**BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH**

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| In the Matter of the Review of the Report Prepared for PacifiCorp entitled "Assessment of Long-Term System-Wide Potential for Demand-Side and Other Supplemental Resources." | ) ) ) ) ) ) | Docket No. 08-035-56 |

# COMMENTS OF UTAH CLEAN ENERGY AND WESTERN RESOURCE ADVOCATES ON PACIFICORP'S DSM POTENTIAL STUDY

Submitted November 6, 2008

On September 25, 2008, the Utah Public Service Commission requested "comments on the use of the demand side management (DSM) Report for DSM evaluation at both the planning and program approval stages of DSM program analysis and on how well the report fulfills the required commitment criteria". In accordance with the above request, Utah Clean Energy (UCE) and Western Resource Advocates (WRA) jointly submit the following comments on the use of the report entitled: "Assessment of Long-Term, System-Wide Potential for Demand-Side and Other Supplemental Resources" ("Study"). In addition to the questions asked by the Commission above, we will provide further comments on the solar analysis that was included in the Study and the additional analysis that RMP included in their responses to stakeholder comments.

We believe that the Company conducted the study in good faith and that it imparts useful information about a base level of demand side management (DSM) that should be pursued by the Company. It is the position of UCE and WRA that the Study fulfills the commitment criteria. However, due to the limitations of studies of this nature, as described below, we believe that the Study should not be used as the primary tool for DSM evaluation, program approval and planning.

## General Comments about the Study and Efficiency Potential Studies

In formal written comments and discussion at the October 1st, 2007 Rocky Mountain Power DSM Advisory group meeting, parties expressed concern that achievable DSM potential found in the Study greatly underestimated Utah's DSM potential. The Study was based on historical performance of current measures coupled with survey results, and did not examine new measures and technologies. Furthermore, the survey data used to inform the Study represents the historical

marketing and outreach methods for DSM programs and did not examine the impact of new, more aggressive marketing techniques. Comments file by the Southwest Energy Efficiency Project on August 24, 2008, pointed out that the energy efficiency potential identified in the Study of 7% of retail sales in 2027, or 0.35% savings per year on average, is less than Utah is achieving today (0.58%)[1]. Other energy efficiency efforts have resulted in much greater savings. For example, Vermont, whose electric load profile is typical of the rest of the nation, has turned their load growth negative through their electricity energy efficiency efforts. Their 2007 savings rate was 1.74% of annual sales per year, a level which is nearly three times RMP's current savings level.[2]

Historically, DSM and energy efficiency potential studies continue to underestimate energy efficiency potential. This summer, at the American Council for an Energy Efficient Economy (ACEEE) Summer Study, David B. Goldstein, the Head of Natural Resources Defense Council's Energy Efficiency Section, gave a presentation that addressed and explained overly conservative biases in energy efficiency potential studies. [3] David Goldstein's paper is included with these comments. He explains that these studies are generally used for planning purposes and thus the researchers do not want to over promise the savings potential; the studies contain 'self-proclaimed' conservative assumptions, which when coupled together can result in dramatic underestimates of the energy efficiency potential. The following is a summary of some of the systematic biases of these studies, paraphrased from Goldstein's report:

1. **Researchers would rather underestimate than risk overestimating –** Studies do not report the most likely value for energy efficiency potential, but rather they report values only if they have a very small likelihood of being overestimates.

2. **Subjecting Efficiency Measures to a Criterion of Proof Beyond Doubt –** Almost all potential studies address uncertainty by intentionally biasing the assumptions (lowering energy savings projections and/or raising cost projections) to the point that there is little technical doubt that the predicted cost of saved energy for each measure in the supply curve will not be lower than what is subsequently found in the real world.

3. **Lack of Research on the Cost or Feasibility of a Particular Measure Means that it is Excluded from the Study** – Studies generally focus on measures where the cost is well established and measures that have already been implemented successfully.

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[1] Gellar, H. (2007) *Comments on PacifiCorp's DSM Potential Study*, Southwest Energy Efficiency Project, August 24, 2007

[2] Parker, S. and Hamilton, B. (2008) *What Does it Take to Turn Load Growth Negative? A View From the Leading Edge*, 2008 ACEEE Summer Study on Energy Efficiency in Buildings, 10-106.

[3] Goldstein, B. (2008) Extreme Efficiency: *How Far Can We Go If We Really Need To?,* 2008 ACEEE Summer Study on Energy Efficiency in Buildings Proceedings, 10-44

4. **A failure to Consider Greater Savings with Systems Integration –** The best example for this bias has to do with buildings. A recent study looking at prescriptive, component based efficiency measures in buildings shows a savings of 20-35%; however when integrated design is used the savings potential is 50%.

5. **An Assumption that Once Known Efficiency Measures Are Implemented, Technological Progress Ceases and No Further Improvements Are Possible –** Potential studies limit themselves to technologies that are either commercially available or readily visible on the horizon, they do not consider future advancements in energy efficiency.

6. **Ignoring the Economic Value of Non-Energy Benefits –** Many energy efficiency measures also deliver non-energy benefits. These benefits may exceed, or even greatly exceed, the economic value of the energy savings themselves. Yet they are almost never included in efficiency potentials studies in a way that affects how measures are ranked in terms of cost of saved energy.

7. **A Reliance on Projected Costs of Efficiency Without Looking at Realized Costs, Which, Whenever Data Has Been Available, Have Always Been Lower than Projected Costs and Often Lower than Zero –** Potential curves are often based on incremental costs that are projected from looking at products or design services at an immature market stage when they represent typically a fifth of the market or even less. (If this weren't the case, potentials would revolve around taking 80% market shares and increasing them to 100%, which is almost never the case.)

   But, policies that induce large changes in market share also induce reductions in price through several different economic mechanisms. This effect has been observed in practice and is also the expected result from economic theory.[4]

8. **Ignoring the Economic Benefits of Reductions in Energy Price Due to Reductions in Demand with the Same Amount of Supply –** American and global economic experience over the last several years has shown that the price of major market-traded energy commodities such as natural gas and crude oil is highly dependent on a narrow balance between supply and demand. Very small changes in demand leverage very large changes in price: short-term elasticities are far in excess of 1. The effect of reducing energy prices can be large. For the case of gas furnaces, one analysis show that the benefits of a hypothetical energy efficiency standard in terms of reducing gas prices to non-users of the regulated product vastly exceeded the benefit in terms of lower

[4] Goldstein, D. (2007) *Saving Energy, Growing Jobs*. Pt. Richmond, California: Bay Tree Publishing, as cited in Goldstein, D. (2008), see Ref. 3

quantities consumed to the users themselves.[5] No potentials study has quantified this effect.

These biases illustrate how, by their nature, DSM potential studies are biased towards more conservative results and do not take into account current innovations or likely future changes. It is reasonable to assume that interest in energy efficiency will continue to grow as energy prices rise and awareness of climate change and environmental impacts increases. For example, programs such as Architecture 2030, ENERGY STAR, the U.S. DOE Zero Energy Building Initiative, and Near Zero Energy Homes programs are gaining popularity; it is not unrealistic to expect programs such as these to play a larger role in the future. These programs along with increased utility DSM investments and increased federal and state programs and incentives will likely have a synergistic effect that could compound the actual DSM potential significantly.

**Use of DSM Potential Study for Planning**

Like the majority of studies of this nature, this Study includes a number of the biases discussed above. Written and verbal comments reiterate the underestimation of DSM potential in PacifiCorp's system. We support the Company's assessment and direction as explained in the August 13th, Technical Conference that the Study describes a base level of energy efficiency, that all cost effective and available demand side resources will be pursued, and that it would likely update the study every three to four years.

In the current integrated resource plan (IRP), we support the use of the *technical potential* data provided that the 2027 time frame is not used as a constraint for achieving the total DSM potential and that the DSM potential is considered a floor level rather than a maximum achievable level. For the IRP analysis, we do not support limiting the technical potential by what PacifiCorp considers to be achievable. Instead, PacifiCorp' should identify the full cost-effective level of DSM and then make provision in its path analysis (contingency analysis) for the possibility that the amount of DSM chosen by the model may not be achieved in the timeframe modeled.

We do not support the use of the Study results for identifying DSM potential beyond the current IRP. We understand the need for utility planners to be careful not to significantly overestimate the energy efficiency potential in resource planning; however, utilizing data that significantly *underestimates* the potential also carries a risk. If the planning process doesn't recognize the maximum potential for energy efficiency it will be more difficult to identify gaps, develop programs and marketing strategies, provide adequate staffing for programs, and identify the

[5] Goldstein, D. and Tannenbaum, K. (2004), *Comments of the Natural Resource Defense Council and The Dow Chemical Company On Advance Notice of Proposed Rulemaking, Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers*, November, 2004. San Francisco, California: Natural Resources Defense Council, as cited in Goldstein, D. (2008), see Ref. 3

necessary regulatory changes to achieve the greatest amount of cost-effect DSM to the benefit of ratepayers.

It is our position that the Study does not serve as an adequate planning document for the Company and regulators to follow in achieving the DSM potential that we believe exists. As was previously noted, the Study describes a 'floor' rather than the maximum DSM potential. This being the case, the Study provides no indication of the maximum DSM potential, except that the maximum potential must exceed what is presented in the Study. If the maximum potential were found to be many times greater than what is presented in the Study, this could have significant impacts on the planning process, program design, implementation, marketing and regulatory framework.

**Use of the DSM Potential Study for Approval of Programs**

While the Study provides some valuable guidance, UCE and WRA do not consider the Study as a tool for program approval. Furthermore, it is our position that the Total Resource Cost test as the *premier* test for program evaluation is not in the best interest of ratepayers in this carbon and energy constrained times. In the Company's response to the DPU, they state that, "The TRC perspective is the appropriate measure, since it allows DSM resources to be evaluated against supply options on a level playing field."[6] For a number of reasons, it appears to us that use of the utility cost test (UCT) is the appropriate measure to assure that demand side and supply side resources are evaluated on a level playing field. We look forward to addressing this issue in Docket No. 07-035-T04.

In a carbon and energy resource constrained environment, energy efficiency should be our highest priority resource. Energy efficiency mitigates against the major risks facing the electric industry: carbon price risk; fuel price risk, and technology risk. And, as discussed above, by reducing pressure on natural gas supplies, it may moderate natural gas prices for residential customers and those industrial processes that cannot easily substitute one fuel for another.

Recognizing energy efficiency as a high priority resource is the first recommendation in the National Action Plan for Energy Efficiency developed by approximately 60 other stakeholders including MidAmerican Energy Company along with the U.S Environmental Protection Agency, and the U.S. Department of Energy[7]. In addition, the Energy Independence and Security Act of

[6] Jeffery Larsen for Rocky Mountain Power: *Report on the Assessment of Long Term System Wide Potential for Demad Side and Other Supplemental Resources Report*, Docket No. 08-999-02, submitted September 15, 2008

[7] National Action Plan for Energy Efficiency (2006) www.epa.gov/eeactionplan

2007 requires that "Each electric utility shall … adopt policies establishing cost-effective energy efficiency as a priority resource."[8]

Energy efficiency is also supported by the Utah State Legislature in its 2006 Energy Policy for the State, HB 46:

> **"Utah Code §63M-4-301 State energy policy**:
> (1) It is the policy of the state that:… (f) Utah will pursue energy conservation, energy efficiency, and environmental quality;"[9]

It is further supported by Governor Jon Huntsman Jr.'s energy efficiency policy:

> "Elements of and Energy Efficiency Plan (1) Make Energy Efficiency a Priority for Utah and Set Energy Efficiency Goals for the State of Utah. And (1)a The Western Governor's Association has set a goal of 20% increase in energy efficiency by 2020. Utah will work to meet this goal in advance of this target with an objective date of 2015, thereby saving Utah's citizens and businesses energy and money."[10]

If energy efficiency is to be a high priority resource and evaluated on a 'level playing field' with supply side resources, the Total Resource Cost (TRC) test should not be the premier cost test for evaluating DSM programs. The UCT is more appropriate because it symmetrically evaluates the utility investment for both demand side and supply side resources. Just as subsidies to supply side resources, for example the Price Anderson Act for nuclear power, are not included as part of the cost of these resources in the IRP analysis, neither should participant cost be included in the evaluation of demand side resources. Inclusion of the participant cost in the TRC test is further inappropriate since it does not adequately reflect the benefit to the participant and society in the analysis of DSM. We appreciate that the Company and the Utah Public Service Commission have initiated a regulatory process to evaluate cost-tests for DSM and look forward to the opportunity to provide further input.

**Comments related to the evaluation of solar programs**

The comments by PacifiCorp to NREL are clear about their assumptions on calculating the levelized cost of energy (LCOE) for solar, especially in their description of the Operations and Maintenance (O&M ) costs. We agree that the cost of inverter replacement should be included in the O&M cost. However, we still disagree with the final calculation of $0.79/kwh for solar.

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[8] Energy Independence and Security Act of 2007, H.R. 6 http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h6enr.pdf (accessed November 3, 2008)

[9] Utah HB 46, http://www.le.state.ut.us/~2006/bills/hbillenr/hb0046.pdf (accessed November 4, 2008)

[10] Energy Efficiency: Utah Policy to Advance Energy Efficiency in the State, http://www.utah.gov/energy/governors_priorities/utah_policy_to_advance_energy_efficiency_in_the_state.html (accessed November 4, 2008).

Our reasoning is two-fold:

1. As NREL pointed out in their comments, the aggregation of repeatedly taking the conservative estimate of each input results in an answer that is no longer a conservative evaluation, it is an improbable evaluation. This is further compounded if the conservative estimates themselves are highly conservative, as it is for the total cost of the solar PV system. For example, as Vote Solar points out in their memo (attached),[11] PacifiCorp's assumption that the capital costs would remain nominally constant (decreasing in real terms), is highly conservative since the historic trend from 1998-2007 was a nominal decrease of 3.1% (4.8% real).[12] Therefore, we echo the previous comments by NREL and the attached comments by Vote Solar and recommend that the LCOE calculations include a sensitivity analysis around a range of inputs, and to take the mean output of that range as an overall conservative estimation of the LCOE of solar PV

2. The federal and state tax credits should be included in the evaluation of the cost of the system. Just as the production tax credit is included in the evaluation of supply-side resources such as wind, the investment tax credits should also be included in the evaluation of solar photovoltaics (PV). The solar tax credit was just extended for 8 years[13], so there is certainty in its application in planning documents. In addition, the residential tax credit was expanded from 30% of the cost of the system with a cap of $2,000 to 30% of the cost of the system with no cap. The commercial tax credit stayed the same at 30% of the total cost with no cap. The analysis by PacifiCorp shows a significant decrease in the levelized cost of PV using the old tax credit, and we support the application of the new tax credits in calculating the levelized cost of PV.

Finally, we have a question regarding the solar rebate program evaluation performed by PacifiCorp. What are the administration costs and how are they calculated? What does "total capital cost" refer to, the system cost or the cost to the utility? We read this as the administrative cost is 15% of the total capital cost of the system, which would be a considerable administrative cost of $1.35/W for a system total capital cost of $9/W. The rebate to the customer is assumed to be $2/Watt, and if we are reading this correctly then the administrative cost of the program would be roughly 2/3 ($1.35/$2.00) of the rebate cost. Please clarify this input for us.

[11] Memo from Gwen Rose of Vote Solar to Utah Clean Energy, November 4, 2008.

[12] Wiser, Ryan, Lawrence Berkeley National Laboratory. "An Empirical Investigation of PV Cost Trends, and Implications for Incentive Program Design". Solar Power International, October 2008.

[13] H.R. 1424, the Emergency Economic Stabilization Act of 2008, October 3, 2008.

**Does the Study Fulfill the Merger Commitment Criteria?**

As discussed above, the Study is in line with current industry practices for this type of evaluation. While UCE and WRA interpret these practices as following a pattern of overly conservative assumptions to ensure that there is 1) a very low probability of not achieving the DSM found in the Study and 2) a very high probability of underestimating the real DSM potential, we recognizes that the Company conducted the study in good faith and that fulfills the commitment criteria It should be recognized that the Company has acknowledged the Study's limitations and will be undertaking updates on a regular basis, therefore exceeding the merger commitment.

Given our current carbon and energy constrained world, however, we recommend that the update of the Study address additional questions, including: 1) How much cost-effective DSM can we achieve if DSM is the recognized as the highest priority resource? 2) How can we avoid the biases that result in a significant underestimate of DSM potential? 3) What barriers must be removed to achieve the maximum achievable DSM?

We appreciate this opportunity to provide comments to the Utah Public Service Commission. Please contact any of the undersigned with any questions you may have related to these comments.

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