

“A Model Retail Pricing Scheme to Reduce Peak Demand”

A Piece to Elicit Discussion

T. Foley

This is one of three papers that will be used to stimulate discussion among stakeholders at a May 2, 2007 meeting at the Northwest Power and Conservation Council offices in Portland. The meeting and follow on work will be aimed at supporting an October 2007 report to the utility regulators in the Northwest states of Washington, Oregon, Idaho, and Montana. This paper focuses on pricing strategies that would be designed to better reflect the true costs of serving loads at various times of the day and year. The two other papers address how we should measure the cost-effectiveness of Demand Response (DR), and how to include transmission and distribution planning in Integrated Resource Planning (IRP).

Each of the papers will be open-ended, because they are designed to elicit brainstorming among participants at the May 2nd meeting. At that meeting we will examine information available from pricing strategies implemented by others and the lessons we can learn from those efforts in the event pricing strategies are adopted in the Northwest. We should also discuss what additional work should be done to improve our understanding and ability to plan for different pricing alternatives in the Northwest.

Background and theory

Economic theory says that buyers respond differently to price signals in both the short- and long-run. In the short run, buyers will change behavior as the price of one commodity increases relative to all other goods and services purchased by consumers. In the short-run, for example, when faced with rapidly increasing electric rates people may adjust their thermostats, pay more attention to turning off unneeded lights, and so forth. In the long-run, consumers have the time and planning flexibility to purchase more efficient HVAC systems, and to acquire more efficient appliances, as well as engaging in more careful management of loads.

Although we do not always see what happens in individual facilities when rates rise, we have read in the newspapers about how people have responded to sharp increases in gasoline prices. That response confirms how we would expect people to behave with increased electric rates. The first response of drivers was to drive less or drive the most efficient vehicle more often (in two car families). A later response has been to increase the demand for Hybrid vehicles at the expense of large SUVs. .

In the economic literature, long-term price elasticity, which measures consumers' responses to prices, has typically been much higher (perhaps 10 times as high) in the long

term than in the short term. Critical peak pricing rate designs implemented elsewhere seems to have confirmed this¹.

As we will discuss below, this difference in response to rate increases in the short and long term makes our tasks more difficult. That is, we are limited by what we can learn in a pilot program.

Difficulties with and benefits of short-term pilots:

Pilots can tell us a lot about how consumers operate their existing cadre of electric-using devices when prices change. However, pilots will not tell us how equipment may be changed if the pricing structure of the pilot were to remain in place indefinitely.

However, we can learn much from the pilots about social and political acceptance of pricing strategies and the degree to which demand response can rely on active decision making by customer or whether response needs to be automated, and we can learn how to go about implementing these strategies.

Why are we interested in pricing power to reflect better on the cost of serving loads?

For discussion:

- Better allocation of resources. Considerable resources are in place to serve loads that do not occur very often. Lowering these loads lowers costs.
- Lower costs to consumers over time due to better allocation of resources.
- Difficulty in siting and building transmission.
- Fosters more efficient use of electricity through more efficient appliances, et. al.
- Fuel costs at peak are high, and can be avoided.
- Is pricing a better strategy (is it complementary?) than straight load control, or voluntary load control? Should pricing strategies stand alone, or be implemented as part of a broader package of DR?
- What is the affect of pricing strategies on carbon loading? Would loads be shifted toward coal plants and away from CTs? Do we need to internalize carbon costs in some way to address this phenomenon? If so, what are the implications for when and by how much demand response is used?

Summary of findings and proposed discussion based on past pilot projects

At the meeting we will be presenting results from pilot projects deployed elsewhere. Some issues to think about:

- What price differentials between peak and off-peak are needed to see significant response?

¹ Communication with RAP.

- Should sticks (“high prices”) be the tool or should we offer carrots (“bill credits”) for demand response?
- How would pilots from elsewhere transfer to the Northwest?
- Can we hypothesize that significant behavioral responses in the short-run would portend significant changes in improvements to capital efficiency if the pilot were to be adopted as standard procedure?
- Should behavior be automated? Should customer discretion be limited or encouraged? That is, should we let each customer set his/her own price points, or programmatically use the same price points for everyone for purposes of triggering demand response?
- How does total use affect a person’s ability to respond?
- Will responses seen early in a pilot be sustained if the pilot lasts a longer time?
- What social problems were encountered in setting up the pilots? Did participants self select? If so, what different problems would there be with a mandated time-or-use strategy?
- Can we extrapolate results from a self-selected group to the group of customers as a whole?
- Do people respond more when there is a visible signal that prices are high? Is it enough to know the times of the day when you will be charged higher prices, or does a visible signal increase response. (San Diego Gas & Electric used a colored sphere that changed colors when prices changed, e.g.)
- How important is advanced metering to the outcome of a pricing strategy?
- Conversely, how much of the value of demand response can be captured with low-tech approaches that may already exist as legacy systems?
- If pricing becomes a common practice, load shapes would probably change. How should pricing strategies be reflected in IRPs?

Expected results of a retail pricing pilot in the Northwest and “how do we proceed from here?”

For discussion.