Comments on PacifiCorp's 2013 DSM Potential Study

Howard Geller, SWEEP and Kevin Emerson, Utah Clean Energy
September 9, 2013

1. Achievable potential is low

The identified maximum achievable Class 2 DSM savings potential over a 20-year period for RMP is only 560 MWa or 4,905 GWh/yr (excluding CHP and on-site solar potential). This represents 12% of projected baseline electricity sales in 2032, meaning savings of only 0.6% per year on average.

For comparison, RMP has saved an average of 1.0% per year from its Class 2 DSM programs implemented in Utah over the past five years; notably higher than the 0.6% per year of potential identified in the Study. The Company's reported annual Class 2 DSM energy savings in Utah ranges from 23 - 28 aMW per year (site) / 25 – 30 aMW per year between 2009 and 2012.[1] Yet the Study estimates that the cumulative Class 2 DSM potential for Utah over 20 years is 384 aMW, or only 19.2 aMW per year on average. We are concerned that the average per year Class 2 DSM savings potential is unrealistically low as compared to the actual Class 2 DSM savings realized by the Company between 2009 and 2012.

The Company's recent energy efficiency achievements were realized from a limited (not comprehensive) set of DSM programs as well as with limits on incentive levels and marketing efforts. With an expanded set of programs, higher incentives, and more vigorous marketing, RMP could no doubt achieve more than 1.0% savings per year as other utilities in the region, including Xcel Energy in CO, and APS and SRP in AZ have done. In reality the achievable Class 2 DSM savings potential is at least double and possibly triple what the DSM savings potential study indicates (i.e., at least 1.2% per year and possibly 1.8% per year), at least in the foreseeable future.

We acknowledge that some efficiency measures offer diminished savings potential for utilities over time due to market saturation effects or the fact that they become the baseline due to building energy codes or equipment efficiency standards. But experience has shown that other savings measures or strategies arise that offer new opportunities for cost-effective energy savings, replacing the loss of future savings potential from older measures with diminished future potential. For example, LED lamps are a major savings opportunity in all sectors that did not exist on a practical, cost effective level five years ago. Nor did Home Energy Reports exist as a practical, cost-effective savings strategy previously. These newer measures are discussed in more detail below.

2. Comparison to other potential studies

Other DSM potential studies show much greater achievable savings potential than the Cadmus study. SWEEP's *$20 Billion Bonanza* study estimates 20.3% achievable savings potential in Utah by 2020 from implementation of Best Practice EE programs over an eleven

[1] Data taken from Rocky Mountain Power DSM annual reports for Utah, for the years 2009, 2010, 2011, and 2012.

year period (2010-2020).[2] Using more conservative assumptions about ramp rates, it should be possible to achieve at least 20% savings over a 20 year period.[3]

In another example, a recent DSM potential study update prepared by Xcel Energy for its Colorado service territory indicated a 23 percent economic savings potential and 13 percent maximum achievable savings potential for EE programs implemented over an eight year period (2013-2020).[4] This represents average savings rates of 2.9% per year (full economic potential) and 1.6% per year (maximum achievable potential)—far greater than the average savings of 0.6% per year in the Cadmus study for PacifiCorp. For comparison, Xcel achieved 1.3% savings as a fraction of sales from DSM programs implemented in 2012 (based on net savings).

An increased level of potential energy savings is also corroborated by a nationwide analysis that found that "by 2020, the United States could reduce annual energy consumption by 23 percent from a business as usual projection."[5] It is reasonable to assume that the same energy efficiency potential exists in RMP's service territory over the next 20 years.

3. **Energy savings from emerging technologies and approaches were not considered**
The study by definition only includes measures "commonly available, based on well-understood technologies" (p. 58). This is not a reasonable assumption to make in a forecast of DSM savings potential *20 years into the future*. The study should include an adjustment factor to account for emerging and new technologies, if not include these measures explicitly. It is not possible to predict exactly which emerging/new technologies will be commercialized and become commonly available in the future or by when, but we know for sure that some new energy savings technologies will reach the marketplace and get incorporated into future utility DSM programs.

4. **Residential energy efficiency**
Regarding residential sector measures and their individual savings potentials (p. 79), the measures that appear to have very low savings potential as a percent of baseline sales for that end use include computers and monitors, what is termed standard lighting, clothes dryers, and TVs. For electronic products there are steady improvements in efficiency and strategies that have been demonstrated in the Northwest and California for EE programs to capture a significant fraction of this savings potential. For lighting, the big opportunity is LED lighting. In 2012, the U.S. DOE published a study that estimated a 67% potential reduction in residential electricity use for lighting by 2030 as a result of LED lamps, which are expected to steadily improve in performance and decline in price in the coming years.[6] This is a huge

---

[2] H.Geller et al. *The $20 Billion Bonanza: Best Practice Utility Energy Efficiency Programs and Their Benefits for the Southwest.* SWEEP. Oct. 2012. http://www.swenergy.org/programs/utilities/20BBonanza.htm

[3] Note that the SWEEP study included savings from CHP in the High Efficiency Scenario. Excluding CHP, the identified achievable savings potential is 18.2% over 11 years.

[4] *Update to the Colorado DSM Market Potential Assessment (Revised).* Report prepared by KEMA, Inc. for Xcel Energy. June 2, 2013.

[5] *Unlocking Energy Efficiency in the U.S. Economy*, McKinsey & Co. July 2009

[6] *Energy Savings Potential of Solid-State Lighting in General Illumination Applications*. Report prepared by Navigant Consulting, Inc. for the U.S. DOE, Jan. 2012.
http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_energy-savings-report_jan-2012.pdf

opportunity not appropriately captured in the Cadmus study. For clothes dryers, the big savings opportunity is heat pump clothes dryers which are now being sold in Europe and look they could be technically and economically viable in the U.S., offering around 40-50% energy savings potential with a 5-6 year simple payback period at a projected incremental cost of $300 and an average electricity price of $0.12/kWh.[7] While not a commonly available efficiency measure in the U.S. today, it is highly likely that they will be marketed in the U.S. in the coming years. In fact, efforts have begun to promote the introduction of advanced clothes dryers in the U.S. market (i.e, the so-called Super Efficient Dryer Initiative). This is one example of an emerging technology that should be included in a DSM potential study that looks 20 years into the future.

5. **Commercial energy efficiency**

Regarding commercial sector measures and their individual savings potentials (pp. 81-82), the measures that appear to have very low savings potential as a percent of baseline sales for that end use include computers, monitors and other plug loads; air ventilation, and lighting. For lighting, the big opportunity once again is LED lighting. The Navigant study for DOE cited above projects a 35% potential reduction in total commercial sector electricity use for lighting by 2030 as a result of LED lamps. For comparison, the Cadmus study projects only a 10% achievable savings potential for interior lighting in commercial buildings over 20 years, and a 26% savings potential for commercial exterior lighting. The other major electricity end use in the commercial sector with relatively low achievable savings potential in the Cadmus study is air ventilation and circulation, with only 10% achievable savings potential over 20 years. Much higher savings should be possible through a combination of right sizing equipment, more efficient equipment, and better control strategies including (but not limited to) use of variable speed drives and variable flow ventilation systems.[8] Regarding computers and monitors, the combined achievable savings potential in 2032 is 13% of baseline electricity use. More savings should be possible through a combination of more efficient equipment, greater enabling of power management features, and PC virtualization—all of which can be promoted through utility DSM programs.

6. **Class 3 DSM**

In the *Current Program and Product Offerings* section (p. 22 – 26) existing Class 3 DSM Resources are discussed. While Table 6 presents the estimate of existing Class 3 DSM, including inverted rate pricing, the Study doesn't evaluate the potential of alternative, more steeply inverted residential rate pricing scenarios as an energy efficiency resource over the next 20 years. Please explain why this resource wasn't included in the study.

7. **Class 4 DSM**

The DSM potential study ignores savings potential from behavior change-oriented programs such as Home Energy Reports and support for energy managers and Strategic Energy Management in the C&I sectors, both of which are energy savings strategies that RMP has

[7] D. Denkenberger, et al. *Analysis of Potential Energy Savings from Heat Pump Clothes Dryers in North America*. CLASP. March 2013. http://clasponline.org/~/media/Files/SLDocuments/2013/2013_Analysis-of-Potential-Energy-Savings-from-Heat-Pump-Clothes-Dryers-in-North-America.pdf

[8] See, for example, *ENERGY STAR Buildings Upgrade Manual*, Chapter 8, Air Distribution Systems. U.S. EPA. 2008. http://www.energystar.gov/ia/business/EPA_BUM_Full.pdf

started to include in its programs in Utah and that could be scaled up to deliver significant savings, incremental to the EE measure-based programs, in the medium and longer term. This is a major shortcoming of the Cadmus potential study that should be corrected in future DSM potential studies. In doing so, the study should account for expected improvements in information feedback technologies and strategies in the future including opportunities presented by smart grid infrastructure (i.e., it is reasonable to assume that there will be improved and more cost effective information feedback technologies over time).

8. Interaction between DSM Potential Study and Integrated Resource Plan

The DSM potential study states that its "*results will be incorporated into PacifiCorp's 2013 IRP and subsequent DSM planning and program design efforts"* (p. 1). The Company's 2013 Integrated Resource Plan identified 1,590 aMW of Class 2 DSM resources available over 20 years, or 79.5 aMW per year, on average, in the preferred case (EG2-C07). Given the notable variation of Class 2 DSM in the DSM study (19.2 aMW on average per year) and the IRP, we request that the Company explain more fully how the results of this potential study were incorporated into PacifiCorp's 2013 IRP and how the results will be used to inform the planning and design of future programs.

9. Recommendations

For the reasons pointed out above we interpret this study as reflecting a "business as usual" technical potential as opposed to a "full" technical potential. In order to present a more complete analysis of RMP's full technical potential, the Study should include an alternative scenario that considers the energy savings impacts of:

- The interactive effects of building efficiency measures (reduced heating load in a building due to high efficiency lighting and daylighting, and improved building thermal envelope);
- How higher rebate incentive amounts can motivate additional participation and realize greater potential;
- More vigorous marketing and promotion of DSM programs;
- An adjustment factor to account for new/emerging efficiency technologies;
- Comprehensive Class 4 DSM programs for all residential and commercial customers;
- Best practice utility regulation that could accelerate the amount and timing of Company investments in energy efficiency resources (for example, a decoupling scenario and a shareholder performance incentive scenario).

Further, prior to the next DSM potential study, UCE and SWEEP recommend soliciting input from stakeholders on how the potential study might be conducted such that it more accurately reflects the real technical potential of energy efficiency and DSM programs.