

Utah's Energy Issues and Implications for Public Policy

By Caroline Gleich

While the rest of the world progresses toward renewable energy production, Utah continues to be heavily dependent on nonrenewable fossil fuel resources. Here, I examine Utah's current energy situation as the basis for critiquing the Governor's recently published 10-year energy plan. Current energy supplies derive mainly from coal, natural gas, and imported oil while renewable resources, such as solar, wind, and biomass, constitute only a small fraction of available energy. The environmental impact of present energy policies will lead to increased carbon dioxide production, more water contamination, exacerbated dangers for miners, and worsening air quality. After this analysis and critique, I make a series of public policy recommendations to diversify Utah's energy portfolio and bring it up-to-date with national and international efforts to increase the sustainability of our energy practices.

Brandon Phillips, age 24, had been working in Crandall Canyon Mine for less than two weeks when a heavy jolt seized through the mountain on the evening of August 6, 2007 (Frosch & Lee, 2007; Templeton, 2008). Phillips was about three miles from the surface when the walls imploded, trapping him and five others deep underground (Gorrell, 2009). He had a 5-year-old son at home and had taken the job to try to turn his life around. In the coal mining business, most workers are used to experiencing "mountain bumps" from walls settling, but this one was catastrophic. A University of Utah Seismograph Station's report measured the collapse at a magnitude 3.9 (Caldwell, 2007; Gorrell, 2009). These "bumps" become more frequent at mines, such as Crandall, that have been dug past depths of 1,500 feet, a point that some experts believe exceeds weight-bearing limits (Frosch & Lee, 2007). Ten days after the initial collapse, rescuers were still searching for signs of life when another "bump" killed three rescue workers, one of whom was searching for his cousin (Caldwell, 2007). Overall, six miners were seriously injured and nine lost their lives.

Does it stretch the imagination to connect this story with Utah's energy policy? Most of us do not think twice when flicking on a light switch or turning on the water to warm up a hot shower. These linkages are often intentionally veiled from consumers, who, we are told, are most concerned with keeping energy costs low. If we continue with our current energy strategy in the state of Utah, where coal provides about 90% of all electricity (Newell, Taylor & Farnsworth,

2008), we will endanger many more miners' lives by having to dig deeper and deeper to compensate for our ever-growing demand for electricity.

Given the absence of a formal energy policy for the state, Governor Gary Herbert recently announced a 10-year strategic energy plan for Utah (Herbert, 2011), developed by a series of subcommittees, private and public individuals, and discussions from four public hearings held throughout the state. In order to predict Utah's energy future, one must understand the state's current energy portfolio, usage and available resources, and the environmental issues related to each resource. From there, I will critique Governor Herbert's energy plan and consider a number of policy recommendations that contribute to planning for the state's future energy usage, including a discussion of the transition to renewable energy sources.

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UTAH'S CURRENT ENERGY PORTFOLIO

Utah has one of the nation's highest growth rates¹ and with that comes an ever-increasing demand for energy. In 10 years, from 1996-2006, Utah's population increased by half a million people and is continuing to grow at a substantial rate (Berry, 2007). In 2008, Utah's total energy consumption was 827 Trillion British Thermal Units (BTUs).² Total produc-

¹Utah's annual population growth rate is 2.1%, making it the fourth fastest growing state in the nation. Electricity consumption is increasing faster than the growth rate, up 3.3% per year, which is 50% higher than the national average (U.S. Department of Energy, 2010).

tion was 1,167 trillion BTUs, making Utah a net-energy exporting state (Berg, 2009). Some of this excess is from a 1,640 megawatt coal plant, the Intermountain Power Project which goes to southern California (Berry, Hurlbut, Simon, Moore & Blackett, 2009).

Although Utah has diverse and abundant energy resources, traditional fossil fuels (coal, petroleum, and natural gas) account for all but 2.0% (hydroelectric, geothermal, biomass) of Utah's energy consumption. The energy issue that concerns most Utah residents is the price they pay at the pumps. Transportation, mostly involving people driving in their cars, accounts for about one-third of the state's energy consumption. Each day, Utahns guzzle over 3 million gallons of motor fuel. Three out of four employed Utahns drive to work alone (Newell, 2008).

Utah is the nation's thirteenth oil-producing state (Berg, 2009) and hosts one of the nation's largest oil fields (Newell, 2008). The state is home to five oil refineries which process crude oil from Utah, Colorado, Wyoming, and Canada via the Frontier Pipelines. After refining, Utah exports oil to Idaho, Oregon and Washington. This unique system of commerce is a way to keep production one step ahead of consumption. Without it, Utah would deplete its reserves in only six years given current consumption levels, illustrating the state's underlying dependency on imports (Newell, 2008). According to the U.S. Energy Information Administration (1998), the United States imports over half of all the crude oil and petroleum products consumed. The demand for oil is expected to rise, statewide, nationally, and worldwide.

There are many downsides to our dependence on petroleum. Oil exploration, drilling and refining disrupts sensitive ecosystems and visually interrupts the scenic landscapes that make Utah a world-class tourist destination. But perhaps the biggest problem with Utah's dependence on gasoline is air pollution, especially in the urban, mountain valleys where the vast majority of the state's population resides. Vehicle exhaust is responsible for over half of the air pollution in Utah's urban areas. The haze is visually disturbing, often obscuring mountain views but, more importantly, it puts many people's, especially children and the elderly, health at risk (State of Utah, 2009).

UTAH'S FUTURE: FOSSIL FUELS?

One area where Utah is energy independent is in the production and consumption of coal. It supplies almost half (41.8%) of the energy consumed in the state (Berg, 2009) and has always been a backbone of Utah's economy. According to the Utah Geological Survey (2010), the state's relationship with coal mining dates back to the 1850s. Production over the next century waxed and waned until oil prices began to rise in the 1970s prompting the state to intensify coal production. In 1982, the peak revenue year, over \$1 billion dollars was made

in Utah (inflation adjusted to current time). In 1996, the peak production year, Utah produced 27 million short tons.³ Utah's coal ensures inexpensive electricity for residents and businesses. Nationwide, the state has some of the lowest utility costs (Economic Development Corporation of Utah, 2010). Surplus to Utah coal is sold to other Western states such as California and Nevada and is even shipped to Tennessee, Wisconsin, and Missouri where it is regarded highly and sought-after for its low-sulfur and low-ash content. According to the U.S. Energy Information Administration (2010), in 2008, Utah was estimated to have a recoverable supply of 212 million short tons of coal. One caveat in this analysis, however, is that the remaining coal supply tends to be more difficult and dangerous to mine and of lower quality (U.S. Department of the Interior, 2008). The Utah Foundation (2008) estimates Utah's coal will last a maximum of 40-45 years while the Governor's Energy Plan puts the reserves of coal at only 10 years, given current production rates. Despite this, one of the Governor's main goals is to "ensure Utah's continued economic development through access to our own clean and low-cost energy resources," which he identifies as coal (Herbert, 2011).

The future of coal in Utah is difficult to forecast due to impending federal legislation as well as environmental and political pressures statewide. If legislation is enacted to regulate carbon dioxide, future coal production in Utah will be low because coal burning contributes heavily to carbon dioxide and other greenhouse gases. However, if researchers are able to develop technologies to capture carbon successfully and power plants can be modified to utilize the technologies, the demand for Utah coal will continue to rise (Economic Development Corporation of Utah, 2010).

Although Utah's mining industry is proactive in mitigating the physical landscape disturbances, their activities negatively affect water quality and ecosystems. Burning coal releases a toxic mix of sulfur dioxide, nitrogen oxides, particulates, carbon dioxide, and mercury into the air. These emissions cause a variety of problems including respiratory illness and neurological damage in humans and acid rain and greenhouse gases in the environment (U.S. Energy Information Administration, 1998). Carbon sequestration, coal gasification, coal washing, and advanced combustion systems are examples of some new technologies currently being researched or employed by coal-fired power plants to lessen their negative environmental impacts.

Another area where Utah is energy independent is in natural gas production. It is home to some of the nation's largest natural gas fields and is a top 10 state in terms of production and proven reserves (Utah Geological Survey, 2010). Natural gas heats most (85%) of Utah resident's homes and provides hot water at the second lowest prices nationwide (Newell, 2008; Utah Geological Survey, 2010). From 1980-2006, production of natural gas tripled. After accounting for

²A British Thermal Unit is the approximate energy that is needed to raise the temperature of a pound of water 1° F.

³A short ton is a unit of weight equal to 2,000 pounds.

in-state use, Utah is able to export half of its produced natural gas to Wyoming, Colorado, and Southern California (Newell, 2008). The industry is becoming a key sector to Utah's economy, valued at over 2.6 billion dollars in 2008 and is likely to continue growing due to increasing demand (Utah Geological Survey, 2010).

Proponents of natural gas frequently mention its ease of extraction compared to other resources, its low cost, and how cleanly it burns. However, new information is coming to light about the environmental consequences of natural gas drilling. Gas companies use a technique called "hydraulic fracturing," (also called hydrofracking or fracking), where large amounts of water, sand, and chemicals are injected at high pressure deep into shale rock formations. In 2005, under the Bush Administration, Congress amended the Safe Water Drinking Act to exclude hydrofracking from EPA regulation (Zeller, 2011). This exemption is now dubbed the "Halliburton Loophole," since Halliburton is one of the major players in the fracking business (Soraghan, 2011). In four years from 2005-2009, 32.2 million gallons of diesel fluid, or fluids containing diesel fuel were deployed into the earth by natural gas companies, containing known carcinogens such as toluene, xylene, and benzene (Zeller, 2011). Environmentalists worry that fracking wastewater will contaminate drinking water. Investigations are confirming their worries: *The New York Times* reports, "At least 12 sewage treatment plants in three states accepted gas industry wastewater and discharged waste that was only partly treated into rivers, lakes and streams." It's also entering the environment through sloppy handling and spills (Urbina, 2011).

This information could have a huge impact on the future of the natural gas industry in Utah and nationwide. Preliminary reports are spurring action. Congress is looking at the FRAC Act, which would end fracking fluid's exemption to the Safe Drinking Water Act. Wyoming will be the first state to require drillers to tell consumers what chemicals make up their fracking fluids (Water Contamination Center, 2010). If these claims of water contamination are true and fracking fluid becomes subject to new regulation, it could rapidly change Utah's energy portfolio and usage.

UTAH'S RENEWABLE ENERGY SOURCES

Utah's energy portfolio is heavily dominated by fossil fuels. In 2008, less than 2% of Utah's energy production was from renewable sources, despite plentiful resources (Berg, 2009). In 2009, Utah's renewable electric generation came from conventional hydroelectric, wind, geothermal, and biomass, with a very small contribution from residential and commercial solar panels (U.S. Energy Information Administration, 2009). Utah continually ranks near the bottom nationally for renewable energy production and consumption, but does stand out for being one of several states generating geothermal resources (Berg, 2009).

Most of Utah's hydroelectric generation comes from the Flaming Gorge plant, operated by the U.S. Bureau of

Reclamation. There are dozens of small hydropower facilities operating throughout the state but they contribute fluctuating amounts of energy based on precipitation levels (Berry, 2007). Although hydroelectric power is not without large environmental impacts, it is a flexible means of renewable power generation because reservoirs can release more water through powerhouses during peak demand hours (PacifiCorp, 2010). The downsides of hydroelectric power are the effects of dams on local ecology including the disruption of fish migration and physical changes in water flow. Reservoirs also contribute to greenhouse gases by emitting unknown amounts carbon dioxide and methane (U.S. Energy Information Administration, 1998).

In 2006, hydroelectric energy accounted for 78% of Utah's renewable energy production. Geothermal contributed the other 22%, accounting for 0.5% of Utah's total energy production (Berry et al., 2009). Given its resources, geothermal is underproducing in Utah's energy portfolio, as it is flat with the U.S. average (in 2008, 0.4% of total U.S. electricity generation came from geothermal power) (U.S. Energy Information Administration, 1998). The main geothermal plant, contributing 37 megawatts, is owned by Rocky Mountain Power and is located outside of Milford, Utah. There is a smaller geothermal plant operated by Rasor Technologies that generates 10 megawatts of power for out-of-state users (Berry et al., 2009). Utah has a wealth of geothermal resources located in the middle and northwest areas of the state (Renewable Energy Atlas of the West, 2002). Utilizing this resource could contribute to residential heating and cooling, thereby negating some of the negative effects of natural gas drilling. The U.S. Environmental Protection Agency touts geothermal as one of the most energy efficient, clean, and cost effective systems for controlling temperature. A geothermal power plant releases 99% fewer carbon emissions than a fossil fuel plant and scrubs clean the hydrogen sulfide found in the hot water. The biggest environmental concern is that many hot spots are in nationally protected wilderness areas, such as Yellowstone National Park (U.S. Energy Information Administration, 1998).

Nationally, wind energy contributed 1.3% to the country's electricity generation portfolio in 2008 (U.S. Energy Information Administration, 1998). Utah has a small amount of wind energy development, producing 19 megawatts, near Spanish Fork, Utah (Berry, 2008). Energy from the nine, 2.1-megawatt turbines is purchased by PacifiCorp to bring a renewable energy option to its 1.7 million customers (PacifiCorp, 2010). In 2008, another wind project scheduled to produce 185 megawatts began construction in Beaver and Millard County but power generated will go out-of-state (Berry et al., 2009). Wind is a clean and renewable source of energy. However, the rotating blades can kill wildlife, especially birds. They produce low-level of noise pollution, and, to some, they are visually displeasing (U.S. Department of the Interior, 2008).

Wind power in Utah has a bright future and construction of wind farms will likely continue. The state has over 365,000 acres of windy land with a potential capacity greater than 9,145 megawatts (Renewable Energy Atlas of the West, 2002; Berry et al., 2009). Federal programs and funding, available through 2013, will also fuel wind development (Gorrell, 2010).

Another energy area in which Utah has tremendously underutilized production potential is with solar resources. Currently, Utah has one utility-owned solar installation in St. George, but its 100 kilowatt capacity is too small to add to the overall portfolio. In 2007, 0.3% of Utah's renewable energy consumption came from commercial and residential-scale solar generation. However, that number is on the rise due to personal and corporate tax credits that are applicable to solar energy installations (Berg, 2009; Renewable Energy Atlas of the West, 2002).

Preliminary research into Utah's solar production shows tremendous potential. According to the Utah Renewable Energy Zones Task Force Phase I Report (2009), "Its technical potential for large-scale solar power exceeds its total electricity consumption by orders of magnitude. All told, Utah's theoretical potential equates to about 826 gigawatts of utility-scale solar generating capacity." Solar also has potential in remote areas of Utah. Currently, a solar installation in the Glen Canyon National Recreation Area saves over 65,000 gallons of diesel fuel per day (Renewable Energy Atlas of the West, 2002). Solar is a clean, renewable energy resource. However, manufacturing photovoltaic solar cells requires the use of toxic materials, and large solar power plants can harm wildlife (U.S. Energy Information Administration, 1998). Moreover, solar panels have a limited lifespan, and their wattage output decreases over time.

Solar and wind are attractive resources but they are inconsistent. Currently, researchers are trying to figure out what to do on breezeless or cloudy days. Other issues that need to be addressed are how to maximize efficiency and how to store and transmit energy. Transmission lines are expensive to build but will be necessary in any large scale renewable energy development. As market forces create further demand for renewable energy, new research, technology, and funding will continue to address these issues.

Currently, Utah generates 3.6% of its renewable energy and 0.5% of its overall energy from biomass (Berg, 2009). This pales in comparison to the national average where biomass fuels provide about 4% of all energy used (U.S. Energy Information Administration, 1998). Biomass is a broad term used to describe organic plant and animal materials that can be used as fuel (Utah Clean Energy, 2009). In historical context, a century and a half ago, biomass, in the form of wood, provided 90% all of our energy (U.S. Energy Information Administration, 1998).

In Utah, the Hill Air Force Base has developed a power plant that uses methane gas from the Davis County landfill. It decreases emissions and odors, provides one megawatt of power, and saves approximately \$600,000 per year on energy

costs at the base (Gluck, 2004). Biomass is a relatively untapped energy goldmine for the state of Utah. The state has the potential to generate over a million megawatts per year from landfill gas alone (Renewable Energy Atlas of the West, 2002). Biomass has a number of applications that could be used in the transition from fossil fuels to renewable energy sources such as burning bioenergy feedstocks to produce steam, mixing biomass with fossil fuels in conventional power plants, gasification, and biofuels, such as ethanol, methanol, and vegetable oil. Burning biomass emits less sulfur dioxide compared to coal and lowers nitrogen oxide and carbon dioxide emissions when mixed with coal (Utah Clean Energy, 2009).

The main negative environmental impact from biomass is the release of carbon and other greenhouse gases when burned. However, growing crops for biomass helps to capture carbon. Furthermore, fireplaces and stoves can be retrofitted to capture particulates and greatly reduce air pollution. Utilizing biomass for energy has several positive environmental effects. For example, capturing methane from landfills greatly reduces greenhouse gases. Ethanol and other biofuels reduce emissions from vehicles, and they are nontoxic and biodegradable in the case of a spill. Biodiesel contains no sulfur (U.S. Energy Information Administration, 1998). Another benefit for the arid state of Utah is the fact that utilizing biomass reduces the risk of wildfires by cleaning up dry brush (Utah Clean Energy, 2009). Because biomass is such a generalized area of renewable energy production, it is difficult to assess Utah's production capacity although a preliminary report from the Western Governor's Association shows that it could produce 15,000 megawatts of electricity for Western states by 2015 (Utah Clean Energy, 2009).

Before proceeding to discuss policy guidance related to Utah's energy portfolio, it is worthwhile to discuss alternative and nuclear energy production. Utah's geology holds rich oil shale (an estimated 77 billion barrels in north-central Utah) and tar sands (14-15 billion barrels) reserves (Berg, 2009). Exploration and extraction efforts of these non-traditional resources are in their infancy. One especially problematic concern for the state of Utah is the water availability to process these petroleum resources into usable fuels. Currently, only one company has a lease from the U.S. Bureau of Land Management to pursue oil shale development, and two companies are researching tar sands development (Berg, 2009).

Surprisingly, nuclear energy does not play a part in Utah's energy production or consumption. The state does, however, have a long history of producing uranium, necessary in the production of nuclear energy. After a 16-year hiatus from processing uranium ore, several Utah mines have reopened in 2007 because of the increased demand and price (Berg, 2009). Comparatively, nuclear power was responsible for 19% of the nation's total electricity generation in 2007. With the state's increasing energy demands, developers have been looking at building a nuclear power plant in Utah, with an estimated operating life of 40-80 years and a cost of \$2-3 billion dollars to build. Although nuclear energy does not emit greenhouse

gases, it does create radioactive waste that needs to be stored for countless generations. Another concern for nuclear energy in Utah, one of the driest states in the nation, is the enormous amounts of water it requires to operate.

UTAH'S POLICY CHALLENGE: HUNTSMAN VS. HERBERT AND FURTHER

In terms of public policy, Utah currently has a future energy portfolio in place. Former Governor Huntsman (2004-2009) created the Energy Resource and Carbon Emission Reduction Initiative that mandated electrical corporations and municipal utilities to generate 20% of sales from renewable sources, if cost-effective. This last clause changes the mandate into more of a loosely defined goal that corporations can adjust if necessary to their commercial viability (Berg, 2009). Huntsman also signed an executive order to increase energy efficiency by 20% by 2015 (Huntsman, 2006). In 2004, the Western Governor's Association set the following goals: "develop 30,000 megawatts of clean energy by 2015; increase energy efficiency by 20% by 2020; and provide a 'reliable and secure' transmission system in the West" (Berry, 2007).

Governor Herbert's 10-Year Strategic Energy Plan for Utah is a series of suggestions for the state, without any policy initiatives, mandates, or budget allocations attached. As it says in the guiding principles in the introduction, "Governor Herbert's Energy Plan is not a static document; it ushers in an ongoing open and transparent public discussion about best practices" (Herbert, 2011). Perhaps the document is too static, as the state needs bold leadership to guide us through the next decade.

The goals of the document are lofty, "to develop the best new cutting-edge technologies," to "modernize the regulatory environment to support sustainable power generation," and to "promote energy efficiency, conservation, and peak consumption reductions" (Herbert, 2011). The governor states:

Because of our vast natural resources, Utah can lead our nation in the development of both traditional and renewable energy resources. We should do this through a broad portfolio, such as coal, oil, and natural gas; as well as wind, solar, nuclear, and clean coal. I will lead by example, with a focus on conservation and encouraging the development of new technologies in energy. (Herbert, 2010)

Thus far, his administration has done little to establish Utah as a national leader in energy security and has yet to diversify the energy portfolio. The governor vetoed the Electrical Utility Amendments, Efficiency and Conservation Tariff (SB47) that would have allowed Rocky Mountain Power to shut off air-conditioning units for 15 minutes during Utah's summer peak hours, improving system operations, reducing outage risk, and saving consumer's money. This sent a powerful anti-conservation message. Also notable is a State Construction Code Adoption (HB45), which passed under

Herbert's administration that excludes new residential homes from having up-to-date energy conservation codes, adding 15% or more to monthly utility bills (Wright, 2010). A great first step to creating energy security for the state would be to at least build new homes right from the start, which costs an average extra \$983. It costs homeowners an average of \$4,800 to retrofit homes for efficiency. "Improving the energy efficiency of Utah's homes and businesses will lower Utahns' vulnerability to rising costs and volatile fuel prices, and decrease the need for utilities to build expensive new power plants that we all pay for" (Peacock & Ursenbach, 2010).

There are a number of actions our government should take now in order to create real energy security for the state of Utah. The first recommendation is to gradually increase the tax on gasoline. Although this will be unpopular, it is necessary to create revenue to wean us off our deadly oil addiction and create true energy independence for the state of Utah. According to *The Economist* (2010), "America's gasoline taxes

are among the lowest in the developed world...America's reluctance to tax petrol heavily helps explain why Americans drive more than Europeans and why they love gas-guzzlers." Revenues from gasoline taxes could go to the development of reliable public transit and subsidize the initial investment costs in the development of renewable energy. The government could also create incentives for individuals who carpool and

utilize public transit.

In addition to increasing the tax on gasoline and petroleum products, there should be an increased tax on coal and natural gas or the enactment of a cap and trade program to help reduce emissions and pollution from our reliance on these fossil fuels. According to former Governor Huntsman's Blue Ribbon Advisory Council on Climate Change (BRAC) (2007), "The principal source of Utah's GHG (greenhouse gas) emissions is electricity use, accounting for 37% of total State gross GHG emissions in 2005." The increase in price would help the public begin to realize the externalized costs of the state's reliance on cheap coal. When prices go up, people become more conscious about their energy usage (Newell, 2008). A tax increase on traditional energy could go a long way to improving energy conservation efforts and help balance the budget.

Perhaps one of the biggest problems with Governor Herbert's energy initiative is his conviction that industries will voluntarily adopt significantly diversified energy portfolios without government intervention. One of the guiding principles of the Strategic Energy Plan states:

Utah's economy is dependent upon responsible energy development. Governor Herbert, his Cabinet and his energy policy task force will consider and thoroughly examine the potential for development of all energy resources- allowing the free market to drive while the state provides appropriate legislative and regulatory oversight. (Herbert, 2011)

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One of the goals is to “meet the project energy growth demands over the next decade by making balanced use of fossil fuels and alternatives and renewable resources in a market-driven, cost effective, and environmentally responsible way” (Herbert, 2011).

There are several problems with this reasoning. The first is that the energy industry in Utah can hardly be called a free enterprise system. Questar is the primary gas provider in the state and owns most of the natural gas reserves (Economic Development Corporation of Utah, 2010). Rocky Mountain Power, a subsidiary of PacifiCorp, is Utah's only electrical utility company and dominates the entire residential market and over 75% of the total electrical customers in the entire state (Berry, 2007). PacifiCorp dominates energy production and distribution in the Western United States, with over 1.7 million customers (PacifiCorp, 2010). Rocky Mountain Power publishes that it exchanges a franchised, monopoly service area (the state of Utah) for an obligation to meet customers' needs. It is heavily regulated by the state but remains faithful to returning an investment to its shareholders.

In a real free market economy, a consumer who desired utilities from renewable sources could choose a provider who fulfilled their needs. In Utah's semi-socialist, mixed economic market, consumers who want renewable energy have to supply the means of production, by putting solar panels on their roofs or a wind turbine in their backyard. For most people, the upfront cost is prohibitive.

By definition, a “free market” is one that is not controlled by the government, where people can freely choose with whom to exchange economic goods. In the case of Utah utilities, consumers cannot choose another provider. There is no competition. If Rocky Mountain Power or Questar fail to meet consumer expectations, there is no other choice. For example, neither utility offers consumers a direct option for renewable energy. Perhaps one of the best things the Governor could do to make his Strategic Energy Plan work is to introduce competition to the marketplace. Without competition, there is no incentive for companies to invest in cutting-edge technologies of alternative forms of energy production that could have a long term benefit for consumers.

It is important to note that both these utilities offer energy efficiency programs and incentives for consumers. Questar offers a variety of rebates for retrofitting home efficiency. Rocky Mountain Power also provides an option for consumers to purchase energy certificates from renewable energy facilities, helping to build a market for future renewable energy projects. However, the renewable energy choices presented to consumers are very limited, and it is doubtful that these government-sanctioned monopolies will change their modus operandi without direct guidance from new public policy.

Second, there are significant time-horizon problems with the short-term logic of the market place. Utah's fossil fuel resources have limited availability and will begin to run out in the next few years. The governor's Energy Plan admits that there are only 10 years of coal reserves remaining at current

production rates (Herbert, 2011). In most industries, this would be cause for alarm. However, the governor's plan states that we “should continue to use existing fossil fuel resources while augmenting them with new, cost-effective energy efficiency measures and alternative and renewable energy resources as they become more economically feasible.”

If industry continues to choose cheap coal and natural gas, digging deeper into the reserves instead of beginning to innovate and diversify, Utah's energy economy will collapse. Power companies are in the business of maximizing return and making a profit and will therefore choose whatever energy option is most cost effective. As it stands now, many of the costs of utilizing fossil fuels are externalized. For instance, the health costs during red air days are paid for by the individuals and the health care system and the full consequences of emitting carbon into the atmosphere remain unknown. As long as these costs are not realized up front, it will be difficult for renewable energy production to compete with our current dependence on coal-fired power plants and natural gas.

In its executive summary, Governor Huntsman's Blue Ribbon Council on Climate Change outlined a series of options to reduce greenhouse gas emissions in Utah. Among the high priority options in terms of energy supply are “develop[ment of] significant amounts of renewable energy resources...green power purchases and marketing...tax credits and incentives for renewable energy, pricing and metering strategies and research and development” (2007). For agriculture/forestry, it advises promoting the production of biomass fuels, and for cross-cutting issues, it argues for the creation of a regional/state cap and trade program, carbon tax or hybrid, and evaluation of existing climate proposals at the regional, federal, and international levels. Other recommendations include retrofitting existing electricity generation plants with CO₂ capture and retiring old plants. They urge for government to set an example by creating mandatory efficiency targets, incentives for green building construction and improving building codes. For transportation/land use, they urge for the implementation of an “aggressive mass transit strategy” and promotion of low-carbon fuel and vehicle technologies.

Many of these “high-priority options” recommended by the group are being outright dismissed by Governor Herbert. It seems that instead of developing a new plan that refuses to address greenhouse gases and climate change, Herbert's energy task force could greatly benefit from revisiting the leadership shown by former Governor Huntsman. In the analysis of energy options, Huntsman's advisory council states (2007), “...there may be costs and benefits associated with the policy recommendations in this report, any economic analyses conducted must also take into account the potential costs associated with inaction.”

In addition to these recommendations, Berry (2007) has proposed an avenue for raising funds to develop a reliable renewable energy supply in Utah: a Clean Energy Fund from a small surcharge on utility bills. In 2007, 19 other states

developed this fund that has generated millions of dollars for renewable energy programs. According to Berry (2007), in order to meet the goals established by the Western Governors' Association, "State and federal policy must be and have been the driver to accelerate sources such as renewables." Different states are employing different scenarios. If the Utah fund were enacted to mimic California's, adding a mere \$0.0008 per kilowatt hour to all utility customers in Utah, it would cost the average residential customer an extra \$0.58 per month or \$7.00 per year, generating \$4.5 million. Coupled with the commercial sector (\$57.8 million) and the industrial (\$5.6 million), the fund would generate about \$680 million in 10 years, plus interest. If Utah applied the Oregon model, charging customers 3% of their monthly bill, the state could generate \$1.6 billion over 10 years (Berry, 2007). Implementing this fund would greatly enable the diversification of Utah's energy portfolio by providing essential funding for its reorientation.

CONCLUSION

The state needs investment to diversify its energy portfolio. Currently, it is weighted heavily toward coal and other non-renewable fossil fuels. It is the view of this author that the state is failing its residents, present and future. This failure is from a lack of preparation, planning, and oversight for future energy production and consumption, and overall ignorance of adverse environmental impacts from Utah's current energy portfolio.

The transition to a new energy policy will not be easy. There are many fronts on which it can happen. In Salt Lake City, the International Brotherhood of Electrical Workers' installed solar panels on the roof of its building to offset its electricity and to train employees in renewable energy projects. "It's the wave of the future," says 31-year-old electrician, Nick Harrison. "I want to learn so that if it comes up in the future, I'll know how to do it...Technology changes, so you have to keep changing with it." Salt Lake Community College is currently developing a specialized renewable energy training program, focusing on green construction, alternative fuels, energy management, renewable-energy transmission, wind power, solar systems, and geothermal resources (Gorrell, 2010). Renewable energy development in Utah has the potential of creating 7,000 new ongoing jobs, without closing coal plants. According to the study by Utah Clean Energy, "For each job that would have been created in developing traditional power plants, nearly two jobs are created by developing efficient and renewable energy" (Lee, 2010).

As Utahns, we have a strong work ethic and an independent idealism in our unique culture. We are not like other states, nor do we want to be. However, we can become energy independent without furthering our dependence on coal.

Instead of moving mountaintops, drilling deeper, and burning more, we need to embrace change and invest significantly in renewable energy. It will take compromise to find common ground. Environmentalists and industry need to come to the table with government, and we need to quantitatively assess the data through unbiased eyes. Energy production certainly has its risks, but they can be mitigated through proper training and planning. The current snapshot of Utah's energy portfolio shows a huge chunk of coal and oil, illustrating our dependency on these fossil fuels. As Governor Herbert's energy agenda continues to unfold, let us hope it provides the leadership necessary to take Utah forward into a future of energy security.

A year after the mining tragedy at Crandall, a U.S. Senate committee published a report detailing the deficiencies in the mine's engineering, accusing Murray Energy company of "ignoring warning signs of danger and doing unauthorized mining." Another report conducted by the Mine Safety and Health Administration (MSHA) said "the retreat mining plan at Crandall Canyon was so poorly engineered that the mine was 'destined to fail'" (Gorrell, 2009). While active coal miners are continuing to experience seismic thunder deep inside the mountains of Central and Southern Utah,

Salt Lake's workforce is learning how to manage the direct current collected in solar panels, which "creates a larger shock...you need proper training to touch panels" as Thaniel Bishop, a 25-year-old electrician says (Gorrell, 2010). Clearly, risk is not eliminated with renewable energy, but many aspects of cleaner, renewable fuel will make our precious planet a cleaner place in the present and a more viable place in the future.

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MOUNTAINTOPS, DRILLING
DEEPER, AND BURNING
MORE, WE NEED TO EMBRACE
CHANGE AND INVEST
SIGNIFICANTLY IN
RENEWABLE ENERGY. IT
WILL TAKE COMPROMISE TO
FIND COMMON GROUND."

REFERENCES

- Berg, M. (2009). Utah's Energy Landscape [PDF document]. *Public Information Series 95*, Utah Geological Survey, a division of Department of Natural Resources. Retrieved from <http://geology.utah.gov/online/pi/pi-95.pdf>.
- Blue Ribbon Advisory Council on Climate Change: Report to Jon M. Huntsman, Jr. (2007, October 3). Executive Summary: Utah's Emissions Inventory. Retrieved from http://www.deq.utah.gov/BRAC_Climate/docs/Final_Report/Sec-1-BRAC_EXECUTIVE_SUMMARY.pdf.
- Berry, J. (2007, May 30). Diversifying Utah's Energy Portfolio: A Review of State Clean Energy Funds. *Policy Brief*, Center for Public Policy and Administration, University of Utah. Retrieved from http://www.cppa.utah.edu/publications/energy/Diversifying_Utahs_Energy_Portfolio.pdf.
- Berry, J. (2008, July 30). Utah Renewable Energy Overview: Technology, Resources, and Energy Zones. *State Energy Program*. Retrieved from http://geology.utah.gov/sep/renewable_energy/urez/phase1/meeting073008/pdf/urez_berry0708.pdf.
- Berry, J., Hurlbut, D., Simon, R., Moore, J., & Blackett, R. (2009). Utah Renewable Energy Zones Task Force Phase I Report: Renewable Energy Zone Resource Identification. Utah Geological Survey, a division of Utah Department of Natural

- Resources. *Miscellaneous Publication 09-1*. Retrieved from http://geology.utah.gov/sep/renewable_energy/urez/phase1/pdf/mp-09-1low.pdf.
- Caldwell, A., (2007, August 18). Rescue Miner in Utah Was to be Outside. *USA Today*. Retrieved from <http://www.usatoday.com>
- Economic Development Corporation of Utah (2010, February 2). Utah Utilities. Economic Development Corporation of Utah [PDF document]. Section 7 of the B&E Profile. Retrieved from http://www.edcutah.org/documents/Section7_UtahUtilitieswCvrPg.pdf.
- Economic Development Corporation of Utah (2010, June 23). Utah Energy Industry: Industry Profile. Retrieved from http://www.edcutah.org/documents/UtahEnergyIndustry_062820102.pdf
- Economic and Financial Indicators: Petrol Tax (2010, September 25). *The Economist*, p. 118.
- Frosch, D. & Lee J., (2007, August 17). 3 Killed and 6 Injured in Rescue Effort at Mine. *The New York Times*. Retrieved from <http://www.nytimes.com>
- Gorrell, M., (2009, May 13). The Crandall Canyon Mine Disaster. *The Salt Lake Tribune*. Retrieved from <http://coalmountain.wordpress.com/2009/05/13/the-crandall-canyon-mine-disaster/>
- Gorrell, M. (2010, September 7). Utahns Keep Current, Train for Future with 'Green Power'. *The Salt Lake Tribune*. Retrieved from <http://www.sltrib.com/sltrib/money/50210626-79/energy-power-training-wind.html.csp>
- Gluck, R. (2004, May-June). Hill Air Force Base Generation Plant. *Distributed Energy: The Journal of Energy Efficiency & Reliability*. Retrieved from <http://www.distributedenergy.com/may-june-2004/hill-air-force-1.aspx>.
- Herbert, G., (2010, June 8). Energy Initiatives and Imperatives: Utah's 10-Year Strategic Energy Plan. Retrieved from <http://www.utah.gov/governor/docs/Energy-Initiatives-Imperatives.pdf>.
- Herbert, G. (2010). Governor's Priorities: Energy Security. Retrieved from <http://www.utah.gov/governor/priorities/energy.html>.
- Herbert, G. (2011, March 2). Energy Initiatives & Imperatives: Utah's 10-Year Strategic Plan. Retrieved from <http://www.utah.gov/governor/docs/Energy-Initiatives-Imperatives.pdf>
- Huntsman, J. (2006, July 1). Governor, Administration: Governor's Executive Order 2006-004: Improving Energy Efficiency. *Utah State Bulletin*. Vol. 2006, No 13. Retrieved from <http://www.rules.utah.gov/execdoks/2006/ExecDoc113478.htm>.
- Lee, J. (2010, February 26). Clean Fuels Can Create New Jobs, Study Says. *Deseret News*. Retrieved from <https://secure.deseretnews.com/article/700012220/Clean-fuels-can-create-new-jobs-study-says.html>.
- Newell, D., Taylor, S., Farnsworth, H. (2008, May). Utah's Energy Use & Resources: Powering Our Standards of Living. *Utah Foundation Executive Summary*. Report Number 685. Retrieved from <http://www.utahfoundation.org/img/pdfs/rr685summary.pdf>
- Peacock, B., and Ursenbach, B. (2010, September 13). Utah Homeowners Missing Out on Energy Savings. *The Salt Lake Tribune*. Retrieved from <http://www.sltrib.com/sltrib/opinion/50246864-82/energy-utah-code-homes.html.csp>.
- PacifiCorp (2010). Energy Sources: Hydropower. Retrieved from <http://www.pacificcorp.com/es/hydro.html>.
- PacifiCorp (2010). Company Overview. Retrieved from <http://www.pacificcorp.com/about/co.html>.
- Renewable Energy Atlas of the West (2002). Utah Renewable Energy Resources. Retrieved from http://www.energyatlas.org/PDFs/LowRes/atlas_state_UT.pdf.
- Roche, L. (2010, July 22). Corroon Unveils Energy Plan for Utah. *Deseret News*. Retrieved from <http://www.deseretnews.com/article/700050091/Corroon-unveils-energy-plan-for-Utah.html>.
- Soraghan, M. (2011, January 31). Fracking Companies Injected 32M Gallons of Diesel, House Probe Finds. *The New York Times*. Retrieved from <http://www.nytimes.com/gwire/2011/01/31/31greenwire-fracking-companies-injected-32m-gallons-of-diesel-24135.html>.
- State of Utah (2009). Clear the Air Challenge: Be Part of the Solution. Retrieved from <http://cleartheairchallenge.org/challenge.php>
- Templeton, K., (2008). Crandall Canyon Mine Memorial. Retrieved from <http://www.templetonsculpture.com/crandall-canyon-mine-disaster-memorial>
- Urbina, I. (2011, February 26). Regulation Lax as Gas Wells' Tainted Water Hits Rivers. *The New York Times*. Retrieved from: <http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all>
- Utah Geological Survey (2010, January 28). Utah's Fossil Fuels. Retrieved from http://geology.utah.gov/utahgeo/energy/fossil_fuels.htm.
- U.S. Department of Energy (2010, June 10). Utah Energy Summary. Retrieved from http://apps1.eere.energy.gov/states/energy_summary.cfm/state=UT.
- U.S. Department of the Interior, Utah Bureau of Land Management (2008, April 30). Coal. Retrieved from <http://www.blm.gov/ut/st/en/prog/energy/coal.html>.
- U.S. Department of the Interior, Utah Bureau of Land Management (2008, April 30). Wind Energy Environmental Impacts. Retrieved from http://www.blm.gov/ut/st/en/prog/energy/wind_energy/wind_energy_environmental.html
- U.S. Energy Information Administration. (1998). Energy Kids. Retrieved from <http://www.eia.doe.gov/kids/contact.cfm>.
- U.S. Energy Information Administration (2009). Total Renewable Electric Generating Net Summer Capacity by Source and State, 2009. Retrieved from <http://geology.utah.gov/emp/energydata/statistics/renewables6.0/pdf/T6.1.pdf>.
- U.S. Energy Information Administration (2010, September 23). State Energy Profiles: Utah. Retrieved from http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=UT.
- Utah Clean Energy (2009). Biomass 101. Retrieved from http://utah-cleanenergy.org/clean_energy_101/biomass_101.
- Water Contamination Center (2010, September 16). Fracking Study Sees Public Health Risks. Retrieved from http://www.water-contamination-from-shale.com/story_9.php.
- Wright, S. (2010, April 7). Wins, Losses for Clean Energy. *Deseret News*. Retrieved from: <http://www.deseretnews.com/article/700022523/Wins-losses-for-clean-energy.html>.
- Zeller, T. (2011, January 31). Gas Drilling Technique Is Labeled Violation. *The New York Times*. Retrieved from: <http://www.nytimes.com/2011/02/01/business/energy-environment/01gas.html>