

Electric rate structures and their impact on demand response decision making

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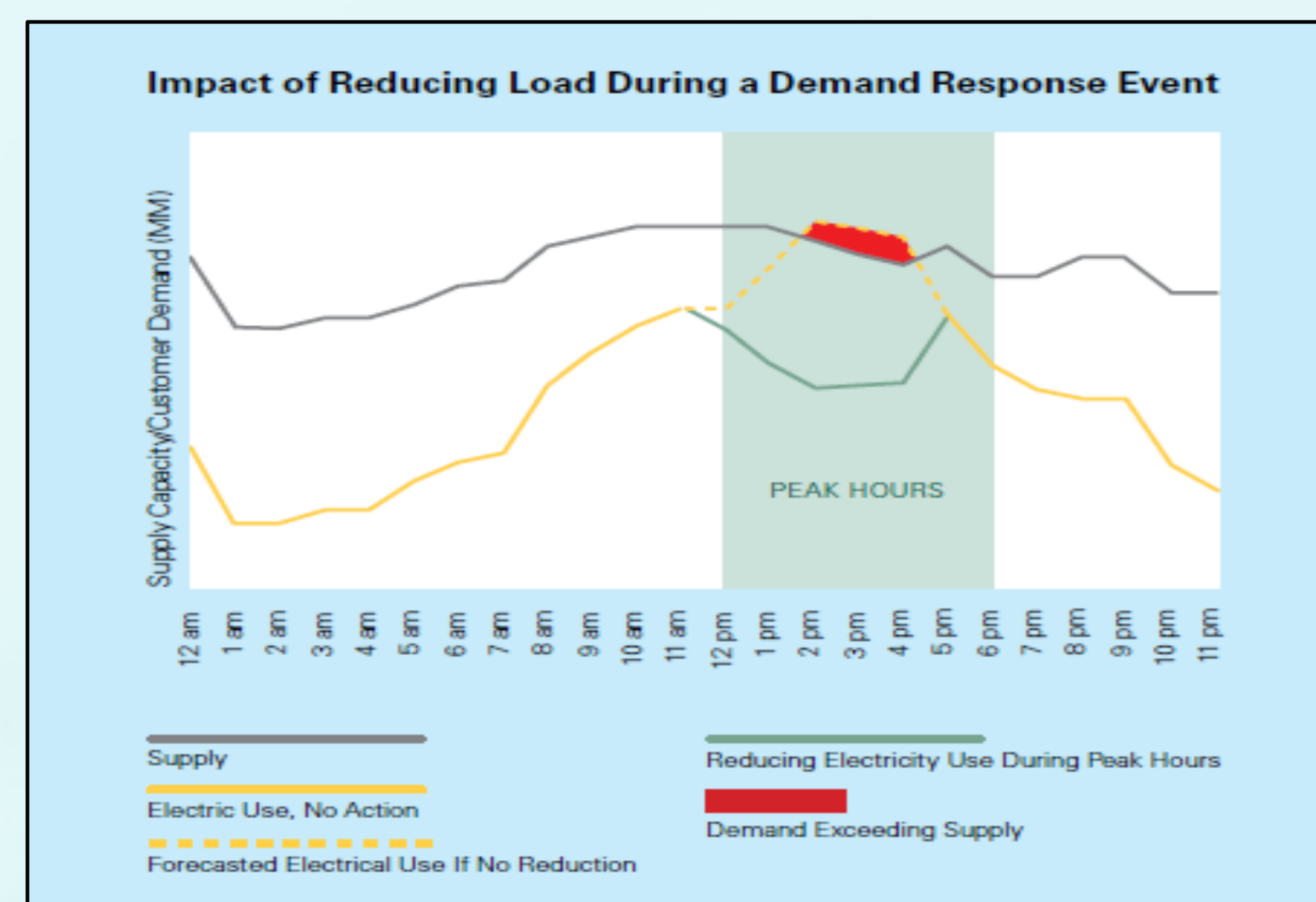
Introduction

The Renewable and Distributed Systems Integration (RDSI) "Jump Start" Program is a project within FortZED, an initiative whose goal is to become the largest active net zero energy district in the world. Based in Fort Collins, CO, the "Jump Start" Program plans to test the ability of a combination of demand response (DR) resources to reduce electricity demand when either of two circuits peak. DR strategies among site partners (e.g. raising or lowering temperature set points or running on-site generators) will be implemented during feeder peaks with the goal of reducing peak load by 20-30% for a total of about 3.5 MW in demand reduction. The ability or the degree to which the "Jump Start" Program can reduce demand, however, may be limited by the electricity rate structure in place.

Research Question

How will the "Jump Start" program's goals and existing economic incentives influence DR decisions?

Demand Response



Southern California Edison, 2010

- Reduces or shifts end-use commercial customers' electricity loads at times of high energy demand or wholesale prices
- Inexpensive means for ensuring electricity reliability requirements
- Enables utilities to avoid running the most-expensive power plants during peak demand as well as avoid making long-term investments in increased generation capacity
- Can help customers reduce their electricity bills by decreasing their energy consumption

Fort Collins Electricity

Platte River Power Authority (PRPA)

- Wholesale electric utility
- Provides power and generation services to four municipal utilities: Fort Collins, Estes Park, Longmont, and Loveland

City of Fort Collins Utilities

- Municipal electric utility that provides electric distribution services to 62,000 homes and businesses (as of 2008)
- Summer peaking utility

Electric Rates

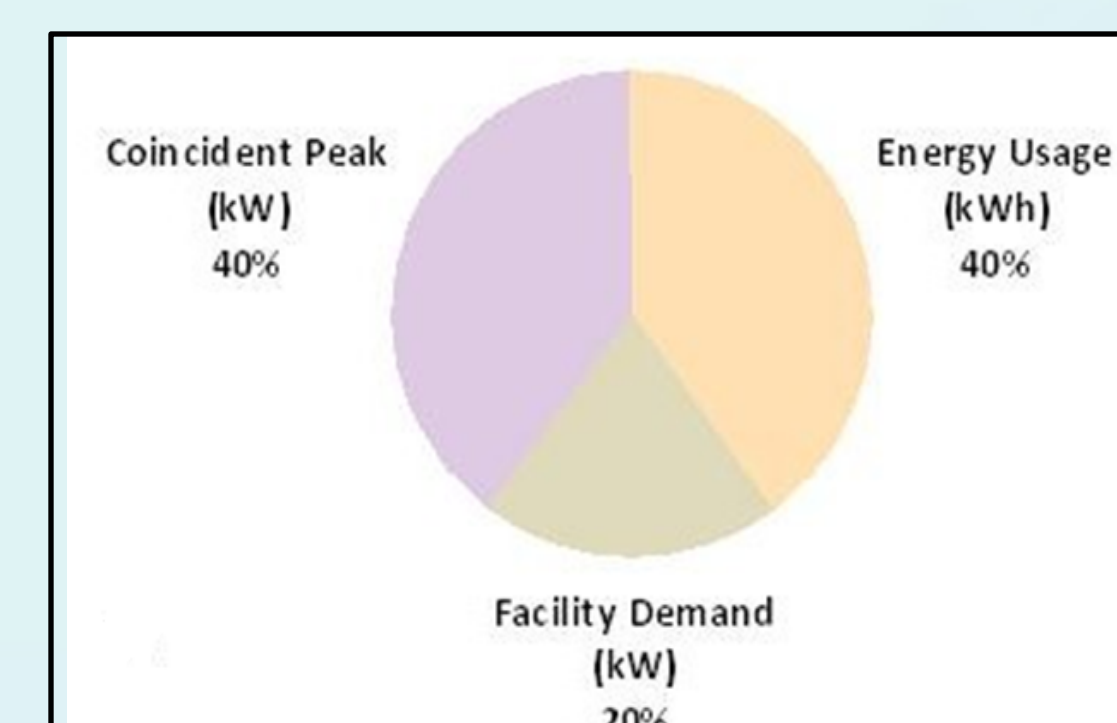
Commercial Electric Rates

Commercial Rates	Average Demand	Energy Usage	Facility Demand	Coincident Demand Charge
Schedule GS-50	50 KW - 750 KW	\$0.0212/kWh	\$4.77/kW	\$13.18/kW
Schedule GS-750	> 750 KW	\$0.02029/kWh	\$4.70/kW	\$12.98/kW

- Fort Collins Utilities passes PRPA's wholesale rate directly to commercial customers

Coincident Peak

- Coincident peak is a facility's demand during PRPA's monthly peak hour (12 coincident peaks per year)
- Only 12 hours a year represents 40% of a commercial customer's electricity bill
- Commercial customers have an incentive to reduce demand during those 12 hours



Bauleo, 2009

- Reducing demand during coincident peak saves money for commercial customers and Fort Collins Utilities

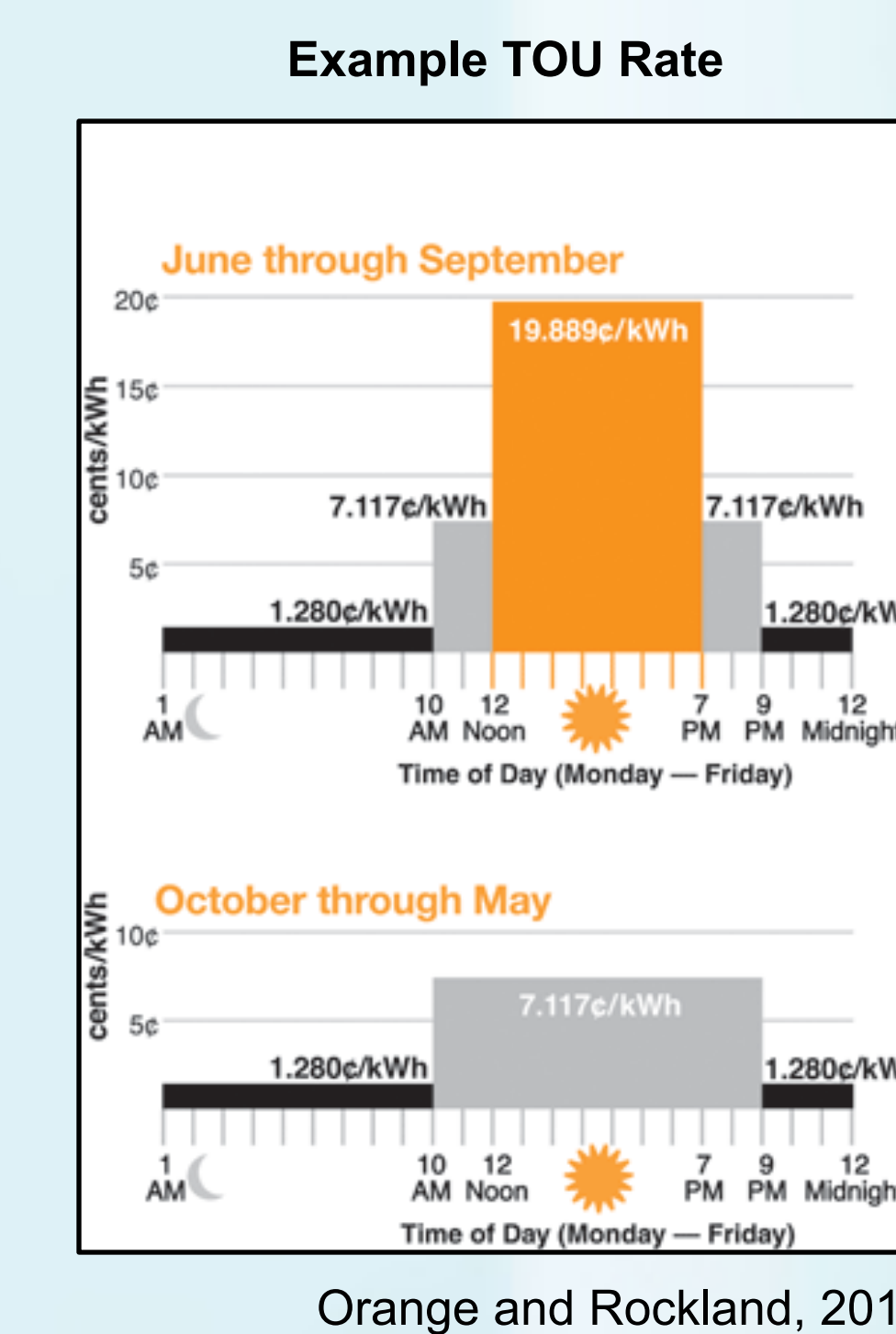
Conflicting Interests

- To reduce demand during coincident peaks, Fort Collins Utilities sends a signal to warn commercial customers (Load Management Program)
- Feeders peak midday whereas coincident peak occurs late afternoon (during the summer)
- If feeder peak demand is reduced midday but a coincident peak signal is received later, customers would not only be unable to reduce demand for additional hours but would actually rebound during the coincident peak
- **RDSI "Jump Start" will place constraints on feeder peak demand control if a coincident peak signal is sent so as not to jeopardize the financial wellbeing of customers**

- Limits the degree of demand reduction possible

Future Electricity Rates

- Fixed costs are recovered in the coincident peak charge
- There exists a disconnect between costs and pricing (recovering fixed costs within a single peaking hour does not account for baseload production costs)
- PRPA is hurt financially if commercial customers reduce demand significantly during coincident peak



Orange and Rockland, 2010

- PRPA is exploring the possibility of a seasonal and Time-of-Use (TOU) electricity rate

References

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Bauleo, P. 2009. *Load Management and Demand Response*. A presentation during a RDSI PM Team Meeting.

Orange and Rockland. 2010. *Time-Of-Use Rate*. Available at www.oru.com/programsandservices/incentivesandrebates/timeofuse

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