

Appendix A: PRISM Impacts Model

Quantifying the Benefits of Dynamic Pricing In the Mass Market

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APPENDIX A: PRISM IMPACTS MODEL

The PRISM Impacts Model consists of four worksheets. The purpose of each worksheet is described below.

PRISM Impacts Inputs

All user-defined inputs to the model are entered into the PRISM Impacts Inputs worksheet. In the All-in Rate table, the user enters both the current rate and the critical peak pricing (CPP)/time of use (TOU) rate that is being analyzed. These rates are entered as all-in rates. In other words, they incorporate generation charges, any other variable charges, and any fixed charges on a \$/kWh basis. The CPP/TOU rate is entered for the critical peak, peak, and off-peak periods (as appropriate for the specific rate).

In the Average Customer Usage Distribution table, the user enters the “typical” customer’s average consumption during peak and off-peak periods on both critical and non-critical days. This version of the model is currently set up to accept load shapes for the average residential customer, the average customer with central air conditioning (CAC), and the average customer without CAC for a hypothetical utility. These could be replaced with other residential customer types.

In the CAC Saturation table, the user enters the CAC saturation for the region. In this hypothetical example, the saturation is assumed to be 75 percent.

In the Weather Data table, the user enters the weather conditions for the region of interest. The weather conditions are based on cooling degree-hours data.

Elasticity Estimates

The inputs from the PRISM Impacts Inputs worksheet are used in the Elasticity Estimates worksheet. This worksheet contains the PRISM model coefficients that were estimated from the data obtained during the California Statewide Pricing Pilot (SPP). The model coefficients, when combined with the input parameters, produce elasticity estimates by customer type and day type.

Impacts per Participant

The Impacts per Participant worksheet reads in each customer type’s load shape and rate and, using the elasticities calculated in the Elasticity Estimates worksheet, calculates the average kWh-per-hour reduction for each period (i.e., peak period during critical days, off-peak period during non-critical days, etc). This is also represented as the percent reduction in demand during each period.

Impact Summary

The Impact Summary worksheet simply summarizes the output that is calculated in the Impacts per Participant worksheet. Table A-1 provides an example of the results summary worksheet assuming a critical peak price of \$1.30 per kWh, a peak price of \$0.14 per kWh, and an off-peak price of \$0.083 per kWh. This worksheet provides two impacts: the change in consumption in the peak and off-peak periods by day type in terms of kWh per hour, and percentage change from the original load. These results show that the change in consumption during critical peak hours for the average residential customer is a reduction of 24 percent.

Table A-1: Example of PRISM Results Summary Worksheet

Change in Consumption, by Customer Type (kWh per Hour)

	Residential			
	Average	CAC	No CAC	CAC + Tech
Critical Days - Peak	-0.65	-0.81	-0.20	-1.06
Critical Days - Off-Peak	0.09	0.10	0.05	0.13
Non-Critical Days - Peak	-0.04	-0.05	-0.01	-0.07
Non-Critical Days - Off-Peak	0.04	0.05	0.01	0.07

Change in Consumption, by Customer Type (% of Original Load)

	Residential			
	Average	CAC	No CAC	CAC + Tech
Critical Days - Peak	-24.2%	-28.4%	-10.6%	-36.9%
Critical Days - Off-Peak	4.7%	4.8%	4.0%	6.2%
Non-Critical Days - Peak	-2.6%	-3.1%	-1.3%	-4.0%
Non-Critical Days - Off-Peak	3.1%	3.7%	1.2%	4.9%