

# Louisiana Climate Action Plan

## *Draft Final Report*

December 22, 2021



GOVERNOR'S  
OFFICE OF  
COASTAL  
ACTIVITIES



# Table of Contents

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<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>VISION, GOALS, AND OBJECTIVES</b> .....	<b>1</b>
<b>PLANNING PROCESS AND METHODOLOGY</b> .....	<b>3</b>
<b>LOUISIANA’S GREENHOUSE GAS BASELINE</b> .....	<b>9</b>
<b>THE RISKS OF INACTION: WHY CLIMATE ACTION IS CRITICAL FOR LOUISIANA</b> .....	<b>13</b>
<b>REALIZING THE BENEFITS OF THIS CLIMATE ACTION PLAN</b> .....	<b>25</b>
<b>CLIMATE STRATEGIES AND ACTIONS</b> .....	<b>33</b>
<i>Clean Energy Transition</i> .....	34
<i>Industrial Decarbonization</i> .....	43
<i>Actively Manage Methane Emissions</i> .....	54
<i>Transportation, Development, and the Built Environment</i> .....	60
<i>Natural Working Lands and Wetlands</i> .....	76
<i>An Inclusive, Low-Carbon Economy</i> .....	85
<i>Collaboration and Partnership to Ensure Successful Implementation</i> .....	92
<i>Accountability and Adaptability to Ensure Lasting Success</i> .....	<b>Error! Bookmark not defined.</b>
<b>NEXT STEPS AND ADAPTIVE MANAGEMENT OF LOUISIANA’S FIRST CLIMATE ACTION PLAN</b> .....	<b>105</b>
<b>IMPLEMENTATION MATRIX</b> .....	<b>107</b>
<b>ACRONYMS</b> .....	<b>117</b>
<b>GLOSSARY</b> .....	<b>119</b>
<b>TASK FORCE MEMBER LIST</b> .....	<b>126</b>
<b>SECTOR COMMITTEES MEMBER LIST</b> .....	<b>127</b>

ADVISORY GROUP MEMBER LIST..... 129

REFERENCES..... 133

# Executive Summary

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The risks posed by climate change to the people of Louisiana are high. The evidence reveals that these impacts have been worsening and will continue to increase in the future. Addressing climate change, however, presents an opportunity for Louisiana to build on existing strengths and to maintain competitiveness in various sectors such as energy, manufacturing, and maritime transportation in the midst of a global energy transition. Taking action to address climate change is also an opportunity to improve the health, equity, and quality of life of Louisiana residents, conserve the environment and cultural heritage, and grow and diversify the economy, while offering safe, meaningful employment to workers.

**In August, 2020, Governor John Bel Edwards signed an executive order that called into being the Climate Initiatives Task Force to develop strategies and actions to address the threats of climate change and seize the opportunities presented by the energy transition.** Like many other states around the nation, and nearly one fifth of the world's 2,000 largest companies, the Governor's executive order committed Louisiana to achieving net zero greenhouse gas emissions by 2050. The order also established immediate goals and interim goals in accordance with the Paris Climate Agreement.

With a structure that included a Task Force made up of government, private sector, academic, environmental, and community voices; six sector committees focused on solutions from different aspects of the economy; and four advisory groups including equity, science, law, and economics; and through nearly fifty public meetings, the work of the Climate Initiatives Task Force has been intensive over the sixteen months from the signing of the executive order to the completion of this report. **Throughout this work, the Governor and the Task Force have prioritized broad engagement from multiple stakeholder voices, transparency with the public, and a reliance on the best available science and information in order to arrive at a set of balanced actions to address this complex and enormous challenge.**

**The plan recommends strategies (high-level vision statements) and actions (specific policy recommendations) to reduce greenhouse gas emissions, to meet the goal of net zero by 2050, and to avert the worst impacts of climate change, make our current adaptation efforts more successful, and reduce risks for future generations.** The plan also offers strategies and actions that can improve health outcomes and the quality of life of Louisiana residents immediately by reducing the amount of fossil fuel combustion in the production of electricity and manufactured goods and from buildings and transportation while helping to slow the warming of the atmosphere that causes other climate impacts harming health, safety, and quality of life. The Task Force also developed objectives around creating a more equitable society. By prioritizing equity in the design of policies, this plan seeks to ensure that the costs of mitigation or adaptation actions do not fall unequally on people currently and historically disadvantaged in Louisiana. This plan is an opportunity to implement climate mitigation and adaptation measures which also address long-standing inequities while promoting new opportunities for a more inclusive, low-carbon economy in the future.

Louisiana's economy and workforce can also benefit from many of the actions and strategies in this plan. New investments in renewable power and distributed energy, re-investment in facilities and infrastructure to adapt existing industries for success in the low-carbon economy, cleaning up orphaned wells and methane leaks, and other activities that expand access to economic opportunity more broadly are all supported by this plan. In

addition, the state can maintain or increase its ability to naturally sequester carbon dioxide while promoting resilience for communities and ecosystems by implementing this plan. Other benefits, like more sustainable soils, better water quality, and natural protection for communities and major economic engines, are also possible with action to address climate change. Louisiana is already a leader in coastal adaptation and is creating new systems to address flooding statewide. As implementers adopt measures in this Climate Action Plan to reduce GHG emissions, they can also support community adaptation measures and extensive co-benefits. Distributed solar with storage, energy efficiency improvements, and land use planning can all support emissions reductions and bolster adaptation as well.

**While an understanding of the issues and opportunities facing Louisiana related to the impacts of climate change is critically important, it is all the more important to begin taking action to address the root cause of climate change.** The Task Force’s adopted portfolio of strategies and actions herein identifies needed steps across every sector of the economy for reducing greenhouse gas emissions and forging a better future for all Louisianans.

The plan provides numerous actions and strategies which are interdependent and interconnected. Net zero is attainable through this set of strategies and actions, but whether Louisiana achieves net zero by 2050, on the other hand, depends on full-scale and timely implementation, as well as support from the federal government. In addition, achieving co-benefits and successful implementation will depend not just on what is done, but how action is taken. **This plan charts a path for climate action in Louisiana in ways that effectively reduce greenhouse gas emissions and meet the target of net zero by 2050, while also improving equity, public health and quality of life, preserves and protects the environment, builds confidence and awareness among the public, and makes us more resilient and adaptable to changing environmental conditions.**

# Vision, Goals, and Objectives

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Governor Edwards charged the Task Force with developing actionable recommendations to achieve the following Vision and Emission Reduction Goals. The Task Force, Committees, and Advisory Groups established a set of Objectives to further guide their planning and evaluation of strategies and actions.

## VISION

***Reduce GHG emissions to limit the impacts of climate change that harm the state's natural and cultural heritage while adapting to maintain Louisiana's position as a world leader in energy, industry, agriculture, and transportation.***

*Executive Order JBE 2020-18*

## GHG EMISSIONS REDUCTION GOALS

The GHG emissions reduction goals (Figure 1) are derived in part from the declaration by the Intergovernmental Panel on Climate Change (IPCC) that “global net human-caused emissions of carbon dioxide...would need to fall by about 45 percent from 2010 levels by 2030, reaching ‘net zero’ around 2050.”<sup>1</sup> These goals also align with the U.S.’ Nationally Determined Contributions (NDCs) which represent its commitment in the Paris Agreement to limit global warming to 1.5°C,<sup>2</sup> and are calibrated to 2005 to correspond to Louisiana’s 2010 GHG inventory. Additionally, Governor Edwards’ goals put Louisiana in line with commitments made by dozens of other states as well as businesses operating in multiple sectors internationally, nationally, and within Louisiana. These businesses span a variety of industrial sectors including energy producers, public utilities, chemical manufacturers, technology firms, and finance.

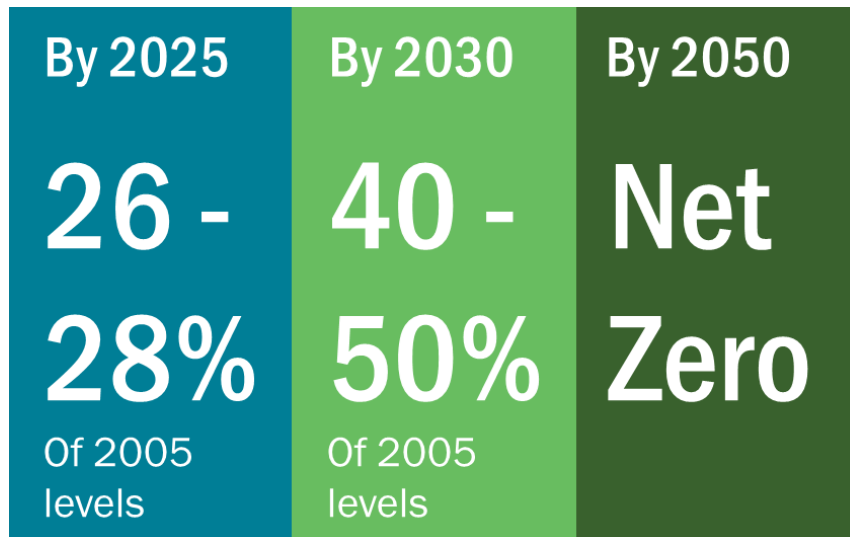


FIGURE 1. LOUISIANA'S GHG EMISSIONS REDUCTION GOALS.

## OBJECTIVES

Fundamental objectives are the essential goals of this effort and served to guide the development and evaluation of climate mitigation actions and strategies considered in this plan. The fundamental objectives represent strongly held values that helped to identify co-benefits and potential negative consequences of action. The seventeen fundamental objectives of this plan are grouped in Table 1 by theme.

TABLE 1. FUNDAMENTAL OBJECTIVES USED TO GUIDE DEVELOPMENT AND EVALUATION OF ACTIONS AND STRATEGIES WITHIN THE CLIMATE ACTION PLAN.

Category	Fundamental Objective
<b>1. Reducing Net Greenhouse Gas (GHG) Emissions</b>	Minimize net greenhouse gas emissions
<b>2. Improving Health and Quality of Life for Residents and Communities</b>	Maximize quality of and access to essential goods, services, and infrastructure for residents
	Maximize positive public health outcomes and public safety
	Maximize the preservation of cultural heritage
<b>3. Creating a More Equitable Society</b>	Reduce socioeconomic, demographic, and geographic disparities in future opportunities and outcomes
	Maximize reduction and mitigation of historical and structural inequities and their impacts for underserved and marginalized communities, including communities of color and Indigenous peoples
	Maximize engagement with and participation of communities in decision-making and implementation
<b>4. Managing for Short- and Long-Term Success</b>	Maximize confidence of the public and stakeholders in the outcome of emissions-reduction strategies to increase support for their implementation
	Maximize the efficiency and effectiveness of emissions-reduction strategies
	Maximize timely implementation of emissions-reduction strategies
	Maximize the durability of emissions-reduction strategies in an uncertain future
<b>5. Strengthening the Economy and Workforce</b>	Maximize employment, economic opportunity, and support for Louisiana workers
	Maximize economic growth
<b>6. Conserving Natural Resources &amp; Protecting the Environment</b>	Maximize preservation of natural resources and ecosystem services
	Maximize environmental stewardship and support of healthy ecosystems
<b>7. Adapting to a Changing Climate</b>	Increase resilience of the built and natural environment to climate change
	Increase the resilience of communities to climate change



# Planning Process and Methodology

Governor Edwards called on the CITF to produce a Climate Action Plan that outlines actions to reduce net GHG emissions from all sectors of the economy and to set Louisiana on a path to meet its short-, medium-, and long-term emission reduction goals. Actions and strategies reduce GHG emissions while achieving other co-benefits for Louisiana's communities, environment, and economy. Achieving this vision and the state's emission reduction goals in a manner that is inclusive and balanced requires a deliberate and transparent planning process.

## STRUCTURE

The CITF, its sector committees, and advisory groups comprise over 140 experts and stakeholders from state government, colleges and universities, the private sector, and civil society that advised and contributed to the strategies and actions contained in this Climate Action Plan (Figure 2). See full membership at the end of this report.

Membership across these bodies is reflective of the Governor's vision to achieve balance through their broad-based composition with representatives from corporate entities, advocacy organizations, regulators, academics, and community representatives. Bringing together a variety of stakeholders with varying interests and values allowed for robust and challenging discussions that ensure an end result of comprehensive strategies that set Louisiana on a path to net zero GHG emissions by 2050.

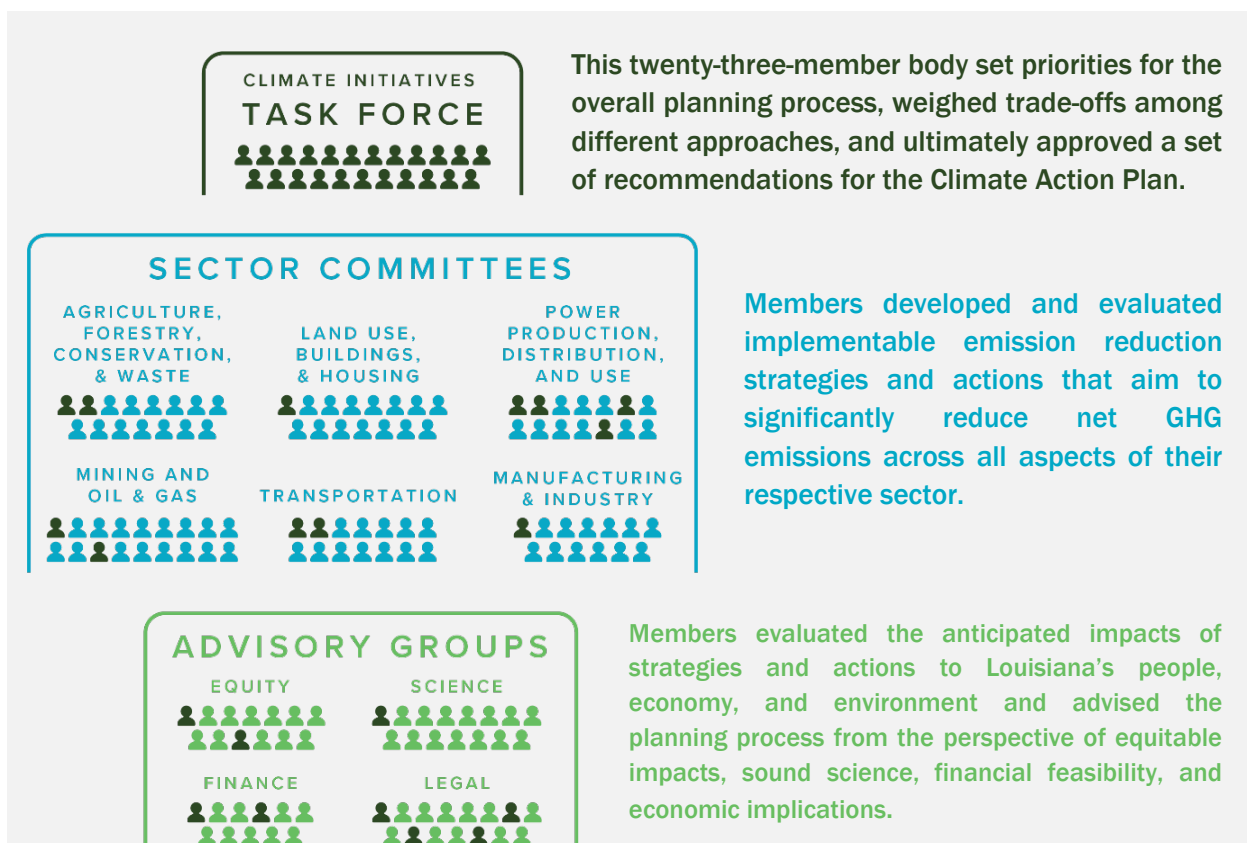


FIGURE 2. THE PLANNING PROCESS STRUCTURE USED TO DEVELOP LOUISIANA'S CLIMATE ACTION PLAN.

The CITF is chaired and staffed by the Office of the Governor, Coastal Activities (GOCA). Under leadership of the Executive Assistant to the Governor for Coastal Activities, GOCA serves as the staff and managers of the CITF, advisory groups, and sector committees in coordination with advisory and committee chairs. As staff of this effort, GOCA also works alongside all members, state agencies, outside stakeholders, and the public to increase engagement in the process, expand partnerships, and coordinate among all entities. As Louisiana’s Innovation and Collaboration Hub, the Water Institute of the Gulf (TWI) assisted GOCA as it led the planning process for and development of the Climate Action Plan. This Planning Team, comprised of GOCA and TWI, ensured the CITF remained on track to complete the deliverables within the timelines.

## STRUCTURED DECISION MAKING

The planning process for developing this Climate Action Plan was grounded in a Structured Decision Making approach (Figure 3). In basic terms, this six-step framework is “a formalization of common sense for decision problems which are too complex for informal use of common sense”.<sup>3,4</sup> This approach combined science and policy to break down complex decisions and identify solutions that meet the goals and objectives of the Task Force in a manner that is explicit and transparent.



FIGURE 3. THE SIX-STEP STRUCTURED DECISION MAKING PROCESS.

## PLANNING TIMELINE

This plan was developed, evaluated, and refined over an intensive 16-month collaborative process that included **49 public meetings** of the Task Force, sector committees, and advisory groups as well as opportunities for the public to share their ideas for climate actions and provide feedback on the draft plan components. The following timeline includes the phases of this planning process, tagged to their corresponding Structured Decision Making step.

### **EXECUTIVE ORDER ESTABLISHES TASK FORCE: August 2020**

Governor Edwards signed Executive Order JBE 2020-18, establishing a twenty-three-member CITF, supported by six sector committees and four advisory groups, and calling for an updated GHG emissions inventory, an interim report in February of 2021, and a final climate strategy by February of 2022.

Referencing the value of Louisiana's coast and the projections for an additional 2,250 to 4,120 square miles of coastal land loss over the next fifty years, Executive Order JBE 2020-18 connects Louisiana's coastal crisis, the catastrophic human costs of natural disasters, and the international scientific consensus that GHG emissions are causing unprecedented global warming. "To improve our resilience, sustain our coast, and help avoid the worst impacts of climate change," the order states, "Louisiana must proactively work to reduce the GHG emissions that are driving up global temperatures, raising sea levels, and increasing risks that threaten our health and safety, quality of life, economic growth, and vital habitats and ecosystems." Governor Edwards also clearly articulated his desire for solutions to this problem to be developed in partnership with multiple stakeholders with the ultimate goal of reaching a "balanced" set of strategies that would both help "limit the impacts of climate change that harm our state's natural and cultural heritage," and provide ways for us to adapt "to maintain [our] position as a world leader in energy, industry, agriculture, and transportation."

### **KICK-OFF AND OBJECTIVE SETTING: November 2020 – February 2021**

The Task Force met for the first time in November 2020, kicking off a 14-month planning process to develop this strategy. The Task Force and each of the sector committees and advisory groups met in December to discuss and identify objectives important to Louisiana in how the state approaches reducing its GHG emissions. Objectives included measures of health and quality of life, equity, economy and jobs, the environment, resilience, and effectiveness and durability. These fundamental objectives served as the backbone of this planning process and were directly considered in the development of climate actions and strategies and in evaluating and refining solutions.

### **WORKSHOPPING HIGH-LEVEL STRATEGIES: March 2021**

Each of the sector committees met in March to begin brainstorming strategies – high-level paths to reducing GHG emissions within their sector. This focus on bigger picture vision helped to ensure a comprehensive approach to the development of practical actions.

### **PUBLIC CALL FOR ACTION PROPOSALS: February – April 2021**

Sector committee, advisory group, and Task Force members as well as the public were invited to submit proposals for actions to be considered in this plan. Actions are based around a specific and directly implementable policy, program, or project that will result in a net reduction in GHG emissions and/or comprehensively address a cross-cutting



implementation priority (climate equity, economic transition, scientific advancement, or governance). Actions were developed using a common Action Proposal Template that included a title, description, impact on net GHG emissions, co-benefits, consequences, timeframe, lead and partners, climate equity priorities, and other implementation and feasibility considerations.

In addition to individual sector committee and advisory group working sessions, six Cross-Sector Action Workshops were held in April to improve draft action proposals and identify new Action proposals through a cross-disciplinary discussion of key technical, tactical, and implementation issues that cut across sectors. The cross-sector themes included: siting of new power generation and energy infrastructure; state and local codes, procurement and contracting policies; advancing research and supporting new technology; carbon pricing; increasing participation in climate action; and combining climate mitigation goals with adaptation and resilience goals.

In total, **171 action proposals** were received by the April 30, 2021 deadline. All raw action proposals are publicly available on the Climate Initiatives Task Force website.

#### **ASSESSING ALTERNATIVE APPROACHES: March – June 2021**

Two rounds of evaluation were conducted to investigate the impacts of climate action in Louisiana on the state’s GHG emissions and on the people, economy, and environment. An initial analysis of potential positive and negative impacts, called the “consequence analysis,” of high-level hypothetical emission reduction scenarios was undertaken in Spring 2021. This analysis was intended to understand better the magnitude of Louisiana’s GHG emissions challenge, the maximum benefits or limitations of particular approaches, and the various impacts on the people, environment, and economy of Louisiana. This consequence analysis focused on evaluating the impacts of a “business-as-usual” case (no targeted effort to reduce net GHG emissions for Louisiana) as well as a set of four hypothetical strategy portfolios (“what-if” scenarios) designed to evaluate what the outcomes for different types of GHG-reduction strategies might be. Scenarios included intensive electrification through zero-carbon renewable energy; reduced energy demand, consumption, and waste intensive; industrial carbon removal, capture, use, and storage intensive; and natural sequestration and sinks intensive.

The hypothetical portfolios were evaluated against each of the 17 fundamental objectives of this planning process. The net-GHG emission reduction potential of each portfolio was evaluated using a beta version of the Louisiana Energy Policy Simulator modeling tool (developed for Louisiana by Energy Innovation) as well as through referencing additional research, including national net zero pathway studies. Impacts to the other 16 fundamental objectives were evaluated using a survey to elicit the expertise of advisory group members.

Key take-aways from this first consequence analysis included an acknowledgement that no single strategy or approach is the solution and that aggressive action across multiple approaches will be necessary to meet Louisiana’s emission reduction targets. Strategies will also require intentional action to ensure co-benefits and positive outcomes for all people and across all of the fundamental objectives.

The full results of this consequence analysis are detailed in a Technical Memorandum developed by The Water Institute.



**DEVELOPING A PORTFOLIO OF DRAFT STRATEGIES & ACTIONS: May – August 2021**

Action proposals received through the public call were posted to the Climate Initiatives website, sorted into sectors and themes, and discussed by the relevant sector committees. The Planning Team reviewed all proposals and worked to organize, refine, combine, gap-fill, and group actions under high-level strategies. A comprehensive Draft Portfolio of Climate Strategies and Actions was shared with the Task Force, sector committees, advisory groups, state agencies, and the public in August 2021 for review and feedback.



**EVALUATING CONSEQUENCES OF STRATEGIES & ACTIONS: September – October 2021**

A second round of consequence analysis considered the likely outcomes and impacts of the Draft Portfolio of Climate Strategies and Actions. As with the first consequence analysis in the Spring, the draft portfolio was evaluated against each of the 17 fundamental objectives of this planning process. The net-GHG emission reduction potential of the portfolio was evaluated by The Water Institute using a now-public version of the Louisiana Energy Policy Simulator modeling tool. Impacts to the other 16 fundamental objectives were evaluated using a survey to elicit the expertise of advisory group members. Results of the consequence analysis were shared and discussed with the Task Force in October 2021. The full results of this consequence analysis are detailed in a second Technical Memorandum developed by The Water Institute.



In addition to a second consequence analysis, GOCA also encouraged technical feedback on strategy and action details from sector committee members, discussed implementation considerations with state agencies, and received public comments on the draft portfolio and draft report sections during this phase in the planning process.

**GHG INVENTORY UPDATE: October 2021**

The LSU Center for Energy Studies (CES) conducted an update to Louisiana’s Greenhouse Gas Inventory, which was released as a public report in October 2021. This inventory estimates and assesses the state’s GHG emissions from all major sources, activity types, economic sectors, and pollutant types and provides an important updated snapshot in time of Louisiana’s GHG baseline. The report also provides trends in data from 2000-2018. LSU CES last conducted a statewide GHG inventory in 2010 using 2005 data. This 2021 update using 2018 data provides valuable insight into the nature of Louisiana’s GHG emissions profile and how that has changed.



The Science Advisory Group provided oversight and direction to guide the GHG inventory update process, including two rounds of comments. A presentation of draft findings was shared with the Task Force in its July 2021 meeting.

**WEIGHING TRADE-OFFS AND REFINING THE PLAN: October 2021 – January 2022**

GOCA reviewed all points of feedback and evaluation, considered diverging priorities and perspectives, carefully weighed trade-offs, sought ways to improve anticipated outcomes, and clarified implementation details in revising the Draft Portfolio of Climate Strategies and Actions. The updated portfolio also set specific targets and goals, identified and strengthened in the portfolio to provide specificity and direction for individual action. These goals were established based on their ability to drive down emissions towards net zero, determined through research and utilization of the Louisiana Energy Policy Simulator tool



and best practices from other states pursuing similar ambition. This revised draft portfolio represented a further effort at striking the balance between the needs and perspectives of different stakeholders, meeting the urgent need to address the root causes of climate change, while also supporting values related to a more equitable society, quality of life, the environment, resilience, and the economy. This draft was discussed by the Task Force in their December meeting and shared again with the public. A round of final edits to the portfolio was made and presented to the Task Force again in early January.

**TASK FORCE RECOMMENDATIONS SHARED WITH GOVERNOR: *February 2022***

The Task Force met in late January 2022 to approve this final plan before it was sent to the Governor on February 1, 2022, for his consideration.

**IMPLEMENTATION: *February 2022 - Ongoing***

Realizing the full benefits of this Climate Action Plan will require concerted effort by state government, in coordination with federal and local government, industry, academia, civic organizations, and the public, to implement actions and adaptively manage the plan over the years to come.



# Louisiana's Greenhouse Gas Baseline

## 2021 INVENTORY

The Louisiana 2021 Greenhouse Gas Inventory<sup>5</sup>, prepared by the LSU Center for Energy Studies using data from 2018, provides information about the GHG emissions across major economic sectors in the state. Using the EPA's State Inventory Tool (SIT) methodology, with additional analyses, this inventory is consistent with the methodology used to prepare the state's previous inventory. The prior GHG inventory was completed in 2010, using 2005 data.

Louisiana's net GHG emissions in 2018 were **216 million metric tons** of carbon dioxide equivalent (MMT CO<sub>2</sub>E), compared to 215 net MMT CO<sub>2</sub>E in the previous inventory (2005 data). The state's emissions have been nearly flat across this time period, despite increases in industrial production and decreases in coal-fired power generation, among other changes and trends.

Louisiana's GHG emissions baseline is unique among states and is significantly different than the nation's emissions baseline as whole (Figure 4). In the US, 17% of overall national emissions come from the industrial sector; **in Louisiana, the industrial sector contributes an overwhelming 66% of overall state emissions.** Though Louisiana's GHG emissions are most concentrated in the industrial sector, transportation and power generation emissions across the state are also significant. The transportation sector is responsible for 19% of CO<sub>2</sub> emissions, and the electric power sector makes up 13% of Louisiana's CO<sub>2</sub> emissions.

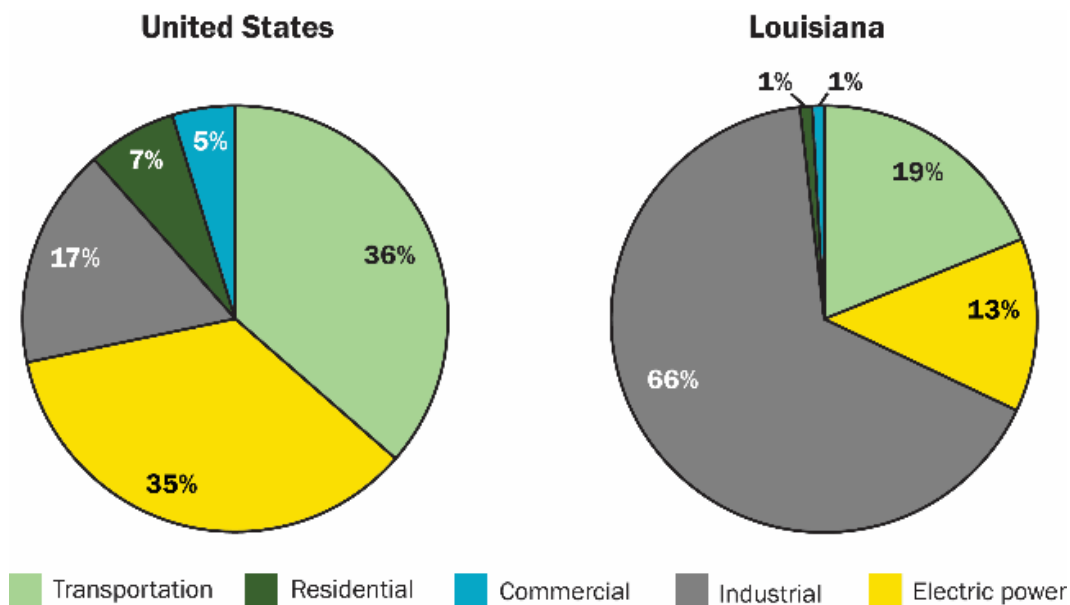


FIGURE 4. SUMMARY OF UNITED STATES AND LOUISIANA EMISSIONS PER SECTOR, 2018. NOTE: FUEL COMBUSTION VALUES ARE FROM FOSSIL FUEL COMBUSTION ONLY. SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2018; AND STATE CO<sub>2</sub> EMISSIONS FROM FOSSIL FUEL COMBUSTION. FIGURE DERIVED FROM FIGURE 4 IN THE [LOUISIANA 2021 GREENHOUSE GAS INVENTORY](#).

**This unique profile represents a significant challenge for reducing Louisiana's emissions to net zero by 2050.** Unlike other states, or even national strategies, Louisiana cannot rely on transportation or power sector

strategies alone. Industrial emissions are widely thought of as the most difficult to abate emissions, and in Louisiana, they must be abated to have a chance at achieving net zero.

Compared to the United States, Louisiana’s power generation fuel mix distribution is less diverse (Figure 5). Louisiana’s power generation fuel mix is composed of 71% natural gas and 1.6% renewable, compared to the U.S. where 45.3% of power generation is composed of natural gas and 15.3% is renewable. In 2018, industry accounted for 40% of GHG corresponding to electricity consumption in Louisiana, followed by 34% by residential and 26% by commercial.<sup>6</sup>

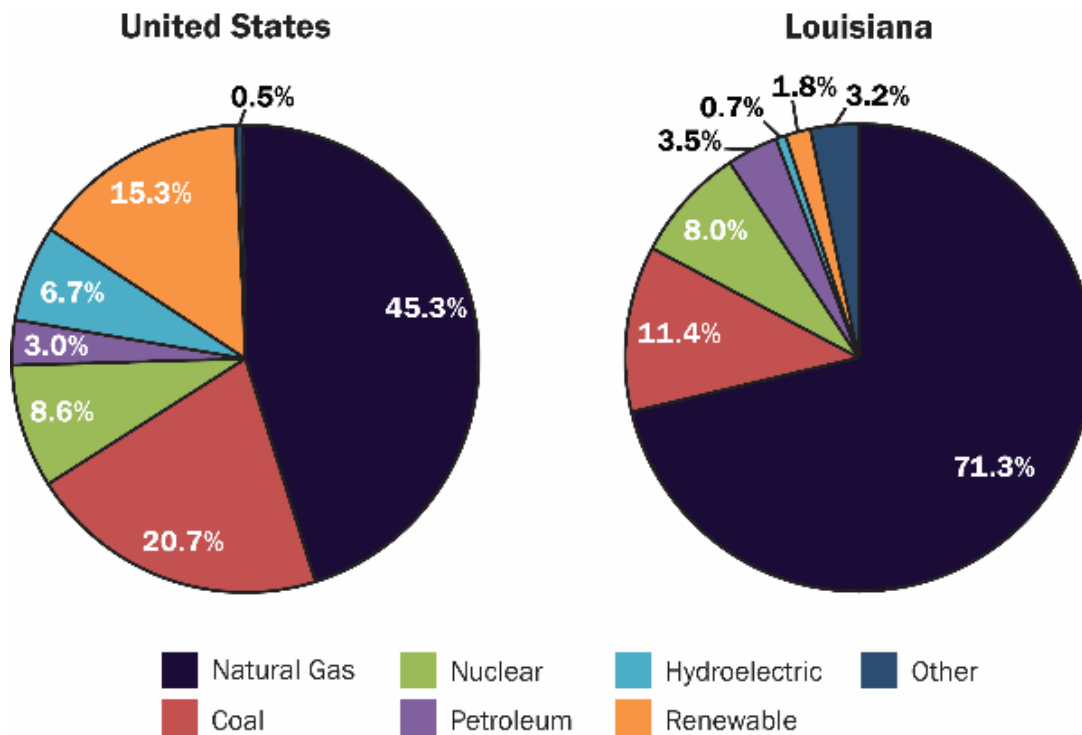


FIGURE 5. COMPARISON OF POWER GENERATION FUEL MIX IN THE UNITED STATES AND LOUISIANA IN 2019. SOURCE: ENERGY INNOVATION ADMINISTRATION. FIGURE REPRODUCED FROM FIGURE 16 IN THE [LOUISIANA 2021 GREENHOUSE GAS INVENTORY](#).

Louisiana’s leading sectors in industrial CO<sub>2</sub> emissions include chemical manufacturing, petroleum and coal (refining), and natural gas processing. Together, these three sectors make up 94% of the state’s industrial CO<sub>2</sub> emissions. In 2019, Louisiana’s top 20 GHG emissions sources produced 72,251,830 total metric tons of CO<sub>2</sub>, with an average of 3,612,591 metric tons per year. Between 2012 and 2019, total CO<sub>2</sub> emissions within the top 20 emitting sources increased by 5,724,571 metric tons.

The top three highest emitting facilities in 2019 included the chemical manufacturing facility CF Industries Nitrogen-Donaldsonville (10,005,456 metric tons), petroleum refining and chemical manufacturing complex ExxonMobil Baton Rouge Complex (6,360,077 metric tons), and the power generation facility Brame Energy Center (5,409,289 metric tons).



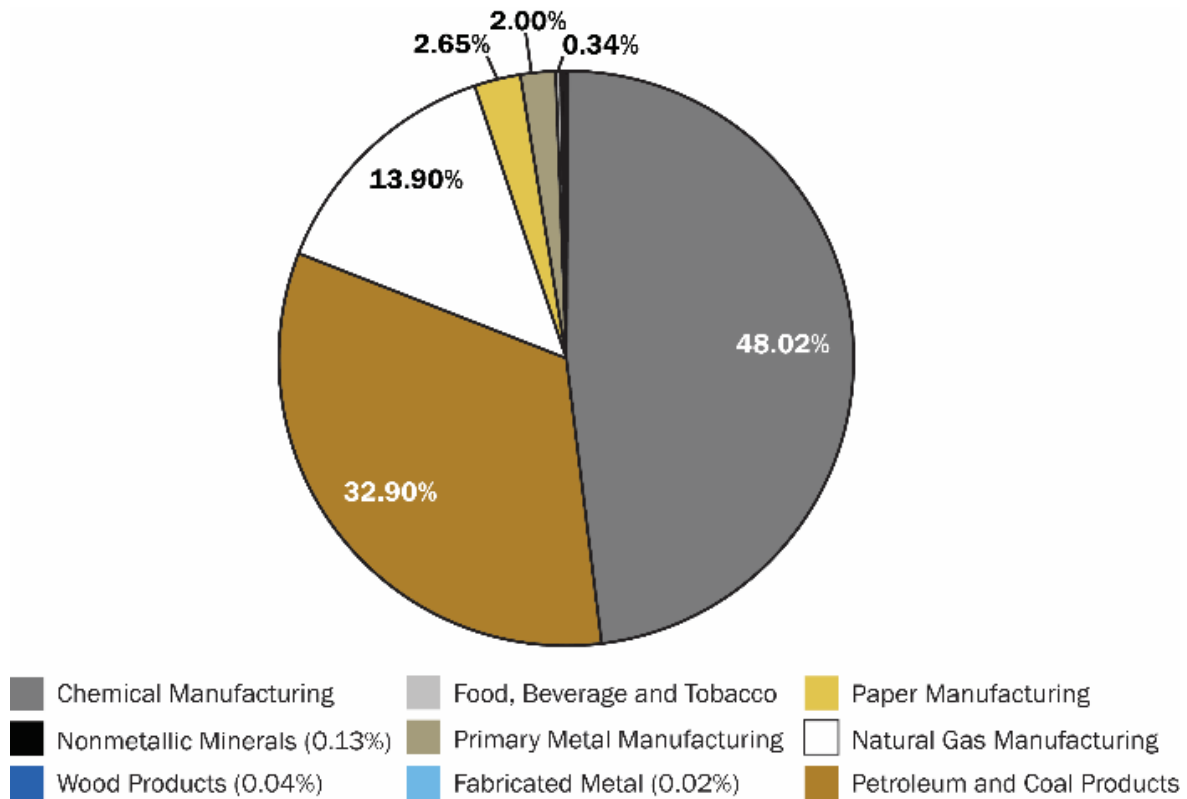


FIGURE 6. LOUISIANA INDUSTRIAL CO<sub>2</sub> EMISSIONS BY SECTOR FOR 2019. SOURCE: U.E. EPA FLIGHT. FIGURE REPRODUCED FROM FIGURE 19 IN THE [LOUISIANA 2021 GREENHOUSE GAS INVENTORY](#).

In addition to Louisiana’s current emissions, many industrial expansions or new facilities have been announced across the state. Based on announced projects that have received permits, cumulative new industrial GHG emissions could reach up to 120 MMT per year. Potential impact of these facilities is included in the upper bound of the projected business-as-usual model below.

## PROJECTING A BUSINESS-AS-USUAL FUTURE

**The ways in which Louisiana’s emissions might increase, particularly from industrial facilities, are important to consider when taking climate action.** The Louisiana Energy Policy Simulator (EPS) Tool, used for both rounds of consequence analysis and for informing policy design, includes a Business-As-Usual (BAU) case that factors in some amount of economic growth, rebounding from a COVID-related recession, and other factors. This BAU case represents a future without climate action, continuing on a trajectory of increased emissions (Figure 7). There are some uncertainties with the business-as-usual future as well, such as the approximately 50 announced industrial expansions or new facilities for 2021 or later, noted in the section above.

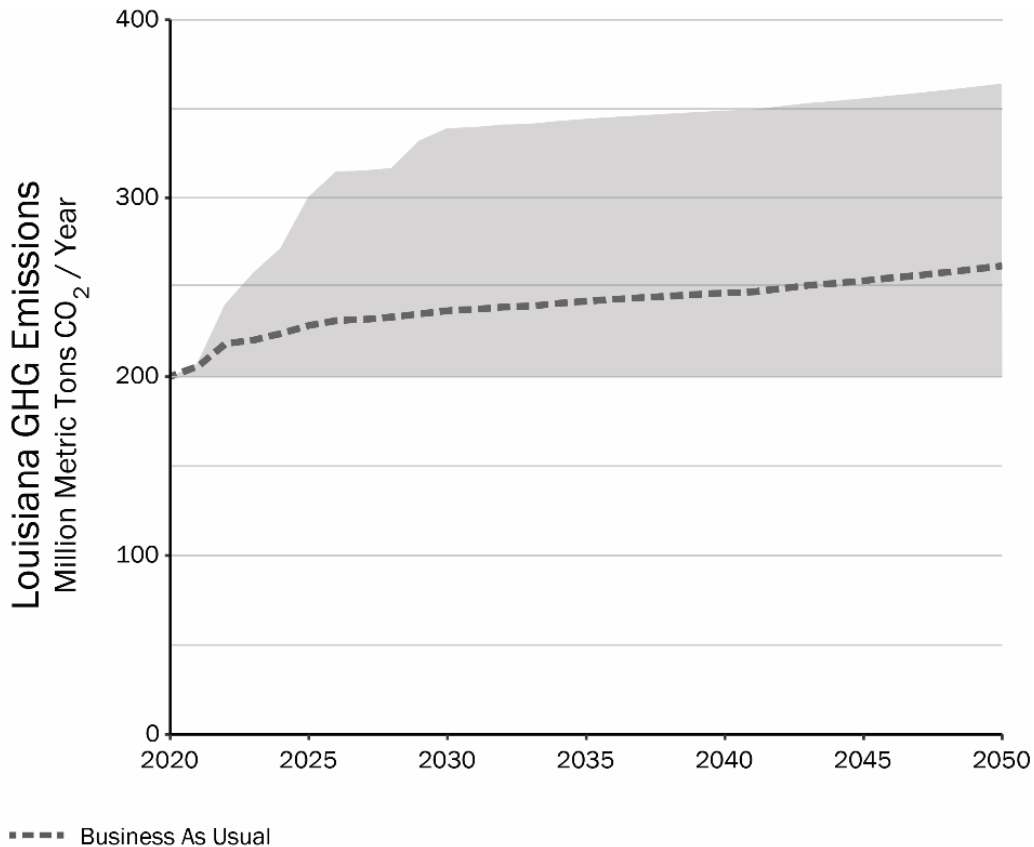


FIGURE 7. BUSINESS AS USUAL SCENARIO OF GHG EMISSIONS IN LOUISIANA, 2020-2050.

**However, even the BAU case is subject to uncertainty.** Emissions could continue to increase – especially if new facilities and expansions are permitted and built. Those emissions are in the upper bound of the uncertainty seen in Figure 7 above. Industrial production could continue to increase while efficiency gains are also made, which might lower emissions; given that the state’s emissions were essentially flat from 2005 to 2018, this represents the lower bound of the uncertainty. What is certain is that business as usual will not lead to a net zero future for Louisiana, and aggressive action is needed.

**The math problem of how Louisiana confronts its emissions is difficult.** While this planning process began with the 2005 data, it was unclear until the middle of 2021 that statewide emissions were relatively flat from 2005 to 2018. Without the benefit of that information, the goal-setting for 2025 was done without an understanding of how far Louisiana would have to go to achieve reductions from the 2005 baseline. If Louisiana had taken earlier climate action, those short-term goals may have been achievable. Notably, 2018 GHG emissions from electric power generation were down by 21% from 2005 levels, while industrial emissions (inclusive of natural gas and oil systems) rose by 14% over the same period.<sup>7</sup>

**While, in some ways Louisiana is catching up to other states that have been taking climate action over the past decades, in other ways Louisiana is charting new ground. No state has ever attempted to tackle industrial emissions at this scale. This aggressive plan offers the opportunity for Louisiana to lead the way in climate action, particularly industrial decarbonization, and set a global example.**

# The Risks of Inaction: Why Climate Action is Critical for Louisiana

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Climate change is a planetary threat being driven by human-induced increases in GHG concentrations in the atmosphere that have raised global temperatures and made extreme weather more common.<sup>8</sup> In 2019, carbon dioxide (CO<sub>2</sub>) concentrations in the atmosphere were at their highest over the last 2 million years,<sup>9</sup> and 19 of the 20 warmest years on record have occurred since 2000,<sup>10</sup> arctic summer sea ice reached its lowest level on record in 2012,<sup>11</sup> and global average sea level has risen faster in the past century than at any time in the past 1000 years.<sup>12</sup> The unprecedented fires, droughts, floods, and heatwaves the world is already experiencing will intensify as global temperature continue to go up putting millions of lives and trillions of dollars of assets at risk.<sup>13</sup> Throughout this ongoing upheaval, the most severe impacts have and will continue to fall on the poor and otherwise marginalized communities.<sup>14</sup>

## **Louisiana is among the most vulnerable states in the United States to the impacts of climate change.**

Impacts from climate change are significantly affecting the amount of coast that can be preserved and the effectiveness of state and local restoration and protection efforts. Inland from the coast, other climate impacts are making flooding more common and heat more unbearable, and they are straining our best efforts to become more resilient. Most of all, these changes to the environment are translating into hardships for the people who call this state home—hardships that will continue to increase in scope, scale, and intensity unless the world comes together to dramatically reduce global GHG emissions.

**The impacts to people being felt today in Louisiana include direct physical, mental, and financial tolls from extreme weather and indirect impacts to social systems and infrastructure that is struggling to cope with the increasing prevalence and severity of natural disasters.** As is the case globally, Louisiana's low-income communities, communities of color, Indigenous people, and other marginalized residents are being hit especially hard because they are more likely to live in areas vulnerable to extreme weather and are typically less financially able to take on the economic challenges of recovery or relocation.<sup>15</sup> These groups have been excluded from the opportunity to build wealth for generations, are more likely to live and work in overburdened communities, are more likely to live in areas with higher flood risk, and more likely to experience insufficient or delayed investments in infrastructure and disaster recovery efforts.

The need for climate action in Louisiana is paramount. Throughout the state, whole communities are being displaced. People regularly lose their cars to flooding from abnormal rain events. Some are unable to evacuate from hurricanes because they lack the means or must stay and work in order to keep their jobs. We are losing our coast and the culture that it supports; inland areas are challenged as well with too much or too little water or extreme heat; and the state's economy is consistently stressed by the disruption and damages of disaster, response, and recovery. This section provides an overview of the scientific underpinnings to the problem of global climate change and more details on how those environmental changes are producing impacts to communities, ecosystems, and the economy in Louisiana.

Since 1988, the Intergovernmental Panel on Climate Change (IPCC) has provided scientific information to governments at all levels for the development of climate policy. The regular reports issued by the IPCC represent contributions from thousands of scientists spanning the globe who assess the latest published works to arrive at a comprehensive summary of what is known about climate change. They report on the drivers of climate change, the impacts and future risks associated with climate change, and how adaptation and mitigation can reduce current and future exposure.<sup>16</sup>

In 2018, the IPCC issued its *Special Report: Global Warming of 1.5 °C* to inform the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. This report affirmed that human activities are estimated to have contributed to 1 °C of global warming above pre-industrial levels and that global warming is anticipated to reach 1.5 °C above preindustrial levels between 2032 and 2050 if current rates continue. This rate of global warming, the IPCC concluded, will increase the overall “climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth.” These risks further increase as global temperatures rise to 2 °C above pre-industrial levels.

In August of 2021, the IPCC released a working group report on the latest scientific understandings of climate change as well as projections for future warming and its impact on the Earth’s systems. Some of the report’s conclusions include:

- There is no doubt that human-induced climate change is already affecting many weather and climate extremes in every region across the globe.<sup>17</sup>
- Global warming of 1.5 °C and 2 °C will be exceeded during the 21st century unless deep reductions in CO<sub>2</sub> and other GHG emissions occur in the coming decades.<sup>18</sup>
- Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic Sea ice, snow cover and permafrost.<sup>19</sup>
- With further global warming, every region is projected to increasingly experience concurrent and multiple changes in climatic impact-drivers. Changes in several climatic impact-drivers would be more widespread at 2 °C compared to 1.5 °C global warming and even more widespread and/or pronounced for higher warming levels.<sup>20</sup>
- From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO<sub>2</sub> emissions, reaching at least net zero CO<sub>2</sub> emissions, along with strong reductions in other GHG emissions. Strong, rapid and sustained reductions in methane emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality.<sup>21</sup>

Scientists working across the U.S. government and the National Academy of Sciences also produce summary reports detailing the impacts of climate change on the U.S. specifically known as the National Climate Assessment. In 2018, the most recent National Climate Assessment was released with similar findings as the IPCC report, including the conclusion that “climate change creates new risks and exacerbates existing vulnerabilities in communities across the U.S., presenting growing challenges to human health and safety, quality of life, and the rate of economic growth.”<sup>22</sup>

Another point made by both the IPCC and the National Climate Assessment is the unequal distribution of climate impacts. The vulnerable, those who are low income, communities of color, children, the elderly, Indigenous populations, and others who are marginalized have a lower capacity to prepare for and cope with extreme weather, climate-related events, and other changes.<sup>23</sup> Vulnerable populations may also be disproportionately affected by actions taken to address the underlying causes and impacts of climate change if those inequities and circumstances are not considered explicitly.

Louisiana is particularly vulnerable to the impact of climate change. The National Climate Assessment produced four key messages for the southeastern region of the U.S., and each resonates deeply with Louisiana.

1. **Urban Infrastructure and Health Risks.** Compared to cities in other regions of the country, cities in the southeast are particularly vulnerable to climate change impacts to infrastructure and human health specifically from increasing heat, flooding, and vector-borne diseases.<sup>24</sup>
2. **Increasing Flood Risks in Coastal and Low-Lying Regions.** Home to people, critical industries, cultural resources, and tourism economies, the coastal plain and low-lying regions of the southeast are extremely vulnerable to climate change impacts. Flood frequencies, extreme rainfall events, and sea level rise will affect property values and the viability of infrastructure.<sup>25</sup>
3. **Natural Ecosystems will be Transformed.** Diverse natural ecosystems that provide multiple social benefits will be transformed by climate change through changing winter temperature extremes, wildfire patterns, sea levels, hurricanes, floods, droughts, and warming oceans that will redistribute species and greatly modify ecosystems. “Future generations can expect to experience and interact with natural systems that are much different than those that we see today.”<sup>26</sup>
4. **Economic and Health Risks for Rural Communities.** More regular extreme heat and changing seasonal climates are projected to have impacts on exposure-linked health and economic vulnerabilities in agricultural, timber, and manufacturing sectors. Reduced labor hours from extreme heat can also compound existing social stresses.<sup>27</sup>

With climate risks manifesting every day and all but certain to grow in severity in the future, the need to reduce GHG emissions driving global warming is crucial. Reducing GHG emissions is a viable way to mitigate climate-related risks and increase opportunities for people and improve or protect their quality of life in the long run. As is made clear in national and international scientific reports, the evidence of human-caused climate change is overwhelming, the impacts of climate change are present today and intensifying, and the threats to physical, social, and economic well-being are on the rise.<sup>28</sup> In the coming sections, brief glimpses of climate change’s current and future potential impacts on Louisiana will be explored through the lenses of social, health, equity, economic, and environmental outcomes.

## HUMAN AND ENVIRONMENTAL IMPACTS TO LOUISIANA

Louisiana’s human and physical geography makes it one of the earliest and hardest hit areas of the U.S. when it comes to experiencing the negative impacts of climate change. The state’s hot and humid climate and location at the mouth of the Mississippi River and the edge of the Gulf of Mexico carry environmental challenges that have direct and indirect impacts on communities. While the widespread risks from climate change are alarming, this troubling fact can be a unifying force across an often fractured political and social spectrum, serving to point us all toward common action. Despite the commonality of risk experienced across Louisiana, it is also true that some communities are feeling more pain, greater disruption, and more severe impacts to their health, quality of life, and economic stability than others. This reality is observed by both the IPCC and the National Climate Assessment and manifests in Louisiana along racial, income, ethnic, and age categories.

During the planning process a potential future scenario was evaluated to help the Task Force and public understand the consequences of inaction for the people, economy, and environment in Louisiana. In this “business as usual” scenario, greenhouse gases were not reduced and climate change was not mitigated beyond what is being achieved through current trends. This scenario was judged by evaluators on the Task Force’s Advisory Groups to produce negative or very negative outcomes across every one of the fundamental objectives. Specific negative outcomes expected from the strategy of inaction in the business as usual scenario included regional and more widespread negative consequences in the near term and established negative trends that would persist for the long term.

This section provides an overview of the ways that climate change is today producing impacts to communities and the environment in Louisiana as well as how those impacts are projected to change in the future.

## HEALTH IMPACTS

According to the National Climate Assessment, climate change is already producing negative health effects for Americans that will worsen as climate change progresses. In addition to the intensification of current health challenges, climate change will also bring new challenges to individual and public health. These challenges will arise as more people are exposed to hazardous conditions like heat waves, floods, droughts, vector-, food-, and water-borne diseases, as the quality and safety of water, air, and food deteriorate, and as these many conditions create additional strains on mental health and well-being.<sup>29</sup> Beyond the direct health effects of extreme weather events, human health can also suffer from the disruption of vital public health, healthcare, and related systems in ways that can be harmful to health long after a weather event. The following sections look at national and Louisiana-specific ways that human health suffers because of climate change.

### HEAT

Globally, more than 1/3 of heat-related deaths can be attributed to the extra warming associated with climate change which, in many locations, adds up to dozens to hundreds of deaths each year.<sup>30</sup> In the U.S., more deaths are caused by extreme heat than by any other severe weather event.<sup>31</sup> As the climate continues to change, the dangers of heat exposure will increase as extreme heat becomes more frequent with both higher summer temperatures overall and the onset of high temperatures earlier in the spring and lasting longer into the fall. The effects of warmer temperatures are of particular concern in Louisiana because the state experiences some of the highest average summer temperatures in the nation and because high humidity further compounds the impact of high heat on the body by impairing its ability to cool itself through evaporation of sweat.

Heat is so dangerous to human health because core body temperature must be maintained within a very narrow range. Normally, when the body's internal temperature increases above the range, mechanisms such as sweating and increased blood flow work to emit excess body heat. In situations of extreme internal heat, the body's coping mechanisms are compromised, resulting in a cascade of heat-related illnesses (HRI) ranging from mild effects like dehydration to severe health effects such as heat exhaustion or heat stroke which can result in multi-organ failure and possibly death.<sup>32</sup> Even when heat is not deadly, exposure to excessive heat can exacerbate chronic conditions, increase injuries, and diminish productivity and labor capacity.

The extreme heat and humidity that increasingly characterize Louisiana's summers pose important health risks to everyone, but the most vulnerable are the young, elderly, people with chronic health conditions, and outdoor workers.<sup>33</sup> Infants and young children (ages 0-9) and the elderly (> 80 years) have lower rates of heat related illness than other age groups but more severe health outcomes. Young children's immature thermoregulation systems cause rapid increases in core body temperature compared to adults and they are also vulnerable to the actions of others because they rely on parents or caretakers to protect them from overexposure. Infant and child vulnerability to high heat can have severe consequences: hyperthermia is the leading cause of non-crash-related vehicle deaths for children younger than 14 years of age, with an average of 38 deaths per year in the U.S.<sup>34</sup> Individuals over eighty are more susceptible to heat due to a number of factors including less efficient sweat cooling mechanisms and reduced capacity for pumping blood than younger adults, decreases in overall fitness, and exacerbation of pre-existing health conditions. Co-morbidities such as heart conditions can also impair the heart's ability to properly circulate blood and cool the body, and high blood pressure and diabetes impair the blood vessels' ability to dilate properly, also restricting blood flow.

Extreme heat is already on the rise in Louisiana, particularly in urban areas that experience higher air temperatures associated with the urban heat island effect. A report by Climate Central, a research and journalism organization, published in 2020 found that cities in Louisiana are experiencing at least two more weeks of extremely hot days compared to 50 years ago. Shreveport felt 31 more days above 95 °F, Baton Rouge, Lake Charles, and Monroe each saw 22 more days above 95 °F, Lafayette had 20 additional days, New Orleans 15, and Alexandria had 13 additional days over 95 °F compared to 1970.<sup>35</sup> In July of 2021, Climate Central published another study of the urban heat island effect in U.S. cities and ranked New Orleans the worst of 159 cities nationwide. This study found that temperatures in New Orleans could be as much as 9 ° warmer inside the city than in areas outside of developed areas. Lafayette, Louisiana ranked 19<sup>th</sup>.<sup>36</sup> Looking to the future, a study by the Union of Concerned Scientists estimated that Louisianans will experience three full months where the heat index is over 105 by the end of the century.<sup>37</sup>

Within a city, factors like the amount of green space and tree canopy, the amount of heat absorbing and radiating surfaces like asphalt, highways, and parking lots, as well as architectural choices and surface reflectivity can create a “heat gap” between neighborhoods that can be disproportionately experienced along racial and economic lines. National studies have documented a lack of tree canopy and a greater instance of impervious surfaces in low-income communities relative to higher income communities<sup>38</sup> and parts of cities that are poorer and with higher concentrations of residents of color can be 5 to 20 ° hotter in the summer than wealthier and whiter areas of the same city.<sup>39</sup> According to a 2021 study in the journal *Nature Communications*, the average person of color lives in a census tract with a higher surface urban heat island intensity than non-Hispanic whites in all but 6 of the 175 largest urbanized areas in the continental U.S. A similar pattern was found for people living in households below the poverty line relative to households more than two times the poverty line.<sup>40</sup>

In 2016, a study by the University of Richmond found that this heat gap was a reflection of redlining practices perpetrated throughout the 1900s. Beginning in the 1930s, the federal Home Owners’ Loan Corporation created racially-biased “residential security” maps in hundreds of cities that helped fuel the practice of denying access to federally backed mortgages and credit to racial minorities. Within New Orleans, the only Louisiana city included in the University of Richmond study, a 4.6-degree heat gap was observed between the “most desirable” neighborhoods in New Orleans and those labeled “hazardous” by HOLC maps.<sup>41</sup>

Vulnerability to heat is also influenced by a number of socio-economic and community factors such as poor housing, social isolation, and limited commercial infrastructure that can amplify health threats.<sup>42</sup> About 20% of Louisianans live in poverty with sharp racial disparities: 34% poverty among African-Americans compared with 12% among Whites. Housing factors, particularly older buildings and mobile homes, can increase susceptibility to HRI as they may not be able to effectively cool their homes, and in some cases may have no air conditioning or are unable to afford the cost of using their air conditioner. Access to air-conditioned environments is particularly important during periods of high heat and humidity when there is minimal variation between the daily maximum and minimum temperature.

High heat also carries environmental and economic implications for Louisiana. Seasonal changes to temperature caused by climate change are disrupting the natural system and the ability for people to make a living from those systems. Heat is a well-recognized occupational hazard and workers may be one of the highest at-risk populations for HRI and are often among the first to be exposed to the impacts of climate change.<sup>43</sup> Unlike other vulnerable groups who may be at a greater liberty to respond, workers’ exposure and responses are largely controlled by their job requirements and employer. About one-quarter of Louisiana’s workforce is at risk of HRI due to outdoor and physically demanding work: agriculture, construction, oil and gas, transportation, and utilities, and some manufacturing. Indoor workers who work in non-climate-controlled environments such as warehouses and factories are also at risk. Accordingly, the highest rates of hospitalization or emergency room visits for heat-related illness in Louisiana are among working-age men. Studies have also documented that Louisiana has a higher rate of occupational heat-related illness than other southeastern states, and one of the highest rates of

all U.S. states.<sup>44</sup> By the end of the century, it is estimated that health concerns from increased heat could result in a reduction of labor hours by more than five hundred million in the Southeast for high-risk industries, such as agriculture, forestry, fishing, mining, manufacturing, transportation, and utilities.<sup>45</sup> All of these factors contribute to worker vulnerability and reduced work capacity and productivity resulting in negative economic impacts for LA workers and employers.

Hurricanes and other weather events also have multiple heat-health impacts as response and recovery work involve long and strenuous work during very hot temperatures and frequently without access to air conditioning. Additionally, many non-acclimated volunteers and residents engage in physically demanding work. There were five heat-related fatalities due to Hurricane Laura including two men who died while removing storm debris (LDH 2020). After Hurricane Ida in 2021, LDH attributed 9 deaths specifically to excessive heat during the extended power outage and another six deaths from carbon monoxide poisoning (from improper generator usage or operation).<sup>46</sup>

## AIR QUALITY

According to the National Climate Assessment “more than 100 million people in the U.S. live in communities where air pollution exceeds health-based air quality standards” and unless specific action to improve air quality is taken, “climate change will worsen existing air pollution levels.”<sup>47</sup> “This worsened air pollution,” the National Climate Assessment reports, “would increase the incidence of adverse respiratory and cardiovascular health effects, including premature death.”<sup>48</sup> As the climate continues to change, heat-related health risks will intensify, and progress toward clean air will become even more difficult.<sup>49</sup>

Many of the factors that contribute to air quality are connected to weather; for example, higher temperatures promote the increased formation of ozone and stagnant weather conditions can produce higher concentrations of particulate matter, both carrying their own deleterious health effects like triggering asthma attacks and increased risk of premature death from heart or lung disease.<sup>50</sup> Particulate matter concentrations are affected by wildfire emissions and air stagnation episodes, among other factors. By increasing these different factors, climate change is projected to lead to increased concentrations of ozone and particulate matter in some regions. Increases in global temperatures could cause associated increases in premature deaths related to worsened ozone and particle pollution.<sup>51</sup>

Estimates that assume no change in regulatory controls or population characteristics have ranged from 1,000 to 4,300 additional premature deaths nationally per year by 2050 from combined ozone and particle health effects. Less confidence exists about the responses of airborne particles to climate change than the response of ozone. Health-related costs of the current effects of ozone air pollution exceeding national standards have been estimated at \$6.5 billion (in 2008 U.S. dollars) nationwide, based on a U.S. assessment of health impacts from ozone levels during 2000–2002,<sup>52</sup> and a more recent study estimated that ozone pollution could account for approximately \$580 billion in annual global health and economic costs by 2050.<sup>53</sup>

Even with population and economic growth, ozone air quality in the U.S. has improved dramatically due to pollution control efforts for specific emissions over the past few decades dropping by 22% between 1990 and 2016. Louisiana has also shared in this positive trend but not to the degree of the rest of the country.<sup>54</sup> In a 2021 analysis of EPA data, the Louisiana Legislative Auditor found a 20.9% increase in good air quality days in Louisiana and a 75% decrease in unhealthy air quality days between 2008 and 2018. Among the state’s top four air pollutants, Nitrogen Oxides declined by 25.2%, Sulfur Dioxide was down 43%, Carbon Monoxide was reduced by 27.8%, and Volatile Organic Compounds releases showed a 16.3% drop. The National Climate Assessment warns, however, that, “the prevailing evidence strongly suggests” that climate change will partially counteract the progress made in reducing ozone precursors.<sup>55</sup>



The National Climate Assessment clearly documents that impacts to air quality will harm certain groups more than others: the elderly, children, and those with chronic illnesses are particularly vulnerable to ozone and particulate matter-related effects.<sup>56</sup> Impacts from climate change on outdoor air quality will affect urban areas where larger proportions of minority, low-income, homes, and immigrant populations reside. Air pollution affects people of color in particular because of disproportionate exposure in urban areas and higher prevalence of underlying diseases such as asthma and COPD that makes them more sensitive.<sup>57</sup>

A recent study by researchers at the EPA-funded Center for Air, Climate, and Energy Solutions found that people of color are largely exposed to more particulate air pollution on average across income level, within individual states, and within individual urban and rural areas.<sup>58</sup> These findings were reinforced by a November 2021 EPA report on Climate Change and Social Vulnerability in the United States. In the report, the EPA found that among the socially vulnerability factors of income, race, education, and age, people of color are most likely to currently live in areas that are projected to have the highest levels of climate change impacts with 2 degrees Celsius of warming or 50 cm of global sea level rise. Citing its most recent Particulate Matter Integrated Science Assessment, EPA acknowledged that "race and ethnicity are important factors in determining PM2.5 related risk, and that Black individuals, in particular, are at increased risk for health effects, in part due to disparities in exposure."<sup>59</sup> For example, Black individuals are 41-60% more likely than others to currently live in areas with the highest projected increases in premature mortality from climate-driven changes in PM2.5.<sup>60</sup> Black individuals are also 34% more likely to live in areas with the highest projected increases in childhood asthma diagnoses due to climate-driven changes in particulate air pollution.<sup>61</sup>

The final "key message" in the National Climate Assessment related to air quality, human health, and climate change points to the potential for co-benefits across these three categories as a result of mitigating greenhouse gas emissions. "Many emission sources of greenhouse gases also emit air pollutants that harm human health. Controlling these common emission sources would both mitigate climate change and have immediate benefits for air quality and human health. Because methane is both a greenhouse gas and an ozone precursor, reductions of methane emissions have the potential to simultaneously mitigate climate change and improve air quality."<sup>62</sup>

## WILDFIRES

While not a natural disaster that gets a tremendous amount of attention in the state of Louisiana, climate change is projected to increase the risk of wildfire. This increased likelihood of wildfires carries associated risks from air emissions with harmful health impacts. According to the Department of Agriculture and Forestry, there are 18.9 million acres of land under fire protection by LDAF and the state's wildfire occurrence is "high" by regional and national standards."<sup>63</sup> Between 2007 and 2016, an average of 1,413 wildfires burned almost 15,000 acres of forestland each year in the state.<sup>64</sup>

Changes to the climate that include long periods of record high temperatures are also associated with droughts that contribute to dry conditions, lengthening the wildfire season in some areas.<sup>65</sup> Wildfire smoke contains particulate matter, carbon monoxide, nitrogen oxides, and various volatile organic compounds (which are ozone precursors) and can significantly reduce air quality, both locally and in areas downwind of fires with severe impacts for human health.

Smoke exposure increases respiratory and cardiovascular hospitalizations; emergency department visits; medication dispensations for asthma, bronchitis, chest pain, chronic obstructive pulmonary disease (commonly known by its acronym, COPD), and respiratory infections; and medical visits for lung illnesses. It has also been associated with thousands of deaths annually, based on an assessment of the global health risks from landscape fire smoke.

## DISEASE

Climate change is affecting the transmission of many different diseases by directly altering the pathogens' biology and the organisms that carry the pathogens, as well as by indirect changes to transmission because of changes to ecosystems or human behavior.<sup>66</sup> Mosquitos, ticks, and other disease-carrying animals, or "vectors," can be expected to have altered ranges, seasonal distributions, or abundance as climate change continues to impact weather patterns, ecosystems, and human land use and demographics. These changes can also lead to new interactions between species which can heighten the likelihood of disease spread from animals to humans.<sup>67</sup> For example, the southeastern region of the U.S. already has the most favorable conditions for the *Aedes aegypti* mosquito which can carry diseases such as dengue fever and the Zika virus. With warming temperatures associated with climate change, the potential for expanded mosquito habitat and disease will increase risk.<sup>68</sup> Climate change can also affect life cycle traits of disease-carrying mosquitos like biting rate, lifespan, population size, distribution, and egg laying.<sup>69</sup>

Prime conditions for bacterial and fungal diseases can also be expected to expand under a changing climate. As these pathogens evolve to be more heat tolerant than other related species, they may be more capable of moving between habitat, to birds, and then into humans.<sup>70</sup> Respiratory pathogens such as the influenza virus persist year-round in tropical locations while being more seasonal in temperate environments. As tropical conditions expand with climate change, there is the potential for the evolution of these types of viruses.<sup>71</sup> For individuals, respiratory infections from viruses can also be heightened by air pollution which is a risk for urbanizing areas and can carry disproportionate impacts for low-income and communities of color.<sup>72</sup>

As water temperatures increase, it can change the seasonality and range of pathogens and harmful algae. As rainfall events become more frequent and intense, runoff can create negative impacts for recreational bodies of water and drinking water sources and cause additional problems for inadequate water and sewer infrastructure that can in turn lead to bacterial and viral contamination of water that can be harmful to public health.<sup>73</sup>

## MENTAL HEALTH

A number of mental health impacts can be attributed to the stress and distresses caused by climate change-related circumstances. These mental health effects interact with other health, social, and environmental stressors in ways that can compound and negatively affect an individual's mental well-being. As with so many other impacts of climate change, some groups are more likely than others to be at risk to the negative mental health effects including those with preexisting mental illness, first responders, the elderly, pregnant women, the economically disadvantaged, and Indigenous people.<sup>74</sup> Experiencing a flood, even flood risk, has been documented to produce higher levels of depression and anxiety that can persist for years after the event.<sup>75</sup> Disasters and droughts are also linked to increased use of alcohol and tobacco, higher temperatures can lead to an increase in aggressive behaviors.

## IMPACTS TO INDIGENOUS PEOPLES

In addition to the ways that everyone is affected by climate change, Indigenous peoples are also uniquely and disproportionately impacted particularly because of impacts to ecosystems, species, and lands that are culturally, economically, and historically significant; and by the compounding health issues related to the loss of traditional foods, practices, or the mental stress of adaptation or relocation.<sup>76</sup> The National Climate Assessment contains an entire chapter dedicated to the challenges posed by an ever-changing climate on Indigenous peoples nationwide and the contributions Indigenous peoples have made to an understanding of local and national climate change risks in earlier assessments. The efforts by Indigenous peoples to adapt to climate-change-

induced changes can also be curtailed by limitations to self-determination that arise differently for federally or state-recognized tribes and non-federally and non-state recognized tribes.<sup>77</sup>

In matters of health, Indigenous peoples can be even more vulnerable to the physical challenges brought on by climate change because of “social determinants of health” related to historic and ongoing social, political, and economic factors with tangible impacts on human health. While health outcomes vary regionally, Indigenous peoples are disproportionately more likely to suffer from asthma, cardiovascular disease, Alzheimer’s disease or dementia, diabetes, and obesity, disparities that can be exacerbated by climate-induced changes to pollen, air quality, and exposure to extreme weather events.<sup>78</sup>

Indigenous peoples are 48% more likely than others to currently live in areas where the highest percentage of land is projected to be inundated due to sea level rise.<sup>79</sup> They are also 37% more likely to live in areas with the highest projected labor hour losses in weather exposed industries due to climate-driven increases in high-temperature days.<sup>80</sup> In coastal Louisiana, hurricanes, saltwater intrusion, erosion, subsidence, sea level rise, and manmade challenges like the creation of canals fracturing the wetlands and the *Deepwater Horizon* oil spill have all undermined the ability of Indigenous people to carry on traditional activities and threaten their survival. In 2020, four non-federally recognized tribes from coastal Louisiana joined with another tribe from Alaska in a protest to the United Nations arguing that sea level rise and coastal erosion had overcome burial sites and that continued land loss threatens food sources that federal and state government had done too little to address it.<sup>81</sup> Indigenous peoples in coastal Louisiana are also working toward or actively pursuing relocating as an adaptation strategy to accelerating environmental risk.<sup>82</sup> In 2021, Hurricane Ida was particularly devastating for many of Louisiana’s Indigenous peoples living in the southeastern portion of the state. The category four storm destroyed 68 of 80 homes in the Pointe-Au-Chien community, and all of the homes on Isle de Jean Charles.<sup>83</sup> Almost every member of the Grand Caillou/Dulac Band of the Biloxi-Chitimacha-Choctaw suffered the complete or near complete loss of their homes,<sup>84</sup> and as many as 15,000 members of the United Houma Nation, the largest tribe in Louisiana, also lost their homes.<sup>85</sup> The lack of federal recognition has hampered the ability of many of Louisiana’s Indigenous peoples from qualifying for direct disaster assistance. The United Houma Nation, for example, have been pressing for federal recognition for forty years, but the process of obtaining recognition itself is being challenged by climate change as the required documentation grows more difficult as communities continue to be displaced by land loss and natural disasters.<sup>86</sup>

## ENVIRONMENTAL IMPACTS

Louisiana’s coastal plain has been slowly sinking for nearly 90 years with nearly 2,000 square miles of land lost since the 1930s. As climate change-driven global warming increases sea levels, coastal Louisiana’s current challenges to staying above water will also increase. According to the National Climate Assessment, relative to the year 2000, global mean sea level rise is very likely to increase by 1 to 4.3 feet by 2100 with the western Gulf of Mexico likely to experience relative sea level rise that is greater than the global average.<sup>87</sup> As sea levels rise, some coastal ecosystems will be submerged and converted to open water, saltwater penetration will move further inland displacing inland ecosystems, and hurricane impacts will stretch further on shore causing additional ecological changes.<sup>88</sup>

Already, Louisiana’s coastal land loss crisis has exposed nearly 2 million people to the dangers of storm surge-based flooding with some communities threatened to be completely submerged just three or four decades into the future. Projections in the 2017 Coastal Master Plan indicate that without significant investment in coastal restoration and protection projects southern Louisiana could lose between 2,254 and 4,123 square miles of additional land over the next fifty years. Even with an investment of \$50 billion in the implementation of every

project in the master plan, 1,454-2,965 square miles of coastline are still likely to be submerged due to continued subsidence and sea level rise.<sup>89</sup>

This loss of land translates directly into greater exposure to hurricane risk, an exposure that will also increase as hurricane characteristics change in response to global warming. This level of risk poses an existential threat to individuals, families, neighborhoods, and entire towns and economies alongside vibrant cultural traditions, hunting and fishing grounds, and long held, sacred lands. By 2014, the National Oceanic and Atmospheric Administration (NOAA) had already removed 40 place names from nautical maps of Louisiana including bays, bayous, and small islands because they had become indistinguishable from open water.<sup>90</sup> The National Climate Assessment estimates that one meter of sea level rise will erase over 13,000 recorded historic and prehistoric archaeological sites and more than 1,000 locations that are currently eligible for inclusion on the National Register of Historic Places across the southeast.<sup>91</sup>

Climate change is also having an impact on coastal residents' ability to get out of harm's way when hurricanes approach. The rapid intensification of hurricanes, as seen most recently in Hurricanes Harvey, Michael, Laura, and Delta, has been partially attributed to climate change.<sup>92</sup> Hurricane Delta, for example went from a Tropical Depression to a Category 4 storm in less than two days.<sup>93</sup> Fast moving changes to a hurricane's strength, especially just before landfall can pose challenges for forecasters and can make effective evacuations, which are already challenging for some senior citizens, people with disabilities, workers who cannot take time off, and those physically or economically unable to leave their homes, impossible. Indirect challenges to populations from storm surge and coastal flooding events can also be disastrous as a result of impacts to transportation networks and healthcare facilities.

Other implications of environmental change are also affecting fishing and seafood harvesting. According to the National Climate Assessment, fishing and oyster harvesting activities along the coast will face "substantial challenges." Challenges, such as increased ocean temperature, acidification, and sea level rise translate to a decline in oyster harvests by between 20% and 46%.<sup>94</sup>

All across Louisiana, people and ecosystems must adjust to the extremes of too much or too little water. Flooding—be it from storm surge, persistent high tides, increasingly heavy downpours, or rivers swollen from up-basin precipitation patterns—is affecting populations throughout the state. Even floods that do not force people from their homes disrupt lives, add financial and emotional stress to individuals and families, and strain resources that could otherwise be invested elsewhere. Shortly after the 2016 floods in Louisiana, which forced the evacuation of 30,000 people and flooded at least 60,000 homes across twelve parishes, NOAA and collaborators at World Weather Attribution (WWA) used the Louisiana event to conduct a rapid assessment of the role that climate change played on the intensity and probability of similar storm events in the central U.S. Gulf Coast.<sup>95</sup> Researchers found that heat-trapping GHGs increased the likelihood of this type of event by at least 40% and the intensity by at least 10% as compared to similar events that would have occurred around 1900.<sup>96</sup>

Moreover, temperature and rainfall changes create challenges for crops and livestock as well. While some crops may become newly viable alternatives under changing conditions, the overall impact will be negative. Decreasing productivity in cotton, corn, soybeans, and rice is expected with higher temperatures as are increased stresses on livestock.<sup>97</sup> Changes in precipitation patterns can also be expected to impact forestry.

## **ECONOMIC IMPACTS TO LOUISIANA**

The impacts of climate change are exceedingly costly. These costs strain individual households, cities, states, and countries and can even threaten the health of the entire financial system.<sup>98</sup> According to NOAA's National

Centers for Environmental Information, in 2020 “[t]here were 22 separate billion-dollar weather or climate related disaster events, shattering the previous annual record of 16 events, which occurred in 2017 and 2011.”<sup>99</sup> It was also the sixth year in a row with 10 or more billion-dollar natural disasters.<sup>100</sup> The costliest event in 2020 occurred in Louisiana when Hurricane Laura caused \$19 billion in damage.<sup>101</sup> According to the National Climate Assessment, without sustained and substantial mitigation and adaptation efforts, “climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century.” In combination with other losses caused from impacts to human health and the environment, annual economic losses have the potential to reach hundreds of billions of dollars by the end of the century, which is more than the gross domestic product of many states.<sup>102</sup>

Estimates of future risk to Louisiana include two prominent examples from the coast. Estimates of economic risk to Louisiana from the 2017 Coastal Master Plan suggest that coast-wide expected annual damages from storms with a 1% chance of occurring in a year at the end of 50 years could reach \$12.1 billion dollars under a medium sea level rise scenario.<sup>103</sup> And an economic study by LSU estimated that a storm with a similar track to Katrina could cause \$138 billion in damages to the New Orleans region in a future without master plan investments even with the existing \$14.5 billion Hurricane Storm Damage Risk Reduction System.<sup>104</sup>

Climate change also increases the frequency and likelihood of chronic conditions that can also pose high economic costs for states like Louisiana. Rainfall events that do not rise to the level of a federal disaster, nuisance flooding, and saltwater intrusion all bring financial costs to homeowners, municipalities, and weaken infrastructure that is costly to repair, replace, or redesign. Damages to the economy also occur as transportation networks and commodities flows that are significant for the state and national economy are interrupted by major and minor climate-related events. There is also considerable unknown risk in the built environment because existing federal flood insurance rate maps do not account for the future flood risk anticipated as a result of climate change or new development that may also reduce a floodplain’s ability to manage stormwater. The nonprofit First Street Foundation created a tool to estimate and communicate a property’s flood risk that includes risk from riverine, rainfall, tidal, and storm surge sources as well as how that risk can change over time due to environmental factors affected by climate change. According to their calculations, 14.6 million properties across the country are at substantial risk including 5.9 million who are currently not identified as being within a FEMA special flood hazard area. Louisiana, already one of the most at-risk states, will see an increase in flood risk of 69.7% by 2050.<sup>105</sup>

Additionally, as global demand gradually shifts away from carbon-based fuels, some refineries may close because of reduced demand, or because the cost of continued operations is too high to remain profitable. Louisiana is currently home to 20% of U.S. refining capacity,<sup>106</sup> so making large changes in this sector is particularly concerning for the state in a variety of ways. Large facilities are major, if not the largest employers in the communities in which they reside and often among the largest tax payers. If and when they decide to close, local communities are at risk from the direct losses of jobs for energy workers and their families, and indirect effects from the loss of wages and taxes flowing into the local economy. A final community risk linked to the economics of the energy transition is related to underperforming or unsold facilities that may experience damages from hurricanes or other extreme weather events. Natural disasters can further reduce the economic viability of a facility and potentially expose their communities to hazards after a disaster.

Reporting for Reuters linked refinery sales in the U.S. to a pandemic-related reduction in demand for gasoline and jet fuel alongside an accelerating shift among top auto makers to electric vehicles, similar concerns as well as the need to lower the carbon intensity of its products globe in the next few years.<sup>107</sup> These assertions were supported by comments from Phillips 66 CEO Gregory Garland who indicated that he believed, “the U.S. refining business in the future is going to be smaller, not bigger.”<sup>108</sup> In the past two years, Louisiana has experienced two examples of this trend. In one case a refinery in St. James Parish closed as “part of the company’s global

strategy to invest in a core set of uniquely integrated manufacturing sites that are strategically positioned for the transition to a low-carbon future.”<sup>109</sup> And in the second, a decision was made to convert a refinery in Plaquemines Parish to an oil terminal after a brief attempt to sell the facility and experiencing damages from Hurricane Ida.<sup>110</sup>

Other types of future economic losses are possible as markets and investors make decisions about community capacity to address climate risk and about the ability of existing industrial facilities to minimize their carbon footprint. Today, investors, large financial institutions, and bond ratings agencies are beginning to consider risks posed by climate change in their decisions. These determinations could have real impacts on a community's ability to finance infrastructure or a business's cost of raising capital.

## CONCLUSION OF IMPACTS

Whether drawing from the National Climate Assessment, the IPCC, or other research around climate impacts, it is clear why the Task Force's Advisory Groups evaluated the “business as usual” scenario as unacceptable for Louisiana. According to their analysis, the risks of inaction were too high and maintaining the status quo was synonymous with falling behind. In their estimation, inaction would lead to worsening conditions for infrastructure, public health, cultural preservation, and the environment, and marginalized populations would continue to experience a disproportionate share of the damages. Additionally, the necessity of adapting to our changing environment would become more difficult with communities and ecosystems becoming less resilient. On the economic front, market pressures to reduce carbon in the economy would continue to put pressure on the energy sector, capital markets, banking, and insurance, which would also be expected to produce long term negative economic implications for the state.

Without special attention from policy makers, social and economic factors – such as community access to safe housing and transportation, experiences of racism, discrimination, and violence, or access to resources like educational and workforce opportunities – will invariably exacerbate climatic conditions and impacts.<sup>111</sup> Today's existing vulnerabilities and inequities need to remain in focus as the state copes with the consequences of a changing climate and implements this Plan to avert the worst impacts of climate change and grow an inclusive, low-carbon economy.

Not only were negative or very negative outcomes predicted by the Task Force's advisory groups along social, economic, and environmental objectives from a strategy of inaction, but these consequences were also expected to be accompanied by steadily rising GHG emissions. Modeling results from the business-as-usual scenario in the EPS tool indicate that Louisiana's GHG emissions would grow through 2050 and beyond with the 200 million metric tons of carbon dioxide equivalent emissions produced in 2020 growing to 261.9 million metric tons in 2050. This path of inaction can be predicted to perpetuate and worsen Louisiana's human, ecological, and economic vulnerabilities to climate change while increasing GHG emissions that will drive even more disasters. This downward spiral of impacts would damage the state while simultaneously decreasing the State's capacity to cope and adapt.

# Realizing the Benefits of this Climate Action Plan

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The dangers of inaction in the face of climate change in Louisiana are staggering. They threaten tremendous harm to our people, natural environment, and economy. The silver lining is that the state is joining a growing chorus of countries, subnational governments, and private corporations that are endeavoring to do their part to lower the GHG emissions that are driving these catastrophic changes to the earth's atmosphere. While dangerous consequences from climate change are already manifesting here and around the world, these risks can be mitigated and adaptation efforts can be more successful if the global community is successful in keeping global warming below 1.5°, or even 2°C, by the end of this century.<sup>112</sup> Every actor at every level has a role to play in achieving this global goal, including Louisiana.

To achieve the level of GHG mitigation needed to avert the worst impacts of climate change, an unprecedented investment of time, resources, and labor will be required across every sector of the economy. The International Energy Agency estimated that annual investments in clean energy alone would need to reach \$4 trillion by 2030 to meet next zero emissions targets.<sup>113</sup> These investments to mitigate the effects of climate change will help avoid some of the negative impacts of climate change detailed in the previous section of this report and also create an opportunity to reshape our state: to preserve and care for our abundant natural resources, to create thousands of good-paying jobs in an inclusive clean energy economy, to share more equitably the opportunities to create wealth while adapting to a low carbon economy, and to lead by example for other states and communities.

This section will identify a few key areas of opportunity for Louisiana as it begins to take action to reduce the GHG emissions fueling global climate change.

## REDUCING NET GHG EMISSIONS

Governor Edwards' Executive Order set out specific, ambitious goals for GHG emissions reduction for Louisiana. As seen in the figure below, net zero by 2050 is attainable through this portfolio of strategies and actions. Whether Louisiana achieves net zero by 2050, on the other hand, depends on full-scale and timely implementation, as well as support from the federal government. While the short-term goal for 2025 may have required past action to be achievable, the portfolio of strategies and actions in this plan will set up Louisiana to achieve net zero GHG emissions by 2050. Similarly, while reaching the interim 2030 goal of 40-50% reduction will be difficult, aggressive implementation of the portfolio with maximum effort can result in achievement of at least a fair share of the 2030 goal. In the fall and winter of 2021, draft versions of this portfolio were modeled using the Louisiana EPS Tool (Figure 8). While many policy-specific actions were either not able to be modeled or were modeled imperfectly in this tool, this tool provided insights into gaps in the portfolio and the timing of when high impact actions need to be pursued over the next 30 years.

While the EPS Tool, like any policy model, is inherently limited and cannot dictate how to implement these policies in a local context, it can and did help test approaches to emissions reduction. Through these modeling insights and other inputs mentioned in the Planning Process, the portfolio was revised and remodeled in an iterative process of policymaking. This finalized portfolio of strategies and actions embodies the lessons learned from two rounds of analysis in the EPS Tool and two comment periods.

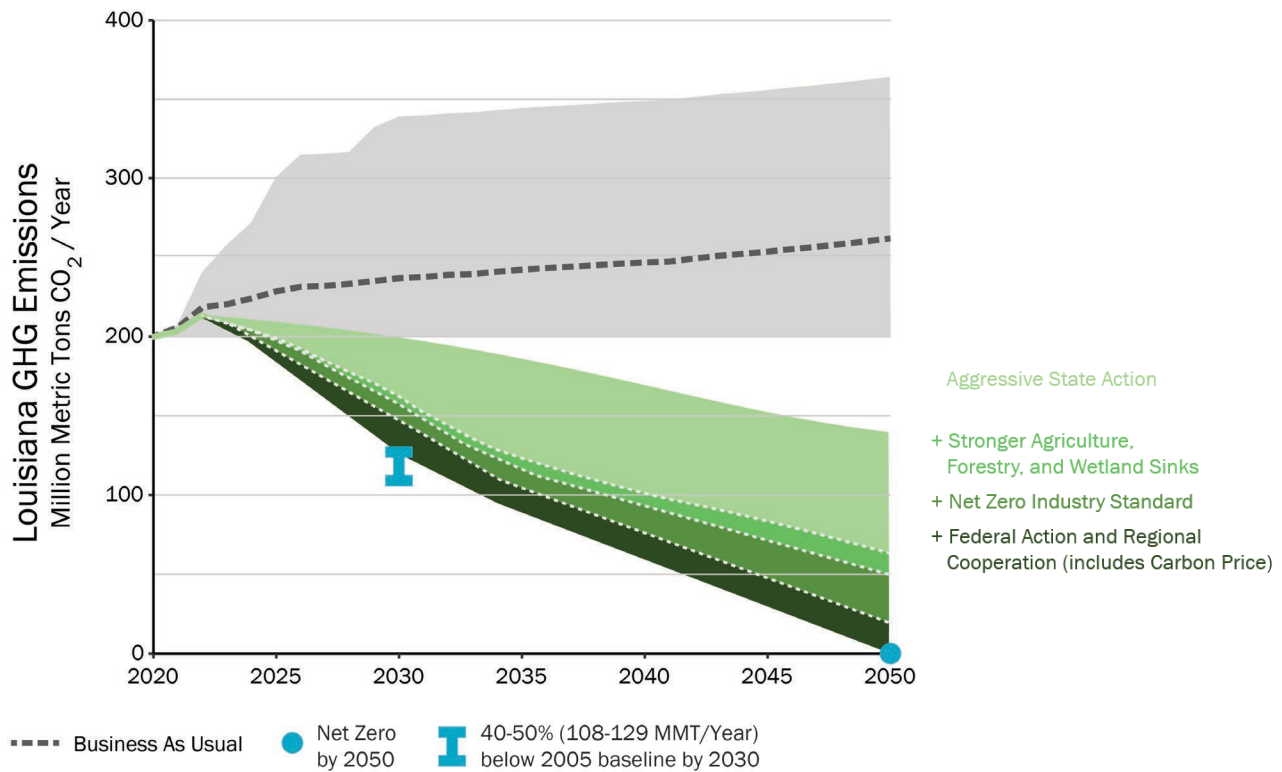


FIGURE 8. GHG EMISSIONS FOR LOUISIANA, 2020-2050. THE MODELLED GHG EMISSIONS REDUCTIONS (GREEN) ARE BASED ON THE STRATEGIES AND ACTIONS WITHIN THIS PLAN. INTERIM (2030) AND NET ZERO (2050) GOALS ARE INDICATED. THE BAU SCENARIO (GREY) IS ALSO PROVIDED FOR COMPARISON.

While no modeling can predict the future, particularly as far out as 2050, there are several specific uncertainties worth noting. First, the EPS tool treats Louisiana like an island for modeling purposes. In reality, there will be federal action on regulatory standards and other climate action, global changes in supply and demand of GHG-intensive products, regional changes in electricity production and transmission partnerships, and more. There are many ways in which these shifts alone could result in a much more aggressive trajectory for Louisiana's emissions than what is possible to be modeled in the Louisiana EPS.

Second, the EPS Tool does not provide the needed granularity to determine the capacity of natural lands and wetlands to serve as carbon sinks, as it is primarily an energy demand model. Louisiana's abundant natural lands and wetlands are important not only for carbon sequestration, but also for maintaining cultural heritage, coastal and agricultural economies, and reducing flood risk. These wetlands and natural lands have a strong potential to sequester more carbon than can be modeled in the EPS Tool.

Finally, implementation of the EPS policies and actions of this plan can provide variable results for Louisiana and determine the state's ability to attain net zero by 2050. Louisiana must act aggressively to reach the bottom portion of the uncertainty shown in Figure 8 above and must quickly accelerate actions that have the largest potential to reduce emissions and can be implemented as soon as possible. If coordination and cooperation are high, emissions could be reduced faster and more effectively. But if timelines are extended, or standards are weakened, or enforcement is lacking, it is more likely that Louisiana will remain in the higher uncertainty bound, and not reach net zero by 2050.

The need for strong implementation is most clearly demonstrated in the EPS Tool through three main challenge areas to achieve net zero by 2050: renewable electricity generation, industrial electrification, and clean hydrogen



with industrial fuel switching. Because two thirds of the state's emissions come from the industrial sector, abating these emissions through electrification is one of the strongest and most necessary actions for Louisiana. However, industrial facilities use enormous amounts of energy, and switching to electricity will increase the demand for electricity accordingly. If that electricity provided to newly electrified facilities is produced using fossil fuels, then the overall emissions are unchanged. Similarly, if industrial facilities can move their high-heat processes to hydrogen fuel, that hydrogen should be produced with no or minimal carbon emissions for the best chance at achieving net zero. If clean hydrogen is produced with electrolysis, the source of the electricity powering the production must be considered. All three of these challenge areas must be addressed in coordination with each other for maximum benefit, utilizing multiple policy mechanisms to accelerate implementation. If fully implemented, actions and strategies in this plan will set up the environment where Louisiana can pursue and coordinate implementation in all three areas, with potential to utilize federal policy pushes as well, such as the US Department of Energy's Hydrogen Earthshot, aiming to achieve \$1 per kilogram clean hydrogen in one decade.<sup>114</sup>

As technological advances are made and research gaps are closed with actionable science, Louisiana will be able to adaptively manage this plan to further pursue actions that are working to reduce emissions. The uncertainty found in the modeling should not be a deterrent, but rather a call to action, to cooperatively and aggressively implement the actions and strategies in this plan, and adaptively manage the plan for future reductions in emissions.

## IMPROVING HEALTH AND QUALITY OF LIFE FOR RESIDENTS AND COMMUNITIES

The public health impacts associated with GHG emissions are tremendously costly for Louisiana in terms of lives and dollars, but addressing emissions through policies and programs to reduce the risks brought on by climate change can have short and long-term benefits for human health.<sup>115</sup> Similarly, the impacts of climate change can be detrimental to other factors that contribute to a high quality of life for Louisiana's residents, but mitigation activities found in this plan can reduce those detrimental outcomes while producing new opportunities to improve people's lives. These issues were captured by the Task Force in three fundamental objectives related to maximizing the quality of and access to essential goods, services and infrastructure; improving health and safety; and preserving cultural heritage.

Multiple strategies and actions in Louisiana's Climate Plan contribute to neutral, positive, or very positive outcomes for public health and quality of life. As the modeling results from the Louisiana EPS tool show, the Climate Action Plan can be expected to prevent over 1,800 premature deaths and nearly 55,000 asthma attacks per year. These estimated improvements to public health can be attributed to activities in the plan related to pollution reduction, such as reducing the combustion of fossil fuels in the generation of electricity, at manufacturing facilities, and in transportation. As activities relying on the combustion of fossil fuels decrease, overall air quality improves, but the improvements are most pronounced in communities nearest to where the emissions originate. Addressing methane emissions can produce its own benefits to health, and utilizing CCUS requires the use of systems that are designed to remove virtually all sulfur dioxide, particulate matter, nitrogen dioxide, sulfur trioxide, and many metals from the carbon dioxide stream.<sup>116</sup> These findings are supported by the National Climate Assessment that found that many of the processes that produce GHG emissions also release hundreds of other air pollutants that can cause serious illness and premature death. Because of this relationship, cutting GHG emissions to reduce the impacts of climate change can also mitigate other harmful impacts on human health.<sup>117</sup>

Other strategies in the plan are also tied to indirect changes that can produce benefits to public health and quality of life. For example, monitoring programs for GHG emissions can be used to track other types of pollutants

that may have benefits for neighboring communities; enhancing the safe access to active transportation options like walking and biking promotes exercise which improves health; and both rural and urban users have greater access to goods and services when public transport services improve, with particular benefits being realized for those without a private vehicle or who are unable to drive themselves. Reducing electric utility costs through energy efficiency improvements can have measurable benefits to a family's bottom line as can the successful development of a more inclusive and resilient economy.

## CREATING A MORE EQUITABLE SOCIETY

In Louisiana and around the world, climate change and GHG emissions disproportionately impact low-income, Black, and Indigenous communities. These communities are the least responsible for emissions, but bear the highest costs in health and environmental degradation. In addition to their own inherent value as people of the state of Louisiana and the price they have paid through past inequities, these communities hold tremendous knowledge of the state's lands, waters, wildlife, and environment and are leaders in the implementation of GHG reductions.

Representation and process integration are the foundation for equitable opportunity and outcomes. From the start of the Climate Plan development process, CITF and supporting committee members were chosen with this reality in mind and open discussion of equity considerations were fostered during meetings. In addition, an equity advisory group was formed to specifically consider the potential outcomes of policy proposals for advancing or negating progress toward a more equitable society. The equity advisory group developed a definition of climate equity and criteria were developed to help measure each proposed policy's potential impact on the three equity-centered fundamental objectives aimed at reducing disparities, addressing historic and structural inequities, and increasing participation for Black, low-income, historically marginalized, and Indigenous peoples across Louisiana.

With these objectives as guideposts, the Task Force developed actions and strategies with climate equity at the forefront. Representation and equitable processes must be continued to help inform, design, and implement climate actions that offer tangible benefits to under-resourced communities and lead the vision and work of repairing our environment and building an equitable and sustainable clean energy future. Importantly, this work also produces positive benefits that are enjoyed by everyone, including communities that have been historically marginalized. For example, modernizing public transit and providing greater access to broadband internet can provide particular tangible benefits to underserved communities. Further, utilizing traditional ecological knowledge to conserve and restore the environment is an avenue for engagement to communities that have often not had the opportunity for input with overall benefit to everyone.

Without intentional policy design, however, Louisiana's actions to build a new, low-carbon economy will reinforce and replicate the stratification and divisions present today. Addressing these present and future burdens experienced by people of color, and particularly by Black and indigenous peoples, must recognize the historical systems of discrimination and oppression that directly and indirectly contribute to these social vulnerabilities to environmental hazards and climate change. For example, addressing industrial GHG emissions in Louisiana's industrial corridor along the Mississippi River should recognize the history of enslavement and disenfranchisement of Black people and the prior land use serving as plantations. Effectively policymaking should further seek out opportunities to remedy these disproportionate impacts of environmental and climate hazards on these historically marginalized peoples and communities.

While many ways to reduce GHG emissions can create positive co-benefits to historically marginalized communities, access to these technologies or programs is of critical importance. Vastly expanding distributed solar energy or building the fueling or charging infrastructure for alternative fuel vehicles presents a tremendous opportunity to utilize local, minority-owned businesses and employ disadvantaged workers, but it will be imperative to establish these goals and track them as these pursuits are implemented. Similarly, distributed renewable energy generation provides opportunities for customers to have greater control over their energy supply and can reduce energy costs, and promoting opportunities to establish community solar expands access to the benefits of solar power to those who do not own their own home. Careful design and execution of these actions can ensure that energy efficiency actions alongside investments in urban green spaces and natural lands

increase access to the outdoors and provide relief from the urban heat island effect. This intentionality can also ensure other actions reach the most in-need and historically marginalized residents first.

By deliberately moving considerations of climate equity to the forefront and proactively incorporating representation from all communities moving forward, Louisiana's Climate Plan aims to ensure that the costs of mitigation or adaptation actions do not fall unequally on the already disadvantaged, and that this opportunity to advance climate mitigation and adaptation addresses long-standing inequities while promoting new opportunities for a more inclusive, low-carbon economy in the future.

## STRENGTHENING THE ECONOMY AND WORKFORCE

Much of the rest of the country and the world is moving towards carbon neutrality, which will affect Louisiana's economy. This transition to a greener economy creates the need for rapid new developments in technology and carbon-reduction solutions, but there is clear demand and willingness to make significant investments in low- and zero- carbon energy and industry. Although the global transition to a low carbon economy will be challenging for Louisiana given the large role carbon-intensive industries have played historically for the state, careful action now can position Louisiana to capitalize on these new investment and economic opportunities. The Climate Action Plan recognizes this reality and helps give the state the chance to address the challenges and opportunities of a changing economy head on while growing new businesses and industries to meet the needs of a global low-carbon economy.

The Task Force has held up economic growth and support for Louisiana workers as two fundamental objectives under the effort to reduce Louisiana GHG emissions. In recent decades, Louisiana has found economic benefits from aggressively taking action against the coastal crisis.<sup>118</sup> Just as investment in the state's coastal program has created expertise and experience for Louisiana businesses to export around the world, state investment and leadership in the work of GHG emission mitigation and developing low-carbon energy and technologies could also provide significant economic opportunities to the people of this state. High profile international studies have indicated that creating and mobilizing new technologies in clean energy, batteries, hydrogen electrolysis, carbon capture, and direct air capture will create millions of new jobs globally.<sup>119</sup> And when reviewing policies associated with meeting the United States' commitments under the Paris Agreement in Louisiana within the EPS tool, significant investments in new hydrogen equipment, solar projects, electric vehicle chargers, and other infrastructure are estimated to produce around 111,000 jobs in 2030 and 263,000 jobs in 2050.<sup>120</sup>

One area of considerable job growth and economic opportunity is renewable energy, which the Climate Action Plan is designed to catalyze with actions that promote job training and investment that can lead to overall benefit to the workforce. A dramatic drop in costs for solar energy and onshore wind have helped lead investments in renewable power across the country. Interest in solar development is growing inside the state<sup>121</sup> and Louisiana is working with the Bureau of Ocean Energy Management (BOEM) to complete the necessary steps to hold a lease sale in the Gulf of Mexico for offshore wind power production. According to the National Renewable Energy Laboratory, Louisiana ranks fourth highest state in the nation for offshore wind technical potential,<sup>122</sup> and a single offshore wind project could create 4,470 construction jobs and 150 full time operations jobs.<sup>123</sup> In addition to offshore wind deployment, Louisiana is well positioned to be a manufacturing and servicing hub for offshore wind being proposed and implemented across the U.S. In fact, Louisiana companies were integral to the design, fabrication, and construction of the nation's first commercial offshore wind farm in Block Island, Rhode Island.<sup>124</sup>

The Climate Plan is also designed to build on and expand the significant investments Louisiana has already seen to build on its traditional industrial and manufacturing strengths while providing lower carbon products or processes that can better meet the changing demands of the market. In 2021 alone, major investments have been planned for the state that consist of new facilities or expansions in biofuels, renewable diesel, and hydrogen

and liquefied natural gas with carbon capture.<sup>125</sup> This slate of announcements verifies studies and models showing the economic potential associated with this type of investment for Louisiana. EPS tool analysis indicates that the highest potential for job creation from efforts to meet the United States' Paris Agreement commitments in Louisiana are driven by industrial fuel switching.<sup>126</sup> A study by the Rhodium Group estimates that jobs in Louisiana associated with capital investments in carbon capture could produce between 2,700 and 4,000 total jobs per year on average over the next fifteen years and an additional 1,700 to 2,500 jobs would be created each year to operate and complete retrofits.<sup>127</sup> Not only do these activities present opportunities for Louisiana to create jobs through retrofitting and new facilities construction, but they also help pilot technologies and approaches that can be used on similar facilities around the country and the world with Louisiana experience at the center.

The Louisiana Climate Action Plan also supports activities like the plugging of orphaned wells and addressing methane leakage that can reduce economic losses for companies while preventing the release of powerful greenhouse gases and creating jobs.<sup>128</sup> Procurement changes in Louisiana to preference clean materials proposed in this plan also help create demand for low-carbon products and materials that will help encourage and reward changes to manufacturing processes and create a market for new or emerging products. Procurement changes in the Climate Action Plan also support the production of Louisiana agriculture and forestry products.

Other actions and investments supported by the Climate Action Plan also encourage economic opportunities more broadly. Improvements to public transportation for urban and rural residents, rail connections between major cities, and the expansion of broadband internet access across the state all reduce GHG emissions while connecting workers to opportunities, promoting economic activity and commerce, and bringing greater access to goods and services.

Leaders and new partnerships are already laying the groundwork for an inclusive, low-carbon economy. In December, 2021, The Greater New Orleans Development Foundation received a competitive \$500,000 grant from the U.S. Economic Development Administration's Build Back Better Regional Challenge to develop a green hydrogen energy cluster to decarbonize the south Louisiana industrial corridor. Partnering across government, academic institutions, businesses, nonprofits, and economic development organizations, the H<sub>2</sub>theFuture plan includes specialized worker training, infrastructure investment in green hydrogen, carbon utilization and sequestration, naval engineering, and the creation of a clean energy research center and startup incubator. This proposal also seeks to provide benefits to energy workers, rural communities, and historically marginalized populations while protecting the environment and transforming the economy.<sup>129</sup>

## CONSERVING NATURAL RESOURCES & PROTECTING THE ENVIRONMENT

Reduction of net GHG emissions can provide numerous environmental benefits, including both direct benefits through supporting natural areas that sequester carbon and indirect benefits realized through, for example, improvements in air quality. According to the 2021 Greenhouse Gas Inventory, Louisiana's forested areas "are a considerable carbon 'sink'", with wetlands – assessed for the first time in this inventory – also supporting carbon sequestration. Despite severe losses to wetland areas caused by the 2005 hurricane season, Louisiana's land-based carbon sequestration has increased since 2012, contributing to an annual reduction of 35 million metric tons of carbon dioxide equivalents, which is comparable to the entire power generation sector.<sup>130</sup>

Natural lands and wetlands are much more than a carbon sink. They are part of the state's cultural heritage, particularly for Indigenous communities, and efforts to preserve those lands produce benefits across the Task Force's fundamental objectives. Broad support for the conservation of Louisiana's natural resources and

protecting the environment was expressed across the wide array of stakeholders involved in Louisiana's climate planning efforts.

Strategies and actions addressing land use and development can preserve habitats and open spaces while also support floodplain management, water quality improvements, healthier lifestyles, and higher quality of life. Agricultural best practices can reduce nutrient runoff, improve water quality, and lead to lower incidences of harmful algal blooms. They can yield healthier soils, greater sustainability, and higher productivity for local ecosystems and provide additional benefits to public health and safety. Protecting and restoring coastal ecosystems can further support adaptation efforts by enhancing community resilience to the threats of sea level rise and severe storms by providing natural buffers. Preserving the coast also helps protect many significant economic engines for Louisiana including waterborne commerce, commercial fishing, energy production and distribution, and more. Healthy ecosystems also support fishing and hunting resources that are available to all, but can be particularly important for some Indigenous communities. And when strategic investments in green infrastructure and the urban tree canopy are deployed, the urban heat island effect can be reduced while providing access to green space and lowering the demand for energy.

## ADAPTING TO A CHANGING CLIMATE

Climate adaptation is an immediate need in Louisiana. Impacts from climate change are already being felt across our state with the most dramatic occurring along our coast. According to the 2021 IPCC report, many of these changes are already irreversible for the foreseeable future.<sup>131</sup> Taking immediate steps to reduce greenhouse gas emissions is a crucial step to avoiding even more severe adaptation challenges in the coming decades. When possible, these mitigation steps can also be used to build resilience against current and future challenges. Two fundamental objectives of the Task Force focus on adapting to a changing climate by considering increases to the resilience of the built and the natural environments, as well as communities, to the impacts of climate change.

In many cases, efforts to reduce GHG emissions in this plan and adaptation measures go hand-in-hand. This plan supports enhanced access to distributed solar resources, energy storage, the development of microgrids, and improvements to energy efficiency that can all promote community resilience. Improving energy efficiency reduces energy demand and emissions and can also make way for other gains that improve resilience to extreme weather events. In New Orleans, the state's first net-zero apartment complex features energy efficiency and solar power that help offset costs for the building's residents and battery storage that provided power during Hurricane Zeta, winter storm Uri, and in the aftermath of Hurricane Ida.<sup>132</sup> Hurricane Ida has also spawned other efforts to provide renewable energy and storage to communities most impacted by the hurricane specifically in ways that also support culture, quality of life, and community.<sup>133</sup>

The plan also calls for coordinated land use planning to reduce sprawl and support healthy and resilient communities. Here, smart land use planning supported by a statewide, coordinating authority, compact development, and model ordinances can help communities anticipate and reduce the potential for negative impacts from extreme weather events. Finally, as seen in the prior section, restoring and protecting Louisiana's coastal wetlands both preserve valuable carbon sinks and maintain a natural buffer between the Gulf of Mexico, tropical weather events, and communities.

## MANAGING FOR SHORT- AND LONG-TERM SUCCESS

For GHG emissions reductions to occur – and for any of the other benefits to the people of Louisiana to be realized – the Climate Action Plan must be successful in the short- and long-term. In practice, that means that the strategies and actions must be implemented in a timely fashion, effective at reducing GHG emissions,

adaptable to new technologies and approaches as they become available, and rooted in public trust for sustained buy-in and support. In addition to integrating short- and long-term success into actions, two sections of the portfolio, *Collaboration and Partnerships to Ensure Successful Implementation* and *Accountability and Adaptability to Ensure Lasting Success*, are explicitly designed to advance these fundamental objectives.

Though this set of strategies and actions outlines a pathway to net zero, this effort requires decades of action and is highly dependent on maximizing these short- and long-term objectives. The portfolio includes immediate actions to build public trust and address sectors that account for a large fraction of Louisiana's emissions, such as energy efficiency and conservation. These actions are paired with longer-term actions, such as at-scale deployment of green hydrogen, to set long-term ambition.

Accountability and transparency, alongside long-term durability and effectiveness, are also vital for building public confidence in the Climate Action Plan. For this reason, GHG monitoring actions and regular plan updates are explicitly called out to ensure that actions and strategies can be adjusted as needed if they are not producing the expected outcomes or as new technology is understood to catalyze further success.

Finally, the Climate Action Plan was developed recognizing that partnerships and collaboration are critical for short- and long-term success as well as for enabling positive change for the people, economy, and environment of Louisiana. For example, some actions enable education, research, and private sector innovation to attain strategies that require new technology development and deployment at scale. Additionally, where possible, actions highlight opportunities for federal partnerships and funding, particularly through the Infrastructure Investment and Jobs Act of 2021. Deliberate alignment across state agencies, local governments, and communities can ensure new policies, incentives, and regulations work together and are as effective as possible at reducing net GHGs and at providing co-benefits.

# Climate Strategies and Actions

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## INTRODUCTION TO PORTFOLIO

As framed in the Climate Action Plan so far, Governor Edwards' imperative for the CITF alongside the planning process, consequences of inaction, and benefits of climate action all point to the necessity of a comprehensive approach to GHG emission reduction in Louisiana, not only to attain net zero by 2050 but also to maximize co-benefits for other CITF fundamental objectives. Louisiana's comprehensive approach hinges upon high-level vision statements, herein called "strategies," and practical policy steps, herein called "actions," for each emission-producing sector and cross-cutting priority. The following section lays out a portfolio of 28 strategies and 84 actions, which has undergone two rounds of analysis through the EPS Tool and two rounds of review by the CITF, its subgroups, and the public.

*\*Note: The following Portfolio of Strategies and Actions in this Draft Climate Action Plan is identical to the December 3-Revised Portfolio because it is currently undergoing a public comment period through December 31, 2021. Based on comments submitted in this timeframe, the Portfolio will be revised a final time prior to the January 11-CITF Meeting and Final Climate Action Plan.*



# Clean Energy Transition

Electricity is the backbone of the economy and a requirement for high quality of life, powering, heating, and cooling homes and business, information systems and infrastructure, and industrial facilities of every size. As the world moves to reduce greenhouse gases (GHGs) from the economy, clean, reliable electricity will become even more important as the built environment, transportation systems, and large industrial users all move away from the combustion of fossil fuels and onto the electric grid. To make the most of this transition while meeting greenhouse gas emissions reductions goals and the fundamental objectives, Louisiana should support this transition by working to ensure that the electricity supplying all of these activities is clean. This section contains two major strategies, one targeting the grid and the utilities, and the other, end users. Infrastructure and economic build out are intentionally not addressed in this section.

- **Strategy 1: Shift towards a clean, renewable, and resilient power grid**
- **STRATEGY 2: Increase access to and deployment of distributed energy resources**



# STRATEGY 1. Shift towards a clean, renewable, and resilient power grid

The transformation of our electricity grid to clean and renewable energy sources is a fundamental building block for meeting Louisiana’s climate action goals. Here, “clean” is defined as energy generation that results in emission of little to zero GHGs (e.g., nuclear, biowaste, and natural gas with carbon capture) and “renewable” is defined as naturally replenishing energy sources with zero GHG emissions (e.g., solar, wind, and geothermal). As we shift energy sources to electricity used by Louisiana’s industries, vehicles, buildings, and more, overall demand for electricity will increase and the source of that electricity becomes increasingly important. Actions under this strategy are directed at the electric grid and power generation facilities, including the utilities that aim to reliably meet the rapidly increasing demands of an electrified economy. Here, actions are aimed at increasing clean and renewable sources of power generation, while also increasing the reliability and resilience of the electricity grid.

## Highlights of how this strategy can realize benefits for Louisiana:

- *Public Health:* Generating electricity from increasingly renewable sources can improve air quality and reduce negative public health impacts to communities living near power plants.
- *Economy and Jobs:* Investment in local renewable power production can lead to the creation of new jobs and economic opportunity for Louisianans, particularly with accompanying strategies to support local job training and economic development.
- *Community Resilience:* Updating and modernizing the electrical grid may reduce downtime due to weather or other disruptions, thus supporting communities by improving electrical grid dependability.

## ACTION 1.1 Adopt a Renewable and Clean Portfolio Standard and create a statewide market for Renewable Energy Certificates

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities	Establish a RCPS	100% renewable or clean by 2035, at least 80% from renewable sources

A Renewable and Clean Portfolio Standard (RCPS) is a law or regulation that reduces the GHG emissions associated with electricity generation. Louisiana’s RCPS would require electricity used in the state to be generated from an increasing percentage of renewable or clean sources with clear guidelines for how combined heat and power generation should be considered. To qualify as clean energy, power generation facilities reliant on carbon capture technology should capture at least 90% of facility emissions, which is currently a typical target for CCS projects, but the capture efficiency requirement should increase as the technology improves and costs decline over time, Louisiana’s RCPS should align with proposed federal requirements that all electricity generation be generated from renewable or clean resources by 2035, with at least 80% from renewable sources. and encourage improvements in efficiency as well as a reduction in GHG emissions. To reduce generation from unabated natural gas peaker plants, demand response should also be included as a mechanism to achieve targets.

To support the RCPS, Louisiana should also establish a statewide market for Renewable Energy Certificates (RECs) which are market-based instruments that represent the property rights to the environmental, social, and other non-power attributes of renewable electricity generation. RECs play an important role in accounting, tracking, and assigning ownership to renewable electricity generation and use. The REC value and market would be underpinned by requiring utilities to purchase RECs as an alternate mechanism for meeting the RCPS. This action proposes engagement of the

Louisiana Public Service Commission (LPSC), utilities, and stakeholders to develop and implement a RCPS and a statewide market for RECs. **(Associated Submitted Action Proposals: 16, 56, 119, 145, 152, 162, 172)**

**ACTION 1.2 Improve electric generation resource planning and procurement to streamline the retirement and replacement of energy resources**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities / Governor’s Office	Engage in Entergy Louisiana, LLC and Cleco Power LLC IRP Process in 2022	Encourage generation of renewable power

Integrated Resource Plans, or IRPs, are how utilities plan for future electric generation needs. IRPs identify future needs and different types of resources a utility can use to reliably serve customers in Louisiana. Over the next decade, Louisiana’s electric utilities will be undergoing a rapid transition from predominantly fossil fuel generation to more renewable resources (coupled with energy storage) and new, high-efficiency natural gas generation facilities necessary to ensure grid reliability. Beyond the next decade, the federal government will likely require 30-year assets be low- or no-carbon by 2050, further emphasizing the importance of planning now. Where appropriate, the electric utility industry should complement large base load power stations with smaller, more distributed generation facilities strategically located to enhance grid reliability and achieve emissions reductions. This action proposes working with the LPSC to: evolve the IRP and regulatory process to 1) accommodate the dynamic nature of the transition; 2) evaluate the costs and benefits of operating older generation facilities; 3) examine the risk of early retirement or substantial retrofitting of new fossil fuel-based generation facilities due to future federal climate action; 4) expedite renewable energy procurement in a way that will improve competition, reduce ratepayer costs, and improve Louisiana’s air quality, and (5) better incorporate distributed energy resources. For example, when the Dolet Hills power station, one of Louisiana’s few remaining coal-fired power plants, was closed in the fall of 2021, five years ahead of schedule, it was reported to save utility customers between \$9 and \$15 each month because of the lower cost of renewable power that would replace it. **(Associated Submitted Action Proposals: 112, 114, 116, 117)**

**ACTION 1.3 Strategically plan for the development of offshore wind power**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities / industry / LED / DNR / universities	Prioritize offshore wind strategic planning for outreach, workforce, and impacts assessments	5 gigawatts of offshore wind generation by 2035

Given the availability of wind power as a potential energy resource from the Gulf of Mexico, Louisiana’s advantage as a strong offshore energy producing state, and the economic development opportunity that wind power presents, Louisiana should continue collaboration across sectors and develop plans for the accelerated implementation of offshore wind power generation. This action proposes enactment of an offshore wind power generation goal of 5 gigawatts by 2035. This goal requires strategic collaboration across Louisiana state agencies and the federal government, transmission planning agencies, energy regulators, and the private sector, to take additional steps to advance development of offshore wind power generation. To spur large-scale development, efforts should prioritize early and repeated stakeholder outreach, strategic planning for anticipated transmission and workforce needs, and improving understanding of potential environmental and social impacts and opportunities to avoid or address them. **(Associated Submitted Action Proposals: 61, 101)**

## ACTION 1.4 Establish utility green tariffs

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities	Establish tariff offerings for renewable and clean power	Encourage purchasing of renewable power

Green tariffs are optional programs offered by utilities that allow customers to purchase renewable or clean power from specific projects through a special utility tariff rate (fee structure). Opting to pay a green tariff for renewable or clean energy helps customers meet sustainability targets and helps promote the development of additional renewable energy generation projects sooner. To maximize market participation and consumer choice, a green tariff program should provide separate renewable power and clean power tariff options. This action would include utilities working with the LPSC to establish tariff offerings for renewable and/or clean power for residential, commercial, industrial, non-profit, and governmental customers through a Utility Green Tariffs program. **(Associated Submitted Action Proposals: 111, 118, 175)**

## ACTION 1.5 Explore the role of Power Purchase Agreements and deregulating power generation in the energy transition

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities / industry	Understand implications of deregulated power generation	Encourage generation of renewable power

Power Purchase Agreements (PPAs) are long-term contracts between customers and renewable energy developers that allow purchase of renewable energy at certain volumes and prices. Renewable energy developers design, permit, finance, install, operate, maintain, and own a renewable energy project. Basic co-benefits of PPAs are two-fold: 1) customers that enter PPAs can avoid the up-front capital costs of installing a renewable energy system while still increasing access to renewable power; and 2) developers get revenue certainty that helps to finance the renewable energy project. Physical PPAs require renewable energy developers and customers to be located within the same electricity market and provide for the physical transfer of electricity from the generator to the customer. This action requests the LPSC to further review the benefits and costs of physical PPAs and deregulated power generation as mechanisms to efficiently and expeditiously add renewable energy generation to the grid and make electrification more accessible to industrial facilities. **(Associated Submitted Action Proposals: 11, 47, 144)**

## **ACTION 1.6 Develop a regional long-range transmission infrastructure plan to meet Louisiana’s transmission goal**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
PSC / utilities / MISO / SPP / DNR	Assess infrastructure needs across the state to plan for renewable connectivity	30% increased grid infrastructure by 2030 and 100% increase by 2050

Long-range transmission planning, which seeks to optimize regional transmission infrastructure investments over a 20-to-30-year planning horizon, ensures that the electricity grid can accommodate the changes occurring in the energy sector as Louisiana transitions to lower GHG-emitting sources (e.g., electrification, the growth of distributed generation, the retirement of aging or inefficient generation, offshore wind, development of reliable and affordable energy storage). The gap between current and 2035 targets for renewable electricity generation indicates the necessity to rely on regional transmission infrastructure and import renewable power that creates a system of longevity and continuity. Louisiana is an active participant in two regional transmission organizations, the Midcontinent Independent System Operator (MISO) and the Southwest Power Pool (SPP), through the LPSC, where states collaborate on and share infrastructure to support regional transmission. Recognizing the important role of long-range transmission planning for achieving GHG emissions reduction goals and maintaining reliable service during extreme weather events, this action recommends the Department of Natural Resources (DNR) Energy Office join with the LPSC, MISO, and SPP to develop a strategic plan for the buildout of Louisiana’s grid and transmission infrastructure to meet a near-term goal of 30% increase by 2030 and a long-term goal of 100% increase by 2050. This action should begin in the short-term with an understanding of where and how much electricity is most needed across the state, with particular attention to industrial clusters and power facilities. From this baseline, the LPSC, MISO, and SPP can plan for and ensure connectivity across the MISO and SPP infrastructure that supports Louisiana’s renewable power needs, emphasized in the “Clean Energy Transition” and “Industrial Decarbonization” Sections. **(Associated Submitted Action Proposals: 122, 123, 165)**

## **ACTION 1.7 Adopt and develop measures to meet an energy storage target**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
PSC / utilities / DNR Office of Energy	Solicit funds for energy storage pilot projects	100 megawatts of energy storage by 2030

Energy storage is a necessary component of Louisiana’s energy transition infrastructure to ensure grid reliability and resilience. Storage enables larger quantities of and greater reliance on renewable energy sources by storing intermittent solar and wind power generation and “dispatching” them when the renewable energy is not being generated. Many states, including Virginia and Nevada, have enacted energy storage targets and a streamlined regulatory environment that incentivize energy storage. This action proposes the LPSC evaluate the role that energy storage can play in increasing reliability and resilience and enabling deployment of renewable energy. This action proposes working with utilities and DNR’s Office of Energy to develop energy storage pilot projects and consider a goal of 1000 megawatts by 2030 and setting a higher target for 2050 to ensure continued progress towards a reliable, clean power grid. **(Associated Submitted Action Proposals: 174)**

## **ACTION 1.8 Publish “climate rankings” for electric utilities within the statewide GHG monitoring program to increase public awareness, transparency, and accountability**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / utilities / DEQ	Assess gaps and synthesize existing data on generation	Encourage generation of renewable power

Customers of electric utilities should have easy, understandable access to information about where and how their electricity is produced and how that mixture of energy production sources changes over time. This action proposes engaging with the LPSC, Department of Environmental Quality (DEQ), and utilities to develop a regularly updated "report card" that synthesizes data on the diversity of a utility's generation portfolio. This should include load, mixture of energy production sources, and renewables forecasting, as well as carbon dioxide (CO<sub>2</sub>) and other emissions, to incorporate into DEQ's statewide GHG monitoring program. Much of this data is available, so actions to compile and synthesize data should begin immediately, noting any gaps in monitoring data and capacity. DEQ should work with utilities to fill monitoring gaps and ensure the report card is comprehensive of this energy source mix and emissions profile. Updates to this report card should be completed every two years to incentivize, track, and reward decarbonization of utilities. In the medium and long term, a climate scorecard should be developed to compare data and trends across utilities around the state and the nation, develop decarbonization challenges across utilities, and promote leadership within the state. ***(Associated Submitted Action Proposals: 108, 115)***

## STRATEGY 2. Increase access to and deployment of distributed energy resources

In addition to utility-scale actions, investments in distributed renewable resources—local generation of electricity at or near where it will be used—can accelerate the deployment of renewable technologies and projects in Louisiana. Actions under this strategy provide a range of mechanisms to support more affordable access to and financing of distributed renewable resources for residential, community-based, commercial, institutional, and industrial consumers.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Economy and Jobs:* Investments in distributed renewable projects can support the growth of local businesses and jobs within the solar, wind, and other renewable industries in Louisiana.
- *Energy Affordability:* Distributed renewable generation provides an opportunity for energy customers to control their energy supply, reduce their energy costs, and in some cases profit from their surplus energy production. Additional attention in policy design and implementation of actions will be necessary to ensure that programs are accessible to low-income residents, including renters. Models like community-owned solar can expand access to the benefits of distributed renewable projects for all users.
- *Community Resilience:* Local renewable electricity generation, when combined with storage, can provide backup power to local businesses, residents, and community facilities during a grid outage, such as after a storm. This can ensure the continued provision of essential services to communities.
- *Protecting the Environment:* Distributed energy generation reduces the power generation needed from large-scale solar or wind farms, potentially reducing the amount of land (or offshore acreage) that would need to be converted from natural areas.

### ACTION 2.1 Authorize tax incentives for residential, commercial, and community-based renewable energy installation and storage

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature	Reinstate incentives for renewable installation and storage	Encourage purchasing of renewable power

Financial incentives for renewable energy installation and storage at household and commercial scales, particularly solar (electricity and water heating), are important for ensuring equitable access to renewable energy across Louisiana. Similar tax incentives have been employed in the past and this action would reinstate and update that program to provide a tax rebate (e.g., 30% or number of kW installed) based on the cost of installation with a cap per household/project and an annual budget limit for the state. The program would prioritize low-income households. This action would also work to implement tax incentives or credits to promote and support community-owned solar installations. Community solar refers to local solar facilities shared by multiple community subscribers who receive credit on their electricity bills for their share of the power produced. The primary purpose of community solar is to allow members of a community the opportunity to share the benefits of solar power even if they cannot (renters, or those with homes or roofs unsuitable for solar for example) or prefer not to install solar panels on their property. If this action is implemented, it will be important to ensure that this program is accessible for low- and moderate-income homeowners through mechanisms such as “carve-outs”, availability for community solar and

other non-ownership models, pairing with other incentives, targeted messaging, and outreach. **(Associated Submitted Action Proposals: 113, 147, 126)**

**ACTION 2.2 Review net metering and crediting policies for on-site and community solar energy system owners and participants**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC	Review net metering policies	Account for value of distributed solar energy generation

Many on-site (e.g., rooftop) solar energy system owners produce more electricity than they consume. Billing mechanisms can provide these customers with credit for the energy they generate or add to the grid. Virtual net metering applies similarly to the electricity bills of subscribers of community solar projects. When a solar energy system is built at a school, grocery store, or other consolidated site in a community, residents can choose to share that solar system through partial ownership or “subscription.” Net metering helps financially justify the cost of solar energy system installation thereby increasing demand for solar energy and creating jobs for those in the solar industry. In PSC jurisdictions, owners of systems installed prior to 2020 are grandfathered into a full retail credit net-metering schedule until the end of 2034, while owners of systems installed in or after 2020 only receive credit for the utility’s “avoided cost” when selling excess energy back to the grid. This action proposes working with the LPSC to review its prior ruling on net metering for solar energy system owners and community solar participants to ensure customer rate schedules are equitable while fully accounting for the value of the distributed solar energy generation. **(Associated Submitted Action Proposals: 57, 126, 164)**

**ACTION 2.3 Strategically foster the development of resilient microgrids and dispatchable batteries**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
FEMA / GOHSEP / Louisiana National Guard	Plan and implement microgrids and dispatchable battery units	Speed post-disaster recovery and resilience

Microgrids are localized “islands” of electricity generation that can be isolated from the larger macrogrid to supply power. Dispatchable battery units can likewise supply power in response to outages. With the ability to disconnect and operate independently, microgrid systems can provide for grid resilience, mitigate disturbances by natural disasters, and allow for faster response system and recovery. This action requires collaboration across the U.S. Federal Emergency Management Agency (FEMA), the Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP), Louisiana National Guard, the LPSC, and local stakeholders to plan deployment and implementation of microgrids and dispatchable battery units for businesses and communities to build resilience against increasing natural disasters. With near-term federal funding available through the Infrastructure Investment and Jobs Act, this action recommends immediate implementation through pilot projects for strategic assets with a goal of broader deployment of microgrids and dispatchable batteries to improve the resilience of at-risk communities over the long-term. **(Associated Submitted Action Proposals: 176)**

## ACTION 2.4 Evaluate an Emission Reduction Generation and Supply (ERGS) program

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC	Determine best mechanisms for third-party generation to sell energy back to the grid	Encourage generation of renewable power

Maximizing the usefulness of the simultaneous cogeneration of electricity and heat or renewable sources by industrial facilities can encourage more efficient onsite energy generation for large consumers, reduce energy waste, and lower the demand on the energy grid while potentially providing energy for additional uses or users. This action would request that the LPSC evaluate the creation of an Emission Reduction Generation and Supply (ERGS) program in which industry or other third-party generation created from emission-reducing sources (e.g., CHP, battery storage, on-site renewable energy generation, waste-heat generation) could be automatically sold back to the grid on an as available basis, or made available to nearby facilities through privately-owned transmission infrastructure without classifying the energy resource owner as a regulated electric public utility. This action would evaluate the benefits and costs of incentivizing industrial customers to build or utilize larger-scale reduced-emissions energy resources by allowing them to share the electricity produced. **(Associated Submitted Action Proposals: 43, 52, 89, 124, 160)**





# Industrial Decarbonization

Industrial decarbonization refers to avoiding the combustion of fossil fuels to reduce emissions from the industrial process chain. Industry is Louisiana's largest sector of emissions, making it critical to develop concrete steps towards a less energy-intensive industry that partners with industry in this transition. Many opportunities exist to decarbonize this sector, which are possible through efficiency, electrification, fuel switching, CCUS, and reduced carbon intensity of materials. As such, this area contains four strategies: 1) monitor, inventory, certify, and support industrial decarbonization, 2) improve efficiencies in and modernization of industrial processes and facilities, 3) accelerate industrial electrification, switching to low- or no-carbon fuels and low- or no-carbon feedstocks, and 4) promote reduced- carbon materials.

- **Strategy 3: Monitor, inventory, certify, and support industrial decarbonization**
- **Strategy 4: Improve efficiencies in and modernization of industrial processes and facilities**
- **Strategy 5: Accelerate industrial electrification, switching to low- or no-carbon fuels and low- or no-carbon feedstocks**
- **Strategy 6: Promote reduced-carbon materials**

### STRATEGY 3. Monitor, inventory, certify, and support industrial decarbonization

Industrial sector emissions are Louisiana’s largest contributing source of GHG emissions, accounting for over 65% of total state GHG emissions in 2018 based on the [2021 Greenhouse Gas Inventory](#). An accurate baseline understanding of Louisiana’s industrial emissions is a critical first step towards measuring, certifying, supporting, and accounting for reductions from the industrial sector. Baseline information, with robust and reliable monitoring efforts, will allow for comprehensive tracking of Louisiana’s emissions across a diverse and complex industrial profile and ensure accountability in reduction.

**Highlights of how this strategy can realize benefits for Louisiana:**

- *Public Confidence:* Tracking and monitoring industrial emissions alongside transparent communication of emissions reductions to the people of Louisiana are critical for ensuring confidence in this climate action plan.
- *Human and Environmental Health:* Monitoring programs that track GHG emissions can also be used to monitor other toxic and potentially hazardous emissions. Improving Louisiana’s understanding of all industrial emissions will help inform and mitigate potential impacts to communities and the natural environment.
- *Maximizing Future Success:* Monitoring and inventorying industrial emissions allows the efficacy and impacts of all actions to reduce these emissions to be evaluated and improved as the plan is implemented over time.

#### **ACTION 3.1 Require self-reporting carbon intensity and emissions audits from industrial facilities to incorporate into the statewide GHG monitoring program**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / EPA / Industry	Compile, calibrate, and assess gaps of existing data from facilities	Provide facility-specific accountability in emission reduction

To establish a baseline of current emissions on a facility-by-facility basis, this action proposes mandatory, self-reported emissions and carbon-intensity audits from all industrial facilities and a repository in which state-wide data can be stored and made publicly available. This database should be a component of the broader DEQ GHG Monitoring Program, described in Action 28.1, and build upon existing publicly available datasets generated by the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Reporting Program, Title V Clean Air Act Permit Information, and others. Under this action, the Louisiana DEQ should compile and calibrate existing data, ensure all facilities submit reports, and update the GHG monitoring database annually with emissions and intensity information for all facilities. Immediate implementation is recommended so that the Governor’s Office, state agencies, federal partners, industry, utilities, and environmental stakeholders are able to ensure continual progress towards emission reduction in this sector. **(Associated Submitted Action Proposals: 51, 108, 140)**

### ACTION 3.2 Develop an Industry Certification Program for GHG emission reduction activities

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / EPA / Industry	Develop framework for facility-level GHG reducing plans	Provide facility-specific support in emission reduction

With a sufficient baseline of industrial emissions and a monitoring program to track reduction, Louisiana can creatively develop approaches that mitigate emissions and accommodate varying types, sizes, and operations of industries. To offer such flexibility in implementation and reward decarbonization, this action establishes a voluntary Industry Certification Program in DEQ that incentivize industries to implement GHG reduction measures. This program would require participating industries to propose and implement site-specific GHG emission reduction plans, tailored to their industry and locational needs on an achievable timeline towards net zero by 2050. Plans should then be evaluated and certified by DEQ using a common metric to evaluate and track success, updated by annual site visits and certification renewals.

Industries will only be required to pay a small participation fee but benefit in many ways: recognition in emission reduction, use of the program’s promotional material and monitoring capability, advantages in government procurement, potential grants for GHG-reducing facility improvements, and information sharing across industry peers. The participation fee Industry Certification Program would cover costs to increase agency capacity, allowing the program to become self-funding and income-generating. Similar programs have been successfully implemented in California and Texas alongside the EPA Natural Gas STAR Program. Medium-term implementation of this action is most beneficial, to ensure a firm baseline of emissions is established first and drives the certification program. **(Associated Submitted Action Proposals: 62)**

### ACTION 3.3 Advocate for a national carbon price and explore joining a multi-state carbon pricing system to advance GHG emissions reduction and direct proceeds toward the advancement of strategies in the Louisiana Climate Action Plan

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / Legislature / Governor’s Office	Identify carbon pricing mechanism best suited for Louisiana	Provide facility-specific accountability in emission reduction

As inherent in its name, a carbon price applies the external cost of GHG emissions (e.g., public or social costs for damage to crops from drought, community loss from flooding, etc.) to the source of emissions through a price, intended to shift the burden for damage of GHG emissions back to those who are responsible for it and who can avoid it. Carbon price can either encourage emitters to shift activities to lower emissions or continue emitting and pay for it. Multiple mechanisms can be used for carbon pricing, with cap-and-trade and carbon tax as leading methods, applied economy-wide or to a specific emissions sector. Cap-and-trade programs establish a declining limit on major sources of GHG emissions (a mandated “cap”) and creates a powerful economic incentive for investment in cleaner, more efficient technologies. Under these programs, emissions allowances are purchased and sold by emitting entities (creating a market to “trade” allowances). Alternatively, carbon tax is a more straightforward system, where government sets a price that emitters pay for each ton of GHG emissions emitted. These mechanisms are used by states, regions, and nations, designed to support intended outcomes, needed flexibility, and political feasibility. This action tasks Louisiana’s DEQ to explore joining a multi-state carbon pricing system. Alongside exploring and joining a regional system, this action tasks state leaders to continue advocating for a national carbon pricing system, where the federal government sets a national price on carbon to avoid carbon leakage across states. Regardless of the system pursued, this action directs proceeds from the sales of emissions

allowances be used to support incentive programs for the equitable expansion of renewable energy deployment, electric vehicle adoption, weatherization and energy efficiency programs, workforce transition, climate change adaptation, and other goals established by the Louisiana Climate Action Plan. **(Associated Submitted Action Proposals: 8, 48, 53, 173)**

**ACTION 3.4 Develop a comprehensive strategy to reduce industrial GHG emissions**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / DNR	Develop an implementation strategy for this Section	Ensure coordinated implementation of industrial decarbonization

Industrial sector actions require intentional engagement and support to ensure GHG-reducing regulations, incentives, and programs are implementable for a wide range of facility sizes, types, and operations. With many solutions and approaches set forth in this section, this action tasks DEQ and DNR jointly to develop a statewide strategy to achieve actions of this section, enforce industrial emissions reductions, prevent waste from new and existing sources, and attract clean energy industry to the state. DEQ, with its monitoring and regulatory authority, and DNR, with its permitting authority and energy office, are central implementers of monitoring, inventorying, certifying, and supporting industrial decarbonization. This cooperative endeavor should outline a strategic path forward to implement actions of Louisiana’s Climate Action Plan and to monitor and reduce industrial emissions. Alongside ensuring agency collaboration and role in implementation, this framework should create opportunities for engagement with other state agencies, federal partners, industry, and environmental advocates to ensure a comprehensive approach is developed, implemented, and provides a tool for accountability. Particularly, this effort should also include specific outreach and engagement with Louisiana’s top emitters to develop targeted measures to decarbonize their facilities. Alongside the GHG monitoring program, this framework would benefit the Climate Action Plan most through immediate implementation to set Louisiana on a trajectory to address its largest emission sector and to best support major emitters of the sector. **(Associated Submitted Action Proposals: N/A)**

# STRATEGY 4. Improve efficiencies in and modernization of industrial processes and facilities

Improving the efficiency of industrial processes is the quickest, simplest way to reduce industrial energy demand and corresponding GHG emissions. Efficiency can also lower energy cost, mitigate risk, increase competitiveness, and make electrification more feasible. Efficiency approaches can encompass internal operations, supply chains, products and services, and cross-cutting issues across a variety of types and sizes of industry. Actions under this strategy are directed at increasing efficiency via implementation of standards and direct engagement with energy users and manufacturers.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Timely Implementation:* Increasing industrial efficiency can occur now. Technologies are currently available to increase efficiencies in the near-term.
- *Quality Improvements:* Increasing energy efficiency can improve other important aspects of industrial operation including product quality, worker health and safety, and environmental performance.
- *Economy and Jobs:* Investment in the development and deployment of new technologies to improve efficiency creates jobs in research and development (R&D) and installation. The implementation of energy efficiency projects and good energy management practices can save energy and reduce costs for companies, thereby increasing industrial competitiveness.

## ACTION 4.1 Set Industry Efficiency Standards

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR	Pursue rulemaking for implementation of standard	Reduce energy intensity of industry

Mandatory standards are necessary to signal a commitment to efficiency. This action proposes that the state further energy efficiency through Industry Efficiency Standards. To ensure that the benefits of efficiency are realized, DNR should immediately pursue Industry Efficiency Standards through rulemaking, based on total building or structure performance. Near- and long-term standards will ensure efficiency remains a priority even after appropriate phase-in measures and near-term goals are met. Agency resources must be allocated to ensure accountability that standards are followed and goals are met across facilities. **(Associated Submitted Action Proposals: N/A. Referenced Resources: 1)**

## ACTION 4.2 Develop and implement a Strategic Energy Management Program

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR / LSU-IAC	Assess needed support for implementation of Action 4.1	Support reduced energy intensity of industry

Education, technical assistance, and financial incentives must accompany mandatory standards to ensure their widespread adoption and success. Strategic Energy Management (SEM) encourages efficiency through direct engagement with manufacturers to identify sources of significant energy use, implement efficiency measures, and track progress toward implementing energy efficiency standards. This action proposes the establishment of an SEM Program

in Louisiana's DNR Energy Office that would ensure continual energy improvement is integrated into the culture of facility management. The SEM should partner closely with and expand upon existing work of Industrial Assessment Centers (IACs), federally funded partnerships with local universities to identify energy efficiency improvements for small and medium-sized manufacturers. Louisiana's IAC is a team of Louisiana State University (LSU) faculty and students that provide no-cost assessments to small and medium-sized U.S. manufacturers to identify potential cost savings from energy efficiency improvements, waste minimization, pollution prevention, and productivity improvement. Through an SEM Program, state agencies, industries, and universities should discuss and address concerns, limitations, and feasibility of various methods to improve efficiencies, building on experience and knowledge of the LSU IAC. The SEM program may fund pilot projects and conduct studies on carbon intensity, life cycle accounting, competitiveness, resilience, and the impacts of energy-intensive industry for various processes to guide decisions, track progress, and set further standards. Alongside efficiency standards, the SEM is immediately implementable and would ensure successful adoption of efficiency standards. **(Associated Submitted Action Proposals: n/a. Referenced Resources: 1, 2)**

# STRATEGY 5. Accelerate industrial electrification, switching to low- or no-carbon fuels and low- or no-carbon feedstocks

The fossil-derived energy used to power Louisiana’s industrial sector is the state’s largest source of GHG emissions. Moving this energy demand to zero-carbon electricity and fuels is the most powerful action that can be taken to mitigate Louisiana’s emissions and ensure Louisiana remains a global industry leader in a net-zero future. Some electrification technology is readily available and deployable across various industrial processes, particularly for those of low- and medium-heat and for green hydrogen in high-heat processes. However, decarbonizing industrial processes is a newer challenge with few blueprints to follow. Several actions under this strategy highlight the importance of research and development and pilot projects to better understand how electrification, low- and no-carbon fuels, and carbon capture, use, and storage (CCUS) can best be deployed in Louisiana’s industrial facilities.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Public Confidence:* Tackling Louisiana’s largest emissions sources head-on will inspire additional action at the local and facility levels. Leadership from the state and industry, showing that Louisiana is serious about mitigating its hardest-to-abate emissions, will increase confidence in the state’s industrial future and commitment to the clean energy transition.
- *Economy and Jobs:* Investments in electrification and industrial fuel-switching will create jobs in retrofit and new facility projects, piloting technology and approaches that can be used on industrial facilities around the world with Louisiana leading the way.
- *Human and Environmental Health:* Reducing fossil energy combustion in and near industrial facilities can reduce not just GHG emissions, but other pollutants as well, improving the health of fenceline communities and benefitting the environment.

## ACTION 5.1 Accelerate electrification of industrial processes and equipment through pilot projects, incentives, and requirements

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LED / DNR / PSC / Governor’s Office / Industry	Invest in mechanisms to accelerate industrial electrification	Abate industry emissions through electrification to the extent practicable

Technology currently exists to electrify many types of systems and processes within industrial facilities, but the economic and feasibility and scalability of this technology has not been widely demonstrated in Louisiana. This action proposes the development of pilot projects to electrify systems within Louisiana industrial facilities (e.g., building systems and motors) to demonstrate the potential for more widespread implementation. Electric furnaces for temperatures above 350°C are also ripe for pilot projects, as they are in development but not yet technologically mature for industrial use.

Alongside demonstration projects, incentives will meaningfully drive changes in industrial investment. This action tasks Louisiana to advocate for a federal industrial-scale electrification incentivize, similar to the 45Q tax credit for carbon capture and storage (CCS). Such large-scale, near-term federal investment will drive demand for electrification, facilitating accelerated progress towards industrial decarbonization and grid transformation. Any incentives should be based on criteria that prioritize communities most closely impacted by industry and where explicit reduction co-benefits of replacement technology have been identified and will be most quickly realized. Alongside federal investment, this action

tasks Louisiana Economic Development (LED) to work with DNR and LPSC to begin developing regulatory requirements for industrial transformation to electrification by 2050. **(Associated Submitted Action Proposals: 29, 63)**

### **ACTION 5.2 Promote low-carbon alternative fuels and feedstocks for petrochemical industrial processes**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR / US-DOE / Industry	Invest in research and demonstration projects to accelerate fuel- and feedstock-switching	Abate heavy industry emissions through alternative feedstocks and fuels to the extent practicable

Industrial feedstocks (raw materials used to supply a manufacturing process) have traditionally been petroleum, natural gas, and their derivatives. Natural gas is also widely combusted in Louisiana to achieve high temperatures for chemical manufacturing and petroleum refining. Louisiana is one of the largest producers of bulk chemicals, like ammonia, in the country, and chemical manufacturing accounts for over half of Louisiana’s industrial GHG emissions. As well as being a large producer of bulk chemicals, Louisiana also utilizes bulk chemicals as intermediate products to create end products like plastic containers and fertilizers. To reduce emissions from chemicals production and refining manufacturing, low- and no-carbon hydrogen as well as captured CO<sub>2</sub> can replace carbon-intensive feedstocks. Low-carbon fuels can also replace carbon intensive fuels that manufacturers currently rely on to achieve the high temperatures needed in many industrial processes. This action proposes investment in research, development, and demonstration of low- and no-carbon fuels and feedstocks, such as clean hydrogen, to complement industrial electrification for a comprehensive decarbonization strategy for Louisiana’s heavy chemical industry. The DNR Energy Office should partner with the U.S. Department of Energy (DOE) to solicit funding for Louisiana to lead research, development, and demonstration in this area and become a clean hydrogen hub for the nation. As electrified equipment become more available in the coming years, this action also proposes Louisiana lead in piloting and deploying clean technologies. **(Associated Submitted Action Proposals: 6, 12, 51, 107, 125. Referenced Resources: 1)**

### **ACTION 5.3 Support the safe and responsible deployment of carbon capture, utilization, and storage for high-intensity and hard-to-abate emissions**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR / US-DOE / Industry / Communities	Invest in research for siting and impact assessments of CCUS buildout	Abate remaining high-intensity emissions through carbon capture and storage

CCUS is a suite of technologies that can play a significant role in GHG emission reduction. Carbon capture can use a variety of techniques to remove emissions from industrial and power production operations pre- and post-combustion. With expansive geologic storage potential, highly concentrated industrial corridors, and a trained workforce, Louisiana has potential for deployment of this technology and infrastructure. CCUS has a critical role to play in decarbonizing the global economy. This is particularly true in the industrial sector, where high temperature processes cannot be readily transitioned to electrification or low-carbon alternatives and where process emissions from chemical reactions are unavoidable except with CCUS.

This action proposes that the state continue to work with federal and state partners, industry, and communities to determine potential sites for safe carbon capture storage, to identify a regulatory and legal framework that supports CCUS, and to determine impacts of capture and transport infrastructure buildout. While the overall impacts of CCUS deployment are expected to be positive as they relate to air quality, further assessment, quantification, and engagement



of local communities is needed to fully understand potential impacts of CCUS on local criteria air pollutants and other emissions resulting from carbon capture retrofits at industrial facilities. These efforts should result in responsible CCUS projects that address cumulative pollution and incorporate environmental justice and equity concerns into siting and decision making. Further actions under Strategy 26 outline specific areas for impact analysis needed in the near-term prior to permitting and deployment of infrastructure. **(Associated Submitted Action Proposals: 7, 45, 49, 74, 155)**

**ACTION 5.4 Invest in research for utilizations of captured carbon and life cycle analyses to understand their overall impact**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Universities	Solicit funding to understand utilization techniques	Recycle emissions through utilization of captured carbon

The capture and use of CO<sub>2</sub> to create valuable products (CCUS) has potential to lower the net costs of reducing emissions while removing CO<sub>2</sub> from the atmosphere. This process of utilization refers to the use of CO<sub>2</sub> directly or as a feedstock in industrial or chemical processes to produce carbon-containing products that generate economic value. Utilization technologies of CCUS are still nascent in form and barriers to implementation remain, so more funding is needed to research and pilot various techniques. This action proposes that Louisiana universities solicit funding for studies that more comprehensively understand various utilization techniques and their applicability and feasibility to reduce emissions from Louisiana industries. Research should begin in the short-term to influence and inform medium- and long-term implementation. **(Associated Submitted Action Proposals: n/a)**

**Action 5.5 Develop Industrial Cluster Decarbonization Plans to plan for and direct facility-level investment**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
US-DOE / DEQ / DNR / PSC / Utilities / Industry / Communities	Strategically plan decarbonization of industrial clusters	Provide cluster-specific support in emission reduction

Louisiana is home to three major “industrial clusters,” geographic areas where industries are co-located and share resources. Though they are major emission sources, clusters provide opportunities for deployment of decarbonization technologies at scale, sharing of risks and resources of their location, and aggregation and optimization of energy demand. This action proposes the U.S. DOE, DEQ, and DNR Energy Office partner with utilities, the LPSC, industrial clusters, and nearby communities to develop site-specific Industrial Cluster Decarbonization Plans (“Cluster Plans”) that utilize industry co-location to develop facility-level decarbonization measures. Cluster Plans should be led by companies in the respective clusters with leadership from the U.S. DOE, DEQ, DNR Energy Office, and neighboring communities and focus on transmission buildout, grid updates, and storage capacity to facilitate industrial-scale electrification, alongside development and utilization of hydrogen and CCS hubs. State leadership should build upon initiative taken by state agencies in Action 3.4, with federal engagement regarding funding opportunities and pilot projects. Since success is dependent upon collaboration and unified action across all stakeholders, development and adoption of Cluster Plans allows industry to tailor action to their specific needs and locations, while also meaningfully engaging and addressing the needs of surrounding communities. Action by facilities in major industrial clusters is central in meaningful reduction of industrial emissions and grid transformation, so results of this action should further those of this strategy and of the “Clean Energy Transition” section. **(Associated Submitted Action Proposals: 29, 71, 73, 139)**

# STRATEGY 6. Promote reduced-carbon materials

The lifecycle emissions and embodied carbon in fuels, construction materials, and other products are an easily overlooked source of GHG emissions that can be mitigated. Using the government’s power of the purse to encourage and incentivize selection of materials and products created through lower carbon intensity processes is a powerful tool for building cleaner while creating a stronger market for lower-carbon products. Actions under this strategy aim to address material sourcing in a systematic approach, from public construction projects to household recycling, to reduce Louisiana’s reliance on higher carbon intensity products.

**Highlights of how this strategy can realize benefits for Louisiana:**

- *Economy and Jobs:* An understanding of the GHG emissions from materials production and supply chains can help state and federal entities make better choices when investing in construction projects. Increased government demand for lower carbon alternatives, with requirements to source from within the U.S., will spur economic growth and innovation to meet new requirements.
- *Community Engagement and Environmental Stewardship:* State and local programs that consider the life cycle of products can serve as an entry point for greater public engagement in climate action. Commitment from the state and private sector to identify reuse opportunities for waste streams can inspire individual action to continue waste reduction.

**ACTION 6.1 Develop a “Buy Clean Louisiana” policy for procurement of materials with lower carbon footprints for use in public construction projects**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Secure green vendors through procurement practices	Reduce GHG footprint of state government while growing market for clean and green products

Adoption of a “Buy Clean Louisiana” policy utilizes procurement to create market shifts and incentivize the use of building materials (e.g., concrete and steel) manufactured through lower carbon intensity processes to reduce the GHG emission footprint of construction. This action, spurred by Louisiana’s Division of Administration (DOA), would require all state agencies to consider embodied carbon emissions (all CO<sub>2</sub> emitted in producing materials) of industrial products when contracting for state infrastructure and non-infrastructure projects. Securing green vendors through procurement is immediately implementable through adjusting procurement procedures of DOA. However, incentivizing use of green vendors through weighted scoring criteria requires legislative action that should be worked towards. Buy Clean has been pursued by other states, with programs in development for Texas, Colorado, New York, Oregon, Minnesota, Connecticut, New Jersey, and Washington, and one established in California. **(Associated Submitted Action Proposals: 135)**

## **ACTION 6.2 Explore how circular economy principles can be applied to lifecycles of products created and used in Louisiana**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / Waste Management Entities / NGOs / Universities	Invest in pilot projects to reduce lifecycle emissions of products	Minimize wasted energy through circular principles

A circular economy is a systemic approach to economic development based on understanding of product lifecycles. Circular economies are designed to benefit businesses, society, and the environment while promoting zero waste – where every material after use becomes the feedstock for another use. Reducing GHG emissions by implementing material waste reduction programs, providing incentives for recycling, and investing in new technologies that consider the “lifecycle” of material products (e.g., plastics) are important actions to consider when reducing overall wasted energy. This action, coordinated across DEQ, waste management entities, non-governmental organizations (NGOs), and private industry, tasks university partners with reviewing opportunities to increase efficiency in recycling practices, exploring possible incentives for industrial use of recycled materials, and identifying other opportunities for the productive reuse of waste materials in Louisiana. Louisiana universities should then work with state agencies and manufacturers involved in the promotion of exports of goods and materials manufactured in Louisiana to develop specific supply chain opportunities for circular economy principles. **(Associated Submitted Action Proposals: 72, 82, 85)**



# Actively Manage Methane Emissions

Methane is more than twenty-five times as potent as carbon dioxide at trapping heat in the atmosphere, which makes it important to actively mitigate the highest sources of methane. Though methane is present in many sectors and throughout other sections of the action portfolio, methane is addressed separately here to emphasize potential to mitigate oil and gas infrastructure emissions through short-term action. Increased resources for decommissioning legacy infrastructure paired with monitoring and regulation on oil and gas infrastructure are significant strategies required to manage methane emissions.

- **Strategy 7: Increase and mobilize resources for decommissioning legacy oil and gas infrastructure**
- **Strategy 8: Monitor and regulate methane emissions**

## STRATEGY 7. Increase and mobilize resources for decommissioning legacy oil and gas infrastructure

Charting a course for Louisiana’s clean energy transition must address the persistent and complex challenge of methane emitted from oil and gas infrastructure, particularly orphaned wells. Orphaned wells are abandoned oil and gas wells for which no one is a responsible party or the responsible party has failed to maintain the infrastructure. Management of this legacy and inactive infrastructure presents a unique challenge since legal responsibility and potential safety may shift over time. Without steps that tighten active enforcement and make available additional resources to adequately manage these sites, methane leakage from legacy infrastructure will continue to impose an economic, environmental, and public health toll on surrounding communities. Actions under this strategy aim to address legacy infrastructure through tightening regulations and enforcement at the state level while aligning with near-term federal funding opportunities.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Economy, Jobs, and Education:* Investment of funds specifically for worker training and retraining in plugging leaks of legacy and abandoned wells can position Louisiana’s residents for increased employment opportunities and additional career pathways. Engagement with community colleges across the state should be central in implementation.
- *Public Health:* Addressing legacy infrastructure can reduce potential negative environmental and public health impacts of these sites to surrounding communities.
- *Environmental Protection:* Legacy site remediation reduces potential harm of orphaned and abandoned wells to surrounding ecosystems and can even improve ecosystem functioning through restoration practices.

### ACTION 7.1 Hold former well operators accountable for orphaned wells

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR	Pursue rulemaking to tighten the definition of “responsible party” and establish a companion database	Provide clarity and accountability for responsible parties

Leaks from orphaned wells create a large source of methane emissions where operators are not legally held responsible after wells are plugged and abandoned. This action recommends DNR take legislative and regulatory measures to ensure that former operators are held responsible for abandoned wells. Through rulemaking, the DNR Office of Conservation should amend the definition of “responsible party” to include all former operators. This definition of “responsible party” is significant to ensure responsibility for abandoned infrastructure does not shift to the state over time. DNR should also collect and publish a database of orphaned wells that indicates their responsible parties to clearly identify the location and ownership of infrastructure in the event leaks are detected and need to be repaired immediately. We recommend this action be pursued immediately to identify responsible parties and kickstart methane reductions. **(Associated Submitted Action Proposals: 167)**

## ACTION 7.2 Strengthen financial security requirements for plugging wells

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR	Pursue legislation to raise financial security and remove blanket securities	Incentivize compliance with operator requirements

Financial security requirements are state bonds that guarantee compliance of operators with regulations for the issuance of permits for oil and gas exploration, drilling, and plugging. Since 2014, DNR’s Office of Conservation has implemented stronger regulatory practices of requiring financial security from operators and more frequent inspections, which has caused the number of identified orphaned wells to nearly double. However, extensive loopholes in financial security regulation allows operators to avoid financial security requirements, leading to a failure to plug wells. Of the 716 wells that have been orphaned since financial security became a requirement, 55% were exempt from financial security. Therefore, this action recommends comprehensive legislative reform to raise the amount of financial security and remove the ability of operators to use blanket securities, which allows the operator to circumvent financial security. Additional financial security should be added to the Oilfield Site Restoration (OSR) Program to fund plugging of abandoned infrastructure. **(Associated Submitted Action Proposals: 166, 168)**

## ACTION 7.3 Tighten the “future utility” designation and requirements for inactive wells

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR	Pursue rulemaking to tighten the definition of “future utility”	Provide clarity and accountability for inactive wells

Under current regulation, operators can classify inactive wells with a “future utility” status if the well has potential for use in the future. However, DNR’s ability to grant indefinite extensions creates a higher risk for “future utility” wells to become orphaned wells and subsequently creates potential negative impacts on the environment and communities. For example, over 1500 wells have been classified as “future utility” status for more than 25 years, over 400 more than 50 years. Over 7000 wells are currently listed as “future utility” and have had that status more than 5 years. This action recommends that DNR’s Office of Conservation develop measures that tighten the definition and requirements of a “future utility” designation in its application and limit the duration a well can remain at “future utility” status. Under this action, current “future utility” wells would be reviewed and added to the list of orphaned wells as appropriate. Similar to other actions of Strategy 7, this action requires, and would benefit from, immediate action. **(Associated Submitted Action Proposals: 169)**

## ACTION 7.4 Provide workforce training to plug legacy wells

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR	Invest in workforce training programs for monitoring and plugging wells	Provide Louisiana workers opportunities to transition

Current Louisiana law limits operator responsibility to initial plug and abandonment; however, even capped and plugged oil and gas wells weaken and leak over time. Plugs are expected to last 100 years, even without enduring environmental stressors, and provide limited methane mitigation. This means that today: 1) millions of legacy wells are likely failing; and 2) all wells eventually become the responsibility of the government. For these reasons, this action proposes investment in training Louisiana’s workforce to monitor wells and quickly respond to leaks by plugging them. This action tasks DNR’s Office of Conservation to establish an Abandoned Well Pilot Program from federal and state funding that provides training and jobs for unemployed residents in Louisiana to plug orphaned wells. Pilots of this program should be initiated in parishes with the highest concentration of oil and gas infrastructure. **(Associated Submitted Action Proposals: 131)**

# STRATEGY 8. Monitor and regulate methane emissions

Methane, more than twenty-five times more potent than CO<sub>2</sub>, is a common and elusive GHG that must be monitored and abated for Louisiana to meet its emissions goals. Alongside leakage in pipeline infrastructure, methane is also intentionally and unintentionally released into the atmosphere through routine industrial practices, including at the wellhead of extraction, during transport and storage, refining, and direct use. Waste management facilities and sites are also sources of methane emissions that require monitoring and regulation. Stopping these leaks and avoiding intentional methane releases both require new techniques for monitoring, measuring, and capturing methane, set forth in actions of this strategy.

## Highlights of how this strategy can realize benefits for Louisiana:

- *Economy & Jobs:* Increasing the efficiency of methane extraction, reducing methane leakage, and maximizing methane recapture creates fewer economic losses from waste and leaks. Repairing methane leaks will also create jobs.
- *Effectiveness and Longevity:* Methane leaks and intentional releases are not fully known or tracked, so monitoring programs with emerging technologies can ensure leaks are detected and quickly repaired, increasing the effectiveness of methane reduction.
- *Human and Environmental Health:* Reducing methane leaks can improve air quality and pipeline safety, benefiting Louisiana’s ecosystems and residents. Data freely available to the public can build community support for actions directed at curbing emissions. With transparent access to methane emission information, communities can see realized benefits of investment in methane reduction.

## ACTION 8.1 Enact methane waste rules

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DNR / DEQ	Pursue rulemaking to align with methane rules of other states	Reduce amount of methane released

This action proposes that, through the interagency framework of Action 3.3, DNR’s Office of Conservation and DEQ collaboratively develop rules that require methane emitters to establish a baseline methane waste capture rate, determined by their quarterly reports, and enact methane waste rules in line with rules of other states. States such as New Mexico and Colorado have recently enacted methane waste rules to eliminate this wasteful practice with support from industry and environmental groups. New Mexico requires operators to capture no less than 98% of produced gas by December 31, 2026, starting on April 1, 2022. Although not setting a strict capture limit, Colorado requires use of modern, zero-emitting (clean) components at all new and most existing facilities to limit methane emissions. DEQ and DNR should immediately begin studying the standard best suited for regulating methane waste in Louisiana and begin the rulemaking process to align with the progress of other states. **(Associated Submitted Action Proposals: 43, 89, CO, NM)**



## ACTION 8.2 Establish methane monitoring stations in the GHG Monitoring Program

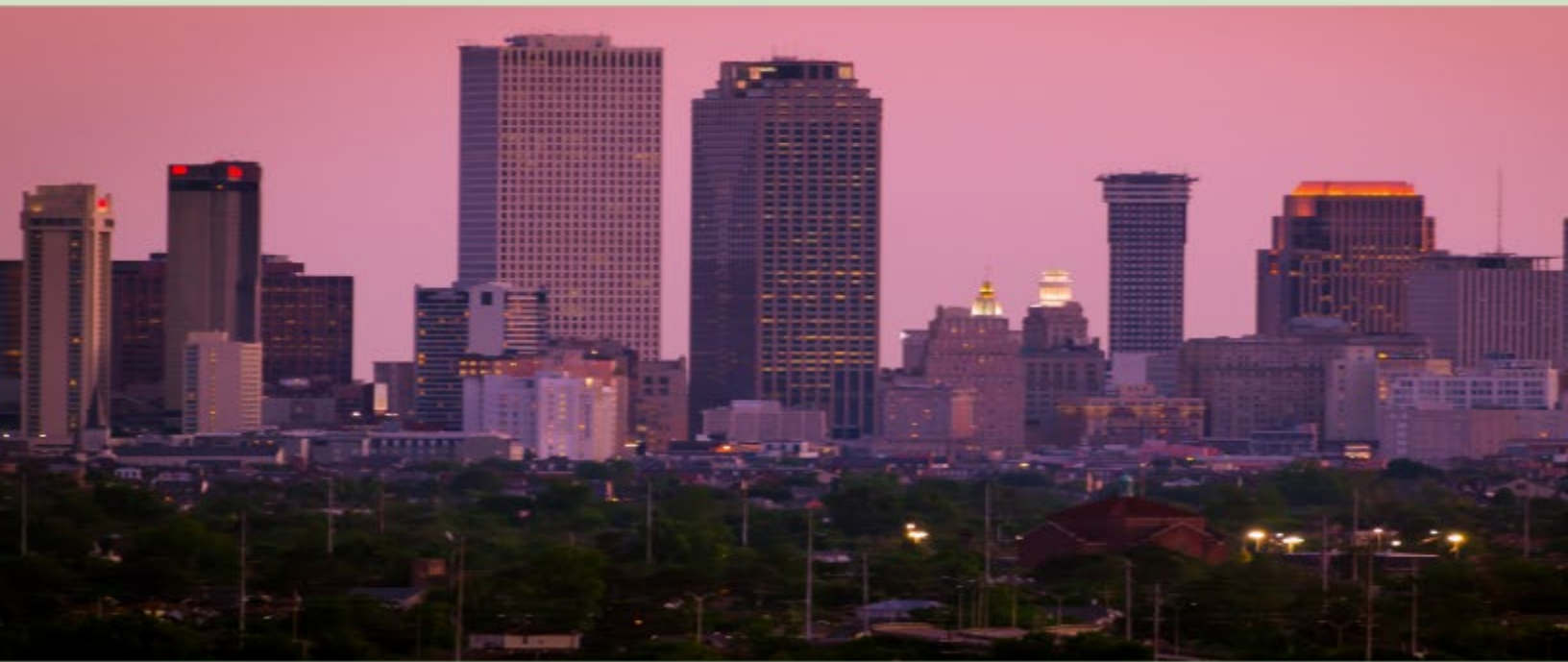
IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ	Incorporate emerging technologies into methane monitoring	Monitor methane releases with more frequency and accuracy

The most effective way to reduce leaks is to require frequent, and where possible, continuous monitoring. To more comprehensively monitor potent methane emissions, this action proposes that DEQ incorporate methane monitoring capabilities into the DEQ GHG Monitoring Program, proposed in Action 28.1 to ensure methane emissions are adequately understood and monitored. DEQ should work with outside stakeholders to utilize and deploy emerging technologies, such as remote sensing and satellite imagery, alongside traditional in-situ sensing for continuous monitoring of methane emissions. The GHG Monitoring Program should also ensure that data and maps that show regular fluxes in methane emissions are provided freely to the public and are updated on an annual basis. **(Associated Submitted Action Proposals: 76, 151)**

## ACTION 8.3 Enable an effective Leak Detection and Repair Program

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ / DNR / US-EPA	Strengthen LDAR best practices to monitor and fix malfunctioning practices	Repair methane releases with more frequency and accuracy

To align with federal rules to curb methane emissions by 30% by 2030, more regularly scheduled inspections, sufficient oversight measures, facility-wide leak rate goals, frequent component monitoring, and other measures are needed to complement federal funding and comprehensive monitoring to ensure leaks throughout the supply chain are swiftly detected and repaired. Many states have established Leak Detection and Repair (LDAR) programs, modeled after the U.S. EPA LDAR Program and [Best Practices Guide](#), to monitor GHG emissions and criteria pollutants and require owners and operators to find and fix leaky and malfunctioning equipment at production facilities, compressor stations, natural gas storage facilities, and process plants within a set time period of detection. Alongside reduced emissions, air quality and pipeline safety improvements make LDAR programs very cost-effective for all parties involved. Provided with the proper funds, DNR and DEQ, through their implementation framework in Action 3.3, should build on existing LDAR programs for criteria pollutants and develop a methane LDAR program. **(Associated Submitted Action Proposals: 91)**



# Transportation, Development, and the Built Environment

Five strategies and twenty-three actions encompass broad aspects of three priority areas: transportation, land use planning and development, and the built environment. Transportation approaches decarbonization of passenger, medium-duty, and heavy-duty vehicles alongside freight, aircraft, and shipping emissions. Development and the built environment-related strategies seek to reduce emissions through coordinating comprehensive land use planning and resilience as well as efficiencies of homes and buildings.

- **Strategy 9: Accelerate adoption and accessibility of clean vehicles and fuels**
- **Strategy 10: Reduce vehicle miles traveled and increase transportation efficiencies**
- **Strategy 11: Increase urban, rural, and regional public transit services**
- **Strategy 12: Coordinate land use planning to reduce sprawl and support healthy and resilient communities**
- **Strategy 13: Improve the efficiency and resilience of homes and non-residential buildings**

## STRATEGY 9. Accelerate adoption and accessibility of clean vehicles and fuels

Transitioning transportation from fossil fuel combustion to electric vehicles and low-carbon fuels will play a critical role in reducing emissions from this sector. Louisiana can support greater adoption of clean vehicles by expanding the infrastructure to support this transition, including charging and fueling stations that are accessible to more drivers and passengers across income levels. This strategy includes actions focused on light-duty passenger vehicles as well as actions tailored to the additional technological and infrastructural needs to transition medium- and heavy-duty transportation, shipping, and aviation to low or zero-carbon fuels. The state of Louisiana can lead by example through efforts to transition public fleets to clean and zero-emission vehicles.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Supporting the Workforce:* Investments enhancing transportation infrastructure, in conjunction with targeted job training, can provide employment opportunities to Louisianans, including those of differing educational backgrounds.
- *Strengthening the Economy:* Global and national trends may lead to broad, increased use of electric vehicles. This shift may alter expectations of residents, tourists, and commercial interests alike, and proactive preparation will enable a smooth transition and mitigate negative economic impacts.
- *Human and Environmental Health:* Increasing use of electric vehicles – which produce limited or no tailpipe emissions – can improve overall air quality with subsequent benefits to public health and the environment.

### ACTION 9.1 Shift public fleets to low and zero-emission vehicles

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Update procurement practices to meet public fleet transition goals	Transition 50% public fleets to low- and zero-emission vehicles and fuels by 2035 and 100% by 2050

With over 80,000 public vehicles operating in Louisiana, significant GHG emissions reduction can be realized by transitioning state and local government fleets to low- and zero-emission vehicles and fuels. This action would set a statewide policy and goal for the transition 50% of public fleet vehicles to low- and zero-emission vehicles and fuels by 2035 and 100% by 2050. Unless agency needs dictate otherwise, passenger, light-duty vehicles should move to zero-emission, electric vehicles, while heavy-duty trucks and vehicles transition to low-carbon alternative fuels, such as renewable diesel, that can be used in existing vehicles. Action should be led by DOA but requires coordination across state agencies, local government, and other public fleet users (e.g., levee boards) to update procurement policies and practices. To ensure successful implementation, training for vehicle maintenance should be made available to fleet managers. In order to meet the fleet transition goal, implementation must begin immediately with DOA prioritizing a transition for passenger, light-duty vehicles while technology continues to evolve for medium- and heavy-duty vehicles. **(Associated Submitted Action Proposals: 28, 36, 41, 143, 157)**

## **ACTION 9.2 Expand the availability and reduce socio-economic and geographic barriers of low- and zero-emission passenger vehicles and supporting infrastructure**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>DOTD / NGOs / MPOs / Local Governments</b>	<b>Utilize federal funding to intentionally build out infrastructure</b>	<b>250 electric vehicle charging stations per 100,000 residents by 2050</b>

As low- and zero-emission vehicles become increasingly available for passenger transit, steps need to be taken to ensure strategic and equitable statewide buildout of vehicle electrification infrastructure, with special attention given to underserved and overburdened communities. Louisiana’s Department of Transportation and Development (DOTD), in partnership with Louisiana Clean Fuels and others with local knowledge, can utilize federal funds to deploy electric vehicle charging infrastructure across the state in a way that is strategic and increases access for all communities. Together, DOTD and partners should also provide community education to increase the demand for and adoption of electric vehicles. A goal of 250 stations per 100,000 residents by 2050 should be adopted to ensure progress is made towards this action. Alongside charging infrastructure, action must also be taken to ensure access to the vehicles themselves across more income levels. To this end, incentives for low- and zero-emission vehicles should be reinstated by the Legislature, either in the form of a targeted incentive program or tax credit according to income, to accelerate adoption and reduce barriers to vehicle access. **(Associated Submitted Action Proposals: 83, 137, 175)**

## **ACTION 9.3 Prepare for the expanded availability of alternative fuels for waterborne transport, medium- and heavy-duty vehicles, and aviation**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>DOTD Transportation Research Center</b>	<b>Research efficacy of alternative fuels to decarbonize heavy transit</b>	<b>Research and deploy at scale solutions to decarbonize freight</b>

Increased availability of alternative fuel sources is critical to reducing GHG emissions and facilitating a smooth transition to carbon neutral transportation. This action proposes increased access to alternative fuels (particularly for heavy trucks), efficient and sustainable fuels (particularly for aviation), and investments in innovation (particularly for waterborne transportation). DOTD’s Transportation Research Center can immediately take the lead in advancing and innovating solutions that will reduce the GHG emissions from medium- and heavy-duty vehicles, waterborne shipping, and aviation. Meanwhile, other successful programs like the Port of New Orleans’ Clean Truck Replacement Incentive Program should be implemented with other Louisiana ports. **(Associated Submitted Action Proposals: 12, 13, 22, 27, 84, 94, 125)**

## ACTION 9.4 Implement targeted pilot projects to accelerate transition of medium- and heavy- duty vehicles to low- and zero-emission vehicles

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / DNR / DEQ	Identify and pursue pilot projects to decarbonize heavy transit	Research and deploy at scale solutions to decarbonize freight

Targeted pilot programs and demonstration projects can encourage and accelerate a transition to low- emission medium- and heavy-duty vehicles now, while technology advances to become more accessible and deployable at scale in the long-term. This action proposes DOTD, in partnership with DNR and DEQ, identify and implement targeted pilot projects to test emerging technologies in the near term that prepare for deployment at scale of clean medium- and heavy-duty transit. With recent federal investment in freight truck electrification, states agencies should partner with the U.S. DOE to access and serve as a conduit for freight decarbonization across the nation. Similarly, funding to replace diesel-fueled with electric school buses is available at the federal level. These vehicle transitions not only reduce emissions but can also serve as mobile power sources to meet community energy needs post-disaster. **(Associated Submitted Action Proposals: 41, 84, 137)**

## STRATEGY 10. Reduce vehicle miles traveled and increase transportation efficiencies

A central approach to reduce GHG emissions from the transportation sector is to reduce total travel demand and overall fuel usage by passenger and freight vehicles. Fewer trips and fewer vehicles on the road also reduce traffic congestion and traffic-related accidents. This strategy pursues efficiency through reduced vehicle idling, lowers the number of trips taken by expanding access to online services and remote work capabilities, and shifts passenger and freight trips to more efficient modes of transportation.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Human and Environmental Health:* In addition to reducing GHG emissions, reduction of vehicle miles traveled would reduce the production of other pollutants found in vehicle exhaust that can be harmful to public health and the environment. Furthermore, increasing safe access to active transportation options such as walking and biking provides more opportunities for exercise and is tied to improved public health outcomes.
- *Broader Access to Essential Services and Job Opportunities:* Increasing internet access and teleworking opportunities can provide additional access to essential services and employment opportunities to individuals for whom working or traveling outside the home may be challenging.

### ACTION 10.1 Promote opportunities to reduce vehicle miles traveled

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / MPOs / Local Governments	Utilize multiple mechanisms to implement VMT reduction strategies	Double use of alternative modes of transportation by 2035

Vehicle Miles Traveled, or VMT, are a common measure of transportation demand and can serve as a proxy for reducing GHG emissions associated with the movement of people or goods. Promoting alternatives to VMT can be accomplished through transportation mode shifting, where alternatives to automobile travel like walking or bike riding are encouraged, low-carbon or more fuel-efficient freight options, or where multiple individual trips are consolidated through carpooling or public transit. This action proposes that Louisiana set goals of doubling use of alternative modes of transportation by 2035. To meet this goal, the action tasks DOTD to support regional Metropolitan Planning Organizations (MPOs) and local governments to implement VMT reduction strategies that support, promote, and incentivize: 1) Complete Streets infrastructure (where the safe mobility for all users including pedestrians, bicyclists, public transit users, and automotive users is enabled and supported); and 2) the effective integration of local and regional transit and land use strategies, such as evaluating how project design criteria and scoping can be modified for different outcomes. This action pairs with the transit initiatives in Strategy 13 and the compact development actions in Strategy 14 and should build on existing success stories from partnerships with local government, nonprofits, and advocacy groups. **(Associated Submitted Action Proposals: 69, 70)**

## ACTION 10.2 Expand broadband internet access

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
BEL Commission	Leverage federal funding for expansion of broadband access	Reduce vehicle miles traveled through at-home resources

The COVID-19 pandemic has accelerated the transition to online services and work from home opportunities, but this transition has not been widespread nor accessible for all Louisianans due to limited access to broadband internet connections. Expanding broadband, particularly for rural communities, can facilitate easier access to e-commerce, telecommuting, employment opportunities, and virtual health while reducing overall transportation demand and GHG emissions. The state established the Broadband for Everyone in Louisiana (BEL) Commission in 2019 to facilitate adoption by private sector providers, public entities, and other stakeholders and availability of broadband for Louisiana residents. This action proposes partnering with the BEL Commission and their [2020 Action Plan](#) to maximize the potential of expanding broadband availability to mitigate GHG emissions and ensure cross-government and collaboration with multiple stakeholders to build out broadband effectively, efficiently, and equitably in public rights of ways and through other means. Specifically, with available federal funds from the 2021 Infrastructure Investment and Jobs Act, this action tasks the BEL Commission to apply for grants that connect Louisiana’s underserved communities to expanded broadband access and deployment. **(Associated Submitted Action Proposals: 25)**

## ACTION 10.3 Enact a state policy that allows for hybrid workplaces and telecommuting

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Adopt a statewide hybrid workplace policy	Reduce vehicle miles traveled through at-home resources

DOTD implements a variety of Travel Demand Management (TDM) strategies designed to maximize choice while reducing travel, single occupant trips, and congestion. TDM options are funded by DOTD and MPOs and include biking, walking, ridesharing, public transit, and telecommuting. To further reduce regular travel demand in Louisiana, this action proposes DOA adopt a statewide policy that allows for and encourages hybrid workplaces with reduced or staggered in-office days with telecommuting for public employees. Alongside reducing emissions, this policy eliminates time spent commuting and can cut energy usage in public buildings. **(Associated Submitted Action Proposals: 81)**

## ACTION 10.4 Reduce idling of public fleets

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Pursue rulemaking to require telematics for fleets	Maximize efficiency of GHG-producing vehicles

One gallon of fuel can be burned per hour of idling, wasting fuel and producing up to 20 pounds of CO<sub>2</sub>. Idle reduction technologies and practices can reduce the time that vehicle engines run while at rest and reduce these unnecessary GHG emissions and fuel waste. This action proposes that DOA requires idle reduction telematics be placed on all of Louisiana’s publicly owned GHG emitting vehicles. Implementation of this action would be supported by fleet telematics software,

already installed in many state-owned vehicles, to manage fuel usage and set an automatic shutoff for vehicles after prolonged idling. Training for fleet managers and operators in all agencies is necessary to support telematics usage and successful implementation across public fleets. Telematics requirements should be pursued in the short-term to reduce emissions from gasoline-fueled vehicles as the public fleet transitions to zero-emission vehicles. **(Associated Submitted Action Proposals: 33, 100, 161)**

**ACTION 10.5 Explore short-term opportunities and incentives to increase efficiency of freight transport**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / DOA / LED	Invest in research of smart transit techniques and best practices	Maximize efficiency of energy-intensive freight transit

Given the disparity between needed investments for freight infrastructure and available funding, DOTD, in partnership with DOA and LED, should work with private freight companies (ground, rail, ports, and aviation) to elicit, prioritize, and fund project proposals that can improve the efficiency of freight transportation in and through the state. Project examples include targeting emissions reductions for freight transport along highways, at ports, and at airports such as those that optimize traffic, directly reduce emissions and idling such as shore power, reduce carbon intensity, and explore mode shifting in ways that build upon existing DOTD congestion reduction programs. **(Associated Submitted Action Proposals: 1, 33, 106)**



## STRATEGY 11. Increase urban, rural, and regional public transit service

Reliable public transit systems are pivotal in the effort to reduce VMT and vehicle emissions. The hallmarks of a successful public transit system include consistent, high rates of ridership and stability of the systems that support both frequency and reliability of public transit service. To meet VMT reduction goals, more funding should be allocated to the State Transportation Plan and transit operations across Louisiana. Additionally, it will be important to coordinate more on-demand rural transit services and improve regional transit connectivity. This has the potential to connect communities to employment opportunities and other essential services across the state that are otherwise inaccessible.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Strengthening the Economy and Providing Access to Jobs and Services:* Investing in public transit can provide direct employment opportunities that strengthen the economy in the short-term, while increasing access to jobs more broadly by connecting workers to opportunities and providing long-term increases in workforce productivity.
- *Improving Quality of Life:* Public transportation infrastructure in both rural and urban settings can enable all Louisianans broader regional access to goods and services. It expands access to groceries, health services, and other basic necessities as well as avenues for recreation or entertainment for individuals and families that do not own a private vehicle—including members of historically marginalized communities.

### ACTION 11.1 Increase financial support to urban transit operators to increase statewide ridership

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / Regional MPOs / Municipalities	Leverage available funding for urban transit deserts and local jurisdictions	Reduce VMTs through connectivity within urban areas

More reliable and frequent public transit is necessary to increase ridership and reduce single-vehicle trips. Increased funding for local transit service, particularly in high-population areas of low-wage workers known as “transit deserts,” will also benefit marginalized, transit-dependent populations in urban areas and provide competitive access to economic opportunity. This action proposes that more resources be allocated to DOTD through the state budget and the Infrastructure Investment and Jobs Act to increase funding for transit operations in “transit deserts” and provide greater funding of the State Transportation Plan. The state should work with federal partners to ensure more federal funding moves down to regional MPOs to subsidize annual transit operations, provide resources to urban transit deserts, and allow local jurisdictions to secure funding more easily for transit locally. **(Associated Submitted Action Proposals: 95, 138)**

## ACTION 11.2 Enable access to resources outside urban centers for rural transit access

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / Local Governments / Rural Transit Providers	Develop on-demand ridership systems in rural areas	Reduce VMTs through connectivity within rural areas

Nearly 750,000 of Louisiana’s 4.6 million residents live in rural areas. Therefore, a necessary measure to reduce passenger vehicles on the road requires access to resources beyond urban centers and greater investment in rural transit service. This action builds on the prior action focused on local transit in urban areas and proposes that DOTD, local governments and rural transit providers take a variety of measures to enable resource access to rural communities including obtaining smaller transit vehicles for more specialized trips, developing an on-demand ridership system, and scheduling planned trips to city centers coordinated and supported by the community. Federal funding, allocated to the State Transportation Plan, should be prioritized for these expanded services. **(Associated Submitted Action Proposals: 81, 95, 128)**

## ACTION 11.3 Invest in regional transit to connect communities to jobs and services across Louisiana

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD / Local MPOs / Rural Governments / Municipalities	Collaborate and plan intentional connectivity between cities	Reduce VMTs through connectivity across regions of Louisiana

Alongside local and intra-city transit, regional connectivity can encourage greater use of public transportation across rural and urban areas and transport systems. Dedicated bus lanes and high-occupancy vehicle (HOV) lanes on interstates, state highways, and major arterial roadways allow for more efficient travel on highways and urban streets. For example, a portion of the \$66 billion available for passenger rail in the federal Infrastructure Investment and Jobs Act could be used to support a high-speed rail between New Orleans and Baton Rouge that could help minimize light-duty and bus travel between Louisiana’s largest cities for daily commuters, increase tourism economic activity, and participation in cultural or entertainment events. This action proposes federal investment through Louisiana DOTD, local MPOs, rural governments, and municipalities to intentionally begin collaborating on and planning in the short-term to build infrastructure that supports medium- and long-term regional connectivity across Louisiana. **(Associated Submitted Action Proposals: N/A)**

## STRATEGY 12. Coordinate land use planning to reduce sprawl and support healthy and resilient communities

Mitigating the emissions causing climate change is interconnected with adapting to the impacts of climate change, particularly as it pertains to land use and land use management. Reducing sprawl and promoting compact development, a practice where land is used efficiently and intentionally, reduces GHG emissions and makes communities more resilient. Compact development promotes risk reduction and open space conservation while encouraging reuse and retrofit of existing structures, energy efficiency, use of public transit and active modes of transportation like walking and biking, and reduced VMT. In order to coordinate across risks, vulnerabilities, relevant ongoing initiatives, and land use objectives throughout Louisiana, a statewide framework is needed to unify and guide holistic land use management. Actions under this strategy aim to improve the coordination of land use practices across the state and to assist local communities in planning for a climate-ready future.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Protecting the Environment:* Reducing sprawl slows expansion of new development into natural settings, preventing negative impacts to ecosystems and reducing the destruction of habitats.
- *Strengthening Community Resilience:* Smart land use planning enables communities to anticipate and mitigate the potential negative impacts of forces beyond their control, such as designing transportation systems that can withstand climate-related disasters and formulating proactive solutions to manage population growth.

### ACTION 12.1 Create a statewide authority to provide guidance for resilient local land-use practices

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Create an Office of State Planning	Support locals in comprehensive land use, climate mitigation, and adaptation planning

This action proposes the creation of an Office of State Planning housed within DOA. This Office should facilitate coordinated decision making as it relates to comprehensive land use, prioritizing initiatives that support flood risk reduction, maximizes community resilience, and reduces GHGs. The Office of State Planning should build strong partnerships across state agencies and with local and regional officials to demonstrate the potential for land use practices to help meet climate goals and reduce climate risk. The Office should support locals in the development of comprehensive land use plan and climate adaptation and mitigation plans that address the spectrum of relevant community challenges and incorporate the needs of underserved and overburdened populations. This land use authority should also partner with DOTD to promote and implement ways to VMT reduction measures (Action 10.1) and compact development practices (Action 12.2). **(Associated Submitted Action Proposals: 18, 40, 69, 128)**

## **ACTION 12.2 Encourage compact development through local trainings, incentives, tools, and model standards and ordinances**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>DOA Office of State Planning / DOTD</b>	<b>Convene stakeholders to plan and design compact development across levels of government</b>	<b>Maximize VMT reduction and utilization of regional transit through land use planning</b>

To encourage compact development, this action proposes DOTD and the Office of State Planning start in the near-term by convening public, private, and local government bodies that plan and design compact development, permitting, and regulation to maximize land conservation, community resilience, and reduced VMT. After receiving feedback from local groups, the state, through DOTD and the Office of State Planning, should pilot promising approaches to local planning and design incentives and regulatory systems that support compact development, Complete Streets, and equitable transit access. **(Associated Submitted Action Proposals: 65, 69, 70)**

## **ACTION 12.3 Align statewide transportation planning and decision making with land use and compact development planning**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>DOA Office of State Planning /Regional MPOs / Local Government</b>	<b>Develop land use and transportation modeling tools for utilization in decision making</b>	<b>Maximize VMT reduction and utilization of regional transit through land use planning</b>

Transportation infrastructure often dictates how and where land is used and developed in Louisiana. To ensure compact development, regional transit, and other actions set forth in this section are prioritized in the state, this action proposes that transportation planning align with smart land use practices. Land use and transportation modeling tools can test land use scenarios and transportation pricing programs and should be incorporated into how decisions are made in transportation. This alignment would not only reduce VMT, allow for widespread implementation of Complete Streets, facilitate equitable access to public transit, and reduce the need for single-occupancy vehicles, but would also allow for greater implementation of green infrastructure and resilience measures to mitigate against Louisiana’s flood risk. This action proposes empowering local governments and MPOs to develop tools that provide adequate information on alignment of these priorities, led by DOA’s Office of State Planning for land use guidance in partnership with DOTD in transportation guidance. Alignment of transportation planning with smart land use would be led by DOA with support from DOTD in close partnership by MPOs and local jurisdictions. **(Associated Submitted Action Proposals: 65)**

## ACTION 12.4 Evaluate the climate impacts of major state-funded transportation projects

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOTD	Incorporate a climate impact analysis into DOTD project planning and design	Mitigate unintentional emissions through large-scale transportation

Major transportation projects, such as the construction of new or expanded roadways, can have multiple cascading impacts on GHG emissions as well as community resilience—from the materials used in construction to the spurring of new areas of development to inducing more VMT and increased congestion. This action should require that proposals for medium- to large-scale state-funded transportation projects include an analysis by DOTD of their climate impacts, including induced GHG emissions as well impacts on community resilience from future weather events. Tools developed by DOTD for this analysis would be made freely available to parish and municipal governments to inform their decisions about locally-funded transportation projects. Transportation spending can also help jump start the “Buy Clean Louisiana” program (Action 6.1), prioritizing lower carbon intensity materials and advancing best practices and standards in road construction. Further, this action prepares Louisiana for policies set forth through the [US Department of Transportation’s Climate Action Plan](#), released in August of 2021. **(Associated Submitted Action Proposals: N/A)**

## ACTION 12.5 Develop a model solar ordinance for adoption by local governments

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA Office of State Planning / DNR	Create model solar ordinance policy materials	Encourage purchasing of renewable power

The interest by solar developers in building out infrastructure in Louisiana communities is increasing steadily and will need to continue to grow to meet Louisiana’s clean power needs. Ordinances can be important tools for guiding these developments while achieving community goals and standards. However, many - if not most - local governments lack the capacity and technical expertise to develop ordinances on their own. Furthermore, lack of knowledge or misinformation about solar energy facilities may leave communities unprepared and unprotected from the impact of this type of industry and land use. The model solar ordinance developed by this action would be a tool available to local governments and contain the comprehensive policy language needed to protect properties, environments, and people, as well as guide and support solar energy investments locally. This tool would provide context, information, and capacity to local governments, increase predictability of impact, and support current and future solar energy investments that can significantly help the state transition to renewable energy. This action recommends DOA Office of State Planning, in partnership with DNR, be the lead and authorizing entity to provide guidance for local governments and coordination with local land use. **(Associated Submitted Action Proposals: 20)**

## STRATEGY 13. Improve the efficiency and resilience of homes and non-residential buildings

Energy efficiency improvements and electrification of building components and appliances can reduce GHG emissions from residential and commercial buildings, while also reducing utility costs and potentially decreasing other air pollutants associated with electricity production. Combining energy efficiency retrofits with storm weatherization and other resilience improvements can ensure Louisiana homes and businesses are prepared for the future. Actions under this strategy support building retrofit programs as well as updates to energy efficiency standards and building codes.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Energy Affordability:* Enhancing the efficiency of homes decreases overall energy costs for families, through improved insulation, air sealing, and appliance and HVAC efficiency. Examples include increasing home insulation, reducing heating needs, and replacing lighting with lower wattage bulbs.
- *Economy and Jobs:* A regular pipeline of building retrofits and energy efficiency upgrades could create a steady pipeline of jobs in the construction trades.
- *Increased Quality of Life:* Retrofitting of homes provides opportunities to enhance the quality of life for residents by mitigating excess energy usage and improving indoor air quality and circulation, while conducting efficiency upgrades, such as remediation of lead and mold.

### ACTION 13.1 Accelerate the retrofitting of existing residential and commercial buildings to support comprehensive energy efficiency and resilience upgrades

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
PSC / LHC / DNR / DOA-OCD	Inventory and streamline application to existing efficiency programs	5% retrofit of residential and commercial buildings each year

With multiple residential and commercial efficiency programs in existence, this action proposes that the LPSC, in partnership with the Louisiana Housing Corporation, DNR, Office of Community Development, and local governments, streamline existing programs and leverage federal funds to reach a 5% retrofit per year retrofit target. Multiple programs across various governing entities, including DNR’s Home Energy Loan Program (HELP), the expired Home Energy Rebate Option (HERO) program, and the Louisiana Housing Corporation (LHC) Weatherization Assistance Program (WAP), often obfuscate eligibility and requirements for potential applicants. Similar to the New Orleans EnergySmart Program, this action should provide a centralized home assessment for homeowners needed to apply for any programs, clarify the intents of various efficiency programs, and direct residents and building owners to the application best suited for their needs. Lastly, program development through this action should coordinate outreach to encourage homeowners and small businesses to understand their energy usage, identify possible areas for improved efficiency, and develop loans or rebates for low-income communities to participate. This outreach is necessary to ensure equitable access to efficiency programs and to provide assistance for low-income communities. As mentioned in prior actions, opportunities for federal funding will flow through existing weatherization programs, which will provide immediately realized benefits upon implementation of this action. Alongside federal funding explicit for weatherization, federal pre- and post-disaster funding disbursed by the state should be required

to incorporate energy efficiency and weatherization best practices into residential and commercial new builds and retrofits of buildings. **(Associated Submitted Action Proposals: 16, 87, 102)**

**ACTION 13.2 Redesign and expand property-assessed clean energy (PACE) financing**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature / Local Governments	Pursue legislation for redesign of PACE	Encourage effectiveness of existing building efficiency programs

This action provides a voluntary avenue for home and business owners to finance energy efficiency and renewable energy projects for their property through property-assessed clean energy (PACE). The types of projects under PACE tend to include energy efficiency improvements (e.g., insulation, weather sealing, high-efficiency water heaters) as well as solar and other on-site renewable energy systems. Retrofitting low-income homes should also consider roof repairs, which may be a prerequisite for the effective deployment of rooftop solar. This program covers the up-front cost of qualified energy improvements with financing from a local government and then spreads the repayments over a longer period such that the costs of these energy improvements would be distributed over the lifetime of the project. This action proposes working with the Louisiana Legislature and local governments to redesign, enable, and expand PACE in Louisiana with specific provisions to provide access to low-income households, and to provide consumer protections. This includes education and outreach to developers, realtors, mortgage lenders, title companies, appraisers, and homeowners as well as streamlining and consistency of practices among actors. **(Associated Submitted Action Proposals: 146)**

**ACTION 13.3 Incentivize the electrification of building components in residential and commercial buildings**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature	Pursue legislation for efficient and electric appliance rebates	Encourage efficiency of building components

Alongside the need to retrofit homes for increased efficiency and weatherization, appliances and systems (e.g., water heaters, HVACs, driers, and stoves) account for a large share of building energy use. Electrifying these building components and systems not only reduce GHG emissions when they are powered by renewable or clean electricity, but they also save the user money due to increased energy efficiency. This action proposes that the Louisiana Legislature develop a rebate program to incentivize the purchase of efficient electric appliances and systems by homeowners and small businesses. To improve equitable access, rebates should be on a graduated scale based on income. This action would also work with retailers, contractors, and distributors to increase stocking of these appliances, so they are available options for unplanned upgrades (i.e., appliance breaks). It also includes making more widely available point-of-purchase materials to increase awareness. **(Associated Submitted Action Proposals: 29)**

### ACTION 13.4 Strengthen minimum energy and lighting efficiency standards for residential, commercial, and public buildings

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature / LSUCCC	Pursue legislation for energy efficiency code updates and standards	Require minimum efficiency of buildings

Minimum efficiency standards can reduce energy demand and the associated GHGs from buildings. Currently, the authority to set energy efficiency standards for buildings and structures is distributed across multiple state entities, including the Louisiana State Uniform Construction Code Council (LSUCCC), the state fire marshal, and DNR. This action proposes that the Louisiana Legislature allow the LSUCCC to update Part IV-Energy Conservation of the International Residential Code beyond the 2009 edition. This action further proposes that the state fire marshal update the Commercial Building Energy Conservation Code to strengthen energy efficiency standards. The state fire marshal, and the LSUCCC should it receive authority to update the Residential Energy Conservation Code, should consult with the DNR Office of Energy, DOA Office of Facility Planning and Control, local governments, the LPSC, LHC, residents, and key stakeholders when updating these respective codes. **(Associated Submitted Action Proposals: 133)**

### ACTION 13.5 Lead by example in Louisiana through energy benchmarking in state public buildings

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DOA	Pursue funding for implementation of energy benchmarking requirements	Monitor carbon impact of buildings and building materials

The Louisiana Legislature passed Act 1184 in 2001, requiring benchmarking and disclosure of energy performance of buildings constructed with state funds. However, funding constraints has impeded implemented by DOA's Office of Facility Planning and Control. With immediate emission reductions that can be actualized, this action proposes that the state allocate funding in the near-term for DOA's implementation of Act 1184 and development of a system for benchmarking the energy performance of public buildings in Louisiana. This benchmarking system would use a life-cycle analysis methodology to calculate the carbon impacts from construction, materials, and operations over time. This system can be used to guide scoping, design, and procurement, but also in evaluating the carbon impacts of retrofits compared to a new build alternative. Once developed, the energy benchmarking system could also be used by state subdivisions, parishes, and municipalities in the medium- and long-term as a guide for developing their own initiatives, such as the St. Tammany Healthy Resilient Buildings Initiative, that can realize energy cost savings and improved air quality. **(Associated Submitted Action Proposals: 50, 87, 104, 134, 161)**



## ACTION 13.6 Update statewide building codes

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LSUCCC	Pursue building code updates through the 2021-2022 revision process	Require minimum energy performance standards of buildings

The Louisiana State Uniform Construction Code Council (LSUCCC) is tasked with reviewing and approving updates to the state’s building code. The Louisiana Legislature has, in the past, directed the LSUCCC to review and adopt new codes, such as the plumbing code. In the near-term, this action encourages the LSUCCC to complete the process of code adoption that is underway and adopt stronger minimum energy performance standards and codes for Louisiana by July 1, 2022. If newer building codes were adopted, building projects could take advantage of the latest low-carbon materials such as mass timber. In implementing this action, the Louisiana Legislature should also change the LSUCCC authorization and require them to adopt the latest model codes (such as the residential I-Codes or the ASHRAE 90.1 energy code) automatically as new versions are published, except if overridden by a majority vote of the LSUCCC. **(Associated Submitted Action Proposals: 75, 133, 50)**



# Natural Working Lands and Wetlands

This section includes three strategies to promote a comprehensive approach to action in the sector. Natural lands address preservation and conservation of existing lands to increase sequestration potential of Louisiana's lands and forests. Working lands promotes regenerative and sustainable agriculture practices to reduce emissions and enhance sequestration of farming, ranching, and forestry lands. Wetlands promote work done through the Coastal Master Plan and increase sequestration capacity of wetlands. Across these three strategies, the section aims to maximize climate mitigation and adaptation goals simultaneously, understanding that resilience and flood risk must be maximized in how Louisiana protects our lands for sequestration potential and comprehensive ecosystem benefits.

- **Strategy 14: Preserve and expand natural lands and urban green spaces to maximize climate mitigation and adaptation goals**
- **Strategy 15: Restore and conserve Louisiana's coastal wetlands to maximize climate mitigation and adaptation goals**
- **STRATEGY 16. Support the sustainable management and conservation of working agricultural**

# Strategy 14. Preserve and expand natural lands and urban green spaces to maximize climate mitigation and adaptation goals

Louisiana’s natural lands, from bottomland hardwood forests to urban green spaces, sequester carbon while also providing multiple ecosystem services and playing an important role in statewide resilience to the effects of climate change. The continuation and enhancement of these co-benefits hinges on natural land and urban green space preservation, conservation, and expansion. The actions within this strategy emphasize the importance of social equity in conservation planning to ensure that co-benefits can be realized for all Louisianans and ecosystems.

## Highlights of how this strategy can realize benefits for Louisiana:

- *Access to Healthy Ecosystems:* Preservation and restoration of natural lands such as riparian buffers can contribute to continued access to clean water and productive ecosystems that also support fishing and hunting resources, both recreational and commercial. Natural lands are central to Louisiana’s cultural heritage, including Indigenous cultures.
- *Reduced Environmental Disparities:* Investments in urban green spaces and natural lands can directly benefit local communities by increasing access to recreational amenities and reducing urban heat island effects through shading building surfaces, deflecting radiation from the sun, and releasing oxygen. Thoughtfully focusing investments in historically underserved communities can narrow existing socioeconomic disparities in access to green space and its benefits.

## ACTION 14.1 Conserve Louisiana’s interior natural lands, prioritizing forested lands, floodplains, wetlands and riparian areas

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LDAF / land trusts / local government / private landowners	Assess a baseline of areas most in need of conservation	30% conservation of interior natural lands by 2030

This action sets a target for 30% of Louisiana’s interior natural lands be conserved or protected by 2030. This is a reasonably ambitious target based on the data and information that we have to date; however, a comprehensive baseline assessment of existing conserved and protected lands and areas to prioritize for conservation that maximize ecological and social co-benefits will be a critical first step towards meeting this target and refining it if necessary. Because of the state’s flood risk, action should focus on forested land, floodplains, wetlands, and riparian areas that provide critical watershed function and flood risk mitigation. Priority areas should be preserved in partnership with private landowners through voluntary expansion of conservation servitudes and other conservation tools in partnership with landowners, land trusts, Louisiana Department of Agriculture and Forestry (LDAF), and local government. This action should also ensure alignment with projects and models of flood risk from the Coastal Master Plan and Louisiana Watershed Initiative. **(Associated Submitted Action Proposals: 40, 68)**

## ACTION 14.2 Support the expansion of urban tree canopy and green spaces

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LDAF / parish and municipal governments	Convene stakeholders of major urban areas	30% conservation of interior natural lands by 2030

Activities that reforest public areas in urban environments and increase urban green spaces (e.g., parks, gardens, farms) can sequester carbon while also reducing heat island effect, reducing localized flooding, and increasing access to open space. This action proposes the state government, through LDAF, serve as convener of parish and municipal governments to develop and promote a coherent, statewide approach that supports tree plantings and maintenance in urban areas, particularly in historically underserved communities. In addition to this statewide approach, this action should empower locals to survey existing tree canopies in urban areas, with progress tracked and reported annually. Funding for this initiative should come from a requirement that state-funded transportation projects dedicate at least 3% of project costs to the planting of trees and the provision of landscape-based stormwater runoff management, with a specific focus on conservation in low-income, urban areas in both regional and local plans (e.g., State Watershed Plan, Hazard Mitigation Plan, Comprehensive Plans). **(Associated Submitted Action Proposals: 2, 4, 44, 64, 68, 78)**

# STRATEGY 15. Restore and conserve Louisiana’s coastal wetlands to maximize climate mitigation and adaptation goals

As with Louisiana’s inland natural lands, our coastal wetlands sequester carbon and provide important ecosystem services, while also serving a critical role in buffering against rising sea levels and severe storms. Restoring and maintaining coastal wetlands for mitigation against these climate change-related threats can benefit Louisiana’s vulnerable coastal communities and ecosystems, as realized through implementation of Louisiana’s Coastal Master Plan. While sources of GHG emissions are well characterized in the 2021 GHG Emissions Inventory, significant knowledge gaps remain related to sequestration of carbon by the diverse ecosystems of Louisiana. Actions in this strategy include mechanisms to fill knowledge gaps and improve the accuracy of our data on natural carbon sinks in Louisiana.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Resilience to a Changing Environment:* Investments in restoration and conservation planning can increase community resilience to the threats of sea level rise and severe storms by providing a natural buffer to these threats.
- *Cultural Heritage:* The unique cultural heritage of South Louisiana is intrinsically tied to the natural environment of the coast, highlighting the need to protect environments important to traditional living cultures, including Indigenous cultures and traditional fishing communities. Project-by-project considerations are important for understanding how restoration projects impact cultural heritage.
- *Economy and Jobs:* Louisiana’s coast is a working coast, with 20% of U.S. waterborne commerce coming through our ports and coastal wetland that provide important habitat for commercially important fish and game species. Conservation and restoration of Louisiana’s coastal habitats is critical to both our local and national economy.

## ACTION 15.1 Optimize the carbon sequestration potential of Louisiana’s coastal wetlands through implementation of Coastal Master Plan projects

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
CPRA	Study carbon storage potential of wetland projects	Maximize carbon sequestration of coastal wetland restoration

Implementation of Louisiana’s Coastal Master Plan includes coastal restoration actions to reduce land loss with a focus on risk reduction to support coastal communities. This action proposes that the Coastal Protection and Restoration Authority (CPRA) incorporate climate mitigation goals and measures (e.g., carbon sequestration potential of wetlands) into future iterations of the Coastal Master Plan as well as into project design and prioritization. Carbon sequestration potential should further make the case for investment in Louisiana’s coastal program and unlock additional resources for project implementation. *(Associated Submitted Action Proposals: 77)*

## **ACTION 15.2 Quantify and monitor the potential coastal blue carbon in Louisiana habitats and Coastal Master Plan projects**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>CPRA</b>	<b>Invest in assessments of net carbon flux of coastal wetlands</b>	<b>Maximize carbon sequestration of coastal wetland restoration</b>

Quantification and monitoring to assess net carbon flux of Louisiana’s coastal wetland habitats (fresh, intermediate/brackish, saline, and submerged aquatic vegetation; also known as coastal blue carbon) and open water habitats is a crucial step towards building a robust carbon finance framework. Carbon financing presents an opportunity for the state to partner with industry to expand coastal wetland restoration initiatives. Though a comprehensive understanding of blue carbon requires long-term study, existing efforts should continue through: 1) research and development led by the state, non-profits, the private sector, and/or academic institutions to create accurate models that will allow quantification of Louisiana’s coastal blue carbon over time and across variable environmental conditions; and 2) expanded support and monitoring capacity of existing foundational monitoring programs (e.g., System Wide Assessment and Monitoring Program (SWAMP) that includes the Coastwide Reference Monitoring System (CRMS)) to quantify coastal blue carbon across coastal Louisiana over time. **(Associated Submitted Action Proposals: 59, 60, 77)**

## **ACTION 15.3 Develop crediting mechanism and market specific to blue carbon**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>Universities / CPRA</b>	<b>Collaborate with stakeholders to design a carbon credit and market</b>	<b>Maximize investment in carbon sequestration of wetland restoration</b>

Existing carbon markets are designed primarily for terrestrial forests and have not readily accommodated crediting of coastal wetlands. Specifically, standards for additionality and permanency must be tailored for dynamic coastal wetlands to recognize and account for their GHG benefits while being grounded in the realities of those dynamic systems. The natural carbon sequestration potential of Louisiana’s coastal habitats is too valuable to be entirely precluded from market-based systems that can support the conservation and restoration of these important ecosystems. Louisiana should evaluate the design and market interest for the creation of a specialized carbon credit and market specific to Louisiana’s coastal wetland habitats. This potential Louisiana credit and market would more directly take into account the sequestration potential of coastal wetland habitats as well as the shorter time scales that conservation or restoration efforts would be expected to offer given the dynamic nature of deltaic systems. This credit and market would attempt to match the local and global demand for natural carbon credits with the urgent need to protect and restore Louisiana’s wetland ecosystems for the preservation of the state’s culture, communities, economy, and environment. **(Associated Submitted Action Proposals: 59, 60, 77)**

# STRATEGY 16. Support the sustainable management and conservation of working agricultural and forestry lands

Agriculture and forestry are a large component of Louisiana’s economic prosperity as a state and requires intentional management to curtail and sequester GHG emissions. Best management practices and adoption of new technologies can help Louisiana reduce emissions from land practices while restoring natural ecosystems and biodiversity. Adoption of such practices will benefit from rural and urban focus, where equitable access for all farmers and foresters to such practices and technologies can be explored through grants and research programs. Actions within this strategy emphasize collaboration across all stakeholders and agencies to support the transition of Louisiana’s farmers to adopting less GHG-intensive agricultural and forestry practices.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Public Health and Safety:* Agricultural best management practices can reduce nutrient runoff and improve water quality leading to lower incidences of harmful algal blooms, higher productivity for local ecosystems, and additional benefits to public health and safety.
- *Community Engagement and Participation:* Stakeholder engagement is critical in encouraging voluntary adoption of new practices and technology that better manage and increase the carbon sequestration potential in Louisiana’s agricultural and forestry lands. Implementation of this strategy must consider engagement at multiple scales and through multiple mechanisms to communicate benefits of transitioning away from high GHG-emitting practices.
- *Strengthening Louisiana’s Economy:* Sustainable use of working lands leads to healthier soils, which promote long-term management and greater longevity of production. Moreover, encouraging Louisiana’s investment in its own consumption of Louisiana-derived agricultural and forestry products will provide further strength to the state’s economy while reducing GHG emissions stemming from product export.

## ACTION 16.1 Establish a Louisiana Conservation Innovation Program

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
USDA / LDAF	Leverage USDA investment for innovative practices	Encourage conservation practices that sequester carbon

Founded on the U.S. Department of Agriculture (USDA) Conservation Innovation Grant Program, many states have established Conservation Innovation Programs to incite creativity and promote development of innovative conservation practices uniquely tailored to benefit the state. This action proposes creation of a Louisiana Conservation Innovation Program within the LDAF to stimulate development and adoption of innovative conservation approaches and technologies that curtail and sequester GHG emissions. Through partnering with USDA, the LDAF should request funding to promote pilot projects, field demonstrations, and on-farm conservation research for the development of innovative practices specific to Louisiana. **(Associated Submitted Action Proposals: 42, 110)**

## ACTION 16.2 Support the transition to regenerative agriculture and forestry practices

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
USDA-NRCS / SWCDs / LDAF	Convene farmers, ranchers, and foresters to identify barriers	Increase access to regenerative agriculture and forestry practices

Regenerative agriculture is a system of farming principles and practices that seeks to rehabilitate and enhance farm ecosystems by emphasizing soil health, water management, fertilizer use, and other best management practices. Transition to regenerative agriculture and forestry practices is essential to minimize the agricultural sector’s GHG emissions, maximize agricultural sequestration potential, and promote healthy soils and ecosystems. However, many barriers impede widespread transition. This action proposes that, in the short-term, LDAF and local Soil and Water Conservation Districts (SWCDs) convene focus groups of farmers, ranchers, and foresters to identify barriers to adoption of various conservation practices and identify opportunities and solutions to overcome those challenges. As consensus is built around impediments to adoption of regenerative agriculture and forestry conservation practices 16.2 LDAF, SWCDs, and the USDA Natural Resource Conservation Service (NRCS) should collaborate to develop a competitive grant program that offers technical and financial assistance to landowners that guide and support transition and lower barriers to on-farm conservation practices. *(Associated Submitted Action Proposals: 88)*

## ACTION 16.3 Expand implementation of on-farm conservation plans

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
USDA-NRCS / SWCDs / Landowners	Advocate for further on-farm conservation funding	Increase access to regenerative agriculture and forestry practices

On-farm conservation plans have had the largest success in transitioning farmers, ranchers, and forest landowners to implementing conservation practices. The Louisiana Conservation Delivery Program, a partnership of the USDA NRCS and local SWCDs with individual landowners, is responsible for development of voluntary on-farm conservation plans of sustainable practices through enhancing and conserving soil, water, and related natural resources. This action proposes uplifting this successful collaboration and program through advocating for expansion of federal and state funding. With more funding, the program should incorporate and fund removal of marginal lands (land that has little or no agricultural or industrial value) from production into conservation plans. *(Associated Submitted Action Proposals: 38, 39)*

## ACTION 16.4 Measure carbon sequestration potential of conservation farming and forestry best management practices

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Universities / LDAF / DEQ	Study ability of BMPs to reduce and sequester GHG emissions	Encourage conservation practices that sequester carbon

Best management practices (BMPs) are central in the transition to regenerative and conservation farming and forestry, though their emission reduction and carbon sequestration potential have not been uniformly quantified. This action tasks Louisiana’s research institutions to study, monitor, and publish data on the co-benefits and impacts of BMPs to abate



GHG emissions, improve soil and water quality, improve natural ecosystems, and sequester carbon. We recommend this study begin immediately so that results can be incorporated into best management practices and on-farm and on-forest conservation programs implemented. **(Associated Submitted Action Proposals: 34)**

**ACTION 16.5 Establish an urban agriculture and conservation program in the LDAF**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LDAF / SWCDs	Develop an urban agriculture and conservation program	Increase urban access to regenerative agriculture and forestry practices

As expressed in prior actions, LDAF currently offers a variety of approaches to conservation through partnerships, programs, and projects through its Office of Soil and Water Conservation and SWCDs. To build on this extensive work and bring more stakeholders to the conservation conversation, this action proposes the development of an urban agriculture and conservation program within the LDAF to ensure adoption of regenerative and sustainable practices across all Louisiana landscapes. The proposed program should provide educational resources, workforce development and training, marketing assistance, and grant support for farmers, landowners, foresters, and other stakeholders in urban areas. We recommend near-term creation of this program to ensure a comprehensive and inclusive approach to conservation across Louisiana. **(Associated Submitted Action Proposals: 88)**

**ACTION 16.6 Establish regional compost facilities and accompanying local programs**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LDEQ / LDAF	Collaborate on strategic design and locations of compost facilities	Increase access to regenerative agriculture practices

Composting is an effective waste and GHG reduction measure that diverts organic materials from landfills and incinerators and converts those materials into valuable fertilizer to replenish and stabilize the soil. LDEQ already implements an Agriculture Solid Waste BMP Program, though compost is not always the use at the end of the waste stream. This action proposes LDEQ and LDAF partner to designate regional compost facilities, promote compost as a solid waste BMP, and partner with parish- and municipal-level compost programs. LDEQ should designate and fund regional compost facilities for partnership with local entities, and LDAF should work with farmers to promote on-farm compost. Near-term implementation of these actions will increase the viability of local compost program and community gardens that further promote sustainable and local agriculture, providing resources to underserved and overburdened communities. **(Associated Submitted Action Proposals: 154, 158, 159, 160)**

## **ACTION 16.7 Encourage sustainable forest management and greater use of Louisiana forest products for construction**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LFA / LDAF / DOA / LED	Convene major foresters for educational sessions	Increase access to regenerative forestry practices

Markets for wood products create incentives for landowners to plant more trees and better management forests, resulting in more carbon sequestered. Educating landowners on sustainable forestry practices that maximize carbon sequestration and how to participate in carbon markets as well as encouraging manufacturers and end users to use of sustainably forested products in construction and consumer products increases the amount of carbon stored by trees. This action proposes LDAF’s Forestry Protection Program and the Louisiana Forestry Association (LFA) partner to educate major foresters on the sustainable management of forests and the necessary steps to engage in existing carbon markets. DOA and LED should also encourage use of Louisiana forest products – lumber, plywood, paper, wood pellets, and biomass – in state capital projects and other construction projects. Cognizant of Louisiana’s forestry resources and markets, it is recommended that outreach to foresters, manufacturers, and end users begin immediately for this transition to be effective. **(Associated Submitted Action Proposals: 26, 31, 67)**



# An Inclusive, Low-Carbon Economy

Two strategies and nine actions detail key components to an inclusive, low-carbon economy that supports and promotes clean energy development and transition. This section focuses on how Louisiana workers and businesses are centered in the transition through accessibility of education and resources to retrain. Education, research, and innovation are another necessary focus of this section that take steps to coordinate research, train the next generation of citizens and workers, and enhance partnerships with unions and the private sector

**Strategy 17: Build a more inclusive and resilient economy for all Louisiana residents**

**Strategy 18: Strengthen climate education, research, and innovation as a focus of Louisiana's energy transition**

**Strategy 19: Prioritize Louisiana workers and businesses in the transition to a low-carbon economy**

# STRATEGY 17. Build a more inclusive and resilient economy for all Louisiana residents

Deliberate action is necessary to ensure that all Louisianans have equitable access to future economic opportunities and that any disruptions to the economy associated with the energy transition do not fall disproportionately on any one community. By prioritizing the success of those who have historically been excluded from the benefits of prior economic transitions and those who are most directly affected by the energy transition, the shift to a low carbon economy can more broadly, inclusively, and equitably provide benefits throughout the state.

**Highlights of how this strategy can realize benefits for Louisiana:**

- *Supporting historically marginalized groups:* Targeted effort to address historical and ongoing inequities is more likely to lead to positive outcomes for the clean energy transition and for historically marginalized communities and residents, including communities of color and Indigenous peoples.
- *Strengthening the economy:* By proactively providing training and opportunities, Louisiana can ensure that people and communities historically left out of previous economic booms can be part of building Louisiana’s clean energy future.

## ACTION 17.1 Establish a Louisiana Plan for Economic Transition

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LED / LWC / Louisiana Technical and Community College System	Convene stakeholders to develop vision and ambition for the transition plan	Support Louisiana agencies, industries, and workers in energy transition

This action proposes the establishment of a Louisiana Plan for Economic Transition to help provide strategic direction and support to the state, workers, and small businesses as they manage overlapping economic transitions. This planning effort should conduct research and develop a statewide and regional strategies for addressing the transitions resulting from globalization and trade disruptions, rapid technological shifts such as increased automation, changes to fossil fuel prices and demand, global efforts to decarbonize the energy sector, and other challenges resulting from climate change. The Plan for Economic Transition should consider opportunities for economic development that diversify the Louisiana economy while also encouraging growth in low-carbon industries like renewable energy and outline educational and training opportunities and programs to support and grow Louisiana’s workforce. This planning effort would also identify specific strategies and programming to ensure that current workers in the energy industry are assisted as the energy transition occurs, and that economic opportunities are available and tailored to communities that have been historically marginalized or excluded from participating in economic advancement. This action would be a joint effort by LED, the Board of Regents, regional economic development organizations, the Louisiana Technical and Community College System, and the LWC. Together, these entities would help promote and attract new economic opportunities to the state while also preparing workers for emerging opportunities related to the low-carbon economy of the future.

# STRATEGY 18. Strengthen climate education, research, and innovation as a focus of Louisiana’s energy transition

To build climate leadership throughout the state, it is critical that Louisiana allocates the funding and resources necessary to coordinate climate education programs across the state and facilitate better collaboration among research institutions that specialize in climate change mitigation and adaptation. Education, at all levels, and applied research are the foundation of a more inclusive, low-carbon economy and critical to ensuring that the next generation is prepared, resilient, and innovative when facing future climate threats.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Economy and Jobs:* The national and global focus on climate change and reduction of GHG emissions will present numerous opportunities for researchers, innovators, and practitioners to apply climate-related expertise in locations outside of Louisiana and bring revenue and opportunities to the state.
- *Increasing the Likelihood of Success:* Many promising technologies to reduce net GHG emissions reductions, particularly from industrial sectors that form key parts of the Louisiana economy, have yet to be fully developed or applied at scale. Research and development to advance GHG reduction solutions is vital to achieving success as a low-carbon economy.

## ACTION 18.1 Establish a Research Practitioner Partnership (RPP) Program to support climate education

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Department of Education	Develop climate curricula and projects for K-12 education	Center climate education in K-12 classrooms

This action, enabled through the Louisiana Department of Education STEM Team and the LA STEM Council, proposes a Research Practitioner Partnership (RPP) Program, led by the Louisiana Department of Education, to provide dedicated, yearly funding and support for K-12 climate education projects and curricula implemented by educators, researchers, practitioners, industry, and policy makers. Expansion of climate education is a critical step towards ensuring that the next generation is prepared, resilient, and innovative when facing future climate threats. This action recommends the Department of Education begin conversations with the LA STEM Council to build a framework for climate education with long-term ambition to establish the RPP Program followed by schools across Louisiana in K-12 education. **(Associated Submitted Action Proposals: 54)**

## ACTION 18.2 Teach, re-train, and employ Louisiana residents in clean energy sectors

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LWC / Universities / Community Colleges	Develop relevant education, training, and re-training courses and curricula	Guarantee job training for workers in energy transition

Training Louisiana workers is a critical step towards transitioning and growing the state’s local clean energy industry. This action, enabled by the Louisiana Board of Regents and the Louisiana Workforce Commission (LWC), would create a Climate Corps Program in the LWC for local community colleges and Louisiana universities to provide education, training, and re-training necessary to support the growth of the renewable energy industry. This action would also encourage the growth of rural jobs that take advantage of natural carbon sequestration, such as encouraging employment of foresters and land managers who understand the best practices for natural carbon sequestration. With the ability to utilize federal funding from President Biden’s Build Back Better Framework, near-term leadership from the LWC will enable training and career track transition programs in the form of four-year degrees, two-year degrees, and industry certificate programs to be offered by universities and community colleges in the following areas: information technology, electrical engineering, utility management, and electrical vehicles (manufacturing, operations, maintenance). **(Associated Submitted Action Proposals: 23,99, 137)**

## ACTION 18.3 Coordinate climate change mitigation and adaptation research needs across Louisiana’s academic, public, and private institutions

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
The Water Institute of the Gulf	Collaborate with universities to identify existing climate-related work and research gaps	Support Louisiana universities in energy transition

Louisiana’s extensive research institution and university networks offer widespread expertise well-suited to inform climate action. Many research institutions are already investing in and undertaking research related to various aspects of climate action, though this research and development is often not coordinated. This action proposes centralized coordination of climate action across the public, private, and academic networks. Immediate action should be taken by the Water Institute of the Gulf (TWI), designed as the state’s Innovation and Collaboration Hub, to inventory interdisciplinary climate research capabilities across the state and provide a broad understanding of existing in-state expertise in climate action to the Governor’s Office. Following completion of this inventory, TWI should launch a partnership program to serve as the coordinating unit that convenes institutions to identify state research needs, discuss emerging work, and partner across universities on grant and project proposals that seek to understand existing emissions and emission reduction measures. Partners of this program would meet semi-annually beginning in 2023 to coordinate ongoing work and identify emerging opportunities for research, development, and demonstration or pilot projects for the state. **(Associated Submitted Action Proposals: N/A)**

# STRATEGY 19. Prioritize Louisiana workers and businesses in the transition to a low-carbon economy

For Louisiana to successfully shift to a low-carbon economy, the state must invest in the training and preparation that Louisiana workers need to build and maintain clean energy infrastructure and find opportunities in other industries and sectors as the economy retools. This will require targeted training and re-training initiatives, a strong commitment to the development of renewables industries, and the creation of proactive programs that ensure the successful transition of oil and gas workers to job placements in clean energy and beyond.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Supporting the Workforce:* The state of Louisiana is likely to see shifts in the types of industries providing employment opportunities for workers, particularly those with varying educational backgrounds. Workers can benefit from the transition to a low-carbon economy through targeted training that will equip them with the high-demand skill sets needed to deploy the strategies laid out in this plan.
- *Strengthening the Economy:* By ensuring that Louisianans have the knowledge and skill sets needed to support building and maintaining the infrastructure needed to reduce net GHG emissions, this transition can serve as an economic driver and attract future investment into the state.

## ACTION 19.1 Promote and invest in Louisiana-based low-carbon industries, including specialized worker training and long-term economic development planning to recruit, develop, and retain firms and workers

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LED / LWC / Louisiana Community and Technical College System	Invest in Louisiana-based low-carbon industry through tax incentives	Support Louisiana industries in energy transition

Louisiana has many programs and investments in place to promote the existing energy industry that could be modeled or retooled to promote and invest in emerging low-carbon opportunities such as renewable energy, coastal blue carbon, hydrogen, and low carbon fuels. For example, the technical needs of solar power generation can be different at the utility scale than the distributed scale. However, with the proper training, a worker could be qualified to work on either installation thereby improving the likelihood of maintaining steady work across utility and distributed projects. This action recommends a combination of legislative and executive actions by LED, regional economic development organizations, the Board of Regents, the Louisiana Community and Technical College System, and the LWC to adjust and propose tax incentives, worker training programs, and determine other ways to speed and smooth the transformation of the state’s energy systems, workforce, and economy. **(Associated Submitted Action Proposals: 23, 61, 93)**

**ACTION 19.2 Establish and expand entrepreneurial and jobs programs in under-resourced communities to meet the needs of the energy transition**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LED	Prioritize investment in disadvantaged business enterprises and communities	Support underserved communities in energy transition

If the energy transition is to reach communities most impacted by climate change and disinvestment, Louisiana should extend the physical reach of entrepreneurial and workforce training programs specifically to these communities. Implementation of this action includes extending existing offices and programs, like the Small Business Assistance Centers run by the LED, to all communities and expanding new services specific to the energy transition for all communities (e.g., Rapid Response teams, Action 19.3). This action recommends LED identify and plan targeted outreach opportunities to assist disadvantaged business enterprises with state and federal procurement, alongside identifying business development opportunities for small businesses and workers in these communities. A combination of community- and business-based outreach will help ensure access to and widespread benefit from investments in renewable energy and other aspects of the energy transition. *(Associated Submitted Action Proposals: N/A)*

**ACTION 19.3 Enhance the Louisiana Workforce Commission’s Rapid Response services to anticipate and provide tailored support to oil and gas and related workers facing job displacement and layoffs**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LWC	Assist transitioning workers through Rapid Response teams	Support displaced workers in energy transition

Louisiana has lost thousands of jobs in oil and gas over the last decade, and as the energy transition accelerates, it is inevitable that additional workers in this industry will face layoffs. To make sure that these workers are supported and assisted, this action proposes the enhancement of the Louisiana Workforce Commission’s Rapid Response teams to anticipate and provide specific support and services for those facing job losses and facility closures. These Rapid Response teams should partner with the workers and their families, ensuring that the workers receive unemployment benefits, support services, and that relevant training or new job opportunities are identified. Louisiana’s oil and gas workers are skilled and valued, and the state should proactively work to place them in new high-quality jobs where their skills can be used, even if not every worker can transition to the renewable energy industry. This action instructs the LWC to review its existing Rapid Response programming and make improvements so that energy workers and their families are better served throughout a changing energy and economic landscape. *(Associated Submitted Action Proposals: 153)*



**ACTION 19.4 Establish partnerships with Louisiana educational and non-profit institutions, businesses, and unions to better guarantee job placements for workers in low carbon training programs**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
LWC / non-profits / businesses / unions	Convene stakeholder groups for coordinated job placement	Guarantee job placement in energy transition workforce

Enrolling in a training or educational program can mean lost time, taking on personal expense, and missed wages. Still riskier is the chance that there will be no jobs available at the end of the program. This action creates partnerships between educational and non-profit institutions, businesses, and unions to better guarantee job placements for graduates of training programs in low-carbon sectors so that workers know and see their investment to gain new skills is worth the risk. Closer coordination and improved job placements will increase the number of workers enrolled and completing training programs in clean energy and other skills needed for the energy transition, necessary for successful implementation of all actions in this strategy and of Action 17.1. **(Associated Submitted Action Proposals: N/A)**



# Collaboration and Partnerships to Ensure Successful Implementation

Partnerships are central in successful implementation of Louisiana's Climate Action Plan. This section broadly outlines the alignment and coordination necessary for meaningful progress towards emission reduction targets, noting different stakeholders and their unique roles in collaboration and implementation. Key stakeholders identified in the portfolio are federal, state, and local governments; the private sector, communities—particularly those historically disadvantaged, and Indigenous peoples

- STRATEGY 20. Ensure Louisiana is prepared to maximize potential federal funding opportunities
- STRATEGY 21. Position Louisiana as a climate leader by engaging in national and regional dialogues and planning
- STRATEGY 22. Align climate action approaches across state government
- STRATEGY 23. Coordinate action with local governments
- STRATEGY 24. Call upon the private sector to align their practices and play a leading role in climate action
- STRATEGY 25. Improve engagement with disadvantaged communities and Indigenous peoples

## STRATEGY 20. Ensure Louisiana is prepared to maximize potential federal funding opportunities

With passage of the 2021 Infrastructure Investment and Jobs Act alongside continued momentum around President Biden's Build Back Better Framework, numerous federal opportunities exist in the coming years for increased funding for climate mitigation and resilience initiatives across all emission sectors and fundamental objectives. Louisiana's efforts to utilize allocated funding and to compete for available federal resources should be coordinated across agencies to maximize the potential for success and the realization of many goals and values of the Climate Action Plan. This coordination should be led through the Office of the Governor with leadership and input from departments identified as eligible applicants or recipients. Federal funding is imperative for Louisiana's successful transition to a low-carbon economy, so Louisiana must be proactive in advocating for increased federal support, inclusive but not limited to the following priority areas:

- Converting public fleets and heavy-duty vehicles to zero-emission vehicles; buildout of electric vehicle infrastructure (SA# 158, 162, 29, 27, 36, 137)
- Plugging, remediating, and reclaiming orphaned wells (SA# 166, 167, 168)
- Expanding monitoring of methane and other GHGs (SA# 91, 151)
- Measuring, monitoring, and enhancing wetland sequestration (SA# 59, 60)
- Pre-disaster mitigation and community-focused resilience (SA# 152)
- 45Q for industrial carbon capture and sequestration (SA# 109, 120, 121)
- 45Q equivalent for industrial-scale electrification
- Hydrogen Hubs and Direct Air Capture Hubs
- Accelerating offshore wind opportunity in Louisiana (SA# 61, 101)
- Attracting clean energy industries and investments (SA# 29)
- Investments in energy efficiency improvements and weatherization programs (SA#119, 162, 16, 177)
- Expanding programs that assist workers displaced by climate or energy transitions (SA# 153, 23)
- Advocating for a streamlined federal acknowledgement process for Louisiana tribes
- Investing in statewide broadband (SA# 25)
- Sustainable and regenerative agriculture, forestry, and soil management

### Highlights of how this strategy can realize benefits for Louisiana:

- *Reducing the Cost of Transition:* Federal funding can offset some of the costs of a transition to a low carbon economy, reducing the state and private investment needed to implement the strategies and actions contained in this plan.
- *Quality of Life:* Federal programs can help catalyze the broader social, economic, and health benefits associated with the strategies and actions of the Louisiana Climate Plan, such as the reduction of pollution resulting from vehicle electrification and capping of orphan methane wells.
- *Ensuring Effectiveness and Durability:* Positioning Louisiana to capitalize on Federal resources expands the resources available to support plan implementation into the future.

## STRATEGY 21. Position Louisiana as a climate leader by engaging in national and regional dialogues and planning

Partnerships are essential to make meaningful progress towards Louisiana's targets. Regional partners are necessary to advance carbon pricing systems, electricity transmission planning, offshore wind development, regional transit connectivity, and climate adaptation. This strategy recommends that Louisiana initiate and participate in discussions with other states to establish a regional cap-and-trade or carbon tax program, intentionally plan expansion of electrified transmission infrastructure and offshore wind development, strategize connectivity of interstate communities, and set goals towards climate resilience with states facing similar threats. Regional partnerships are essential to reduce incidence of carbon leakage and to ensure states collaborate in working towards similar goals. However, state-level action is not sufficient alone to lead economy-wide transitions. Local and national partners are also essential to secure funding and ensure support for the state's goals and to pilot nationwide initiatives that move towards carbon neutrality. In addition to federal priorities mentioned above, this strategy also recommends Louisiana pursue intercity partnerships and lessons learned from other cities.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Ensuring Effectiveness and Durability:* Through proactive engagement with federal and state partners, Louisiana can help shape the discussion on the national stage to support strategies and actions that require federal policy shifts—or infrastructure updates—for successful implementation.
- *Strengthening the Economy:* Louisiana can become a leader in a global transition to a low-carbon economy. Engagement and leadership at the regional and national scale can help ensure that the potential economic benefits of state leadership are realized, such as the development of infrastructure for transmission of renewable energy generated within and offshore of Louisiana.

## STRATEGY 22. Align climate action approaches across state government

A whole-of-government approach within Louisiana is necessary to advance emission reduction actions. The Governor's Office will encourage cross-agency collaboration and alignment, the setting of climate-related goals within individual agencies, and the strengthening of partnerships with local government, communities, and Indigenous peoples to coordinate and carry out actions that cross and extend beyond agency jurisdictions. As the central implementer of this Climate Action Plan, state agencies must maintain alignment and function as a coordinated unit for climate action to be successful. The Governor's Office will also seek to collaborate with other state entities such as the LPSC, LDAF, and the Louisiana Legislature.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Timely Implementation:* Through close coordination of state agencies, the strategies and actions of the Climate Action Plan can be implemented as quickly and efficiently as possible, resulting in faster realization of benefits for the people of the state.
- *Durability and Long-Term Success:* The net GHG emission reduction strategies and actions in this plan span across sectors that are supported or regulated by multiple state agencies. Close coordination of those agencies ensures that new policies, incentives, and regulations are complementary and effective in reducing net GHG emissions and providing other benefits to Louisiana, while also streamlining implementation.

## STRATEGY 23. Coordinate action with local governments

Local governments are significant collaborators and implementers of climate action within their jurisdictions. State partners must work alongside local government to encourage local climate action planning that complements Louisiana's Climate Action Plan, reduces emissions locally, enhances economic activities, and advances equity around local concerns as climate mitigation activities are implemented. Alongside engagement with communities on climate change emissions, parishes and municipalities will work to build community awareness, safer regulation, sufficient funding, and collective implementation of equitable disaster planning and recovery across the rural to urban gradient.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Enhancing the Local Benefits of Climate Action:* Active engagement of local government can help ensure that individual communities fully realize the potential economic, societal, and health co-benefits of a low-carbon economy transition.
- *Increasing Public Trust:* The close ties that local government has within the community provide the most direct connection to the people of Louisiana and therefore the most effective avenues of enhancing community outreach and engagement.

## STRATEGY 24. Call upon the private sector to align their practices and play a leading role in climate action

Businesses are crucial partners for developing innovative and technical solutions to reduce emissions and critical sources of resources to meet environmental goals. The Governor's Office and state partners must work with and engage in continuous solution-building with the private sector and regulated utilities to implement the actions set forth in this Climate Action Plan. This can be done through direct engagement with business leaders to support mutually beneficial steps toward climate action and by the establishment of entities like a Resilience Fund. A Louisiana Resilience Fund should leverage public and private dollars for the implementation of climate mitigation and adaptation initiatives, particularly for underserved low carbon and resilient financing markets. Similar institutions around the country have been used to provide bridge loans for renewable energy projects and energy efficiency retrofits, direct financing for community solar, and credit enhancement to increase the willingness of private actors to provide capital for resilience projects.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Strengthening the Economy:* Louisiana-based technological and industrial solutions necessary for successful implementation of multiple actions within the Climate Action Plan can be marketed and deployed nationally and globally.
- *Enabling Timely Implementation:* Technological innovation is vital for reducing net GHG emissions from the industrial sector. Given the high percentage of emissions that result from industrial processes within the state, the timeliness of success is closely tied to the development of effective solutions by the private sector.

## STRATEGY 25. Improve engagement with disadvantaged communities and Indigenous peoples

Disadvantaged communities and Indigenous peoples must be at the center of collaboration and partnership in the development and implementation of climate action. In development, this action tasks the CITF with ensuring actions set forth in this Climate Action Plan create new opportunities for and benefits to disadvantaged communities and Indigenous peoples, particularly those historically marginalized, those who face disproportionate climate impacts, and those of low-to-moderate income. In implementation, this action tasks the CITF with enabling and encouraging communities and Indigenous peoples to engage in knowledge sharing, solution building, and decision making. This action further tasks the Governor's Office and state agencies with investing in sustainable two-way communication of needs and progress with Indigenous peoples and marginalized communities.

This approach to engagement can be seen specifically in Actions within this plan, such as Actions 13.1 (Retrofitting Buildings and Homes), 18.2 (Clean Energy Job Training), 19.2 and 19.4 (Targeting Job Placements and Energy Transition Opportunities), and 26.3 (Incorporating Environmental Justice into Statewide Siting Planning). The outreach and community consultation as part of these Actions will be a starting point for a programmatic approach to engagement that centers these communities in the state's climate plan implementation.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Supporting Historically Marginalized Groups:* Meaningful engagement of—and leadership by—disadvantaged communities and Indigenous peoples is critical for achieving widespread success and equitable outcomes of a low carbon transition.
- *Preservation of Culture and Cultural Resources:* Indigenous people and communities have the greatest understanding and ties to cultural resources, and incorporating their input into action implementation will help ensure that the rich cultural history of the state is preserved.



# Accountability and Adaptability to Ensure Lasting Success

This final section contains two strategies intended to ensure the long-term success of the state's climate mitigation efforts. By establishing the Governor's Office of Climate Resilience, the Climate Action Plan strategies can be effectively and transparently implemented. Once the initial office is formed and strategies are underway, long-term monitoring of GHG emissions will be a top priority to ensure the state is on track to meet GHG reduction goals. As investments in new technology become more feasible and models change, the GHG inventory and Climate Action Plan must also be updated so that Louisiana's climate actions are based on the best available science and are responsive to changes in the marketplace and conditions here on the ground

- **STRATEGY 26.** Advance an equitable, efficient, and sustainable siting and permitting process for new energy and infrastructure projects
- **STRATEGY 27.** Ensure that Climate Action Plan strategies are effectively and transparently implemented
- **STRATEGY 28.** Track progress in reducing net GHG emissions reductions and adapt the approaches taken as needed

## STRATEGY 26. Advance an equitable, efficient, and sustainable siting and permitting process for new energy and infrastructure projects

Implementation of this plan will require the construction of new energy and infrastructure projects, such as renewable energy generation (e.g., solar farming, offshore wind), expanded electricity transmission infrastructure, charging stations and battery storage, and CCUS facilities and pipelines. Our state's siting and permitting processes must be updated to ensure that new projects are safely and equitably developed. Meeting our climate goals will also require revisiting Louisiana's existing practices and regulations that guide the development of new and expanded industrial facilities. This strategy aims to ensure that new projects align with Louisiana's climate action goals, mitigate adverse impacts to communities and environments now and into the future, and incorporate environmental justice considerations.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Human and Environmental Health:* Amending permitting and siting regulations to reflect Louisiana's emission reduction targets will mitigate impacts to air quality throughout the state. Additionally, the development of new permitting and siting processes that prioritize environmental justice and consider the needs of marginalized communities that have been disproportionately impacted by pollution-related health impacts will improve public health outcomes.
- *Community Engagement:* Community input into revised permitting and siting practices is necessary to ensure the updated processes are equitable and sensitive to the needs of groups who have historically been marginalized.
- *Timely Implementation, Durability, and Long-Term Success.* Updating permitting and siting processes to be more streamlined enables the fastest implementation of actions requiring new infrastructure. At the same time, aligning those processes to support net-GHG emission reductions and other objectives associated increases the likelihood of long-term success.

### ACTION 26.1 Increase the resources and staffing capacity of participating state agencies to plan for, oversee, and monitor the deployment of new clean energy technologies and infrastructure

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature / DOA	Invest increased resources in implementing agencies	Maximize effective implementation of the Action Plan

DNR's jurisdiction over utility-scale solar and wind energy on state lands and water bottoms makes the agency central in deployment of clean energy in Louisiana. This action recommends DNR guide the development of a process to assess, monitor, and make regulatory determinations on development of CCS, CCUS, and clean/renewable energy infrastructure technologies (e.g., solar farming, transmission lines, offshore wind). Specifically related to CCS and CCUS, a new and unique set of research and technology needs have been identified for DNR alongside monitoring needs from DEQ. Prior to the permitting of any projects, this action requires an internal audit of the deploying agency to ensure that it is adequately funded and prepared to assess, monitor, and make regulatory determinations for the specific project (e.g., related to geologic storage in the



development and maintenance of CCS well sites). This action also supports increased capacity of DNR and DEQ to monitor potential air quality impacts, leaks at CCS well sites, complications of underground storage, and others. Since proposed clean and renewable energy infrastructure projects currently are undergoing the permitting process, this action proposes state funding be allocated to DNR and DEQ in the near term. **(Associated Submitted Action Proposals: n/a)**

**ACTION 26.2 Solicit a study to more comprehensively understand potential impacts of CCUS technology and infrastructure on communities, ecosystems, and cultural resources to inform siting and permitting deployment**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Universities / DNR	Prioritize federal and state research funding for CCUS analysis	Maximize effective implementation of the Climate Action Plan

With Louisiana’s extensive geologic storage potential and federal incentives for near-term investment, Louisiana is seeing significant interest and investment in the deployment of CCUS to address industrial GHG emissions. Members of the Task Force and the public have raised concerns related to the capture process at facilities, transport through pipelines, and geologic storage underground. To address these concerns, this action recommends the state and its research institutions synthesize existing research on CCUS and disseminate information and materials for public education. The state and its research institutions should also promote a comprehensive understanding of CCUS impacts, including but not limited to siting impacts on cultural characteristics of neighboring populations, air quality impacts on nearby communities, increased energy intensity for different industry processes, pipeline safety implications, environmental and resilience impact of pipeline buildout, potential incidents of geologic storage, and long-term risks and costs. **(Associated Submitted Action Proposals: N/A)**

**ACTION 26.3 Collaboratively develop regulatory frameworks and statewide siting plans for new energy technologies with considerations for both climate and environmental justice**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Governor’s Office / State Agencies	Establish an interagency working group to develop pre-permitting environmental siting analysis	Ensure safe and resilient siting of energy infrastructure for the environment and communities

For emerging energy generation and emissions reduction technologies in Louisiana (e.g., solar farming, offshore wind, CCUS), there is opportunity to ground the permitting and siting frameworks around the Fundamental Objectives identified in Louisiana’s Climate Action Plan. In anticipation of the significant investment in and deployment of large-scale low- or no-carbon technologies, this action establishes an interagency working group that, with the benefit of robust public input particularly from those who face disproportionate climate and environmental impacts, will engage in a prospective, pre-permit siting analysis. One of the primary goals of this action is to ensure that future permitting and siting decisions for the above-mentioned emerging technologies are consistent with the Fundamental Objectives of Louisiana’s Climate Action Plan and address the potential impacts on and preferences of nearby communities, environmental impacts, and environmental justice

considerations. To the extent possible, this effort would seek to identify areas where the necessary conditions (solar, atmospheric, geologic, and economic) for a given technology are highest and the potential for conflicts or adverse impacts (health, environmental, economic) are lowest. **(Associated Submitted Action Proposals: 46, 92, 96)**

**ACTION 26.4 Update existing permitting and facility siting practices and regulations to align with Louisiana’s emission reduction goals**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Governor’s Office / State Agencies	Establish an interagency working group to review existing siting and permitting procedures	Ensure safe and resilient siting of energy infrastructure for the environment and communities

Currently, the construction of new and expanded industrial facilities are handled by multiple state agencies with multiple permit guidelines depending on the nature of the technology and the location of the proposed facility. All such decisions must be made in accordance with Article IX, §1 of the Louisiana Constitution, which serves as the basis for what is known as the “Public Trust Doctrine.” However, varying agency priorities, regulatory nuances, and administrative or judicial decisions have led to a complex and at-times disjointed process. Additionally, siting decisions are made on a permit-by-permit basis without having the benefit of a comprehensive statewide plan or framework, as addressed by Action 26.3. Members of the Task Force and the public have raised concerns about the ability of current permitting regulations to fully integrate the most recent understanding of climate impacts and environmental justice concerns. Via executive order (EO), the Governor should mandate that all project, permitting, and facility siting decisions align with goal of net zero GHG emissions by 2050 and consider opportunities to practicably avoid or minimize GHG emissions. This action would include convening an interagency panel (including DOA, DOTD, DEQ, DNR Office of Conservation, DNR Office of Coastal Management (OCM), LDAF, CPRA, Department of Wildlife and Fisheries (LDWF)) with the benefit of robust public input, particularly from those who face disproportionate climate and environmental impacts, to review and update projects, regulations, and permitting practices to ensure that project, permitting, and siting decisions are climate neutral and are not exceeding the cumulative risk burden on vulnerable communities, tribal lands, or the environment. With the ultimate goal to streamline permitting processes, this action ensures efficient and strategic development of energy infrastructure that benefits all participating stakeholders. **(Associated Submitted Action Proposals: 46)**

## STRATEGY 27. Ensure that Climate Action Plan strategies are effectively and transparently implemented

Realizing lasting success in reducing net GHG emissions reductions and ensuring positive overall benefit to the state requires that the actions and strategies outlined here translate to meaningful change. This success must be founded on continued transparency as well as regular monitoring and oversight of plan implementation. Actions under this strategy are designed to maintain that transparency and oversight, ensuring that the people of Louisiana can have confidence that the economy, environment, and their well-being will be maintained and improved while GHG emissions are reduced.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Effectiveness and Durability:* Establishing mechanisms for active management and public engagement of Climate Action Plan implementation ensures that actions in the plan are carried out as intended.
- *Public Confidence:* The confidence of the public in the effectiveness and outcomes of the Climate Action Plan – and support for its continued implementation – relies on transparency in execution and clear accountability of the state’s progress towards its GHG emission reduction goals.

### ACTION 27.1 Establish a statutory and organizational framework for coordinating and implementing statewide climate resilience

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature / Governor’s Office	Develop and workshop a governing framework for climate resilience	Ensure long-standing and adaptive implementation of the Action Plan

Climate change mitigation and adaptation require extensive coordination across multiple stakeholders inside and outside of government. It also requires focus and authority to oversee the implementation of this plan and assess progress toward meeting the Governor’s GHG emission reduction goals. In the near-term this action proposes that the Edwards administration work with the Louisiana Legislature to create a statutory and organizational framework to staff, coordinate, and implement continued management of climate and resilience initiatives and ensure the successful implementation of the actions contained in this Climate Action Plan. Through this organizational framework, the Governor, his staff, and cabinet members and agencies would receive advice on action related to climate mitigation and adaptation to ensure vision and action for decarbonization are threaded across the Administration. This near-term action prepares the Administration to advocate for a more permanent framework that governs climate change mitigation and adaptation across agencies, levels of government, and external stakeholders.

**ACTION 27.2 Legislatively establish the Climate Initiatives Task Force and support for statewide goal of net zero GHG emissions by 2050**

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
Legislature / CITF / Governor's Office	Develop a public governing body for effective climate resilience	Ensure long-standing and adaptive implementation of the Action Plan

Alongside a designated organizational framework to coordinate and oversee climate and resilience initiatives across the State of Louisiana, longevity of the CITF is necessary to ensure public coordination and oversight of climate and resilience actions. Formally recognizing and establishing the CITF in statute would enable regular CITF meetings to ensure progress is made towards the implementation of emission reduction strategies and actions; the impacts of these actions on the people, environment, and economy of Louisiana are understood; transparency and accountability are maintained; and the critical issue of climate change in Louisiana remains in focus across changes in executive leadership. Regular meetings of the CITF would chart progress on implementation of the climate mitigation efforts, provide a forum for public engagement and oversight, and identify opportunities to increase the effectiveness of action implementation. Creating the CITF in statute requires near-term legislative enablement to ensure efforts to meet the Governor’s emission reduction goals remain central for the state for years to come.

## STRATEGY 28. Track progress in reducing net GHG emissions reductions and adapt the approaches taken as needed

Another vital component to catalyzing the success of the Climate Action Plan is monitoring the progress of the actions and strategies in driving net GHG emissions reductions. In addition, these outcomes must be used as part of a data-driven approach to revisit and update the Climate Action Plan over time through an adaptive management process. Actions that have proven successful can be continued as part of this process, while actions that have not been as impactful in practice as anticipated can be refined or updated. Implementation of actions under this strategy will ensure that there is a framework for making updates to the Climate Action Plan and for collecting the data and information necessary to make adaptive management decisions.

### Highlights of how this strategy can realize benefits for Louisiana:

- *Flexibility and Adaptability:* New technologies, processes, approaches, and programs aimed at reducing net GHG emissions can be incorporated into this Climate Action Plan as they become available. Demonstration of new technologies and approaches at an operational scale via pilot projects can serve as an important first step.
- *Continued Success:* By using data to monitor progress in the near-term, the trajectory of Louisiana towards meeting its goals can be objectively tracked. Tracking and evaluation of this Climate Action Plan over time can also identify and strengthen the most effective actions and strategies as part of reaching the state's long-term goals. As a living plan, adaptive management of all strategies and actions is key for long-term success in an uncertain future.

### ACTION 28.1 Establish a Louisiana GHG monitoring program

IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	GOALS
DEQ	Create a GHG Monitoring Program	Hold implementers accountable in incremental GHG reductions

Regular collection of GHG data across the state is vital to providing checkpoints on GHG reduction to adaptively manage emission reduction approaches across all sectors. This action directs immediate creation of a GHG Monitoring Program by DEQ to collect GHG data across all emission sectors, which will be used in conjunction with regular updates of the GHG inventory. As mentioned in prior actions, the GHG monitoring program will incorporate detailed data for specific sectors, including utility climate rankings (Action 1.5), carbon intensity and emission audits from facilities (Action 3.1), and the methane monitoring stations (Action 10.2). Immediate integration of and regular updates to these detailed datasets is essential for tracking progress, ensuring accountability, and repairing leaks across high-intensive emission sectors. In addition, this action would facilitate benchmarking that could be used to determine whether the strategies and actions included in the Louisiana Climate Action Plan are effective once implemented.

### **ACTION 28.2 Update the state GHG inventory every five years**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>Legislature / DEQ</b>	<b>Ensure mandatory, consistent updates to the GHG inventory</b>	<b>Hold implementers accountable in incremental GHG reductions</b>

In conjunction with regular collection of GHG data (Action 28.1), updates to the GHG inventory are necessary to consistently monitor progress and hold the state accountable for progress towards reduction goals. This action tasks the Louisiana Legislature to statutorily mandate updates to the GHG inventory every five years with consistent funding to support these efforts, with the ability of the CITF to request a GHG inventory sooner than five years if the technology has significantly improved. Additionally, this action supports work by the state to continue to increase the accuracy of this assessment as technologies evolve. The U.S. EPA State Inventory Tool (SIT) model has been used as the primary information source for inventory updates, but this methodology has known and acknowledged limitations. This action proposes investment in remote sensing, satellite imagery, and other tools to provide more accurate and comprehensive monitoring of GHG emissions in Louisiana, as well as incorporating more continuous data from the GHG monitoring program (Action 28.1) and criteria pollutants monitored by the existing DEQ Air Quality Monitoring Program into the GHG inventory.

### **ACTION 28.3 Update the Louisiana Climate Action Plan every five years**

<b>IMPLEMENTATION PARTNERS</b>	<b>NEAR-TERM ACTION</b>	<b>GOALS</b>
<b>CITF / Legislature / Governor’s Office</b>	<b>Ensure mandatory, consistent updates to the Action Plan</b>	<b>Hold implementers accountable in adaptive management of the Action Plan</b>

The strategies and actions outlined in the Louisiana Climate Action Plan have been selected based on their expected effectiveness in reducing net GHG emissions while also having the best anticipated outcomes for the state and its people. Regular GHG monitoring (Action 28.1) and updated GHG inventories (Action 28.2) will reveal where those actions are effective, while at the same time new strategies or actions may become available due to advances in technology or increased understanding of the most effective approaches in net GHG emission reduction. Therefore, the Climate Action Plan should be updated one-year following each updated GHG inventory (Action 28.2). Through near-term legislation, this action would allow and require updates to Louisiana’s Climate Action Plan every five years by the Governor’s Office to ensure that climate action continues to be based on the best available science and that the actions taken demonstrate benefits to Louisiana’s communities, environment, and economy to the greatest extent possible. Planned updates are necessary to ensure ineffective actions could be modified or replaced, the greatest investment is in the most effective approaches, and new technologies could be incorporated when available.

# Next Steps and Adaptive Management of Louisiana's First Climate Action Plan

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This Climate Action Plan lays out 28 strategies and 84 actions to meet Louisiana's 2050 goal of carbon neutrality. Strategies set forth provide high-level vision, intended to be consistent across timescales, while actions represent policy-specific steps towards emission reduction. Actions take a comprehensive approach to mitigate GHG emissions as best determined in 2021, but as technologies, markets, and stakeholder preferences continue to evolve, actions will need to as well.

Through utilizing the EPS Tool, this Action Plan indicates EPS policies with the greatest impact to drive down GHGs, particularly industrial-scale electrification, renewable generation, and green hydrogen with electrolysis. However, the model lacks granularity where Louisiana's inventory also lacks granularity, leaving a range of uncertainties in certain sectors. Notable gaps are in methane monitoring and reporting, natural carbon sequestration potential by habitat type, source and sink of emissions in agriculture, forestry, and coastal management practices, carbon pricing design, transportation policy modeling, and other forms of clean hydrogen production. These gaps do not infringe on the efficacy of the Action Plan but offer primary areas where modeling needs to be refined and actions made more accurate.

Alongside academic research solicited in individual action descriptions, cross-action information gaps require intentional study to inform deployment at scale. Acknowledging its impact on emission reduction, particularly prevalent is the pairing and sequencing of renewable and clean electricity generation with industrial electrification, together with the need to identify facility-level electrification potential. Other information gaps arise in understanding the current landscape and needed improvements in the regulatory environment, sequencing the energy transition with bolstering the clean energy job pipeline, and timing of industrial fuel-switching to clean hydrogen.

These gaps in understanding, modeling, and sequencing of GHG-reducing actions serve as starting points to bridge gaps of and strengthen the Action Plan. As this information is better understood, in conjunction with more accurate GHG accounting through the GHG monitoring program and GHG inventory updates, the Task Force must review, revise, and amend the Climate Action Plan every five years.

In addition to reviewing and commenting on statewide GHG accounting, the Task Force was created to balance interests and maximize fundamental objectives set forth at the beginning of this effort. Diverging opinions within the Task Force have primarily arisen from how to balance these objectives. Though discussions have begun, more work must be done to continue sharing values, understanding perspectives, and finding balance in policy recommendations. Additional research must be done to account for impacts to fundamental objectives in the implementation of this Action Plan. Relevant to improving quality of life and creating a more equitable society, mechanisms to meaningfully measure improvements in equity, community engagement, public health, and quality of life are essential to accountability. Relevant to the economy and workforce, further understanding of implications on ratepayers and customers must be better accounted for and incorporated into updates of the Action Plan. Similarly, as the impacts of climate change are increasingly felt across Louisiana, conservation of natural resources and climate adaptation must be aggressive but responsive.

In summation, this Action Plan represents a bold step forward for Louisiana to meet its 2050 goal of carbon neutrality but requires continual effort to implement, adaptively manage, and better understand climate solutions. The Governor's Office shall maintain a central role in chairing and staffing the Climate Initiatives Task

Force to continue discussions of the Task Force, hold implementers accountable, update the Climate Action Plan, and urge ambition to meet the Governor's emission reduction goals. Alongside regular meetings of a long-standing Task Force and updates to the Climate Action Plan every five years, agencies and other implementers should formally report out to the Task Force each year with progress towards near-term action and longer-term goals. This first iteration of Louisiana's Climate Action Plan is intended to serve as a catalyst for continued bold action by all implementers – current and future – now through 2050.



# Implementation Matrix

ACTION NUMBER	IMPLEMENTATION PARTNERS	NEAR-TERM ACTION	FUNDING NEEDED <input checked="" type="checkbox"/>	GOALS
<b>CLEAN ENERGY TRANSITION</b>				
1.1	PSC / utilities	Establish a RCPS	<input checked="" type="checkbox"/>	100% renewable or clean by 2035, at least 80% from renewable sources
1.2	PSC / utilities / Governor’s Office	Engage in Entergy Louisiana, LLC and Cleco Power LLC IRP process in 2022	<input checked="" type="checkbox"/>	Encourage generation of renewable power
1.3	PSC / utilities / industry / LED / DNR / universities	Prioritize offshore wind strategic planning for outreach, workforce, and impact assessments	<input checked="" type="checkbox"/>	5 gigawatts of offshore wind generation by 2035
1.4	PSC / utilities	Establish tariff offerings for renewable and clean power	<input type="checkbox"/>	Encourage purchasing of renewable power
1.5	PSC / utilities / industry	Understand implications of deregulated power	<input checked="" type="checkbox"/>	Encourages generation of renewable power
1.6	PSC / utilities / MISO / SPP / DNR	Assess infrastructure needs to plan renewable connectivity	<input checked="" type="checkbox"/>	30% increased transmission infrastructure by 2030 and 100% by 2050
1.7	PSC / utilities / DNR Office of Energy	Solicit funds for energy storage pilot projects	<input checked="" type="checkbox"/>	100 megawatts of energy storage by 2030

1.8	PSC / utilities / DEQ	Assess gaps and synthesize existing data on generation	<input checked="" type="checkbox"/>	Encourage generation of renewable power
2.1	Legislature	Reinstate incentives for renewable installation and storage	<input checked="" type="checkbox"/>	Encourage purchasing of renewable power
2.2	PSC	Review net metering policies	<input checked="" type="checkbox"/>	Account for value of distributed solar generation
2.3	FEMA / GOHSEP / Louisiana National Guard	Plan and implement microgrids and dispatchable battery units	<input checked="" type="checkbox"/>	Speed post-disaster recovery and resilience
2.4	PSC	Determine best mechanisms for third-party generation to sell energy back to the grid	<input checked="" type="checkbox"/>	Encourage generation of renewable power

### INDUSTRIAL DECARBONIZATION

3.1	DEQ / EPA / Industry	Compile, calibrate, and assess gaps of existing data from facilities	<input checked="" type="checkbox"/>	Provide facility-specific accountability in emission reduction
3.2	DEQ / Industry	Develop a framework for facility-level GHG reducing plans	<input checked="" type="checkbox"/>	Provide facility-specific support in emission reduction
3.3	DEQ / Legislature / Governor's Office	Identify carbon pricing mechanism best suited for Louisiana	<input checked="" type="checkbox"/>	Provide facility-specific accountability in emission reduction
3.4	DEQ / DNR	Develop an implementation strategy for this Section	<input checked="" type="checkbox"/>	Ensure coordinated implementation of industrial decarbonization
4.1	DNR	Pursue rulemaking for implementation of efficiency standard	<input type="checkbox"/>	Reduce energy intensity of industry

4.2	DNR / LSU-IAC	Assess needed support for implementation of efficiency standard	☒	Support reduced energy intensity of industry
5.1	LED / DNR / PSC / Governor's Office / Industry	Invest in mechanisms to accelerate industrial electrification	☒	Abate industry emissions through electrification to the extent practicable
5.2	DNR / US-DOE / Industry	Invest in research and demonstration projects to accelerate fuel- and feedstock- switching	☒	Abate heavy industry emissions through alternative feedstocks and fuels to the extent practicable
5.3	DNR / US-DOE / Industry / Communities	Invest in research for siting and impact assessments of CCUS buildout	☒	Abate remaining high-intensity emissions through carbon capture and storage
5.4	Universities	Solicit funding to understand utilization techniques	☒	Recycle emissions through utilization of captured carbon
5.5	US-DOE / DEQ / DNR / PSC / Utilities / Industry / Communities	Strategically plan decarbonization of industrial clusters	☒	Provide cluster-specific support in emission reduction
6.1	DOA	Secure green vendors through procurement practices	☒	Reduce GHG footprint of state government while growing market for clean and green products
6.2	DEQ / Waste Management Entities / NGOs / Universities	Invest in pilot projects to reduce lifecycle emissions of products	☒	Minimize wasted energy through circular principles

### ACTIVELY MANAGE METHANE EMISSIONS

7.1	DNR	Pursue rulemaking to tighten the definition of “responsible party” and establish a companion database	☒	Provide clarity and accountability for responsible parties
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7.2	DNR	Pursue legislation to raise financial security and remove blanket securities	<input type="checkbox"/>	Incentivize compliance with operator requirements
7.3	DNR	Pursue rulemaking to tighten the definition of “future utility”	<input type="checkbox"/>	Provide clarity and accountability for inactive wells
7.4	DNR	Invest in workforce training programs for monitoring and plugging wells	<input checked="" type="checkbox"/>	Provide Louisiana workers opportunities to transition
8.1	DNR / DEQ	Pursue rulemaking to align with methane rules of other states	<input checked="" type="checkbox"/>	Reduce amount of methane released
8.2	DEQ	Incorporate emerging technologies into methane monitoring	<input checked="" type="checkbox"/>	Monitor methane releases with more frequency and accuracy
8.3	DEQ / DNR / US-EPA	Strengthen LDAR best practices to monitor and fix malfunctioning practices	<input checked="" type="checkbox"/>	Repair methane releases with more frequency and accuracy

### TRANSPORTATION, DEVELOPMENT, AND THE BUILT ENVIRONMENT

9.1	DOA	Update procurement practices to meet public fleet transition goals	<input checked="" type="checkbox"/>	Transition 50% public fleets to low- and zero-emission vehicles and fuels by 2035 and 100% by 2050
9.2	DOTD / NGOs / MPOs / Local Governments	Utilize federal funding to intentionally build out infrastructure	<input checked="" type="checkbox"/>	250 electric vehicle charging stations per 100,000 residents by 2050
9.3	DOTD Transportation Research Center	Research efficacy of alternative fuels to decarbonize heavy transit	<input checked="" type="checkbox"/>	Research and deploy at scale solutions to decarbonize freight

9.4	DOTD / DNR / DEQ	Identify and pursue pilot projects to decarbonize heavy transit	<input checked="" type="checkbox"/>	Research and deploy at scale solutions to decarbonize freight
10.1	DOTD / MPOs / Local Governments	Utilize multiple mechanisms to implement VMT reduction strategies	<input checked="" type="checkbox"/>	Double use of alternative modes of transportation by 2035
10.2	BEL Commission	Leverage federal funding for expansion of broadband access	<input checked="" type="checkbox"/>	Reduce vehicle miles traveled through at-home resources
10.3	DOA	Adopt a statewide hybrid workplace policy	<input type="checkbox"/>	Reduce vehicle miles traveled through at-home resources
10.4	DOA	Pursue rulemaking to require telematics for fleets	<input checked="" type="checkbox"/>	Maximize efficiency of GHG-producing vehicles
10.5	DOTD / DOA / LED	Invest in research of smart transit techniques and best practices	<input checked="" type="checkbox"/>	Maximize efficiency of energy-intensive freight transit
11.1	DOTD / Regional MPOs / Municipalities	Leverage available funding for urban transit deserts and local jurisdictions	<input checked="" type="checkbox"/>	Reduce VMTs through connectivity within urban areas
11.2	DOTD / Local Governments / Rural Transit Providers	Develop on-demand ridership systems in rural areas	<input checked="" type="checkbox"/>	Reduce VMTs through connectivity within rural areas
11.3	DOTD / Local MPOs / Rural Governments / Municipalities	Collaborate and plan intentional connectivity between cities	<input checked="" type="checkbox"/>	Reduce VMTs through connectivity across regions of Louisiana
12.1	DOA	Create an Office of State Planning in DOA	<input checked="" type="checkbox"/>	Support locals in comprehensive land use, climate mitigation, and adaptation planning

12.2	DOA Office of State Planning / DOTD	Convene stakeholders to plan and design compact development across levels of government	<input checked="" type="checkbox"/>	Maximize VMT reduction and utilization of regional transit through land use planning
12.3	DOA Office of State Planning / Regional MPOs / Local Government	Develop land use and transportation modeling tools for utilization in decision making	<input checked="" type="checkbox"/>	Maximize VMT reduction and utilization of regional transit through land use planning
12.4	DOTD	Incorporate a climate impact analysis into DOTD project planning and design	<input checked="" type="checkbox"/>	Mitigation unintentional emissions through large-scale transportation
12.5	DOA Office of State Planning / DNR	Create model solar ordinance policy materials	<input checked="" type="checkbox"/>	Encourage purchasing of renewable power
13.1	PSC / LHC / DNR / DOA-OCD	Inventory and streamline application to existing efficiency programs	<input checked="" type="checkbox"/>	5% retrofit of residential and commercial buildings each year
13.2	Legislature / Local Governments	Pursue legislation for redesign of PACE	<input checked="" type="checkbox"/>	Encourage effectiveness of existing building efficiency programs
13.3	Legislature	Pursue legislation for efficient and electric appliance rebates	<input checked="" type="checkbox"/>	Encourage efficiency of building components
13.4	Legislature / LSUCCC	Pursue legislation for energy efficiency code updates and standards	<input type="checkbox"/>	Require minimum efficiency of buildings
13.5	DOA	Pursue funding for implementation of energy benchmarking requirements	<input checked="" type="checkbox"/>	Monitor carbon impact of buildings and building materials
13.6	LSUCCC	Pursue building code updates through the 2021-2022 revision process	<input type="checkbox"/>	Require minimum energy performance standards of buildings

## NATURAL AND WORKING LANDS AND WETLANDS

14.1	LDAF / Land Trusts / Local Governments/ Private Landowners	Assess a baseline of areas most in need of conservation	<input checked="" type="checkbox"/>	30% conservation of interior natural lands by 2030
14.2	LDAF / Parish and Municipal Governments	Convene stakeholders in major urban areas	<input checked="" type="checkbox"/>	30% conservation of interior natural lands by 2030
15.1	CPRA	Study carbon storage potential of wetland projects	<input checked="" type="checkbox"/>	Maximize carbon sequestration of coastal wetland restoration
15.2	CPRA	Invest in assessments of net carbon flux of coastal wetlands	<input type="checkbox"/>	Maximize carbon sequestration of coastal wetland restoration
15.3	Universities / CPRA	Collaborate with stakeholders to design a carbon credit and market	<input checked="" type="checkbox"/>	Maximize investment in carbon sequestration of wetland restoration
16.1	USDA / LDAF	Leverage USDA investment for innovative practices	<input checked="" type="checkbox"/>	Encourage conservation practices that sequester carbon
16.2	USDA-NRCS / SWCDs / LDAF	Convene farmers, ranchers, and foresters to identify barriers	<input checked="" type="checkbox"/>	Increase access to regenerative agriculture and forestry practices
16.3	USDA-NRCS / SWCDs / Landowners	Advocate for further on-farming conservation farming	<input checked="" type="checkbox"/>	Increase access to regenerative agriculture and forestry practices
16.4	Universities / LDAF / DEQ	Study ability of BMPs to reduce and sequester GHG emissions	<input checked="" type="checkbox"/>	Encourage conservation practices that sequester carbon

16.5	LDAF / SWCDs	Develop an urban agriculture and conservation program	☒	Increase urban access to regenerative agriculture and forestry practices
16.6	LDEQ / LDAF	Collaborate on strategic design and locations of compost facilities	☒	Increase access to regenerative agriculture practices
16.7	LFA / LDAF / DOA / LED	Convene major foresters for educational sessions	☒	Increase access to regenerative forestry practices

### AN INCLUSIVE, LOW-CARBON ECONOMY

17.1	LED / LWC / Louisiana Technical and Community College System	Convene stakeholders to develop vision and ambition for the transition plan	☒	Support Louisiana agencies, industries, and workers in energy transition
18.1	Department of Education	Develop climate curricula projects for K-12 education	☒	Center climate education in K-12 classrooms
18.2	LWC / Universities / Community Colleges	Develop relevant education, training, and re-training courses and curricula	☒	Guarantee job training for workers in energy transition
18.3	The Water Institute of the Gulf	Collaborate with universities to identify existing climate-related work and research gaps	☒	Support Louisiana universities in energy transition
19.1	LED / LWC / Louisiana Community and Technical College System	Invest in Louisiana-based low-carbon industry through tax-incentives	☒	Support Louisiana industries in energy transition
19.2	LED	Prioritize investment in disadvantaged business enterprises and communities	☒	Support underserved communities in energy transition



19.3	LWC	Assist transitioning workers through Rapid Response teams	☒	Support displaced workers in energy transition
19.4	LWC / Non-Profits / Businesses / Unions	Convene stakeholder groups for coordinated job placement	☒	Guarantee job placement in energy transition workforce

### ACCOUNTABILITY AND ADAPTABILITY TO ENSURE LASTING SUCCESS

26.1	Legislature / DOA	Invest increased resources in implementing agencies	☒	Maximize effective implementation of the Action Plan
26.2	Universities / DNR	Prioritize federal and state research funding for CCUS analysis	☒	Maximize effective implementation of the Action Plan
26.3	Governor's Office / State Agencies	Establish an interagency working group to develop pre-permitting environmental siting analysis	☒	Ensure safe and resilient siting of energy infrastructure for the environment and communities
26.4	Governor's Office / State Agencies	Establish an interagency working group to review existing siting and permitting procedures	☒	Ensure safe and resilient siting of energy infrastructure for the environment and communities
27.1	Legislature / Governor's Office	Develop and workshop a governing framework for climate resilience	☒	Ensure long-standing and adaptive implementation of the Action Plan
27.2	Legislature / CITF / Governor's Office	Develop a public governing body for effective climate resilience	☒	Ensure long-standing and adaptive implementation of the Action Plan
28.1	DEQ	Create a GHG Monitoring Program	☒	Hold implementers accountable in incremental GHG reductions

28.2	Legislature / DEQ	Ensure mandatory, consistent updates to the GHG inventory	☒	Hold implementers accountable in incremental GHG reductions
28.3	CITF / Legislature / Governor's Office	Ensure mandatory, consistent updates to the Action Plan	☒	Hold implementers accountable in adaptive management of the Action Plan

# Acronyms

Acronym	Definition
<b>BMP</b>	Best Management Practice
<b>CCUS</b>	Carbon capture, utilization, and storage
<b>CCS</b>	Carbon capture and storage
<b>CHP</b>	Combined Heat and Power
<b>CITF</b>	Climate Initiatives Task Force
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CPRA</b>	Coastal Protection and Restoration Authority
<b>CRMS</b>	Coastwide Reference Monitoring System
<b>DEQ</b>	Department of Environmental Quality
<b>DOA</b>	Division of Administration
<b>DOE</b>	Department of Energy
<b>DOTD</b>	Department of Transportation and Development
<b>DWF</b>	Department of Wildlife and Fisheries
<b>NRCS</b>	Natural Resource Conservation Service
<b>DNR</b>	Louisiana Department of Natural Resources
<b>EPA</b>	U.S. Environmental Protection Agency
<b>ERGS</b>	Emission Reduction Generation and Supply
<b>GHG</b>	Greenhouse gas
<b>HELP</b>	Home Energy Loan Program
<b>HERO</b>	Home Energy Rebate Option
<b>HOV</b>	High-occupancy vehicle
<b>IAC</b>	Industrial Assessment Center
<b>IRP</b>	Integrated resource plan
<b>LDAF</b>	Louisiana Department of Agriculture and Forestry
<b>LDAR</b>	Leak Detection and Repair
<b>LED</b>	Louisiana Economic Development

<b>LFA</b>	Louisiana Forestry Association
<b>LHC</b>	Louisiana Housing Corporation
<b>LPSC</b>	Louisiana Public Service Commission
<b>LSU</b>	Louisiana State University
<b>LSUCCC</b>	Louisiana State Uniform Construction Code Council
<b>LWC</b>	Louisiana Workforce Commission
<b>MISO</b>	Midcontinent Independent System Operator
<b>MPO</b>	Metropolitan Planning Organization
<b>NGO</b>	Non-governmental organizations
<b>OCM</b>	Office of Coastal Management
<b>OOC</b>	Office of Conservation
<b>OSR</b>	Oilfield Site Restoration
<b>PACE</b>	Property-assessed clean energy
<b>PPA</b>	Power Purchase Agreement
<b>RPP</b>	Research Practitioner Partnership
<b>SEM</b>	Strategic Energy Management
<b>SIT</b>	State Inventory Tool
<b>SPP</b>	Southwest Power Pool
<b>SWAMP</b>	System Wide Assessment and Monitoring Program
<b>SWCD</b>	Soil and Water Conservation Districts
<b>TDM</b>	Travel Demand Management
<b>USDA</b>	U.S. Department of Agriculture
<b>VMT</b>	Vehicle miles travelled

# Glossary

Term	Definition
<b>Action</b>	A specific policy, program, or project that can be directly implemented to achieve a specific goal or complete a process
<b>Adaptation</b>	Long-term adjustments that can be made to aid in withstanding current and future changes in environmental conditions
<b>Adaptive Governance Initiative</b>	State-led effort to increase the resilience of state agencies to the impacts of the coastal crisis. Working through resilience coordinators at each agency, the adaptive governance initiative seeks to integrate projections from the coastal master plan into decision making and develop and institutionalize resilience actions within and across state government
<b>Alternative Fuel</b>	Also known as non-conventional and advanced fuels, these are any materials or substances that can be used as fuels other than gasoline and fossil fuels for power generation, such as natural gas, methanol, biofuel, or electricity
<b>Blue Carbon</b>	Carbon stored in the sediment and plants of coastal and marine ecosystems, such as mangroves, tidal marshes, and seagrass beds
<b>Blue Hydrogen</b>	Hydrogen is a fuel source that has multiple applications in transportation, electricity generation, industrial uses, and many more. Blue hydrogen is produced through the typical reforming process used to create most of the hydrogen used today, but the carbon dioxide that is emitted from that process is captured and stored rather than being released into the atmosphere
<b>Cap and Trade Program</b>	Also called “emissions trading, this is a system for controlling carbon emissions and other forms of atmospheric pollution by which an upper limit is set on the amount of carbon a given business or other organization may produce but which allows further capacity to be bought from other organizations that have not used their full allowance, thus providing economic incentives and creating a market
<b>Carbon Capture</b>	The process of pulling carbon dioxide from the atmosphere naturally or through engineered methods from a point source emitter
<b>Carbon Sequestration</b>	The long-term capture and storage of carbon in oceans, soils, vegetation, and geologic formations, which can occur either naturally or through anthropogenic (human) mechanisms
<b>Carbon Sink</b>	Any reservoir, natural or otherwise, that accumulates and stores some carbon-containing chemical compound for an indefinite period and thereby lowers the concentration of CO <sub>2</sub> from the atmosphere by storing more carbon than it emits
<b>Carbon Storage</b>	The containment of captured carbon when it is injected into deep, underground geological formations, where it is stored long-term, rather than being released into the atmosphere. Storage sites used for CO <sub>2</sub> include former oil and gas reservoirs, deep saline formations, and coal beds
<b>Carbon Dioxide (CO<sub>2</sub>) Equivalent</b>	The number of metric tons of CO <sub>2</sub> emissions with the same global warming potential as one metric ton of another greenhouse gas (GHG)
<b>Carbon Intensity</b>	The number of grams of carbon dioxide (CO <sub>2</sub> ) that it takes to make one unit of electricity a kilowatt per hour (kW/hour); the amount of carbon by weight emitted per unit of energy consumed/unit of economic activity

<b>Circular Economy</b>	A model of production and consumption which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible; in this way, the life cycle of products is extended to reduce waste to a minimum which can help tackle major global challenges like climate change, biodiversity loss, waste, and pollution
<b>Clean Hydrogen</b>	Hydrogen produced with a carbon intensity equal to or less than 2 kilograms of carbon dioxide-equivalent produced at the site of production per kilogram of hydrogen produced, and it includes hydrogen produced from any fuel source (see Infrastructure Investment and Jobs Act (2021))
<b>Clean Portfolio Standard</b>	Regulations that are intended to reduce greenhouse gas emissions through requirements for cleaner energy techniques, where options are expanded beyond renewable energy sources to incorporate efficiency measures and other carbon reduction measures; this includes things like energy efficiency, fuel cells, fuel efficiency improvements, grid improvements, demand-side and direct load measures, nuclear power, and fossil fuel technologies that include carbon dioxide capture and storage equipment
<b>Climate Equity</b>	A people-centered approach to addressing the global climate crisis through action that seeks to achieve long-term equality of outcomes by acknowledging institutionalized harms to historically marginalized people and communities and by holding accountable those who benefit from the root causes of climate change that disproportionately impact the most vulnerable
<b>Coastal Protection and Restoration Authority (CPRA) Board</b>	Group that represents the state’s position in policy relative to the protection, conservation, enhancement, and restoration of the coastal area of the state. They do so by overseeing the Coastal Protection and Restoration Trust Fund, developing a master plan an annual plan for integrated coastal protection, and enforcing compliance with the Coastal Master Plan
<b>Coastal Master Plan</b>	The state’s 50-year blueprint for large-scale restoration and protection of Louisiana’s critical coastal areas. The plan, authored by the Louisiana Coastal Protection and Restoration Authority (CPRA), is updated every five years as required by law to account for evolving science and changing environmental conditions. It combines projects that restore, build or maintain coastal wetlands with projects that provide enhanced risk reduction for coastal communities from storms and flooding
<b>Community Solar</b>	Any solar project or purchasing program, within a geographic area, in which the benefits of a solar project flow to multiple customers such as individuals, businesses, nonprofits, and other groups; in most cases, customers are benefitting from energy generated by solar panels at an off-site array. The solar power installation accepts capital from and provides output credit and tax benefits to individual and other investors; in some systems, a person or group can buy individual solar panels which are installed in the farm after purchase
<b>Complete Streets</b>	A transportation policy and design approach that requires streets to be planned, designed, operated and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation, whether they are pedestrians, bicyclists, motorists or public transportation users
<b>Equity</b>	Fairness or justice in the way people are treated, recognizing that we do not all start from the same place and must acknowledge and make adjustments to

	<p>imbalances. This can be achieved by expanding access to opportunity, quality of life and prosperity</p>
<b>Emissions Pathway</b>	<p>The modelled trajectories of global anthropogenic emissions over the 21st century based on predictions of how concentrations of GHG in the atmosphere will change in the future as a result of human activities</p>
<b>Energy Efficiency Resource Standard</b>	<p>A quantitative, long-term energy savings target for utilities; under direction from this policy, utilities must procure a percentage of their future electricity and natural gas needs using energy efficiency measures, typically equal to a specific percentage of their load or projected load growth. Energy savings are typically achieved through customer, end-use efficiency programs run by utilities or third-party program operators, sometimes with the flexibility to achieve the target through a market-based trading system</p>
<b>Fundamental Objectives</b>	<p>In Structured Decision Making (SDM), these are essential goals or solutions of this work that have been informed by the Climate Initiatives Task Force, Advisory Groups, Sector Committees, and public that guide development and evaluation of strategies and actions</p>
<b>Green Hydrogen</b>	<p>Hydrogen is a fuel source that has multiple applications in transportation, electricity generation, industrial uses, and many more. Green hydrogen is produced using renewable energy through electrolysis. This is a process that splits water into its basic elements – hydrogen and oxygen – using an electric current. The electricity used in the process comes from renewable resources</p>
<b>Green Tariffs</b>	<p>Programs in regulated electricity markets offered by utilities that allow large commercial and industrial customers to buy bundled renewable electricity from a specific project through a special utility tariff rate; this allows customers to source up to 100 percent of their electricity from renewable sources located on their local grid. This is done through a price structure, or an electricity rate, that is approved by the state's Public Utility Commission</p>
<b>Greenhouse Gas (GHG)</b>	<p>A gas that contributes traps heat in the atmosphere by absorbing infrared radiation. The primary GHG in Earth's atmosphere are water vapor, CO<sub>2</sub>, methane, nitrous oxide, and ozone. Many GHGs are naturally occurring, though concentrations can be affected based on human input</p>
<b>GHG Inventory</b>	<p>A list of emission sources, sinks, and the associated emissions over a certain period of time, quantified using standardized methods</p>
<b>High-Occupancy Vehicle (HOV) Lanes</b>	<p>One or more lanes of a roadway that have restrictions on use to encourage ridesharing and can reduce vehicle miles traveled (VMT) by being open to motor vehicles carrying two or more people and sometimes to motorcycles or vehicles that use alternative fuels (hybrid or electric vehicles). The goal of HOV lanes is to provide an incentive to use ridesharing and public transportation, remove congestion from normal lanes of travel, and improve overall traffic operations</p>
<b>Home Energy Loan Program (HELP)</b>	<p>A loan option administered by the Louisiana Department of Natural Resources (DNR) that allows homeowners to get a five-year loan to improve the energy efficiency of their existing home, with the loan functioning as a standard unsecured underwritten residential loan. DNR subsidizes half of the financing for energy efficiency improvements at a low interest rate to participating lenders, up to a maximum DNR subsidy of \$6,000. Each participating lender sets the maximum loan amount offered to homeowners, as well as the interest rate that is charged to the homeowner. A homeowner can qualify for an energy improvement loan in two</p>

	ways – either through an energy audit in which an Energy Home Rater makes recommendations, or by choosing pre-approved home improvements as designated by the program
<b>Home Energy Rebate Option (HERO)</b>	An Existing Homes Program offered by the Louisiana Department of Natural Resources (DNR) for residents to receive cash rebates for energy efficient improvements to existing homes that achieve a minimum of 30% energy reduction. The incentive amount is based on two factors – either the Cost of Energy Savings determined by comparing the pre-improved home to the post-improved home over the useful life of the added improvements or the cost of the energy efficiency improvements. The cash rebate is 20% of the lesser of the two amounts up to a maximum rebate of \$2,000
<b>Industrial Assessment Centers (IAC's)</b>	In-depth evaluations of a facility funded by the United States Department of Energy to spread ideas relating to industrial energy conservation and conducted by engineering faculty with upper class and graduate students from a participating university. Teams located at 35 universities around the country conduct the energy assessments to identify opportunities to improve productivity and competitiveness, reduce waste, and save energy
<b>Integrated Resource Plans (IRP's)</b>	Comprised of an assessment of the future electric needs and a plan to meet those future needs. It is “integrated” in that it looks at both demand side (conservation, energy efficiency, etc.) resources as well as the more traditional supply side (generation/power plants, transmission lines, etc.) resources in making its recommendations on how best to meet future electric energy needs in the state
<b>Intergovernmental Panel on Climate Change (IPCC)</b>	An intergovernmental body of the United Nations that is dedicated to providing the world with objective, scientific information relevant to understanding the scientific basis of the risk of human-induced climate change, its natural, political, and economic impacts and risks, and possible response options
<b>Louisiana Watershed Initiative</b>	State-led program through which floodplain management responsibilities are coordinated across federal, state, and local agencies, with the goal being to leverage the state's past and present flood-risk reduction and resilience efforts through a variety of projects
<b>Metropolitan Planning Organizations (MPO's)</b>	A federally mandated and federally funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities, created and designated to carry out the metropolitan transportation planning process and required to represent localities in all urbanized areas (UZAs) with populations over 50,000, as determined by the U.S. Census
<b>Microgrids</b>	A small network of electricity users connected through a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity, with respect to the grid, via a local source of supply that is usually attached to a centralized national grid but is able to function independently
<b>Midcontinent Independent System Operator (MISO)</b>	An independent System Operator (ISO) and Regional Transmission Organizer (RTO) providing open-access transmission service and monitoring of the high-voltage transmission system in the Midwest United States and Canada, including a southern United States region which includes much of Arkansas, Mississippi, and Louisiana



<b>Mitigation</b>	Generally, The reduction of something harmful or the reduction of the severity, seriousness, or painfulness of its harmful effects. In the climate context, mitigation refers to efforts to avoid and reduce the emission of GHG
<b>National Academy of Sciences</b>	A United States nonprofit, non-governmental organization charged with providing independent, objective advice to the nation on matters related to science and technology. The organization is committed to furthering science in America, and its members are active contributors to the international scientific community
<b>National Climate Assessment</b>	Summary reports detailing the impacts of climate change on the U.S. now and in the future. They are updated and released approximately every 5 years, starting in 2000, through the Global Change Research Act of 1990. The reports are extensively reviewed by the public and experts, including federal agencies and a panel of the National Academy of Sciences
<b>Net Metering</b>	A system in which solar panels or other renewable energy generators are connected to a public-utility power grid and surplus power is transferred onto the grid, allowing customers to offset the cost of power drawn from the utility. Through a billing mechanism, consumers who generate some or all of their own electricity are allowed to use that electricity anytime, instead of when it is generated; this is particularly important with renewable energy sources like wind and solar, which are non-dispatchable
<b>Office of the Governor – Coastal Activities (GOCA)</b>	Team within the Governor’s Office that develops and implements policies, plans, and programs relative to the protection and restoration of Louisiana’s unique coastal resources and the flood protection of communities in the state, as well as climate and coastal resiliency
<b>Peak Electricity Loads</b>	A period in which electrical power is expected to be provided for a sustained period at a significantly higher than average supply level, up to a maximum energy consumption on the grid by the consumer, based on demand
<b>Planning Team</b>	Consists of staff from the Office of the Governor—Coastal Activities and the Water Institute of the Gulf (TWI) tasked with coordinating the planning process for the development of the Climate Action Plan and its timely completion
<b>Portfolio</b>	A comprehensive set of strategies and actions towards achieving the GHG reduction targets and other fundamental objectives
<b>Power Purchase Agreements (PPA’s)</b>	A contract between two parties, one which generates electricity (producer) and one which is looking to purchase electricity (consumer), and defines the conditions of the agreement, such as the amount of electricity to be supplied, negotiated prices, accounting, and penalties for non-compliance
<b>Property-Assess Clean Energy (PACE) Financing</b>	A type of loan offered by the U.S. Department of Energy for financing energy efficiency upgrades, disaster resiliency improvements, water conservation measures, or renewable energy installations and improvements of residential, commercial, and industrial property owners
<b>Relative Sea Level Rise</b>	A combination of the absolute (global) sea level rise, which is the change in the height of the ocean surface above the center of the earth, plus changes (up or down) in land elevation for the relevant coastal area. Sea level rise at specific locations may be more or less than the global average due to many local factors such as subsidence, ocean currents, variations in land height, and whether the land is still rebounding from the compressive weight of Ice Age glaciers

<b>Renewable Portfolio Standard</b>	A regulation that requires the increased production of energy from renewable energy sources, such as wind, solar, biomass, and geothermal, with a requirement that each specified type of utility ensure that at least a specified amount of renewable energy be sold each year
<b>Resilient Louisiana Commission</b>	State entity charged with examining Louisiana’s economy amid the COVID-19 pandemic and making recommendations for more resilient business-related activities and commerce that includes a task force structure dedicated to strengthening specific sectors of Louisiana’s economy. The RLC was specifically created to guide the state through the Covid-19 crisis and expand the economy so that it can cope more easily with any future crises
<b>Social Determinants of Health</b>	Social determinants of health are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. These often contribute to wide health disparities and inequities. Examples may include safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; polluted air and water; and language and literacy skills ( <a href="#">Healthy People 2030</a> )
<b>Social Vulnerability</b>	The potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks ( <a href="#">CDC ATSDR</a> )
<b>Southwest Power Pool (SPP)</b>	A regional transmission organization (RTO and nonprofit corporation mandated by the Federal Energy Regulatory Commission to ensure reliable supplies of power, adequate transmission infrastructure and competitive wholesale electricity prices on behalf of its members by managing the electric grid and wholesale power market for the central United States
<b>Strategic Energy Management (SEM)</b>	A system of organizational practices, policies, and processes that creates persistent energy savings by integrating energy management into business practices while focusing on changes in daily operations that engage staff at all levels of an organization in energy efficiency activities
<b>Strategy</b>	A high-level path (plan of action or policy) designed to achieve a major or overall aim/ one or more long-term or overall goals under conditions of uncertainty (e.g., GHG emissions reduction)
<b>Structured Decision Making (SDM)</b>	An explicit and transparent approach that utilizes a broad set of methods for analyzing decisions and identifying solutions that achieve desired outcomes. This approach supports decisions based on clearly articulated fundamental objectives, integrates science and policy, and remains flexible to legal mandates and public preferences (or values) in decision making
<b>Water Institute of the Gulf</b>	An independent, non-profit, applied research institution advancing science and developing integrated methods to solve complex environmental and societal challenges. The Water Institute is a part of the Water Campus and works to develop scientific and technological solutions to coastal and deltaic issues in Louisiana and the Gulf in general. The Institute connects academic, public, and private research providers and conducts applied research to serve communities and industry and that will help coastal communities and economies become more resilient to land subsidence, storms, rising sea levels, and other coastal threats

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<b>Vector-Borne Disease</b>	Human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors, which are living organisms that can transmit infectious pathogens between humans, or from animals to humans
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# Task Force Member List

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- **Chip Kline**, Executive Assistant to the Governor for Coastal Activities, Task Force Chair
  - Designee: **Harry Vorhoff**, Deputy Director, Governor’s Office of Coastal Activities
- **Gregory M. Bowser**, President and CEO, Louisiana Chemical Association
- **Jonathan Bourg**, Director of Resource Planning and Market Operations at Entergy, as a representative of an electric utility
- **Dr. Chuck Brown**, Secretary, Louisiana Department of Environmental Quality
  - Designee: **Lourdes Iturralde**, Assistant Secretary, Office of Environmental Compliance
- **Dr. Virginia Burkett**, Chief Scientist for Climate and Land Use Change at the United States Geological Survey, as a nonvoting representative of a federal scientific agency
- **Selby Bush**, BHP Petroleum, designee for the Louisiana Speaker of the House Clay Schexnayder
- **Dr. Terrence Chambers**, Director of the Energy Efficiency and Sustainable Energy Center at the University of Louisiana at Lafayette, as a member of Louisiana’s academic community
- **Flozell Daniels**, President and CEO of the Foundation for Louisiana, as a member with experience in community development and engagement
- **Jay Dardenne**, Commissioner of Administration, Division of Administration
  - Designee: **Mark Moses**, Assistant Commissioner, Facility Planning & Control
- **Karen Gautreaux**, Director of Government Relations for Louisiana at the Nature Conservancy, as a member of the environmental nonprofit community
- **Tyler Gray**, President and General Counsel, Louisiana Mid-Continent Oil and Gas Association
- **Bren Haase**, Executive Director, Coastal Protection and Restoration Authority
- **Timothy Hardy**, Breazeale, Sachse & Wilson, L.L.P., designee for Louisiana Senate President Page Cortez
- **Thomas Harris**, Secretary, Louisiana Department of Natural Resources
  - Designee: **Jason Lanclos**, Director, State Energy Office
- **Camille Manning-Broome**, President and CEO of the Center for Planning Excellence, as a member at-large
- **Chief Shirell Parfait-Dardar**, Tribal Chief of the Grand Caillou/Dulac Band of the Biloxi-Chitimacha-Choctaw, as a member of an indigenous tribe, nation, or community
- **Colette Pichon Battle**, Executive Director of the Gulf Coast Center for Law and Policy, as a member of the environmental and climate justice community
- **Don Pierson**, Secretary, Louisiana Economic Development
  - Designee: **Brad Lambert**, Deputy Secretary, Louisiana Economic Development

- **Bill Robertson**, designee of Public Service Commissioner Foster Campbell
- **Jeff Schwartz**, Director of Economic Development for the City of New Orleans, as a representative of local government perspective
- **Mike Strain**, Commissioner, Louisiana Department of Agriculture and Forestry
  - Designee: **Joey Breaux**, Assistant Commissioner, Office of Soil and Water Conservation
- **Dr. Shawn Wilson**, Secretary, Department of Transportation and Development
  - Designee: **Dr. Eric Kalivoda**, Deputy Secretary, Department of Transportation and Development
- **Robert Verchick**, Gauthier-St. Martin Eminent Scholar and Chair in Environmental Law at Loyola University New Orleans, as a member with special qualifications and experience in climate change policy

## Sector Committees Member List

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### AGRICULTURE, FORESTRY, CONSERVATION, AND WASTE

- **Joey Breaux**, Louisiana Department of Agriculture and Forestry (Co-chair)
- **Karen Gautreaux**, The Nature Conservancy (Co-chair)
- **Naveen Adusumilli**, LSU AgCenter
- **Kyla Cheynet**, Drax
- **David Daigle**, Farmer, Cattleman, and Forester
- **Ernest Girouard**, State Soil and Waste Conservation District Commission
- **Gregory Grandy**, Coastal Protection and Restoration Authority
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- **Fran Harvey**, Global Geospatial Institute
- **Justin Kozak**, Center for Planning Excellence
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- **Robbie Laborde**, CLECO
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- **Dr. Craig Colten**, Louisiana State University

- **Chief Shirell Parfait-Dardar**, Grand Caillou/Dulac Band of the Biloxi-Chitimacha-Choctaw
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- **Tyler Gray**, Louisiana Mid-Continent Oil & Gas Association
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- **Timothy Hardy**, Breazeale, Sachse, & Wilson, LLP
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- **Erin Spears**, New Orleans City Council
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- **Tokesha Collins-Wright**, Louisiana Chemical Association

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- **Dr. Mark Zappi**, University of Louisiana at Lafayette (Co-chair)
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- **Dr. Carrie Castille**, United States Department of Agriculture



- **Dr. Monica Farris**, University of New Orleans
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# Acknowledgements

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*To be added in final version of the plan*

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