First Steps to Utah’s Energy Future

By Utah Governor Gary Herbert

As Governor, I am honored to write for the Hinckley Journal of Politics, one of our state’s most influential collections of undergraduate writings. The subject of my paper is energy, one of my three principal leadership goals for Utah. I place energy in my “3 Es”: Economic Development, Education, and Energy. Each of these leadership elements are basic to our state’s needs for an educated workforce leading to new and productive jobs for our citizens. Energy is one of Utah’s primary sources of wealth. We need a solid energy program, protecting our environment, to provide revenues for our state’s educational system.

In my 2010 State of the State address, I conveyed my intention to create a strategic plan that establishes objectives for utilizing Utah’s abundance of energy resources to guarantee our continued energy independence. I believe that as a state, we must approach Utah’s energy future in a market-driven, cost effective, and environmentally responsible way. The Utah Energy Initiative is a 10-year strategic plan that strives to evaluate the state’s future energy demands, challenges, and opportunities.

The plan was developed by a task force I appointed, along with the aid of several subcommittees, having expertise in various energy related fields. The task force and subcommittee members included federal, state, and local officials, representatives from public utilities, environmental organizations, not-for-profits, academic researchers, education providers, consumer advocates, and energy developers.

Five public meetings were held throughout Utah in an effort to make the process of developing the plan as open and accessible as possible to the public. Meetings were held in Salt Lake City, Price, Cedar City, and Vernal. Residents with interest in energy development, economic development, and public health and environmental issues were encouraged to attend. The public meetings helped to produce several guidelines regarding our approach to energy initiatives. With more than 100 members of our subcommittees and with hearings hosting more than 300 citizens, our energy initiative is truly a publicly written document.

GUIDING PRINCIPLES

As governor, I established several guiding principles to direct us in the development of a 10-year energy plan. These principles include:

- Considering all potential energy resources;
- The free market economy should be the primary force directing Utah’s energy development, with regulatory oversight provided by the state;
- The plan must consider impacts on human health, the environment, and wildlife habitats, and take measurable steps to reduce or mitigate these impacts;
- The document is meant to generate ongoing public discussions about best energy practices. It is open to amendments and revisions if and when it is deemed appropriate;
- The plan should seek to balance energy affordability with the cost of continued investment in Utah’s energy infrastructure;
- All involved parties recognize that a move toward even greater energy independence and increased export capabilities can stabilize and further expand Utah’s economy.

UTAH’S ENERGY LANDSCAPE

The energy sector is the second largest component of Utah’s state gross domestic product, comprising about 7-10% of its total monetary value. The state’s energy resource production includes traditional sources such as coal, natural gas, and crude oil; alternative sources like uranium, biomass, and nuclear energy; and renewable sources such as geothermal, solar, wind, hydroelectric power, and compressed air energy storage. Utah currently produces more energy than it consumes (with the exception of crude oil). In addition, the state is able to export a considerable amount of this energy to neighboring states, resulting in net gain to our economy. Nevertheless, energy costs are expected to increase over the next decade, due to costs of raw materials, the cost of increasing regulation, population growth and the impact that growth will have on supply and demand, and the economic climate of the United States, to name a few.

TRADITIONAL SOURCES OF ENERGY

The majority of energy production and consumption comes in the form of traditional fossil fuels. Utah is the 13th largest producer of crude oil in the United States. Oil accounts for about 12% of total energy production and 33% of energy consumed in the state. Yet Utah imports about 72% of the oil that it processes in its five refineries. Utah is also ranked 13th in the nation in the production of coal. Forty-seven percent of the state’s total energy production and 41% of its consumption comes from coal. Coal is primarily responsible for
the generation of electricity. Utah’s proven coal reserves have been steadily decreasing, from a high of 429 million tons in 2000 to 202.5 million tons in 2009. Thus, its role in Utah’s energy landscape may be diminishing in the future. In natural gas, Utah is ranked the 8th largest onshore producer in the country, generating approximately 40% of the state’s total energy resources. Natural gas accounts for 24% of energy consumed by Utahns.

ALTERNATIVE ENERGY SOURCES
In addition to Utah’s three major sources of energy, producers have been exploring and developing alternative sources in recent years. The state possesses extraordinary amounts of oil shale and oil sand resources which, if recoverable, can be converted into conventional oil. Uranium is also mined and processed in Utah. While this source of energy is not heavily utilized, potential nuclear projects would depend on the ore in order to be operational. Biomass utilization technology including gasification and direct combustion is still being developed and thus is only a minor contributor to Utah’s overall production and consumption of energy. Additional research and development is required to take advantage of potential sources of energy like forest undergrowth, crop residue, and animal waste. These alternative energy sources are not likely to be significant contributors to the energy landscape by 2020, but should nonetheless be developed as a supplement to traditional resources.

RENEWABLE RESOURCES
The third major category of energy resources available to the state is renewable energy. At this time, the state produces only minimal amounts of solar, wind, hydroelectric, and geothermal energy. While the state possesses considerable potential in the area of renewables, there are also significant barriers to development. These barriers include the need for substantial investment in transmission infrastructure, technological requirements, and regulatory issues. Thus, renewable energy is currently far less cost effective than its alternatives.

The demand for energy is expected to increase substantially in the next decade. To meet this growing demand, Utah should continue to use conventional sources of energy, while supplementing them with alternative and renewable options, as they become available and economically feasible. Alternative and renewable sources will likely grow at a faster rate than traditional sources of energy, but Utah’s energy landscape will still be dominated by fossil fuels a decade from now.

MODELING
The 10-year strategic plan must devise a way to handle increasing demand in a way that is economically efficient and sustainable. One key approach to evaluating the potential impacts of energy development and consumption is the use of a dynamic model that is capable of monitoring economic impact over time. The task force selected the PI+ model from Regional Economic Models, Inc (REMI) to project these impacts. REMI can project figures such as employment, gross domestic product, and energy prices based on different inputs like change in production rates, new assessments of unproven reserves, and national policy decisions. The model will identify potential challenges and will, in turn, allow for the adjustment of the plan accordingly.

IMPLEMENTATION
Based on the resources available to the state and the projected increase in energy demand, the state will establish an energy office, administered by my Energy Advisor, with an advisory committee to oversee the implementation of the 10-year strategic plan. The advisory committee will be comprised of a diverse group of representatives from throughout Utah with various interests, expertise, and perspectives regarding the production and consumption of energy. The energy office will be created by consolidating existing energy positions and functions currently dispersed throughout state government, thus creating a single, predictable voice on energy policy. The office will be responsible for monitoring and responding to any emerging issues in the energy sector and making subsequent recommendations to the executive office regarding necessary revisions to state policy. This committee will assume the task of developing the additional steps needed to respond to these emerging issues. Proposed actions will be identified and evaluated using economic models such as REMI to assess potential impacts on resources, economic development, and energy transmission.

PUBLIC LANDS AND THE ENVIRONMENT
Utah will strive to keep its public lands open for energy development while striking a balance between economic and environmental sustainability. This aspiration will require continued dialogue and collaboration with federal agencies and other organizations that advocate for energy development on public lands. It will also entail coordination between local governments, state agencies, State and Institutional Trust Lands, and interest groups to identify and work to resolve potential issues. State agencies will be of particular importance, continuing to take leading roles in developing strategies to address impacted resources under state jurisdiction.

Utah’s federally owned and managed public lands encompass nearly 60% of its surface area and include pristine air sheds, wilderness areas, national parks, wildlife habitats, riparian zones, critical water resources, archeologically and culturally significant sites, and prized recreational areas. Conflicts inevitably arise between industry, environmental organizations, state and local government, and federal agencies about the use of these lands. As energy development is a legitimate and important use of the public lands, Utah will continue to work with all stakeholders to reach acceptable solutions that achieve the desired balance between economics and environmental conservation.
Utah will keep careful watch over the debate on climate change in the coming decade. The federal government has not established a policy on carbon emissions and it appears unlikely that one will be developed in the near future. However, western utilities must be mindful of the possibility of carbon regulation and its potential impact on the cost of energy. Accordingly, utility companies have already begun producing economic models that take into account possible changes in the law as a risk-management exercise. These models should help prepare and thus moderate the negative impact that new federal regulations may have.

Another potential issue that we must consider is our fresh water supply and the extent to which continued energy development in the state will impact it. Utah's arid climate and the possibility for increased drought in the future, coupled with the projected population growth for the next decade, suggest that low-water-use technologies should be encouraged wherever possible. Energy officials should examine various energy portfolios to determine the amount of water consumption that will occur. Water quality is another concern for Utah's residents. As such, the state has placed regulations and numerous safeguards that necessitate cooperation between agencies including the development of a memorandum of understanding between the Department of Environmental Quality Division of Water Quality and the Department of Natural Resources Division of Oil, Gas, and Mining. These measures will help ensure continuous access to clean drinking water. Still, water issues will continue to be monitored and evaluated as new, viable technologies emerge and land is developed for energy production.

Utah will continue to strive for the responsible development of energy, using methods that limit potential negative impacts on wildlife, critical habitats, and migration corridors. Currently, the state is working with conservation groups and regional partners to identify highest priority areas for conservation and to develop best management practices. Future energy projects will be reviewed with these practices in mind with the goal of “no net loss” of biodiversity values. In addition, long-term wildlife monitoring will be implemented to measure the success of efforts to mitigate potential harm to these habitats.

**Research and Innovation**

Research and development is, and will continue to be, a vital component to facilitating a strong energy future for the state of Utah. My Energy Advisor will make research a primary focus, partnering with institutes of higher education, industry, and other regionally recognized research organizations. In particular, the 10-year plan advocates the establishment of a “Research Triangle” between Utah's three research universities: the University of Utah, Utah State University, and Brigham Young University. It is anticipated that the Research Triangle will work in partnership with nearby national laboratories, in the areas of fossil fuel research and alternative and renewable energy development, and the junction of these technologies. Since the ultimate objective of this collaboration is the creation of functional innovation, Utah must also work with commercialization agencies to ensure the development of marketable technology.

The prospect of developing the Research Triangle between the University of Utah, Utah State University, and Brigham Young University is particularly exciting given their collective history of accomplishment in scientific research. All three universities are already engaged in energy research and innovation, each with their own particular area of expertise. Combined, their capabilities will be even more impressive and should lead to greater technological advancements.

Utah is fortunate in that much of the groundwork for academic research has already been laid. The University of Utah currently houses two nationally recognized energy research institutions: The Energy and Geoscience Institute (EGI) and the Institute for Clean and Secure Energy (ICSE). EGI focuses on fossil fuel, geothermal, and carbon sequestration research while ICSE concentrates on areas such as fossil fuel combustion, gasification, and computer modeling research. One of the pillars of their research is the responsible utilization of conventional and unconventional fossil fuels and biomass resources. Utah State University's Energy Dynamics Laboratory and its Colleges of Engineering and Sciences are leaders in biofuels, environmental monitoring and sensing, waste water treatment, hybrid energy systems, electrical engineering, and nuclear, geothermal, and wind profiling. Within this research, USU is also able to address environmental and socio-economic issues. Brigham Young University’s research capabilities include combustion, biomass, gasification, clean coal technology, and carbon management. The Advanced Combustion Energy Research Center produces progressive experimental work on clean coal combustion and sustainable energy. The vast collaborative research capabilities of these three institutions in conjunction with the support of national laboratories and state energy officials will allow Utah to maintain its support for the growing energy industry and meet future challenges.

**Economic Development**

Utah’s considerable energy resources will help ensure future employment and promote further investment in the energy sector and related sectors of the economy. Utah consistently has some of the lowest electrical and heating energy costs to consumers in the nation, making it a very attractive place to live and run any type of business. There are well over 1,000 firms in the state operating in the energy sector that in turn employ almost 22,000 Utahans. Utah's energy sector contributes substantially to state tax revenues thereby benefitting the state's economy as a whole. What's more, energy production that takes place on State School and Institutional Trust Lands directly supports K-12 public education, another cornerstone for Utah's economic viability and a primary focus of
my administration. While Utah’s ample resources and ability to provide low cost energy already help to attract businesses, the state will consider the use of tax incentives to influence behavior and encourage additional investment. However, careful assessment of potential incentives must be made first to determine how exactly they will promote energy production, job creation, and the overall growth of the state’s economy.

**Energy Efficiency**

Achieving greater energy efficiency is a goal for Utah over the next decade. The state has already been recognized by the American Council for an Energy Efficient Economy as one of the “most improved” states for energy efficiency. Reducing energy consumption through efficient practices will lower energy costs and delay necessary investments in new electrical generation and natural gas supply. Thus, it is of benefit to both the consumer and the producer. In addition to the steps already taken, Utah plans to establish a state-wide program that enhances public awareness and educates new and existing energy professionals about energy efficient behavior and practices. As part of this state-wide initiative, Utah plans to encourage utilities and regulators to expand demand-side management (DSM) strategies to reduce consumption during peak times.

Rocky Mountain Power and Questar Gas have each developed high quality energy-efficiency and demand-side management plans, as well as effective marketing campaigns to increase public awareness of these programs. Additionally, agencies within the state government have developed several education programs including the State Energy Program, the Utah Building Energy Efficiency Strategies partnership, and Utah’s Weatherization and HEAT programs. These types of educational programs are aimed at businesses, homeowners, local governments, and nonprofits. These education programs include courses designed to increase building officials’ awareness of energy codes and efficient practices through the use of incentives to local building departments for offering additional training. Other programs offer advice and incentives to individuals and families to conserve energy. In addition, it is recommended that homebuyers in the state receive information regarding the importance of energy efficiency and specific details regarding the efficiency of the home they are purchasing.

Embracing energy-efficient practices will reduce consumption per capita, though it will not completely preclude the need for additional production facilities, transmission lines, pipelines, or transportation facilities. Demand will continue to increase as Utah’s population grows. Thus, demand-side management strategies will become ever more important in the coming decades. Rocky Mountain Power has already embraced this technique by creating load-control programs that actively manage specific high energy use equipment during peak hours. Rocky Mountain Power customers who opt to participate in this program, help leverage existing infrastructure, allowing for delayed investment in new electric generation.

**Transportation**

Apart from promoting energy-efficient practices, the state will also look for areas where the use of traditional sources of energy can be supplemented with nontraditional or renewable sources, or alternative practices. One particular area that has generated a lot of innovation and functional development in recent years is transportation. In view of that, the state’s research institutions should pursue development in alternative transportation vehicles and non-traditional fuels. Research and the eventual commercialization of these types of alternatives will help decrease consumption, improve air quality, and reduce our dependency on outside sources of energy over the next decade. In addition, the state will continue to engage in transportation planning that promotes non-motorized and public mass transit infrastructure and use. City and regional planning can also be used to create neighborhood economic centers that reduce commutes by bringing jobs and services closer to home.

Transportation not only consumes a great deal of Utah’s produced and imported fuels, it also accounts for a great deal of air pollution. More than 50% of the air pollution along the Wasatch front can be attributed to transportation emissions. The Utah Division of Air Quality is tasked with monitoring air quality on a daily basis and issuing advisories when the condition of the air falls below acceptable levels specified in the National Ambient Air Quality Standards. It is recommended that Utahans observe these advisories and make an effort to drive less on yellow and red action alert days. This simple effort can have measurable effects on public health in Utah over time.

Creating more efficient traffic flow will reduce the amount of time vehicles spend on the road, improving air quality while lowering fuel consumption and reducing costs. Utah has taken great strides to promote efficient traffic flow through the implementation of HOV/HOT lanes, reversible lanes, and signal coordination. In the years to come, we hope to assess additional strategies such as dynamic speed control, peak hour shoulder use, and the construction of additional park and ride lots.

**Regulatory Environment**

Energy development will be aided through greater transparency and better coordination of the regulatory system and licensing process. Revisions should be made to institute standardized policies and regulations within state agencies. Ideally, a single point of contact for information on state and local regulations and permit requirements should be established. The establishment of a coordinating council between state agencies would help facilitate interagency uniformity in handling emerging energy issues and activities. In addition,
the state's regulatory framework will need to be adjusted in correspondence with technological innovation and increased energy demand.

TRANSMISSION

A detailed, long-range transmission plan for the state should be developed. A plan will support future transmission and infrastructure projects that develop as a response to increasing production and consumption. Electric and natural gas transmission is the most difficult component of the energy delivery system to construct. Transmission plans are long range, involving multiple jurisdictions and requiring huge capital investments. While natural gas transmission capacity has increased dramatically over the last 30 years, there is still a pressing need to update our electrical transmission system to prepare for increased demand. Accordingly, there are several regionally planned electrical transmission projects currently being reviewed. Utah's own transmission plan should be compatible with other regional plans with the goal of development in the next 10 years.

The development of future, large-scale renewable energy projects will also require transmission capabilities. There are several substantial barriers to transmission for renewable energy projects including financing, planning integration across all levels of government, and permitting procedures. In the future, Utah may consider conducting a long range feasibility study that will allow for substantial public and private sector participation to determine how to budget and plan for a renewable energy transmission project.

Along with transmission needs, Utah must also be prepared for the burden that future demand projections will place on utilities’ capacity to provide base load levels of electricity. The state will work with utility providers to assess future coal and natural gas resources with particular emphasis on pipeline capacity and clean coal technology. This assessment cannot be comprehensive without taking into consideration the impact of any potential additional regulations placed on either industry. Possibilities for handling increased base-load demand include exploring opportunities for nuclear power development, renewable forms of energy, and emergent energy storage technologies.

The Utah Energy Initiative seeks to create a practical and comprehensive approach to managing our future energy needs. It strives to balance the use of fossil fuels with the use of alternative and renewable resources in a market-driven way, which is both cost effective and environmentally responsible. The plan will provide for Utah's continued economic development by establishing and maintaining access to clean and affordable energy. Energy production and the availability of low-cost utilities and fuel will continue to promote job growth in all sectors of the economy. Over the next decade, the strategic plan should facilitate opportunities for innovation through the formation of collaborative relationships and the development of cutting-edge technologies.

Implementation of this plan will assure Utah's profitable energy future and preserve the quality of life that we Utahans enjoy.