



Executive Summary

Utahns want a clean, affordable, and resilient energy supply.

- **Current circumstances:**
 - Utah's low energy cost is important to Utahns, helping to keep the cost of living low and attracting businesses to the state.
 - Today Utah uses mostly coal to supply the state's electricity, but utility companies are gradually shifting to natural gas and renewables.
 - Utah has abundant energy resources.
- **Survey findings:**
 - Utahns want Utah to be self-sufficient for energy and do not want to be vulnerable to price or supply shocks.
 - Utahns want to shift to more renewables (wind, solar, etc.), but not to the point where expensive energy storage is required; instead, Utahns want to use natural gas as the base power supply to keep costs reasonable.
 - To do that, Utahns are willing to:
 - Use more land for renewables
 - Use more land for natural gas wells, but in a cautious way that is sensitive to environmental concerns

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The energy & disaster resilience action team worked for 18 months to create scenarios for the future of energy in Utah.

Energy Action Team

2013

Envision Utah and Governor Herbert invited energy experts from across the state to join the *Your Utah, Your Future* action team for those topics. The team has **51 members** from the legislature, industry, local businesses and government, advocacy groups, research institutions, and other organizations. The task force is facilitated by Envision Utah.

Utah Quality of Life Values Study

2014

The study concluded that Utahns are cost conscious concerning energy, but also concerned about the environmental and air quality impacts of energy production and consumption.

Your Utah, Your Future Scenarios & Choices

2015

The action team worked for **18 months** to research and model what Utah's energy future could be like in 2050 under various assumptions. They created **three scenarios** based on different strategies and outcomes for energy production and sources. Based on the public's responses in the *Your Utah, Your Future* survey, the action team will create a vision for Utah's energy future.



Energy & Disaster Resilience Action Team Members

Action team members were selected by Governor Gary Herbert and Envision Utah to represent a spectrum of experience and political persuasions. All action team members were invited to participate by Governor Herbert.

- **Richard Walje, Rocky Mountain Power***
- **Ronald W. Jibson, Questar Corporation***
- **Lisa Sun, BYU Law School***
- Ron Allen, Utah Public Service Commission
- Roger Barrus, Utah State House
- Lane Beattie, Salt Lake Chamber
- Michele Beck, Utah Department of Commerce
- Robert Behunin, Utah State University
- Greg Bell, Utah Hospital Association
- Josh Brown, Rio Tinto
- Scott Brown, Questar Gas
- Lonnie Bullard, Jacobsen Construction
- Ken Bullock, Utah League of Cities and Towns
- Mark Compton, Utah Mining Association
- Bob Dalley, Deseret Power
- Lincoln Davies, University of Utah
- Gene Davis, Utah State Senator
- Jason Davis, UDOT Director of Operations
- Spencer P. Eccles, Governors Office of Economic Development
- Jeff Edwards, EDC Utah
- Bryson Garbett, Garbett Homes
- Kris Hamlet, Utah Department of Public Safety
- David Hinkins, Utah State Senator
- Doug Hunter, UAMPS
- Scott Jenkins, Utah State Senator
- Samantha Julian, Office of Energy Development
- Becky Lockhart, Utah State House
- Tammie Lucero, Uintah County Economic Development
- Laura Nelson, Potash Ridge
- Curt Oda, State Representative
- Chris Parker, Utah Division of Public Utilities
- Amy Shingleton, Rocky Mountain Power
- Selma Sierra, Utah State University
- Amanda Smith, Utah DEQ
- Colonel Keith Squires, Utah Division of Emergency Management
- Todd Stevens, Renewable Tech Ventures
- Chad Teply, Rocky Mountain Power
- Kevin VanTassell, Utah State Senator
- Alan Walker, USTAR
- Judy Watanabe, Utah Emergency Management
- Sarah Wright, Utah Clean Energy
- Robert McIntyre, Walgreens
- John Hill, Utah Petroleum Marketers & Retailers Association
- Ann Allen, Intermountain Healthcare
- Jeff King, Jordan Valley Water Conservancy District
- Chris Siavrakas, Utah Department of Transportation
- Marty Shaub, U of U / Environmental Health & Safety & Emergency Management
- Debbie Kim, Intermountain Center for Disaster Preparedness
- Edward Francis, Utah Hospital Association
- Michael Vaughan, Rio Tinto Kennecott
- Glenn Blackwelder, UDOT

*Action Team Co-Chair

Your Utah, Your Future Background

In Need of a Solution

Projections show that Utah's population will nearly double by the year 2050. The *Your Utah, Your Future* survey was designed for Utahns to create a vision for the State of Utah for the next 35 years.

Identifying the Issues

Envision Utah performed a values study to understand **what** Utahns care about regarding the future and **why** those issues are personally important to them. The study identified eleven key issues: agriculture, air quality, recreation, disaster resilience, public lands, transportation and communities, housing and cost of living, education, energy, jobs and economy, and water.

Identifying Choices and Trade-offs

Four-hundred Utah experts worked in eight task forces to identify Utah's choices for each of the 11 topics. **The information and options in the survey were the direct findings of these taskforces.**

Choosing a Future

The *Your Utah, Your Future* survey was designed to prioritize issues and their associated outcomes in order to make strategic decisions for Utah's future. Nearly 53,000 people weighed in on the future that they want to create in 2050.

The Challenge:

By 2050, Utah's population will nearly double in size. Utah will not.



TODAY THERE ARE

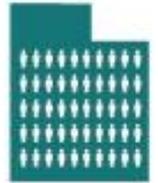
2,900,000

PEOPLE IN UTAH

BY 2050 THERE WILL BE

5,400,000

PEOPLE IN UTAH



The *Your Utah, Your Future* survey asked Utahns to indicate their choices for Utah's Future on 11 specific issues.



Housing & Cost of Living



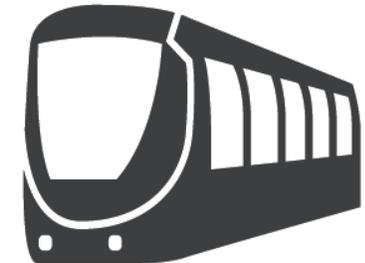
Education



Agriculture



Air Quality



Transportation & Communities



Economic Development



Disaster Resilience



Recreation



Water



Public Lands



Energy

Your Utah, Your Future Background

Survey participants then chose between five overall scenarios for Utah's future, with each overall scenario proposing a set of choices for the 11 specific issues.

VOTE



SEAGULL
SCENARIO

VOTE



BONNEVILLE TROUT
SCENARIO

VOTE



QUAKING ASPEN
SCENARIO

VOTE



SEGO LILY
SCENARIO

VOTE



ALLOSAURUS
SCENARIO

Our goal was for 50,000 Utahns to take the *Your Utah, Your Future* survey about their desires for the future for Utah.



Goal

50,000
Respondents



Actual

52,845
Respondents

Your Utah, Your Future Background

The *Your Utah, Your Future* survey garnered more public participation than any such project ever has.



Envision Utah Quality Growth Strategy
(Wasatch Front and Back—1998)



Show Your Love, San Diego



Heartland 2050
(Omaha, NE)



PLANITULSA
(Tulsa, OK)



(Atlanta, GA)



Louisiana Speaks
(Southern Louisiana after Katrina)

The original *Envision Utah* 1999 survey held the record for many years with 17,500 public responses.



Survey Structure—Part One

Utahns were invited to participate in two parts of the survey.
In the first part:

Survey participants chose among five overall scenarios for Utah's future.



Each overall scenario was made up of a set of choices on 11 different topics.



Housing &
Cost of Living



Education



Agriculture



Air Quality



Transportation
& Communities



Economic
Development



Disaster
Resilience



Recreation



Water



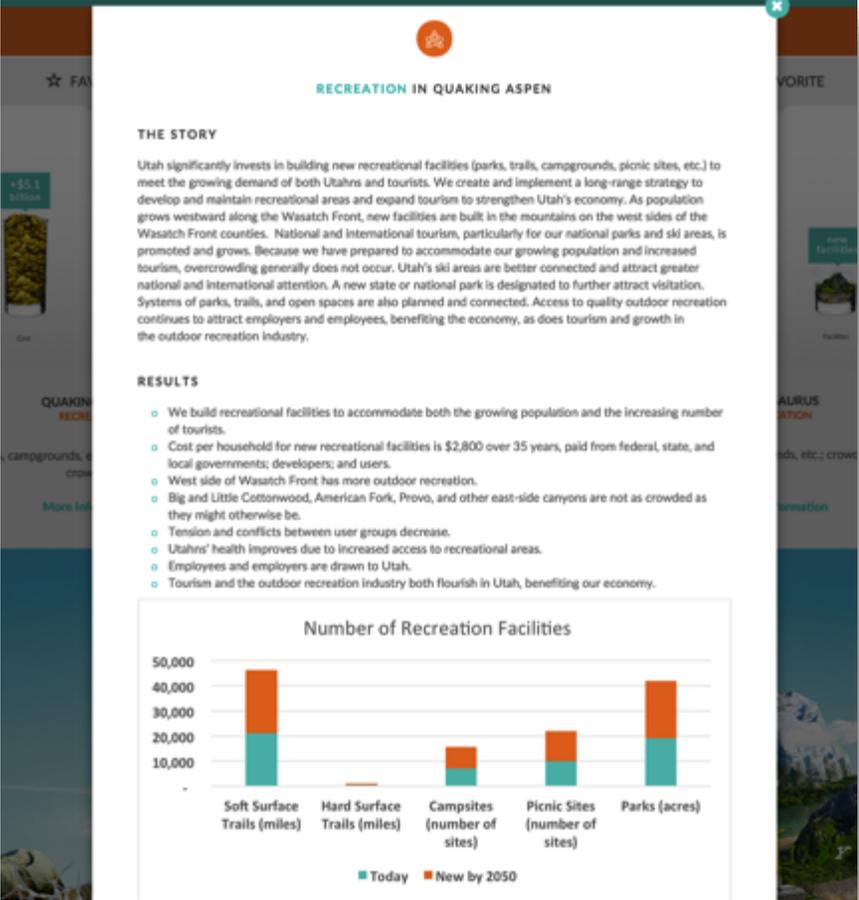
Public
Lands



Energy

Survey Structure—Part One (Cont'd)

Participants compared the different options within each topic and selected their preferred scenarios for that specific topic.



They were provided with in-depth information and background data for each of the topics and choices.



Survey Structure—Part One (Cont'd)

After making selections for each of the 11 topics, participants could study a summary comparison chart and vote on their preferred overall scenario.

| EDUCATION | | | | |
|--|---|---|---|--|
| Moderate investment increase; no consistent strategy; little performance improvement | Significant, strategic investment increase; Utah in top 10 states | Moderate, strategic investment increase; moderate performance improvement | Significant, strategic investment increase; Utah in top 10 states | Investment does not keep up with growth; no strategy; performance declines |
| ENERGY | | | | |
| Natural gas, some renewables; 3% cost increase | Renewables, natural gas, energy storage; 58% cost increase | Natural gas & renewables; 3% cost increase | Natural gas, renewables, & nuclear; 12% cost increase | Natural gas, some renewables; 3% cost increase |
| HOUSING & COST OF LIVING | | | | |
| High housing and transportation costs | Reasonable housing and transportation costs | Reasonable housing costs; average transportation costs | Reasonable housing and transportation costs | High housing costs; high transportation costs in suburbs; low in downtown |
| JOBS & ECONOMY | | | | |
| Average economy | Strong economy | Strong economy | Very strong economy | Struggling economy |

Most Favored

| VOTE | VOTE | VOTE | VOTE | VOTE |
|--|---|--|---|---|
|  |  |  |  |  |
| 3 ★ | 8 ★ | 6 ★ | 1 ★ | 1 ★ |
| SEAGULL SCENARIO | QUAKING ASPEN SCENARIO | SEGO LILY SCENARIO | ALLOSAURUS SCENARIO | BONNEVILLE TROUT SCENARIO |
| Utah makes targeted individual and collective efforts to keep the economy and quality of life strong, without making significant changes or large investments. | Utah becomes more economically resilient through economic diversification, connections to economies around the country and world, improved resilience to natural disasters, and increased ability to rely on local energy and food. | Utahns minimize their impact on the environment, conserve resources, and focus on improving both environmental and community health. | We do not implement strategies to achieve a vision of the future. Individuals, businesses, cities, counties, and other groups work separately to further their own interests. | Utahns continue doing what we're doing now. Our actions are the same as those in recent years. However, the outcomes of our future choices may not be the same as today because of growth and changing circumstances. |
| More Information | More Information | More Information | More Information | More Information |

Survey Structure—Part Two

In the second part of the survey, Utahns participated in more traditional survey exercises.

Prioritizing Issues

| | Most Important | Least Important |
|---|-----------------------|-----------------------|
| ⚡ What sources of energy we use in Utah (e.g., do we use more natural gas, solar, wind, or nuclear energy) and how much we use | <input type="radio"/> | <input type="radio"/> |
| 💰 How high taxes are in Utah | <input type="radio"/> | <input type="radio"/> |
| ☁️ Air quality in the State of Utah | <input type="radio"/> | <input type="radio"/> |
| 🏠 How resilient Utah is to a natural disaster (how many people would be killed/injured, how much damage would occur, and how quickly our economy and way of life would bounce back) | <input type="radio"/> | <input type="radio"/> |

Weighting Outcome Preference

JOBS AND ECONOMY

When thinking about jobs and the economy, there are many things to consider regarding Utah's future. Below are some potential outcomes to contemplate.

Please indicate each outcome's relative importance by allocating 100 points across all outcomes. The more points you allocate to a given outcome, the more important it is to you to achieve that outcome.

Some areas may be left blank, but the sum must total to 100.

- Ensuring Utah's economy is strong so that it provides a lot of tax revenue to spend on our needs
- Ensuring Utah's economy is strong so that we have plentiful, good jobs and high wages
- Limiting how much we spend in taxes and other resources
- Ensuring that a strong economy doesn't attract additional population growth

Total

Indicating Tradeoff Willingness

ENERGY

If Utah were to focus on using natural gas to produce our electricity as we move into the future, costs for electricity would stay as low as possible.

In order to get this outcome, some combination of the following trade-offs would have to take place.

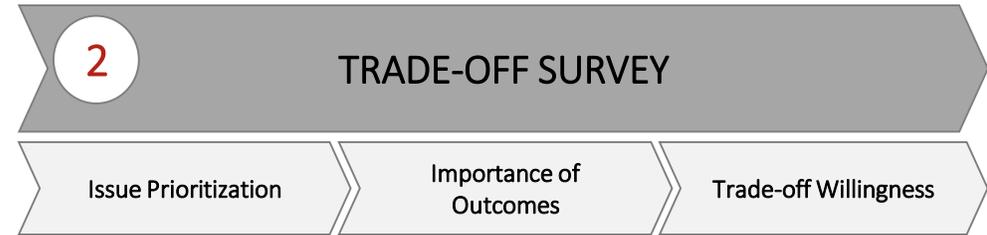
Please indicate your willingness to make each trade-off in order to focus on natural gas as the primary energy source in Utah.

| | Not At All Willing to Make This Trade-off 1 | 2 | Somewhat Willing to Make This Trade-off 3 | 4 | Very Willing to Make This Trade-off 5 |
|---|--|-----------------------|--|-----------------------|--|
| We will be vulnerable to supply shocks/price spikes because of reliance on a single energy source that is shipped throughout the country | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 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 our electricity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| More land will need to be used for natural gas wells, which have environmental impacts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Together, the results of parts one and two of the survey allow a sophisticated analysis of what Utahns want, why they want it, and what they're willing to do to achieve their goals.

Each part of the survey had different goals and provided important information.

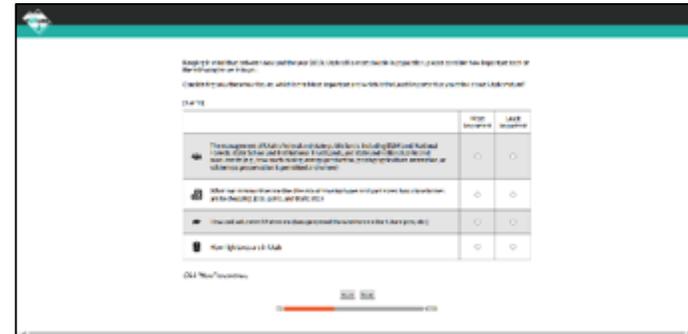
Process



Goals

1. Educate Utahns on the key issues facing the state
2. Quantify preferences for issue-specific outcomes
3. Identify areas of consensus and disagreement across issues
4. Quantify preferences for defined scenarios

1. Force Utahns to prioritize importance / level of concern for all issues
2. Quantify importance of outcomes related to specific issues
3. Assess willingness to make trade-offs in order to reach desired outcomes



A random sample survey of Utahns was used to cross-check outreach results

OUTREACH SAMPLE

Utahns that heard about the survey through Envision Utah's outreach efforts and went to the website to vote

- School outreach
- Digital media
- Partner organization emails and posts
- Radio advertisements
- News coverage

Total participants: 52,845

RANDOM SAMPLE

A statistically representative sample of Utahns randomly sampled to participate in the survey

- Direct email
- Physical mail (postcard invitations)
- Phone recruiting

Total participants: 1,264

All Participants participated in Part One



OUTREACH

n=52,845

RANDOM SAMPLE

n=1,264

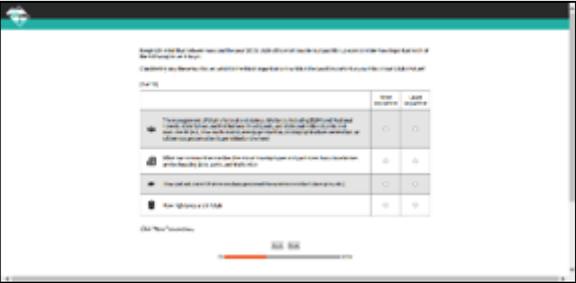
Outreach Participants had the option to participate in Part Two



OUTREACH

n=13,459

All Random Sample Participants participated in Part Two



RANDOM SAMPLE

n=1,264

Outreach and Random Sample participant responses were very much aligned across issues and preferences.

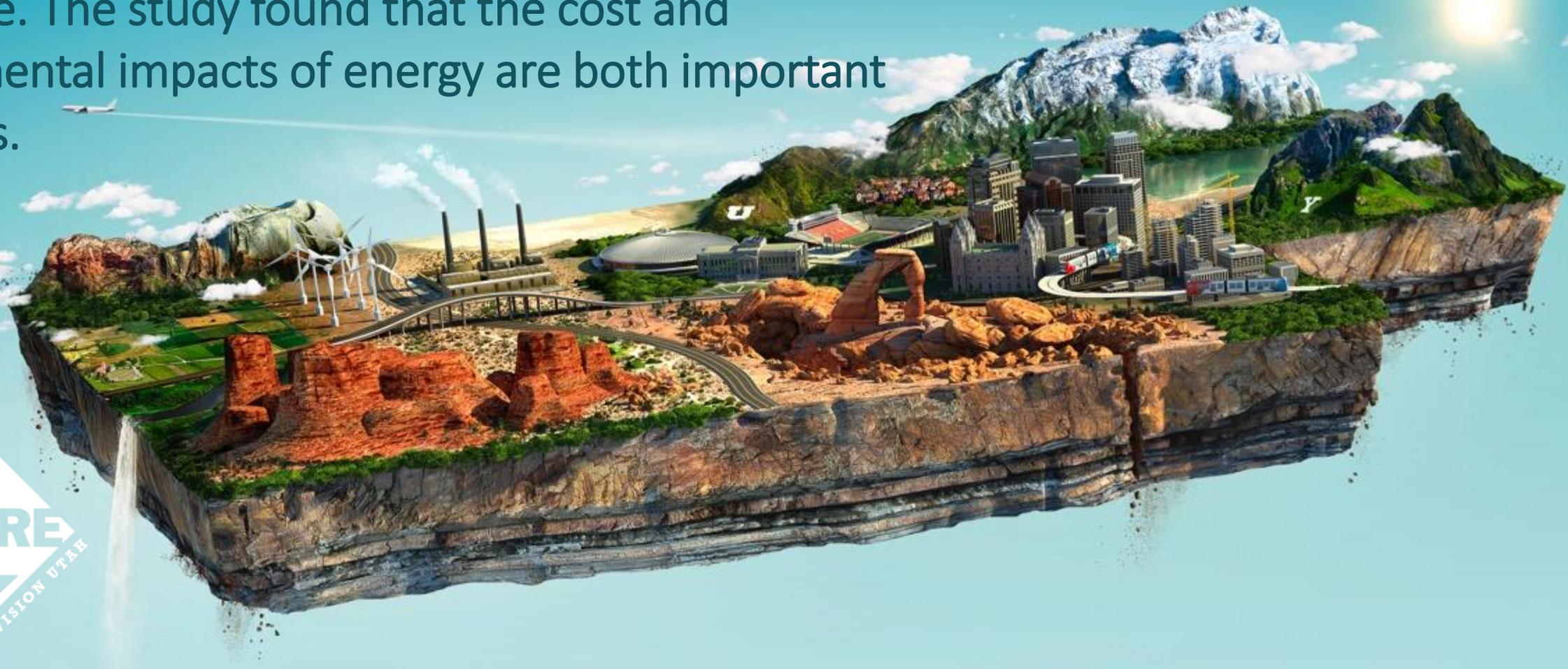
| | Variance Across Most Responses |
|------------------------|--------------------------------|
| Issue "Favoriting" | +/- 3% |
| Scenario Vote | +/- 4% |
| Issue Prioritization | +/- 1.2% |
| Importance of Outcomes | +/- 2% |
| Trade-off Willingness | +/- 7% |

“We can conclude that the results represent the desires and opinions of Utahns.”

“Results were obtained via the largest public outreach effort in the history of Utah, resulting in public input from more than 50,000 people; an effort that was cross-checked with a random sample of 1,264 Utahns, and overseen by Dan Jones & Associates.”

—Cicero; Dan Jones & Associates

Envision Utah performed a values study in 2014 to understand what Utahns care most about regarding the future. The study found that the cost and environmental impacts of energy are both important to Utahns.



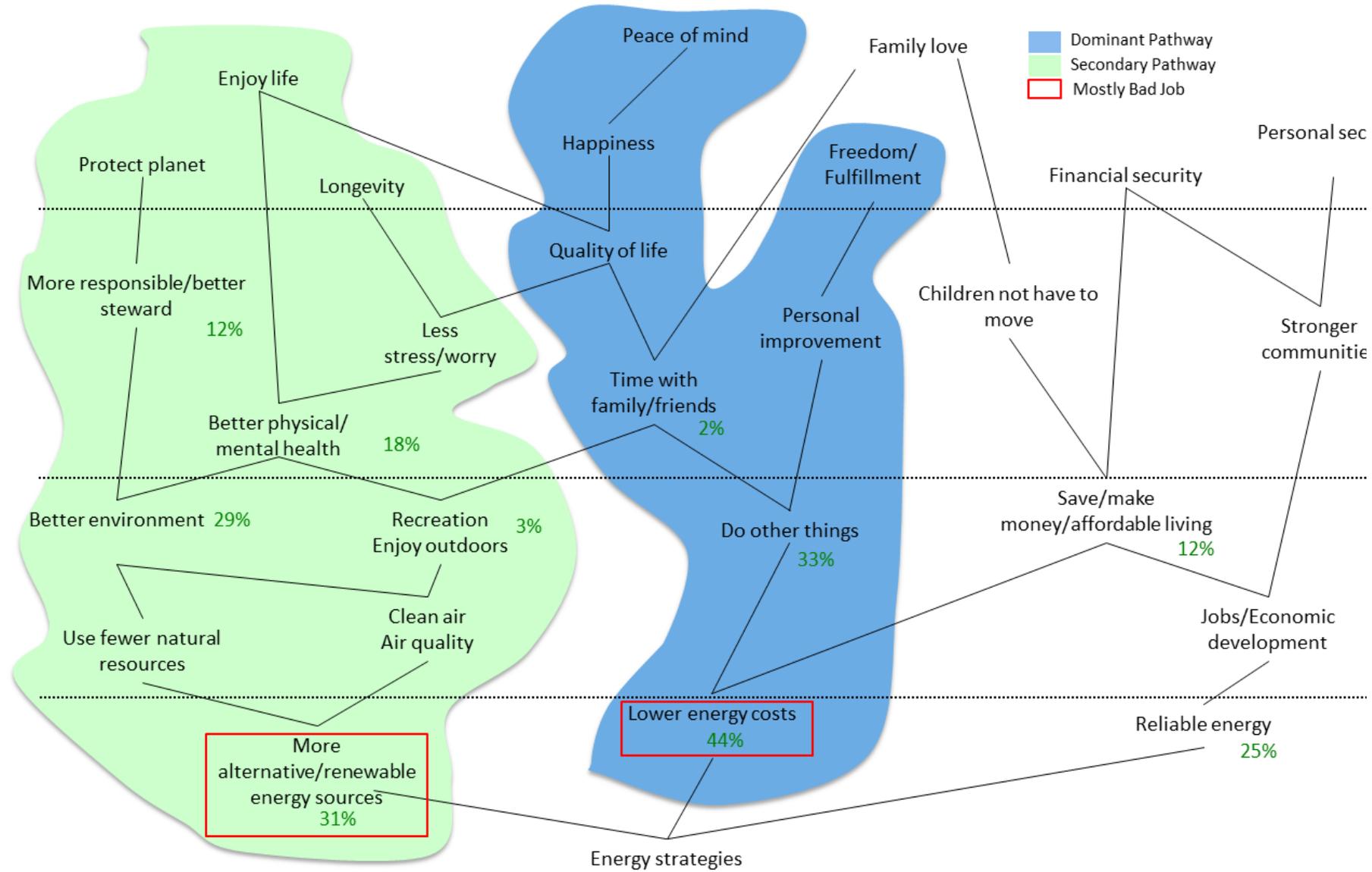
Energy Value Pathways

Personal Values

Psychosocial Consequences

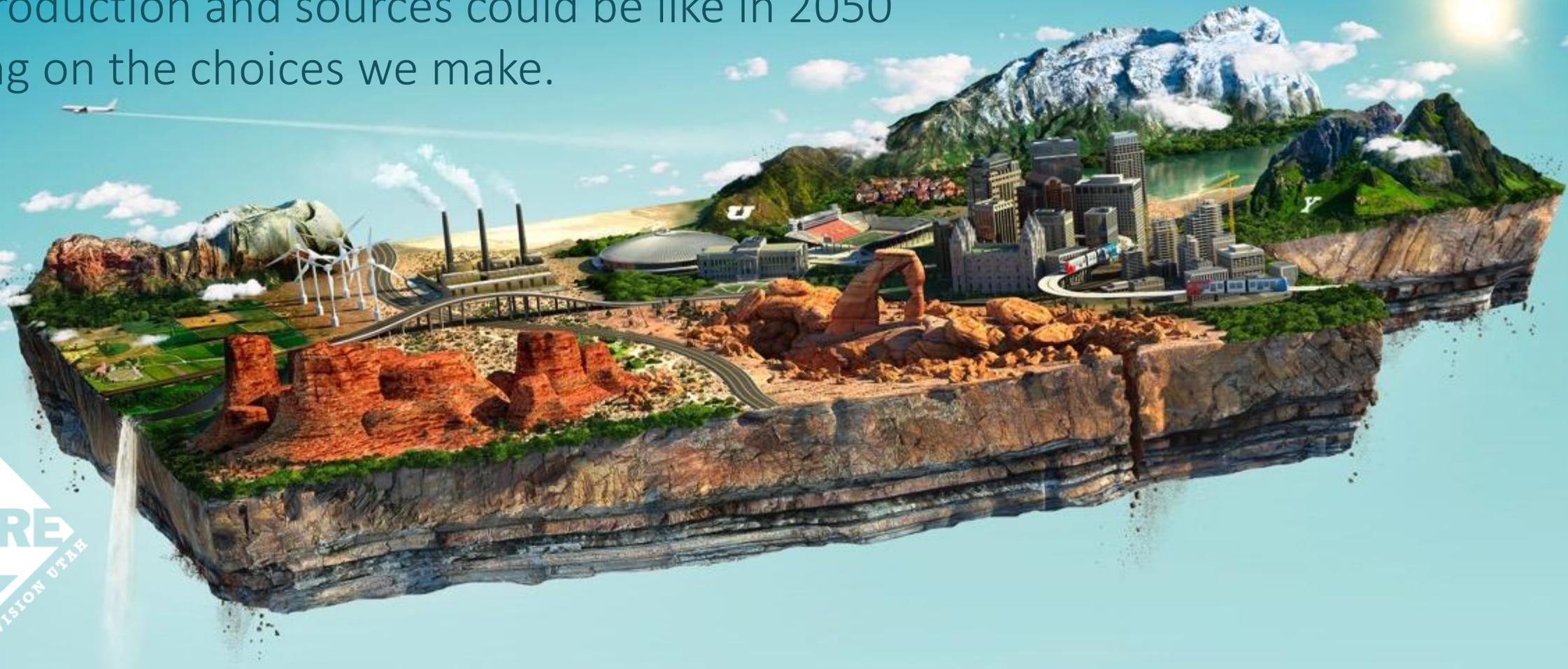
Functional Consequences

Attributes



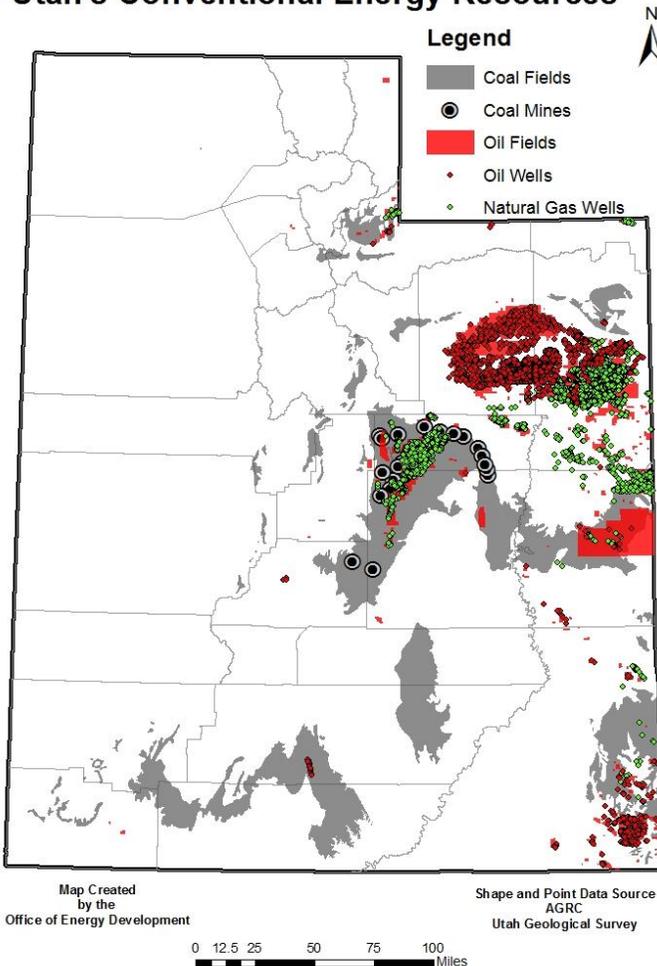
Utahns want low energy costs so they can enjoy a higher quality of life and have peace of mind. They also want to use fewer natural resources and have cleaner air so they can worry less and be better stewards.

In the ***Your Utah, Your Future*** survey, Utahns were given information about Utah's energy today and three different scenarios for what our energy production and sources could be like in 2050 depending on the choices we make.

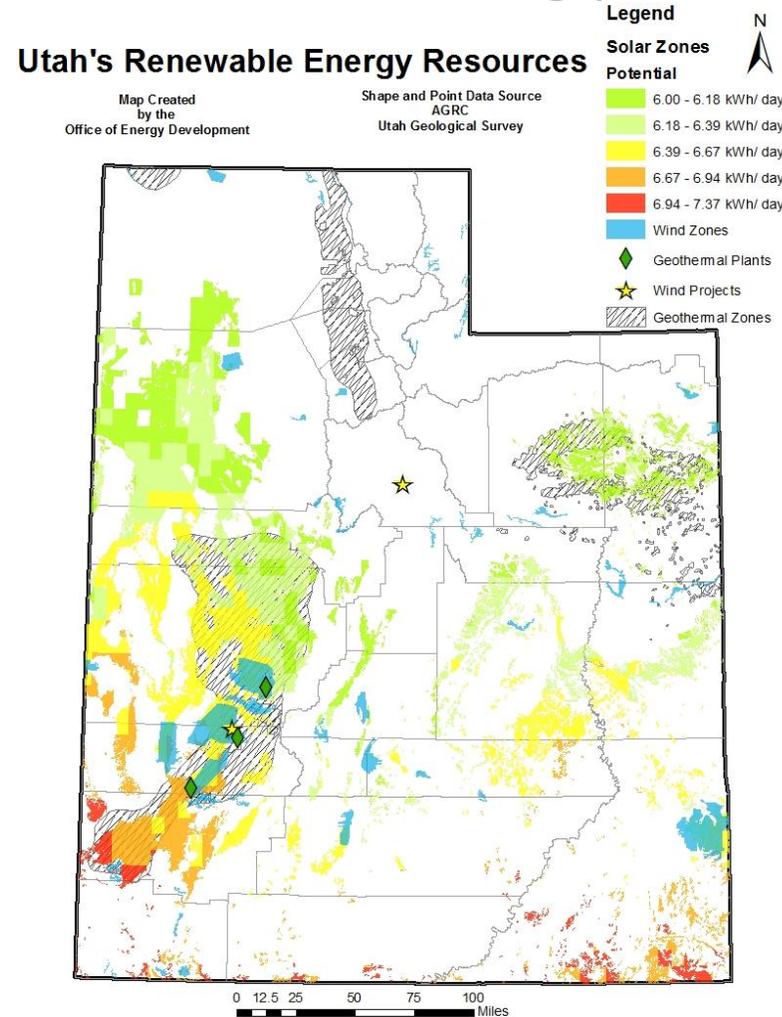


Utah's Energy Today

Utah's Conventional Energy Resources



Utah's Renewable Energy Resources



- Utah's relatively low energy costs make the state attractive to businesses and support a reasonable cost of living.
- Electric power production is transitioning away from coal due to environmental regulations.
- Utah has abundant energy sources, and that allows us the flexibility to adjust as circumstances change.

Questions Concerning the Future of Energy

- What resource mix will Utah use to produce electricity?
- How much natural gas will Utah need to produce?
- Do we want to increase renewables and by how much?
- Do we want nuclear power production in Utah?

Allosaurus, Bonneville Trout, Seagull Scenarios



Requires a significant increase in natural gas production

Electricity generation transitions from coal to natural gas, keeping household costs low, along with increased renewables. **30% of potential future demand is met through conservation and efficiency.** Utah's electricity in 2050 is produced from:

- Natural gas **50%**
- Wind, solar, etc. **27%**
- Coal **14%**
- Other **9%**
- Nuclear **0%**

Quaking Aspen Scenario



Nuclear waste must be transported, stored

Utah is as self-sufficient as possible, producing most electricity locally through natural gas, renewables, & nuclear. **30% of potential future demand is met through conservation and efficiency.** Utah's electricity in 2050 is produced from:

- Natural gas **31%**
- Wind, solar, etc. **31%**
- Nuclear **29%**
- Other **9%**

Sego Lily Scenario

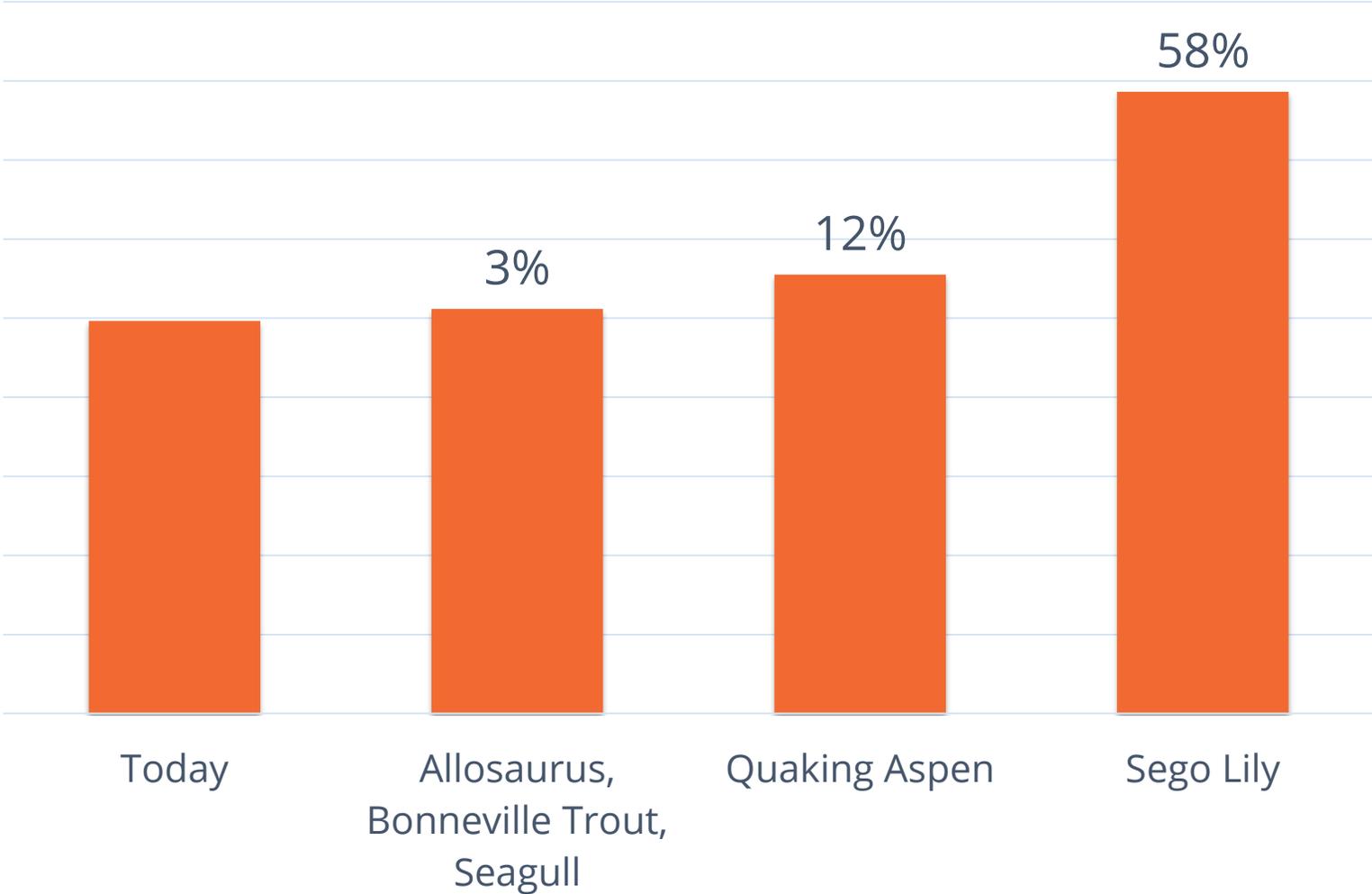


Intermittency of wind/solar requires energy storage

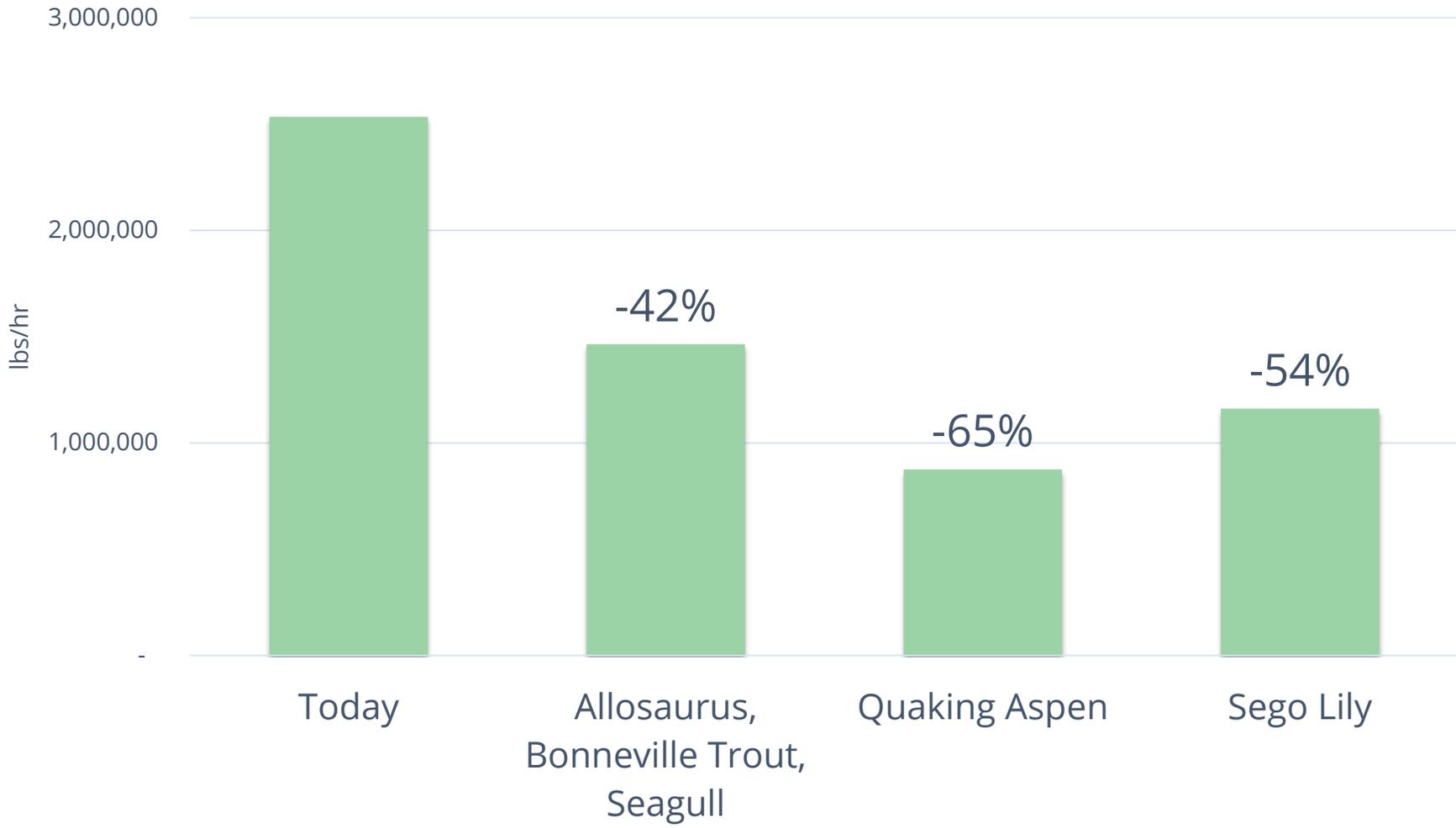
Utah prioritizes renewable energy from wind, solar, & geothermal sources paired with energy storage, which substantially increases cost. **30% of potential future demand is met through conservation and efficiency.** Utah's electricity in 2050 is produced from:

- Natural gas **41%**
- Wind, solar, etc. **50%**
- Other **9%**
- Nuclear **0%**

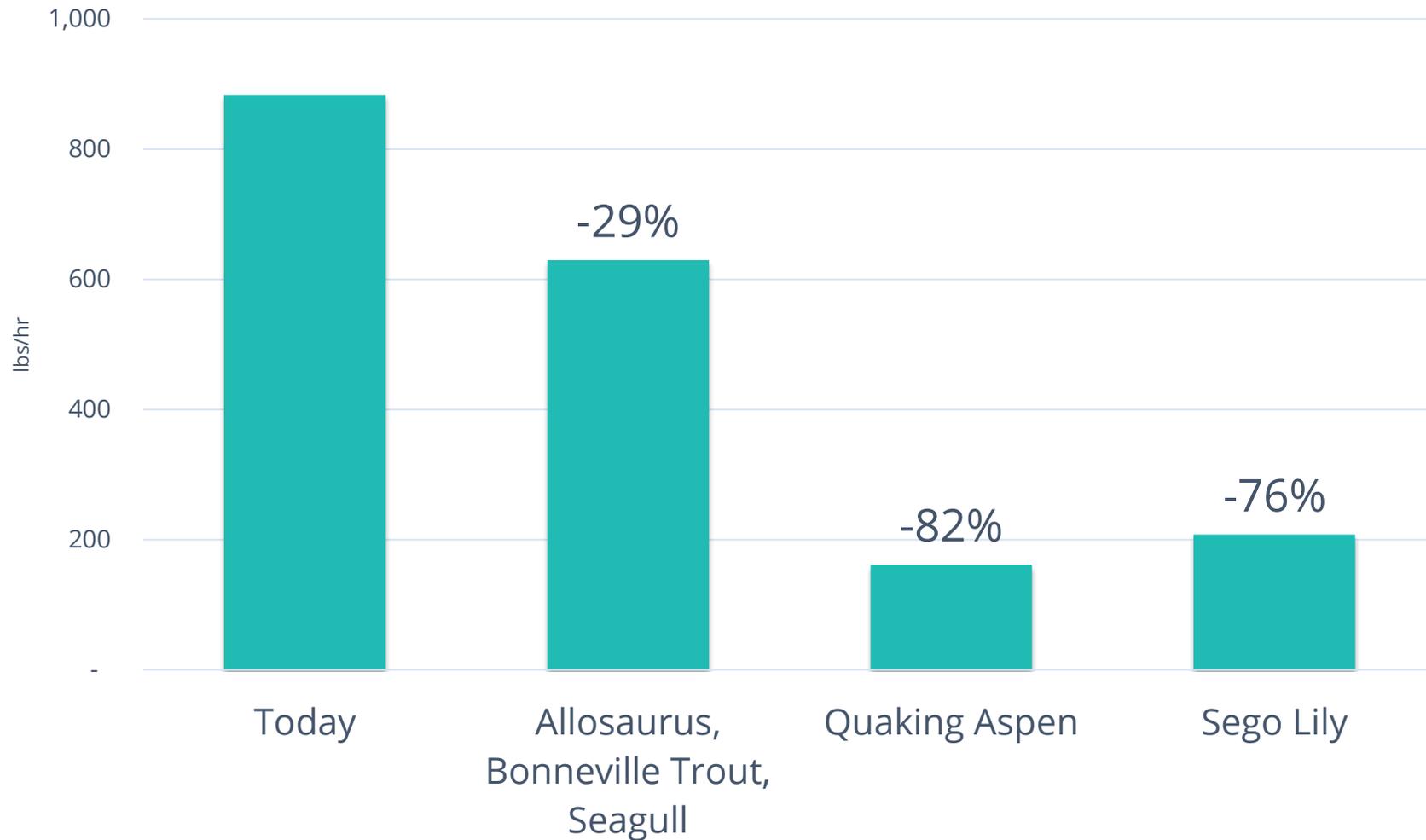
Increase in Household Costs



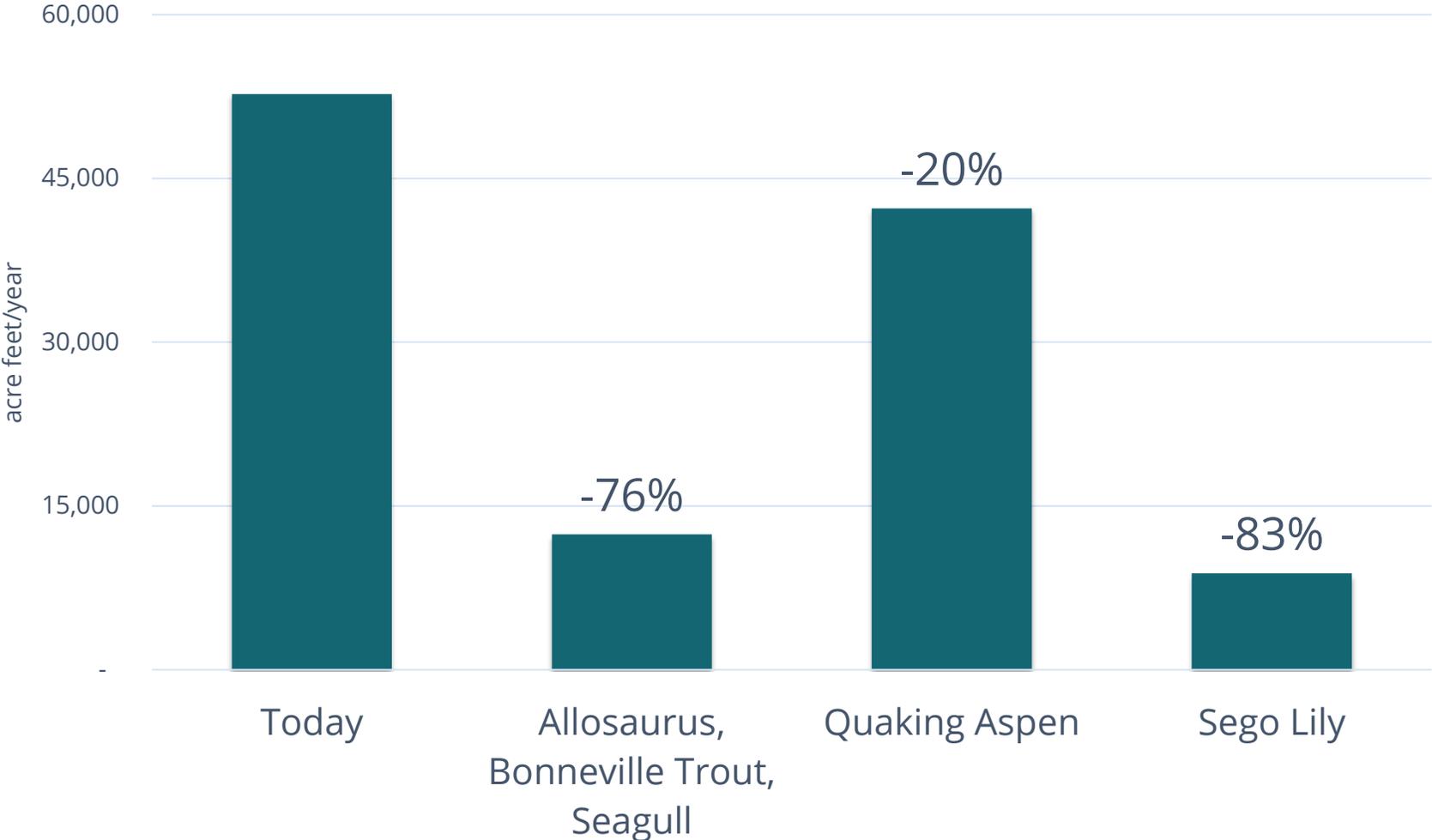
Decrease in Carbon Emissions



Decrease in Air Pollutants (NO_x, SO₂)



Decrease in Water for Electricity Production



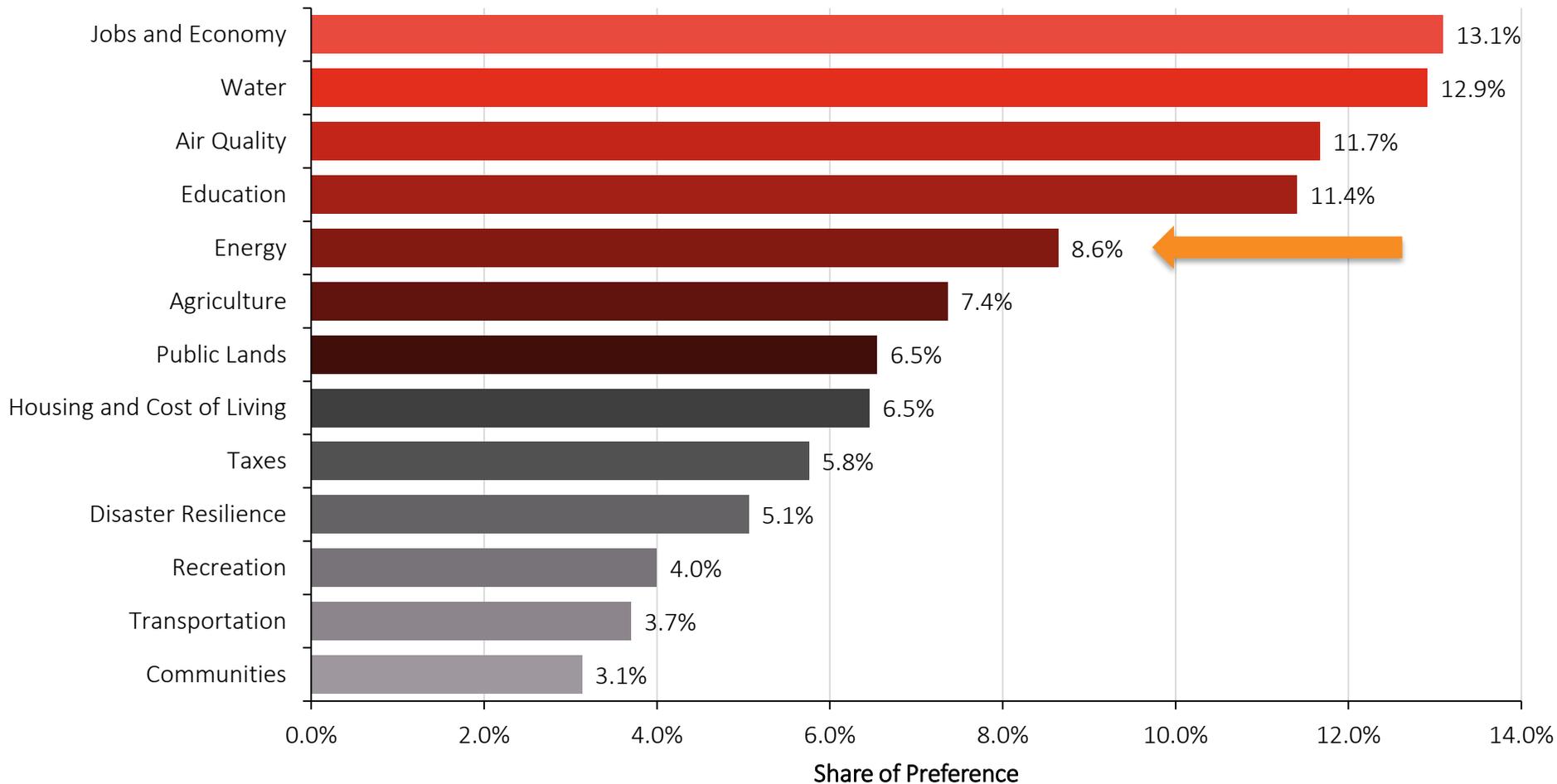


Energy Survey Results



Level of Concern for the Future—Outreach Sample Results

Share of Preference, n=13,459

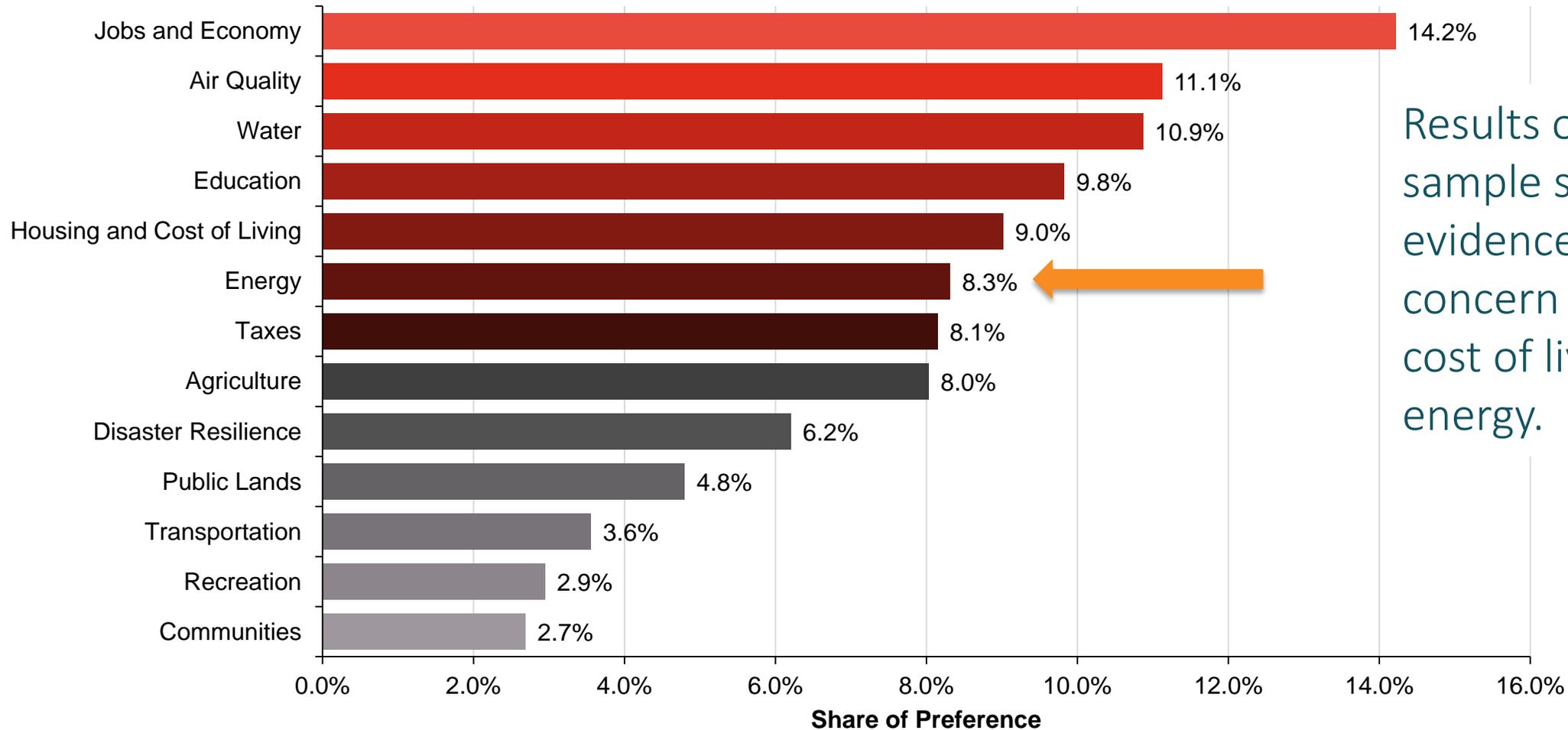


In the 2014 values study, Utahns ranked all 11 issues as being important to Utah’s future. The 2015 survey used a sophisticated technique to force a “weighting” of the issues, providing a wider gradation of concern.

Level of Concern for the Future—Random Sample Results

Share of Preference, n=1,264

RANDOM
SAMPLE
n = 1,264

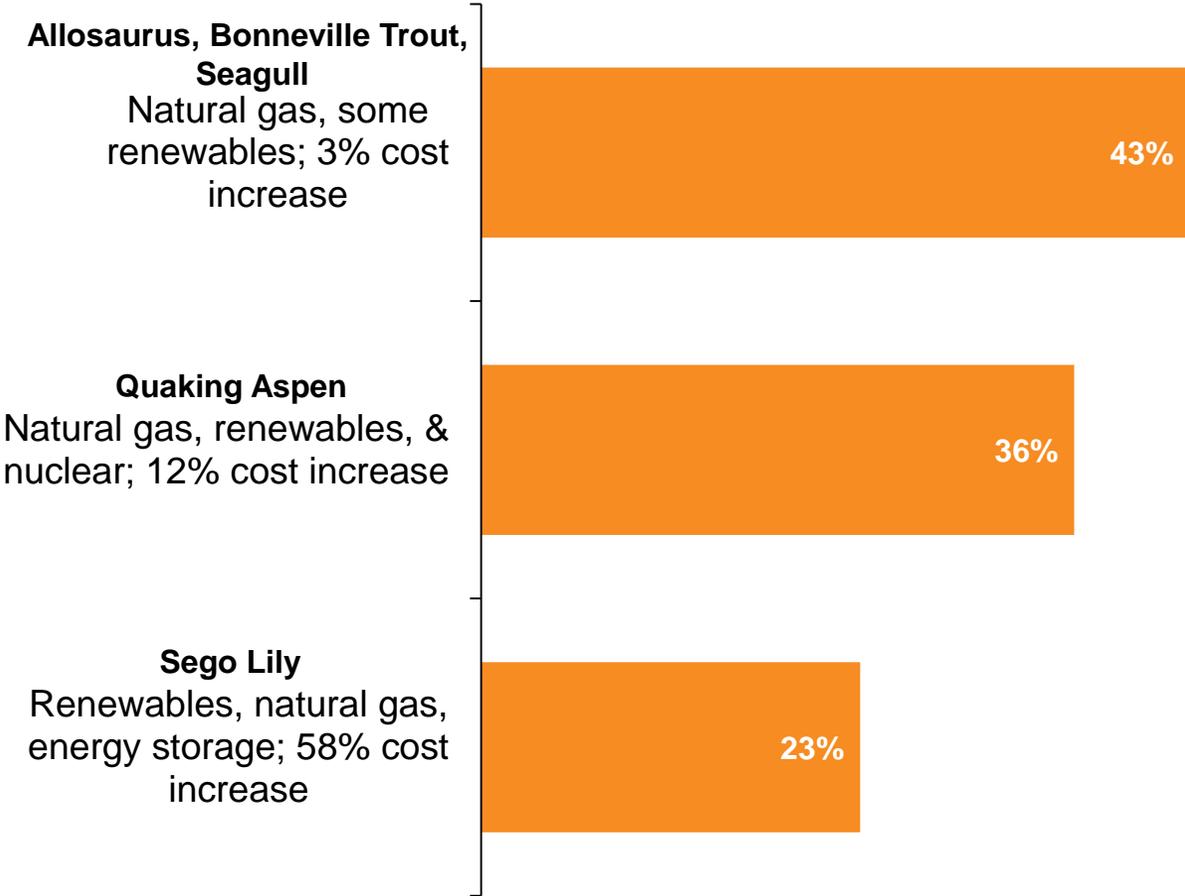


Results of the random sample survey evidenced greater concern for housing & cost of living than energy.

Source: Survey – Keeping in mind that between now and the year 2050, Utah will almost double in population, please consider how important each of the following issues is to you. Considering only these four issues, which is the Most Important and which is the Least Important as you think about Utah’s future?

Issue-specific Scenarios

% "Favorite" Selections, n=19,118



What Utahns Want:

43% of Utahns selected an energy scenario that would keep household energy costs low as we transition from coal to natural gas while increasing renewables.

Another **36%** chose a scenario in which Utah produces electricity from a balance of natural gas, renewables, and nuclear power.

23% want to increase renewables to more than half, requiring expensive energy storage.

Source: Website – Select your favorite energy outcome(s) from the 3 presented below for Utah in 2050. Consider the source of energy and the increase in household cost compared to 2015.

Issue-specific Scenarios

% "Favorite" Selections, n=1,148

Allosaurus, Bonneville Trout, Seagull

Natural gas, some renewables; 3% cost increase

53%

Quaking Aspen

Natural gas, renewables, & nuclear; 12% cost increase

30%

Sego Lily

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

17%

Source: Website – Select your favorite energy outcome(s) from the 3 presented below for Utah in 2050. Consider the source of energy and the increase in household cost compared to 2015.

What Utahns Want:

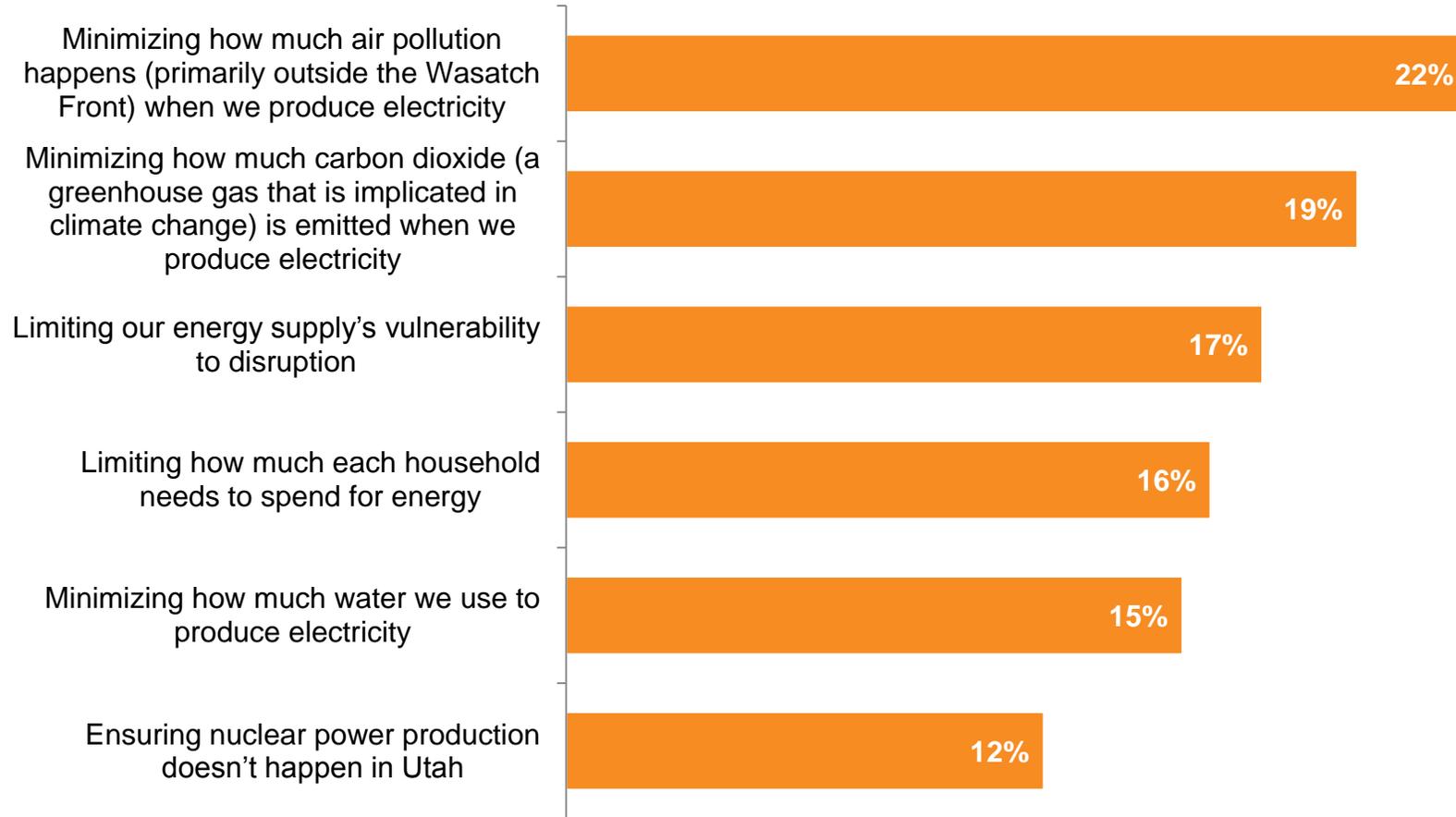
53% of the random sample supported transitioning from coal to natural gas while increasing renewables, a 10% increase over the outreach sample.

30% chose a scenario with a balance of natural gas, renewables, and nuclear power, a 6% decrease from the outreach sample.

17% want to increase renewables with energy storage, another 6% decrease from the outreach sample.

Importance of Outcomes

Average % Allocated, n=4,924



Why Utahns Want to Transition to Natural Gas with Increased Renewables:

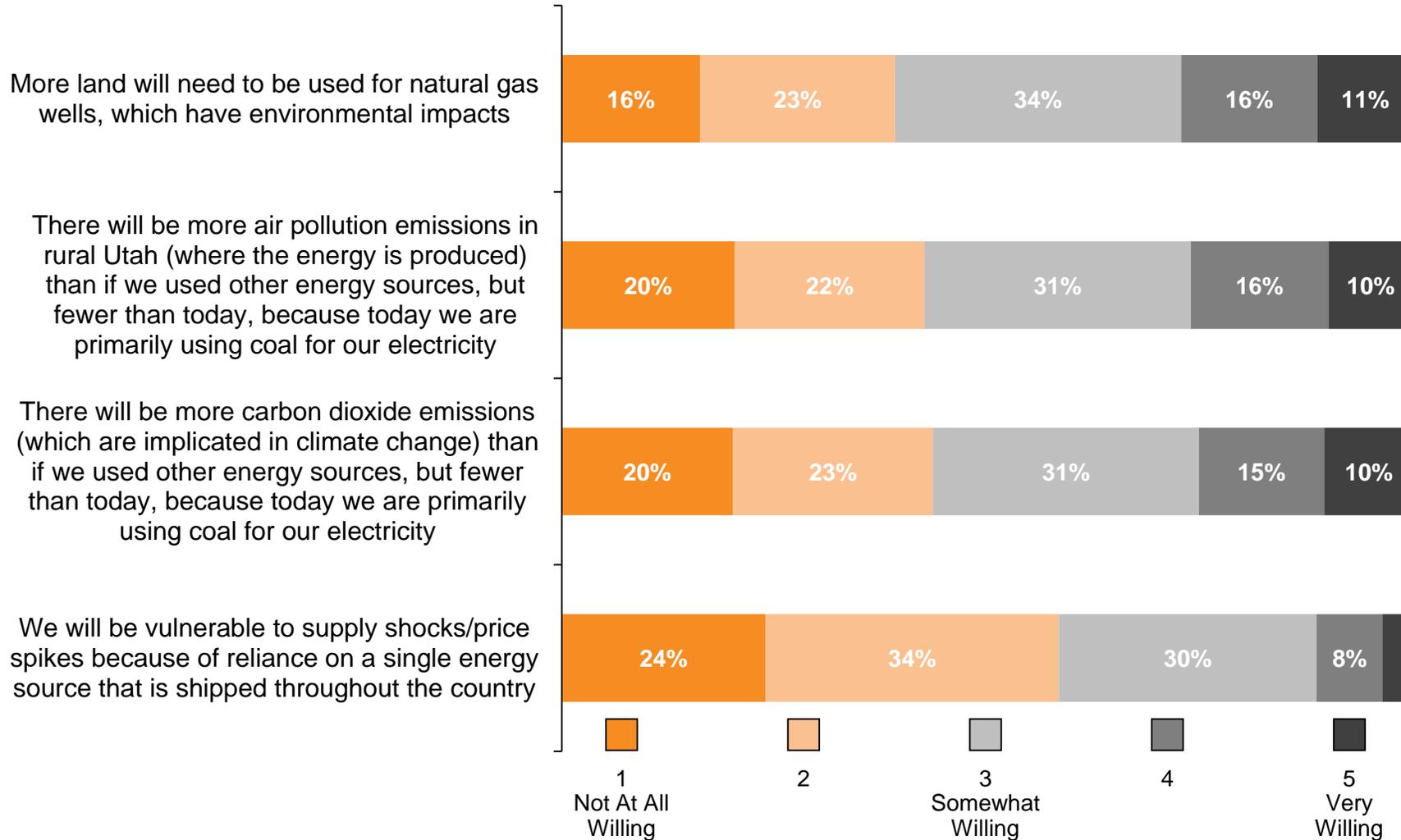
Utahns want clean energy production with few pollutants, a secure and stable energy supply, and low energy costs without using nuclear power.

Source: Survey – Please indicate each outcome's relative importance by allocating 100 points across all outcomes. The more points you allocate to a given outcome, the more important it is to you to achieve that outcome.

OUTREACH
n = 52,845

Willingness to Make Tradeoffs for Natural Gas Production

% Level of Willingness, n=4,924

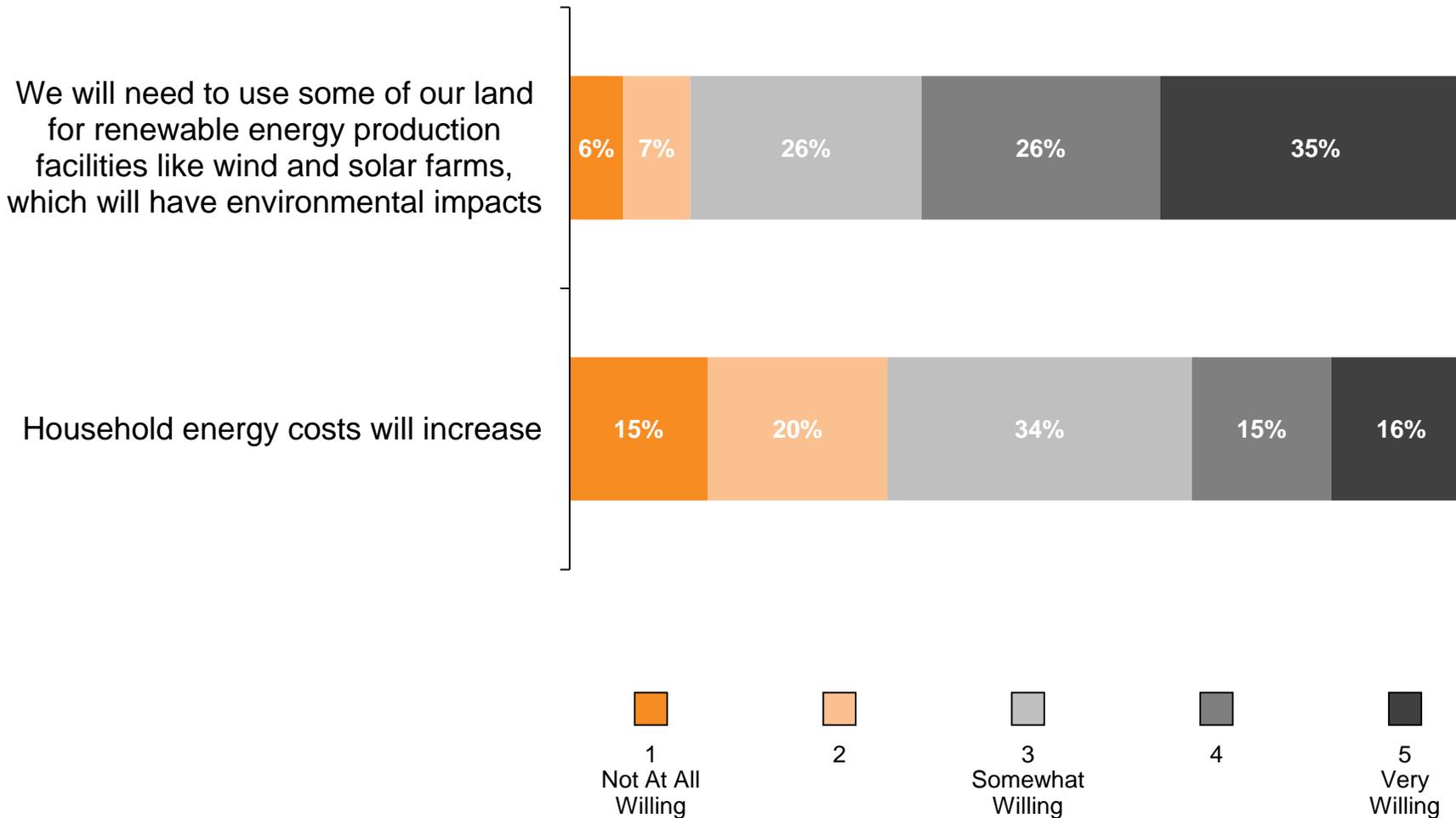


What Utahns are willing to do to keep costs low by using natural gas:

Utahns are willing to use more land for natural gas wells if done in an environmentally responsible manner. Utahns do not want to be vulnerable to supply shocks.

Willingness to Make Tradeoffs for Renewable Energy

% Level of Willingness, n=4,924



What Utahns are willing to do to use renewables:

Utahns are willing to use more land for renewable energy production, and are somewhat willing to absorb minor household energy cost increases.

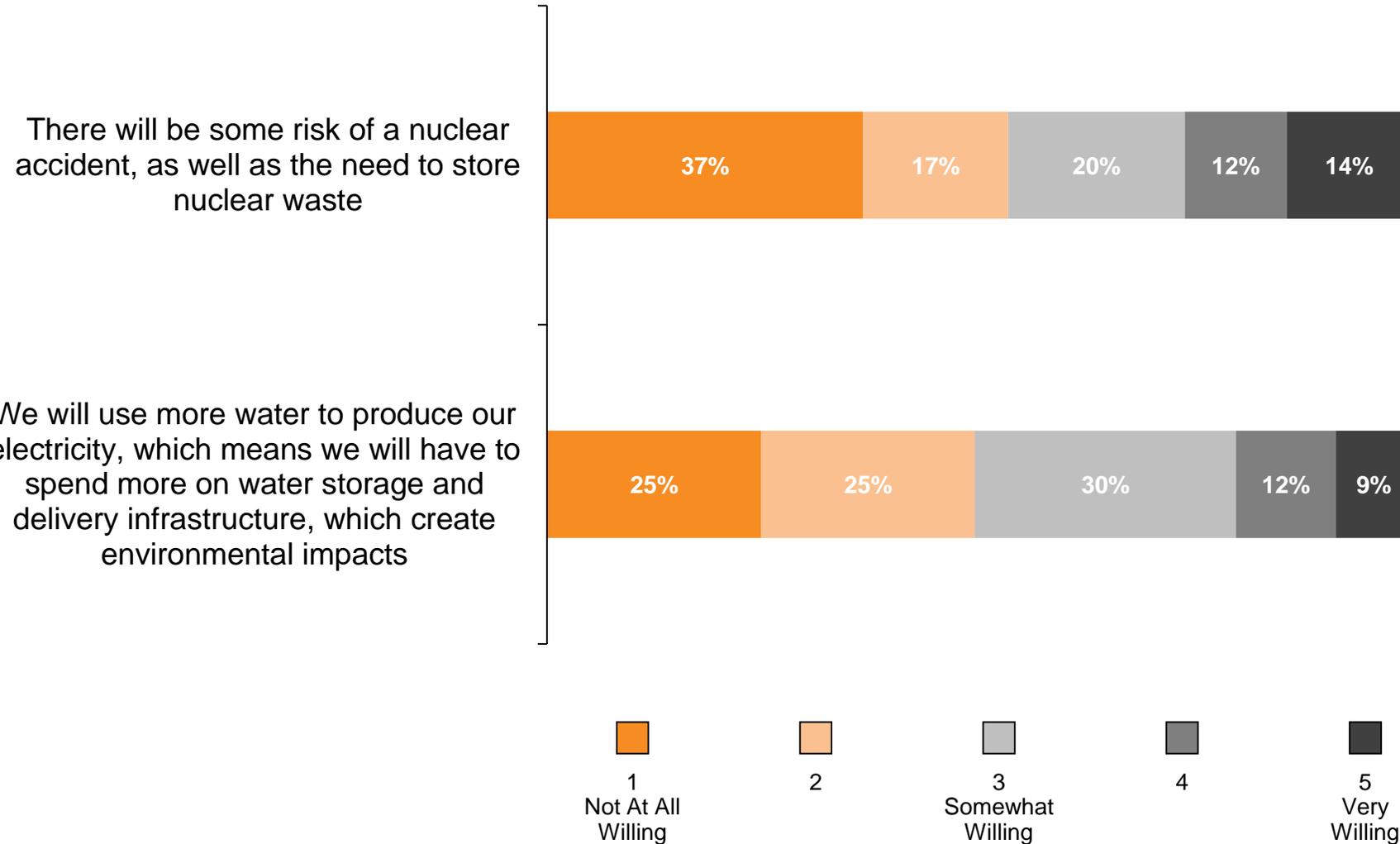
Source: Survey – Please indicate your willingness to make each trade-off in order to increase renewable energy in Utah. Outcomes:

- Reduction in air pollutants in rural areas
- Reduction in carbon dioxide emissions
- Reduction in the potential for energy supply disruptions

OUTREACH
n = 52,845

Willingness to Make Tradeoffs for Nuclear Power Production

% Level of Willingness, n=4,924



What Utahns are willing to do to use nuclear power:

Utahns are unwilling to risk a nuclear accident or store nuclear waste. Utahns are also reluctant to use more water for energy production.

OUTREACH
n = 52,845

Source: Survey – Please indicate your willingness to make each trade-off in order to increase renewable energy in Utah. Outcomes:

- Reduction in air pollutants in rural areas
- Reduction in carbon dioxide emissions
- Reduction in the potential for energy supply disruptions

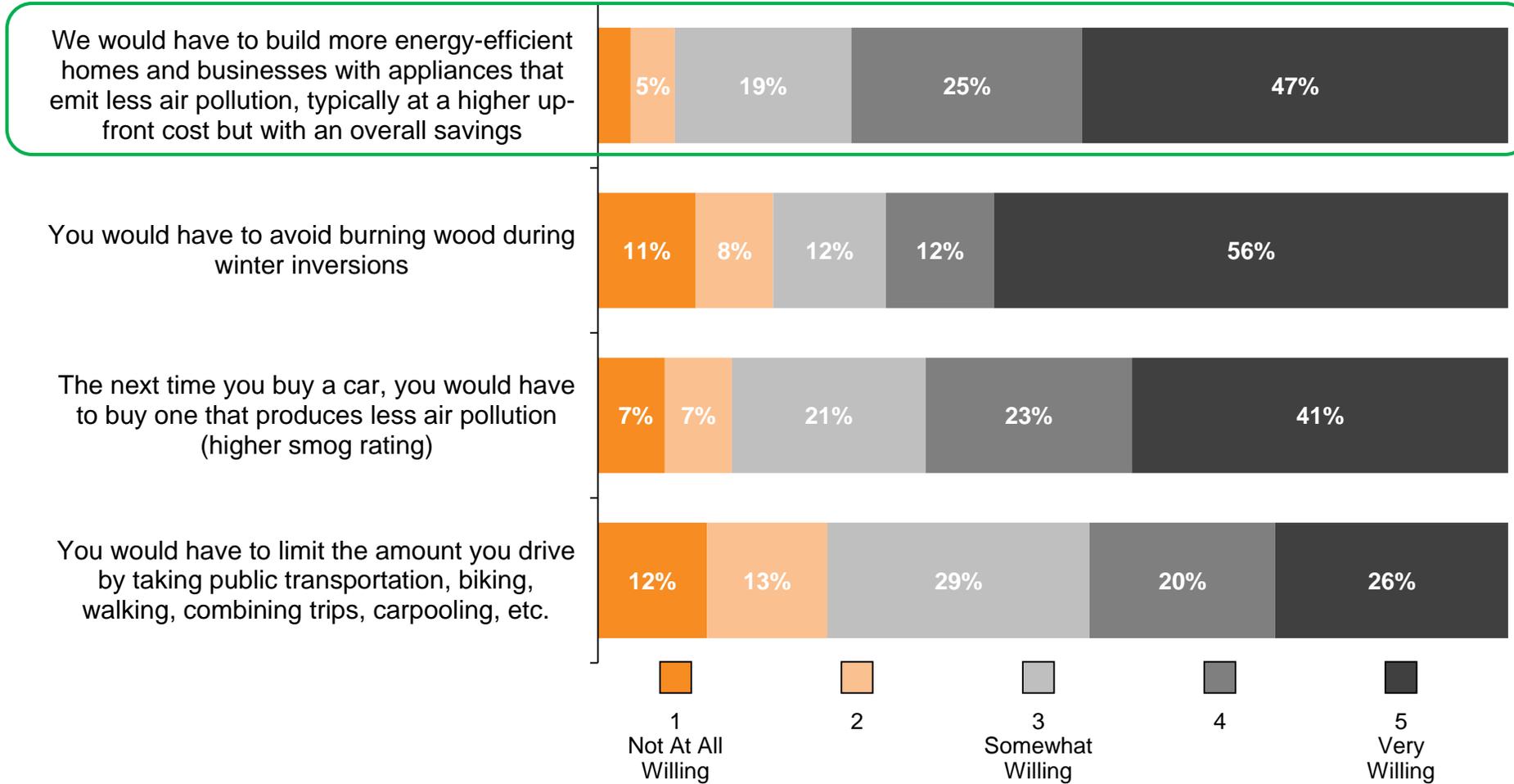
In addition to the specific results from energy questions, a number of results from other topics show strong support for outcomes or strategies that would decrease pollution and reduce energy usage.



Willingness to Make Tradeoffs—Air Quality

% Level of Willingness, n=4,885

OUTREACH
n = 52,845

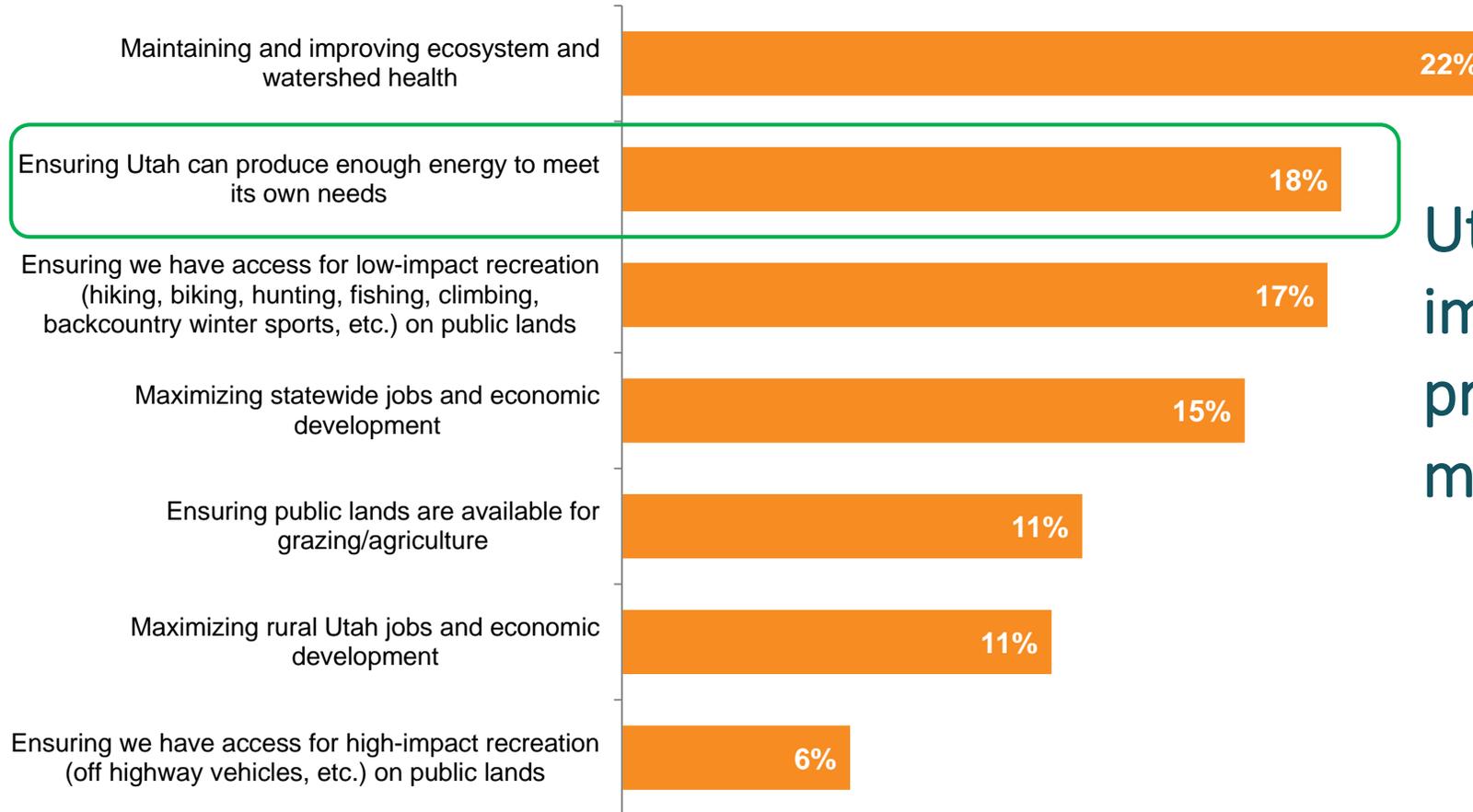


Utahns are willing to build more energy-efficient homes and businesses (use less energy) to improve air quality.

Importance of Outcomes—Public Lands

Average % Allocated, n=4,875

OUTREACH
n = 52,845



Utahns believe it is very important for the state to produce enough energy to meet its own needs.

Source: Survey – Please indicate each outcome’s relative importance by allocating 100 points across all outcomes. The more points you allocate to a given outcome, the more important it is to you to achieve that outcome.

The Survey is still available!

Visit **envisionutah.net** to view the choices for **energy** and each of the 11 topics in the *Your Utah, Your Future* survey.

