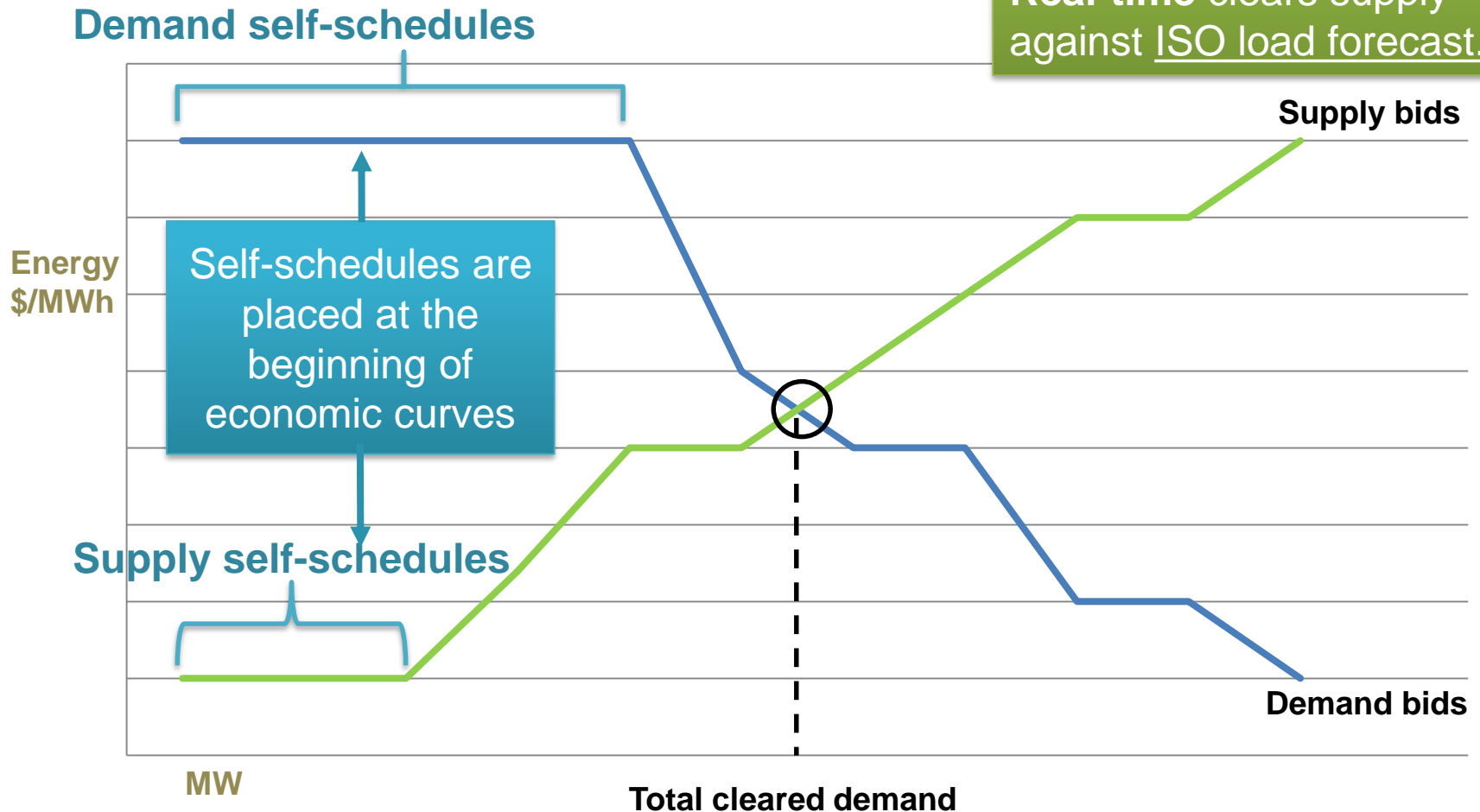


- The self schedule is 11 MW
- If the price is \$75 or less I am willing to purchase 4 more MWs (from 11 MW to 15 MW)
- If price is at least \$65 I am willing to purchase 1 more MW (15 MW to 16 MW)
- If the price is at least \$60 I am willing to purchase 1 more MW (16 MW to 17 MW)

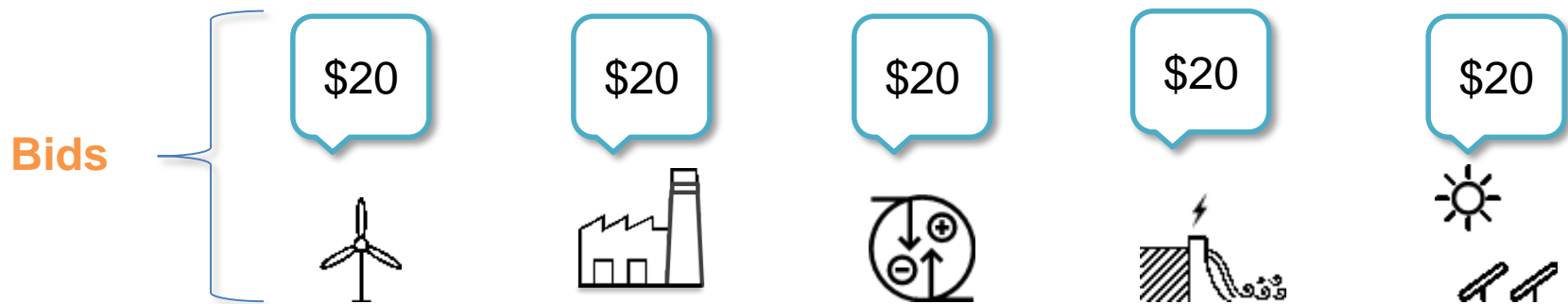
# Economic bids and self schedules

Day-ahead clears supply bids against demand bids;

Real-time clears supply against ISO load forecast.



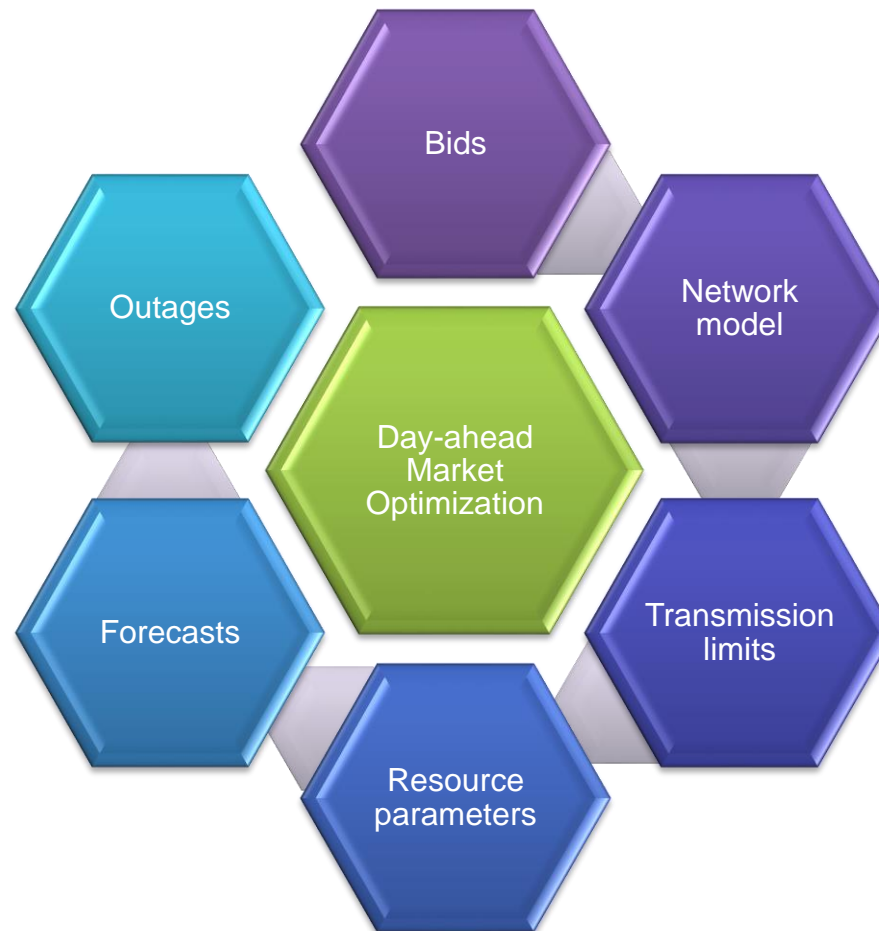
# How does the market decide which resources to commit?



Other costs:

- Start-up cost (one time)
- Minimum load cost (hourly)
- Energy bid curve above minimum load (\$/MWh)

# Other inputs of the **day-ahead** market

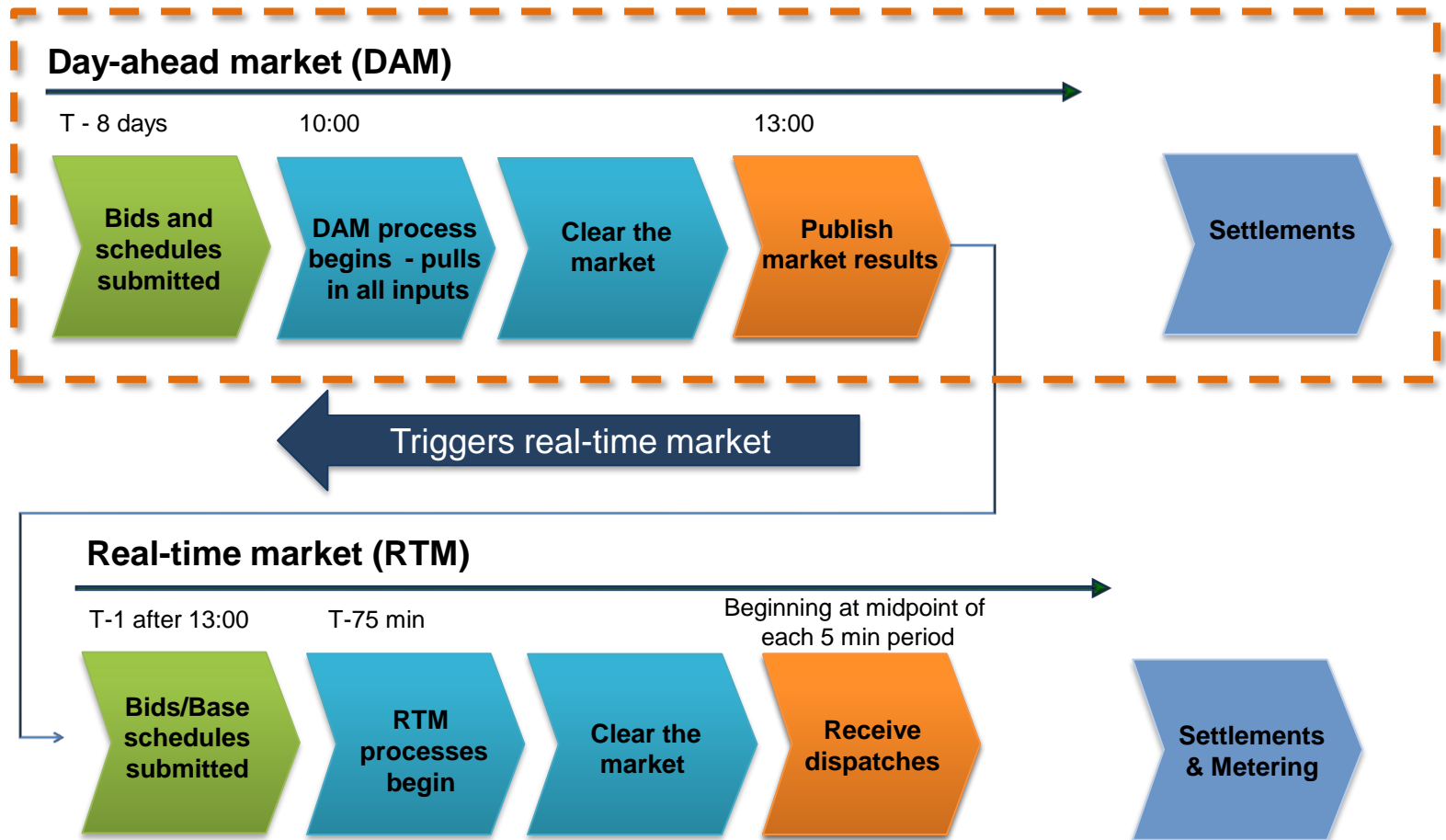


# Break for Questions

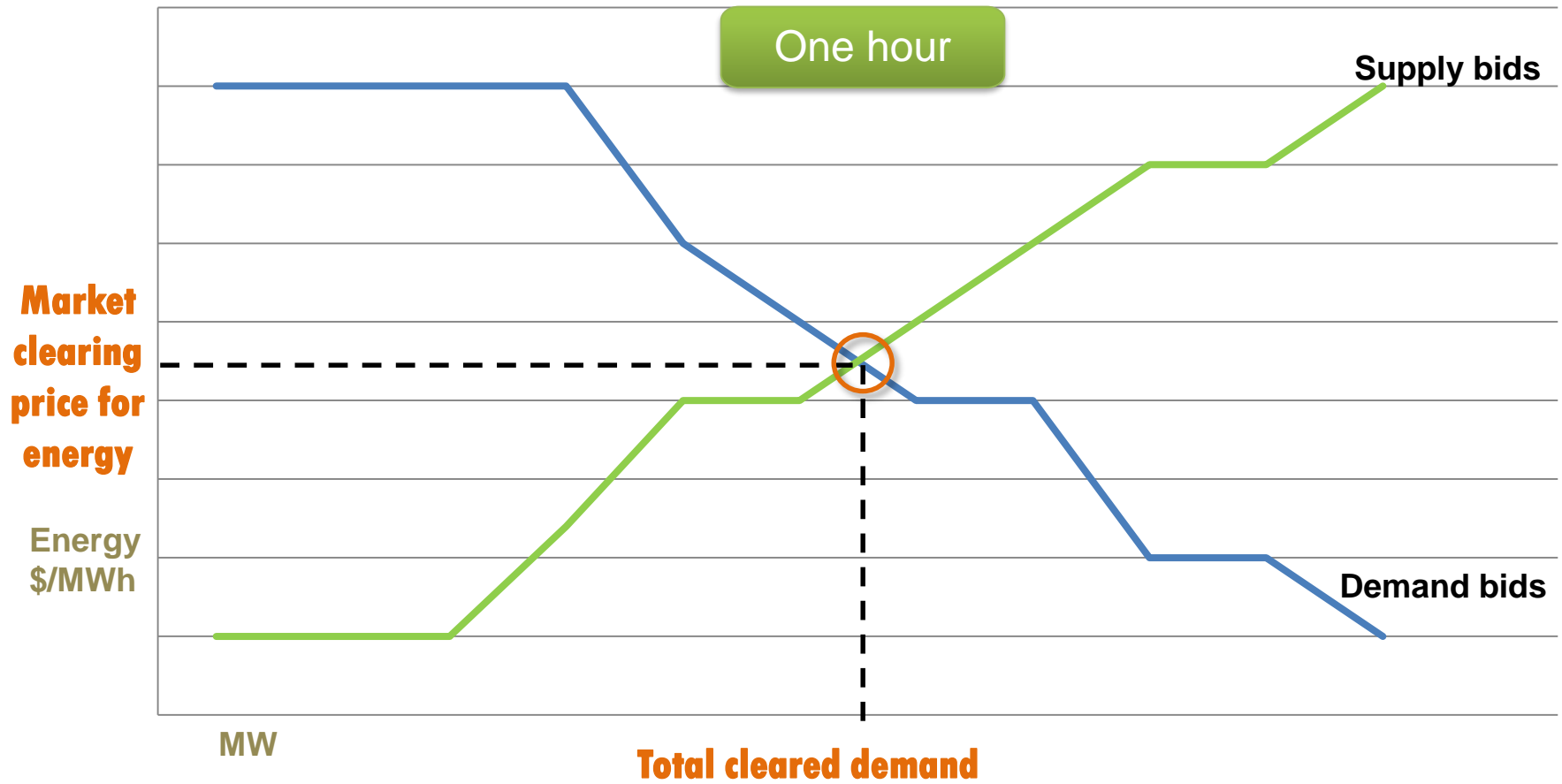
# WHAT DOES THE DAY-AHEAD MARKET DO?



# Market process timelines



The day-ahead market determines the amount of energy that will be purchased for each hour.



# Ancillary services and additional capacity are procured in the ISO BAA to meet reliability requirements

The ISO procures:

## Regulating reserves

- based on procurement targets set by ISO to meet WECC standards

## Contingency reserves

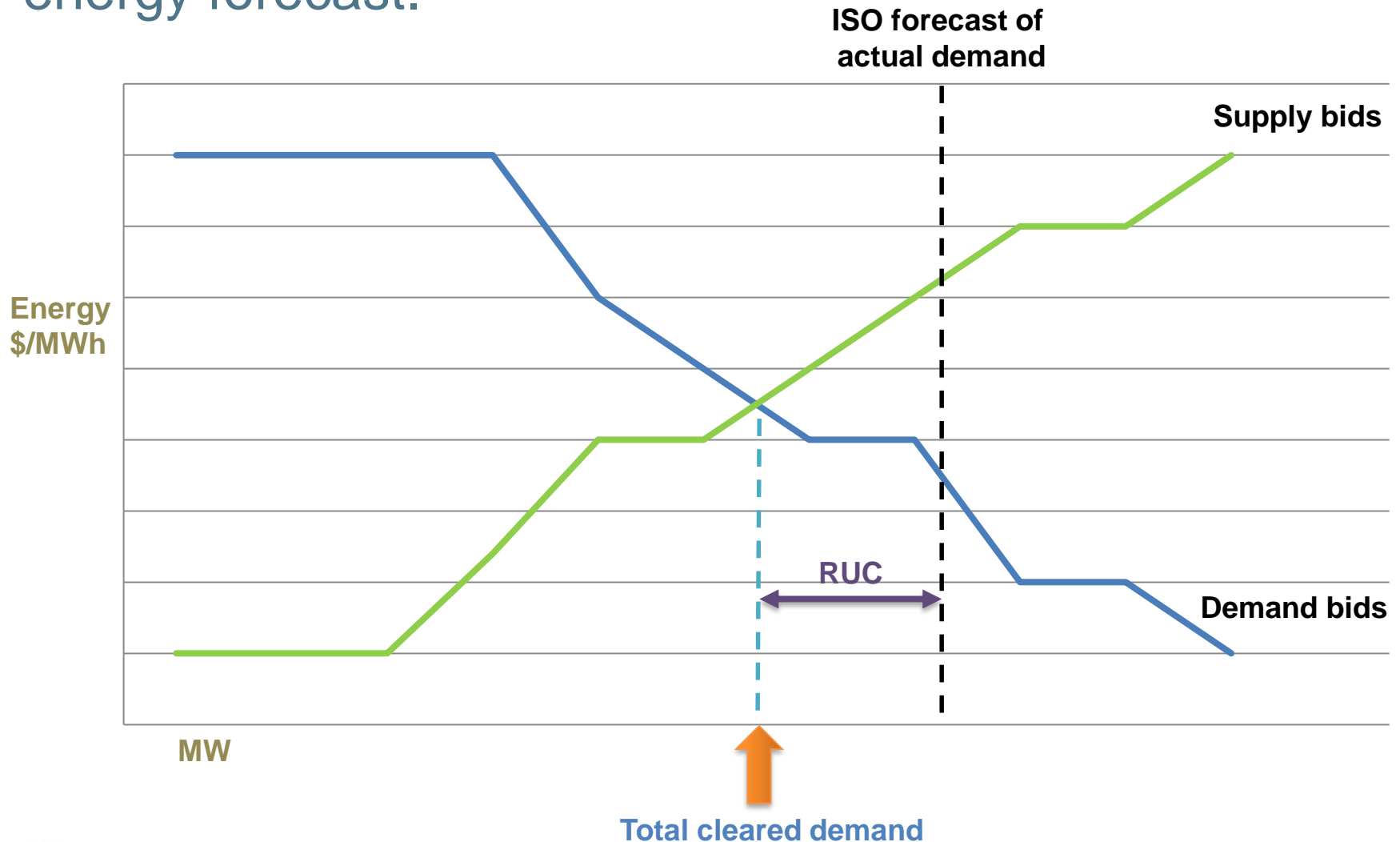
- based on procurement targets set by WECC

## Residual Unit Commitment

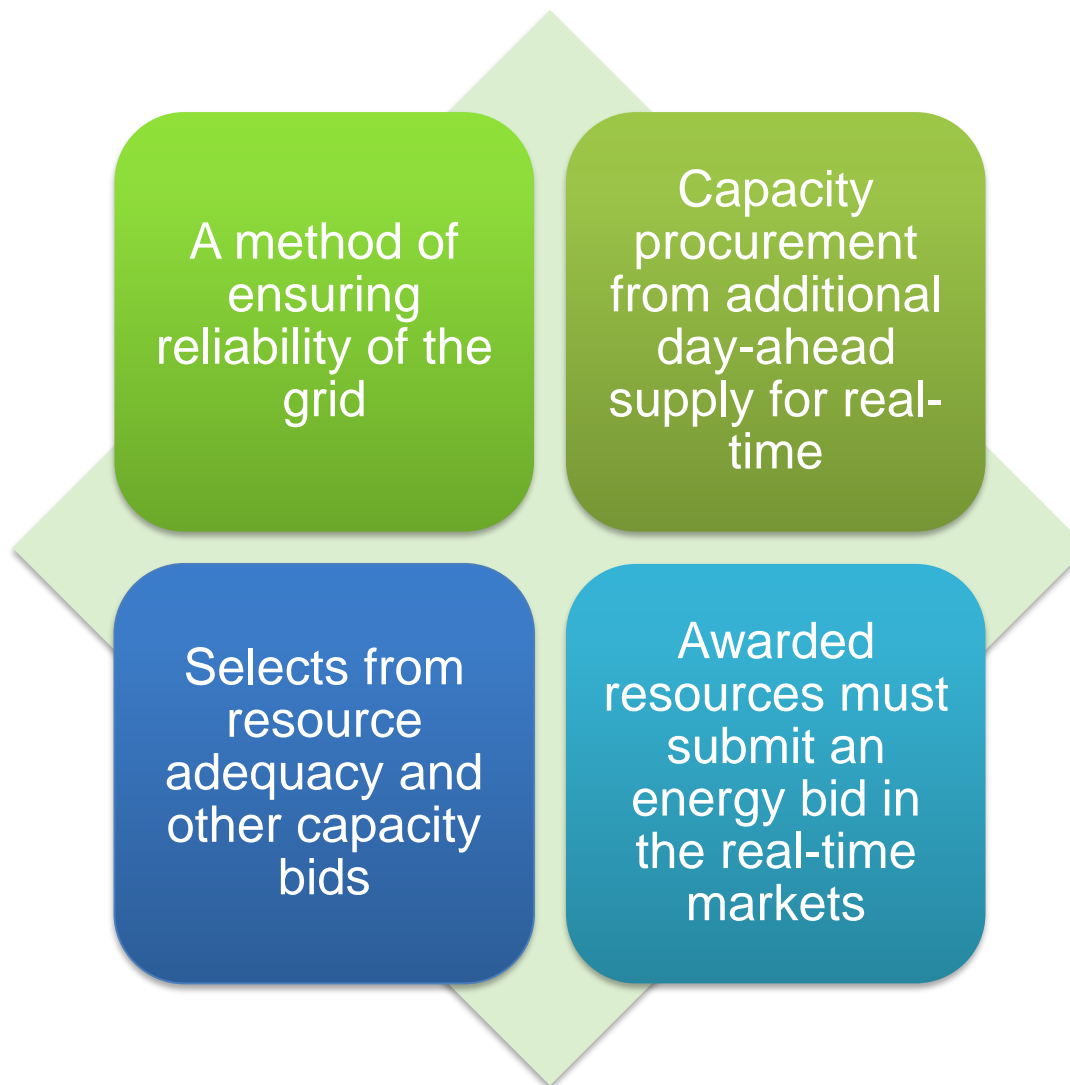
- to meet the ISO system-wide and regional forecasts



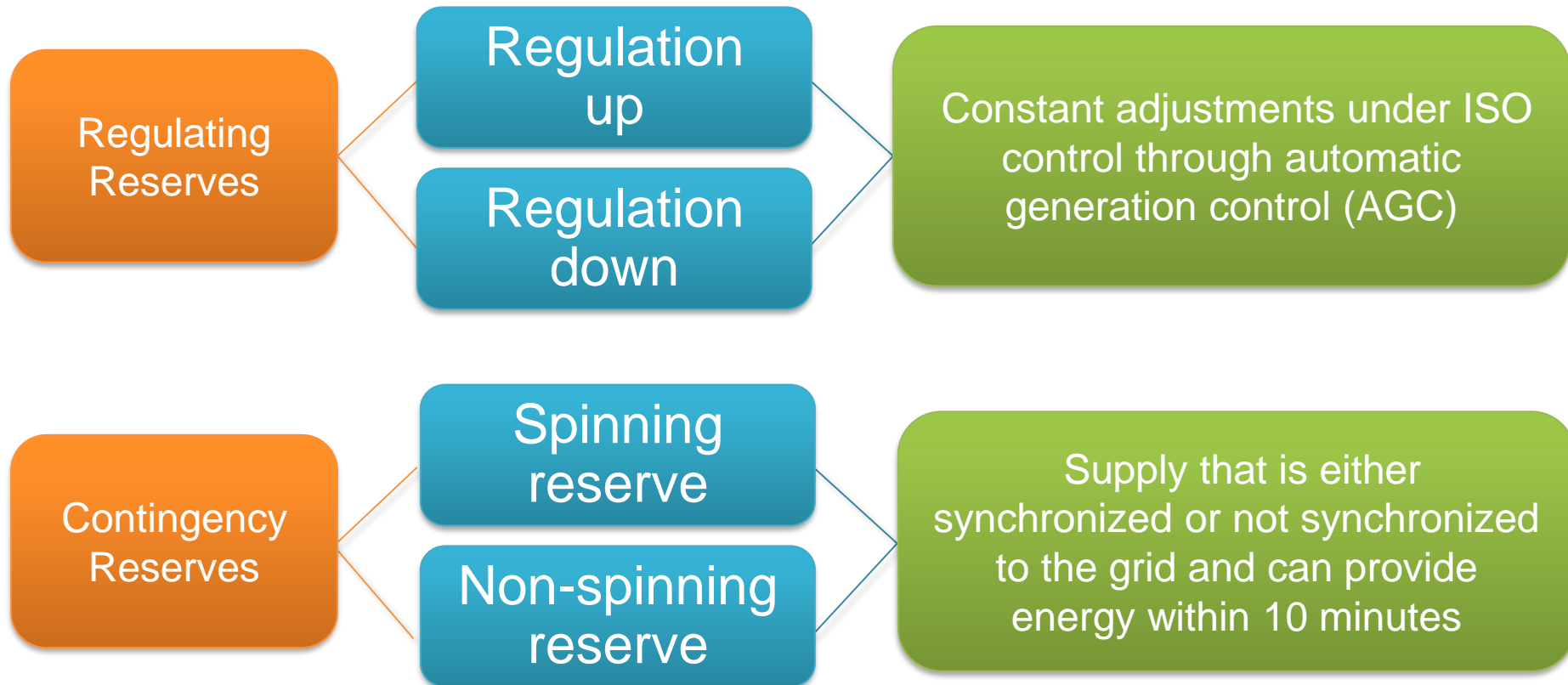
# Residual unit commitment is used to meet the ISO's energy forecast.



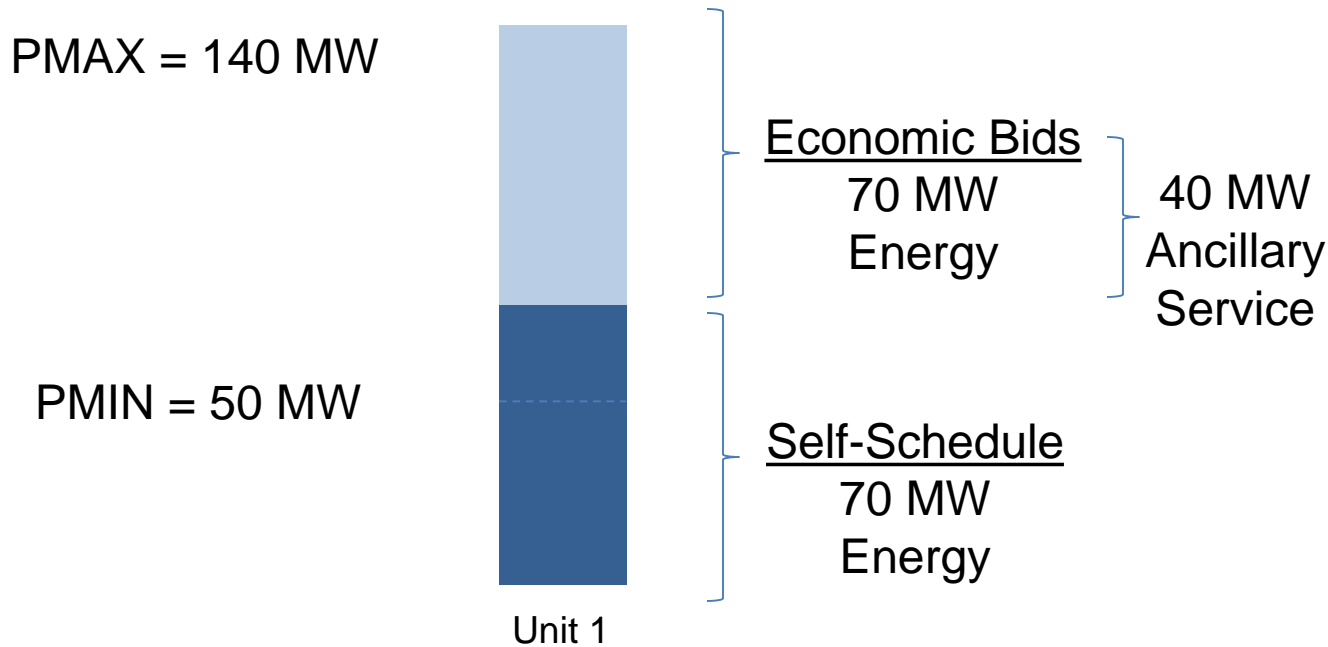
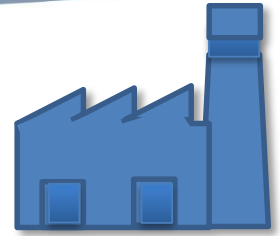
# Residual unit commitment



# The market also procures capacity (ancillary services) to meet reliability requirements

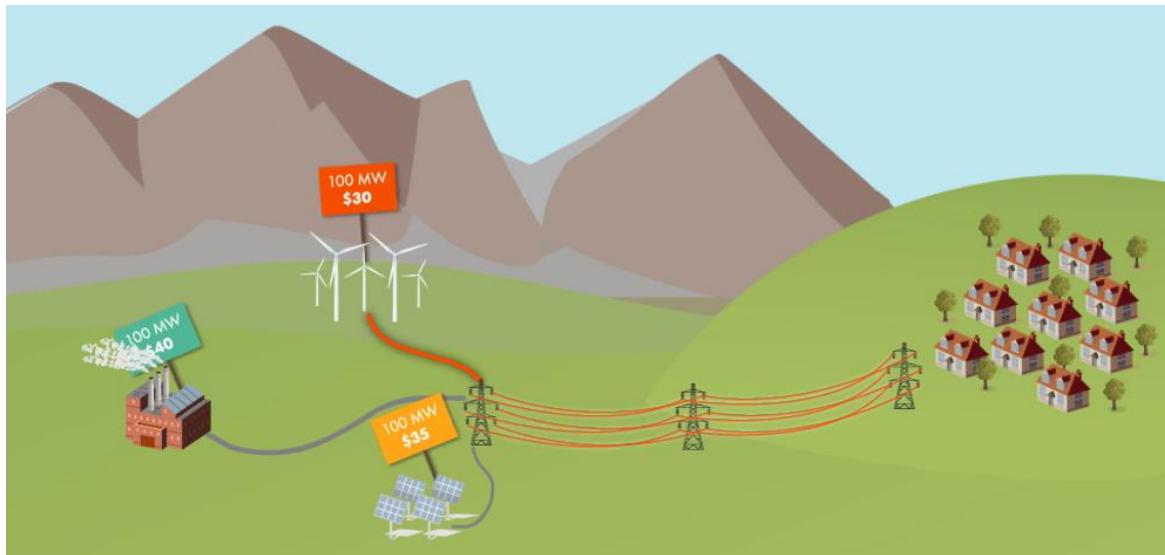


# Day-Ahead Bidding for Supply



- The key point is that the same MWs are being offered to the market across a variety of products
- The market will co-optimize these offers for energy and ancillary services along with those from all of the other resources to determine the optimal solution across the entire day

# Market Power

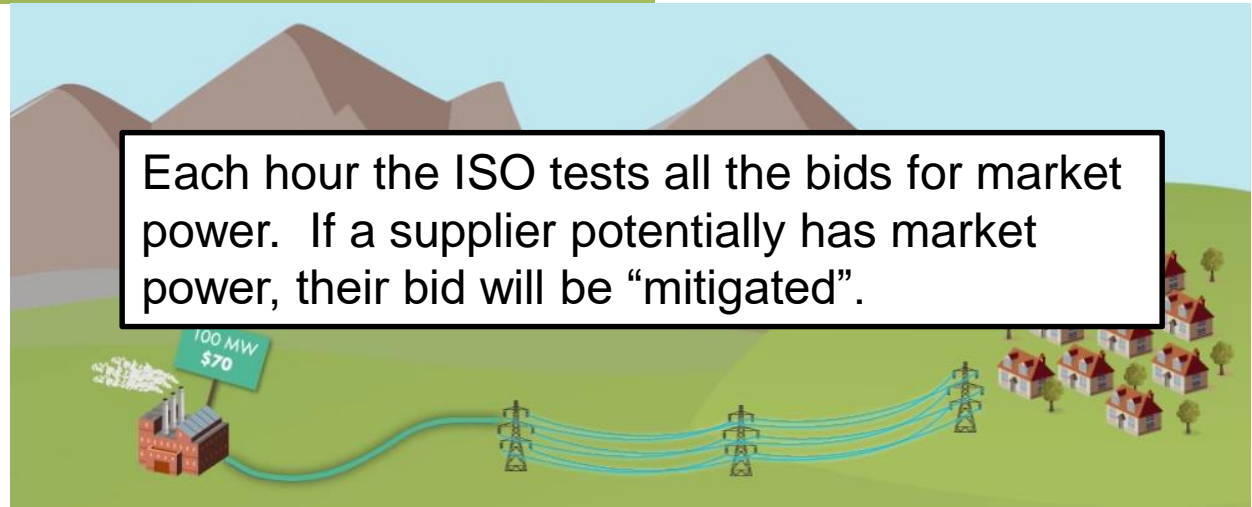


Competition among suppliers to serve the load



No competition = Market power

Each hour the ISO tests all the bids for market power. If a supplier potentially has market power, their bid will be “mitigated”.





# Grid operators need a plan for operating the next day to ensure reliability

- The California ISO uses its **day-ahead market** to create that plan. As a result, resources are committed to provide:
  - Supply to meet the demand that cleared in the market
  - Supply to meet the ISO demand forecast
  - Ancillary services to meet the reliability requirements



# Break for Questions



**Thank you for your participation!**

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Or send an email to:  
CustomerReadiness@caiso.com