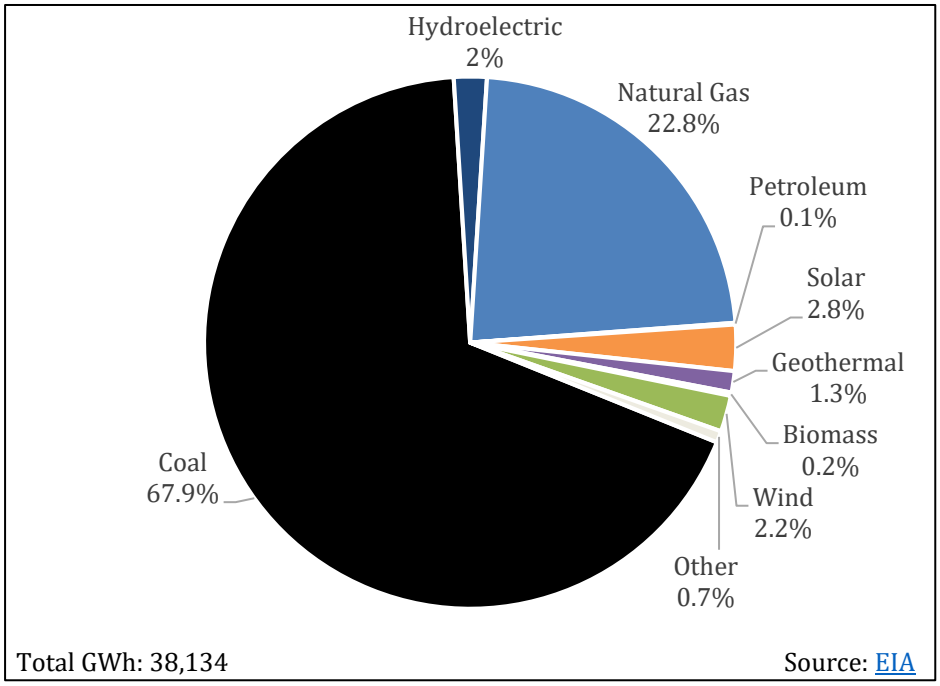
State Brief: Utah

BACKGROUND

Utah's net electricity generation is dominated by coal, comprising two-thirds of the state's energy mix. Four-fifths of coal mined in Utah is consumed in the state. Electric generation from coal has been experiencing a moderate decline; coal's contribution to the energy mix peaked in 2013 at 80.6%.[1] Utah is a net electricity supplier to other western states, and due at least in part to California's emissions rules on purchasing electricity from clean sources, some plants are being converted from coal to natural gas. 2017 data from the Energy Information Administration (EIA) shows the state's solar generation nearly doubled from 2016 to approximately 5.4% in 2017.

Utah's Electricity Mix, 2016



Total GWh: 38,134 Source: EIA

Utah has a voluntary renewable portfolio goal of 20% renewables by 2025. Solar energy had not provided a significant amount of electricity until 2016, when the Beehive State added more than 1200 megawatts (MW) of installed capacity. There is significant potential for wind energy development in the state, but many in-state utility-scale wind projects are not deemed cost-effective by the regulatory commission. Utah is one of the few states with utility-scale geothermal generating capacity, and new facilities are currently under development.

In 2016, Utah Clean Energy and Salt Lake City released a 10-year solar deployment plan for meeting the Wasatch Solar Team's goals, which include meeting a target of 325 MW of rooftop solar by 2024 (the team expects to achieve this goal in 2019). The plan identifies barriers and solutions in five key topic areas: solar markets and access, permitting, interconnection, the utility regulatory model, and solar storage and resiliency.

Utah's Public Service Commission (PSC) regulates the state's investor-owned utilities (IOUs), electric cooperatives, and natural gas utilities. The PSC has three members appointed by the Governor, including two Republicans and one unaffiliated member. Current Governor Gary Herbert (R) has appointed all sitting commissioners. The Republican Party controls large majorities in both legislative chambers.

POLICY STRENGTHS AND OPPORTUNITIES[2]

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[3] an important framework for policymakers to consider. The basic idea behind policy stacking is that there is an interdependency and sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

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[1] Coal experienced a slight uptick in 2017.

[2] For more information on policy opportunities, please visit the SPOT for Clean Energy. For more information on specific policy actions related to these opportunities, please review the *Clean Energy Policy Guide for State Legislatures*.

[3] V.A. Krasko and E. Doris, *National Renewable Energy Laboratory*, 2012. Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions. http://www.nrel.gov/docs/fy13osti/56428.pdf.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, market preparation policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, market creation policies, create a market and/or signal state support for clean energy technologies. Tier 3, market expansion policies, create incentives and other programs in order to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

For example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, states should adopt policies to address interconnection and stand-by rates before adopting financial incentive programs.

GRID MODERNIZATION

Policymakers can view grid modernization as creating a policy structure that supports and ties together many other initiatives, such as smart metering infrastructure, customer data management, energy storage, electric vehicle infrastructure, and utility business models.

In the last two decades, new digital technologies have enabled utilities to better manage the grid and provide opportunities for consumers to customize their services to fit their priorities. These technologies allow a two-way flow of information between the electric grid and grid operators and between utilities and their customers. Emerging technologies improve system reliability and resiliency by enabling better tracking and management of resources. These technologies allow grid operators to incorporate central and distributed energy resources, energy storage technologies, electric vehicles, and assist in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency. On the customer's side of the meter, advanced metering infrastructure, dynamic pricing, and other emerging technologies allow an exchange of information and electricity between a consumer and their electric provider.

Utah places in the bottom 10 states in the 2017 Grid Modernization Index for overall grid modernization efforts. The state received low scores for customer engagement and grid operations, but performed better in the "state support" category, which assesses states' policies supporting grid modernization such as energy efficiency standards, incentives for new technologies, and data access policies. The state does not have a grid modernization plan, but Governor Herbert released the 10-Year Strategic Energy Plan in 2011, which created the Governor's Office of Energy Development (OED). A plan update was published by the OED in 2014. The plan does not offer a comprehensive program to modernize the electric grid, but it presents a series of guiding principles and policy goals, one of which is to "modernize the regulatory environment to support sustainable power generation, energy transmission solutions and energy conservation."[4] The OED released Utah's Energy Action Plan in May 2018, outlining specific measures designed to help meet the state's energy policy goals, which include investments in efficiency programs and alternative vehicle infrastructure, but the action plan does not explicitly focus on grid modernization or resiliency.

Utah is primed to make significant inroads in updating its electric infrastructure. The state could consider the following actions to advance grid modernization in Utah:

1. Develop a grid modernization strategy through a stakeholder process. States may also decide to require that utilities propose a ten-year grid modernization plan within a specified timeframe. Legislation could require plans to outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals. States might also provide incentives or cost recovery mechanisms for utilities to meet grid modernization goals.

2. Require that utilities' integrated resource plans (IRPs) include plans to enhance cybersecurity, integrate distributed energy resources (including EVs and energy storage), increase demand response and/or demand-side management (DSM) programs, and measure and report on the results of grid modernization efforts.

[4] Governor Gary R. Herbert, *Energy Initiatives & Imperatives: Utah's 10-Year Strategic Plan*, Updated Plan, February 2014, pp. 2

3. Utah does not have clear state policies governing customer data access and privacy protections. To address this, policymakers should develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with customer energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data by third parties. The state could establish customer access to energy data through the Green Button Connect program, for example. While there is no requirement that energy data be made readily available, Utah's largest IOU, Rocky Mountain Power (RMP), has implemented Green Button for customers in their service territory.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while maximizing the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Second, the responsiveness of energy storage can allow the utility to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent resources like renewable energy. Finally, energy storage can help the commercial sector avoid costly demand charges. As utilities around the country consider extending demand charges to the residential sector, this will become an even more important issue.

The flexibility of battery storage, combined with advanced metering infrastructure, allows customers to control how and when they use energy from the grid or from solar panels installed on their home or business. In most cases, this can provide greater cost savings than standalone solar systems. Combined with time-varying rates or real-time pricing programs, state policy can further support customer choice and open a new market for energy services. Prices that better reflect the time-varying and location-dependent costs of producing and delivering electricity can lead to a number of economic and environmental gains.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits by 1) establishing a framework for easy integration of energy storage into the grid and 2) establishing a marketplace that monetizes the benefits of energy storage for cost effective investment.

Utah has taken initial steps to expand the battery storage market. In 2016, the legislature passed Senate Bill 115, or the Sustainable Transportation and Energy Plan Act, which authorizes the PSC to approve utility pilot programs for emerging technologies including battery storage. RMP subsequently submitted applications for a smart inverter program, a microgrid program, and an electric vehicle time-of-use pricing program in its 2017 IRP. RMP recently announced plans to fund a public school solar-plus-storage project. In 2017, the clean energy company Go Electric secured a $1.7 million contract to construct a one MW microgrid at Toole Army Depot.

There are several opportunities to develop supportive state policies for energy storage:

1. Amend existing interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. The Interstate Renewable Energy Council (IREC) has produced a series of interconnection protocols that states can easily adopt. The state could establish best practices for interconnecting storage in statute, or legislation could provide an instruction to the PUC to update existing policy.

2. Instruct utilities to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it will be cost effective, or identify the price point at which it will become cost effective.

3. Require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required that utilities evaluate the cost effectiveness of non-wires alternatives (NWAs) to large transmission and generation investments. Alternatively, states might want to require utilities to develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the greatest value.

4. Finance and incentivize energy storage for customers and utilities. Incentives in the form of rebates, grants, and tax credits could enable customers to use storage to manage their electric load, store locally produced renewable energy, and provide a bridge to scalable deployment for storage. Incentives could be designed to decline as

storage values become more readily monetized. Policymakers could allow utilities that provide incentives to customers to recover the costs of installing smart meters. Furthermore, financing energy storage installations for commercial customers could help reduce their demand charges. A good place for policymakers to start is incentivizing solar system owners.

MAINSTREAMING RENEWABLES

As the renewable energy industry has matured, technology has improved, and global production of generating equipment has increased, renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). A 2018 Bloomberg New Energy Finance report predicts that at least 50% of total global electricity will be renewable by 2050. With increased deployment, utilities are learning more about how to integrate renewables effectively, investors are becoming more comfortable with the technologies, and building code officials are recognizing common standards and best practices. For these reasons, it is in the interests of policymakers to ensure that their states are well positioned to benefit from the transition to clean and sustainable energy resources.

To reduce barriers to customer and utility participation in the renewable energy market, Utah might consider several policy options.

Customer-Oriented Policies

1. Interconnection, net metering, and streamlined permitting – In general, customers want a clear, streamlined, affordable, and predictable system for connecting renewable energy systems to the grid. The PSC approved a settlement between RMP and solar advocates in 2017, which ended the state's net metering policy that credits customers at the full retail rate. The settlement instates a three-year transition period for new solar installers while RMP conducts a value-of-solar study, due to the PSC in 2020. Aggregated net metering is allowed in Utah, which is especially beneficial to the state's agricultural operations. Other applications for aggregated net metering include commercial properties and public entities like state and local governments, universities, and schools. The state might also consider establishing either statewide standards for streamlined permitting processes, or resources to support local governments that voluntarily implement a streamlined program. State incentives, such as tax credits, financial incentives, or loans can be tied to systems that are established within a designated streamlined permitting jurisdiction. A few counties have adopted expedited permitting for solar photovoltaics in conjunction with the University of Utah's community solar program.

2. Shared Renewables – Many customers are unable to install renewable energy technologies, especially wind and solar, due to building and property attributes and ownership issues. Allowing shared, or community, renewable energy projects addresses these barriers. These projects have multiple owners or subscribers who pay for a portion of the generation provided by the system. A number of community solar projects are underway in Utah. Lawmakers could consider offering tax credits to incentivize shared renewable energy projects. To expand program participation, the state might consider adopting a virtual net metering policy. Virtual net metering allows a customer to receive credits from a shared system as if the generation were on site. Virtual net metering is different from a power purchase agreement (PPA), which pays the customer for the proportion of power they produce. Because it is treated as a credit on the customer's bill, the customer can avoid the tax implications of a PPA payment - which can adversely affect the economics of the system (and may come as a surprise to the participant). Utah might consider requiring IOUs to incorporate community solar programs into their IRPs.

   Low credit ratings often deter participation in renewable energy markets; this can affect low- and moderate-income (LMI) households' adoption of renewable energy solutions. Supportive policies for shared renewables can be designed to encourage participation by LMI households; this can increase adoption of renewable technologies and reduce energy costs. Low-income participation can be ensured either through a percentage mandate for the overall annual contracted capacity, or by offering a higher rate of payment for the portion of shared solar capacity attributed to low-income customers. States that have a shared renewable program may want to coordinate this program with implementation of the federal Weatherization Assistance Program to provide recipients of assistance with participation in a shared renewable system.

   There are several additional policy options that Utah might consider to promote renewable energy uptake by low- and moderate-income consumers. Generally, successful state policies should be tailored to these customers,

be cost-effective and financially sustainable, have measurable performance indicators, and be flexible enough to allow later changes in design.

3. Corporate Procurement – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. In just the last four years, over nine GW of renewable contracts have been announced by corporate entities. In the first quarter of 2018 alone, corporations signed 14 agreements for over 1700 MW of renewable energy. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. Utah's policy environment is favorable toward corporate procurement; the state passed legislation in 2016 that authorizes "qualified utilities" to implement a renewable energy tariff. RMP's schedule 34 tariff is a "sleeved PPA" in which contracts are negotiated through the utility. Utah's policy allows companies to purchase RECs or renewable energy through green tariffs, own shares in community renewable energy projects, develop or lease onsite renewable energy projects, and enter into onsite third-party PPAs. The products available in Utah meet all six of the Corporate Renewable Energy Buyers' Principles. In addition, it is prudent to incorporate corporate renewable purchase commitments into the IRPs that utilities submit to regulators to plan for resource needs over multiple decades. By integrating these renewable purchase commitments into the IRP process, regulators can avoid over-building resources and stranding generation assets.

Utility-Oriented Policies

Some states have created programs that aim to reduce greenhouse gas emissions and increase investments in clean energy resources. States might see an emissions or clean peak standard as the next step in a progression from renewable portfolio standards (RPSs). Utah has a voluntary renewable portfolio goal of 20% of adjusted retail electricity sales by 2025, with no interim targets. The goal applies to IOUs, cooperatives, and municipal utilities, who must only procure renewable energy if the addition is cost-effective. To increase utility adoption of clean energy technologies, Utah's policymakers might consider the following:

1. Emissions standards can take a technology neutral approach that looks at the total emissions of the utility portfolio and drive emissions down with a combination of renewables, traditional fuels, efficiency, and technological advances. Emissions reductions can be achieved through 1) a carbon portfolio standard approach, or 2) a market-based approach. A portfolio emissions standard sets emissions reduction targets to be achieved over time. This can be implemented through the IRP process or by establishing a maximum allowable rate of emissions per unit. Under a market-based approach, a state or a group of states might set a certain emissions reduction target, for example, 20% below 1990 levels by 2040. This reduction is achieved by the distribution of annual emission allowances that decrease to the point that the standard is met in 2050. One of the advantages of a market-based program is that it is designed to reduce emissions in the most economically efficient manner possible. Such a standard can also address other concerns such as pollution, asthma risk, environmental justice and water use.

2. Clean Peak Standards aim to increase the share of clean energy resources used to meet peak demand and decrease energy bills over the long-term by reducing peak demand in the hours when energy costs are highest. These objectives can be met through different policy options including: planning and procurement that focuses on peak demand; a moratorium on the construction of new peaking units or a phase out of existing units; incentives – including carve-outs in states with RPSs – for clean energy resources delivered during peak times; and/or adopting a new clean peak standard that sets a target for clean energy deliveries during peak times.

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

An estimated 55% of new car sales will be electric by 2040 (Bloomberg New Energy Finance). Therefore, a key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of electric vehicles (EVs) to the grid. One of the most important barriers to increased adoption of EVs is the consumer's awareness of the availability of EV charging stations. Ultimately, drivers want to be sure that their car will get them where they need to go. Another important barrier to increased adoption of EVs is their higher up-front cost as compared to similar conventionally fueled vehicles. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety." See the U.S. Department of Energy's Alternative Fuels Data Center for a map of refueling locations for electric vehicles (as well as biodiesel, CNG, LNG, ethanol, and propane).

A few incentives for alternative-fuel vehicles are available from the state, including a tax reduction for purchasing certain cleaner-burning fuels, as well as a grant and loan program to support business and government entities in procuring alternative fuel vehicles and fueling and charging infrastructure. There are additional opportunities to develop policies to support the electrification of Utah's transportation sector:

1. EV and EVSE Financing and Financial Incentives – Providing additional financial incentives and innovative financing options can help spur greater market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing high up-front costs of EVs and EVSE. While sales tax credits are typically applied at the time of purchase, property and income tax credits may do less to address upfront cost barriers as the credit is not applied at the time of purchase.[5] States have adopted other financial incentives including low-interest loans, grants, vouchers and rebates. A handful of states qualify EVSE under their property assessed clean energy (PACE) programs. A simple solution is to increase and expand existing tax credits to incentivize commercial, publicly available charging stations. Utah does not have incentives for citizens to purchase EVs, but some incentives are available for customers of RMP. The utility offers a credit for participants in their time-of-use charging rate reduction pilot program, and they offer a limited incentive for the purchase of a Nissan Leaf. The state currently does not have EVSE incentives; however, RMP offers a rebate for non-residential and multifamily customers for EVSE purchases.

2. Charging Infrastructure Plan – Locating charging infrastructure is different from locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while a driver of a conventional vehicle stops only briefly at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are parked for a longer period of time, for example when going shopping, going to a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person will be at that location. Legislation could direct a state agency to develop such a plan through a stakeholder process. Utah's legislature approved new registration fees for EVs in the 2018 session. In Washington, a portion of each EV registration fee is used to fund charging infrastructure development across the state.

   Regional collaborations around the U.S. are emerging to coordinate the development of electric transportation infrastructure. Utah is one of eight signatories of the REV West Plan, a collaborative effort among western states to construct a regional EV charging corridor. The memorandum of understanding (MOU) intends to reduce transportation sector carbon emissions, bolster EV adoption, increase consumer awareness about the benefits of EVs, coordinate development of charging infrastructure, and incentivize manufacturing for EVs. Utah's policymakers have been supportive of utility efforts to build-out EV infrastructure in the state, for instance by enacting the Sustainable Transportation and Energy Act (STEP) of 2016, which established funding for EV pilot programs. Following STEP, RMP has implemented several programs to expand the EV market, including rebates for charging stations, time-of-use pricing options, and the construction of an EV charging corridor.

3. Parking Infrastructure Requirements – In tandem with the development of a statewide plan, legislation could set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop make-ready locations. These locations supply power to the point where a utility or third party developer might install an EV charging station. Utah's statewide building energy code could also be updated to include requirements for EV charging infrastructure.

NEWS

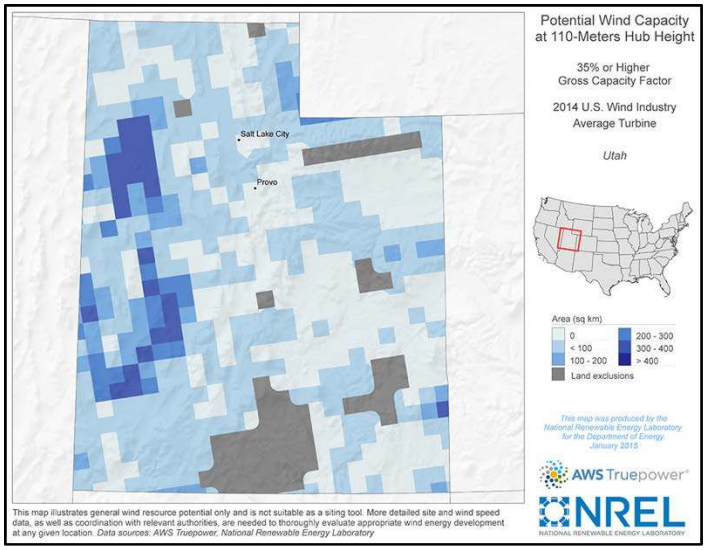
- August 26, 2018: After Surge Before New Rules, Solar Installations in Utah Slip 23%
- August 24, 2018: Western Utilities Want to Join Energy Imbalance Market
- August 16, 2018: Utah Legislative Interim Committee Begins Bill to Allow Renewable Energy Options
- July 5, 2018: Salt Lake City Joins Utah's C-PACE Financing Program for Building Efficiency
- June 29, 2018: 'Just What We Need': Utah Gets Electric Vehicle Corridor Along I-15, More Than 350 Charging Stations Statewide

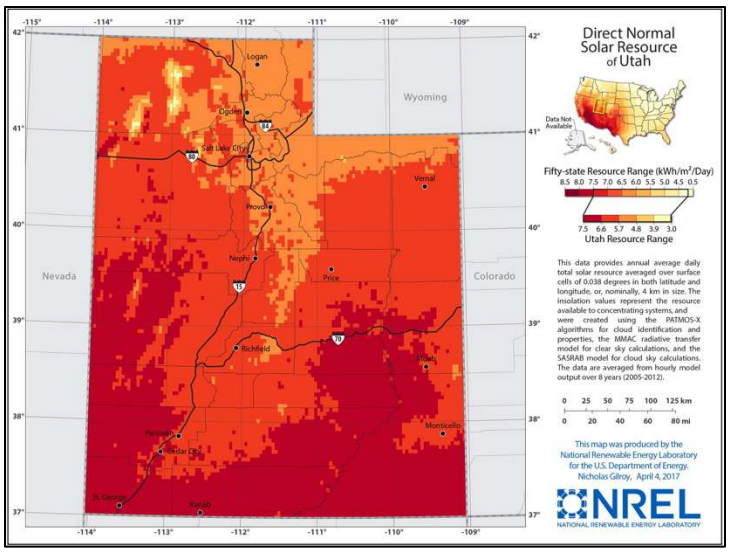
[5] A study by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

- June 28, 2018: DOE Selects Utah University Site for FORGE Geothermal Project
- June 27, 2018: New Renewables RFP Filed with Utah PSC
- June 14, 2018: Utah Will Launch a Major Geothermal Experiment with $140 Million in Federal Energy Grants
- June 13, 2018: This Utah Group Just Proved That Net Zero Energy Buildings Don't Have to be More Expensive
- June 11, 2018: Salt Lake City Manufacturer Taking Giant Steps in Energy Efficiency
- May 29, 2018: Rocky Mountain Power Seeks Bids for New Solar, Wind and Geothermal Projects in Utah, Estimated to Power 34,000 Homes
- April 17, 2018: Utah Clean Energy Launches New Initiative in Utah to Pave the Way for Cost-Effectively Integrating More Solar Energy
- March 30, 2018: REV West States Partner with NASEO to Advance Electric Vehicles
- March 29, 2018: Utah Governor Signs Trio of Solar Power Bills

UTAH'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/ut[6]
SOLAR https://www.nrel.gov/gis/solar.html





OTHER RESOURCES

- Utah Governor's Office of Energy Development: http://energy.utah.gov/
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Utah: https://database.aceee.org/state/utah
- The Database of State Incentives for Renewables and Efficiency, Utah: http://programs.dsireusa.org/system/program?fromSir=0&state=UT
- U.S. Energy Information Administration, Utah: https://www.eia.gov/state/?sid=UT
- U.S. Department of Energy's WINDExchange https://windexchange.energy.gov/states/ut for wind energy data and state ordinances.
- National Renewable Energy Laboratory Solar Resource Maps https://www.nrel.gov/gis/solar.html
- National Renewable Energy Laboratory Biomass Maps https://www.nrel.gov/gis/biomass.html
- U.S. Department of Energy's Alternative Fuels Data Center https://www.afdc.energy.gov/
- SPOT for Clean Energy, Utah: https://spotforcleanenergy.org/state/utah/
- Four Corners Wind Resource Center http://www.fourcornerswind.org/
- The GridWise Alliance, EVs - Driving Adoption, Capturing Benefits: http://gridwise.org/evs-driving-adoption-capturing-benefits/
- The Regulatory Assistance Project, Performance-Based Regulation: https://www.raponline.org/event/performance-based-regulation-the-power-of-outcomes-part-1/

[6] Please see your packet for a higher resolution wind energy capacity map.

Our Resources

CNEE Homepage: http://cnee.colostate.edu/

The SPOT for Clean Energy: https://spotforcleanenergy.org/

The Advanced Energy Legislation (AEL) Tracker: https://www.aeltracker.org/

Clean Energy Policy Guide for State Legislatures: http://cnee.colostate.edu/cleanenergypolicyguide/

The Energy Policy Podcast: http://energypodcast.colostate.edu/

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