

Solar Impacts on Load Shape and New Market Product Solution

Justin Thompson, Gordon Samuel

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PINNACLE WEST: WHO WE ARE

We are a vertically integrated,
regulated electric utility in the
growing southwest U.S.

Principal subsidiary: aps

- Arizona Public Service Company, Arizona's largest and longest-serving electric utility

Customers: 1.2 million (89% residential)

Service Territory:

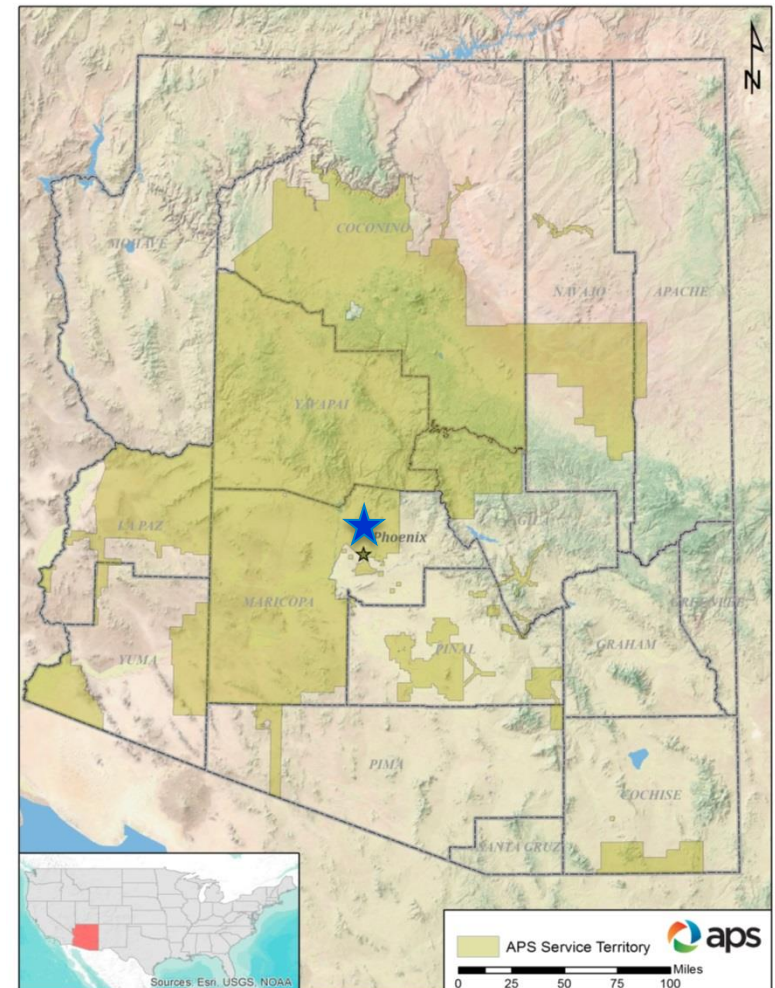
- 34,646 square miles
- 11 of the 15 Arizona counties

2015 Peak BAA Demand: 7,318 MW

Generation Capacity: Over 6,000 MW of owned or leased capacity (~9,400 MW with long-term contracts)

Transmission & Distribution: 34,937 miles

- Transmission: 5,958 miles
- Distribution: 28,979 miles



“The World We Live and Operate in Is Changing Faster Than We Ever Thought”

Who would have ever thought just a few years ago that we would be able to control our thermostat, lights or television with our phone or be able to generate large quantities of energy from solar resources?

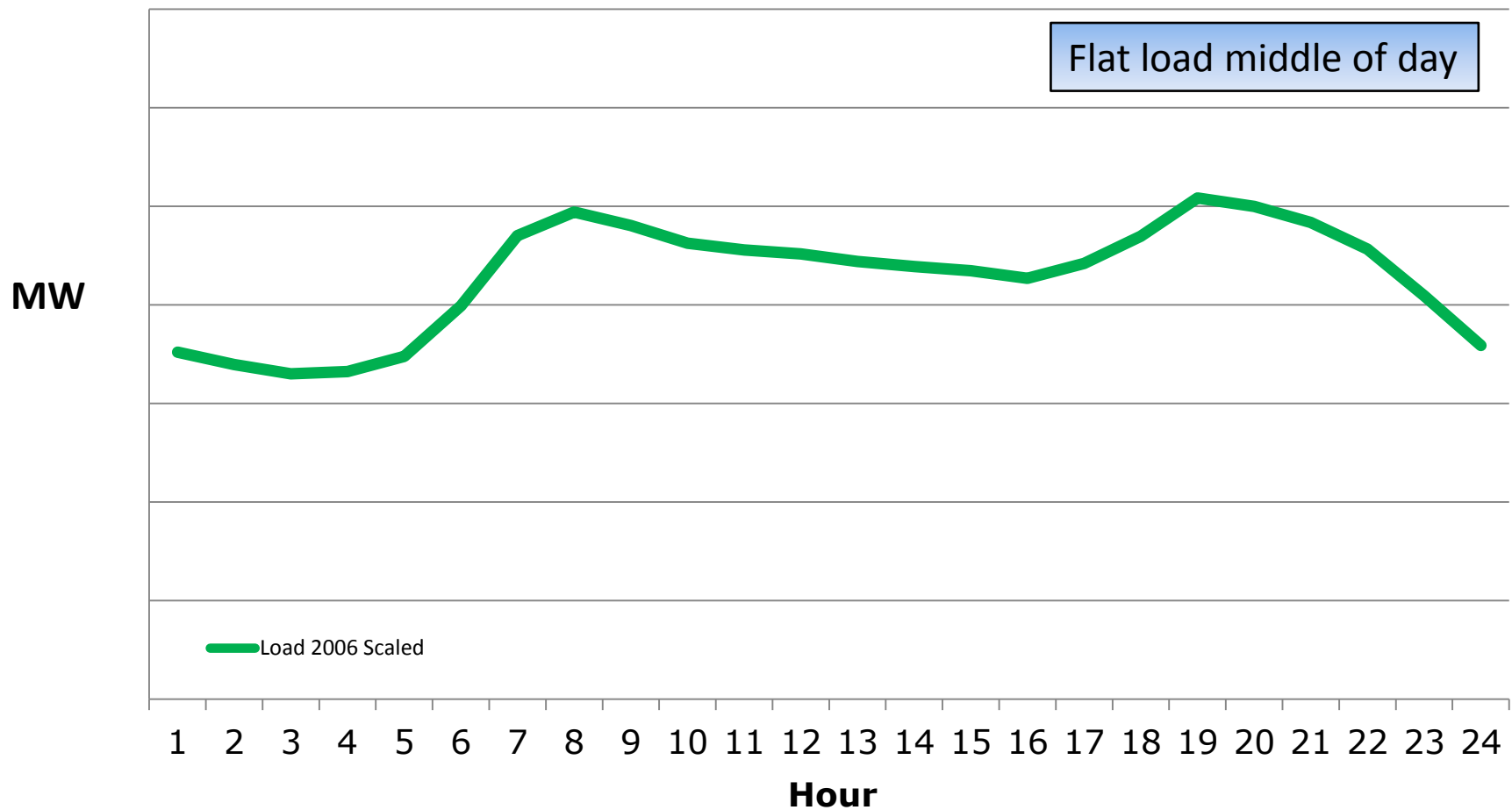
What's next?

How do we stay competitive?

How do we manage the grid reliably?

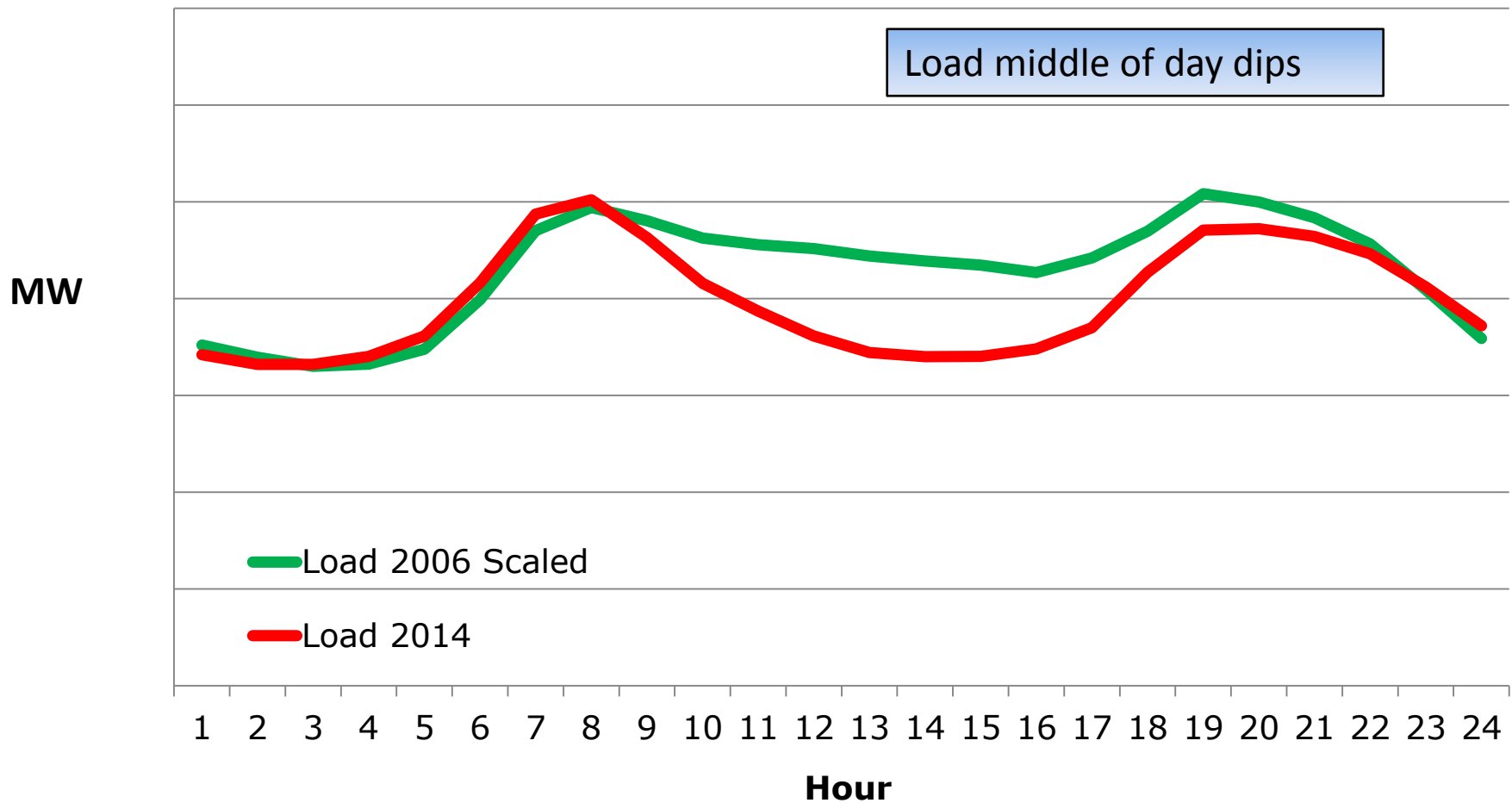
“We Must Continuously Adapt and Improve or Get Left Behind”

APS Load Shape Prior to Significant Rooftop Solar – Late fall day

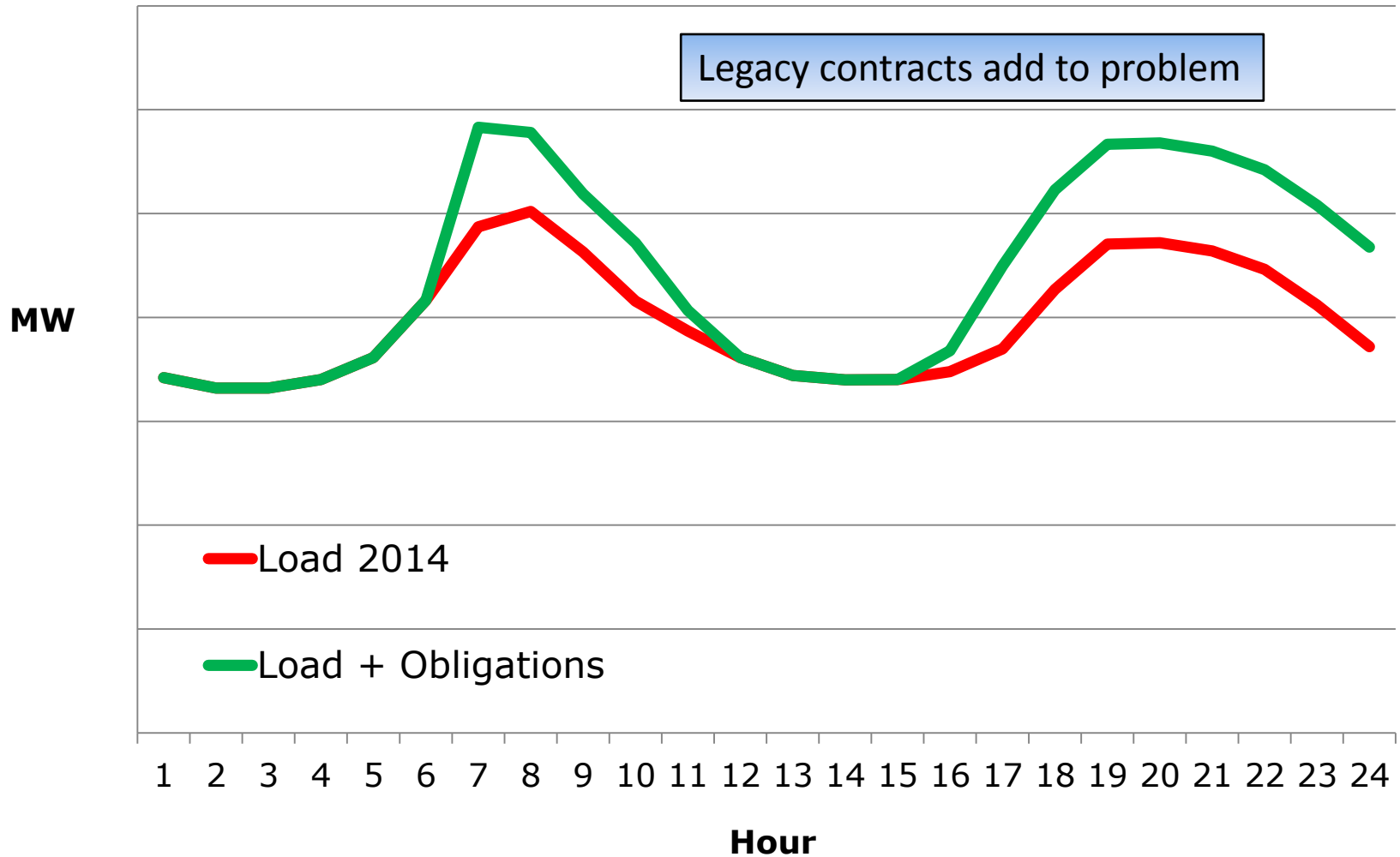


Rooftop Solar Impacts on Load Shape

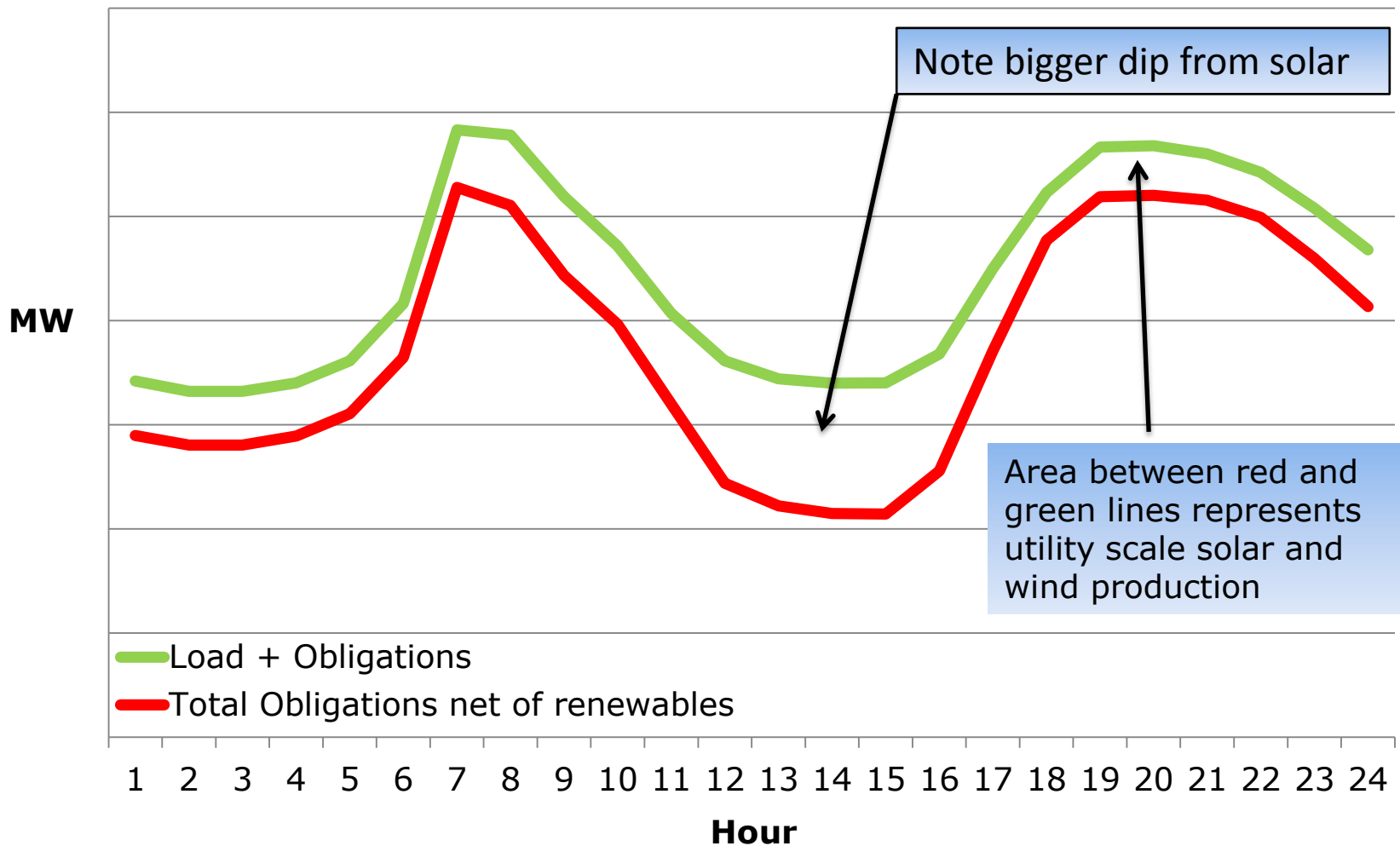
(Late Fall Day 2014 versus 2006)



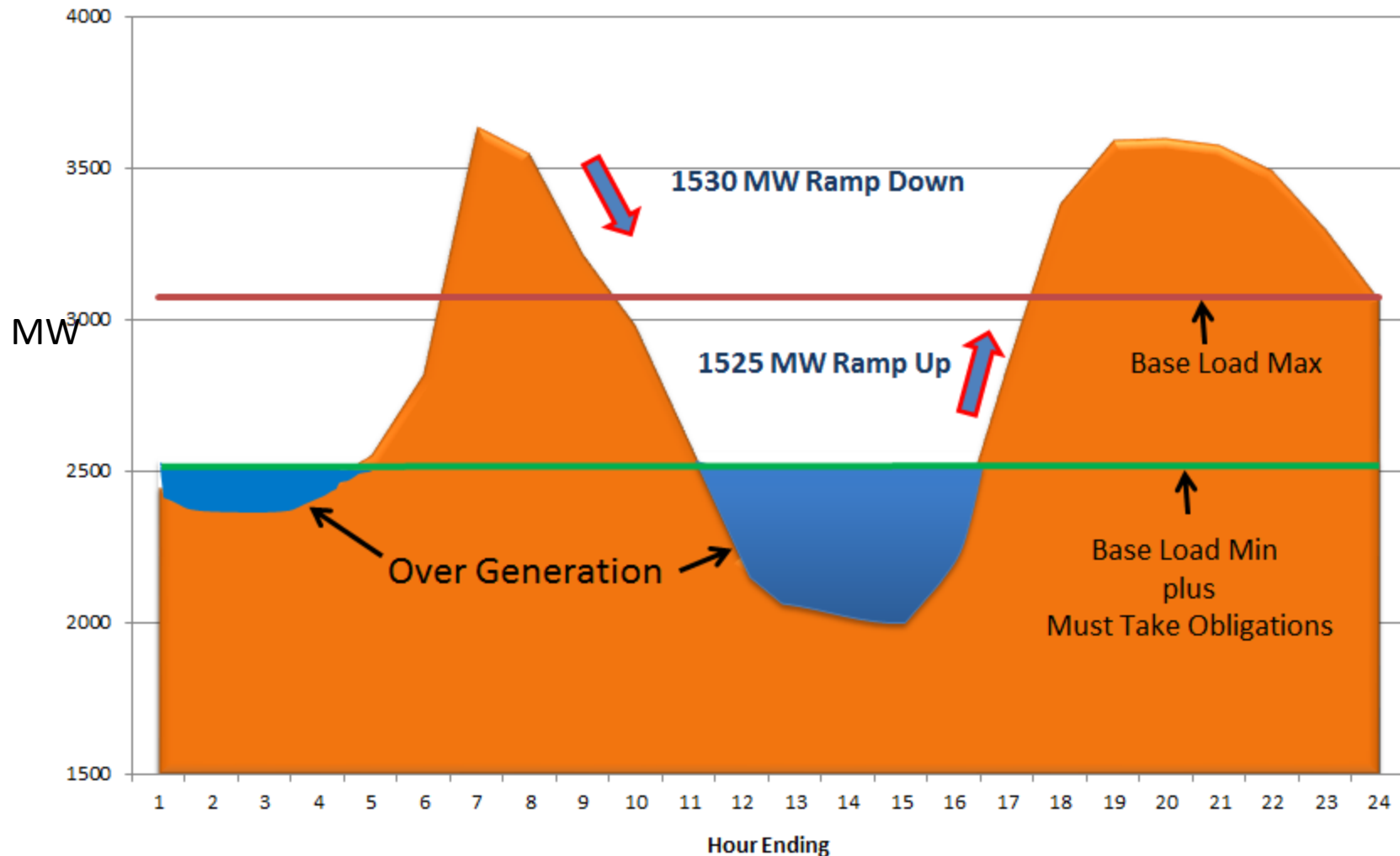
Other Things Can Impact The Difficulty of Managing Load



Utility Scale Renewables Lower the Curve and Change the Shape of What Must be Served by Thermal Generation



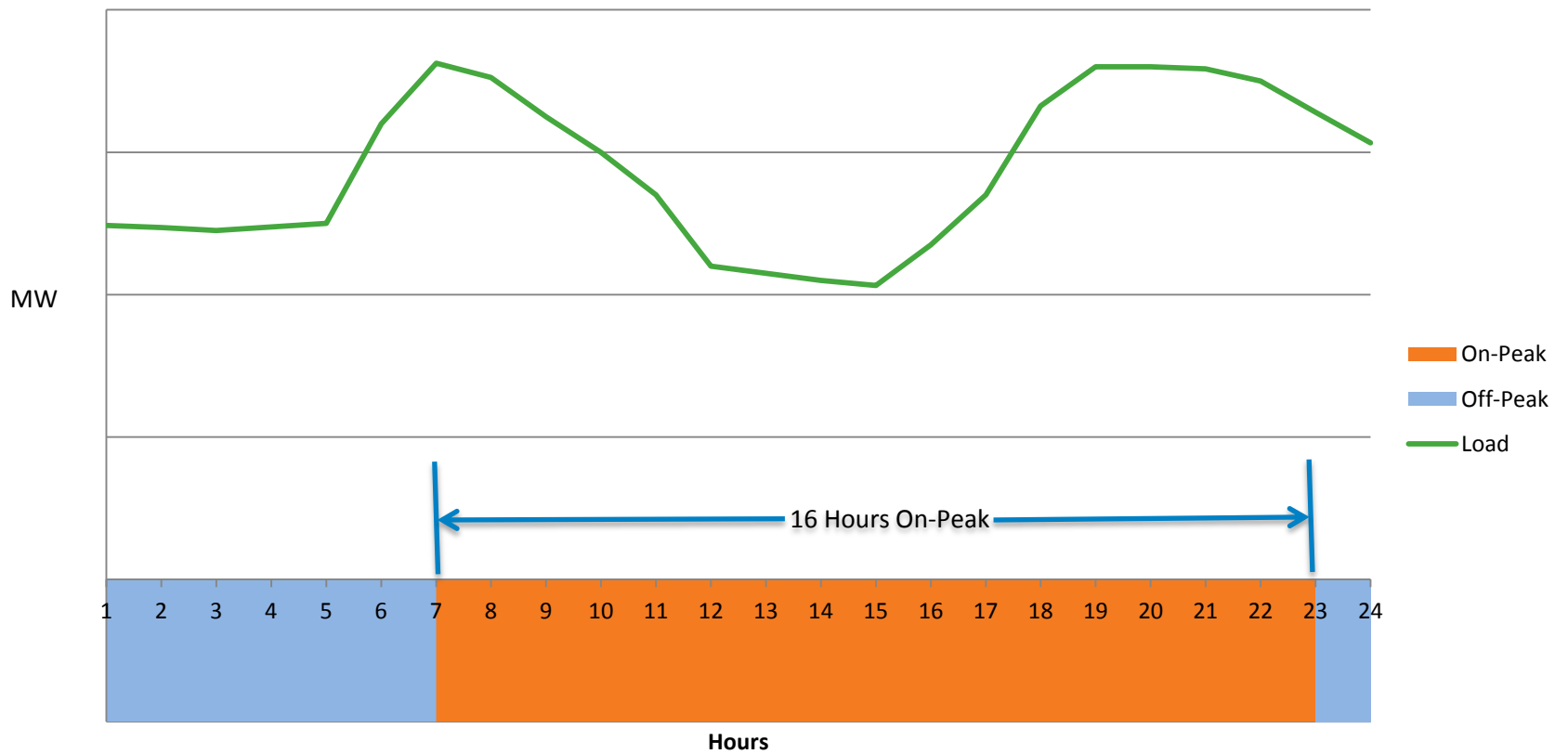
Net Load Shape and Obligations Non-Summer Day – Present



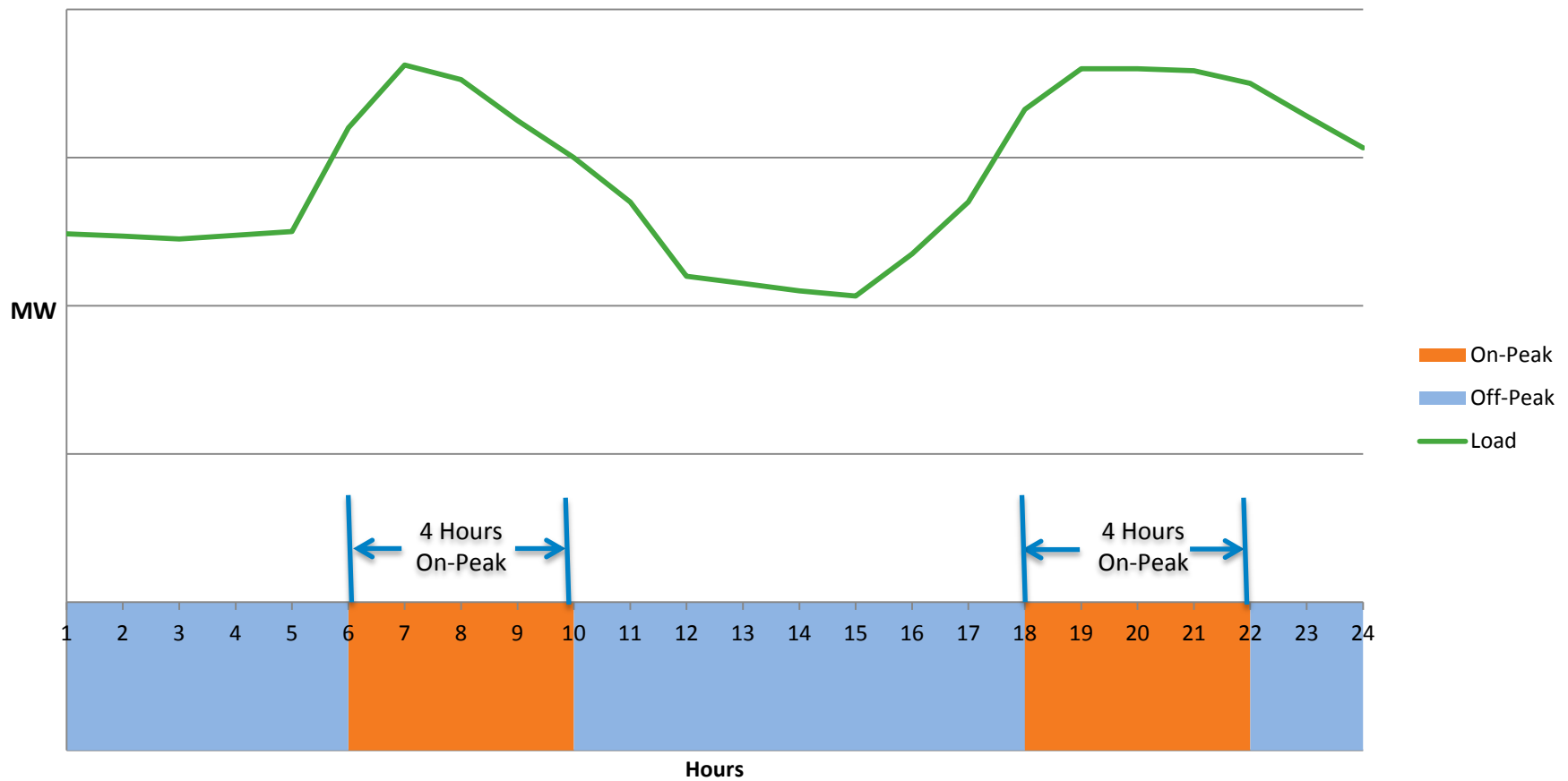
Do We Need New Products?

- Maybe it is time to rethink the standard on-peak and off-peak products
- What about a double peak product for the winter months?

Non-Summer Demand Shape and Standard Product Hours



Demand Shape and Possible New “Double – Peak” Product Hours



Benefits of New Product

- Load Serving Entities can manage peaks more efficiently (Day Ahead, Term)
- Entities with flexible generation can monetize the value more effectively
- Storage resources can discharge twice a day and lock in revenue stream day ahead or on a term basis instead of relying on hourly market

How Do We Bring This Product to Market?

- Any interest in this product?
- We would like feedback on delivery hours
- Will issue survey to WSPP members
- Who else should we reach out to?