Time-of-use sensitivity

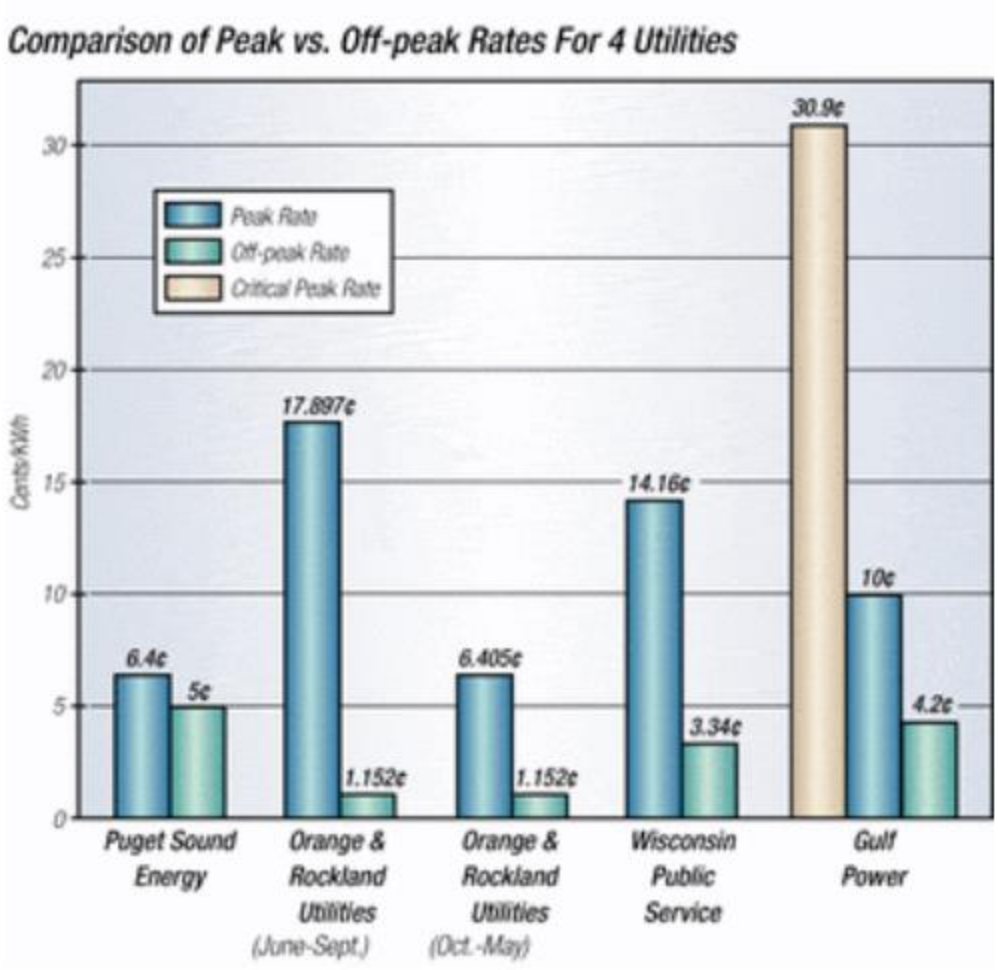
I encourage PSE to include a robust "time-of-use" (TOU) analysis in its sensitivities related to Distributed Energy Resources. The company's recent investments in smart meters enable broad deployment of this important economic signal throughout its service territory.

Why is TOU so important at this time?

1. TOU shifts and smooths the daily demand curve, better matching supply from renewable resources, and helping to reduce greenhouse gas emissions.
2. TOU makes investments in batteries more attractive for customers. Customers can charge their batteries during off-peak hours when TOU rates are low. Then they can withdraw that electricity when TOU rates are high. The difference in the rates allows customers to gradually recoup the cost of their investment. Customers or installers can simply set a few configuration parameters for the battery system. It's truly "set it and forget it." We want to incentivize battery purchases because they make our electric grid more reliable and resilient, keeping the lights on after a big storm or earthquake damages the grid.
3. By avoiding wild swings in electricity consumption throughout the day, stress on equipment is reduced. Less frequent failures save customers money and reduce unplanned outages. Also, reduction of demand peaks reduces the need to overbuild infrastructure to handle excessive peaks. This also saves money.
4. TOU rates give customers another tool to reduce their monthly electric bill. By voluntarily shifting high-demand activities to off-peak times (especially charging EVs or doing laundry), customers can reduce bills significantly.
5. When PSE pioneered TOU rates 20 years ago, the program not only shifted peak consumption, it actually led to overall conservation of about 1%. This should not be a surprise. Customers who are aware of their energy use and make conscious choices about consumption are more likely to avoid wasting electricity, even during less expensive hours.

Although PSE was a leader in TOU technology, the company's large-scale pilot program ended with a whimper. Many customers found the program *increased* their monthly bills, and the UTC pulled the plug on the program. However, this failure can easily be avoided today, for the following reasons:

1. As noted in several post-mortem analyses (like https://www.power-grid.com/2003/01/01/why-time-ran-out-on-pses-time-of-use-program/), the difference between PSE's highest and lowest TOU rates was not great enough to motivate customers to make significant changes. In the graph below, PSE's rate differential was only 1.4 cents per kilowatt-hour. The average differential among the other utilities was almost 10 cents per kilowatt-hour, an amount that could really get customers' attention! A proportional differential would be 15-20 cents today.



2. PSE hired a very expensive subcontractor to manage the large amounts of consumption data generated by the program. PSE passed the costs onto customers, resulting in higher bills than the customers were expecting. Today, PSE can probably handle the data in house at much lower costs.
3. Customers have more options to shift demand now than they did 20 years ago. Many appliances come with timers. All the EVs that I'm aware of have configuration options to delay charging until off-peak hours. Currently, customers have no incentive to configure these options. This will become a challenge for the grid as more customers buy EVs. With TOU rates, a customer who spends a few minutes configuring the charging program can significantly reduce the cost of operating the vehicle.
4. If customers are aware that electricity consumed during peak hours creates higher greenhouse gas emissions, they will have an extra incentive to "do the right thing" and reduce peak consumption, even if they aren't worried about peak prices. PSE can help educate the public as Sacramento Municipal Utility District does so well in this video: https://ipx.bcove.me?url=https%3A%2F%2Fwww.smud.org%2Fen%2FIn-Our-Community%2FWorkshops-and-education-resources%2FResidential%2FEducational-Video-Library%3FvideoId%3D6034376728001&accountId=769719904&experienceId=5bbfbfcbb5a78f000f3eaa37&videoId=6034376728001

If PSE implements a TOU program with a large differential between low and high rates, if data handling charges are handled responsibly, and if the public is well aware of the economic and environmental benefits of this program, we expect to see a significant shift in peak demand that would decrease the need for, and the value of, new peaker plants. If paired with incentives for batteries and Vehicle-to-Grid programs, TOU could become instrumental in achieving CETA goals in a cost-effective, highly reliable manner.

PSE led the industry with a forward-looking TOU program 20 years ago. According to the Power Grid article referenced earlier, "The ballyhooed pilot program garnered industry awards and headliner status at power industry trade shows. It was a bright and shining star in an otherwise gloomy Western power scene, and it had industry participants excited about the prospects of demand response in general."

The time has come for PSE to lead again toward a cleaner, more sustainable future for Puget Sound and the world!

Don Marsh
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