

Natural Gas and Electricity Efficiency in Utah

Energy Efficiency...

- Is one of the cheapest, cleanest and most readily available energy resources.
- Provides a net economic benefit and improves Utah's competitiveness.
- Conserves natural resources and dramatically lessens impacts on the environment.



Utah, like the rest of the nation, has reached a critical energy crossroads. Natural gas prices are unstable and skyrocketing, leaving families, businesses, and industries struggling with rising energy costs.

Utah's electricity demand continues to grow at a rate of over two percent per year, with summer peak demand growing at five percent annually, placing increased pressure on utilities to invest in new plants and delivery infrastructure, which translates into higher energy prices for consumers. Environmental and social considerations add new challenges to energy decisions.

Energy efficiency is a viable resource that can help address these issues and should serve as a key element in Utah's energy future.

The Utah Energy Efficiency Working Group developed this white paper to provide background, describe barriers, and outline recommendations to facilitate and promote energy efficiency in Utah.

Table of Contents

Why Energy Efficiency – What are the benefits?	2
What is currently being done?	2
What is Utah's Energy Efficiency Potential?	3
What are the barriers to energy efficiency?	4
How can Utah capitalize on its energy efficiency potential?	5-6
Resources for Developing Policy	6
Utah Energy Efficiency Working Group	6

What is Energy Efficiency?

Energy efficient technologies and applications are readily available today and can be applied in all sectors of the economy, public and private, residential, commercial and industrial. Better lighting, efficient air-conditioning, efficient motor systems, improved manufacturing processes, and energy efficient building practices are just a sampling of the many cost-effective measures that can save Utahns energy and money.

- Energy efficiency is one of the cheapest, cleanest and most readily available energy resources.
- Energy efficiency provides a net economic benefit and improves Utah's competitiveness.
- Energy efficiency conserves natural resources and dramatically lessens impacts on the environment.
- Energy-efficient technologies often provide better service than the less efficient technologies they replace, thus increasing benefits and resulting in gains, not sacrifice.

Why Energy Efficiency – What are the benefits?

Investing in energy efficiency provides a better return, with lower risk, than many competing energy investments. Energy efficiency is a least-cost resource for both new electric generation and new natural gas supplies.^{1,2} Energy efficiency can be planned and built just as one would plan and build a conventional resource.

Simply stated, energy efficiency has the ability to lower utility bills, make Utah businesses more profitable and competitive, and provide more disposable income for Utah citizens. Energy efficiency provides a broad spectrum of benefits:

- Decreased demand creates a downward pressure on energy prices.³
- For a given investment, energy efficiency creates more jobs than investments in increasing energy supply.⁴
- Efficiency helps reduce the consumption of fossil fuels, thus saving resources for future generations and reducing the need to import energy from outside markets.
- Energy efficiency is the cleanest energy resource available. Efficiency will significantly reduce air and water pollution and is one of the cheapest ways to reduce green house gases and other pollutants.
- Energy efficiency reduces water consumption because generating energy from fossil fuels requires water.⁵

“Simply stated, energy efficiency has the ability to lower utility bills, make Utah businesses more profitable and competitive, and provide more disposable income for Utah citizens.”

What is currently being done?

Utah promotes energy efficiency through both public and private efforts. The US Department of Energy funds a series of educational and implementation programs through the Utah Geological Survey’s State Energy Program. Utah Power has a number of effective energy efficiency programs funded through a Demand Side Management (DSM) tariff rider.

¹ PacifiCorp 2004 Integrated Resource Plan

² The Maximum Achievable Cost Effective Potential Gas DSM for Questar Gas, Final Report Prepared for the Utah Natural Gas DSM Advisory Group, March 2004, GDS Associates, Marietta, GA.

³ *Impacts of Energy Efficiency and Renewable Energy on Natural Gas markets: Updated and Expanded Analysis*, American Council for an Energy Efficient Economy, April 2005, <http://www.aceee.org>

⁴ Elliott, Neal R. (2005) Testimony Submitted to House Government Reform Subcommittee on Energy and Resources. September 14, 2005. Retrieved October 19, 2005 from 2001 IMPLAN database for the United States, per MRG Associations. (2004)

⁵ *New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest*, The Southwest Energy Efficiency Project, November 2002, <http://www.swenergy.org/nml/index.html>.

What is Utah's Energy Efficiency Potential?

Four detailed studies evaluating Utah's energy efficiency potential have been conducted since 2001. Each study took a different approach, however all emphasized the economic potential in Utah and the Southwest and are based on existing proven technologies .

- The 2001 Tellus study shows that using readily available technologies, Utahns could potentially save over \$1 billion in electrical energy costs over a 24-year period.⁶
- A study by the Southwest Energy Efficiency Project estimates that high efficiency strategies using readily available technologies could cut Utah's projected electricity consumption by over 30 percent and save Utahns nearly \$4 billion over a 17 year period compared to a business-as-usual scenario.⁷ (See figure 1)

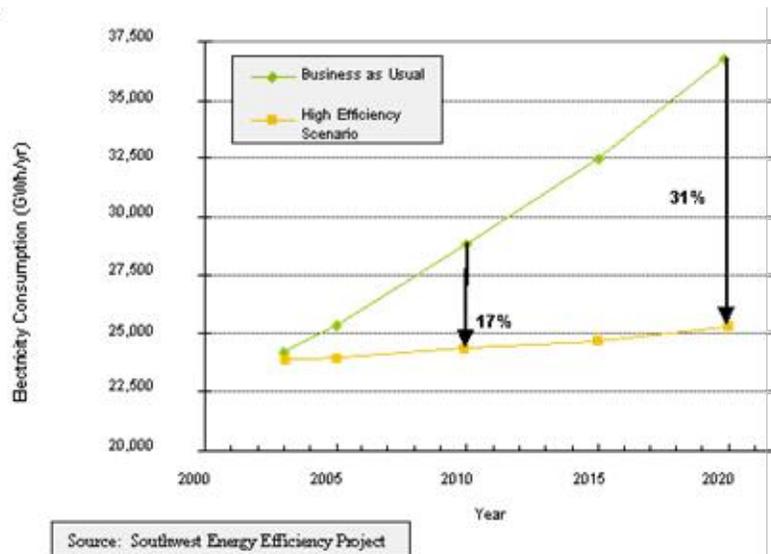


Figure 1. Utah Electricity Savings Potential - Business as Usual vs. High Efficiency Scenario

- A recent study by GDS Associates, Inc. on natural gas efficiency shows that capturing a maximum achievable cost effective potential for energy efficiency in Utah would reduce natural gas energy use by 20 percent by 2013. The net present savings to Questar's residential and commercial customers for service-area wide implementation of cost-effective gas DSM programs is over \$835 million in 2004 dollars.⁸
- The aforementioned GDS study also estimates that approximately 70 percent of low-income households need additional insulation and weatherization measures. In terms of total natural gas and electricity savings, the GDS study found that low-income efficiency programs in Utah have the potential to yield over \$41 million in savings in 2004 dollars.⁹
- State agencies and institutions are one of the state's largest energy users with an annual energy cost of nearly \$60 million. State buildings consist of more than 40 million square feet and more than 3 thousand buildings. The federal government has established a goal of 35% savings by year 2010,¹⁰ and Utah has the potential to capture similar savings.

⁶ *An Economic Analysis of Achievable New Demand-Side Management Opportunities in Utah*, Tellus Institute, 2001.

<http://www.tellus.org/energy/publications/Nichols1.PDF>.

⁷ *New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest*, The Southwest Energy Efficiency Project, November 2002, <http://www.swenergy.org/nml/index.html>.

⁸ The Maximum Achievable Cost Effective Potential Gas DSM for Questar Gas, Final Report Prepared for the Utah Natural Gas DSM Advisory Group, March 2004, GDS Associates, Marietta, GA.

⁹ *Ibid*, pg 53-62.

¹⁰ Savings based on year 1985 energy use in terms of Btus per square foot.

What are the barriers to energy efficiency?

A range of barriers and market failures inhibit widespread adoption of economically viable and desirable energy efficiency measures.

Insufficient utility incentives: Due to the current regulatory environment in Utah, there is a lack of clear financial incentive for regulated utilities to pursue utility energy efficiency programs. Unlike supply side resources, where utilities can earn a return on their investments, they are unable to earn a return on demand side resource acquisitions. Investments in energy efficiency almost never provide economic benefits to the utility given the existing regulatory rate structure.

Barriers vary across utility types:

- Small rural co-ops and municipalities lack infrastructure and resources to implement efficiency programs.
- Utah municipal power providers do not receive the same incentives as their counterparts receive in the Northwest. For example, the Bonneville Power Association provides incentives to implement energy efficiency in the Northwest; however, the Western Power Administration penalizes municipal utilities that don't implement required energy efficiency programs.
- Questar Gas – in partnership with the Utah Energy Office, utility regulators, local stakeholders and energy consultants – evaluated a variety of energy efficiency programs and found a number of cost-effective measures to reduce natural gas use across all sectors. However, natural gas utilities are reluctant to implement efficiency programs because these programs will reduce their revenues by lowering the demand for natural gas.

“Due to the current regulatory environment in Utah, there is a lack of clear financial incentive for regulated utilities to pursue utility energy efficiency programs.”

Split incentives: When the owner of a building or piece of equipment does not pay the energy costs they have no incentive to improve efficiency. This also occurs when an agency's operating and capital budgets are not linked.

Competition for capital: Energy efficiency measures must compete for limited capital.

Lack of awareness: Information on energy efficiency programs, opportunities and equipment is readily available; public awareness and understanding of energy efficiency is lacking.

Delivery limitations: There exists a lack of qualified professionals, service providers and contractors to identify and deliver efficiency projects and products into the market.

Incomplete cost-assessment: Energy costs do not reflect the full costs to society imposed by energy production and consumption. For example, public health, national security, and some environmental costs are not included in energy cost-assessment.

Resistance to change: In general, there exists the mentality of “we've always done it this way and it works just fine– why take a chance?” This approach inhibits the adoption of energy efficiency efforts.

Low rates: While prices tend to be on the rise, current customer rates in Utah are among the lowest in the nation. This produces a near-term cost/benefit hurdle to justification of many energy efficiency investments.

How can Utah capitalize on its energy efficiency potential?

Make Energy Efficiency a Priority for Utah

The Western Governor's Association has set a goal of 20% increase in energy efficiency by 2020.¹¹ By making efficiency a priority and developing effective policies, we can move toward overcoming many of the barriers and begin to reap the significant economic benefits of a more energy efficient economy. Energy efficiency should be a cornerstone of Utah's Energy Policy.

Advanced Energy Portfolio Standard

Advanced energy portfolio standards set goals or requirements for renewable energy, waste heat-to-energy, and energy efficiency. This type of standard can drive new energy technologies without the fiscal impact to taxpayers of incentive based standards. Such standards create a market and drive the most cost-effective and advanced energy resources.

Remove Regulatory Barriers

Our utility regulatory structure provides important services by protecting both the consumer and the utility and ensuring that we have high quality reliable service; however, utility regulation can inadvertently create barriers to increased deployment of energy efficiency. An effort to gain a better understanding of the barriers and means to overcome them will help speed deployment. This includes:

- Improve financial incentives for regulated utilities to promote DSM
- Improve transparency of utility avoided cost rates
- Improve the interconnection process and efficiency evaluations for combined heat and power facilities
- Make efficiency a driving criterion in supply-side selection
- Create a balanced regulatory approach that encourages demand side management as well as supply-side resources

Improve Building Code Requirements, Compliance, Training, and Enforcement

Efficiency requirements for residential and commercial building codes create widespread energy benefits and education opportunities. Ongoing training and education of architects, contractors and building inspectors, along with implementation of best practices and uniform building code enforcement, are necessary to maximize energy efficiency gains.

Natural Gas Utility Energy Efficiency Programs

Seven Western States have utility-funded natural gas energy efficiency programs.¹² To reap the multitude of benefits of reducing natural gas demand, Utah policy could encourage gas utilities to implement cost-effective energy efficiency programs for their customers. The policy should include a strategy to address the disincentives and economic barriers.

Electric Utility Energy Efficiency Programs

State policymakers should encourage all electric utilities to create or expand efficiency programs. To ensure success it will be necessary to address the regulatory barriers and financial disincentives. (continued on page 6)

¹¹ Western Governors' Association, Policy Resolution 04-14 Clean and Diversified Energy Initiative for the West, June 22, 2004, Santa Fe, New Mexico, <http://www.westgov.org/wga/policy/04/clean-energy.pdf>

¹² Responding to the Natural Gas Crisis: America's Best Natural Gas Efficiency Programs, Martin Kushler, Dan York, and Patti Witte, American Council for and Energy-Efficient Economy, Report No. U035, December 2003; <http://aceee.org>.

How can Utah capitalize on its energy efficiency potential? (continued from Page 5)

Energy Efficiency for State Buildings

Utah should continue to promote and implement energy efficiency savings through the State Buildings Energy Efficiency Program (SBEEP). The SBEEP Strategic Plan identifies a variety of cost-effective strategies for state buildings, including retrofits of existing buildings using performance contracting, providing workshops for building operators, continuous commissioning of existing buildings, and energy efficient design for new state buildings.

Encourage Combined Heat and Power (CHP or Co-generation)

Combined heat and power (CHP), also referred to as cogeneration, is an extremely efficient distributed energy source that utilizes waste heat from electrical generation for space heating, water heating, process steam for industrial steam loads, and other thermal energy needs. CHP is sometimes called “energy recycling” because the energy output is used twice—once for electrical energy and once for thermal energy. The end result is a significantly more efficient use of the fuel to generate electricity. The following will help drive the adoption of CHP:

- Adopt fair, equitable and consistent interconnection requirements based on model technical and procedural interconnection standards set forth by Federal Energy Regulatory Commission (FERC),¹³ the National Association of Regulatory Utility Commissioners (NARUC),¹⁴ and the Institute of Electrical and Electronics Engineers (IEEE).¹⁵ These standards are designed to create uniform interconnection standards and procedures while protecting the safety and reliability of our electricity grid.
- Consider output-based emission standards for smaller scale generation that reward more efficient use of resources and greater energy output, based on the model standard developed by Regulatory Assistance Project.
- Consider incentives to promote distributed resources.

Education and outreach

Education, outreach, and public-private partnerships are critical for the success of energy efficiency programs. Increased public awareness about the benefits, viability and availability of energy efficiency products and practices will help spur residential and commercial investments in energy efficiency.

Resources for Developing Policy

The following is a partial list of energy efficiency policy resources:

- National Conference of State Legislators www.ncsl.org
- American Council for an Energy Efficient Economy www.aceee.org
- Nevada Energy Efficiency Study, Southwest Energy Efficiency Project www.swenergy.org
- Alliance to Save Energy www.ase.org
- Western Governor’s Association www.westgov.org

Utah Energy Efficiency Working Group

The Utah Energy Efficiency Working Group is a joint project of the Utah Geological Survey State Energy Program and Utah Clean Energy.

This paper is the result of a collaborative effort among working group members.

To subscribe to the Utah Energy Efficiency Working Group email list, visit:
geology.utah.gov/sep/index.htm or
utahcleanenergy.org.

¹³ Federal Energy Regulatory Commission, Interconnection Guidelines <http://www.ferc.gov/industries/electric/indus-act/gi.asp>.

¹⁴ *Model Interconnection Procedures and Agreement for Small Distributed Generation Sources*, October 2003, The National Association of Regulatory Utility Commissioners, http://www.naruc.org/associations/1773/files/dgiaip_oct03.pdf.

¹⁵ IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems, www.ieee.org.