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August 18, 2006

## MEMORANDUM

**TO:** Council

**FROM:** Ken Corum

**SUBJECT:** Demand response during July 21-24 hot weather

I've conducted a quick and dirty survey of how utilities used demand response to help deal with the peak loads of July 24<sup>th</sup>

For perspective, it's worth noting what an extreme event the July 21-24 episode was. Based on our index of regional temperature (I can provide details if you're interested) July 22 was equal to the hottest day in the region since 1928, July 23 was about a degree hotter than that (i.e. a new record for all days since 1928), and July 24<sup>th</sup> was only 2 degrees cooler. We were quite lucky that July 22 and 23<sup>rd</sup> were on a weekend, or we would have faced even higher loads. It was also an extreme event in California; the California Independent System Operator described it as a "1-in-50 year" event.

Given this event, both in the PNW and in California, together with some generator outages, some utilities were scrambling to cover their loads on the 24<sup>th</sup> even though the system had fairly comfortable reserve margins by most measures. What were they able to do in the way of demand response?

1. Portland General Electric got about 29 MW of load reduction on the 24<sup>th</sup> from their customers. About 25.5 MW of that was from dispatchable emergency backup generators and about 3 MW was reductions in use from their Demand Exchange.
2. Puget Sound Energy got 6 MW from a generator using methane produced at a wastewater treatment plant.
3. Idaho Power got about 32 MW of peak reduction from a combination of irrigation and AC reduction programs. They also made public service announcements explaining that the power system was stressed and asking for the public's voluntary help in reducing loads.

4. Snohomich PUD got about 10 MW of load reduction, about half from operation of emergency backup generators and half from cuts in processes, lighting, etc.
5. Avista made arrangements the morning of the 24<sup>th</sup> for some reductions from industrial customers but couldn't provide a number of MW.
6. Chelan PUD was able to arrange about 10 MW of reduction from one of its industrial customers.
7. PacifiCorp's situation is more complicated. It exercised Cool Keeper (an air conditioner cycling program of about 80 MW), Energy Exchange (a buy-back program with day-ahead offers by the utility), curtailment contracts with some customers and the Power Forward program (an announcement of "Yellow Alert" days in cooperation with the state government in Utah asking for consumers help in reducing electricity use). PacifiCorp's reductions were more in the eastern part of their service territory (Utah and Wyoming), which is outside our region, and were more on July 25<sup>th</sup> and 26<sup>th</sup>, when our region's weather was moderating, but Utah's was continuing to be hot. PacifiCorp declined to put a total MW figure on the total results of their programs.

In total, demand response seems to have reached at least 165 MW and may have reached as much as 250 MW or more (remember that a significant part of this was in Pacificorp's eastern area, out of our region). There may also have been utility demand response efforts that I didn't hear about from my quick e-mail survey, but I don't think I missed anything big.

What lessons should we draw from this experience?

1. I would suggest that we got some useful demand response on very short notice (in several cases, with a few hours notice rather than the more usual "day-before").
2. It looks like most utilities were not expecting to need to use this resource this summer, or perhaps in any summer, and we need to reconsider that expectation.
3. One source told me his utility could recover high spot market costs of buying energy, but could not recover comparable costs of reducing load as an alternative. If this is true, it's a regulatory barrier to demand response that can be addressed.
4. It seems to me that we're not yet prepared to do much in the way of demand response, perhaps because of our current surplus. Preparation now will enable us to meet loads when this surplus has been depleted, and this episode demonstrates that we might see some useful economic benefits on occasion in the meantime.

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