

Energy Price Component

Kelly Stegmann

Senior Market Trainer, Market Training, NYISO

LBMP In Depth

November 8-10, 2022

Remote Learning

Session Objectives

- **Upon completion of this module, trainees will be able to:**
 - Describe the concept of economic dispatch
 - Identify the price setting unit in module examples
 - Understand the role of the NYISO Reference Bus

LBMP Components

- **The cornerstone of the NYISO Market Operation is the use of LBMP.**

$$\text{LBMP} = \text{Energy} + \text{Loss} - \text{Congestion}$$

NYISO Energy Market Operation

- **The principle of efficient economic operation suggests that, in the absence of any transmission losses and transmission constraints, the least costly way of producing electric energy is achieved when all generators supply energy at a MW level such that the price of one more MW of output is the same for all unconstrained units.**

LBMP Components

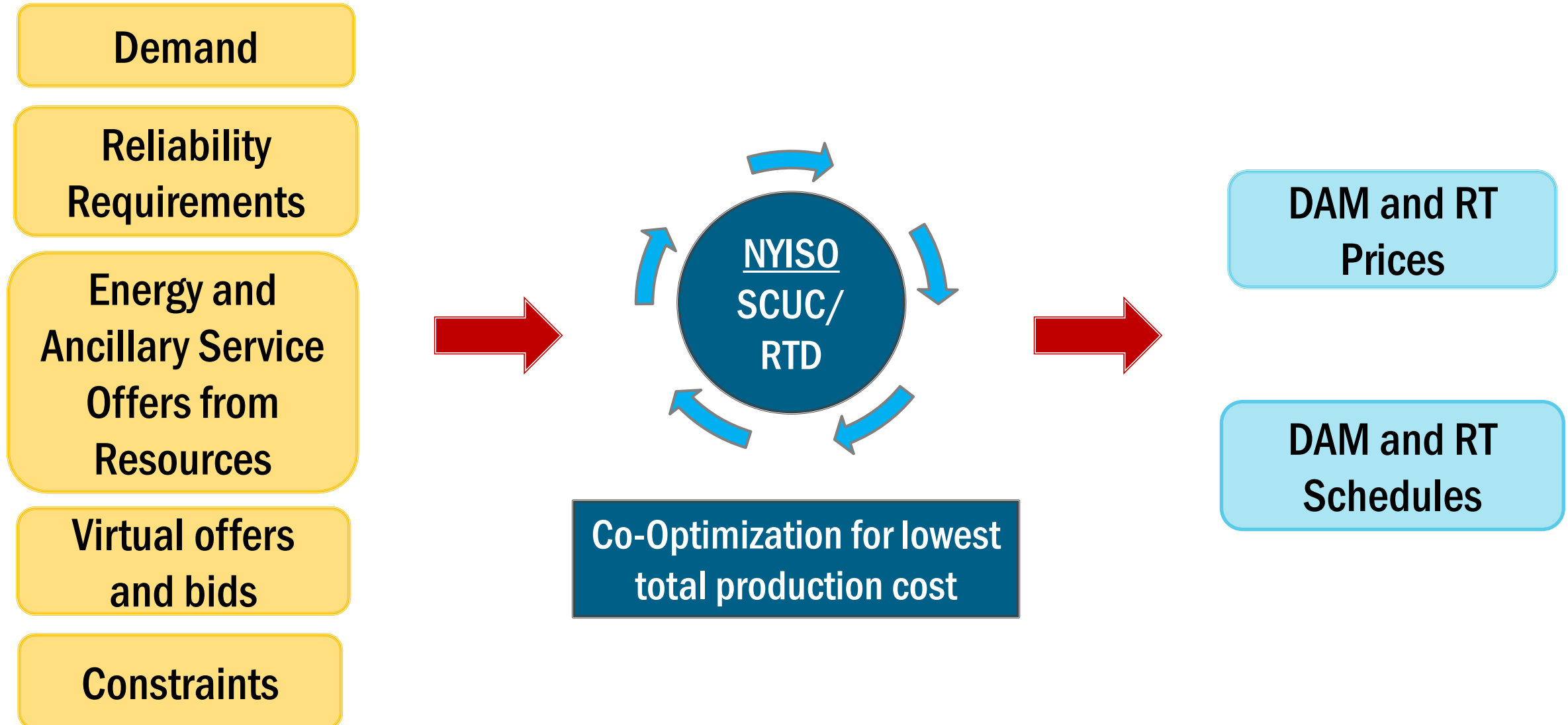
- **In real power networks, the presence of losses and network constraints on the flow of electricity requires a departure from this dispatch to satisfy the most efficient, reliable operation.**

LBMP Components - Energy

- **Actual cost of energy needed to meet load**
- **Same price for all generators and loads for given time period**
- **Ideal operating condition is known as “equal lambda” dispatch**

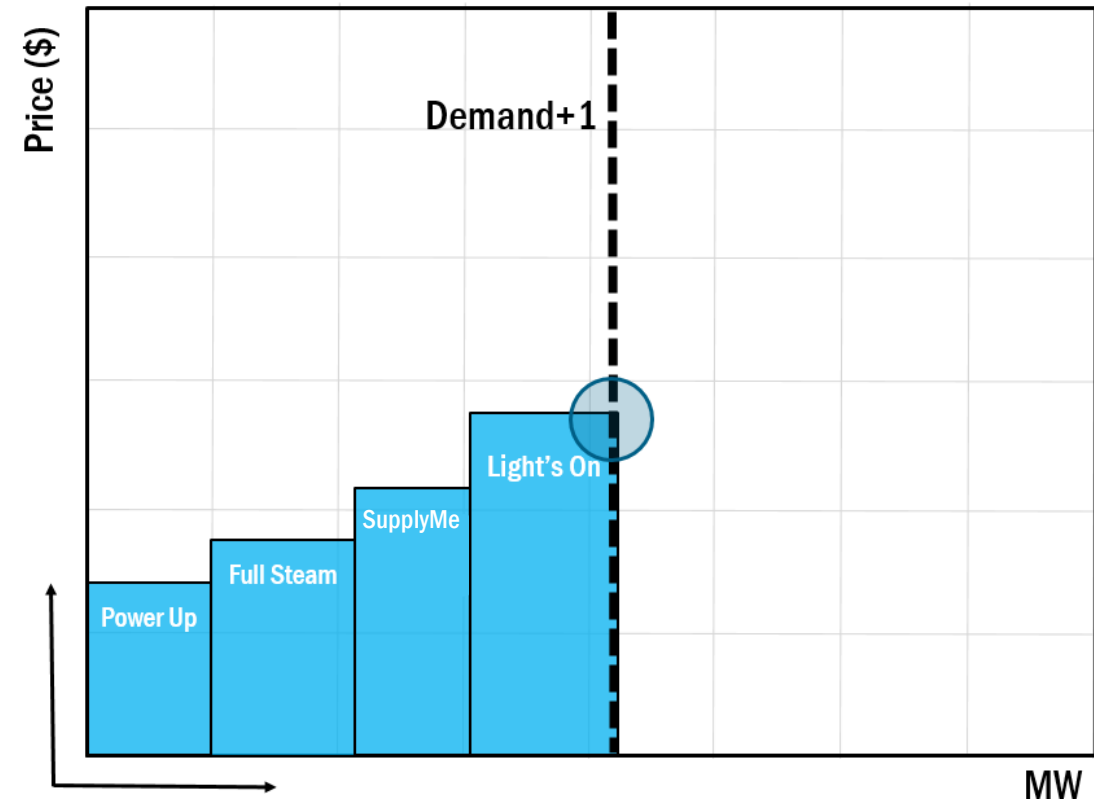
Economic Dispatch

LBMP: Co-Optimization Based on Bids and Offers



System Demand

- **Software solves for total demand on system**
 - Determine pool of resources (offers & parameters)
 - Create a bid stack
 - Least cost solutions (w/ parameters)

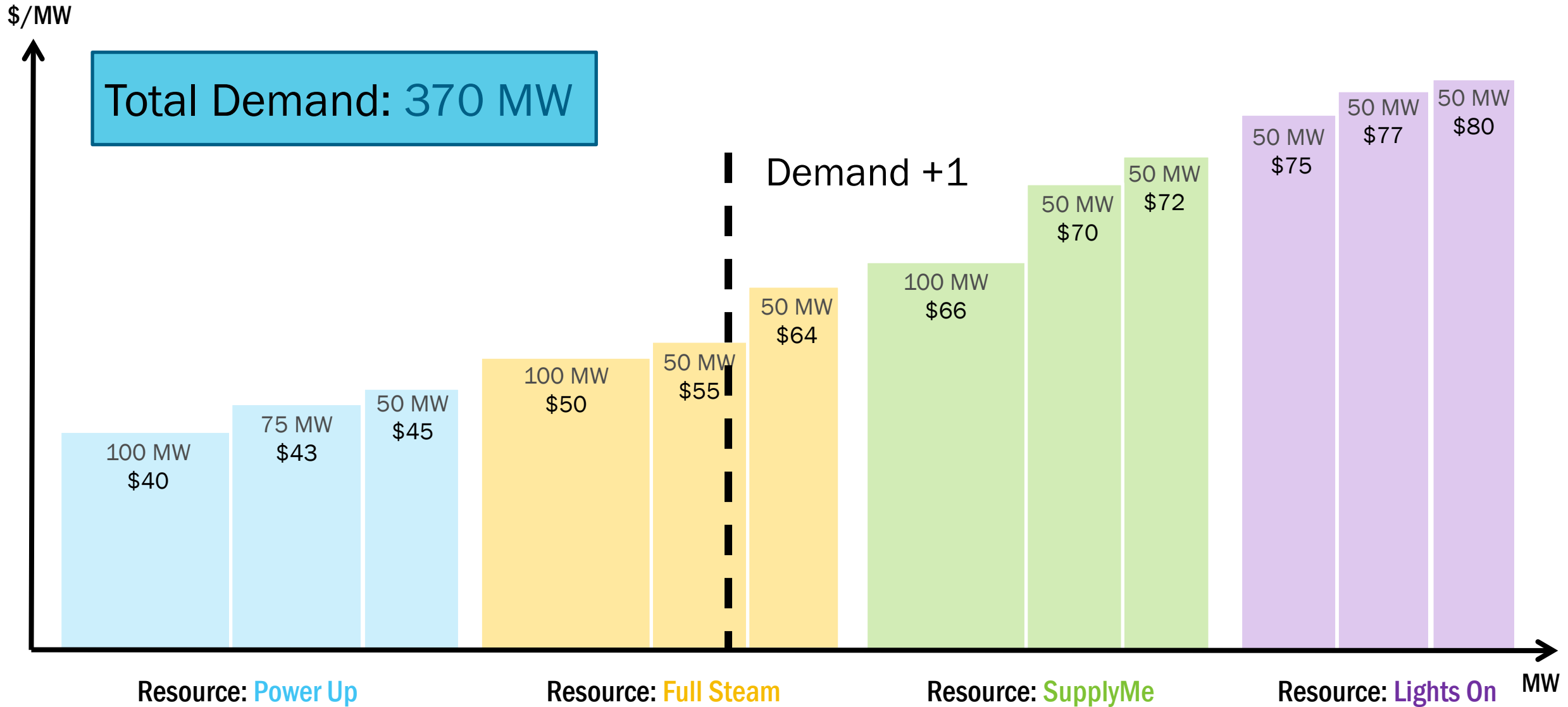


NOTE

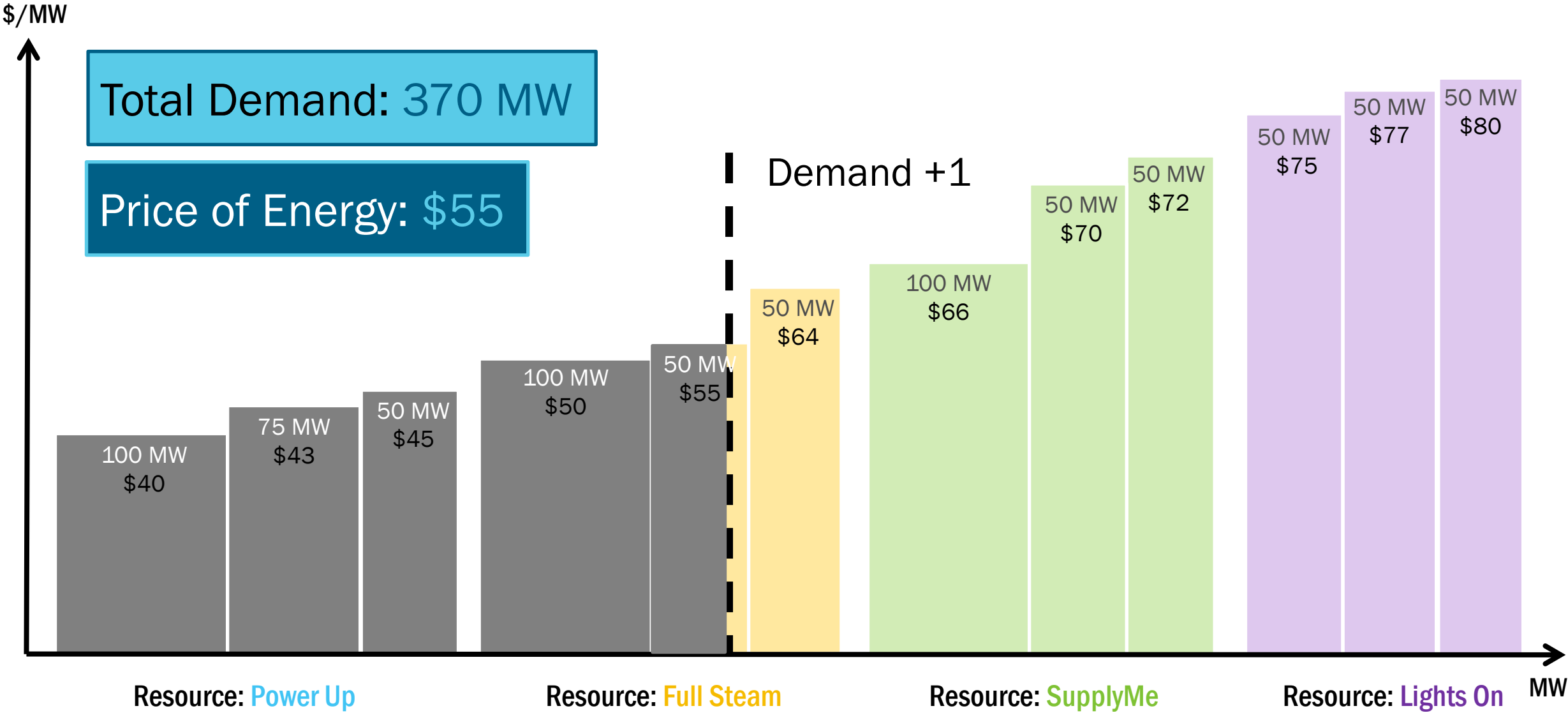
This applies to both DA and RT Markets

Price Setting Unit

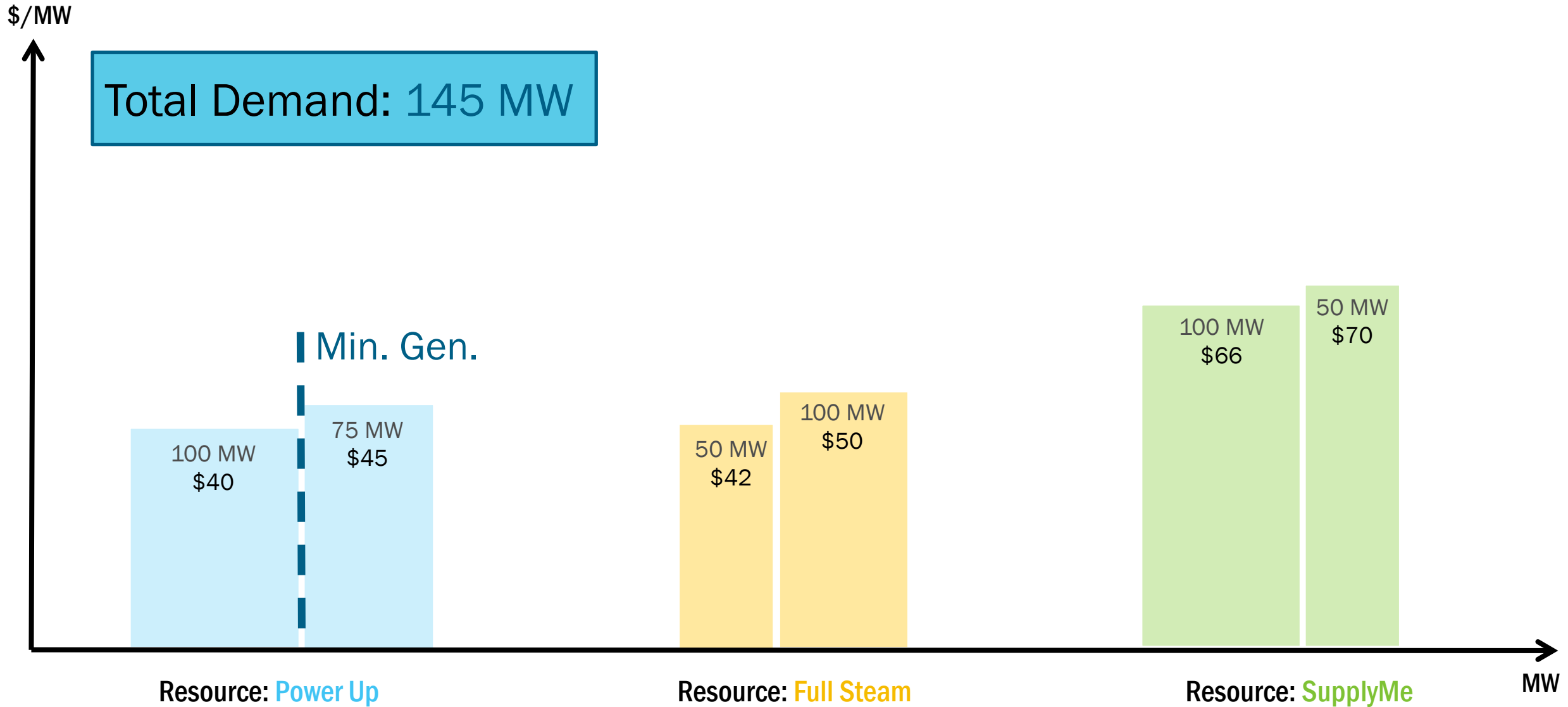
Example 1 - Demand



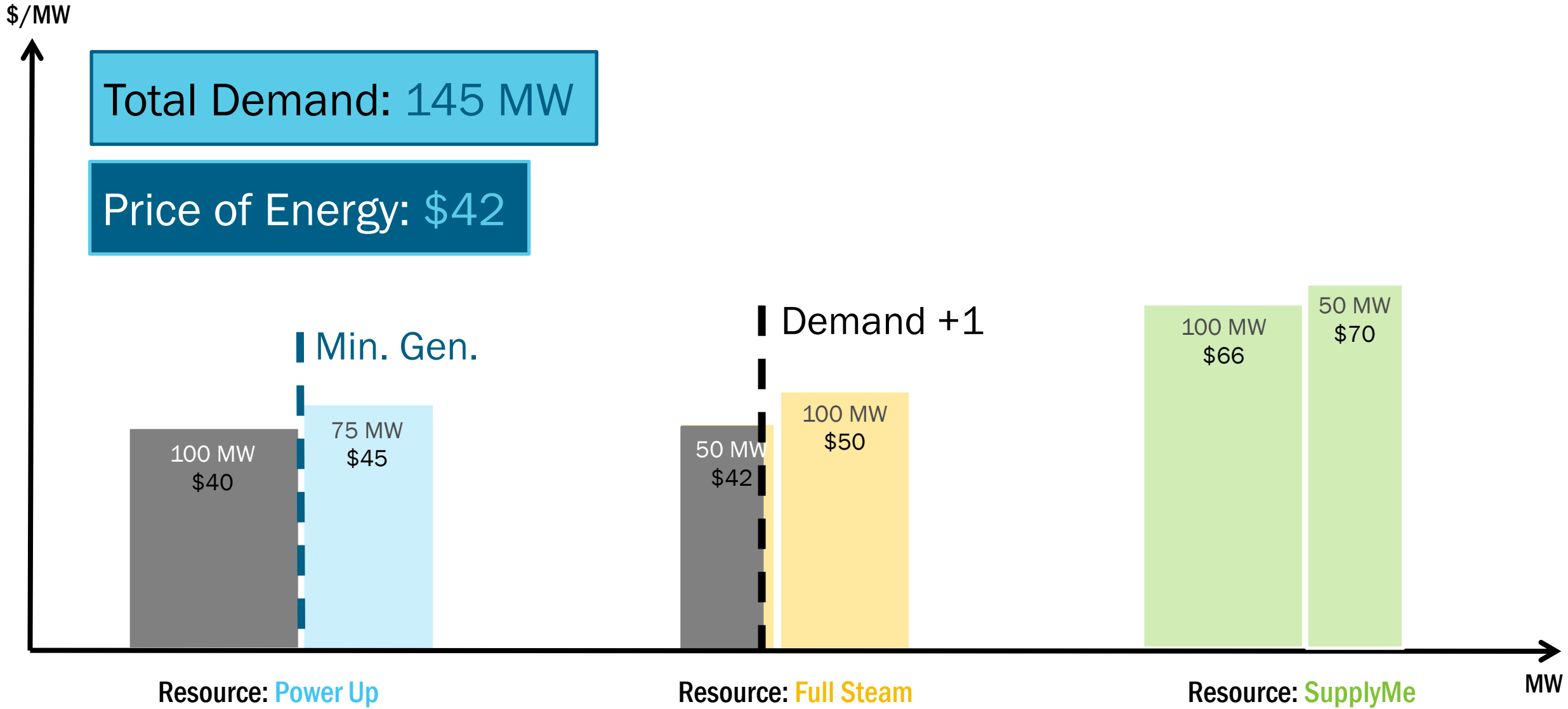
Example 1 - Demand



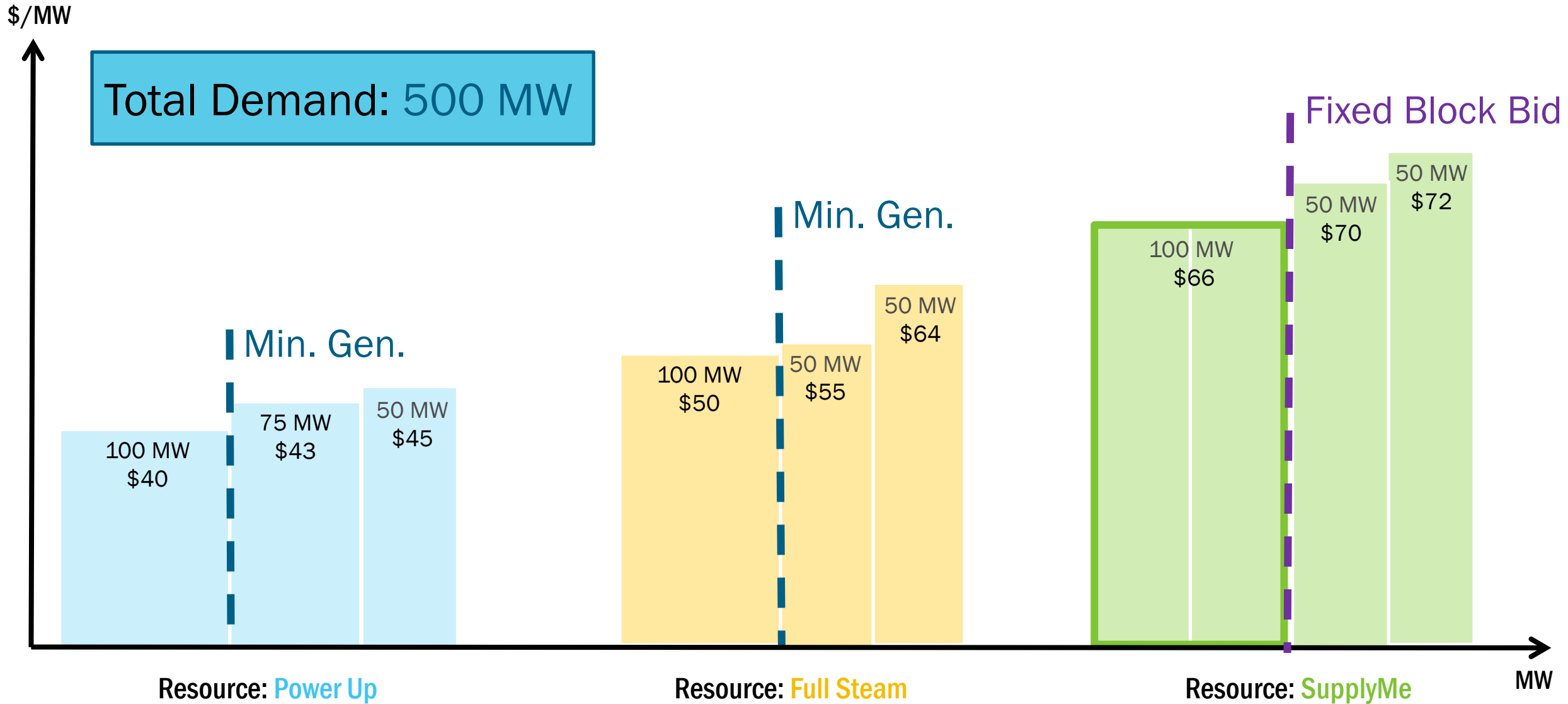
Example 2 – Min Gen



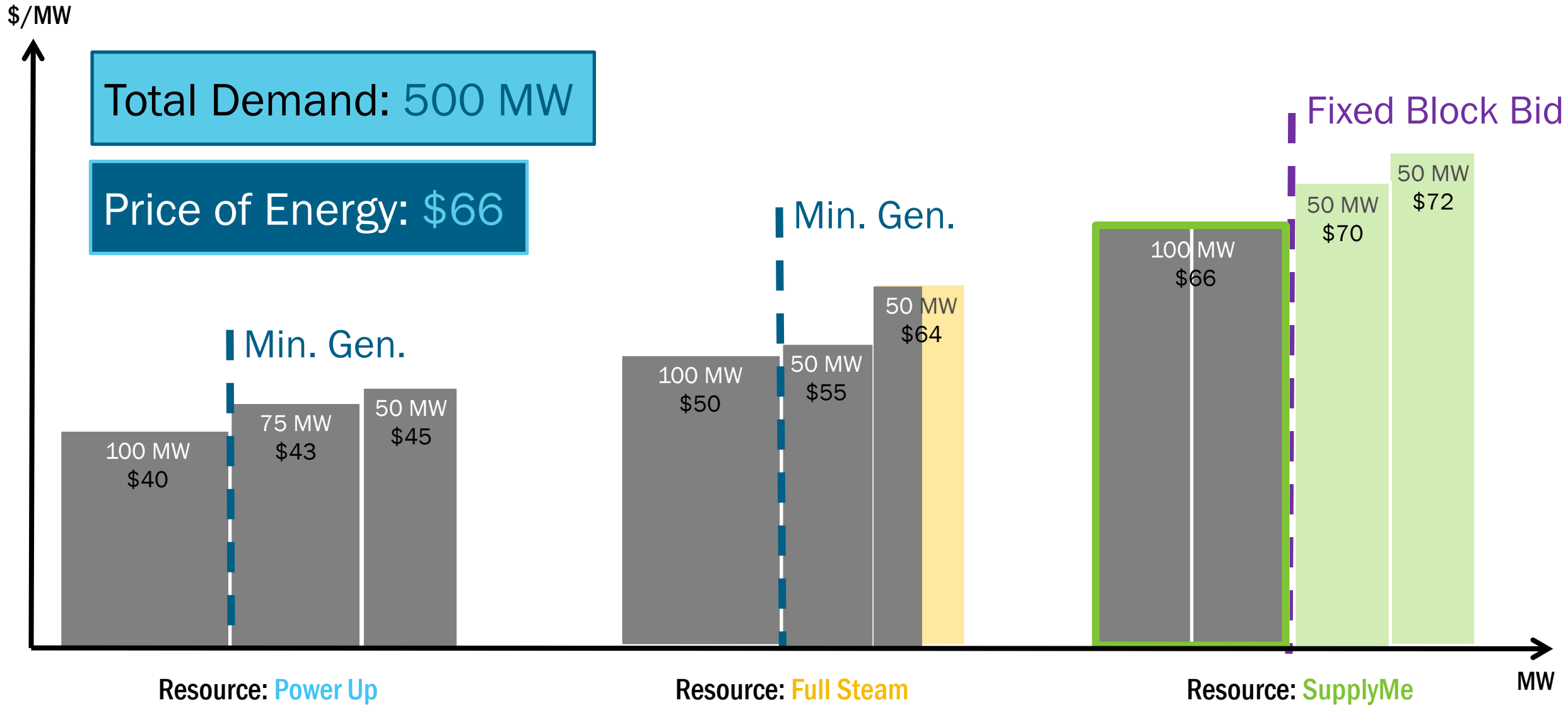
Example 2 – Min Gen



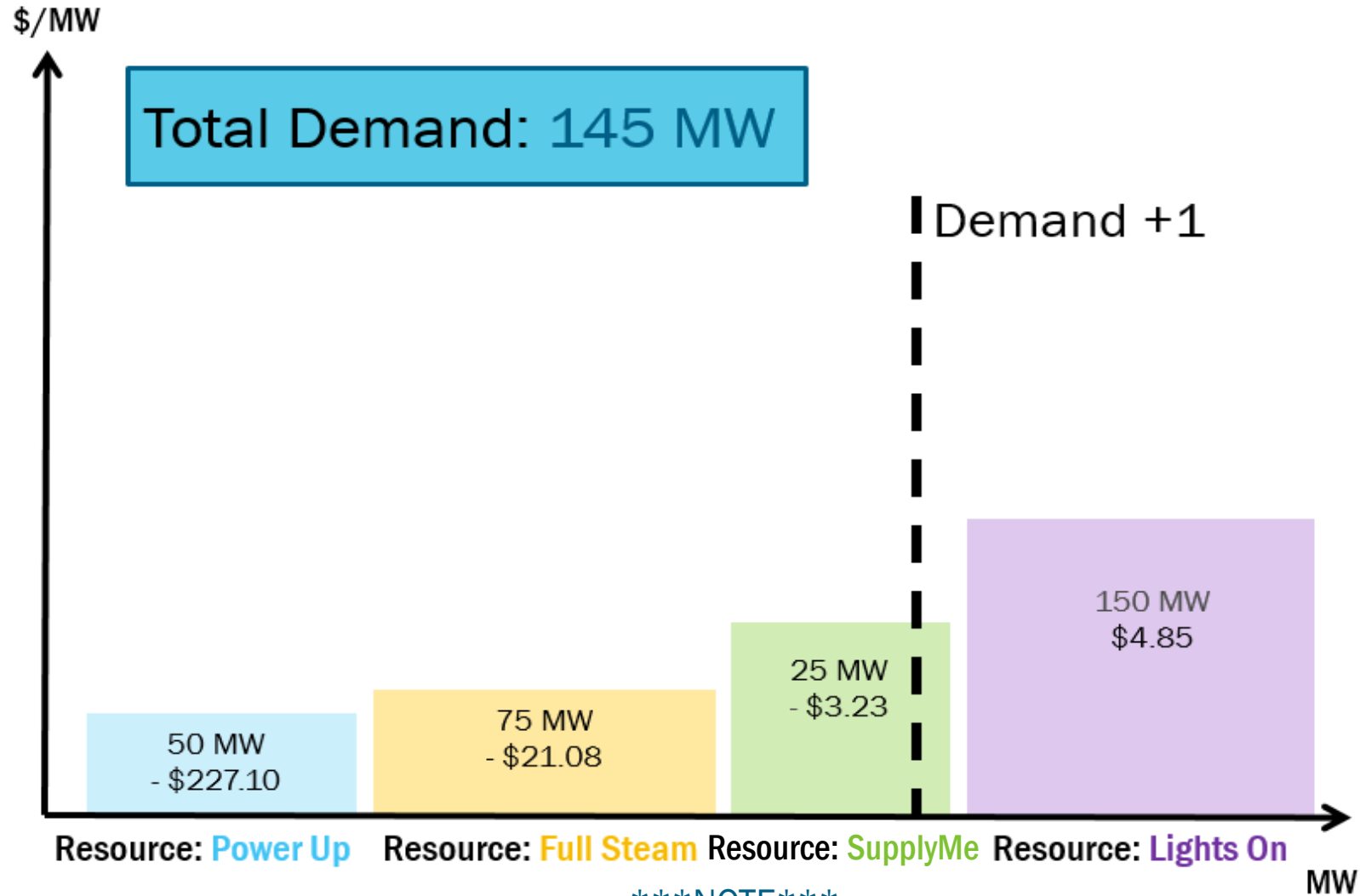
Example 3 – Fixed Block Bid



Example 3 – Fixed Block Bid



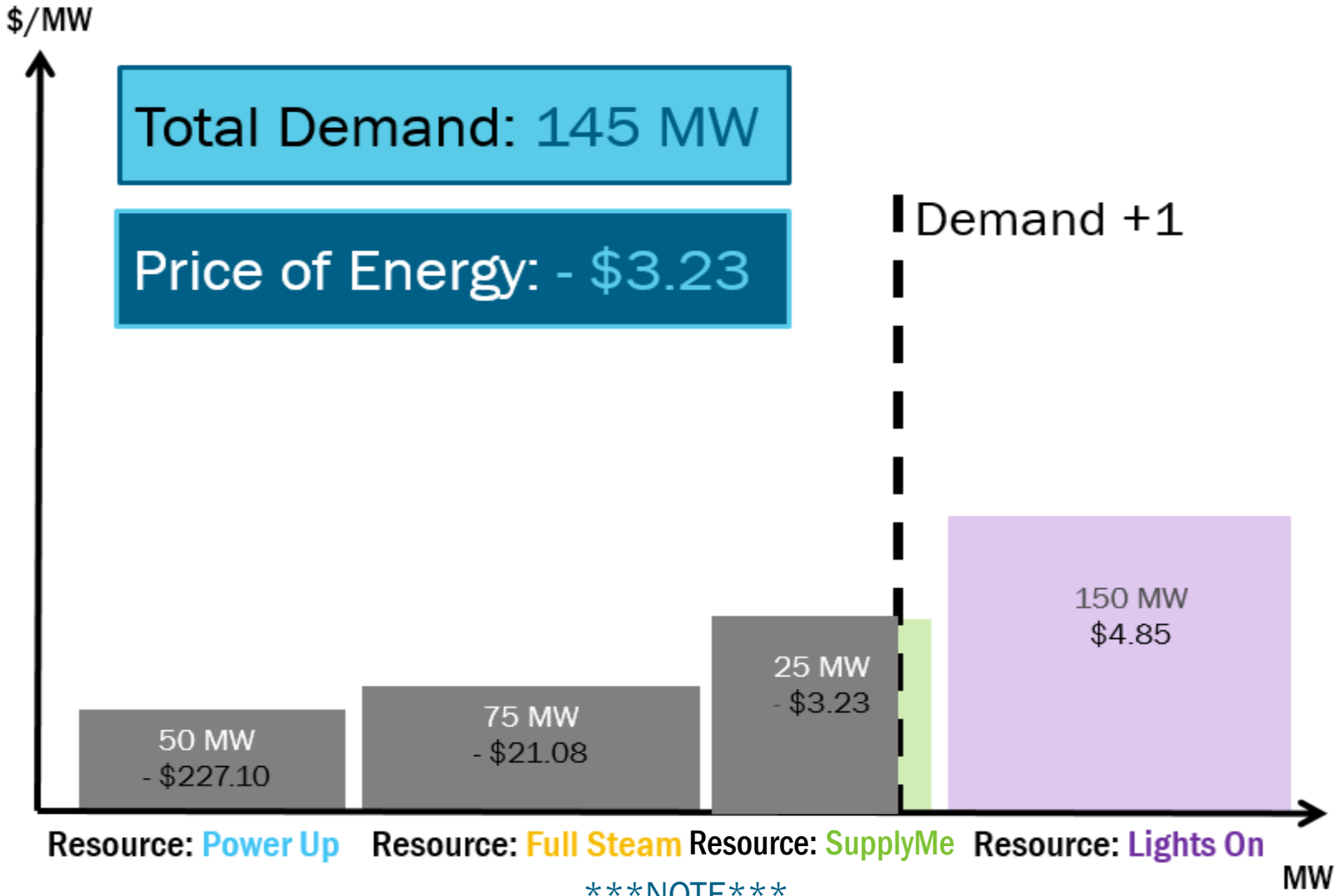
Example 4 – Negative Bid



NOTE

RT Data from 3/13/2020

Example 4 – Negative Bid



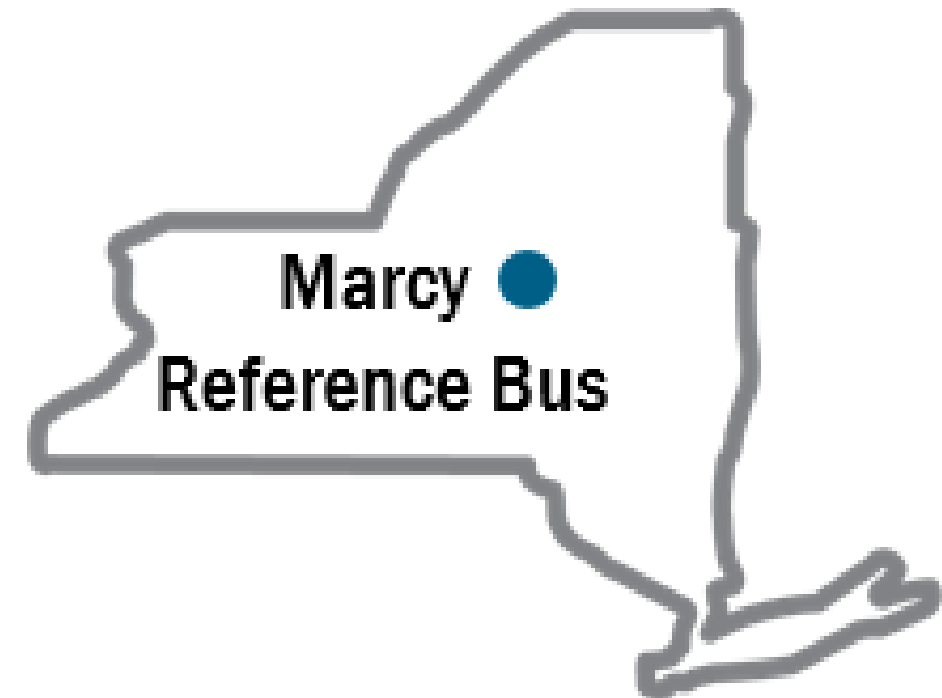
NOTE

RT Data from 3/13/2020

Equal Lambda

Role of NYISO Reference Bus

- **Marginal cost of energy needed to meet load**
- **Same price for all generators and loads for given time period**
- **Central reference point within the NYCA**
- **LBMPs are always defined with respect to a NYISO-selected reference bus**
- **Loss and congestion components at NYISO-selected reference bus is zero**
- **LBMP at Marcy Reference Bus = Marginal Cost of Energy**



Energy Price Component Summary

- **Describe the concept of economic dispatch**
- **Identify the price setting unit in module examples**
- **Understand the role of the NYISO Reference Bus**

Additional Resources

- **Tariffs – OATT & MST**
- **Day Ahead Scheduling Manual**
- **Transmission and Dispatching Operations Manual**
- **Market Participant User's Guide**
- **Technical Bulletins**