

**THE WATER CAMPUS | FEBRUARY 6, 2024**

# INDUSTRY-LSU ENERGY INNOVATION WORKSHOP REPORT



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**PREPARED BY**

LSU FOUNDATION  
LSU OFFICE OF RESEARCH & ECONOMIC DEVELOPMENT  
MELARA ENTERPRISES

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# OUR MISSION

An independent, trusted, and highly respected voice of the energy transition, supporting state, community, and parish policy development.

# OUR VISION

A national model, where leaders in energy-related thought, talent and industrial impact will have the opportunity to invest in the pursuit of a shared vision for the future of energy.

Position LSU as a leader in expertise associated with informed decisions around technology as well as environmental, social and governance issues.



# OUR FOCUS

Advancing scholarship, discovery, outreach and commercialization in these areas:

- Hydrogen/CCUS
- Coastal resiliency
- Low-carbon fuels
- Environmental justice
- Community engagement
- Other areas associated with the energy transition



# OUR LEADERSHIP

THE INSTITUTE IS LED BY A FULL-TIME EXECUTIVE DIRECTOR, WITH GUIDANCE FROM AN ACADEMIC COMMITTEE AND BOARD OF DIRECTORS.

## BOARD OF DIRECTORS

Colette Hirstius, Shell  
Greg Bowser, Louisiana Chemical Association  
Kimberly Lewis, LSU  
Lee Stockwell, Shell  
Robert Twilley, LSU  
Selda Gunsel, Shell  
Tommy Faucheaux, Louisiana Mid-Continent Oil & Gas Association

## DIRECTOR

Brad Ives

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# ENVIRONMENTAL JUSTICE AND COMMUNITY BENEFIT PLANNING

Environmental Justice and Community Benefit Planning is one of the broadest topics that requires multi-skilled interdisciplinary teams to consider complex social considerations of innovative energy technologies. The LSU Institute for Energy Innovation (IEI) is requesting research on Environmental Justice and Community Benefit Planning, focusing on several key objectives. The initiative aims to document local stakeholder questions and concerns regarding energy transition and community benefit planning, specifically through the lens of Environmental Justice. It seeks research to establish a cohesive understanding of the definitions, implications, and mitigations associated with Environmental Justice in the context of technological change in the energy transition. Additionally, the study intends to define Environmental Justice considerations specific to Louisiana and propose strategies for stakeholders at the state, industry, and parish levels to better manage concerns. Furthermore, the initiative will assess workforce needs for the future of Louisiana's energy sector and gather input from stakeholder companies and government representatives on immediate needs related to energy transition topics in the state. Finally, the research will consider best practices from other national and international jurisdictions to inform recommendations and strategies for promoting Environmental Justice and Community Benefit Planning in Louisiana's energy sector.





### **Presentation and Large Group Discussion**

Margaret Reams, Ph.D., Joseph D. Martinez Professor of Environmental Sciences, College of the Coast and Environment at LSU, gave a presentation on Environmental Justice at the workshop covering the imperatives for engaging Environmental Justice communities. She covered new requirements associated with the recent Justice40 initiative linked to certain types of federal funding – a “whole of government” approach across many federal agencies, and the requirement of Community Benefits Plans which necessitates increased public input and attempts to create a “critical path” toward improving the health, safety, and overall resilience of historically underserved communities. Following the presentation, Dr. Reams facilitated a group discussion.

View Dr. Reams’ full slide deck [Click Here](#)

View a video of Dr. Reams’ presentation and the discussion session that followed [Click Here](#)

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# ENERGY AND ENVIRONMENTAL SYSTEM ANALYSIS AND RESILIENCE

The research request for Energy and Environmental System Analysis and Resilience focuses on enhancing the resilience of the Louisiana energy system and manufacturing sectors to severe weather conditions and environmental change. The research should consider the impact on energy and environmental infrastructure and operations. Additionally, the research seeks to assess the environmental impact of pipeline and power transmission line routing on wetlands, emphasizing the importance of conservation and mitigation efforts. Furthermore, the study intends to explore the digitalization of manufacturing work processes to improve efficiency and sustainability in the industrial sector. The initiative also aims to advance Direct Air Capture (DAC) technology and develop economic analyses to address environmental, safety, and health concerns associated with carbon capture. Moreover, the research aims to develop Measurement, Reporting, and Verification (MRV) tools for Blue Carbon Credits and expand nature-based solutions for carbon sequestration, emphasizing the role of natural ecosystems and climate resilience. The initiative will design policy recommendations for a strategic retreat from the coast, considering economic, social, and environmental implications, and explore innovative approaches for recycling CO<sub>2</sub> into products and solid carbon sequestration. Lastly, the research aims to produce and/or organize valuable data for the Louisiana Geological Survey, contributing to scientific understanding and informed decision-making in the state.



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# ENERGY AND ENVIRONMENTAL SYSTEM ANALYSIS AND RESILIENCE SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION



During the tabletop discussion, industry representatives and academic researchers provided valuable insights into Energy and Environmental System Analysis and Resilience in Louisiana. They highlighted the effectiveness of wind testing at LSU and emphasized the need to adapt designs in various industries due to changing weather and flood patterns. The group stressed the importance of maintaining a diverse energy portfolio and understanding solar design codes specific to Louisiana conditions. Participants noted the availability of digital simulation tools at the university but underscored the value of industry data for comprehensive analysis. They recognized the impact of vegetation management on environmental resilience and the necessity to study flooding and storm surges impacted by subsidence for effective impact assessment. Participants highlighted the significance of data sharing between industry and academia and considering climate change implications like the need for increased winterization. They discussed the need to balance resilience with green energy transition tradeoffs and sacrifices, acknowledging the differing perspectives between industry experts, communities, and academia. The role of academia in advising local decisions by providing technical expertise was emphasized, along with the importance of two-way communication to address multiple community considerations. Participants advocated for multiparty communication among communities, NGOs, industry, and academia to foster collaboration and increase understanding. They recognized the crucial role of NGOs in facilitating advocacy and education and suggested that the insurance industry's risk assessments should be shared for better resilience planning. Considerations for the cost of transition and resilience on consumers, as well as equitable justice, were highlighted, emphasizing the need for informed policy decisions and investor education for long-term benefit.



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# LOW CARBON FUELS

The Institute is requesting research on Low-Carbon Fuels, focusing on several key objectives. Firstly, the initiative aims to improve the separation of lignin and its conversion into fuels, exploring innovative techniques to enhance efficiency and sustainability in fuel production. Additionally, the research seeks to increase the efficiency of storage and transportation of feedstock to refining facilities, optimizing logistics and reducing environmental impact. Furthermore, the study intends to analyze the development of Sustainable Aviation Fuels (SAF), considering the economic viability and social/external costs of current liquid fuel technologies. The initiative also aims to explore the intersection of agriculture and low-carbon fuel production in Louisiana, identifying synergies and opportunities for sustainable energy solutions in the agricultural sector. Moreover, the research will investigate biomass as a feedstock, evaluating its potential as a renewable and low-carbon resource for fuel production, with a focus on scalability and environmental sustainability. Through these research efforts, IEI aims to advance the development and adoption of low-carbon fuels, contributing to a more sustainable and resilient energy future.



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## LOW CARBON FUELS SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION

During the tabletop discussion on Low Carbon Fuels in Louisiana, industry representatives and academic researchers discussed various types of low-carbon fuels, including Hydrogen, SAF, Refuse-Derived Fuels, Bio-Diesel, and Ammonia. They highlighted the importance of considering eco-viability from an industry perspective, balancing customer needs with production abilities. Tax incentive options were debated, with considerations for penalizing carbon emissions or incentivizing with financial rewards, while also weighing community benefits against corporate margins and scaling cost-effective production. The group emphasized the necessity of a holistic approach, involving collaboration among communities, legislators, and industry, with academia perceived as a neutral party and the university serving as an “honest broker”. Pilot plants were proposed as potential methods of investigation, with shared facilities among stakeholders and consideration for importing vs. creating innovation and local employment opportunities. Scaling low-carbon fuels was discussed, with considerations for material substitutions, technology, infrastructure, and community education, emphasizing the role of academia in bridging communication gaps and providing support. Industry and university collaboration was highlighted, including connections with LSU, grants provided by industry, and the importance of partnerships and funding for initiatives such as CO<sub>2</sub> capture in oil production. Additionally, the discussion touched on community benefit plans, guidelines provided by academia, and the university's interest in initiatives like California's low-carbon fuel credits.



# HYDROGEN

IEI is soliciting research proposals on Hydrogen with a multifaceted focus. The Institute seeks fundamental research on renewable hydrogen production methods, considering sustainable approaches. Additionally, IEI aims to address the technical challenges of transporting hydrogen in liquid form, assessing limitations and potential solutions. Moreover, the economic and social implications of transitioning to hydrogen use are under scrutiny, with a keen interest in understanding costs and societal impacts. Research into the long-term behavior of hydrogen and storage options, including salt domes, is also desired, with exploration of subsurface versus surface storage strategies. Furthermore, IEI is interested in evaluating tax incentives to spur hydrogen production and adoption, emphasizing the need to incentivize industry participation. Lastly, considerations extend to molecular-level and materials science aspects, exploring enhanced methods for ammonia production and CO<sub>2</sub> conversion into valuable products. Overall, this hydrogen research request aims to advance knowledge and technologies crucial for a sustainable hydrogen economy.



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## HYDROGEN SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION

During the tabletop discussion on Hydrogen as an energy source, industry representatives and academic researchers emphasized collaboration and shared goals for achieving net-zero emissions by 2050. They discussed the importance of a cluster model to leverage the flexibility and diversity of expertise among students and industry professionals, aiming to retain talent in-state and secure funding for research initiatives. Resources such as infrastructure and trained personnel were identified as crucial for advancing hydrogen research, with an emphasis on addressing social impacts and gaining community buy-in through education. Commitment from both academia and industry, in terms of time and financial resources, was highlighted, with academics having more time and community trust. The group underscored the shared interests in environmental sustainability, social welfare, and security, with research validating the importance of hydrogen as an energy source and providing solutions to industry challenges. Key research areas identified included storage and safety requirements, modeling opportunities, scalability, and environmental considerations, particularly regarding greenhouse gas emissions. The discussion also touched on the role of national labs in partnership opportunities and repurposing infrastructure for hydrogen production, as well as the influence academia can have on policy and permitting processes through advocacy efforts. Incentives for US business opportunities and penalties for non-compliance were discussed as drivers for hydrogen adoption, with the recognition that Louisiana has the potential to become a leader in the hydrogen industry through a diverse portfolio of solutions and collaborative efforts between industry, academia, and policymakers.



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# ADVANCED RECYCLING



The desired research on Advanced Recycling has a focus on several key objectives. The initiative aims to explore circular plastics and Li-ion battery recycling through experimental and techno-economic studies, seeking to develop innovative solutions for sustainable materials management. Additionally, the research aims to improve materials handling, transportation, and decontamination processes for recycling, with a specific focus on plastics and Li-ion batteries. Furthermore, the study intends to enhance recycling rates among consumers and corporations, exploring strategies to promote behavior change and increase participation in recycling programs. Through these research efforts, IEI aims to advance the development of advanced recycling technologies and practices, contributing to a more sustainable and circular economy.

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## ADVANCED RECYCLING SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION

During the tabletop discussion on Advanced Recycling, industry representatives, and academic researchers delved into various aspects of advanced recycling techniques and challenges. They defined advanced recycling as breaking down plastic at a molecular level, emphasizing the need to move beyond typical recycling methods involving shredding plastic. Limiting factors such as size, volume, and sorting/contamination issues were identified, with particular attention to a shortage of recyclables in Texas. Participants highlighted ongoing research at LSU utilizing cutting-edge techniques and machinery, addressing key barriers to recycling including financial constraints, social behaviors, and regulatory challenges. Challenges with industry were discussed, including policy regulations, categorizing materials, and concerns about "greenwashing". The group explored alternatives to plastic, such as utilizing bio-waste for non-plastic products, aiming to achieve a circular economy and reduce reliance on single-use plastics. Progress in advanced recycling was noted in New Iberia and New Orleans, with specific attention to challenges posed by lithium-ion batteries and potential solutions involving consumer incentives and proactive systems. Participants emphasized the importance of integrating bio-mass materials into plastics and the circular economy, highlighting the significance of research collaboration between academia and industry. Education and community engagement were underscored as essential for reducing contamination and fostering sustainable practices, with an emphasis on consumer behavior change starting from littering and continuing to recycling.



# RENEWABLES

The Institute is actively seeking research proposals focused on advancing renewable energy, with a particular emphasis on wind and hydrokinetic energy. This includes studies that comprehensively evaluate the environmental, economic, and technical aspects of wind farm deployment, including offshore installations, to inform sustainable electricity generation practices. Additionally, IEI aims to establish guidelines regarding the proportion of renewable and dispatchable electricity sources in Louisiana, recognizing the importance of balancing reliability and environmental concerns in the state's energy mix. Moreover, the role of nuclear power, especially modular generation, in electricity production within Louisiana is under scrutiny, highlighting its potential as a low-carbon energy source. Furthermore, the Institute is keen on analyzing the environmental, technical, and economic viability of harnessing hydrokinetic energy, particularly from the Mississippi River, as an additional renewable energy source. Additionally, research into agrivoltaics, the integration of solar panels into agricultural practices, is sought to explore innovative approaches to renewable energy generation that also support sustainable land use. Overall, IEI's research agenda in renewables underscores a holistic approach to advancing renewable energy technologies while considering their broader impacts on the environment, economy, and society.



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# ADDITIONAL FOCUS AREAS

IEI is soliciting research proposals in several additional focus areas, aiming to address key challenges and opportunities in energy and sustainability. The Institute seeks projects to establish best practices in siting wind, solar, and biomass facilities, recognizing the importance of strategic location selection for optimizing energy generation and minimizing environmental impacts. Additionally, IEI is interested in conducting an inventory of Scope 1 and 2 emissions in the Louisiana oil, gas, and petrochemical industries, highlighting the need for transparency and accountability in greenhouse gas emissions reporting and mitigation efforts. Moreover, the initiative seeks research on renewable electricity production and power storage solutions tailored for the oil, gas, and petrochemical sectors, acknowledging the significance of transitioning towards cleaner energy sources and enhancing energy resilience in these industries. Furthermore, IEI aims to make recommendations for decarbonizing oil, gas, and petrochemical production and transportation processes, emphasizing the imperative of reducing carbon emissions across the entire value chain. Research into batteries, on-site small modular nuclear power, enhanced geothermal energy, and alternative fuel production methods like methanol and ammonia for ocean-going ships is also encouraged, reflecting a commitment to exploring diverse pathways toward sustainability and decarbonization. Additionally, the Institute seeks innovative data solutions, including databases and communication strategies, to effectively share energy transformation information with the public, fostering greater awareness and engagement in sustainable energy initiatives. Overall, IEI's research agenda in additional focus areas aims to advance knowledge, technologies and practices critical for achieving a more sustainable and resilient energy future.





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## RENEWABLES & ADDITIONAL FOCUS AREAS SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION

Renewables and Additional Focus Areas were combined into one breakout session at the workshop for administrative purposes. Industry representatives and academic researchers emphasized collaboration between academia and industry in the renewable energy sector. They discussed various focus areas, starting with solar energy, emphasizing efficient land use in agriculture, and addressing perception studies. Siting policies and tax credits were highlighted, with considerations for which communities qualify for incentives. The group explored options for reusing sites or existing structures. Discussion also focused on addressing challenges such as waste heat and end-of-life management for solar panels. Additionally, the group discussed the continued role of fossil fuels and nuclear energy, considering regulations and potential environmental impacts. Offshore wind energy was identified as a promising area for further exploration. Environmental impact studies were deemed essential, particularly regarding nature-based carbon capture and coastal restoration efforts. The discussion also touched on production and storage challenges within the oil and gas industry, emphasizing the importance of academic involvement in pilot projects and data management. Building trust with the public was highlighted as crucial, with the university seen as an unbiased source of information. Decarbonization efforts were discussed, including strategies beyond renewables such as carbon capture and utilization. Battery technologies were explored, including unorthodox approaches. The group also considered the potential of hydrogen storage. In the context of nuclear energy, cost, advocacy, and public perception were key concerns, with collaboration between academia and industry seen as vital for addressing public concerns while considering long-term goals. Overall, the discussion underscored the importance of collaboration, diversification, and innovation in advancing renewable energy and addressing energy challenges in Louisiana.



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# HAZARD MITIGATION



The Institute is calling for research proposals aimed at Hazard Mitigation across various domains. Interests include projects that focus on modeling and mitigating risks at industrial sites, encompassing processes like carbon capture, utilization, hydrogen production, and electrification. This research involves developing advanced risk assessment models and effective mitigation strategies to enhance safety and sustainability in industrial operations. Additionally, IEI seeks research on the modeling and mitigation of risks associated with pipelines and grids, specifically related to CO<sub>2</sub> transport and electrification of infrastructure. Furthermore, IEI is requesting studies on the management and emergency response needs of municipalities, aiming to improve preparedness and resilience in urban areas facing diverse hazards and challenges. Overall, IEI's research agenda in hazard mitigation aims to address critical issues across industrial, infrastructural, and community levels to promote safety and resilience in the face of various risks.

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## HAZARD MITIGATION SUMMARY OF TABLETOP BREAKOUT GROUP DISCUSSION

During the tabletop discussion on Hazard Mitigation, industry representatives, and academic researchers emphasized the importance of utilizing industry data analyzed by academia to effectively mitigate risks. They discussed the need for mechanisms allowing the industry to anonymously donate data and interpretations, highlighting the resources and models available at LSU, including supercomputing, that could benefit the industry. Understanding how to align with National Science Foundation (NSF) requirements and industry needs was emphasized, as well as providing training and equipment for emergency response in communities along pipelines, such as for carbon dioxide. Participants stressed the importance of developing advanced plans based on thorough analysis and advocated for collaboration between industry and academia in these efforts. They highlighted the significance of outreach and engagement in rural areas, utilizing university resources, and removing restrictions to data access. The group emphasized the state's role in facilitating data collection and underscored the higher level of trust when test results come from universities, which are perceived to have an unbiased interest in the community. The importance of academia conducting modeling assessments, defining risk profiles, and accurately communicating risks to facilitate mitigation and promote understanding was highlighted. Participants also discussed the need for data compatibility and software accessibility to ensure proper interpretation and stressed the importance of communicating academia's capabilities to the industry to improve utilization and collaboration.





# THE RFP

[TO VIEW THE RFP, CLICK THE LINK BELOW  
RESEARCH FOR ENERGY INNOVATION 2024-I \(PHASE II\)](#)

**APPLICATION DEADLINE**

**APRIL 30, 2024 11:59 PM**

## **DESCRIPTION**

LSU Institute for Energy Innovation leads the charge in transforming global energy practices. Through groundbreaking research, the Institute fosters practical solutions and policy recommendations for economic growth and sustainable energy. Phase II funding supports interdisciplinary teams addressing Louisiana's energy challenges, with awards structured across three levels: Level 1 (up to \$100,000, one year) focuses on team formation and groundwork; Level 2 (up to \$150,000, one year) gathers data and expands research plans; and Level 3 (up to \$300,000 per year, two years) enables large-scale grant proposals and lasting research programs, all contributing to a sustainable energy future.

[APPLY](#)

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# PRESENTATION SLIDES & VIDEO RECAP

[TO VIEW THE SLIDEDeck](#)  
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# WELCOME

## INDUSTRY-LSU ENERGY INNOVATION WORKSHOP

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**LSU** | Institute for Energy Innovation



**WORKSHOP VIDEO RECAP**  
[CLICK HERE](#)

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# THANK YOU

THE LSU INSTITUTE FOR ENERGY INNOVATION THANKS YOU FOR YOUR PARTICIPATION IN THE INDUSTRY-LSU ENERGY INNOVATION REPORT WORKSHOP. WE ARE GRATEFUL FOR YOUR COMMITMENT TO ADVANCING THE FIELD OF ENERGY INNOVATION AND FOR SHARING YOUR EXPERTISE WITH US. WE LOOK FORWARD TO CONTINUING THIS RELATIONSHIP AND EXPLORING NEW AVENUES FOR COLLABORATION, AS WE BELIEVE THAT TOGETHER, WE CAN DRIVE TRANSFORMATIVE CHANGES IN THE ENERGY SECTOR.



## EXIT SURVEY

To help the **Institute for Energy Innovation** improve and enhance our collaborative working efforts, we need your feedback on your experience at the Workshop. Please take a few moments to complete a brief exit survey. Your comments will help us refine our future events and tailor them to better meet your needs.

Feel free to email your comments and ideas for improvement to Brad Ives at [bradives@lsu.edu](mailto:bradives@lsu.edu)

