Q1 University of Wyoming Grand Challenges Initiative

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Theme/Problem Statement Form

To get started, please brainstorm three Themes or Problem Statements you consider to be Grand Challenges. At this point, you do not need to have a plan of action or solution in mind. In fact, if you do have a solution we ask that you still work back to find an open-ended description. Themes/Problem Statements should be specific and include only one topic. The problem might influence different groups of people, but it should be a single problem. Please note: we have listed examples below to get you started, but feel free to be creative and to add problem statements beyond those listed here. Theme/Problem Statement examples:

- Education and access to information
- Wyoming ranks 4th in the nation in suicide per capita
- Big data
- Albany County is the poorest county in Wyoming
- Health care inequality
- Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable
- Mass incarceration
- Too few people in rural Wyoming have access to the arts and cultural programming
- Climate change
- Human biology is becoming more resistant to antibiotics
- The quality of democracy, such as inequalities of race, class, and gender
- Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income

In the boxes below, please indicate three Themes or Problem Statements

Theme or Problem Statement 1

- To improve the quality of democracy: the history of race, class and gender relations in the United States

Theme or Problem Statement 2

- Political in/civility

Theme or Problem Statement 3

- What is the future of work, given the impact of technologies
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<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>ADA compliant housing</th>
</tr>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Reliable high speed internet access throughout the Laramie community</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Trap neuter return for community cat colonies within the city limits of Laramie</td>
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</tr>
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<tbody>
<tr>
<td><strong>Food insecurity/injustice</strong></td>
<td><strong>Equity (social, environmental, economic) for Native American people living in the Wind River Reservation and other Sovereign Nations throughout the Mountain West</strong></td>
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Theme or Problem Statement 1: Endemic diseases in wildlife, esp. CWD, rabies, plague, tularemia, brucellosis

Theme or Problem Statement 2: Viable organic agriculture, incl. horticulture

Theme or Problem Statement 3: One Health (diseases shared between people, livestock and wildlife)
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<tr>
<th>Theme or Problem Statement 1</th>
<th>Rural adaptation for natural resource uncertainty</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Indigenous heritage: restoring our founding culture</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>How Fox News altered Wyoming’s political landscape, 1990-2020</td>
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<th>Theme or Problem Statement 1</th>
<th>Invasive species impacts on land management, fire, and agriculture</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Land reclamation - repairing the damage caused by human activities</td>
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<tr>
<td>Theme or Problem Statement 2</td>
<td>Human Factor in Technology and Health</td>
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<td>Brain and Psychological Sciences</td>
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Theme or Problem Statement 1

Software supporting research is needed such as Endnote and Ithenticate as a University Level
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<th>Untreated trauma and adverse childhood experiences</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Economic inequality and poverty</td>
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Theme or Problem Statement 1
Making Wyoming an Energy State, not just a fossil energy state

Theme or Problem Statement 2
Re-imagining our land grant outreach mission in the 21st century (e.g. arts and cultural programming above; health care; etc.)

Theme or Problem Statement 3
Integrating traditional tourism, ecotourism, water resources, rangeland ecology, rangeland management, etc.
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<td>Artificial intelligence</td>
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Theme or Problem Statement 1
The transition to a renewable energy economy

Theme or Problem Statement 2
Breakthroughs in quantum computing and data storage

Theme or Problem Statement 3
Energy storage
#13

**Collector:** Web Link 1 (Web Link)  
**Started:** Tuesday, September 17, 2019 2:12:59 PM  
**Last Modified:** Tuesday, September 17, 2019 2:25:53 PM  
**Time Spent:** 00:12:53  
**IP Address:** 23.220.96.119
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To get started, please brainstorm three Themes or Problem Statements you consider to be Grand Challenges. At this point, you do not need to have a plan of action or solution in mind. In fact, if you do have a solution we ask that you still work back to find an open-ended description. Themes/Problem Statements should be specific and include only one topic. The problem might influence different groups of people, but it should be a single problem. Please note: we have listed examples below to get you started, but feel free to be creative and to add problem statements beyond those listed here.

**Themes/Problem Statement examples:**
- Education and access to information
  - Wyoming ranks 4th in the nation in suicide per capita
  - Big data
  - Albany County is the poorest county in Wyoming
  - Health care inequality
  - Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable
  - Mass incarceration
  - Too few people in rural Wyoming have access to the arts and cultural programming
  - Climate change
  - Human biology is becoming more resistant to antibiotics
  - The quality of democracy, such as inequalities of race, class, and gender
  - Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income

In the boxes below, please indicate three Themes or Problem Statements:

**Theme or Problem Statement 1**

One Health: Diseases/disease processes that affect/impact domestic animals, wildlife, and humans (in all aspects - biology, sustainability, economics/productivity) - plague, brucellosis, chronic wasting disease, Mycoplasma bovis, BVDV, rabies, West Nile virus, extractive energy industry contaminants, air/water contaminants, plastic pollution, global warming and emerging vectors/diseases, invasive species, etc.

**Theme or Problem Statement 2**

Mental Health in the Rocky Mountain West (stigma and "cowboy culture" challenges, lack of services, challenges in broad rural/small town landscapes, economic challenges and links to low income problems, provider challenges, suicide epidemics, depression/loneliness, links with substance abuse)

**Theme or Problem Statement 3**

Not super-impressed with either of your "Environment" or "Natural Resources" categories in that both seem to ignore Wyoming's big opportunities/challenges with the environment and resources other than oil/gas/coal/trona, etc. - wildlife, wild places and spaces, biodiversity (animal, plant, invertebrate) and functioning ecosystems, additive/destructive relationships with agriculture, energy, and other development, tourism including ecotourism and industries/careers/jobs/majors/curricula associated with that (or that could be developed based on that)
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In the boxes below, please indicate three Themes or Problem Statements

<table>
<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Help Wyoming communities prepare for a changing climate as a model for rural community resiliency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Economic development through sustainable outdoor recreation and tourism development</td>
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Theme or Problem Statement 1

Energy transitions have social, economic, land use, and legal impacts and may be regressive or pose environmental justice issues

Theme or Problem Statement 2

Anti-Vaccination in Wyoming

Theme or Problem Statement 3

Community opposition to growth or industrial development
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Wyoming ranks 4th in the nation in suicide per capita

Big data

Albany County is the poorest county in Wyoming

Health care inequality

Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable

Mass incarceration

Too few people in rural Wyoming have access to the arts and cultural programming

Climate change

Human biology is becoming more resistant to antibiotics

The quality of democracy, such as inequalities of race, class, and gender

Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income.

In the boxes below, please indicate three Themes or Problem Statements

Theme or Problem Statement 1

Seeking effective and efficient approaches to improve ecosystem integrity while promoting social well being and economic growth in the West
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<th>Theme or Problem Statement 1</th>
<th>How can Wyoming be a leader in climate change mitigation and adaption?</th>
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<tr>
<td>Theme or Problem Statement 2</td>
<td>What will higher education look like in 20 years and how can University of Wyoming be ahead of the curve?</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>How can be build a resilient economy in the face of technological, demographic and environmental shifts?</td>
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In the boxes below, please indicate three Themes or Problem Statements:

- Theme or Problem Statement 1: Wyoming ranks 4th in the nation in suicide per capita
- Theme or Problem Statement 2: Health care inequality
- Theme or Problem Statement 3: Education and access to information
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<th>Not investing in the people that are already in the community and the skills they have</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Not helping families/couples fit into the community ie: Hire one spouse, but let the other skilled spouse flounder</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Not becoming leaders in new energy sources/being tied to old dying methods to our detriment</td>
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<tr>
<td>Theme or Problem Statement 2</td>
<td>Opioid use/addiction/use dependence as problems of pain therapeutic among Wyoming residents</td>
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Theme or Problem Statement 1

Wyoming needs a diverse economy that generates revenue sufficient to fund infrastructure and social services adequately.

Theme or Problem Statement 2

Citizens and policymakers have low science literacy and information literacy, such that policy is informed by bad information and flat-out false understandings.

Theme or Problem Statement 3

Too many people are food insecure, including children and the elderly.
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<th>Water insecurity / water quality (inextricably linked to climate change / environmental degredation / environmental injustice)</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Rising antibiotic/antimicrobial resistance/selective pressure</td>
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<td>Theme or Problem Statement 3</td>
<td>In/Equitable access to higher education</td>
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Theme or Problem Statement 1
Domestic Violence

Theme or Problem Statement 2
Media literacy and civic engagement

Theme or Problem Statement 3
Adverse Childhood Experiences
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Theme or Problem Statement 1
Changes in machine learning and AI are going to automated between 1/4 and 1/2 of all current jobs in the US in the next 20 years. The critical part of this is the retraining of people to take advantage of this and the largest part is teaching knowledge based and programming skills. Apply machine learning (ML) to teaching a partially automated set of online and interactive classes for teaching programming.

Theme or Problem Statement 2
Multi factor authentication using both biometrics and non-biometric data (geographic information and biometric) to secure computer systems. This uses both machine learning (ML) and adaptive learning.

Theme or Problem Statement 3
Use machine learning to track individual surgical instruments and as a part of infection prevention.
**Q1 University of Wyoming Grand Challenges Initiative**

We invite your participation in the University of Wyoming Research Grand Challenges Initiative. What is a Research Grand Challenge? Grand Challenges are transdisciplinary research opportunities that address issues of high societal and economic importance to Wyoming, the nation, and the world. This activity will identify areas where investments in research capacity are needed, where incentives to promote vibrant partnering need to be created, where opportunities to align and identify academic coursework with Grand Challenges should be sought, and where opportunities for Grand Challenge research to have an economic impact are high. Girding all of this is the requirement that Grand Challenge research serves as a powerful platform for student education, and for educational outreach to citizens of Wyoming and the Mountain West. We intend to identify areas for a broad range of research, involving the arts, the humanities, the sciences, engineering, health, education, the professions, and interdisciplinary areas of inquiry. We wish to invite a broad range of input. In addition to filling out this survey, please also attend a listening session or town hall meeting on campus, to be arranged throughout the fall semester. Theme/Problem Statement Form To get started, please brainstorm three Themes or Problem Statements you consider to be Grand Challenges. At this point, you do not need to have a plan of action or solution in mind. In fact, if you do have a solution we ask that you still work back to find an open-ended description. Themes/Problem Statements should be specific and include only one topic. The problem might influence different groups of people, but it should be a single problem. Please note: we have listed examples below to get you started, but feel free to be creative and to add problem statements beyond those listed here. Theme/Problem Statement examples: Education and access to information Wyoming ranks 4th in the nation in suicide per capita Big data Albany County is the poorest county in Wyoming Health care inequality Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable Mass incarceration Too few people in rural Wyoming have access to the arts and cultural programming Climate change Human biology is becoming more resistant to antibiotics The quality of democracy, such as inequalities of race, class, and gender Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income In the boxes below, please indicate three Themes or Problem Statements

| Theme or Problem Statement 1 | Impacts of climate change on sustainability of agriculture and resilience of ecosystems |

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<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Climate Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Climate Change and water resources</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Climate Change and economy</td>
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<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Climate Change (and science being hijacked by politics)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>True, deep diversification of Wyoming, cultural, economic, etc</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>How will we deal with and support a larger aging population</td>
</tr>
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In the boxes below, please indicate three Themes or Problem Statements.

Theme or Problem Statement 1

Shifting economic base away from extraction toward sustainable, non-consumptive industries

Theme or Problem Statement 2

Overcoming cultural perceptions that create barriers to evolving (i.e. idea that coal is patriotic)

Theme or Problem Statement 3

Protecting open space, wildlife, and wildlife habitat in the face of shifting economies and demographics
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In the boxes below, please indicate three Themes or Problem Statements:

<table>
<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Development of renewable energy resources</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Development of low cost medical diagnostic/screening and condition management platforms</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Development of low cost water testing and purification technologies</td>
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<tr>
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<th>Climate change</th>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>The quality of democracy, such as inequalities of race, class, and gender</td>
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<td>Theme or Problem Statement 3</td>
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<tr>
<td>Theme or Problem Statement 2</td>
<td>Economic diversification</td>
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<td>Theme or Problem Statement 3</td>
<td>Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable</td>
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In the boxes below, please indicate three Themes or Problem Statements

Theme or Problem Statement 1

Global climate change.

Theme or Problem Statement 2

Natural resource management and conservation.

Theme or Problem Statement 3

Equal access to health care.
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<table>
<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Our state government has a crippling bias towards big coal and ranching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>The state has never been able to turn the lack of population into a positive--either practically or in popular imagination</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Gender inequality has made Wyoming a pariah in the eyes of the nation</td>
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</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Wyoming - Uneven Economics - Lack of Action</td>
</tr>
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<td>Theme or Problem Statement 3</td>
<td>Wyoming - Health Care Inequality</td>
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<th>Theme or Problem Statement 1</th>
<th>poverty and the lack of economic development and diversity in WY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>appropriate &amp; timely role of K-12 education &amp; higher ed in addressing grand challenges</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>food security, health care and access for all</td>
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<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Health Care - health needs of an aging and rural population, including mental health as well as caregiving</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Small Business Development - preparing students and residents to explore small business options</td>
</tr>
</tbody>
</table>
Q1 University of Wyoming Grand Challenges Initiative

We invite your participation in the University of Wyoming Research Grand Challenges Initiative. What is a Research Grand Challenge? Grand Challenges are transdisciplinary research opportunities that address issues of high societal and economic importance to Wyoming, the nation, and the world. This activity will identify areas where investments in research capacity are needed, where incentives to promote vibrant partnering need to be created, where opportunities to align and identify academic coursework with Grand Challenges should be sought, and where opportunities for Grand Challenge research to have an economic impact are high. Girding all of this is the requirement that Grand Challenge research serves as a powerful platform for student education, and for educational outreach to citizens of Wyoming and the Mountain West. We intend to identify areas for a broad range of research, involving the arts, the humanities, the sciences, engineering, health, education, the professions, and interdisciplinary areas of inquiry. We wish to invite a broad range of input. In addition to filling out this survey, please also attend a listening session or town hall meeting on campus, to be arranged throughout the fall semester. Theme/Problem Statement Form

To get started, please brainstorm three Themes or Problem Statements you consider to be Grand Challenges. At this point, you do not need to have a plan of action or solution in mind. In fact, if you do have a solution we ask that you still work back to find an open-ended description. Themes/Problem Statements should be specific and include only one topic. The problem might influence different groups of people, but it should be a single problem. Please note: we have listed examples below to get you started, but feel free to be creative and to add problem statements beyond those listed here. Theme/Problem Statement examples: Education and access to information, Wyoming ranks 4th in the nation in suicide per capita, Big data, Albany County is the poorest county in Wyoming, Health care inequality, Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable, Mass incarceration, Too few people in rural Wyoming have access to the arts and cultural programming, Climate change, Human biology is becoming more resistant to antibiotics, The quality of democracy, such as inequalities of race, class, and gender, Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income. In the boxes below, please indicate three Themes or Problem Statements.

Theme or Problem Statement 1

Theme or Problem Statement 2

Theme or Problem Statement 3

Natural resource management

The quality of democracy

Education and access to information
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Themes/Problem Statement examples:
- Education and access to information
- Wyoming ranks 4th in the nation in suicide per capita
- Big data
- Albany County is the poorest county in Wyoming
- Health care inequality
- Natural resource management, including water and energy policies, in Wyoming and globally, need to be made more sustainable
- Mass incarceration
- Too few people in rural Wyoming have access to the arts and cultural programming
- Climate change
- Human biology is becoming more resistant to antibiotics
- The quality of democracy, such as inequalities of race, class, and gender
- Through artificial intelligence and other advances in technology, jobs that have previously required human labor are now becoming automated, including blue- and white-collar labor. This has implications for the future of work, about access to healthcare, and questions about a universal basic income

In the boxes below, please indicate three Themes or Problem Statements:

<table>
<thead>
<tr>
<th>Theme or Problem Statement 1</th>
<th>Addressing the Energy Transition: Production, Transmission, Storage, Economics, Policy, Legal Aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme or Problem Statement 2</td>
<td>Rural Transportation Improvement and the Energy it Requires</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Ensuring the success of the rural economy as industry and their workforce needs change</td>
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<td>Theme or Problem Statement 2</td>
<td>Universal healthcare</td>
</tr>
<tr>
<td>Theme or Problem Statement 3</td>
<td>Loss of research productivity / trust in research establishment</td>
</tr>
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</table>