

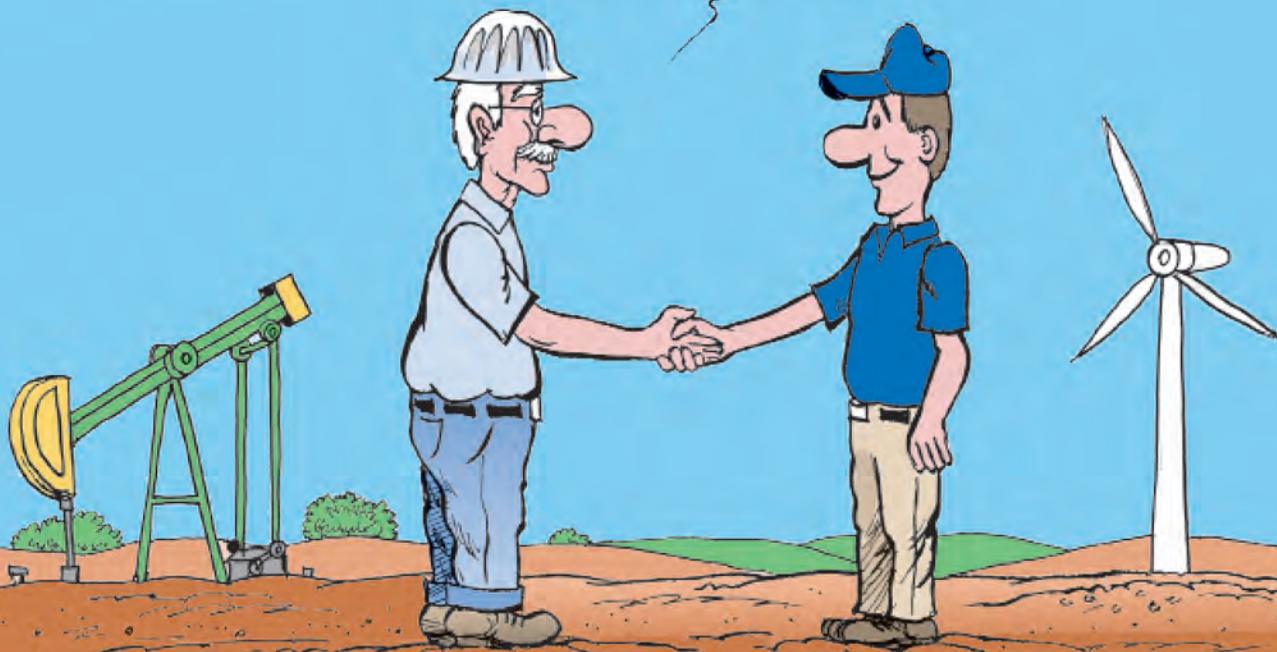


THE 2019 TOWN HALL

Findings & Key Recommendations

PLATE FOR OKLAHOMA ACADEMY

LET'S WORK TOGETHER
TO BUILD A BETTER
ENERGY FUTURE!



OKLAHOMA ENERGY:
Optimizing Our Resources for the Future

Take Action

OKLAHOMA ENERGY: Optimizing Our Resources for the Future
2019 Oklahoma Academy Town Hall



Tips on How to Successfully Talk with Your Legislator and Help the Oklahoma Academy Move Ideas Into Action

The better your relationship is with a legislator, the more the legislator will respect and listen to you. Advocating is all about building relationships. As a citizen, you hold a powerful position; you are a voting constituent who is aware and informed of the issues facing this great state.

- Remember that legislators are human beings. Share your story.
- Be positive. Always make your case without being critical of others' personalities or motives.
- Be respectful. Allow the legislator a chance to respond, listen carefully to their advice and don't interrupt.
- Be prepared to listen and speak. Give them an opportunity to voice their concerns and ask questions.
- Don't be intimidated.
- Be honest. If you don't know the answer to something, admit it and try to get the information later. Be credible, honest and trustworthy.
- Avoid party politics.
- Maintain a positive relationship.
- Find common ground. Build a bond, not a gap.
- Don't apologize. Never apologize for your position.
- Thank you notes.

Be sure to check The Oklahoma Academy website for the complete Library for information on all Town Hall Resource Documents, Issues Briefs and Full Reports. The link to the Library is <http://www.okacademy.org/library.html>.

Building Awareness, Developing Policies, Inspiring Oklahomans to Move Ideas Into Action!

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Introductions

OKLAHOMA ENERGY: Optimizing Our Resources for the Future 2019 Oklahoma Academy Town Hall



Oklahoma has a proud energy legacy and is a world leader in the exploration and production of oil and natural gas and wind energy. We have taken significant steps to install utility smart grid energy technologies. Further, Oklahoma has a very promising future in solar energy and energy storage. But whether Oklahoma remains a global leader in the rapidly changing energy industry depends on the steps that are taken now by government, industry, and the academic and research communities.

The Oklahoma Academy Town Hall focused squarely on how Oklahoma can continue to support and benefit from, and best leverage and optimize, its diverse energy resources, while preserving and sustaining the environment. Town Hall participants offered bold ideas and proposals for future success, which were thoroughly debated and refined. Throughout the Town Hall, participants benefited from the expertise and insights of outstanding speakers. Participants also had an excellent Background Resource Document to reference and use.

After much hard work and effort, the collective wisdom of the Town Hall participants was captured in this Final Report, which serves as the platform for policy recommendations to state officials and other policymakers.

This Report is a guidebook of sensible ideas to move Oklahoma's energy industry forward to ensure a bright energy future for our state. We are grateful for the opportunity to co-chair the Town Hall, and deeply appreciate the efforts of the Town Hall participants, speakers, and Academy staff and volunteers. Together we can ensure that the energy industry that has shaped and defined Oklahoma throughout its history, can continue to innovate and positively impact our future.



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About the Town Hall

The Oklahoma Academy defines leadership as the ability to get people moving in a single direction. One of the most effective ways of achieving that goal is utilizing a process like the Town Hall. The Town Hall incorporates all the elements of a successful consensus-driven process by emphasizing collaboration, cooperation, egalitarianism, inclusivity, and participation. Each must be in place to arrive at the destination improving the overall business climate and quality of life for Oklahoma. The Oklahoma Academy's Town Hall process is successful in implementing recommendations unlike any other because strong group relationships have been developed through the process that results in greater trust amongst the attendees. By "leading" a diverse group of Oklahomans through the Town Hall process, the Oklahoma Academy provides a value-added service unlike any other.

Key Recommendations

OKLAHOMA ENERGY: Optimizing Our Resources for the Future 2019 Oklahoma Academy Town Hall Consensus Recommendations



The Oklahoma Academy elected to focus Oklahoma energy and how to optimize our resources for the future in the 2019 Town Hall. A thorough research document was compiled by the Academy and distributed to the Town Hall Participants in advance to allow them to read and help give the a comprehensive understanding of the issues at hand.

Once the Town Hall had begun, participants were asked to limit their discussions to specific areas of each issue. Those areas included: Oklahoma's energy production, energy and the environment, the economy, and regulation and policy. In addition, experts in the field of energy, environment, incentives and state regulation were invited to provide insight and factual information on issues.

The full report, drafted from the single consensus of all the groups, gives insight into the attitudes and thoughts of the participants. From the full report (located on pages 13 through 27 of this document) the key recommendations and Town Hall findings were constructed. The Town Hall participants advanced 15 recommendations for energy. The key consensus recommendations for energy and how to optimize our resources for the future are as follows.

Consensus Town Hall Key Recommendations

Recommendation= Proposal as to the best course of action

(The recommendations are in bold print in each of the following areas. Page numbers refer to where the recommendation is found within the full report.)

ENERGY PRODUCTION

- The Oklahoma First Energy Plan was finalized and distributed in 2011. Given the rapid changes since 2011 with the overall energy system and major contributions made by renewables, **the Town Hall unanimously recommends the Oklahoma First Energy Plan be reviewed annually and consistently updated by the Secretary of Energy and Environment, no less than every five years, to reflect new achievements in technology, innovation, societal objectives, and resource efficiencies.** The energy plan should include both long-term beneficial objectives, rather than prescriptive mandates that may become irrelevant with technological and market developments, and more immediate short-term goals. This planning process should include continuous improvement and implementation strategies as benchmarks are achieved and objectives change. Ultimately, the State of Oklahoma needs a dynamic state strategy for energy and a mechanism to hear stakeholder voices to incorporate this short and long-term vision. Recognizing the objective achieved set forth in the Oklahoma First Energy Plan, the goals and milestones should be publicly reported annually. Also, while understanding that mandates are not always the most ideal policy vehicles, the Oklahoma First Energy Plan needs to incorporate more concrete goals and milestone objectives for both policymakers and industry to encourage all Oklahomans to rally towards these same objectives. **The Town Hall recommends expanding emphasis on energy storage solutions, electric vehicle charging infrastructure in both urban and rural areas, streamlining the Southwest Power Pool transmission interconnection process, enhancing use of solar technologies, continuous improvements in energy efficiency and demand side management programs, and enhanced multi-disciplinary workforce development for energy related positions from secondary school to vocational training facilities to structured apprenticeship programs.** [Page 16](#)
- Oklahoma has the sixth highest potential for developing solar power, but it ranks in the bottom ten states in the installation of solar photovoltaic capacity. The Town Hall recognizes the significant energy potential solar can bring to Oklahoma. The Town Hall believes that solar technologies are advancing quickly with historic drops in price and that Oklahoma's unique position within the Southwest Power Pool is an advantage for its solar potential. **The Town Hall recommends the Governor prioritize examining solar energy as one of Oklahoma's new energy technologies, especially since the state's solar potential aligns with his platform of making Oklahoma a "Top 10 State."** [Page 16](#)

Key Recommendations

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- Nuclear energy is America’s largest source of emission-free electricity and, with over 98 operating nuclear power reactors in 30 states, nuclear energy produces approximately 20% of the nation’s electricity overall. Despite its low levels of pollution and high levels of reliability, Oklahoma has not never used nuclear energy to generate electricity. According to the discussions and findings from all five panels, **the Town Hall recommends nuclear energy not be included as a future source for Oklahoma-based electrical production, but monitor for technical developments for the medium and long-term.** The list of the most prevalent concerns with nuclear energy include: the high construction and operating costs associated with building a nuclear plant; the federal permitting process (decades long); public perception; political uncertainty; cheaper energy sources; and safety and disposal. [Page 17](#)
- Energy production in Oklahoma presents opportunities for the state to assume a leadership role in the design and implementation of future power systems. **The Town Hall unanimously recommends the state should encourage incentives to study the optimization of energy production and delivery, but no clear recommendation as to how that would be achieved was established. The most common response was the encouragement of more Public Private Partnerships between universities and the private sector. The Town Hall also agrees Oklahoma should encourage and reward institutions and employees who engage in these types of effort be cause rewards are an effective tool to encourage collaboration; however, there was no consensus on what approach should be used.** [Page 18](#)

ENERGY AND THE ENVIRONMENT

- All forms of energy production lead to intensive use of various natural resources, either directly or indirectly. Energy production also requires that states manage the land use, water consumption and air quality. Collaborative approaches to balancing the impact of our energy industry and consumption with environmental protection are critical to a successful approach in Oklahoma. **The Town Hall recommends to continuously examine for best practices, emerging scientific and medical data, and resource conservation when dealing with this balancing act of energy and environmental policy.** This can be achieved by utilizing a multi-stakeholder Council focused on diversity. Therefore, **the Town Hall recommends the formation of the Oklahoma Center for Energy and Environmental Excellence (“OCEEE”). This would be a one stop shop to handle and coordinate all task force, research, and council related recommendations tasked with proliferation of energy literacy, education workforce development, public private partnerships, and growth opportunities in all facets of the energy industry.** The Council would be comprised of diverse delegates from the public and private sectors, public at-large, and representing constituencies such as energy trade associations, education entities, the Oklahoma Department of Environmental Quality, Oklahoma Department of Agriculture, Food & Forestry, Oklahoma State Department of Health, Department of Commerce, Interagency Tribal Councils, Oklahoma Electric Cooperative, Oil and gas Interstate Compact Commission, Oklahoma Water resources Board, Oklahoma Energy Resources Board, Oklahoma Corporation Commission, American Association of Retired People, CareerTech, Oklahoma higher education system, Attorney General, the oil and gas industry, wind and solar industries, investor owned utilizes, municipal power authorities and other critical stakeholders. [Pages 16 & 19](#)
- There are increasing numbers of reports and studies that indicate that climate change is occurring now resulting in significant impacts on the world and its inhabitants. Consumers are demanding cleaner, more sustainable energy solutions and industry is seeking ways to improve efficiencies in production of products. Policymakers are focused on ensuring that the environment is protected. **The Town Hall recognizes the threats to Oklahoma communities and industries resulting from climate change and supports an open, science-based dialogue regarding how to best mitigate these challenges, while utilizing our abundant resources as part of a comprehensive solution.** Public perceptions on the definition of “clean energy” would benefit from a more expansive definition while focusing on the reduction of carbon impact from these sources. This would also help Oklahoma build upon its status as an abundant energy producer and open markets for export, including natural gas, liquefied natural gas, wind and solar export. **The Town Hall also recommends the State of Oklahoma issue a statewide climate report that details greenhouse gas emissions, strategies for mitigation, projected impacts due to a changing climate, and necessary adaptations.** [Page 19](#)

Key Recommendations

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- Energy efficiency delivers several benefits, including reducing pollution, saving households and businesses dollars on energy bills, increasing electric grid resilience, creating jobs, and expanding economic development. Investor-owned utilities as well as some rural electric cooperatives and municipal electric utilities in Oklahoma have a wide variety of energy efficiency programs and partners available to their customers, and participation rates are growing. **The Town Hall recommends increasing/expanding consumer education efforts to move the demand side of the equation and increase the participation rate in the energy efficiency programs.** [Page 26](#)

THE ECONOMY

- Understanding of the nature and role of energy in the State of Oklahoma is of the utmost importance. Oklahoma ranks 4th nationally overall in energy production. Nationally the U.S. Department of Labor recently launched the Energy Literacy Initiative, focused on improving America’s fundamental understanding of energy, and how that effort could improve the proficiency of both teachers and students. **The Town Hall recommends to improve statewide energy literacy, energy curriculum developed or modified should address all sources of energy. The energy industry could play a positive role in developing/enhancing content-neutral curriculum.** This as well as technology is critical in helping to deliver curriculum to improve statewide energy literacy. **The Town Hall recommends the use of energy experts to train teachers and address students to help offset the burden of adding additional materials for teachers to incorporate into their curricula. The Town Hall endorses the Oklahoma Energy Resource Board’s educational outreach programs providing curricula, free training, materials, educational trips and in-class presentations.** Reaching both parents and adults with topical energy literacy materials must be a part of an overall strategy. [Page 15](#)
- The production and consumption of energy are vital to the expansion of economic activity in Oklahoma and globally. However, increased energy production continues to present environmental concerns. Most recently, growing concerns over carbon dioxide emissions from fossil fuel combustion, specifically a carbon rich fuel, suggest that the current carbon intensity of energy produced in the U.S. must either be reduced or mitigated going forward. **The Town Hall recommends fostering carbon sequestration, reuse and capture research and development of partnerships between universities and the private sector potentially supported by state appropriation to match federal and private funds to increase research and development efforts.** This effort should include performance and accountability metrics provided to the Governor and Legislature. This research may include the Oklahoma Center for the Advancement of Science and Technology, the Center for Industry and Innovation, and Oklahoma research universities. As we transition from coal towards alternative fossil fuels and renewable energy resources, reducing and capturing carbon should be a priority. [Page 17](#)
- We, as a state, must achieve “economic agility” with policies and actions that optimize all our resources: natural, human, physical, and entrepreneurial. The best strategies for mitigating the negative effects of the state’s high concentration of energy are to broaden our tax base, diversify our economy, grow and attract higher waged jobs, and continue smart, forward-thinking governmental reforms. **The Town Hall recommends energy-supporting strategies in three areas: (1) expansion of connectivity/broadband, with specific references to rural Oklahoma and rural health, (2) a greater focus on technology jobs and investment, with multiple references to organizations like OCAST, i2e and the recruitment of information- and STEM-based businesses, and (3) improving educational opportunities.** [Page 20](#)

Key Recommendations

OKLAHOMA ENERGY: Optimizing Our Resources for the Future 2019 Oklahoma Academy Town Hall Consensus Recommendations



- Petroleum products dominate the transportation landscape (92% of all use); however, there has been rapid growth in alternative fuel vehicles (AFVs) like natural gas and electric-powered vehicles. **The Town Hall recommends supporting the growth of AFVs of all types, including natural gas. We must support both the public and private sectors to not only better educate consumers about the options available but also in a more expansive network of electric vehicle charging infrastructure.** The advent of the Oklahoma Electric Charging Program (due to the Volkswagen settlement), plus investments from the private sector (On Cue, Loves, etc.), will expand the EV charging infrastructure even further. Prior to these investments and techniques coming to scale, the appropriate jurisdictions work to ensure that the additional grid infrastructure and demand cost be appropriately assessed and allocated in a manner so cost subsidizations do not unintentionally occur to those not using the grid for this purpose. [Page 21](#)

REGULATION AND POLICY

- Oklahoma's energy production generally exceeds the usage in the state, providing opportunities for energy exports. **The Town Hall unanimously and robustly opposes the concept of applying a specific tax to electricity generated for export outside Oklahoma on legal, ideological, practical, and economic grounds.** Such a tax would be a deterrent to encouraging export markets and opportunities in Oklahoma. **The Town Hall wholeheartedly recommends enhancing opportunities for exporting electricity generated in Oklahoma to external markets, in addition to aggressively pursuing liquefied natural gas export opportunities through a variety of means. Advocating for regulatory changes favorable to exports at the federal level, the various Regional Transmission Organizations (RTO), and other relevant jurisdictions is also endorsed. Oklahoma's Congressional delegation should assist with policy changes via statutory amendments, and regulatory changes at the Federal Energy Regulatory Commission that would empower electricity exports to the western markets.** Infrastructure improvements are needed to increase export opportunities with liquefied natural gas (LNG) in both domestic and international markets. Higher levels of exports will generate economic growth for Oklahoma. While pipeline infrastructure projects are underway in several areas, involving the Gulf Coast, Mexico, and American bi-coastal projects, **the Town Hall recommends public incentives be used for this infrastructure build-out and for electric transmission infrastructure.** Korea, China, India and several emerging markets present excellent end-use purchase opportunities for Oklahoma's abundant natural gas supply, which would be aided immensely with more robust LNG terminal port facilities. [Page 21](#)

(Since the Town Hall, the National Petroleum Council has published their Infrastructure study. It should be considered in further plans for Oklahoma. Reference and consider the NPC study in plans that are developed.)

- Our Nation and State are currently experiencing an energy transition. A recent increased focus on methane/carbon capture, especially as it relates to the continued use of natural gas, is becoming a part of our energy landscape. In the march to decarbonize the state, technology now exists, using underground storage, to capture and sequester CO₂, preventing it from reaching the atmosphere. Recent carbon capture utilization and sequestration technology and related federal legislation known as the 45Q tax credit are now stimulating the innovation this technology. **The Town Hall is unanimous in their support of Oklahoma policymakers responding affirmatively to the federal foundational policy for increasing deployment of carbon capture projects.** Furthermore, **the Town Hall recommends that our federal delegation needs to be actively involved in support of this carbon capture, utilization, and storage process.** [Page 24](#)

(Since the Town Hall, the National Petroleum Council has just published their CCUS study. It should be considered in further plans for Oklahoma. Reference and consider the NPC study in plans that are developed.)

Key Recommendations

OKLAHOMA ENERGY: Optimizing Our Resources for the Future 2019 Oklahoma Academy Town Hall Consensus Recommendations



- Thirty-eight federally recognized Native American Tribal governments occupy treaty homelands in Oklahoma. Since statehood, the majority of the lands within those homelands have passed out of tribal jurisdiction and ownership. Nonetheless, Oklahoma tribes remain significant to the economy and intergovernmental fabric that makes up our Oklahoma community. Many public policy matters in Oklahoma often involve a basic question of whether and how non-tribal policymakers should engage with tribal sovereigns. The **Town Hall recommends that tribal governments be consulted by state policymakers and considered as positive community partners as a matter of respecting their sovereignty and increasingly crucial role in building a robust energy economy in Oklahoma.** It must be recognized that each tribal government is unique, possessing cultural, structural, historical, geographical, financial and logistical resources differing from tribal nation to tribal nation. Therefore, potential partnerships between the state and each tribe must be approached on a case-by-case manner, affording due respect and consultation on each tribal government's accords. [Page 24](#)
- The importance of energy storage as we integrate renewable energy sources into the mix of fuels used for electricity generation is a critical component in guiding Oklahoma into the future. Many in the industry feel that electricity storage is the missing piece in the renewables jigsaw. As Elizabeth Weise wrote in an USA TODAY article, "The prevailing wisdom has long been that wind and solar power were all well and good, but they weren't that useful because there was no way to store the energy when the sun sets or the wind is not blowing." This statement is beginning to fall on deaf ears due to advanced energy grids and "utility-scale energy storage systems." In fact, a recent article reported that NextEra Energy Resources will be deploying a major complex combining solar, wind, and storage batteries in northwestern Oklahoma. This project is the first to mix wind, solar, and batteries in the 14 state Southwest Power Pool region. The Town Hall agreed there are no state impediments to electrical energy storage initiatives, but impediments do result from Federal Regional Transmission Organizations. The **Town Hall recommends that Oklahoma policymakers and stakeholders encourage the Southwest Power Pool to develop market rules regarding storage capacity and market participation for electrical energy storage. Specifically, these rules should allow energy storage capacity accreditation for a 4-hour system. Ultimately, Oklahoma policymakers should build a favorable climate supporting energy storage activity and development of affiliated technology and infrastructure. The Town Hall also recommends the Governor establish a one-year task force to study the regulatory and tax treatment for electrical energy storage. Additional storage options should be explored by this task force and research and development entities, including pumped-hydro, compressed gas, and excess wind conversion to hydrogen making it shelf stable, as well as determining the best use of those sources. Also, this task force should investigate the impact of net metering/time of use, electric vehicle charging, and home-based electric storage. This task force should be overseen by the aforementioned Oklahoma Center for Energy and Environmental Excellence (also to be created as described in the Town Hall report).** [Page 27](#)

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The Oklahoma Academy wishes to acknowledge the following entities for contributing the time of the very talented individuals serving as Panel Recorders and Report Co-Chairs for the 2019 Town Hall.



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Town Hall Final Report



Final Report

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The energy market is undergoing rapid and transformative change driven by new technologies and changes in customer demands and expectations, which provides both opportunities and challenges for Oklahoma’s energy industry. We have moved from scarcity to abundance, and our challenge now is how best to leverage and sustainably manage this. Oklahoma is an energy producing state. We have been blessed with not only our great oil and natural gas supplies, but we are leading the pack when it comes to electricity generation from wind. These transformative changes can create new winners, but it also impacts the legacy players that have been the driving force of our great state for generations. And with these changes comes uncertainty.

Better understanding this new energy system, and how to optimize our resources, technologies and behaviors is now more important than ever to guide our path into the future. That is why the Oklahoma Academy 2019 Town Hall focused on our energy resources to determine how best to maximize our role as an energy leader, and to enhance our economy, consumer needs, and the environment.

In the pages that follow, the dedicated and focused Town Hall participants studied the issues and participated in the policy development process on how to optimize our resources for the future. Moreover, the education that was obtained on this topic from this Town Hall and the discussions were beneficial to not only the participants, but will be beneficial to our general conversation as a State.

Operating through five Panels, each led by a Panel facilitator with discussions captured by a Panel reporter, all five Panels followed the same discussion question outline. This report includes the deliberative discussion of the Town Hall participants in answer to the discussion question outline all five Panels followed.

This Town Hall Report is written to convey the essential discourse of those who participated in two days of panel deliberations and their recommendations from the final plenary session. We believe the Report reflects accurately on the scope, tenor, thoughts and conclusions of those participants.

Oklahoma Energy: Optimizing our Resources for the Future

As our Town Hall co-chairs - Stuart Solomon and Mike Ming – point out in their welcoming article, Oklahoma is an energy producing state that is blessed with both great oil and natural gas supplies and is the second leading state in electrical generation from wind. Balancing and utilizing both our finite and renewable energy resources to enhance our economy (jobs), consumer needs (reliability and affordability), and the environment is our challenge today and for years to come.

The term optimization is defined as “the action of making the best or most effective use of a situation or resource.” In essence, that is what the Town Hall Participants were charged with doing. First, to review a 170-plus page Background Resource Document including ancillary reports prior to attending the Town Hall. Second, once at the Town Hall, participate in and consider the deliberations within their panels for two days, supplemented by a strong contingent of speakers. Finally, on the final morning of Town Hall, read, debate, and amend the report with all panels in attendance. How can Oklahoma’s Economy, Energy, and Environment co-exist together while maximizing the value of each?

Day 1, Question 1

Our opening speaker Monday morning was Mark Stansberry, a 30-plus-year veteran in energy analysis and consumer engagement. While much of his presentation focused on Digital Transformation, he referenced one of his books (America Needs America’s Energy: Creating Together the People’s Energy Plan) dealing with how to more effectively optimize the discussions we have concerning energy efficiency and environmental preservation (see pages 3-5 of the Background Resource Document). He stressed the importance of working together, of civil dialogue, and how factual, non-emotional conversations are critical to addressing both energy issues and solutions.

The first question of the Monday morning session dealt with the importance of improving energy literacy in this state, a state that ranks 4th nationally overall in energy production. The Participants were informed about the U.S. Department of Labor’s recently launched Energy Literacy Initiative, focused on improving America’s fundamental understanding of energy, and how that effort could improve the proficiency of both teachers and students.

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On the question of what recommendations The Oklahoma Academy Town Hall should make to improve statewide energy literacy, the Panels had a number of suggestions. In general, there was consensus that any energy curriculum developed or modified should address all sources of energy, that the energy industry could play a positive role in developing/enhancing that curriculum (which must be content-neutral), and that technology is critical in helping to deliver that curriculum. One Panel did point out that levels of technology vary across the state, so upgrades would need to be made if the primary conduit for curriculum distribution and staff development occurs in an online digital format. Energy education and literacy should progressively advance from energy resources and the economy to the impact upon daily life as students advance.

While the question focused on K-12 education as the primary conduit and most Panels made suggestions with that in mind, one Panel suggested greater use of our Career Technology centers implementing an “energy center cluster program.” Concern was expressed by one Panel for adding additional materials for teachers to have to incorporate into their curricula, but several Panels suggested that by using energy experts to help train teachers and address students, some of those burdens could be offset. Most Panels agreed that reaching both parents and adults with topical energy literacy materials must be a part of an overall strategy.

While there was not consensus, there were several unique recommendations that addressed the importance of utilizing technology. One Panel suggested developing apps, games, and podcasts that could be distributed to students, teachers and adults. Another suggested incorporating 5G technology and the use of summer camps. Another suggested 15-minute TED talks, again, for wide distribution. Finally, the majority of panels were supportive of the Oklahoma Energy Resource Board’s (OERB) educational outreach programs providing curricula, free training, materials, educational trips and in-class presentations. It was discussed that OERB curriculum fails to mention potential environmental consequences. In fact, this perception is not true; the OERB’s educational curriculum and programs do address environmental concerns as well as their ongoing commitment to clean-up Oklahoma’s orphaned and abandoned well sites. OERB is a private entity that is funded by oil and gas producers and royalty owners. They have established an educational curriculum to address issues regarding their industry. The suggestion that the state develop an educational curriculum which includes all forms of energy is admirable, as long as it is understood that an entity would need to be created and funded to house, administer, update and share that curriculum.

Stakeholders involved in this collaborative education venture should include the private sector, non-profits, Corporation Commission, and education entities.

Day 1, Question 2

The Town Hall next addressed the potential for an expanding footprint for solar energy in this state. According to the research, Oklahoma has the sixth highest potential for developing solar power, but it ranks in the bottom ten states in the installation of solar photovoltaic capacity. Given the explosion of wind energy and its contribution to the production of electricity over the past decade, could solar energy follow a similar trajectory as wind over the next decade?

Town Hall Participants recognized the significant energy potential that solar can bring to Oklahoma. Oklahoma is blessed with both wind and solar as renewable natural resources, and both should be developed. Although the scale of solar relative to wind in Oklahoma may not be as developed, the current trajectory of growth in solar will likely mirror the growth in wind and will likely exceed wind in many other southern states. There are barriers in place regarding solar, much like wind. These include lack of storage and transmission infrastructure. As well as residential construction codes/costs for rooftop systems and lack of incentives provide additional obstacles.

While there was concern about solar matching the scale of wind in the near term, there were several suggestions that could improve the outlook, including development of infrastructure that is flexible and can change overtime; as well as continuing the development of storage.

The Town Hall believes that solar technologies are advancing quickly with historic drops in price and that Oklahoma’s unique position within the Southwest Power Pool is an advantage for its solar potential. It was noted that the SPP marketplace has thousands of megawatts of utility scale solar in the interconnection queue for Oklahoma.

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The Town Hall suggests that the Governor prioritize examining solar energy as one of Oklahoma's new energy technologies, especially since the state's solar potential aligns with his platform of making Oklahoma a top ten state.

Day 1, Question 3

The Oklahoma First Energy Plan was finalized and distributed in 2011. Given the rapid changes since 2011 with the overall energy system and major contributions made by renewables, the Town Hall unanimously recommends that the Oklahoma First Energy Plan be reviewed annually and consistently updated by the Secretary of Energy and Environment, no less than every five years, to reflect new achievements in technology, innovation, societal objectives, and resource efficiencies.

Several Panels noted that the stakeholder participants in the energy planning process should be as inclusive as possible reflecting a broad range of Oklahoma's demographics, energy sectors, natural resource managers, public citizenry, alongside public utility, cooperative, municipal and transportation infrastructure interests. Such an energy planning process should be living, responsive to the permeable changes in energy technology and infrastructure, with consistent updates made by the planning participants and public celebration of benchmark achievements. One specific recommendation to grow and preserve energy jobs in the state involves the formation of a non-partisan, multi-stakeholder Council (The Oklahoma Center for Energy and Environmental Excellence) focused on energy diversity, tasked with proliferation of energy literacy, education and workforce development, public private partnerships, and growth opportunities in all facets of the energy industry. The Council would be comprised of diverse delegates from the public and private sectors, public at-large, and representing constituencies such as energy trade associations, education entities, the Oklahoma Department of Environmental Quality (ODEQ), Oklahoma State Department of Education, Oklahoma Department of Agriculture, Food & Forestry, Oklahoma State Department of Health, Oklahoma Department of Commerce, Interagency Tribal Councils, Oklahoma Association of Electric Cooperatives, Oil and Gas Interstate Compact Commission, Oklahoma Water Resources Board, Oklahoma Energy Resources Board, Oklahoma Corporation Commission, American Association of Retired People, Career Technology, Oklahoma State Regents for Higher Education, Attorney General, the oil and gas industry, wind and solar industries, investor owned utilities, municipal power authorities, and other critical stakeholders. The Council would be unfunded, and members would serve on a voluntary basis. This would serve as a one-stop shop for coordinating all task force, research, and council-related policy recommendations.

The general basis of the energy plan should include both long-term beneficial objectives, rather than prescriptive mandates that may become irrelevant with technological and market developments, and more immediate short-term goals. This planning process should include continuous improvement and implementation strategies as benchmarks are achieved and objectives change. Ultimately, we need a dynamic state strategy for energy and a mechanism to hear stakeholder voices to incorporate this short and long-term vision. Recognizing the objective achieved set forth in the Oklahoma First Energy Plan, these goals and milestones should be publicly reported annually. Also, while understanding that mandates are not always the most ideal policy vehicles, the Oklahoma First Energy Plan needs to incorporate more concrete goals and milestone objectives for both policymakers and industry to encourage all Oklahomans to rally towards these same objectives.

While multiple concepts were discussed for inclusion within an updated Oklahoma First Energy Plan, the Town Hall Panels recommended expanded emphasis on energy storage solutions, electric vehicle charging infrastructure in both urban and rural areas, streamlining the Southwest Power Pool transmission interconnection process, enhancing use of solar technologies, continuous improvements in energy efficiency and demand side management programs, and enhanced multi-disciplinary workforce development for energy related positions from secondary school to vocational training facilities to structured apprenticeship programs.

Alongside updating the energy plan to account for new technologies, Oklahoma public officials and agencies should be encouraged to update legislative and regulatory mandates to reflect said developments. Furthermore, publicly financed facilities, specifically public schools and state buildings, should implement energy efficiency upgrades, utilize renewable resources like solar energy technology to lower operating expenses (accounting for maintenance costs for the solar infrastructure), and alternative fuel sources for transportation fleets.

Other areas in the plan to update should include carbon capture and sequestration, water usage and hydroelectric generation, cybersecurity planning for grid infrastructure, battery recycling, energy infrastructure (renewable or otherwise) decommissioning, recycling and reuse.

Finally, as indicated by its name, the energy plan should first focus on Oklahoma's resources, needs and goals, while also recognizing and broadcasting Oklahoma's position as a global energy leading powerhouse.

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Day 1, Question 4

The Town Hall next addressed the prospects of introducing nuclear power into our electrical energy mix. Despite being a low polluter, a low emitter of greenhouse gases, and a stable base load of energy, the cons of nuclear power are quite significant, and according to all five Town Hall Panels, “we cannot currently make a case for nuclear power.”

The list of concerns is many and consistently appear in most Panel deliberations. The most prevalent reasons include: the high construction and operating costs associated with building a nuclear plant; the federal permitting process (decades long); public perception; political uncertainty; cheaper energy sources; and safety/disposal concerns. One Panel called for “leaving the door open to progress.” Most Panels said “not in the near future,” “not at this point and time,” or “not in the immediate future.”

The longer-term hesitancy was explained by not knowing what future regulatory and construction modifications (e.g., smaller, modular units) might occur to make the energy source more cost- and safety-competitive. Oklahoma should actively monitor developing nuclear technology developments. One panel even suggested there is a generational bias against nuclear and in time, the energy source might be viewed more favorably. But in the end, the panels were unanimous in the rejection of including nuclear power into the current resource portfolio plans.

Day 1, Question 5

The production and consumption of energy are vital to the expansion of economic activity in Oklahoma and globally. However, increased energy production continues to present environmental concerns. Most recently, growing concerns over carbon dioxide emissions from fossil fuel combustion, most specifically coal, suggest that the current carbon intensity of energy produced in the U.S. must either be reduced or mitigated going forward. A sharp pullback in the use of coal in electric power production represents one of the recent changes in domestic energy production that receives broad support.

The Town Hall was tasked with contemplating how Oklahoma achieves a balance of its current and historical position as a major fossil fuel producer with increasing demands for cleaner forms of energy production now and in the future, and if there are any potential policy changes that present sensible ways for the state to begin transitioning to less carbon intensive forms of energy production.

Oklahoma should be proud of its demonstrated leadership in reducing carbon dioxide emissions in the United States through its rapid adoption of clean energy technologies, including wind, solar, and natural gas, as we transition away from a reliance on coal. The Town Hall Panels agree Oklahoma is a national leader in energy, with a corresponding leadership role in advancing energy literacy in the country. One example is the need to clarify the broad term “fossil fuels”. When striving to combat climate change, it’s necessary to distinguish between coal, a major contributor of carbon, and the more clean burning and energy intensive natural gas. More than 8% of the nation’s proved natural gas reserves are in Oklahoma and the state should continue to produce and use natural gas as part of a cleaner energy portfolio.

The Town Hall Panels recognize the balance between maintaining consistent energy accessibility and affordability, and that this often conflicts with mitigating environmental impact; however, balance is achievable by taking a holistic approach to diversified energy portfolios, emphasizing efficiency, and enhanced recovery methods. For instance, one example is, as demonstrated by the Air Quality Index, that Oklahoma has done an admirable job enhancing this balance and improving environmental and public health conditions in the process, although there’s always room for improvement.

To achieve a balance between traditional fuels and demands for cleaner energy there should be more efficient and measured exploration of less carbon intensive fuels such as natural gas, aimed at maintaining healthy reserves and reliance on market forces to promote cleaner fuels coupled with state efforts to encourage use of cleaner transportation technologies, such as CNG, propane, or electric vehicles. As we transition from coal, in addition to using less carbon intensive fuels such as natural gas, this narrative should consider options for reducing and capturing carbon.

Additionally, reducing fugitive oil and gas methane emissions and promoting Oklahoma’s successful efforts should be part of this approach. One suggestion includes ensuring effective inspection protocols in the field while preventing the inhibition of growth and discovery by the industry.

There is support for fostering carbon sequestration, reuse and capture research and development partnerships between universities and the private sector potentially supported by state appropriation to match federal and private funds to increase research and

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development efforts. This effort should include performance and accountability metrics provided to the Governor and Legislature. This research may include the Oklahoma Center for the Advancement of Science and Technology, the Center for Industry and Innovation, and Oklahoma research universities.

Policy recommendations for enhancing this balance should include cohesive positive reinforcement of cleaner energy sources, but not at the expense of existing oil and gas resources. Several Town Hall Panels noted that the environmental costs of carbon are often excluded from economic analyses pertaining to energy production and usage and that public policies should be reevaluated to acknowledge these costs in relation to consumer affordability.

As we transition from coal towards alternative fossil fuels and renewable energy resources, reducing and capturing carbon should be a priority. A possible carbon tax credit for carbon dioxide conversion into beneficial secondary products is one potential policy recommendation, but financial viability of these practices must be analyzed. A public understanding of the difference between carbon sequestration and produced water injection will be instrumental to popular support for such an incentive initiative for carbon sequestration.

Ultimately, public policies that balance renewables and fossil fuels in a complementary fashion will be the most beneficial and all costs (e.g. direct, indirect, long-term, public health) should be a part of these calculations. We should be mindful of stranded assets, cost feasibility, and alternative fuel viability.

Day 1, Question 6

The breadth of energy production in the state presents opportunities for the state to assume a leadership role in the design and implementation of future power systems. The Town Hall Participants were first asked whether the state should encourage incentives to study the optimization of energy production and delivery? The Panels were unanimous as to “yes,” but there was no clear recommendation as to how that would be achieved. The most common response was the encouragement of more Public Private Partnerships (“PPPs”) between universities and the private sector.

However, on that latter point there were several Panels that raised concerns about research ownership, monetary compensation, and intellectual property issues that would need to be resolved or clarified. Additionally, the PPPs tend to be underutilized and few are funded, thus discouraging involvement. There was a suggestion to have existing organizations like the Oklahoma Center for the Advancement of Science & Technology (OCAST) and i2E to pursue further funding, perhaps through the Small Business Innovation Research (“SBIR”). Finally, there was a reference to developing best practices and guidelines regarding tech transfer, and that Purdue University might be an ideal model.

The second part of this question asked whether Oklahoma should encourage and reward institutions and employees who engage in these types of efforts. While most Panels felt that rewards were an effective tool to encourage collaboration, there was no clear consensus on which approach would be the best. One Panel stated a “clear policy directive” was essential but did not specify by whom.

Another idea by one Panel suggested commercialization tenure tracks within the higher education system and the creation of centers of excellence on the development of energy policy. In conclusion, like the first question, there was general agreement of a reward structure however there was no clear majority recommendation on how to achieve an institutional and employee award structure.

Day 1, Question 7

All forms of energy production lead to intensive use of various natural resources, either directly or indirectly. Energy production also requires that states manage the inevitable tradeoffs over land use, water consumption and air quality. The Town Hall was tasked with determining if there are areas of state policy concerning issues surrounding land, water, and air that should be examined given ongoing and expected future changes in the pattern of energy use and production, and further, if Oklahoma is striking an appropriate balance between energy production, delivery, and consumption with environmental protection.

Collaborative approaches to balancing the impact of our energy industry and consumption with environmental protection are critical to a successful approach in Oklahoma. Expanded working groups focused on the myriad of environmental repercussions of different energy sectors, like the Produced Water Working Group, are very helpful to this end, but should include more public

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transparency, diversified participation and public accountability and follow-through. In the end, all areas of policy dealing with this balancing act of energy and environment should be continuously examined to account for best practices, emerging scientific and medical data, and resource conservation.

The role played by local governments in the implementation of air, water, and soil quality protection initiatives is another helpful component to programs currently in place throughout Oklahoma.

Not surprisingly, with water being such an essential component to community health and viability, along with the range of industries located therein, several Panels discussed the need for continued policy development surrounding appropriate water quality, use, and reuse safeguards. Considering the diverse range of hydrological and geological formations found across Oklahoma, it is important that such policies and protections incorporate the unique needs of local communities and preserve their ability to determine best practices for their jurisdictions.

Such policies include setback requirements for various forms of energy production, public notification requirements for oil and gas operators when producing a resource, and appropriate surety bonds for decommissioning, or environmental impact liability for all energy production sources.

With advances in resource recycling and reuse occurring at a substantial pace over the past decade, policies encouraging water reuse (and the possible marketability of said reused water) and industrial component recycling, including wind blades and towers, should be supported with substantial deference to cost and implementation viability.

One Panel encouraged the Oklahoma Secretary of Energy and Environment to use the existing framework of the Oklahoma Energy Initiative to utilize academic resources in the state to provide non-partisan policy analyses and recommendations, specifically considering the impacts on municipalities and rural water districts.

Day 1, Question 8

There are increasing numbers of reports and studies that indicate that climate change is occurring now, resulting in significant impacts on the world and its inhabitants. Consumers are demanding cleaner, more sustainable energy solutions and industry is seeking ways to improve efficiencies in production of products. Policymakers are focused on ensuring that the environment is protected.

The Town Hall Panels were tasked with discussing how Oklahoma can appropriately balance energy production and environmental protection, if there are opportunities for Oklahoma to leverage its clean energy resources, and what additional steps Oklahoma policymakers should take to deal with climate change.

The Town Hall Panels recognize the threats to Oklahoma communities and industries resulting from climate change and support an open, science-based dialogue regarding how to best mitigate these challenges, while utilizing our abundant resources as part of a comprehensive solution. Public perceptions on the definition of “clean energy” would benefit from a more expansive definition while focusing on the reduction of carbon impact from these sources. This would also help Oklahoma build upon its status as an abundant energy producer and open markets for export, including natural gas, liquefied natural gas, wind and solar.

Publicizing existing efforts made by Oklahoma’s public and private sectors to enhance energy conservation, environmental protection, and to combat climate change would help our citizenry understand the issue apart from controversial rhetoric. Highlighting the victories on a case-by-case basis would also make the subject more digestible. To achieve these objectives, the State of Oklahoma should issue a statewide climate report that details greenhouse gas emissions, strategies for mitigation, projected impacts due to a changing climate, and necessary adaptations.

As a national and international leader in energy production and innovation, Oklahoma and its policymakers should embrace opportunities to capitalize on our energy expertise to address climate change and market Oklahoma and its private companies as resources in this arena. Policymakers are strongly encouraged to engage in this discussion, utilizing credible outside resources to guide the dialogue and work towards proactive solutions.

Another bold policy initiative proposed by one Panel would be to leverage Oklahoma’s clean energy resources involves marketing these resources to large industrial electric consumers, such as data centers, and implementation of policies authorizing loop systems.

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Through legislative and regulatory pilot programs, clean energy providers can submit competitive bids to individual energy consumers/purchasers individually or through aggregate agreements. Recognizing that such policy efforts would be incredibly in-depth and involve easing of restrictions found within the Oklahoma Certified Territory Act (*17 OK Stat § 17-158.25 (2014)*) bold initiatives like this both leverage Oklahoma's existing clean energy resources and foster market opportunities for new growth in our state.

Additional recommendations for our Regional Transmission Organization, Southwest Power Pool, are to increase transmission capacity within the SPP, eliminate seams with western and other markets, and reduce the backlog of interconnection approvals.

The most effective steps for enhancing efforts to combat climate change by leveraging our clean energy resources involve infrastructure creation and upgrades, including transmission and distribution lines, energy storage/batteries, and collaborative exporting.

Day 2, Question 1

Day two of Town Hall began with a presentation by Russell Evans, economist at Oklahoma City University's Meinders School of Business. His presentation was high level and posed a series of questions we might consider as we approach our discussions on how the economy and natural resources interact. He closed his presentation with a new concept for attendees to ponder: how do we, as a state, achieve "economic agility," or the ability to quickly transition from one economic identity to another when the time comes? That will require policies and actions that optimize ALL our resources: natural, human, physical, and entrepreneurial.

His comments were a nice lead-in to the first question of the day which revolved around a discussion of Oklahoma's high concentration of oil and gas extraction and its impact on the state's economic present and future (booms and busts are much more pronounced with a high concentration of one industry). Several articles in the BRD mentioned that best strategies for mitigating the negative effects of the state's high dependence upon energy are to broaden our tax base, diversify our economy, grow and attract higher waged jobs, and continue smart, forward-thinking governmental reforms.

The Town Hall Panels were asked to discuss what energy-supporting recommendations, if any, should the Town Hall make regarding the bolded strategies above? There were over 20 recommendations from the five panels that generated consensus in three areas: (1) **expansion of connectivity/broadband**, with specific references to rural Oklahoma and rural health, (2) **a greater focus on technology jobs and investment**, with multiple references to organizations like OCAST, i2e and the recruitment of information- and STEM-based businesses, and (3) **improving educational opportunities**. One Panel advocated for Oklahoma to become the leader in next generation virtual presence, which would allow rural and urban Oklahomans, and their income, to remain in Oklahoma while working for companies or organizations outside of the state or country. Oklahoma ranks top 10 in cost of living coupled with quality of life, so being a leader in next generation virtual presence should attract new companies here as the state is able to support them in a global next generation presence. There were suggestions of a faster roll out of 5G and one panel even mentioned 6G technology (advanced 5G wireless technology).

The third area – improving educational opportunities – focused on access and outcomes in the state to make us more competitive and attractive. One Panel suggested the creation of a "council" that would focus on education and workforce needs. Another Panel had a higher education focus to spur aerospace and security spinoffs. One Panel suggested a thorough review of the Singularity University model, which is a global learning and innovation community, as a way of improving human capital and its attractiveness.

Another Panel focused on lowering the barriers to educational opportunities by encouraging and incenting the private sector to fund scholarship programs. Finally, one Panel had a strong emphasis on manufacturing: enhanced curriculum about manufacturing careers in both K-12 and career tech, as well as strong support for the Oklahoma Manufacturing Alliance. In sum, greater budget stabilization will be achieved through diversification into wind and solar and lessen the impact of petroleum commodity price volatility in the petroleum industry.

Day 2, Question 2

The Town Hall Participants were next asked to address the issue of energy use in our transportation network. While petroleum products dominate the transportation landscape (92% of all use), there has been rapid growth in alternative fuels vehicles (AFVs) like natural gas and electric-powered vehicles. Having presented the pros and cons of moving more rapidly to an alternative-fuels environment, the attendees were asked to address two questions: what roles can OR should the private and public sectors play in greater buildout of the AFVs AND what roles can research and technological innovation play in making Oklahoma a comprehensive energy production state?

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There was strong consensus among the Panels that the Town Hall support the growth of AFVs of all types, including natural gas. Within that support was unanimity that we needed the support of both the public AND private sectors to not only better educate consumers about the options available, but also to more expansively build out EV charging infrastructure. The advent of the Oklahoma Electric Charging Program (due to the VW settlement), plus investments from the private sector (On Cue, Loves, etc.), will expand the EV charging infrastructure even further. Prior to these investments and techniques coming to scale, the appropriate jurisdictions should work to ensure that the additional grid infrastructure and demand costs are appropriately assessed and allocated in a manner so cost subsidizations do not unintentionally occur to those not using the grid for this purpose. Several panels suggested that builders be incented to install charging stations in new home and commercial construction.

Again, there was an explosion of individual recommendations from the Panels, with one Panel alone generating over ten recommendations and three consensus recommendations. There was also a great deal of discussion on how AFVs should be taxed relative to roadway usage (fuel use tax). One suggestion was to look at a VMT tax (vehicle miles traveled) or an opt-out flat annual fee for those opposed to the VMT tax. Another suggestion was that a task force be created, made up of at least the Oklahoma Corporation Commission, ODOT, and the Secretary of Energy and the Environment, to develop a comprehensive solution for taxing all vehicle fuel use. That same Panel made a consensus recommendation within their group supporting CNG charging stations and utilizing the existing infrastructure for medium- and heavy-duty vehicles/trucks. Another Panel specifically requested regulatory clarity dealing with oversight, inspections, and management of EV fueling stations.

Several Panels suggested greater investment in public transit, with one of the Panels suggesting a study for a high-speed rail line between OKC and Tulsa be considered. One Panel had three consensus recommendations within their group: (1) Since the state of Oklahoma currently incentivizes CNG infrastructure and vehicle ownership, the OK Legislature should pass legislation to similarly incentivize EV infrastructure and vehicles; (2) Oklahoma should study and then implement a plan that will equitably tax traditional gas, CNG, hybrid, and EVs to appropriately fund roads and bridges through our state budget; and (3) the State of Oklahoma should commission an economic feasibility study on high speed rail (Bullet Trains) to include environmental and social impacts. The study should focus on the connectivity of markets such as OKC-Dallas and OKC-Tulsa. (As a note, this was a recommendation from The Oklahoma Academy in 1998.)

On the research and technological innovation question, there was no consensus, but a number of ideas that would, individually, help position the state to be a leader in both fossil fuel and renewable energy production. Battery technology was mentioned several times as a forward-reaching R&D emphasis. One panel discussed the role that OCAST is playing in the battery and energy storage research and development. Another panel emphasized the importance of both state-sponsored and private research, with the need to reduce the costs associated with university research, providing incentives for more private research, and standardized contract terms.

Other ideas included using the Baker Hughes Center for cutting edge research on both oil and gas and renewable research. Finally, one Panel suggested that R&D needed to become a “priority for the state,” especially in the areas of new technology and innovation, with greater support and adequate appropriations for both OCAST and i2E.

Day 2, Question 3

Oklahoma’s energy production generally exceeds the usage in the state, providing opportunities for energy exports. The Town Hall Participants were asked what Oklahoma can do to take advantage of these energy export opportunities, and further, should a specific tax be considered to be applied to electricity generated for export outside Oklahoma.

The Panels unanimously and robustly opposed the concept of applying a specific tax to electricity generated for export outside Oklahoma on legal, ideological, practical, and economic grounds. The constitutionality of such a proposal was questioned in several Panels, but even in the absence of such a legal finding, the Panels viewed such a tax as a deterrent to encouraging export markets and opportunities in Oklahoma.

Conversely, the Town Hall Panels wholeheartedly endorsed enhancing opportunities for exporting electricity generated in Oklahoma to external markets, in addition to, aggressively pursuing liquefied natural gas export opportunities through a variety of means.

An impediment to exporting electricity from Oklahoma to external markets is inadequate transmission infrastructure. As this infrastructure has undergone upgrades, updates, and more extensive investment, and Oklahoma has installed enough electric generation capacity to serve external markets at competitive rates, our ability to capitalize on export opportunities is far more realistic

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and attractive. However, substantial transmission and storage infrastructure investments are essential to realizing these objectives, as well as easing of regulatory barriers and expedited interconnection agreements/authorizations.

One specific recommendation is to develop a working group involving the various components of the energy and electric sectors, chambers of commerce, tribal governments, consumer organizations, local governments and trade associations to directly educate and advocate before our Congressional delegation, those of our neighboring states, and those representing end use states, for expanding the ability to export Oklahoma's electric generation to western markets, specifically Colorado and California, and areas of the nation with much higher demand. As it becomes possible, the Mexico market could become an export end user. As we've seen with potential electric export projects, such as the CleanLine transmission project, Oklahoma export opportunities are dependent upon support (or at the very least, an absence of opposition) from neighboring states potentially impacted by said projects. As such, we recommend advocating for regulatory changes favorable to exports at the federal level, the various Regional Transmission Organizations (RTO), and other relevant jurisdictions. Oklahoma's Congressional delegation should assist with policy changes via statutory amendments, and regulatory changes at the Federal Energy Regulatory Commission that would empower electricity exports to the western markets.

To maintain balance with domestic electricity production, which provides Oklahoma a competitive advantage, Oklahoma should continue to develop domestic base load capacity through expanded wind, solar, natural gas, and storage to protect Oklahoma's low electric costs.

Additional export opportunities with liquefied natural gas exist in both domestic and international markets but require similar infrastructure improvements. While pipeline infrastructure projects are underway in several areas, involving the Gulf Coast, Mexico, and American bi-coastal projects, the Town Hall Panels recommended public incentives for this infrastructure build-out and for electric transmission infrastructure. Korea, China, India and several emerging markets present excellent end-use purchase opportunities for Oklahoma's abundant natural gas supply, which would be aided immensely with more robust LNG port facilities. Several panels recommended pursuing such a LNG facility at the Port of Catoosa. As with impediments to electric transmission expansion, collaborative efforts involving key stakeholders and our Congressional delegation to educate states through which such infrastructure must pass should occur to streamline this development and expedite permitting and regulatory approval processes.

Another specific recommendation involves maximizing Oklahoma's participation in Federal Emergency Response plans by utilizing our energy expertise and surplus resources to areas impacted by natural disasters.

Day 2, Question 4

Governor Stitt ran on a number of issues, including expanding economic prosperity, in pursuit of his goal to make Oklahoma a "Top 10 State". The Town Hall Participants were asked what specific recommendations should be made to the Governor or the Legislature to improve the economic prospect of those investing and working in Oklahoma's energy sectors. Also, the Panels were asked how we should preserve and grow energy jobs in Oklahoma, what steps should we take to enhance development of a trained and qualified energy workforce, and how do we encourage and support energy research and development.

The Town Hall agreed that The Oklahoma Academy should continue its support for the repeal or modification of State Question 640 to improve the potential to increase investment in our communities, our schools, and our people. Potential efforts could include recruiting and retaining quality jobs and improving our employee workforce.

(It is important to note, this is the fifth Town Hall to address SQ640 and the impact the 75% threshold has on Oklahoma. There has been strong agreement among the Panels in the 2013, 2015, 2017, 2018 and 2019 Town Halls of the asymmetry of SQ640 -- allowing the Legislature to reduce taxes with a simple majority but requiring a three-fourths vote to raise the same taxes.)

As one Panel stated: "Oklahoma should have a stated objective to address quality of life issues including health, obesity, poverty, and education. A component of this recommendation is to change the narrative and rhetoric surrounding these issues." This objective for community health should seek to be environmentally just and include all demographics of Oklahoma, noting the racial and socio-economic disparities that often exist in community proximity to pollutants.

The Town Hall Panels unanimously encouraged policies substantively revamping our core educational system to provide far more practical, vocational engagement, specifically concerning energy literacy and professional skills development. The K-12

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system should be more amenable and flexible in its vocational applications as part of STEM curriculum, recognizing traditional concepts of education are less applicable for providing a diverse, multi-skilled citizenry necessary for continued growth in the energy sector and beyond. Numerous Panels applauded the CareerTech system and encouraged additional funding for transitional job training specific to the energy industry in all forms, including those professionals displaced as established sectors give way to new arenas (like coal to wind or solar).

Oklahoma policymakers should strengthen math and science requirements to meet, or exceed, college and career readiness demands. Additionally, credit for instruction received within the CareerTech system should be recognized by Oklahoma Higher Education institutions toward degree producing outcomes. The Oklahoma State Department of Education Individual Career Academic Plan process should include career options through CareerTech and Higher Education pathways, and should be endorsed and implemented throughout Oklahoma public education.

As one Panel stated: “to create more opportunities for jobs and education, employers and educators should strongly consider taking a holistic approach to ensuring members of the community are employed regardless of addiction treatment, previous felonies, or other afflictions too often experienced by many Oklahomans. Additional industry partnerships fostering opportunities for re-integration in the work force should be pursued, such as the Oklahoma CareerTech Skills Center programs and the Central Technology Center Truck Driver Training CDL program with Freymiller for the criminal justice reform involvement.”

One specific recommendation includes providing mandatory parental leave policies to enhance diversity and employment opportunities for a more geographically and demographically diverse populations, which would also aid workforce retention. Another recommendation is to review and revise professional licensing processes to evaluate the affordability for Oklahomans to maintain licensure, judicial process for license revocation, and regional accessibility for testing and application (such as rural opportunities for CDL testing), all with the intent of recruiting and retaining quality workers.

Another specific recommendation to grow and preserve energy jobs in the state involves the formation of a non-partisan, multi-stakeholder Council (The Oklahoma Center for Energy and Environmental Excellence) which was proposed earlier in this report. The Council would be tasked with proliferation of energy literacy, education and workforce development, public private partnerships, and growth opportunities in all facets of the energy industry. *(See page 17 of this report)*

One Panel recommended that the Governor be encouraged to create a one-year task force to study concepts of carbon capture, sequestration and storage, and to include the following as members of the task force: Oklahoma Center for the Advancement of Science and Technology, trade associations, the Corporation Commission, Department of Environmental Quality, Department of Commerce, and legislators. This study would include a comprehensive assessment of available and necessary infrastructure, intellectual property issues, recycling, and funding mechanisms, including taking advantage of 45Q tax credits for carbon capture infrastructure. The task force should build upon the findings of the similar task force established in 2009 by SB679 and summarily dissolved in 2011 by SB629.

Another Panel recommended pursuing initiatives for utilizing produced water and its components identified through research partnerships between our higher education system, private enterprise, and non-profit organizations. This same Panel recommended public investment in battery storage research and development. (NOTE: a 17-member Produced Water Working Group (PWWG), led by the Oklahoma Water Resources Board, was tasked in 2017 with studying and recommending alternatives to produced water disposal from oil and gas operations in Oklahoma. The non-regulatory PWWG is still active and has been charged with identifying regulatory, technical, and economic barriers to produced water reuse as well as looking at opportunities and challenges associated with treating produced water for beneficial uses, such as industrial use or crop irrigation.)

Finally, the Oklahoma Quality Jobs Act should be revised to require that incentives evaluation account for displacement of traditional jobs resulting from implementation of technology utilized by the incentive recipient.

Ultimately, this remodeling of Oklahoma’s image and education/workforce development system will require proactive collaboration and industry sponsored education initiatives. By working together rather than quarreling over their spot in Oklahoma’s energy market, the various energy interests can ultimately all benefit by promoting our assets, improving our workforce and investing in our communities together.

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Day 2 Question 5

The Tuesday luncheon speaker was former Colorado Governor Bill Ritter, who provided a detailed description of the current energy transition this country (and Oklahoma) are going through. One of the topics he addressed in defining the transition was the need to focus more on methane/carbon capture, especially as it relates to the continued use of natural gas as part of our energy mix. Following the luncheon, the attendees were asked to deliberate about recent carbon capture utilization and sequestration technology and related federal legislation (45Q). In the march to decarbonize the state, technology now exists, using underground storage, to capture and sequester CO₂, preventing it from reaching the atmosphere. The attendees were asked to respond to three questions: (1) How should Oklahoma policy makers address the on-going Federal rule-making process; (2) What legal and environmental issues should be addressed; and (3) What regulatory frameworks should be recommended?

The Town Hall Panels were unanimous in their support of Oklahoma responding back affirmatively to the federal rule-making process. One panel developed a motto for this effort: “Find Value in Waste.” Additionally, virtually every Panel felt that our federal delegation needed to be actively involved in support of this process and one Panel suggested that Governor Stitt’s administration should also lend their support. One panel also suggested that Oklahoma policy-makers should meet with Governor Ritter’s legislative academy as soon as possible to find out what other states are doing/facing. One Panel also suggested engaging President Trump’s Science Advisor (Kelvin Droegemeir) for his input and involvement.

With all of the support for Carbon Capture Utilization and Storage (“CCUS”), there were a number of concerns and/or questions raised by all Panels. Nearly all Panels expressed both legal and environmental concerns, from potential seismicity/leakage issues to potential water impacts. One Panel suggested the creation of a task force to address these types of issues. The task force, which would include representatives from ODEQ, OGS, Secretary of Energy/Environment, OCC, OCAT, Native American Tribal Governments, and the private sector, would also enter discussions with states (Ohio and Indiana) who have experiences in this area, push to create incentives for CCUS at the state level, and address the common carrier status issues related to pipelines. Other concerns had to do with: (1) making sure we understand the federal rulemaking process and all its related deadlines; (2) understand the regulatory oversight issues (OCC/DEQ vs EPA); (3) perceived stigma of those participating in CCUS; (4) potential transmission issues from site to site; (5) should we set aside funding now for any unknown risks that might materialize; (6) what impacts might the 45Q tax credit have on state taxable income (if any); (7) how will costs be distributed among all parties; and (8) resolving issues of eminent domain. None of the concerns impacted the original support for the technology, but in the end, the Panels erred on the side of caution.

One Panel noted that the Oklahoma Conservation Commission and the Natural Resource Conservation Services are already working in this area and that they should share their findings with the OCC and ODEQ. Another Panel suggested doing small pilot projects first to test the viability of the new technology. Several Panels identified potential benefits for universities going forward in the area of CCUS research and development potential.

Day 2 Question 6

Thirty-eight federally recognized Native American Tribal governments occupy treaty homelands in Oklahoma. Since statehood, the majority of the lands within those homelands have passed out of tribal jurisdiction and ownership. Nonetheless, Oklahoma tribes remain significant to the economy and intergovernmental fabric that makes up our Oklahoma community. Many public policy matters in Oklahoma often involve a basic question of whether and how non-tribal policymakers should engage with tribal sovereigns. Several areas of possible opportunity exist for intergovernmental collaboration that could benefit our energy economy exist.

The Town Hall Panels were asked to identify primary opportunities for collaboration or partnership between tribal and local/state/federal governments with respect to Oklahoma’s energy economy; what means we might use for identifying, exploring and developing those opportunities; and the main sources of conflict that may need to be addressed and resolved.

Recognizing the instrumental role tribal governments and their economic entities play in communities throughout Oklahoma is the first important step towards potential collaboration on energy-related initiatives in our state. Collectively, tribal governments are one of the largest employers, providers of healthcare, housing, and essential services, economic development drivers, and unique cultural features in Oklahoma. All tribal citizens are also citizens of Oklahoma, so the services and opportunities provided by these various tribal governments are complementary in nature to those provided by the state and private industry and often benefit non-tribal citizens as well.

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The Town Hall Panels unanimously voiced the need for tribal governments to be consulted by state policymakers and considered as positive community partners as a matter of respecting their sovereignty and increasingly crucial role. As such, it must be recognized and incorporated into such consultation processes that each tribal government is unique, possessing cultural, structural, historical, geographical, financial and logistical resources differing from tribal nation to tribal nation. Therefore, potential partnerships between the state and each tribe must be approached on a case-by-case manner, affording due respect and consultation on each tribal government's accords.

As it pertains to potential collaboration on energy initiatives, infrastructure development and regulatory consistency, tribal partnerships offer distinct jurisdictional challenges coupled with very attractive federal incentives available to certain tribal governments. The *Murphy* case involving tribal sovereignty, which is currently before the U.S. Supreme Court, must be monitored closely for its potential impact on energy planning in Oklahoma. As recognized by the federal courts, tribal governments possess the ability to adopt air, water, and environmental protection laws governing their property that exceed the standards adopted in bordering local or state governments. Furthermore, many federal laws contain specific provisions applicable to tribal properties that differ from those applied to non-tribal properties, which can result in inconsistent energy policies, as seen in Osage County with mineral rights, regional haze rules, and water quality and quantity provisions. In order to successfully collaborate to build a robust energy economy in Oklahoma, policymakers should consult with tribal governments to create consistent regulatory frameworks conducive to responsible energy development.

As one Panel recommended, continued improvement of state-tribal relations and partnership opportunities is a necessity for the economic stability of Oklahoma and our people. Several Panels urged caution, diligence, and diplomacy in the ongoing discussions regarding gaming compact negotiations so as not to jeopardize the many areas of collaboration and partnership between these governments.

With extensive economic footprints across Oklahoma, abundant natural resource opportunities for energy development and infrastructure, and facilities with large electric loads, tribal governments and their economic entities offer several synergistic areas for energy partnerships. Much like data centers and industrial electricity purchasers, tribal governments have the potential to develop their own energy systems for electricity production, transportation fleets, and more. A few Panels endorsed tribal pursuit of independent energy infrastructure and discouraged investor owned utilities from opposing such ventures because much like with road and bridge partnerships leveraging tribal federal highway funds, infrastructure financing opportunities available for tribal governments can be utilized in similar collaboration.

Tribal governments are eligible for federal set-asides and priority treatment for programs such as the Clean Renewable Energy Bond administered by the Internal Revenue Service. Due to its designation as a Promise Zone, the Choctaw Nation of Oklahoma is eligible for priority and preferential status for a broad range of grant and funding opportunities, such as those administered by the US Housing and Urban Development, US Department of Agriculture, and US Department of Energy involving energy efficiency, residential and commercial solar, and infrastructure.

Tremendous opportunities exist for partnership surrounding education and workforce development, leveraging these same available resources and the role many tribal governments play in Oklahoma's rural communities.

Similarly, export opportunities exist for infrastructure development and Free Trade Zone designation for Liquid Natural Gas export and various processing facilities. Leveraging the nation to nation trade relationships available to tribal governments could be instrumental in fostering international energy export opportunities.

The model for consultation and collaboration should build upon the US Department of Energy's Indian Affairs Division mandatory consulting process, the Oklahoma Secretary of Indian Affairs, and formal consulting through the Oklahoma Legislature.

Finally, one Panel recommended that The Oklahoma Academy Town Hall Report(s) be delivered to and presented at the annual Oklahoma Supreme Court Sovereignty Symposium.

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Day 2 Question 7

Energy efficiency delivers several benefits, including reducing pollution, saving households and businesses money on energy bills, increasing electric grid resilience, creating jobs, and expanding economic development. Despite those benefits, there are some regulatory barriers. While efficiency is seen as a resource that lowers demand and increases productivity, “the traditional utility business model creates substantial financial disincentives for utilities looking to develop the programs.” Town Hall Participants were asked to identify policy or regulatory actions that our state might consider to encourage utilities to invest more heavily in energy efficiencies, allowing them a higher return for those investments. Areas that other states have more effectively embraced are regulatory relief through decoupling (adjustable rates), lost revenue adjustment mechanisms (LRAMs), and performance incentives.

While not in the question, most Panels stated the Oklahoma Corporation Commission imposes relatively few barriers with regard to energy efficiency on investor-owned public utilities. It was noted by several of the Panels that neither the rural electrical cooperatives nor municipal power authorities are subject to state oversight, but both organizations do offer energy efficiency programs. Additionally, several Panels mentioned that the national ranking reports utilize criteria that are mostly mandated programs, while most of what our utilities offer are OCC-approved programs that are voluntary to the customer. One Panel suggested setting our own state efficiency goals and developing steps/ and/or strategies to reach those goals. This would be highlighted for economic development purposes.

Investor-owned utilities in Oklahoma have a wide variety of energy efficiency programs and partners available to their customers, and participation rates are growing. Some rural electric cooperatives and municipal electric utilities have energy efficiency offerings as well. Nearly every Panel suggested increasing/expanding consumer education efforts to move the demand side of the equation and increase the participation rate of these programs. One Panel suggested utilizing the yet-to-be-created Oklahoma Center for Energy & Environmental Excellence, to pursue those efforts for consumers statewide.

There were a number of recommendations from all Panels that would improve both the awareness and number of energy efficiency programs. One Panel suggested all counties adopt the PACE (Property Assessed Clean Energy) program, which is a mechanism for financing energy efficiency and renewable energy improvements, both commercially and residentially. In 2009, Oklahoma enacted SB 668 authorizing counties to help property owners finance energy efficiency and renewable energy improvements, after energy audits are conducted to demonstrate the value of the projects and to ensure that the improvements meet Energy Star ratings. Counties may create grant programs to help non-profit organizations finance energy efficiency improvements. In 2011, Senate Bill 102 established the junior status of PACE liens to previously recorded liens and mortgages.

One Panel suggested the state could “lead by example” by expanding energy efficiency programs in state buildings and state supported schools. Several Panels suggested expanding home weatherization programs for low income families and one suggested state support for the Oklahoma Association for Community Action Agencies, which operates home repair and weatherization programs. Finally, several of the Panels supported the continuation and expansion of high efficiency appliance standards.

Day 2 Question 8

The importance of energy storage as we integrate renewable energy sources into the mix of our electrical production is a critical component to this entire discussion. In fact, many in the industry feel that electricity storage is the missing piece in the renewables jigsaw. As one article in the resource document mentioned, “wind and solar aren’t that useful because there was no way to store the energy when the sun sets or the wind is not blowing.” This statement is beginning to fall on deaf ears due to advanced energy grids and “utility-scale energy storage systems.” In fact, a recent article reported that NextEra Energy Resources will be deploying a major complex combining solar, wind, and storage batteries in northwestern Oklahoma. This project is the first to mix wind, solar, and batteries in the 14-state Southwest Power Pool region.

Panelists were asked if there are market and regulatory barriers to expanding the use of electrical energy storage and if so, what does Oklahoma need to do to increase the storage to shape the future of energy transmission of these energies?

As with everything pertaining to energy-related infrastructure projects and policies, the cost competitiveness and market variables always have to be a key part of the dialogue. Electrical energy storage is no different. With the cost of electrical energy remaining relatively cheap, the demand or market justifications for storage options are not currently prioritizing these endeavors; however, energy storage is clearly an issue that must be mastered as our electrical grid becomes more dependent upon renewable

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resources. A lack of consumer education on this subject impedes addressing this matter more immediately.

The Town Hall Panels agreed that there are no state impediments to electrical energy storage initiatives, but impediments do result from Federal Regional Transmission Organizations (RTOs). Oklahoma policymakers and stakeholders should encourage the Southwest Power Pool to develop market rules regarding storage capacity and market participation for electrical energy storage. Specifically, these rules should allow energy storage capacity accreditation for a 4-hour system. Ultimately, Oklahoma policymakers should build a favorable climate supporting energy storage activity and development of affiliated technology and infrastructure.

In fact checking this segment of the report, the following is SPP's statement:

“Southwest Power Pool (SPP) has worked in complying with the Federal Energy Regulatory Commission’s (“FERC”) directives under Order No. 841 to design and implement changes to its tariff that facilitate participation in SPP by Electric Storage Resources (“ESR”). SPP was one of the first two RTOs in the U.S. to receive FERC acceptance of its proposed tariff language for Order 841 compliance, and SPP is currently working with FERC to finalize remaining compliance details.

“Specifically, when stating these rules should allow energy storage capacity accreditation for a 4-hour system. As SPP has advised FERC, SPP does not have a capacity market, but an ESR may be designated to meet SPP’s Resource Adequacy Requirement as long as it can meet the SPP Planning Criteria’s 4-hour minimum run-time requirement. The SPP Supply Adequacy Working Group is currently studying accreditation issues to determine what minimum levels of continuous run time may be required to meet capacity requirements in the future as the penetration of ESRs in SPP’s footprint increases.”

One specific success regarding storage was the approval of the Federal Energy Regulatory Commission (FERC) Order 841, which should alleviate some market and transmission challenges.

The Panels recommended the Governor establish a one-year task force to study the regulatory and tax treatment for electrical energy storage. Additional storage options should be explored by this task force and research and development entities, including pumped-hydro, compressed gas, and excess wind conversion to hydrogen making it shelf stable, as well as determining the best use of those sources. Also, this task force should investigate the impact of net metering/time of use, electric vehicle charging, and home-based electric storage. This task force should be overseen by the aforementioned Oklahoma Center for Energy and Environmental Excellence (also to be created as described earlier in this report).

Finally, one Panel recommended that the Legislature should request the Oklahoma Corporation Commission to initiate a Notice of Inquiry requesting a report on storage with recommendations including the establishment of a working group for consideration of ongoing issues.

CONCLUSION

As an energy producing state we must move the focus and public dialogue away from polarized arguments and models that in many cases simply are no longer relevant or optimal, to a new and better conversation of a system approach where the focus is on how fuels and technologies work best together to produce a better outcome. The work and time devoted to this Town Hall conference by the Participants has produced a report that will not only guide Oklahoma in the future, but will be used to inform, educate and begin a discussion of open-minded dialogue and fact-based analysis.

We hope to reach the goals listed in this document and address the issues discussed throughout this report in an efficient, collaborative, successful manner. As with previous visioning processes facilitated by the Oklahoma Academy, many of the recommendations included herein will become policy recommendations, and some will become law. Ultimately, each one of us bears an obligation to implement these changes for a more prosperous, healthy and secure Oklahoma by moving ideas into action.

Again, thank you to the Participants, Town Hall Co-Chairs, Town Hall Planning Committee and Town Hall Team for carrying out the honest broker work the Academy promises on this most important topic addressing our energy future. A sound long range energy plan will help ensure Oklahoma is the best place to work, play and live.

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TOWN HALL CONFERENCES

Topics covered at the Town Hall Conference from 2001 - 2019

2001- Competing in an Innovative World

Town Hall Chair: Cliff Hudson, SONIC, America's Drive-In

2002- Oklahoma's Health

Town Hall Chair: Cliff Hudson, SONIC, America's Drive-In

2003- Oklahoma Resources: Energy and Water

Town Hall Co-Chairs: John Feaver, University of Science and Arts of Oklahoma; Howard Barnett, TSF Capital LLC; and Larry Nichols, Devon Energy Corp.

2004- Oklahoma's Environment: Pursuing A Responsible Balance

Town Hall Chair: William R. McKamey, AEP Public Service Company of Oklahoma

2005- Drugs: Legal, Illegal... Otherwise

Town Hall Chair: Howard Barnett, TSF Capital LLC

2006- Strategies for Oklahoma's Future

Town Hall Co-Chairs: John Feaver, University of Science and Arts of Oklahoma; and Larry Rice, Tulsa University

2007- Building Alliances: Tribal Governments, State & Local Governments And Private Sectors

Town Hall Chair: Douglas Branch, Phillips McFall

2008- Oklahoma's Criminal Justice System: Can We Be Just As Tough But Twice As Smart?

Town Hall Chair: Steve Turnbo, Schnake Turnbo Frank PR

2009- Getting Ready For Work: Education Systems And Future Workforce

Town Hall Chair: Howard Barnett, OSU- Tulsa

2010 May- Oklahoma Water- A Special Town Hall on Oklahoma's 50 Year Water Plan

Town Hall Chair: John Feaver, University of Science and Arts of Oklahoma

2010 November- MUNI.OK.GOV- Addressing Municipal Governance

Town Hall Chair: Tom McKeon, Tulsa Community College

2011- Developing the Oklahoma Economy

Town Hall Chair: Susan Winchester, The Winchester Group

2012- It's 2032- Where in the World is Oklahoma?

Town Hall Chair: Steve Kreidler, University of Central Oklahoma

2013- Moving Oklahoma: Improving Our Transportation Infrastructure

Town Hall Chair: Darryl Schmidt, BancFirst

2014- We Can Do Better: Improving the Health of the Oklahoma People

Town Hall Co-Chairs: Kay Goebel, PhD, Psychologist; Gerry Clancy, MD, OU-Tulsa; and Steve Prescott, MD, Oklahoma Medical Research Foundation

2015- Oklahoma Priorities: The Government & Taxes We Want

Town Hall Co-Chairs: Howard Barnett, OSU- Tulsa; and Dan Boren, Chickasaw Nation Department of Commerce

2017- Oklahoma Votes: Improving the Election Process, Voter Access & Informed Voter Engagement

Town Hall Co-Chairs: Dan Boren, Chickasaw Nation Department of Commerce; and John Harper, AEP Public Service Company of Oklahoma

2018- Aligning Oklahoma's Tax Code to Our 21st Century Economy

Town Hall Co-Chairs: Darryl Schmidt, BancFirst; and Dan Boren, Chickasaw Nation Department of Commerce

2019- OKLAHOMA ENERGY: Optimizing Our Resources for the Future

Town Hall Co-Chairs: C. Michael Ming, retired VP Baker Hughes, a GE company, and Stuart Solomon, retired President & COO of Public Service Company of Oklahoma

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