



Texas Interconnection Long-Term Study Update

Presented to Long-Term Study Task Force

Warren P. Lasher

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Project Goals

The intent of this overall project is to:

- Improve the existing ERCOT long-range planning process by developing new sustainable tools and processes**
- Develop a long-range transmission strategy for the ERCOT region**
- Enhance stakeholder involvement in the long-range planning process**

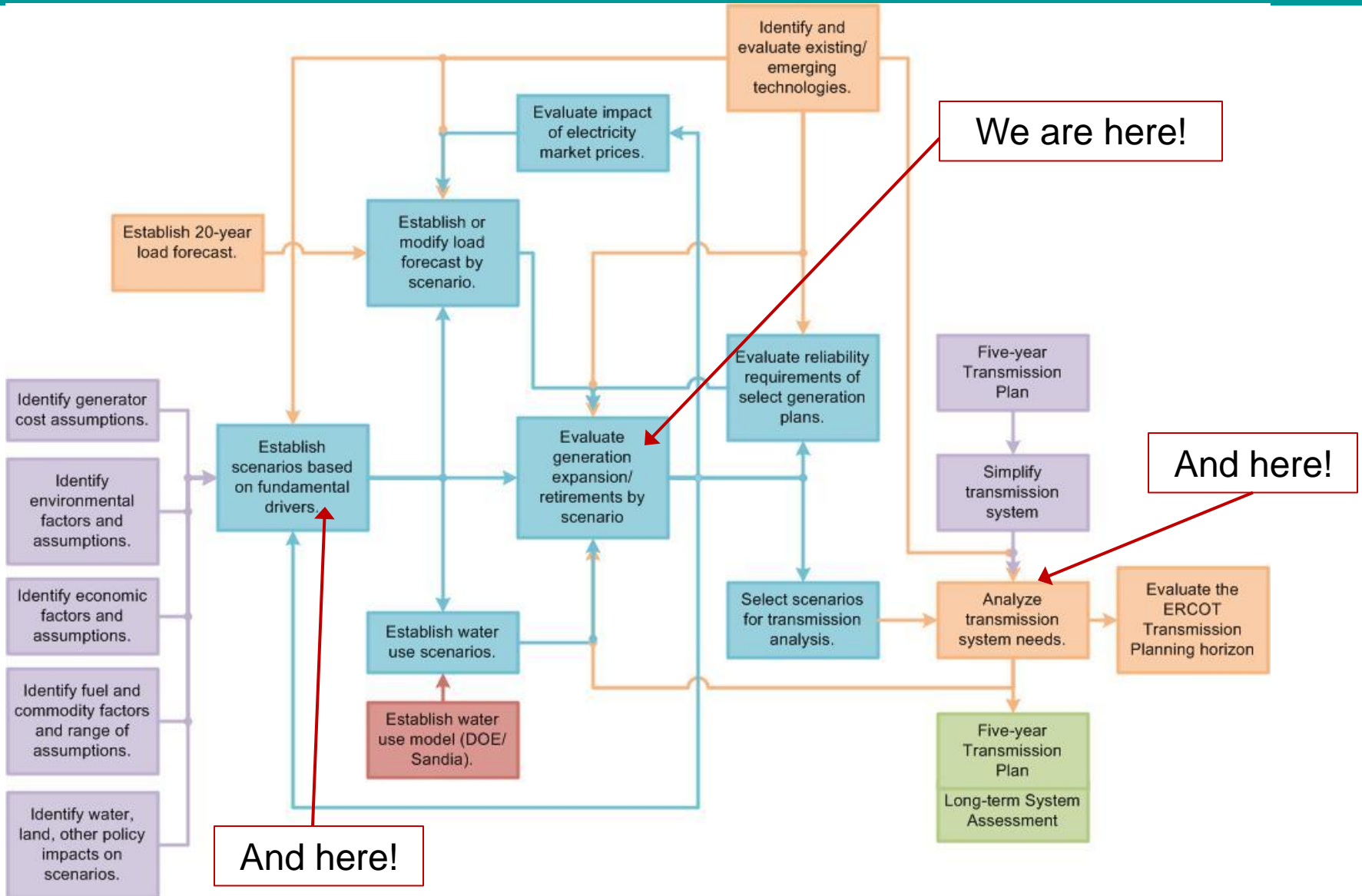
Task Force – 2011 Meeting Dates

2011 Meeting Dates	
January 10	July 11
February 1	August 2
March 1	September 12
April 5	October 4
May 3	November 1
June 7	December 6

Long-Term Study – Immediate Focus

- **Project staff are currently working on:**
 - **Generation expansion analysis for the Business As Usual scenario (continuation of current economic conditions)**
 - **Initial evaluation of long-range transmission needs**
- **Status Updates on these efforts will be provided in the following presentations**
- **Final Discussion today will be on scenario development**

Project Plan



Overview of the Generation Expansion Process

- **The long-range needs of the transmission system will be defined by system load and by the available generation sources.**
- **By developing different future scenarios, we can evaluate transmission system needs under different potential future outcomes.**
- **In order to determine future transmission system needs in each potential future scenario, additional generation, commensurate with expected market conditions, must be added to the model database.**

Purpose of Generation Expansion

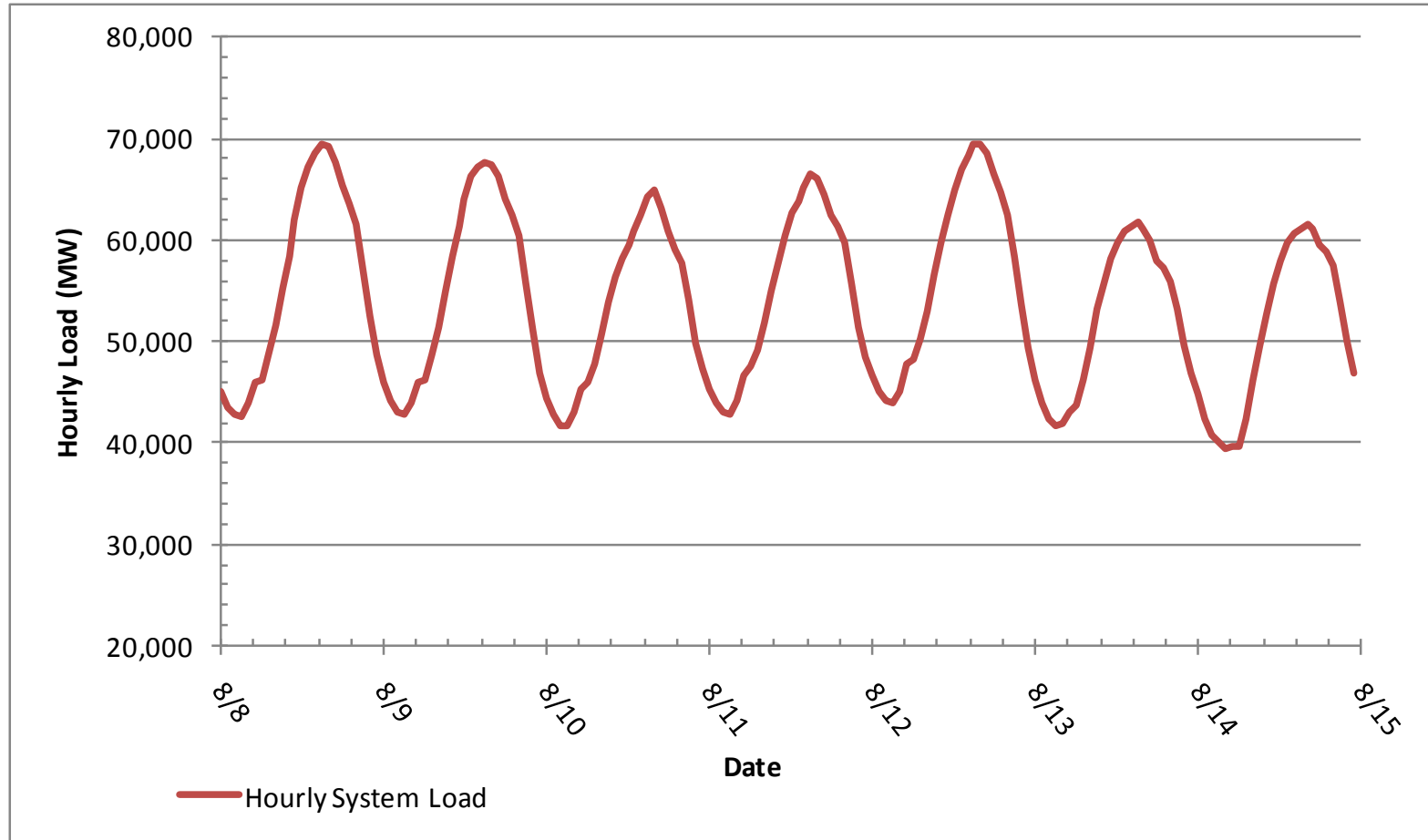
- **ERCOT has a deregulated, energy-only generation market. Under this market design, future generation assets will be developed by independent parties based on their own evaluation of market conditions, and determination of advantageous investment opportunities.**
- **The intent of the generation expansion analysis is not to devise an optimal generation expansion plan for each scenario. Rather, the intent is to determine which generation alternatives would likely be viewed by developers as being economically competitive.**
- **By evaluating the competitiveness of generation technologies under specified market conditions, a potential set of expansion generation can be specified.**

Promod Software

- **The Promod software is an hourly unit commitment and dispatch model. It simulates how a generation fleet would likely be collectively operated, given generation unit characteristics, fuel prices, and hourly loads.**
- **In doing so, it determines likely hourly market prices. By adding a potential generation expansion technology to the generation fleet, Promod can be used to define the market competitiveness of that technology.**
- **MarketPower provides a simplified but similar analysis for a range of potential technologies.**

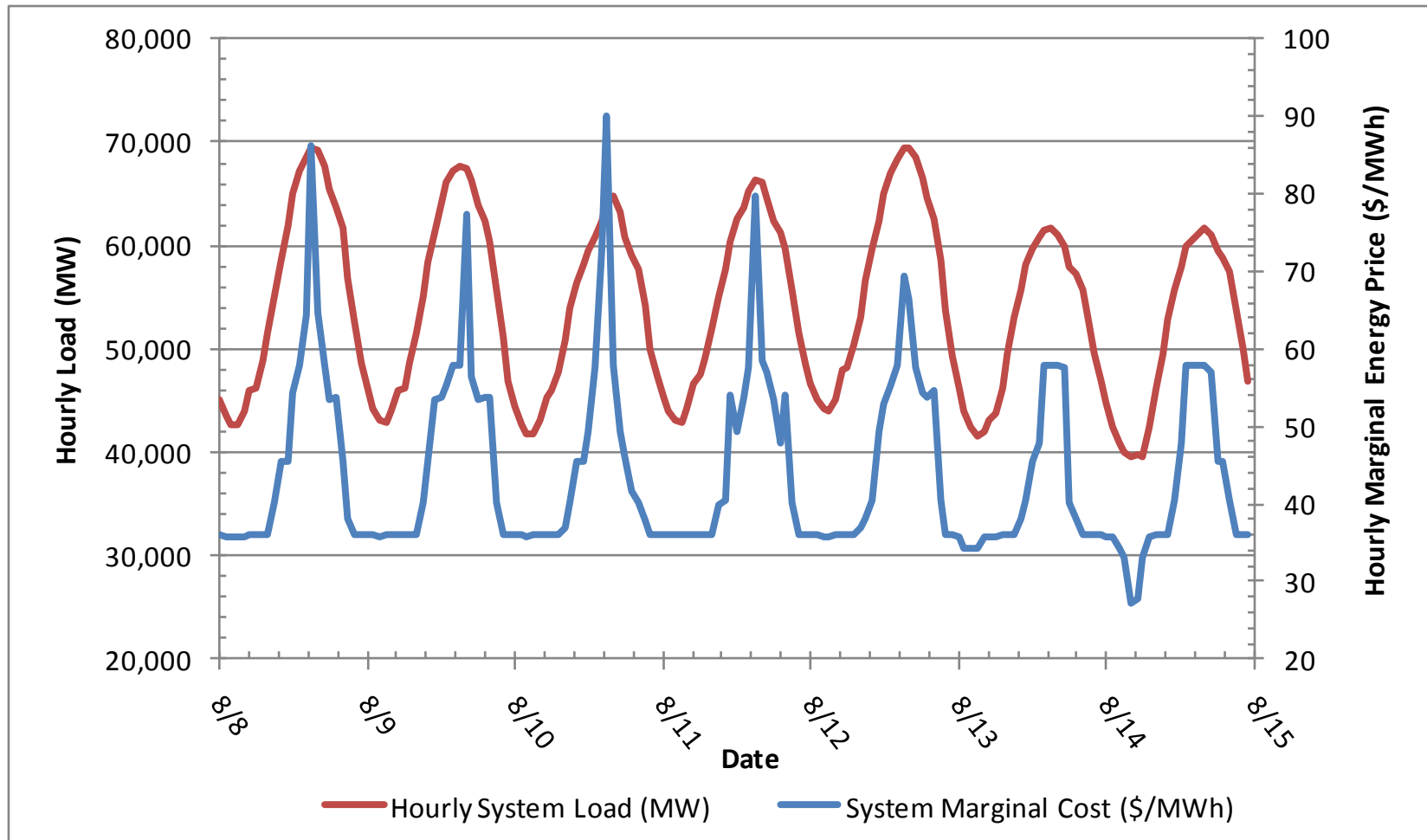
Example – One Week in August

Promod simulates the operation of the ERCOT generation fleet, meeting hourly loads using a combination of units so as to minimize system cost. Given hourly loads and unit specifications...



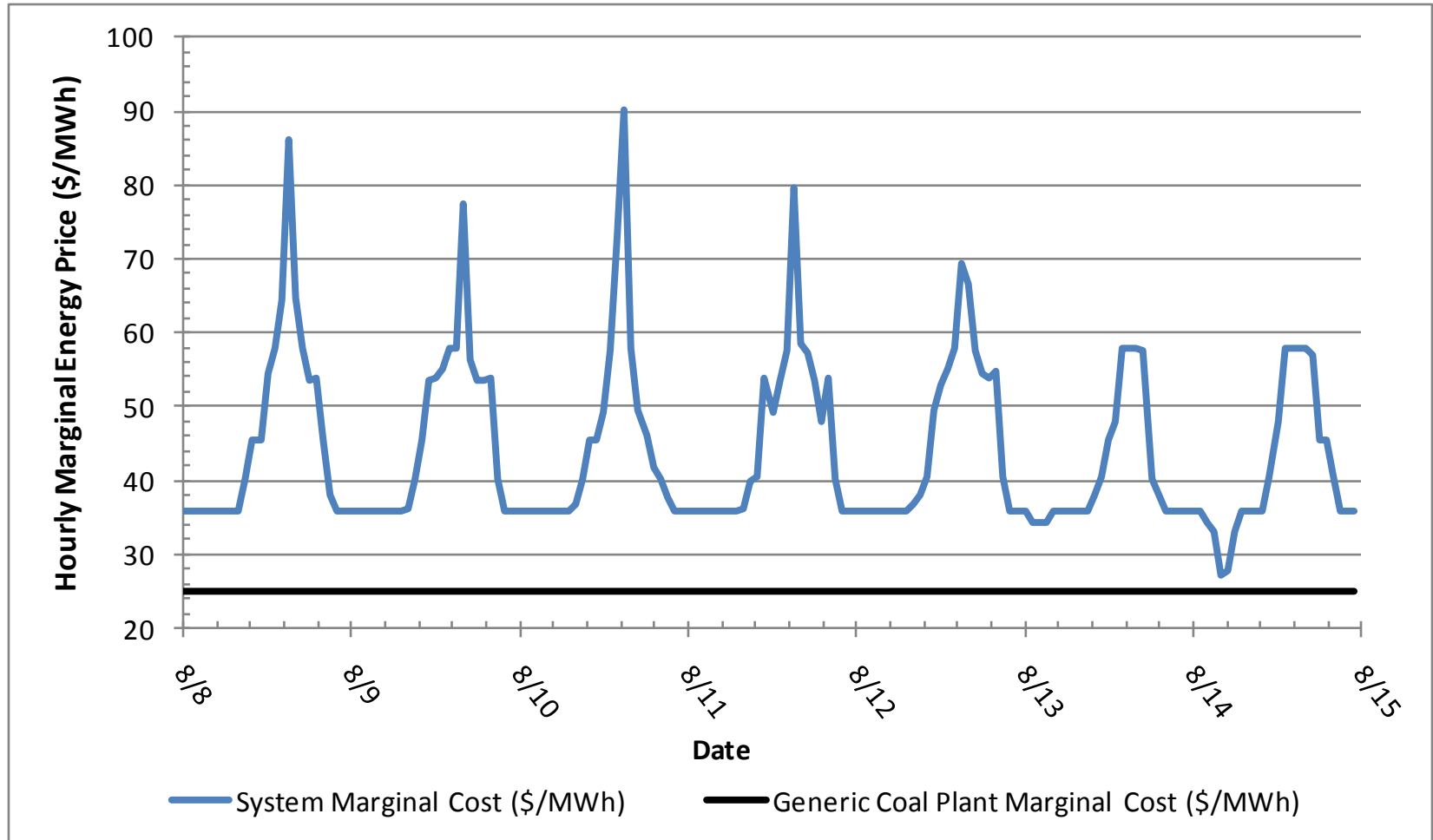
Example

Promod provides a forecast of hourly market prices, thus defining market opportunities for new generation.



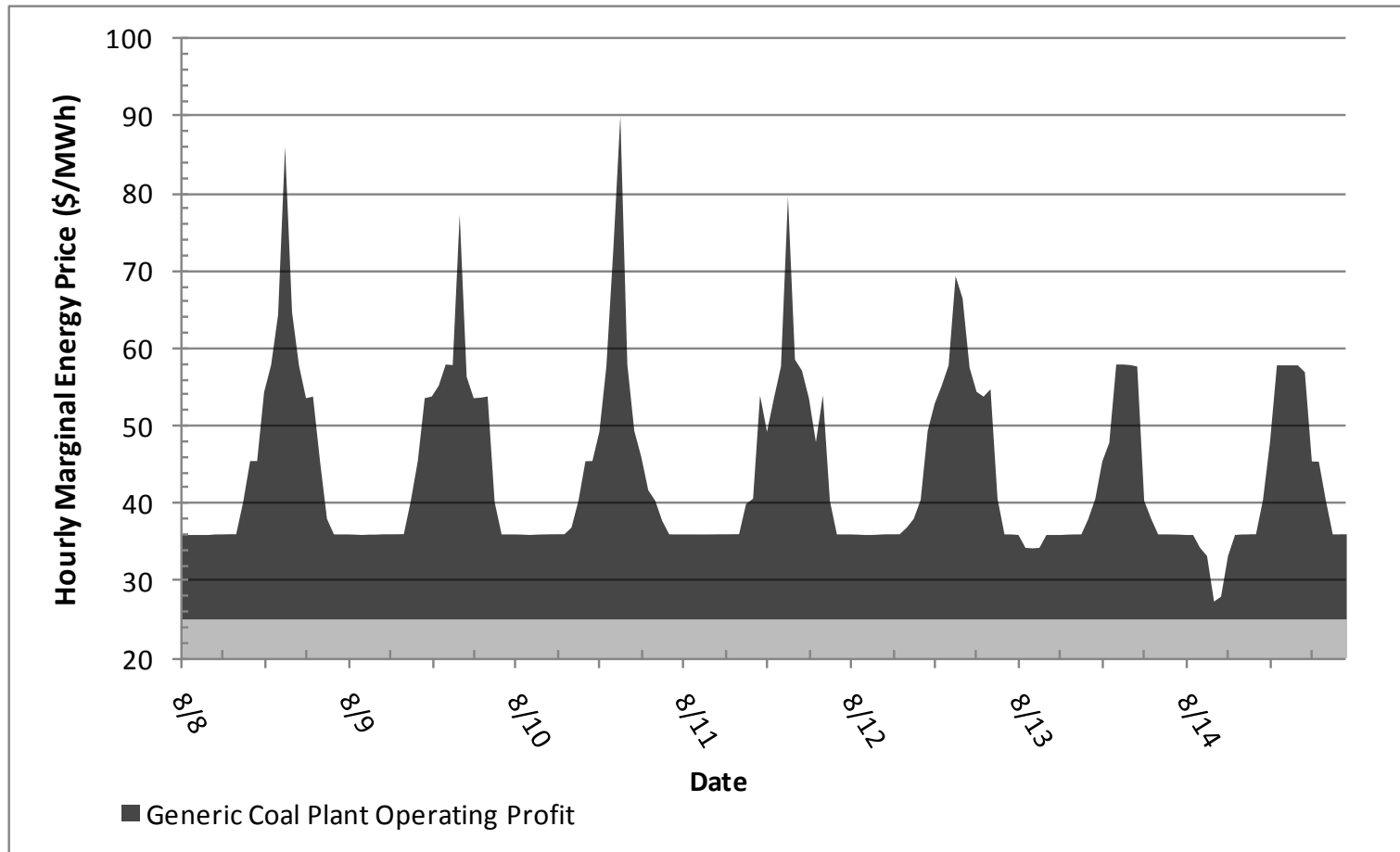
Example – Coal Plant

A coal plant with a variable operating cost of \$25/MWh would be expected to operate in all hours of this week in August, since its variable operating cost is below the system marginal cost in all hours:



Example – Coal Plant

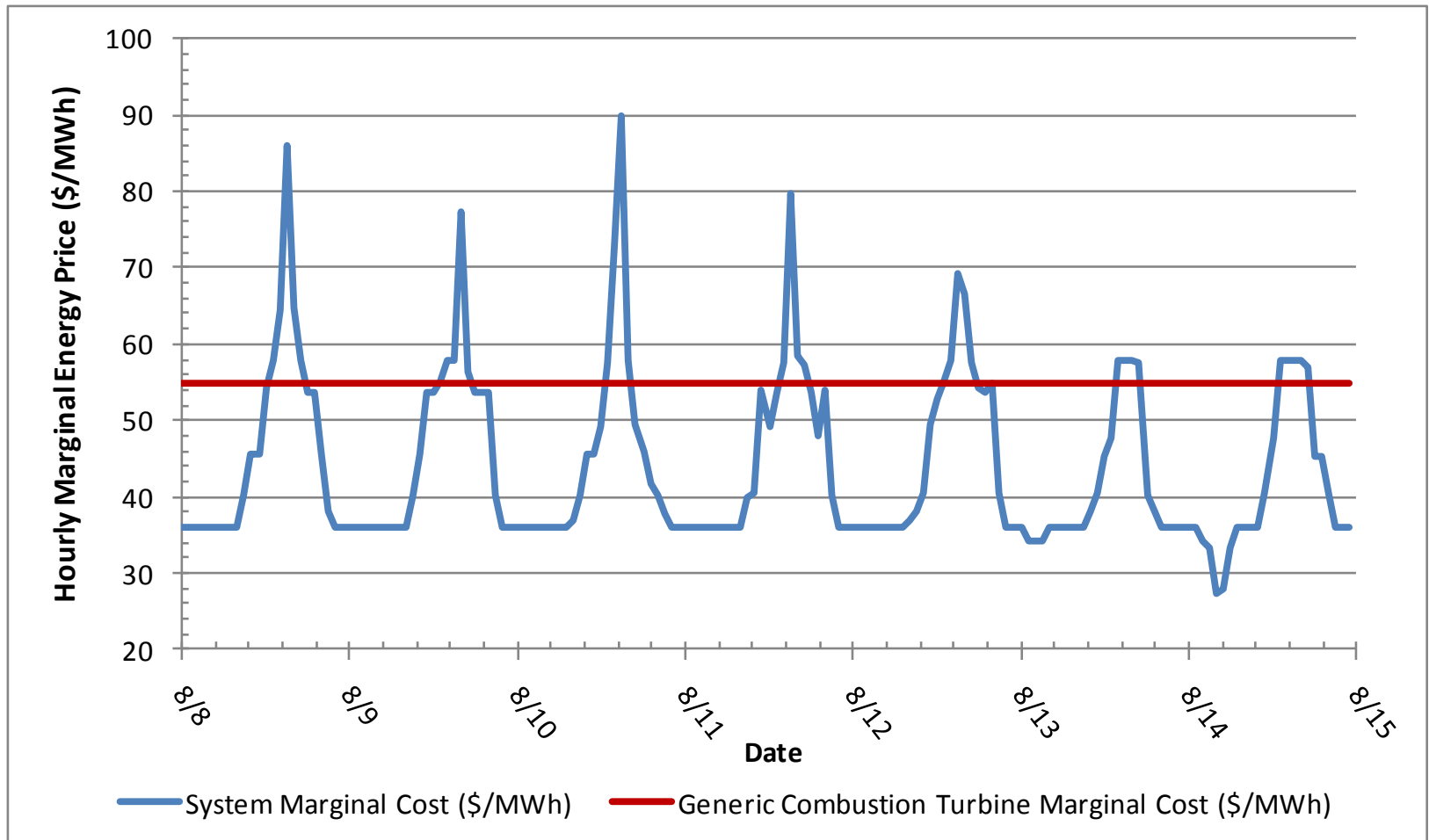
And the profit from operating the generic coal plant would be the difference between its variable operating cost (\$25/MWh) and the system marginal cost:



The generation expansion analysis is based on determining whether the expected operating profit would create ample returns over the life of the unit to justify private market capital investment.

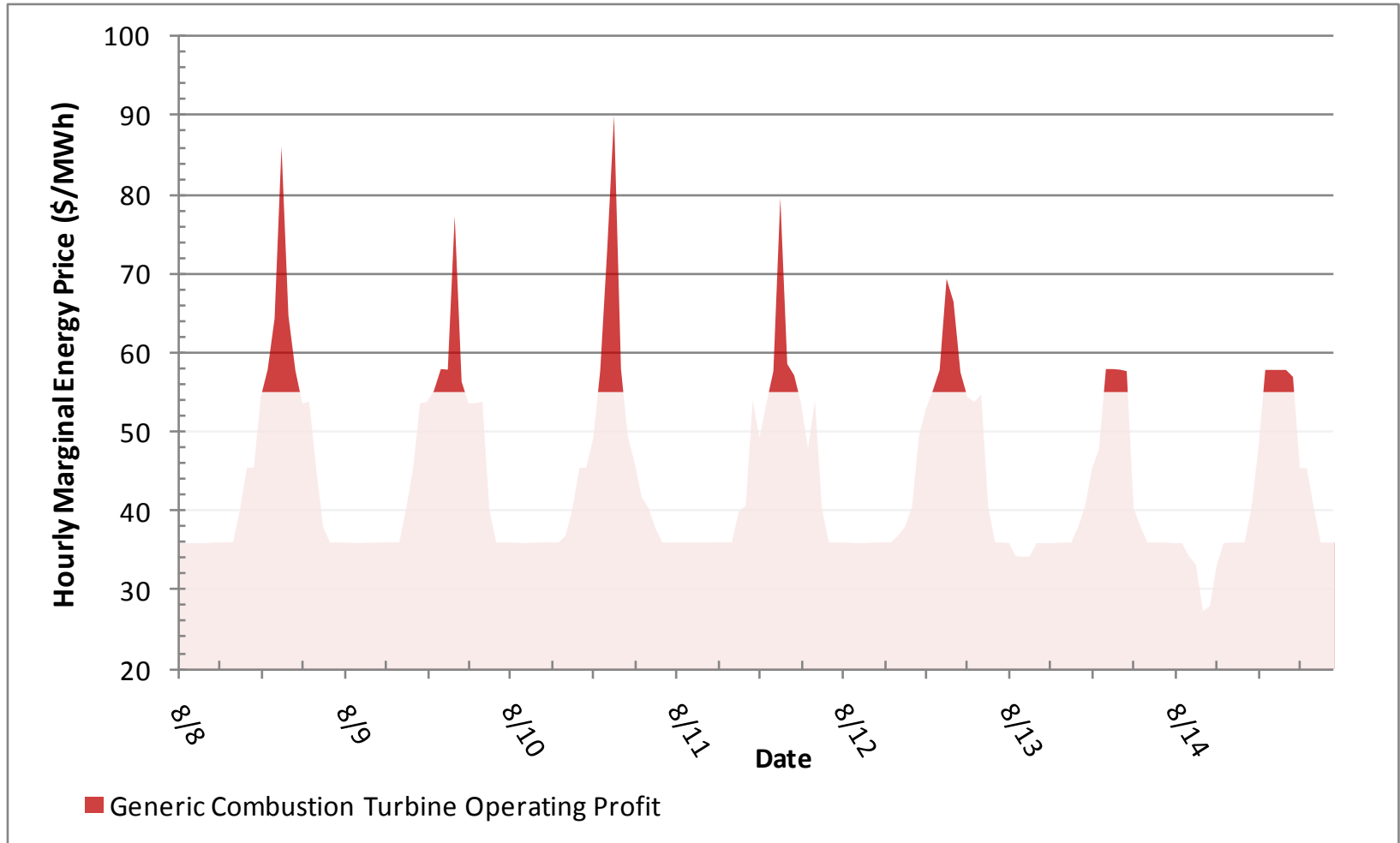
Example – Quick Start Combustion Turbine

A quick-start combustion-turbine unit with a variable operating cost of \$55/MWh would only be expected to operate in the peak afternoon hours since its marginal operating cost is not competitive in off-peak hours:



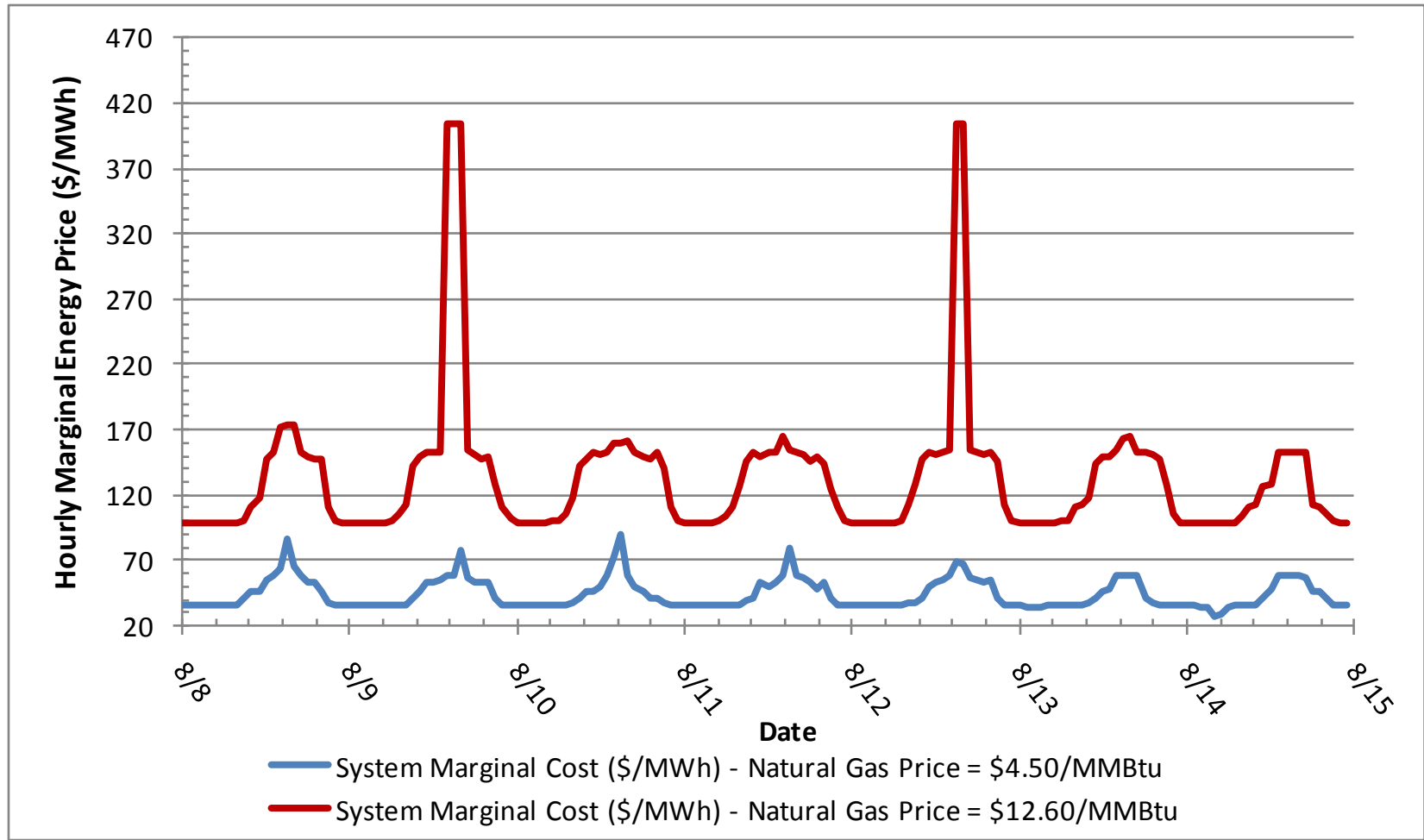
Example – Quick Start Combustion Turbine

And the profit from operating the generic combustion turbine unit would be the difference between its variable operating cost (\$55/MWh) and the system marginal cost in those peak hours:



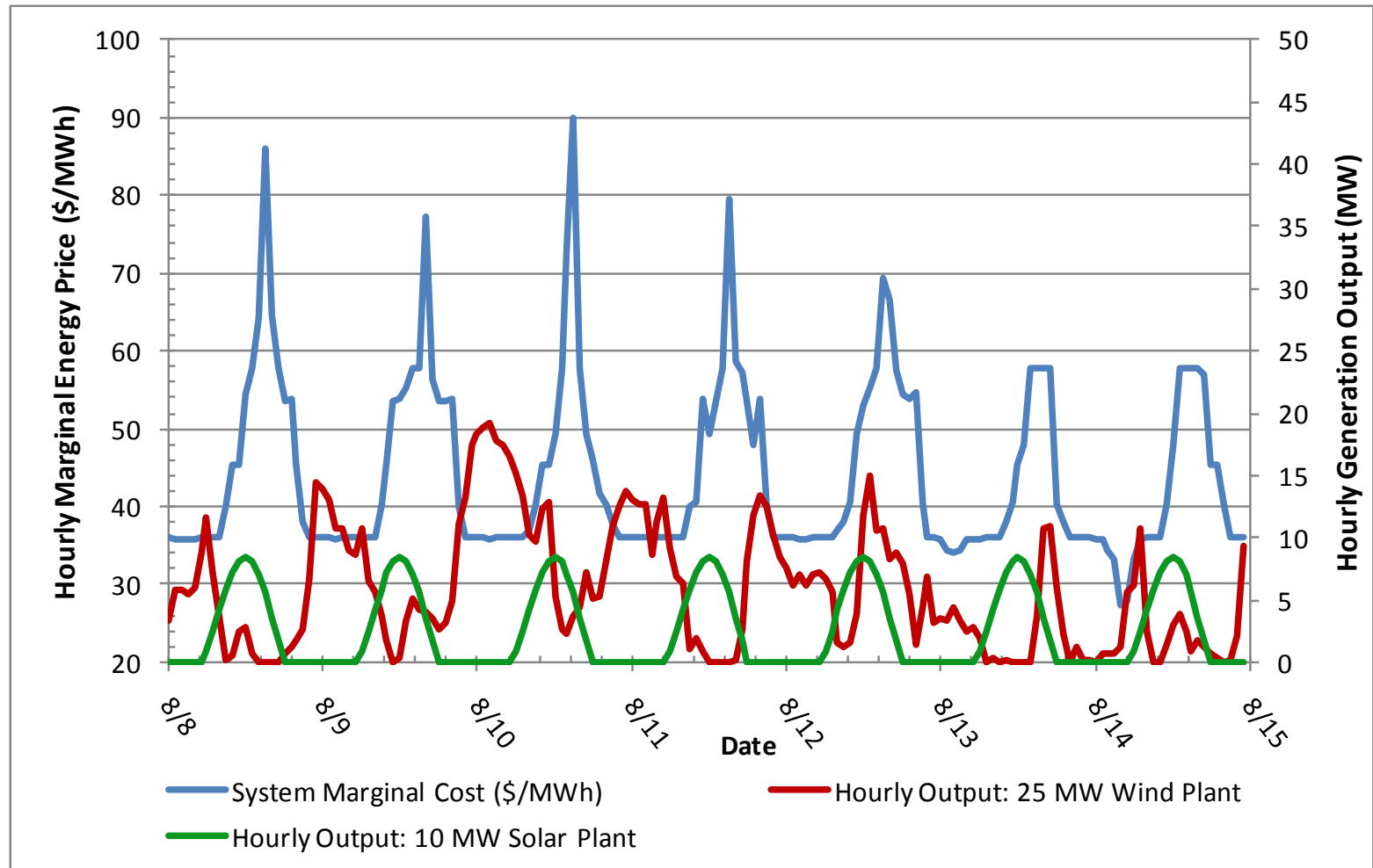
Example

Different market conditions lead to different market opportunities...



Example – Variable Generation

The calculation for return on investment for variable generation must take into account the diurnal pattern of the resource:





Questions?