

UTAHNS' VISION FOR 2050

# ENERGY



**Envision  
Utah**

*Your Utah,  
Your Future*



## TABLE OF CONTENTS

*Introduction*

**4**

*Vision for  
Energy*

**5**

*Where We Are  
Today*

**9**

*People and  
Process*

**13**

*Utahns' Values*

**17**

*Scenario  
Summaries*

**23**

*Survey Results*

**27**

*Recommended  
Strategies*

**37**



UTAHNS' VISION FOR 2050

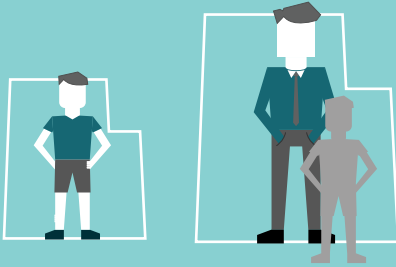
# ENERGY



YOUR UTAH, YOUR FUTURE

# PROCESS

## UTAH IS GROWING.



### TODAY

There are three million people living in Utah.

### 2050

By 2050 there will be 5.4 million—the population will nearly double in 35 years!

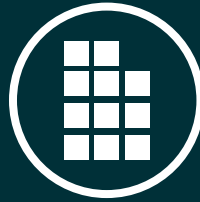
THAT MEANS

# 2 x the

HOMES    JOBS    SKIERS  
CARS    STUDENTS    FOOD

## OUR GOAL

HELP UTAHNS CREATE A VISION FOR UTAH'S FUTURE



### 11 TOPICS

Utahns' values guided the selection of 11 topics critical to the future of Utah.



### UTAHNS' VALUES

Values studies told us not just what Utahns care about, but why they care about those things.



### ACTION TEAMS

Experts from across the state studied the topics and helped shape potential scenarios for the future.

### SCENARIOS



### 8 ACTION TEAMS

OF 400 EXPERTS WORKED FOR 18 MONTHS TO DEVELOP POTENTIAL SCENARIOS FOR UTAH'S GROWTH ACROSS EACH TOPIC.

### YOUR UTAH, YOUR FUTURE SURVEY



### 53,000 UTAHNS

WEIGHED IN ON EACH TOPIC AND EACH SCENARIO, TELLING US WHAT THEY WANT UTAH TO LOOK LIKE IN 2050.

### VISION FOR 2050



### A COMBINATION

OF SURVEY RESULTS, VALUES, AND ACTION TEAM INPUT FORMED A VISION FOR UTAH'S FUTURE.

*Energy is a part of our daily lives, but Utahns don't take it for granted. Utahns want energy that is clean, affordable, and reliable.*

## INTRODUCTION

**ENERGY IS ESSENTIAL FOR POWERING AND HEATING UTAH'S HOMES AND BUSINESSES.** How much energy Utahns use and where that energy comes from can have significant impacts on household and business costs, on air quality and other environmental factors, and on the reliability of the energy supply. Utahns want low energy costs and cleaner air, so they can worry less about their health and finances, enjoy a higher quality of life, and have peace of mind. They desire to be better stewards of the environment by using fewer natural resources. They also want to limit their energy supply's vulnerability to disruption and ensure Utah can produce enough energy to meet its own needs.

**WHEN IT COMES TO ENERGY, UTAHNS WANT TO BALANCE DIVERSITY IN SUPPLY, CLEANER SOURCES, HIGHER EFFICIENCY, AND LOWER COSTS.** Currently, Utah uses natural gas for home and water heating, while the majority of the electricity generation comes from coal. However, as electricity generation moves away from coal due to environmental regulations, use of natural gas will increase. Utahns would like to draw from a diverse supply of energy sources, including more renewable forms of energy, while still using natural gas to provide the base load. In addition to diversifying Utah's energy supply, Utahns want to meet future energy needs, improve air quality, and save money through more conservation and energy efficiency in homes and buildings.

YOUR UTAH, YOUR FUTURE

# VISION FOR ENERGY

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## THE VISION

Utahns envision using energy that is clean, affordable, and reliable. They see a future where energy costs remain low for households and businesses. They also envision clean energy production, using natural gas and renewable sources that are produced responsibly. Utahns want to use the state's many and diverse energy resources to supply its own energy needs, without being susceptible to disruption. As Utah grows, Utahns envision a significant portion of future energy demand being met through energy efficiency and conservation.



## GOALS

- 1** Significantly reduce the amount of energy consumed by each Utahn.
- 2** Diversify energy sources by using Utah's many resources.
- 3** Improve energy self-sufficiency as the population grows.
- 4** Keep household and business energy costs low.
- 5** Limit environmental impacts of fuel and energy production where feasible.
- 6** Limit the amount of air pollution caused by energy production and consumption.
- 7** Build and maintain strong, diverse economies throughout the state, including in energy-producing areas.



## KEY STRATEGIES

- 1** Increase energy conservation and efficiency.
- 2** Transition to natural gas and renewable sources as coal is phased out due to environmental regulations.
- 3** Expand use of renewable energy sources but not to a point where energy storage for renewables dramatically increases cost.
- 4** Promote economic development and self-sufficiency by expanding responsible development of fossil fuel and renewable energy sources.

For more details on these and other strategies, see the Recommended Strategies section beginning on p. 37.

BACKGROUND:

# WHERE WE ARE TODAY

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## **ENERGY HAS A WIDE-RANGING IMPACT ON UTAH'S PROSPERITY AND QUALITY OF LIFE.**

Energy expenses contribute to Utahns' cost of living and their ability to save money or spend it on other needs. Air quality and environmental health are affected by energy production and consumption. If energy supplies are not reliable, energy disruptions are more likely to occur and have detrimental effects on Utahns' businesses and lives. In addition, energy development and production can provide Utah with more jobs and tax revenue.

Utah is an energy-rich state. The state has reserves of natural gas and coal, as well as the potential to generate renewable energy supplies from solar, wind, and geothermal sources. Because Utah produces more energy than it consumes, surplus energy is exported. In 2011, 31% of all energy produced in Utah was exported, including 27% of the state's generated electricity. The Utah Office of Energy Development estimates that in 2013, the market value of Utah's energy sources and renewable electricity was \$5.3 billion.

Most Utah communities are customers of Rocky Mountain Power and receive their electricity from power generation facilities in several states. Currently, the price of residential electricity in Utah is among the

lowest in the nation at about 10.72 cents per kilowatt hour (kWh). In comparison, the price for electricity is 17.05 cents/kWh in California and 19.46 cents/kWh in New York. Our comparatively low energy costs keep household costs low and make the state attractive to businesses and industries.

As Utah's population doubles, its energy needs will increase. Utah will likely use significantly more natural gas for electricity, for space and water heating in homes and commercial buildings, and for industrial uses. How much we diversify our energy mix and develop alternative resources will affect energy reliability, household costs, economic development, and, of course, the environment.

### **COAL**

Today, most of Utah's electricity is generated from coal-fired power plants, but Rocky Mountain Power is increasing the use of other energy sources like natural gas and renewables such as wind and solar. No coal-fired power plant has been built in Utah in the last quarter century. There are no plans to build any new coal plants, and those that exist are planned to be retired or renovated to operate on natural gas. Power plants fired by fossil fuels are currently the largest source of carbon-dioxide (CO<sub>2</sub>) emissions in the U.S., accounting for 38% of the U.S.'s total greenhouse gas emissions in 2013. Natural gas plants produce substantially less CO<sub>2</sub> emissions than do coal plants.

## NATURAL GAS

The natural gas industry in Utah is growing, partly because the electric power sector is transitioning away from coal. Utah ranked tenth in the nation in natural gas production in 2012. Of the natural gas consumed in Utah in 2013, the residential sector used 35%, electric power generation used 25%, the commercial sector used 21%, and the industrial sector used 19%. The price of natural gas in Utah remains low compared to the rest of the nation, with residential natural gas costing an average of \$8.55 per thousand cubic feet in 2013.

## RENEWABLES

Utah has excellent potential to develop energy from a variety of renewable sources, many of which are concentrated in the southern part of the state. Renewable energy sources currently provide a small percentage of the state's total net electricity generation—less than 4%—but Utah has a voluntary Renewable Portfolio Standard, which says that by 2025, 20% of retail electricity sales should come from cost-effective, renewable sources.

- Utah has great solar resources, particularly in the southern part of the state. Today, solar energy is primarily produced through distributed generation (meaning it is made at the same site it is used) in the form of solar panels on homes and other buildings. Though solar power currently represents a small

fraction of Utah's electricity generation, there is significant potential for larger, utility-scale projects. The Bureau of Land Management has identified three solar energy zones suitable for energy production in Beaver and Iron Counties.

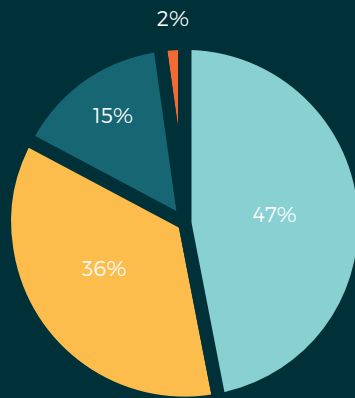
- Utah has several utility-scale wind projects. The best wind resources are concentrated in the southwest, but other locations scattered throughout the state have good, though limited, potential to produce wind energy.
- Utah is one of just six states with developable, utility-scale geothermal resources. Utah currently has about 70 megawatts of geothermal capacity installed. Drilling to confirm that the resources can be developed into energy could be expensive, however, so future development may be modest.
- While hydroelectric facilities currently generate the largest percentage of renewable energy used in Utah, new hydro projects are unlikely to be developed further because of environmental concerns. However, there is some potential for small "micro-hydro" projects to generate power in canals, water lines, or other water sources.

## NUCLEAR

The Utah Office of Energy Development is evaluating the state's potential to produce nuclear energy, while considering factors such as safety, water needs, waste disposal, size of the plant, rail access, transportation of spent nuclear fuel, and public perception.

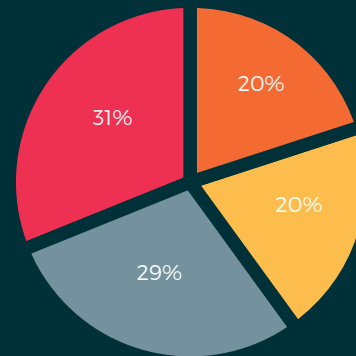
## ENERGY SOURCES AND CONSUMPTION

*What energy sources we use in Utah*



- Natural Gas
- Coal
- Crude Oil
- Hydroelectric, wind, geothermal, biomass, solar

*Who uses our energy in Utah*



- Residential
- Transportation
- Industrial
- Commercial

Source: U.S. Energy Information Administration

HOW WE CREATED A VISION:

# PEOPLE AND PROCESS

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**TO CREATE A VISION FOR THE FUTURE OF ENERGY IN UTAH, A TEAM OF EXPERTS GATHERED OVER A TWO-YEAR PERIOD TO SHARE KNOWLEDGE AND EXTENSIVELY RESEARCH AND DISCUSS OPTIONS.**

Members of the Energy Action Team were selected by Governor Gary Herbert and Envision Utah to represent a spectrum of professional experience and political affiliations. Team members included utility experts, legislators, and other energy specialists from across the state. From 2013 to 2015, the action team met to identify Utahns' choices related to energy, create scenarios for public input, and synthesize a vision for the future. The process of creating this vision also included the following components:

- 1 A 2014 values study. This study was conducted by Heart+Mind Strategies to identify (1) what factors Utahns view as affecting their quality of life the most and (2) the underlying emotions and values tied to those factors. The study concluded that Utahns want the cost of energy to be low but are also concerned about how energy production and consumption will affect the air quality and environment. (More information on the values study can be found in the Utahns' Values section on p. 17.)
- 2 The "Build Your 2050 Utah" web app. This app allowed Utahns to identify what factors concerning energy are most important to them and to visualize in an interactive module the effect certain decisions would have. More than 3,000 people across Utah gave input through the app, and the information gathered indicates that Utahns want to:
  - a) Lower carbon emissions.
  - b) Increase energy efficiency and conservation measures.
  - c) Set aside land for future substations, transmission lines, and other infrastructure.
  - d) Do more to reduce their personal use of energy.
- 3 Analysis and projections. Using the best information currently available, analysis was conducted to model possible effects resulting from changes to Utah's energy source mix.

The action team used this information to create three different scenarios for the future of energy in Utah. The three scenarios differed in the amounts of natural gas, renewables, and nuclear power used to generate electricity. These variations resulted in changes to household costs, pollutants, amount of water used, need for energy storage, and other outcomes. These scenarios (p. 23) were presented to the public in the Your Utah, Your Future survey in spring 2015, and 52,845 Utahns weighed in.

After receiving public input on the three energy scenarios, the action team met to frame a vision, including goals and strategies, to achieve what Utahns said they wanted for energy in 2050.

# ACTION TEAM MEMBERS

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## CHAIRS



**RONALD W.  
JIBSON**

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*President and CEO,  
Questar Corporation*



**RICHARD  
WALJE**

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*President and CEO,  
Rocky Mountain Power*



**Ron Allen**

*Utah Public Service Commission*

**Roger Barrus**

*Utah House of Representatives*

**Michele Beck**

*Utah Department of Commerce*

**Robert Behunin**

*Utah State University*

**Josh Brown**

*Rio Tinto*

**Ken Bullock**

*Utah League of Cities and Towns*

**Bob Dalley**

*Deseret Power*

**Lincoln Davies**

*University of Utah*

**Gene Davis**

*Utah Senate*

**Jeff Duncan**

*Anadarko Petroleum Corporation*

**Bryson Garbett**

*Garbett Homes*

**Jennifer Gardner**

*Utah Office of Energy Development*

**David Hinkins**

*Utah Senate*

**Doug Hunter**

*Utah Associated Municipal Power Systems*

**Scott Jenkins**

*Utah Senate*

**Samantha Julian**

*Utah Office of Energy Development*

**Tammie Lucero**

*Uintah County Economic Development*

**Laura Nelson**

*Utah Office of Energy Development*

**Curt Oda**

*Utah House of Representatives*

**Chris Parker**

*Utah Division of Public Utilities*

**Selma Sierra**

*Utah State University*

**Amanda Smith**

*Utah Department of Environmental Quality*

**Todd Stevens**

*Renewable Tech Ventures*

**Chad Teply**

*Rocky Mountain Power*

**Kevin Van Tassell**

*Utah Senate*

**Alan Walker**

*Utah Science, Technology, and Research*

**Sarah Wright**

*Utah Clean Energy*

WHY ENERGY MATTERS:

# UTAHNS' VALUES

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In 2014, Envision Utah conducted a statewide values study to identify (1) what factors Utahns view as affecting their quality of life the most and (2) the underlying emotions and values tied to those factors.

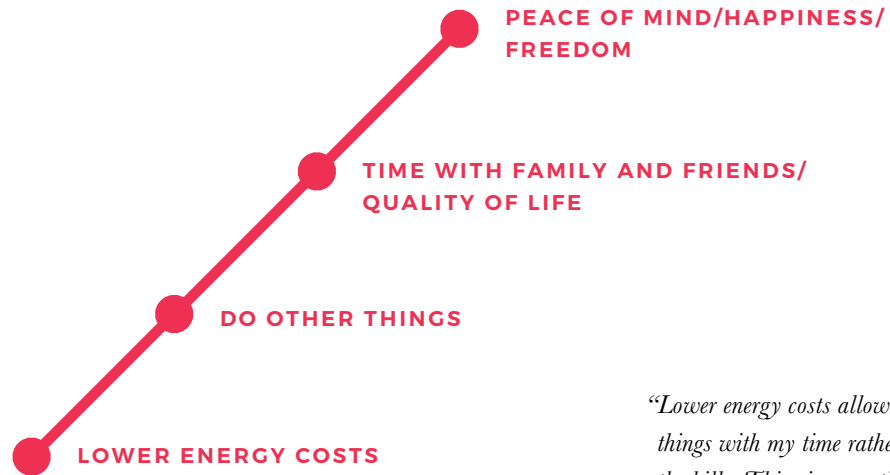
**UTAHNS WANT  
ENERGY THAT IS  
CLEAN, AFFORDABLE,  
AND RELIABLE.**

Utahns value low energy costs. Lowering household energy costs allows Utahns to save money or spend more on other needs and to decrease the amount of time spent working to earn money to pay bills. Working less and saving money, in turn, gives Utahns more time to do activities they enjoy, such as spending time with families and friends. Ultimately, affordable energy contributes to Utahns having a higher quality of life and a greater degree of happiness and peace of mind.

Utahns also value alternative or renewable energy sources that use fewer natural resources and contribute to cleaner air and a cleaner environment. Using renewable resources not only allows Utahns to feel like better stewards, but clean air and a clean environment also contribute to better physical and mental health.

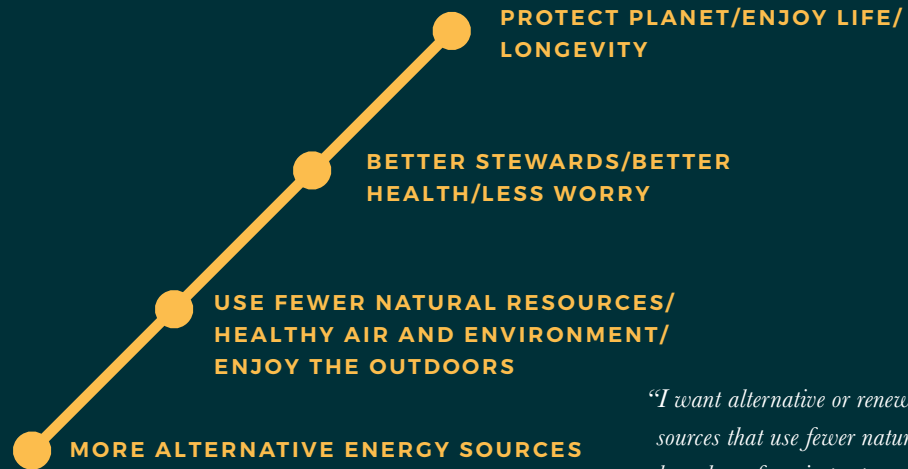
In addition, rural residents link energy production to economic development and an affordable cost of living, which in turn lead to the development of stronger communities and increased opportunities for their children to stay in Utah. This also contributes to a sense of financial and personal security.

## ENERGY AND PEACE OF MIND



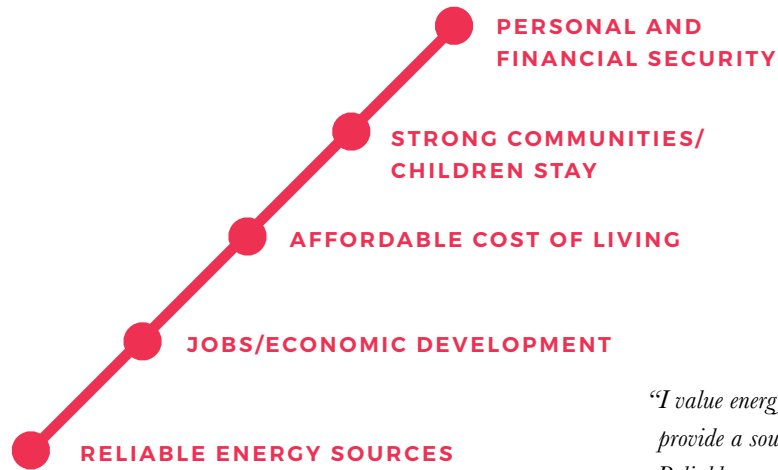
*“Lower energy costs allow me to do other things with my time rather than work to pay the bills. This gives me time to spend with family and friends and improves my quality of life, ultimately giving me a sense of freedom, happiness, and peace of mind.”*

## ENERGY AND STEWARDSHIP



*"I want alternative or renewable energy sources that use fewer natural resources and have less of an impact on air quality and the environment. This makes me feel like a better steward so I worry less about my health and the health of my state."*

## ENERGY AND RURAL SECURITY



*“I value energy sources that are reliable and provide a source of economic development. Reliable energy leads to an affordable cost of living and strong communities, which give me a sense of personal and financial security.”  
(This value is particularly strong in rural Utah.)*



CHOICES FOR THE FUTURE:

# SCENARIO SUMMARIES

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The following scenarios were created by the Energy Action Team to represent possible outcomes for energy in 2050. The primary variable that was modified in each scenario was the source mix for electricity generation. The percentage of energy generated from natural gas, renewables, and nuclear was adjusted in each scenario, resulting in changes to household costs, pollutants, amount of water used, need for energy storage for

renewables, and other outcomes. Because the action team could not foresee a future with significant power production from coal, none of the scenarios included substantial coal-fired electrical generation. The scenarios were presented to the public as part of the Your Utah, Your Future Survey in the spring of 2015.

The scenarios were titled Allosaurus, Bonneville Trout, Seagull, Quaking Aspen, and Segó Lily (the state fossil, fish, bird, tree, and flower).

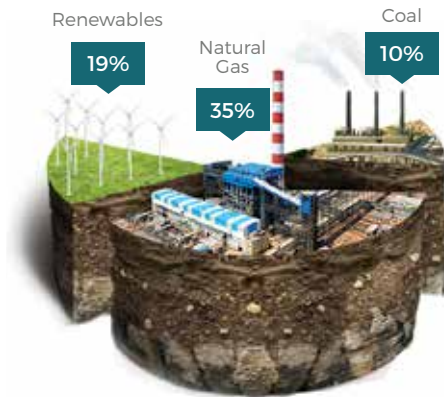
43% OF UTAHNS SELECTED THE SCENARIO PRESENTED IN ALLOSAURUS, BONNEVILLE TROUT, AND SEAGULL.



## ALLOSAURUS, BONNEVILLE TROUT, AND SEAGULL SCENARIO

*Natural gas, some renewables*

30% less electricity use per person  
3% increase in household cost



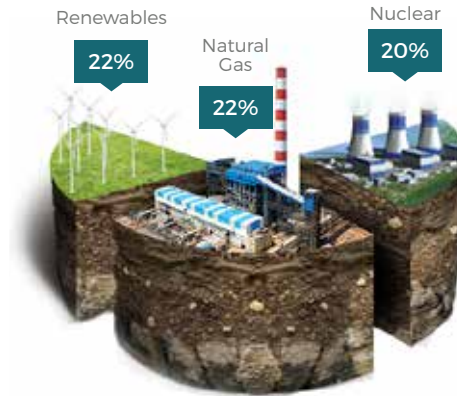
By 2050, the primary source of our electricity transitions from coal to natural gas due to environmental rules concerning emissions from coal-fired power plants. Utahns use 30% less electricity per person than today as a result of energy efficiency and conservation measures. Natural gas produces about half of the electricity we use, and renewables, such as wind and solar, increase to about a fourth. This scenario reflects Rocky Mountain Power's most recent projections and is based on the most economical resource mix.

- Household costs remain low; only 3% increase from what we pay today
- 42% decrease in carbon dioxide emissions
- 29% decrease in air pollutants such as NO<sub>x</sub> and SO<sub>2</sub> (emissions primarily occur outside Wasatch Front.)
- 76% decrease in the amount of water used to produce electricity
- Heavier reliance—natural gas—makes us susceptible to energy supply disruption and price spikes

## QUAKING ASPEN SCENARIO

*Natural gas, renewables, nuclear*

30% less electricity use per person  
12% increase in household cost



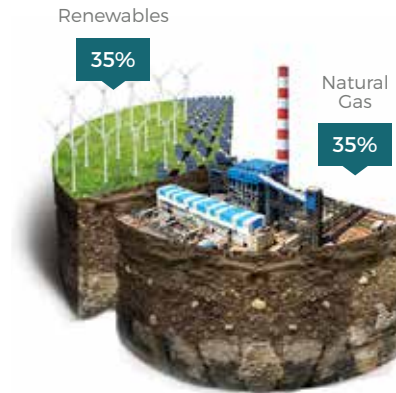
By 2050, Utah is as self-reliant as possible and produces most of the energy that we consume. Renewable energy sources, nuclear power, and natural gas each produce about a third of our electricity. Because we produce energy locally and from a variety of sources, we are better able to withstand fluctuations in energy supply and cost. By 2050, Utahns are using 30% less electricity per person than they are today as a result of energy efficiency and conservation measures.

- Household costs are slightly higher; 12% increase from what we pay today
- 65% decrease in carbon dioxide emissions
- 82% decrease in air pollutants such as NO<sub>x</sub> and SO<sub>2</sub> (emissions primarily occur outside Wasatch Front.)
- 20% decrease in the amount of water used to produce electricity
- More diverse fuel sources make Utah less susceptible to supply disruption and price spikes
- Transportation and storage of hazardous nuclear waste required
- Land needed for new power transmission line corridors

## SEGO LILY SCENARIO

*Renewables, natural gas, energy storage*

30% less electricity use per person  
58% increase in household cost



By 2050, the amount of our electricity produced by wind, solar, geothermal, and other renewable sources increases to about half, while natural gas provides the other half. Because renewable sources like wind and solar are intermittent (the wind doesn't always blow and the sun doesn't always shine), we must store the energy through batteries, compressed air energy storage, etc. Energy storage is relatively limited, expensive, and inefficient today but may improve in the future as technology develops. By 2050, Utahns are using 30% less electricity per person than they are today as a result of energy efficiency and conservation measures.

- Household costs increase significantly; 58% increase from what we pay today
- 54% decrease in carbon dioxide emissions
- 76% decrease in air pollutants such as NO<sub>x</sub> and SO<sub>2</sub> (emissions primarily occur outside Wasatch Front.)
- 83% decrease in the amount of water used to produce electricity
- More land needed for wind and solar farms
- More diverse fuel sources make Utah less susceptible to supply disruption and price spikes.
- Land needed for new power transmission line corridors

YOUR UTAH, YOUR FUTURE

# SURVEY RESULTS

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In April and May 2015, 52,845 Utahns shared their voice through the Your Utah, Your Future survey. Participants chose their favorite scenarios for energy and other topics. After choosing their favorite scenarios, survey participants had the option to answer a series of questions to prioritize energy among other issues, determine the most important outcomes of energy generation, and identify how willing they would be to accept certain tradeoffs for different sources of energy. The survey results were cross-checked against a random-sample survey to ensure they represented the desires and opinions of Utahns.

1

## WHAT UTAHNS WANT FOR ENERGY

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More Utahns chose the scenario presented in Allosaurus, Bonneville Trout, and Seagull than chose any other scenario. This scenario emphasized low cost and a reliance on natural gas, though it also included using substantially more renewable energy than today. A significant number also chose the Quaking Aspen scenario, which included an energy mix of not only natural gas and renewables, but also nuclear power. Fewer were interested in the Segó Lily scenario, in which renewables increased to about half of Utah's energy sources, requiring energy storage and therefore significantly increasing costs.

2

## WHY UTAHNS WANT IT

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Utahns want energy that is clean, reliable, and affordable. Utahns placed most importance on minimizing air pollution, followed by minimizing CO<sub>2</sub> emissions and limiting our vulnerability to supply disruption. Though household cost was a key factor in which scenario people voted for, limiting household costs was ranked the fourth most important outcome by the 52,845 survey participants. Respondents to the random-sample survey, however, ranked limiting household costs second, not fourth.

Rural residents were more concerned about vulnerability to supply disruption than they were about any other outcome.

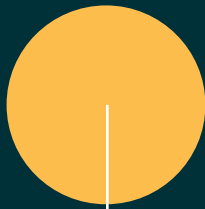
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## WHAT UTAHNS ARE WILLING TO DO

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Utahns are willing to have a diverse energy portfolio that balances all the benefits and concerns of energy production. They are willing to use more of Utah's land for renewable energy production and for natural gas wells as long as it's done in an environmentally responsible manner. However, Utahns are not willing to have more air pollution and CO<sub>2</sub> emissions, and they are very unwilling to be vulnerable to energy supply disruptions or price spikes caused by an over reliance on a single energy source. They are also hesitant to incur significant energy storage costs resulting from much higher renewable energy production. Lastly, Utahns are unwilling to accept nuclear energy because of the risks of accidents and waste storage.

## WHAT UTAHNS WANT



**43%**

*Natural gas and renewables;  
3% cost increase*

Allosaurus, Bonneville  
Trout, and Seagull



**36%**

*Natural gas, renewables, and  
nuclear; 12% cost increase*

Quaking Aspen

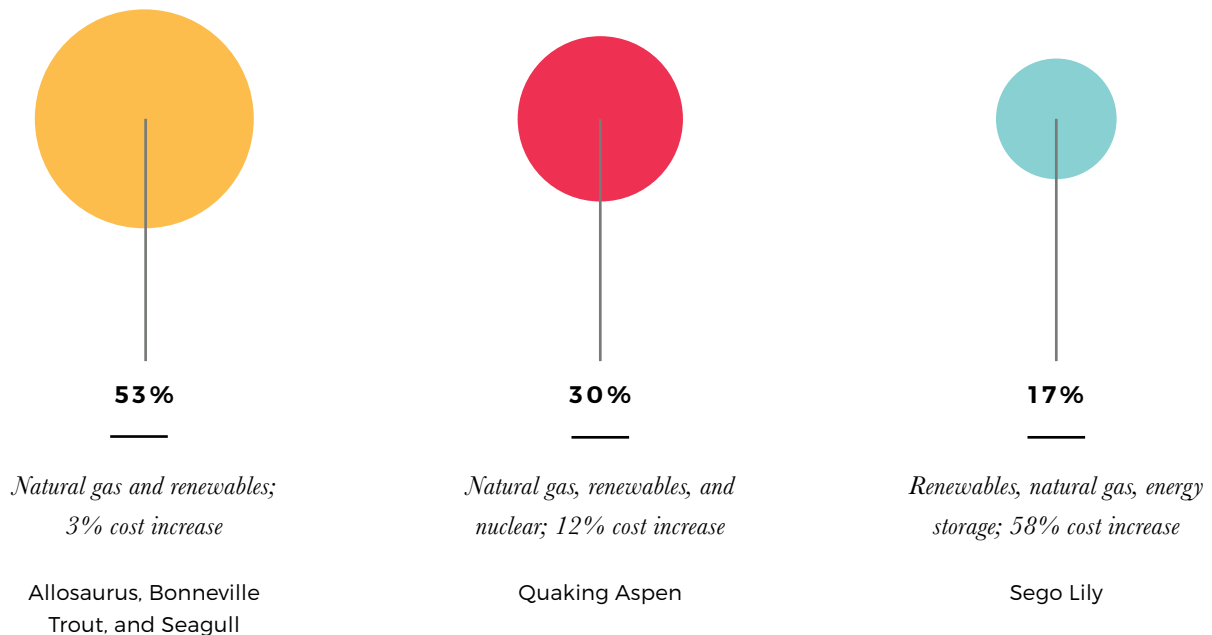


**23%**

*Renewables, natural gas, energy  
storage; 58% cost increase*

Sego Lily

## WHAT UTAHNS WANT (RANDOM-SAMPLE RESULTS)

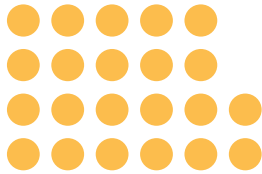


A random-sample survey of 1,264 Utahns was also conducted as part of the 52,845 public responses. The public responses and the random-sample survey results were virtually identical across all topics. However, in the random-sample survey, the preference for the Allosaurus, Bonneville Trout, and Seagull energy scenario increased from 43% to 53%.

In addition, in the larger outreach survey, rural residents chose the energy scenario in Allosaurus, Bonneville Trout, and Seagull in a greater amount (52%) than those in urban or semi-rural areas.

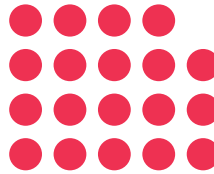
## WHY UTAHNS WANT IT (OR WHAT OUTCOMES UTAHNS EXPECT FROM ENERGY)

Survey participants were asked to allocate 100 points across these outcomes based on which they considered most important.



22%

*Minimizing how much air pollution happens (primarily outside the Wasatch Front) when we produce electricity*



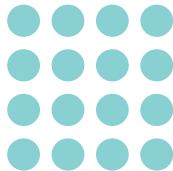
19%

*Minimizing how much carbon dioxide (a greenhouse gas that is implicated in climate change) is emitted when we produce electricity*



17%

*Limiting our energy supply's vulnerability to disruption*



16%

*Limiting how much each household needs to spend for energy*



15%

*Minimizing how much water we use to produce electricity*



12%

*Ensuring nuclear power production doesn't happen in Utah*

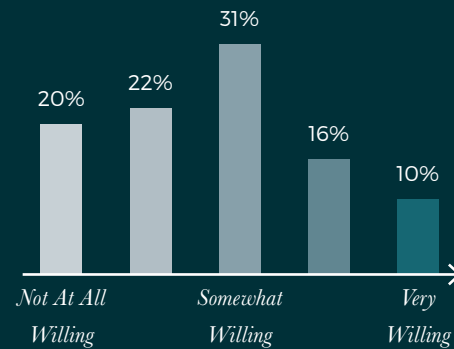


## WHAT UTAHNS ARE WILLING TO DO TO INCREASE NATURAL GAS PRODUCTION

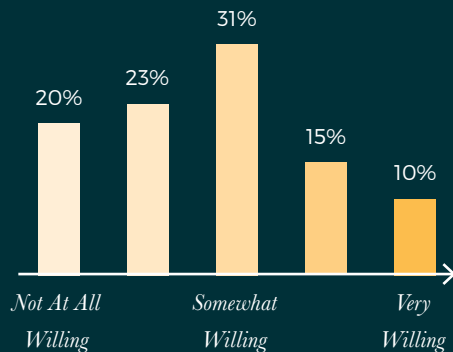
*More land will need to be used for natural gas wells, which have environmental impacts.*



*There will be more air pollution emissions in rural Utah (where the energy is produced) than if we used other energy sources, but fewer than today, because today we are primarily using coal for electricity.*



*There will be more carbon dioxide emissions than if we used other energy sources, but fewer than today, because today we are primarily using coal for our electricity.*

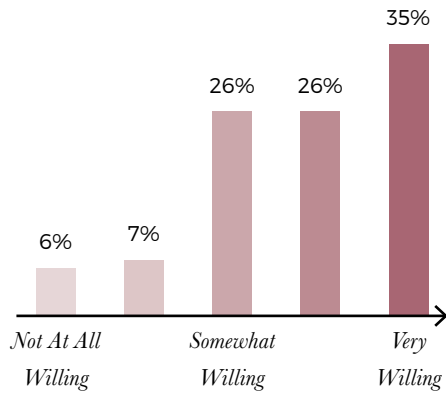


*We will be vulnerable to supply disruption/price spikes because of reliance on a single energy source that is shipped throughout the country.*

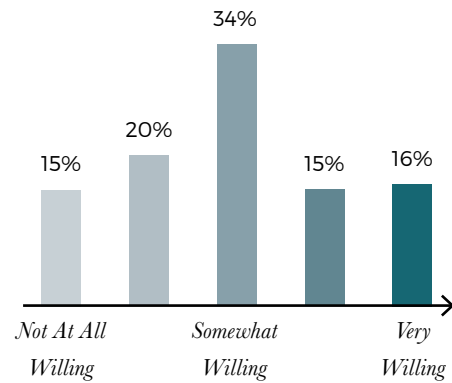


## WHAT UTAHNS ARE WILLING TO DO TO INCREASE RENEWABLE ENERGY PRODUCTION

*We will need to use some of our land for renewable energy production facilities like wind and solar farms, which will have environmental impacts.*



*Household energy costs will increase.*

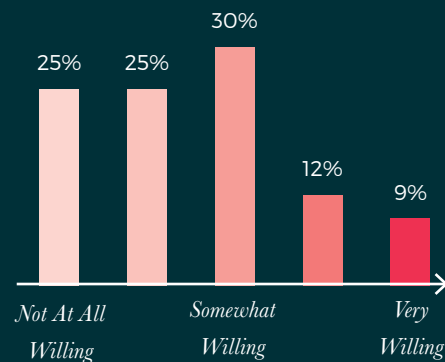


## WHAT UTAHNS ARE WILLING TO DO FOR NUCLEAR POWER PRODUCTION

*There will be some risk of a nuclear accident, as well as the need to store nuclear waste.*

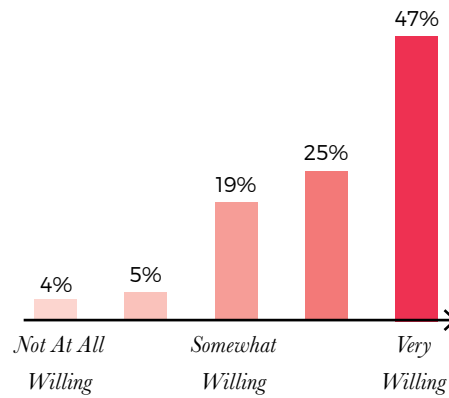


*We will use more water to produce our electricity, which means we will have to spend more on water storage and delivery infrastructure, which create environmental impacts.*

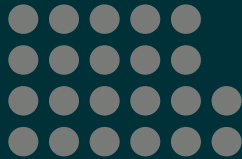


## WHAT UTAHNS ARE WILLING TO DO TO IMPROVE AIR QUALITY THAT WOULD AFFECT ENERGY USE

*Build energy efficient homes and businesses with less polluting appliances and higher upfront cost but with overall savings.*

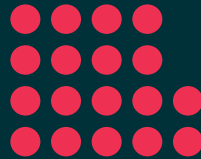


## OUTCOMES UTAHNS EXPECT FROM PUBLIC LANDS THAT IMPACT ENERGY PRODUCTION



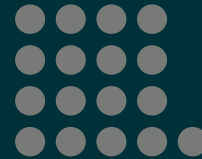
22%

*Maintaining and improving ecosystem/watershed health*



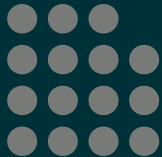
18%

*Ensuring Utah can produce enough energy to meet its own needs*



17%

*Ensuring we have access for low-impact recreation\**



15%

*Maximizing statewide jobs/economic development*



11%

*Ensuring public lands are available for grazing/agriculture*



11%

*Maximizing rural Utah jobs/economic development*



6%

*Ensuring we have access for high-impact recreation*

*\*For complete results, see Public Lands*

REALIZING THE VISION:

# RECOMMENDED STRATEGIES

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## 1 Continue to encourage and expand conservation and energy-efficiency measures.

- a) Encourage people to conserve energy by turning off lights, unplugging appliances, adjusting thermostats, etc.
- b) Reduce the amount of heat that is lost or gained through windows, doors, roofs, and walls.
- c) Improve energy efficiency of features in homes and businesses, including:
  - Lighting fixtures and controls
  - Heating and air conditioning systems
  - Water heating systems
  - Appliances
- d) Provide incentives to residential, business, and industrial consumers to take greater conservation and energy-efficiency measures.

## 2 Continually implement, revise, and update the state's strategic energy plan.

- a) Continue to develop a broad and balanced mix of energy sources that makes use of Utah's many resources.
- b) Integrate and optimize approaches to balancing energy production and demand.
- c) Address the integration of distributed electricity production (generated at the site of use) and utility-scale production (generated on a larger scale for utility buyers).

### SOME BENEFITS OF ENERGY EFFICIENCY AND CONSERVATION:

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- Reduces the amount of energy consumed
- Reduces energy costs for homes and businesses
- Lowers air emissions

- 3 As power companies use less coal due to environmental regulations, continue to transition to cleaner-burning natural gas to provide the base load.**
  - a) Pursue economic development opportunities to mitigate the negative economic impacts of transitioning away from coal.
  - b) Explore technology improvements that allow coal to be used in environmentally sensitive ways.
- 4 Encourage the development of utility-scale renewable energy resources (wind, solar, geothermal, etc.) where appropriate based on cost and location.**
- 5 Continue to encourage private investment in distributed renewable energy generation (e.g., using solar or other technologies to power homes or businesses), and find fair and appropriate ways to pay public infrastructure costs.**
- 6 Explore storage options for both distributed and utility-scale energy generation.**
  - a) Pursue energy storage if it can be done economically.
  - b) Encourage technology improvements that reduce the cost of energy storage.



**7 As neighborhoods, towns, and cities grow with the increase in population, plan ahead and preserve corridors and sites that will be needed for future infrastructure, including electrical transmission lines, pipelines, etc.**

- a) Use population projections and growth trends to determine where development is likely to occur and how much demand for energy there will be.

**8 Develop one or more net-zero pilot communities to test the functionality and economic impact of having communities with greatly reduced energy needs.**

- a) Find an acceptable location to develop such a community.
- b) Design a community with strong environmental attributes and distributed energy resources.
  - Build homes with built-in and integrated rooftop solar, battery storage, high-efficiency HVAC, and fast electric-vehicle charging.
  - Include maximum energy efficiency techniques and equipment.
  - Use low-water landscaping.
- c) Include community solar and battery storage as part of community design.
- d) Develop the net-zero community as a mixed-use center, reducing travel demand; increasing access to jobs, shopping, and amenities; and providing alternative modes of transportation.

**SOME BENEFITS OF PRESERVING CORRIDORS AND SITES FOR FUTURE UTILITIES:**

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- Reduces costs and makes implementation easier
  - Increases awareness for residents and property owners, so they know what to expect as their communities change and grow
  - Helps reduce the negative effects of implementing new infrastructure and facilities
  - For an example of electrical infrastructure planning, see “Powering Our Future: Salt Lake County Electrical Plan - Local Planning Handbook”





