

Executive Summary

Building the Clean Energy Economy: Jobs and Economic Development in Utah

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MRG & Associates



Wikstrom Economic &
Planning Consultants, Inc.

This study is conducted at the request of Governor Huntsman's Energy Advisor, Dr. Dianne Nielson, to analyze the net economic impacts to the State of Utah if it were to achieve a 20 percent increase in energy efficiency by 2015 and 20 percent of electricity sales from renewable resources by 2020 ("20% Clean Energy Scenario"—described in further detail below).ⁱⁱⁱ According to this macroeconomic analysis, new investments in energy efficiency and renewable energy in the state of Utah will result in:

- 7,000 net new jobs;
- \$310 million in net new earnings; and
- A net increase of \$300 million in gross domestic product by state (GDPS).

The benefits estimated in this analysis are likely conservative because it assumes that the production and use of renewable energy and increased energy efficiency addresses only the demand within the state's borders and does not model the economic benefits if Utah becomes a leader and exporter of products, goods and services related to clean energy industries, a situation that is likely to occur given the amount of renewable resources and entrepreneurial initiative in the state.

Study Briefing

Energy efficiency and renewable energy are the new frontiers of the clean energy economy; with Utah's pioneering spirit, our State embodies the resourcefulness and innovation needed to thrive and prosper in this new frontier. These emerging market opportunities are increasingly important as we seek means of stimulating economic growth, diversification and job creation.

Renewable energy and energy efficiency are critical components of Utah's energy portfolio, and the State has adopted two goals to expand the use of these resources significantly over the next several years:

- In 2006 Governor Jon Huntsman, Jr., called for a 20 percent increase in energy efficiency across all sectors by 2015;ⁱ
- In 2008 the *Energy Resource and Carbon Emission Reduction Initiative* was signed into law and established a target for Utah to derive 20 percent of its electricity sales from renewable resources by 2025.ⁱⁱ

This study does not include an analysis of the impact to utility rates. This could be addressed in future economic analyses.

This study evaluates the impacts to all state industries. Any job losses or shifts in economic activity from traditional resource sectors (coal, natural gas, and petroleum) that result from increased renewable energy and/or energy efficiency are accounted for in the net numbers for jobs and economic development.

The 20% Clean Energy Scenario modeled in this study meets projected energy demand growth through 2020 with new energy efficiency and renewable energy re-

Renewable Energy ("RE")

Energy that is derived from natural resources that are continually replenished (renewable).

Energy Efficiency ("EE")

Accomplishment of more work with a given quantity of energy, manifested in almost countless variations at nearly all scales of application. Energy efficiency itself is a resource that can be developed and enhanced like natural resources to increase our energy capacity.

Authors: Kelly Knutsen (Utah Clean Energy), Karen Wikstrom (Wikstrom Economic and Planning Consultants, Inc.), Marshall Goldberg (MRG & Associates) and Sarah Wright (Utah Clean Energy)

Year 2020 Jobs and Economic Development Summary: Reference Scenario Compared to 20% Clean Energy Scenario

	Jobs		Earnings (\$MM)		GDPS (\$MM)	
	Net Total over GOPB Baseline	Net over Reference Scenario	Net Total	Net over Reference Scenario	Net Total	Net over Reference Scenario
Reference Scenario	2,800	N/A	\$160	N/A	\$280	N/A
20% Clean Energy Scenario	6,910	4,110	\$310	\$150	\$300	\$20

Note: All dollar amounts are 2008\$. Assumes no change in demand for coal mining and natural gas drilling for 20% Clean Energy Scenario.

sources. This scenario assumes existing electricity resources currently serving Utah's customers will still be on-line in the year 2020 (see 20% Clean Energy Scenario bar graph).

The New Frontier:

Energy Efficiency and Renewable Energy

Utah's energy efficiency and renewable energy resource potential is well-beyond what is needed to achieve the state-adopted goals.^{iv, v, vi}

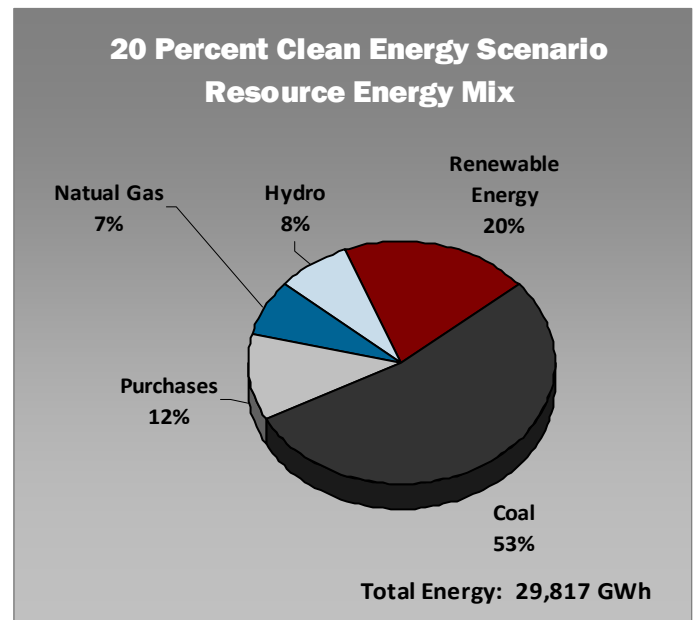
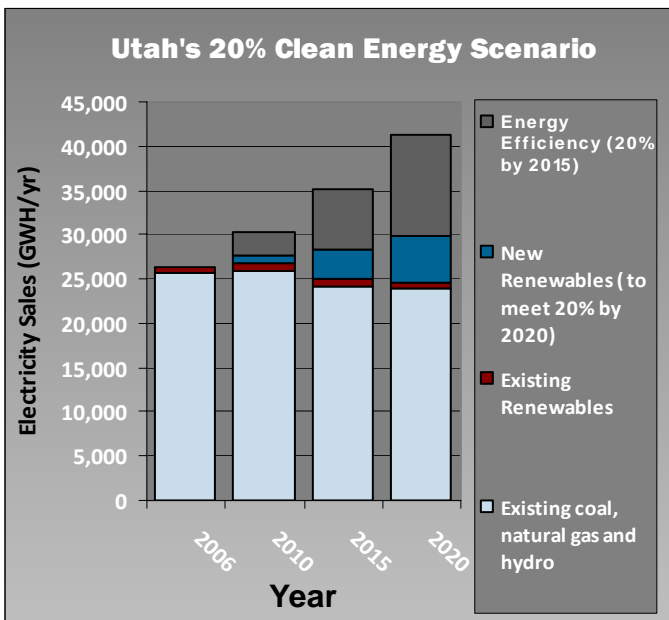
Energy efficiency is a pervasive resource that can be "mined and developed" in every new and existing building, home, industrial operation, fleet, and government facility. Every new construction project or retrofit has the potential to increase efficiency over standard practices, which helps Utah citizens and businesses save energy and money today and into the future. These savings are reinvested into the economy and lead to more job creation and economic development.

Renewable energy resources complement and help diversify Utah's existing electricity resources while creating new opportunities for jobs and economic development, especially in Utah's rural communities. The renewables modeled in this study are predominantly wind and geothermal, with some solar and biomass resources.

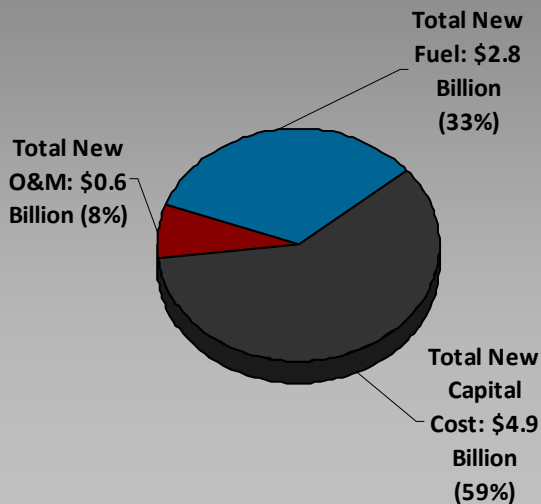
Scenarios Modeled and Evaluated

This study models two distinct energy portfolio scenarios in the year 2020:^{vii}

- Reference Scenario:** This scenario reflects the expected economic impact of current practices, policies and activities, based closely on PacifiCorp's 2007 new electricity resource planning documents^{viii} and treats the entire state of Utah as if it followed PacifiCorp's electricity plan through the year 2020.^{ix} This scenario develops new natural gas plants, 9 percent renewable energy by 2020 (mostly out of state wind) and a modest amount of energy efficiency through utility Demand Side Management Programs (DSM). This scenario also assumes a continuation of Questar Gas' energy efficiency programs at 2007 funding levels.
- 20% Clean Energy Scenario:** This scenario represents increased renewable energy and energy efficiency measures above the Reference Scenario, wherein renewable energy represents 20 percent of all electricity sales in 2020 and energy efficiency is increased by 20 percent by 2015 and the growth rate in electricity to achieve that goal is held constant to 2020. Only a portion of the energy efficiency measures in this scenario come from utility DSM Programs; the additional en-



Reference Scenario: Approximate Investment Costs for New Resources (Utah's Share, 2007-2020)



ergy efficiency improvements come from other measures, such as building efficiency upgrades and lamp and appliance standards. Electricity savings are approximately three times higher than the Reference Scenario, and the natural gas savings are approximately six times higher.

The job creation from both of the above scenarios are compared to a Baseline Scenario (herein referred to as **GOBP Baseline**), which is the anticipated employment by sector in 2020 as projected by the Governor’s Office of Planning and Budget (GOBP). The GOBP Baseline reflects anticipated changes in the structure of Utah’s economy over time.

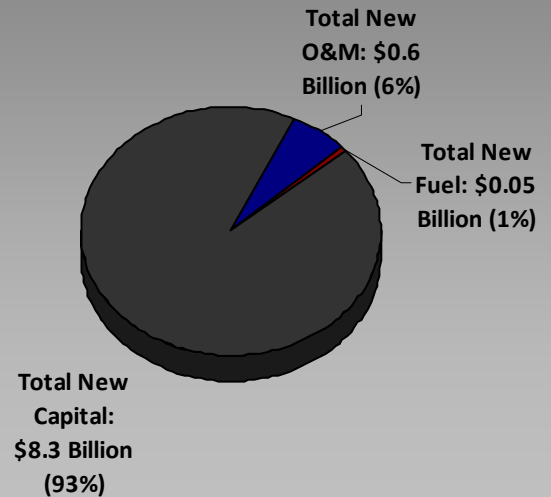
Utah’s Economy in 2020

The input-output model used in this analysis is the IMPLAN (Impact analysis for PLANning) Model which captures economic activities as a ratio of the total change in economic activity in the region relative to the direct change in one or more sectors.

The results presented in this study are the single year (2020) impact from full implementation of the scenarios modeled, not the cumulative total of all impacts realized over the fourteen-year period 2007-2020.

This look at 2020 captures the construction-related impacts associated with developing projects in and around the year 2020, the ongoing operation and maintenance

20% Clean Energy Scenario: Approximate Investment Costs for New Resources (Utah's Share, 2007-2020)



impacts of projects installed from 2007-2020, and the energy savings impacts of previously installed energy efficiency measures from 2007-2020.

Renewable Energy and Energy Efficiency Create Jobs and Stimulate New Economic Development

As the table shows, the 20% Clean Energy Scenario provides a net increase in jobs, earnings, and GDPS over the Reference Scenario, stimulating new economic development for Utah.

Jobs

The 20% Clean Energy Scenario is estimated to create nearly 7,000 new jobs in 2020, above the GOBP Baseline Scenario, led by the construction and service industries. The net increase above the Reference Scenario is over 4,000 jobs.

“Energy is a critical component in sustaining Utah’s vibrant economic growth and preserving our unparalleled quality of life. With just the right blend of ambition, brain power and diverse natural resources, Utah stands ready to lead the charge in energy efficiency, renewable and alternative energy development and new and innovative technologies.”

-Governor Jon M. Huntsman, Jr.

Earnings

The 20% Clean Energy Scenario provides earnings of \$310 million in 2020, while the Reference Scenario provides earnings of \$160 million, yielding a net increase of \$140 million. The 20% Clean Energy Scenario creates a variety of high-paying, quality jobs across all sectors.

Gross Domestic Product by State (GDPS)

In the 20% Clean Energy Scenario, Utah's GDPS is estimated to increase by about \$300 million in 2020. This compares with the Utah Ski industry contribution to 2008 GDPS of approximately \$440 million, suggesting that the renewable energy and energy efficiency sectors can play a substantial role in Utah's economy in the near future.

In the Reference Scenario, GDPS is expected to increase by \$280 million in 2020, with two thirds of the growth anticipated to occur in the oil and gas mining industries.

Investments

The 20% Clean Energy Scenario will require an estimated investment of \$8.9 billion over the 14-year period (2007 – 2020), or \$500 million more than the Reference Scenario. The 20% Clean Energy Scenario invests approximately 93 percent in up-front capital investments, as opposed to ongoing fuel costs. The Reference Scenario will require an estimated investment of \$8.4 billion over the 14-year period, with 33 percent invested in fuel costs.

Both scenarios invest approximately 6-8 percent of total costs on operations and maintenance.

Future economic analyses could evaluate the different costs and risks associated with different investment strategies (i.e. more up-front capital with no ongoing fuel cost resources versus lower up-front capital and ongoing fuel costs).

For more information please contact

Utah Clean Energy
info@utahcleanenergy.org
or
www.utahcleanenergy.org

Conclusions

For a similar level of investment, the 20% Clean Energy Scenario results in more than 4,000 net new jobs, net increased earnings of \$150 million and a net increase in GDPS of \$20 million. Furthermore, the 20% Clean Energy Scenario provides a hedge against volatile fuel costs and future risks and uncertainties in a rapidly changing energy market.

This study presents a modest share of Utah's potential for new clean energy development, suggesting that the 20% Clean Energy Scenario is an excellent first step in meeting Utah's growing energy demand while mitigating risks to Utah businesses and citizens.

A pioneering spirit, leadership and aggressive programs and policies to advance energy efficiency and renewable energy will help make Utah a leader in the New Clean Energy Economy, while generating new high-quality jobs and new economic development in Utah's rural and urban areas.

Notes:

ⁱ Governor Huntsman's Utah Policy to Advance Energy Efficiency in the State. URL: www.energy.utah.gov/energy/governors_priorities/utah_policy_to_advance_energy_efficiency_in_the_state.html

ⁱⁱ Reference Utah Code 54-17-602; The target was established for Utah's municipal, investor-owned, and cooperative utilities to provide 20 percent of their adjusted retail sales from qualifying non-carbon based energy resources by 2025, if cost-effective.

ⁱⁱⁱ It is recognized that the renewable goal is 20 percent renewable energy by the year 2025. However, the year 2020 was selected as the model year for this study to coincide with energy efficiency data from the Utah Energy Efficiency Strategy Report which goes out to 2020. Furthermore, the Utah electricity projected sales growth and capacity requirement data from PacifiCorp's 2007 IRP process goes out to the year 2017 and therefore only required extrapolating three years to 2020, rather than eight years to 2025.

^{iv} Rich Brown, Sam Borgeson, Jon Koomey, Peter Biermayer, "U.S. Building-Sector Energy Efficiency Potential," September, 2008, <http://enduse.lbl.gov/info/LBNL-1096E.pdf>

^v Jason Berry, David Hurlbut, Richard Simon, Joseph Moore, Robert Blackett, "Utah Renewable Energy Zones Task Force Phase I Report: Renewable Energy Zone Resource Identification," December 2008.

^{vi} Energy Strategies assisted with the initial development and review of the inputs and scenarios analyzed in this study. All of these inputs were peer-reviewed by numerous Utah and national energy stakeholders whose feedback was greatly appreciated.

^{vii} 2007 PacifiCorp Integrated Resource Plan, <http://www.pacificorp.com/File/File74765.pdf>, <http://www.pacificorp.com/File/File74766.pdf> and 2007

^{viii} PacifiCorp Integrated Resource Plan Update, <http://www.pacificorp.com/File/File82304.pdf>

^{ix} PacifiCorp serves roughly 80 percent of the state. The remainder is serviced by other public and private utilities such as Murray City Power and Garkane Power.