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24 March 2009

To: Washington Utilities and Transportation Commission

P.O. Box 47350 Olympia WA. 98504-7250

Subject: Comments to Docket U-090222

Concerning EISA Section 532, Standard 16

Conservation of electricity in the Northwest has made very modest gains in the last few years.

The restraining forces are the same old ones. Finding cost effective conservation measures is very difficult, particularly if sound life cycle cost analysis is applied. Most of the easy to pick low fruit has been picked. It is interesting to note that many conservation measures have come from mandated conservation (like building code insulation requirements) and not so many from user initiated upgrades based on good financial returns. While some utilities understand that conservation is their most cost effective source of new capacity, they are mainly dependent on coercing their customers into actually implementing the conservation measures. Cash rebates are sometimes provided but rate structures have not been modified, and the measurement of results is very difficult.

While the collective potential to conserve is huge, this potential tends to be made up of many small items, many of which are quite technical. Others are sufficiently distasteful to the user that they are brushed aside. Many do not center on improving the efficiency of a particular device but are really based on system revisions. Three examples are:

1. Using an air conditioner to preheat hot water along with cooling. (heat pump water heaters)
2. Heat recovery from sewer water
3. Providing refrigeration when a heat pump is in the heating mode.

Unless some manufacturer comes out with these integrated systems in a plug and play package configuration, they won't happen and if they are offered, the cost, is likely to be high, both initially and to maintain. I know several people today, and many HVAC people who do not recommend heat pumps because the maintenance cost is so high. These units are being built to be replaced, not to be maintained. When a unit has to be replaced every 7-10 years, the impact on the life cycle cost is very negative.

Other conservation items are just to big to try and digest. By all common technical sense, every home should be wired 380/240 wye and every motor of any size in that house should be three phase. Believe

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it or not, this is the standard in some African countries. Are you ready to ask Congress to mandate this? Are you ready to require PSE to supply 380/240 wye upon customer request? If your answer is no, than conservation is not being taken very seriously.

ELECTRIC UTILITY EFFICIENCY

Electric utilities (IOU and public) are not much different than other American entities. Short term ROI is what governs. Utilities often take a longer term view than most American industry but even that is often short term compared with what is possible. Utility efficiency has a lot to do with the nature of the utility. For BPA it is corona losses at the top of their list. For REA's it is often foolish use of line regulators. For PSE, at least where I live past Boston Harbor I suspect it is I²R losses, both due to line size and general indifference to power factor....I am not real sure.

However, on a national basis, these losses pale compared to the losses at thermal power plants because of lack of co generation. The lack of cogeneration in the USA is the worst in the developed world.

We require thermal plants to be sited where co gen is difficult. Your regulatory authority is much too weak. Why is the Tonto Plant allowed to operate without cogen? Why are there gas turbine peaking plants at Chehalis and Clark County that do not have waste heat recovery? It is hard to understand why we have gas peaking plants at all in the Northwest. Putting some base load on gas turbines with waste heat recovery and peaking with BPA hydro would be much more efficient.

It is understandable that hydro sites are not near load centers nor are most good wind sites. What is NOT understandable is why the Boardman Plant is where it is. Losses associated with voltage regulation and power factor correction would be significantly reduced with dispersed generation near load centers.

Utilities are so oriented to the bigger central thermal plant being better, that thinking outside that box may be an insurmountable obstacle.

Anticipation of trends is an important part of any successful endeavor. Does WUTC have any idea of what electric vehicle PWM battery chargers are going to do to the harmonic content on the distribution system. Nothing is as effective in mitigating this as local, decentralized synchronous generation.

Utilities frequently specify high transformer impedances to limit fault current. In so doing they sacrifice voltage regulation and efficiency. There are other ways to limit fault current.

Some shift in conservation emphasis from the consumer to the utility makes sense. We have been overemphasizing efficiency on the consumer side compared to the utility side.

RATE DESIGN TO PROMOTE ENERGY EFFICIENCY INVESTMENT

First, I would like to caution that it is a mistake to focus on efficiency alone. Rate structures need to also promote demand management. Basing rate structures to encourage efficiency and demand control is not any more popular politically than it is to base rates on cost of service. It will never fly except for large industrial and institutional users who can generate the considerable resources needed to optimize efficiency and demand.

My background is all private industry, with the later half in the Pulp and Paper industry. There are 4 to 5 Electrical Engineers on staff, plus frequent use of outside consultants, to manage the utilities in a pulp and paper mill. That's more technical talent than half of the numerous electric utilities in the state have.

Do you really think that rate incentives will have much impact on the commercial and residential user?

What will have an impact is mandates concerning the energy efficient equipment that the residential and commercial consumer purchases and rebates to help pay for it. Even something as simple as time of day pricing won't get much results if the consumer has to do the implementation. Just have the utility give him \$500 cash for putting a black box on a water heater.

There is a very small village in North Central Washington, with a private off grid electric utility, that runs most of the fall and winter with a load factor well over 90 % because of a seasonal hydroelectric water shortage.

Does this cause some inconvenience, sure, but everyone understands when the 59 loads that are computer controlled are shed in order of their inverse impact on livability. Ask PSE what their costs would be if they could maintain 90% load factor during the highest demand months of the year. You would be amazed.

SMART GRID INVESTMENTS

Sounds good. Looks good, and fits in with the national fascination with technology. Will it help much with the national energy issue.....unlikely, except for the very biggest consumers.

There is no question that smart grid technology (as I understand it, it is a super cost accounting of making electricity and a super cost of service accounting system.....maybe "smart" needs clarification)

So we all know what each KWH costs at every hour of the day. We know every element of the fixed costs and of the variable costs of our electric bill. Will we do anything different. Probably not unless rate structure provides an incentive AND we know what to do to take advantage of the situation.

The big risk I see in this smart grid information is that it will really pindown the true and accurate cost of service. In so doing, there will be pressure to move to rate structures that are more closely tied to cost of service. As an engineer I really support this but where does that leave today's customer who is getting electricity at well below the cost of service. Is DSHS ready to start paying more electrical bills?

We aren't talking strictly about little old ladies. I have a commercial client who is having a very hard time adjusting to the concept of a rate that covers cost of service. The utility is an REA and for years federal support for the REA has subsidized his service. Now the federal funding is gone. Change comes very hard for some.

There is a very good chance that implementation of a smart grid system will provide minimum tangible benefit. The implementation will do one thing for sure...add to the fixed cost structure.

Most nations, with their nationalized electric systems, have established an acceptable balance between the social welfare part of the electric system and the cost of service part. At the same time they have done a much better job in achieving higher levels of efficiency than we have. What is the major difference. They don't allow poor engineering practices or for policy to be set by special interest groups.

While not on the docket, I would like to suggest that the WUTC charter is much too narrow. While not a big agency, you do have more technical talent in the electrical engineering area than any other state agency. This talent is focused on a few IOU's while dozens of small public utilities are not even interested in improving efficiency, either internally or with their customers. It doesn't make sense to me.

Thank you for this opportunity to make these comments:

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