EB-2008-0272
H1 Transmission Rates
Notes for AMPCO

DRAFT February 27 2009

AMPCO's submission

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1	2	3	4	5	6
The current rate design is arbitrary and inefficient	AMPCO's "High 5" rate design is efficient, easy to implement	Customers understand the value of demand response	Improving the rates will increase demand response	Increased demand response will reduce prices	Improving the rates will increase efficiency

AMPCO's evidence

Providing background and context	Describing AMPCO's proposed changes to the transmission network charge determinant	Understanding the economic value of transmission cost savings from demand response	Understanding the effect of transmission rates on industrial demand	Understanding the effect of transmission rates on energy prices	Considering implications for transmission customers

AMPCO's proposed rate design

- Based on transmission network cost causality
  - The primary cost driver for the network is peak demand
  - This is why customers pay for the network and most transmitters recover network costs based on peak demand
- High 5 rate proposal
  - Customer's charge is based on demand on the 5 days of highest demand in the previous year, regardless of when the five days occur
  - Customer pays the same amount each month.
    - Customers have cost certainty
    - Transmitters have revenue certainty
  - Customer has a strong incentive to reduce demand when it is most valuable to do so

The value of transmission cost savings

- Large customer's perspective
  - Operations in PJM and ERCOT
  - Experience with demand response
- AMPCO proposed change resolves concerns
  - Removes ratchet
  - Provides incentives to avoid peaks when they occur
  - Supports demand response and efficient transmission
- Effective demand response requires
  - Planning: long, medium and short-term
  - Predictive tools and techniques
  - Training and changes to operating procedures

The effect of price on demand

- I have conducted empirical analysis:
  1. Estimating the effects of changes in the Hourly Ontario Electricity Price on demand by industry
  2. Evaluating the impacts of shifts in market demand on the HOEP.
- The objective is to evaluate the welfare implications of a mechanism that would give firms an incentive to reduce demand during peak hours.
- I use publicly available data from the IESO
  - Prices are in terms of dollars per MW hour.
  - Demand is in terms of MW.
  - Data from May to August 2007
- To estimate the effects of the HOEP on demand, I focus on within day differences between peak (7 am – 6:59 pm) and off-peak (7 pm – 12 am) hours.
- I use the following simple empirical specification;
  - Hourly Demand $_t$ averaged over a 12 hour period = b_0 + b_1 Hourly Ontario Electricity Price $_t$ (HOEP) averaged over a 12 hour period + b_2 Hourly Ontario Electricity Price $_t$ (HOEP) averaged over the previous 12 hours + Month Dummy Variables + e_t

The effect of demand on price

- I also use a standard approach to evaluate the effects of total market demand on the HOEP;
  - Hourly Ontario Electricity Price $_t$ (HOEP) = b_0 + b_1 Hourly Ontario Demand + b_2 imports + b_3 Coal Supply + b_4 Gas Supply + b_5 Hydro Supply + b_6 Nuclear Supply + b_7 Gas Prices + b_8 Market Concentration + Hourly Dummies + Month Dummy Variables + e_t
- With respect to the effects of prices on demand I find that
  - (1) Current demand is negatively correlated with current prices
  - (2) Current demand is positively correlated with lagged prices
- With respect to the effects of prices on demand I find that
  - (1)Controlling for all else, a 1000 MW *decline* in market demand is significantly correlated with a $16 per MW *drop* in HOEP during peak periods.
  - (2) Controlling for all else, a 1000 MW *increase* in market demand is significantly correlated with a $4.7 per MW *increase* in HOEP during peak periods.

Implications for transmission customers

Average industrial demand response during summer months	-29	MW
Annual transmission savings per MW	$30,840	$/MW
Total annual industrial transmission savings	-$899,206	$/year
Total annual demand by other customers	132,334,189	MWh
Total summer demand by other customers	44,139,502	MWh
Transmission cost increase to other customers (applies to all MW in the year)	$0.0068	$/MWh
	$899,206	$/year
Net wholesale price change for all customers (applies only to MW during summer months)	-$0.1544	$/MWh
	-$6,813,147	$/year
Net effect on other customers	**-$5,913,941**	**$/year**

This table can be found at Exhibit I, Tab 17, Schedule 14, Page 9 of 9