

PURPA Standard: Integrated Resource Planning

Columbia Water & Light position paper

2007 PURPA STANDARD

Section 532 PURPA 111 (d) Standards

(16) INTEGRATED RESOURCE PLANNING – Each electric utility shall –

(A) integrate energy efficiency resources into utility, State, and regional plans;
and

(B) adopt policies establishing cost-effective energy efficiency as a priority resource.

SUMMARY

At the end of 2008, Burns and McDonnell completed an Integrated Resource Plan for the City of Columbia. It included data on the benefit cost ratio of various demand side management programs. In many cases the cost of ‘buying’ energy efficiency from the customers was less expensive than producing or buying the energy in the future. The Integrated Resource Plan was accepted by the Power Supply Task Force on August 27, 2008 and the City Council approved the plan on September 8, 2009. The Columbia City Council implemented the first round of suggested demand side management measures in the summer of 2009. If the Columbia City Council approves additional funding for the remaining Demand Side Management measures, the utility could save approximately 33 megawatts over the next 20 years. Annually, this would save the electric utility \$7 million in today’s energy market.

INTEGRATED RESOURCE PLAN

Burns & McDonnell developed various supply and demand side options considered suitable for Columbia Water & Light to review as a means to meet the Columbia Water & Light forecast load obligations. The supply side options included:

- solar, wind and biomass options
- local and remote coal-fired options,
- local gas-fired combustion turbine and engine generator options, including combined heat and power
- pumped hydro storage option
- market purchases of capacity and energy

Carbon regulation in the integration phase was modeled based on the proposed Warner-Lieberman Bill. The regulation was assumed to begin in 2015 with an initial carbon credit cost of \$30 per ton.

The demand-side options included the following major categories of programs:

- HVAC modifications
- Lighting
- Appliances

- Thermal envelope

The demand side options were considered for the residential, commercial and industrial sectors. Residential properties were reviewed for single family homes, duplexes, apartments and mobile homes. Commercial buildings were reviewed by type, such as banks, restaurants, etc.

The current programs offered by Columbia Water & Light were also included. In 2008, these programs were being offered by the utility:

- Free energy audits
- Energy efficiency rebates
- Low interest loans for energy efficiency upgrades
- Home Performance with Energy Star
- New Home Energy Star Rebates
- Discounted heat pump electric rate
- Tree Power (free shade tree for electric customers)
- Load Management
- Online energy audits
- Compact fluorescent light bulb rebate
- Conservation Tips video series
- lighting rebates (commercial only)
- Infrared inspections (commercial only)
- Compressed air leak detection program (commercial only)
- Load Shedding program (commercial only)
- Building Operators Certification program (commercial only)

The assumptions for the options were taken from a variety of sources including Department of Energy databases, the Statewide Saturation Study, Burns & McDonnell's experience as an energy services provider and Columbia Water & Light. The options were analyzed in the resource optimization model alongside the optimum supply side case. This provided detailed consideration of the program impacts as compared to the benefits to reductions in supply side costs as determined using the load forecast with no additional DSM activities other than those currently pursued by Columbia Water & Light.

DEMAND SIDE MANAGEMENT SUGGESTIONS

Based on the conclusions discussed in the report, the analysis of Columbia Water & Light's system and Burns & McDonnell's knowledge of the electric utility industry, the following recommendations are offered to CWL for consideration. Burns & McDonnell recommends that CWL should:

1. Pursue the future outlined in the regulated carbon future with DSM. The cost for this future is not significantly different than a future without carbon legislation in the first several years.
2. Work with the City to improve building code standards for commercial and residential structures that have a minimum energy consumption goal of an

- Energy Star rating. Programs to encourage higher Energy Star ratings should be developed using information provided herein.
3. Implement the demand side management programs as outlined. Add staff as necessary at CWL to aggressively pursue these programs and work through the existing building stock over the next ten years. Increase the data gathering for end-use inventories, ages of appliances, use per consumer, and other information needed to refine the evaluation of DSM programs through energy audits on the majority of existing residential and commercial facilities. Increase the verification process for the programs to make sure they are on track to meet the projected demand and energy reductions.
 4. Continue its aggressive pursuit of demand side involvement by the deployment of time of use metering and pricing structure to customers. Industrial and commercial customers should be the first to be moved to time of use pricing followed by residential. This metering can also be used in the further deployment of a Smart Grid.
 5. Prepare in early 2010 to install two engine sets of approximately 8MW each for a commercial operating date of 2012 should the economics reviewed herein remain as studied.
 6. Determine if there is sufficient interest from other utilities in the state to develop the biomass repowering project at Columbia Water & Light's local power plant. Should the renewable referendum being considered by Missouri become law, this type of option could hold significant benefit for other Missouri utilities.
 7. Acquire additional wind energy (or equivalently priced other renewable energy) in the quantities and on the time line as shown in the regulated carbon future with DSM.
 8. Pursue the transmission projects with AECI necessary to improve the firm import capability.
 9. Update the integrated resource plan in 2012 to 2013. This should be sufficient time to determine the success of the demand side programs, have better clarity about the legislation regarding carbon and more knowledge about the advances in renewable energy technologies.

2009 ADDITIONS TO DEMAND SIDE MANAGEMENT PROGRAMS

As outlined in the Integrated Resource Plan, energy efficiency is one of the least cost future power supply options. However, the plan did not address the planning, implementation or validations of the suggested actions. Columbia Water & Light's Utility Services Division has done detailed analysis of the proposed program and has developed a draft Demand Side Management Implementation Plan. This plan has not been reviewed by the city's advisory boards and presented to the City Council at this time.

In the summer of 2009, the Columbia City Council approved additional funding for Demand Side Management programs. This is the first step of implementing additional efficiency programs. The additional funding in 2009 will be

incorporated into existing programs and help develop new ones. The funding will go towards:

- Data base for program evaluation, measurement and verification
- Advertising efficiency programs
- Home Performance with Energy Star rebates
- Comprehensive energy assessments of 5,000 homes
- Market saturation study
- Commercial and Industrial customer efficiency rebates

FUTURE ADDITIONS TO DEMAND SIDE MANGEMENT PROGRAMS

The draft Demand Side Management Implementation Plan outlines how the efficiency measures from the Integrated Resource Plan would be implemented. Most of the items can be integrated into the utility's existing energy efficiency programs. The Home Performance with Energy Star program, the Super Saver Loan program and the Energy Efficiency Rebate program parameters can be changed to include additional items that would make homes more efficient. The commercial sector efficiency programs will be developed in 2009 and 2010 when the new Commercial Services Supervisor analyzes the utility's benefit cost ratio to establish the incentives. Additional funding for the existing lighting rebate will be evaluated along with incentives for heating and cooling system retrofits and machine drives. Measurement and verification of the savings for the utility's energy efficiency savings will be handled by the new Rate Analyst.

ATTACHMENTS:

2008 Integrated Resource Plan
6-22-09 memo to the City Council on Electric Demand Side Management