Baton Rouge

Metropolitan Statistical Area

Priority Climate Action Plan

February 2024

Prepared for

Baton Rouge Metropolitan Statistical Area

Capital Region Planning Commission

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February 2024

Executive Summary

With its enactment of the Inflation Reduction Act of 2022 (IRA), Congress provided many tools to pursue greenhouse gas (GHG) pollution reductions, including the US Environmental Protection Agency's (EPA) Climate Pollution Reduction Grants (CPRG) program. The overall strategy of the CPRG is to address climate change by identifying initiatives that reduce GHGs, provide good-paying jobs, and address environmental injustices and inequalities. CPRG planning grants support the development of climate action plans for states, local governments, Tribes and territories, while CPRG implementation grants are a competitive opportunity to implement specific measures included in the climate action plans.

The Baton Rouge Metropolitan Statistical Area (MSA) received a grant from the CPRG program to develop plans to reduce GHG emissions across the MSA's parishes. This Priority Climate Action Plan (PCAP) is the first of two plans that the MSA will develop with the funding. The primary objective is to identify near-term, high-priority, implementation-ready measures to reduce GHG emissions. These measures are designed to be eligible for CPRG implementation funding (CPRG phase 2).

This PCAP includes a context review, a GHG inventory, business-as-usual GHG emissions projections, identification of low-income and disadvantaged communities (LIDACs), and priority measures for GHG reductions with LIDAC benefits analysis. The PCAP will be followed by the development of a Comprehensive Climate Action Plan (CCAP). The CCAP will provide a more comprehensive set of measures to reduce GHG emissions that will be developed by undertaking further technical analysis and broad and meaningful engagement with the public and affected parties.

The Baton Rouge MSA, also known as the Capital Region, comprises the 10 parishes surrounding the state capital of Baton Rouge: Ascension Parish, Assumption Parish, East Baton Rouge Parish, East Feliciana Parish, Iberville Parish, Livingston Parish, Pointe Coupee Parish, St. Helena Parish, West Baton Rouge Parish, and West Feliciana Parish. The MSA sprawls across nearly 4,200 square miles of the southeastern portion of Louisiana state, with a population of 870,569.

There are already a broad spectrum of initiatives in the Baton Rouge MSA aimed at transitioning towards renewable energy and reducing GHG emissions while fostering economic growth. The PCAP planning process builds upon these efforts and initiatives, and identifies additional measures from transportation such as the MSA's Long Range Transportation Plan MOVE 2046 for a Changing Region.

The development of this PCAP includes: 1) a policy and background review; 2) an inventory of current GHG emissions and business-as-usual projections; 3) two public meetings; 4) a technical analysis of the proposed measures to estimate the emissions reductions, including costs and benefits; 5) LIDAC analysis of the benefits from the proposed measures; and 6) prioritization of the measures, given their benefits and outcomes.

0.1 Greenhouse Gas Emissions Inventory

The total GHG emissions for the Baton Rouge MSA in 2021 was 49 MMtCO_2e (million metric tonnes), with the majority of emissions from the industrial sector (80%) and the remainder from the transportation (11%), residential (5%), commercial and institutional (3%), and solid waste (1%) sectors (Figure E.1).

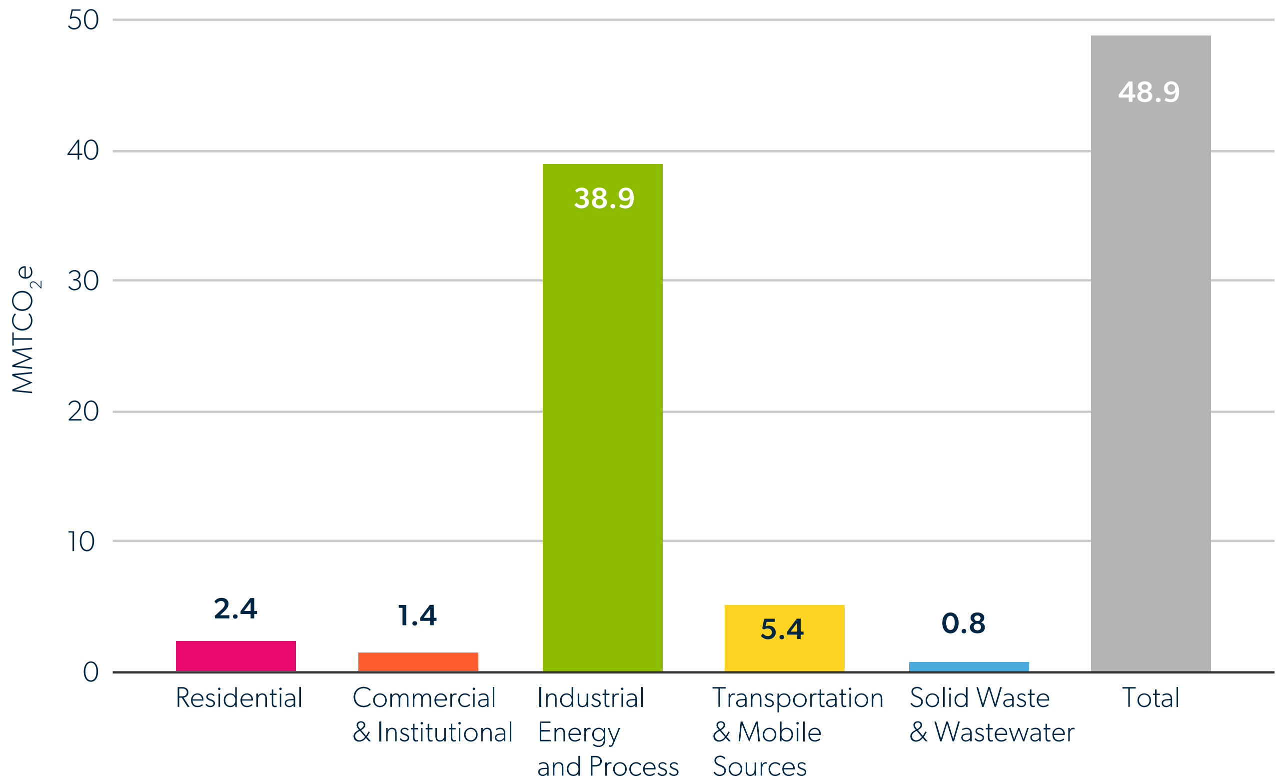

Figure E.1. GHG emissions by sector for Baton Rouge MSA, 2021. Source: SSG analysis.

GHG emissions in the industrial sector are dominated by emissions from fossil fuels, including natural gas (40%) and liquified petroleum gas (LPG; 13%), as well as emissions from industrial processes (e.g. production of hydrogen). Transportation emissions account for 54% of the non-industrial emissions, with most vehicles currently using emissions-heavy gasoline and diesel as fuel. GHG emissions from residential and commercial buildings account for 38% of the non-industrial emissions. Emissions from buildings are dominated by emissions from the electricity generation process, which relies on fossil fuels (coal and natural gas). Emissions from waste result from the biodegradation of organic materials in landfills, where anaerobic digestion of these organic materials produces methane and smaller amounts of CO_2.

The region's grid electricity is generated from a variety of fuels, including natural gas (59%), nuclear power (25%), and coal (11%). Small amounts of renewable electricity add emissions-free electricity to the grid; however, the majority of electricity is generated using fossil fuels.

A business-as-usual projection from 2021 to 2050 was developed based on population growth and increasing renewable generation for electricity. GHG emissions for the MSA are projected to increase from 49 MMtCO$_2$e in 2021 to 50 MMtCO$_2$e in 2050 (Figure E.2). The industrial sector continues to emit the bulk of the GHG emissions (e.g., natural gas, still gas, petroleum coke, hydrocarbon gas liquids (HGL), feedstock, and electricity). Industrial process emissions and stationary combustion emissions can be reduced by switching from fossil fuels to renewable energy and clean hydrogen sources.

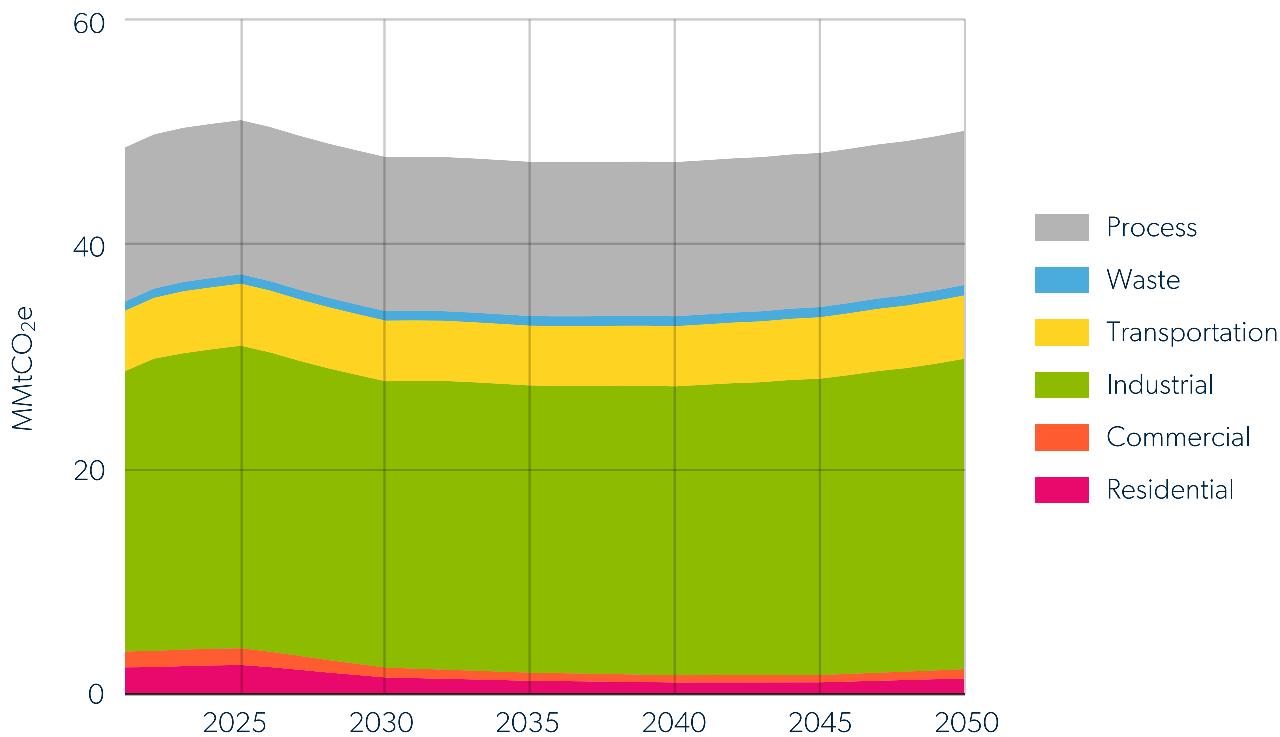

Figure E.2. Total BAU GHG emissions by sector for Baton Rouge MSA, 2021–2050. Source: SSG analysis.

There are also opportunities to reduce GHG emissions in the residential, commercial, and transportation sectors by retrofitting buildings and electrifying vehicles, heating and cooling; and improving public transit access, active transportation, and intercity rail options. The benefits of these actions would be compounded by cleaning electricity at the same time. These measures can reduce the costs of energy, increase resilience, and provide benefits for LIDACs.

0.2 Low-Income and Disadvantaged Communities in the Baton Rouge MSA

LIDACs within the Baton Rouge MSA parishes were identified using the EPA's Environmental Justice Screening and Mapping Tool (EJScreen) and the Climate and Economic Justice Screening Tool (CEJST). The Baton Rouge MSA region has LIDACs in all 10 parishes (Figure E.3). East Baton Rouge is the most populous parish and has accumulated the most burdens, with some tracts affected by all eight of the CEJST burden categories. In general, LIDACs are overburdened and underserved, and as a result, they are more vulnerable to the impacts of climate change. The LIDACs and their respective burdens were used to evaluate potential impact benefits from the PCAP's proposed GHG reduction measures.

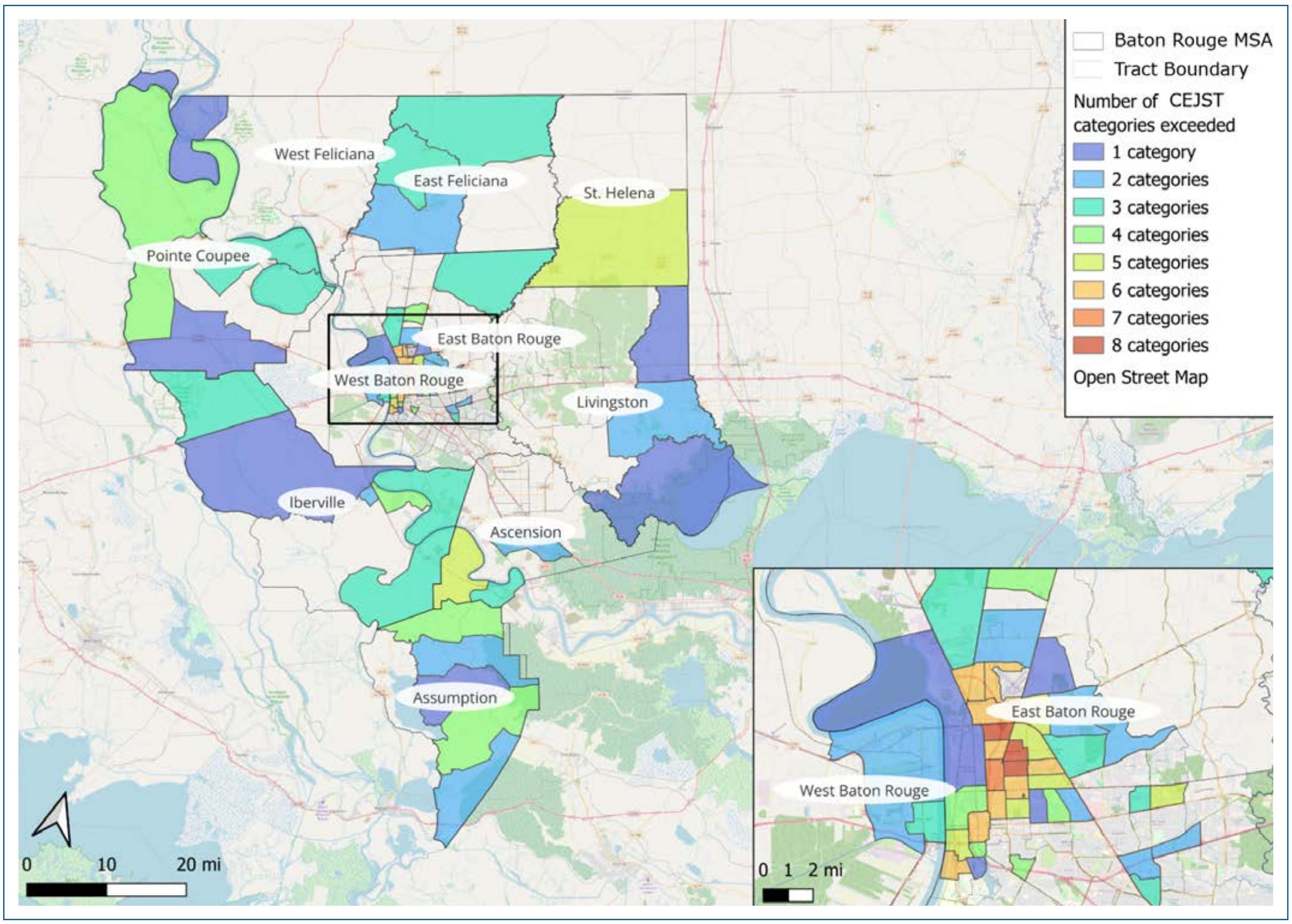

Figure E.3. Map of the LIDACs and the number of categories exceeded in Baton Rouge MSA using the CEJST tool. Source: Adapted from (Council on Environmental Quality, 2022).

0.3 Key Observations

The Capital Region has experienced severe climate impacts, and projections indicate that the trend will continue.

Due to its location on the Gulf Coast, topography, intensifying weather systems, and a variety of built environment and socioeconomic factors, the Capital Region and surrounding areas have experienced recent and devastating climate impacts. Global, national, and local projections indicate that these events will continue to impact the region and will increase in severity and impact.

The region's industrial sector is among the top emitters of GHGs and highest consumers of electricity in the U.S.

The state of Louisiana is among the highest emitters of GHG emissions, most of which are attributable to its chemical, petroleum, and natural gas industries. In the Baton Rouge MSA, industry accounts for 78% of overall energy consumption.

Renewable energy is a key opportunity.

Louisiana's grid has limited renewable energy capacity, and residential solar photovoltaic (PV) installations have slowed. Lower solar PV costs and federal incentives from the IRA provide an opportunity for stimulating uptake in the residential and commercial sectors. A program developing microgrids and storage could also provide energy resilience benefits during outages due to severe weather. Renewable electricity is also critical to developing green hydrogen to support the decarbonization of industry and the reduction of process emissions. Large-scale installations of solar and wind (onshore and offshore) can also help reduce the variability of electricity costs over the long run.

Buildings in the Baton Rouge MSA are poorly insulated and expensive to heat and cool.

In the MSA, residential buildings consume about 28% of electricity and commercial and institutional buildings consume 16%. Louisiana has the highest per-capita residential sector electricity consumption in the U.S., with nearly one half of households uninsulated. Heat pumps can cut this electricity consumption by one third or more, reducing overall electricity consumption, and building weatherization can provide further energy savings, particularly for low-income households.

Decarbonization of transportation can be accelerated.

Across the MSA, transportation emissions account for 54% of non-industrial emissions. Electric vehicle (EV) uptake is relatively slow, with less than 1,000 EVs in Baton Rouge.[1] There are potential investments for transportation infrastructure that could be transformative, including investing in bike paths and pedestrian paths, redesigning of the Capital Area Transit System (CATS), expanding BRT projects and microtransit, the BR-NOLA Rail and improving rural transit, and investing in EV charging stations.

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[1] *ReplicaHQ. Baton Rouge MSA Study Area. Retrieved from: https://studio.replicahq.com/places/studies/kl6hab6/map*

0.4 Priority Climate Action Plan Greenhouse Gas Reduction Measures

The following PCAP GHG reduction measures were identified based on existing initiatives that reduce GHG emissions in the near term, are implementation-ready, and provide benefits for LIDACs (Table E.1). Each of the following measures include modeled estimates of GHG emission reductions, estimates of air pollutant reductions (where applicable), implementation authority, metrics for tracking progress, quantitative cost/benefits analysis, and LIDAC benefits analysis.

Table E.1. PCAP projects for Baton Rouge MSA.

Project Title	Description
1. Active Transportation Infrastructure	Implement and expand the East Baton Rouge Parish Bicycle and Pedestrian Master Plan, which includes 100 miles of on-road bike paths and 250 miles of sidepaths.[2] Establish bicycle and pedestrian mode-share targets of 2% for 2025 and 4% for 2030. Network connections can be expanded to provide active transportation and improved access for LIDACs.
2. Redesign the CATS and Bus Rapid Transit Expansion	Redesign a suite of services offered by the CATS within the City of Baton Rouge and the City of Baker and expand the ongoing Plank-Nicholson BRT Project. This includes a system redesign with route modifications and frequency adjustments and a potential introduction of new mobility options, such as microtransit.
3. BR-NOLA Rail	Implement an intercity passenger rail service between Baton Rouge and New Orleans, providing a highly visible, reliable alternative to driving between these two cities and fostering the development of one super-region.
4. Implement Other Transit Systems	Implement other transit systems across the metropolitan planning area, including rural and specialized transit systems, in five parishes (East and West Baton Rouge, Ascension, Iberville, and Livingston). Improving and coordinating these services would ensure more people have access to transportation options, relying less on personal vehicles.
5. Restore Wetlands and Natural Spaces	Restore and enhance wetlands and natural features. This measure can include floodplain restoration; riparian vegetation restoration; and wetland, prairie, and forest restoration. The objective is to restore 200 acres per year for 10 years (e.g., 7 tons of CO_2e per acre per year of wetlands would be sequestrated).

[2] *East Baton Rouge Paris (2020). Pedestrian and Bicycle Master Plan. Retrieved from: https://www.brla.gov/DocumentCenter/View/9411/East-Baton-Rouge-Pedestrian-and-Bicycle-Master-Plan-PDF*

Project Title	Description
6. Enhance the Parish's Tree Canopy	Enhance tree canopy cover across the MSA, prioritizing areas with LIDACs that have low tree cover and high environmental burdens. Expanding the urban tree canopy results in additional carbon sequestration and improved air quality, as well as cooler spaces, which reduces the urban-heat-island effect.
7. Develop Net-Zero Neighborhoods on Brownfield Sites	Expand the Baton Rouge Planning Commission Brownfields Program to reach 2000 dwelling units by 2034 (additional 200 units per year for 10 years and 200 units per brownfield).
8. Baton Rouge MSA EV Incentives and EV Charging Infrastructure	Establish a Clean Cars 4 All program that provides incentives to help lower-income consumers living in priority populations (LIDACs) replace their old higher-polluting vehicles with newer and cleaner transportation (based on the program from the California Air Resources Board (CARB). This can be integrated with the implementation of the Baton Rouge Electric Vehicle Strategic Plan to support the growth of EVs throughout the Baton Rouge City Parish and across the MSA.
9. Low-Interest Loans for Energy Retrofits Program	Establish a program that provides low-interest loans for home energy efficiency retrofits, with zero-interest loans for eligible low-income households. Targets include: 1% annual retrofit by 2030, 2% annual retrofits by 2050, and 5% annual retrofits by 2040 through to 2050 where the final 10 years will retrofit 50% of residential building stock.
10. High-Efficiency New Buildings	Create development incentives (e.g., density bonuses, reduced parking requirements) for projects that encourage high-efficiency building performance standards and technologies. By 2030, 39% of single-detached homes will be compact single-family homes that achieve a 25% reduction in thermal energy and a 25% reduction in non-thermal energy with heat pumps.
11. Develop Community Solar Projects	Develop community solar projects that will increase solar energy capacity to 50 MW/year by 2030, and to 75 MW per year by 2040, and through to 2050.
12. Develop Microgrids	Develop a 10-year program for establishing two microgrids per year in LIDACs within the Baton Rouge MSA. Target is to establish 37 MW.
13. Industrial Decarbonization	Among the MSA's parishes, create an alliance with the state government to decarbonize industrial processes using different technologies. The sector provides the largest opportunities for GHG emissions reductions through decarbonization of energy use and process emissions. This project would align with the Industrial Decarbonization measure in Louisiana State's PCAP.

0.5 Summary of PCAP Greenhouse Gas Emission Reductions

The PCAP measures (Table E.1) would provide a total of 0.4 $MMtCO_2e$ reductions by 2030, and 5.4 $MMtCO_2e$ by 2050 for the Baton Rouge MSA (Table E.2). This excludes industrial decarbonization (Measure 13) because GHG reductions were referenced from the State of Louisiana's PCAP.

Table E.2. Summary of PCAP measures' GHG emission reductions (excluding industrial decarbonization).

Measures by Sector	Reductions by 2030 ($MtCO_2e$)	Reductions by 2050 ($MtCO_2e$)
Transportation	261,499	1,258,881
Buildings	31,370	1,542,062
Renewable Energy	36,227	1,427,934
Restore and Sequester	113,983	1,163,983
Total	**443,078**	**5,392,859**

0.6 Federal Funding Opportunities

Phase 2 of the EPA's CPRG can provide funding opportunities for the MSA's GHG reduction measures and initiatives. There are many other sources of federal funding that can be leveraged to develop and implement the PCAP measures, such as the EPA Environmental and Climate Justice Block Grants and Tax Credit programs, which will be explored during phase 2 and the development of the CCAP.

0.7 Next Steps

The PCAP provides the foundation for a more comprehensive analysis in the CCAP. The CCAP will identify all GHG sources, sinks, and sectors in the Baton Rouge MSA and will include mid- and long-term GHG emissions reduction strategies. The engagement process for the CCAP will begin later in 2024. Engagement will include meaningful and targeted outreach events with all interested and affected parties. Meetings will include high-functioning meeting technology, online tools, and adequate time for in-depth discussion. The process will enable opportunities for conversations and collaboration among a diverse set of participants.

Successful engagement of the CCAP Engagement Plan will depend on:

- Working with diverse community leaders, organizations, and networks from across the MSA's parishes;
- Connecting the CCAP with people's everyday experiences;
- Tailoring engagement and messaging to LIDACs and diverse populations; and
- Effectively managing divergent perspectives among interested and affected parties.

Disclaimer

This report has been undertaken to address the requirements of the Environmental Protection Agency's (EPA) CPRG program. Reasonable skill, care, and diligence has been exercised to assess the information provided for this analysis, but no guarantees or warranties are made regarding the accuracy or completeness of this information. This document, the information it contains, the information and basis on which it relies, and the factors associated with the implementation of the Priority Climate Action Plan are subject to changes that are beyond the control of the authors. The information provided by others is believed to be accurate but has not been verified.

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This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement 5D-02F46201. The contents of this document do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

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Acronyms and Definitions

Abbreviation	Definition
BR MPO	Baton Rouge Metropolitan Planning Organization
BAU	Business-as-usual
BRAC	Baton Rouge Area Chamber
BREC	Recreation and Park Commission for East Baton Rouge
BR-NOLA Rail	Baton Rouge to New Orleans Louisiana Intercity Rail
BRT	Bus Rapid Transit
Carbon sequestration	Any biological processes that absorb and store atmospheric carbon
CATS	Capital Area Transit System
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CH4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CPEX	Center for Planning Excellence
CPRA	Coastal Protection and Restoration Authority
CPRG	Climate Pollution Reduction Grants
CRPC	Capital Region Planning Commission
CRP	Carbon Reduction Program
DOE	Department of Energy
DOT	Department of Transportation
EBR	East Baton Rouge
eGRID	Emissions and Generation Resource Integrated Database
EIA	Energy Information Administration
EJ	Environmental Justice
EJScreen	Environmental Justice Screening Tool
EPA	Environmental Protection Agency
EV	Electric Vehicle
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GDP	Gross Domestic Product
GHG	Greenhouse Gas Emissions
GWP	Global Warming Potential
HERO	Hubs for Energy Resilient Operations

Abbreviation	Definition
HOMES	Homeowner Managing Energy Savings Program
HVAC	Heating, Ventilation, and Air Conditioning
IIJA	Infrastructure Investment and Jobs Act
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
IRC	International Residential Code
kW	Kilowatt
LADOTD	Louisiana Department of Transportation and Development
LDENR	Louisiana Department of Energy and Natural Resources
LED	Louisiana Economic Development
LIDAC	Low-Income and Disadvantaged Community
LSUCCC	Louisiana State Uniform Construction Code Council
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MT	Metric Ton
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NCA	National Climate Assessment
N20	Nitrous Oxide
NPL	National Priorities List
NREL	National Renewable Energy Laboratory
PCAP	Priority Climate Action Plan
PM2.5	Particulate Matter 2.5, any fine inhalable particle with diameters that are less than or equal to 2.5 micrometers
PRI	Priority Risk Index
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation
RLF	Revolving Loan Fund
RMP	Risk Management Plan
RNG	Renewable Natural Gas
RSEI	Risk-Screening Environmental Indicators
SSG	Sustainability Solutions Group
UNFCCC	United Nations Framework Convention on Climate Change
USGCRP	United States Global Change Research Program
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled

Key Energy and Emissions Units

GHG emissions

$MtCO_2e$ = Metric ton of CO_2 equivalent of GHGs

1 $kMtCO_2e$ = 1,000 $MtCO_2e$

1 $MMtCO_2e$ = 1,000,000 $MtCO_2e$

Energy

1 MMBTU = 1.055 GJ

1 MJ = 0.0001 GJ

1 TJ = 1,000 GJ

1 PJ = 1,000,000 GJ

1 GJ = 278 kWh

1 MWh = 1,000 kWh

1 GWh =1,000,000 kWh

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1 Introduction

1.1 Climate Pollution Reduction Grants (CPRG) Overview

With its enactment of the Inflation Reduction Act of 2022 (IRA), Congress provided many tools to pursue greenhouse gas (GHG) pollution reductions, including the CPRG program. The CPRG program under the Environmental Protection Agency (EPA) seeks to achieve three broad objectives:

- Tackle damaging climate pollution while supporting the creation of good jobs and lowering energy costs for families.
- Accelerate work to address environmental injustice and empower community-driven solutions in overburdened neighborhoods.
- Deliver cleaner air by reducing harmful air pollution in places where people live, work, play, and go to school.

The overall strategy is to address climate change by identifying opportunities that will provide well-paying jobs and address historic environmental injustices and inequities. CPRG includes two phases designed to enable the EPA to work in partnership with state, territory, local, and Tribal officials to advance climate action planning and implementation that is tailored to each recipient's unique needs and socio-economic and environmental make-up. Phase 1 provides planning grants to develop plans to reduce GHG emissions and phase 2 provides implementation grants to implement measures from the GHG reduction plans. The program will advance the goals of the Justice40 Initiative (Executive Order 14008) with the aim to deliver 40% of overall benefits of federal investments to low-income and disadvantaged communities (LIDACs).

Priorities for the Priority Climate Action Plan (PCAP) planning grant are described in Table 1.

Table 1. CPRG PCAP planning grant priorities.

Theme	Description
Analytics	Improve understanding of current and future GHG emissions in order to prioritize actions that reduce such emissions and harmful air pollution where citizens live, work, play, and go to school, particularly in non-attainment areas for the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants.
Programs	Adopt and implement ambitious policies and programs to reduce GHG emissions and accelerate decarbonization across multiple important sectors (e.g., industry, electricity generation, transportation, commercial and residential buildings, agriculture/natural and working lands, and waste and materials management).
Partnerships	Collaborate closely with other entities in their state, region, municipality, and/or air district to develop coordinated plans based on best practices.

Theme	Description
Financing	Explore opportunities to leverage sources of funding and financing from the Inflation Reduction Act of 2022, Bipartisan Infrastructure Law of 2021, American Rescue Plan Act of 2021, and Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022.
Innovation	Stimulate innovative technologies and practices to reduce GHG emissions and associated co-pollutants in hard-to-abate sectors.
Transformation	Prioritize actions and policies that will be durable, replicable, and provide certainty in pollution reductions.
Economic development	Reduce climate pollution while building the clean energy economy in a way that benefits all Americans, provides new workforce training opportunities, and effectively addresses environmental injustices in disadvantaged communities.
Monitoring and evaluation	Adopt robust metrics and reporting programs to track emissions reductions and important benefits throughout the jurisdiction and in disadvantaged communities.

Funding recipients are required to submit three key deliverables over the course of a four-year program period (2023–2027). These deliverables include:

1. A Priority Climate Action Plan (PCAP), due in early 2024;
2. A Comprehensive Climate Action Plan (CCAP), due two years from the date of the award; and
3. A Status Report, due at the close of the four-year grant period.

This PCAP is for phase 1 of the Capital Region Planning Commission's (CRPC) CPRG program requirements.

1.2 The Priority Climate Action Plan

The Capital Region Planning Commission's Baton Rouge Metropolitan Planning Organization (MPO) and its agency partners are participating in the CPRG planning program. The PCAP is the first deliverable of the program. This plan aims to reduce energy consumption and GHG emissions, identify and accelerate initiatives that provide new jobs and address environmental justice, and deliver cleaner air by reducing harmful air pollution throughout the Baton Rouge Metropolitan Statistical Area (MSA).

The primary objective of the PCAP is to identify near-term, high-priority, implementation-ready measures to reduce GHG emissions, which can be submitted as projects under the CCAP implementation phase of CPRG. This PCAP includes a GHG inventory, quantified GHG reduction measures, a LIDACs benefits analysis, and a review of authority to implement the measures. The approach will be developed in alignment with the Louisiana State PCAP, also completed under the CPRG program. This PCAP, and the CCAP to follow, will provide solutions and projects with quantifiable outcomes demonstrating specific GHG emissions reductions for the MSA.

A CCAP will be completed following the PCAP. The CCAP provides the scope for more detailed modeling, technical analysis, and community engagement and will represent a detailed roadmap for decarbonizing the Baton Rouge MSA.

1.3 The Role of Local and Regional Governments

Local governments can have a considerable impact on reducing GHG emissions in the community. By developing a quantitative understanding of the community's GHG emissions (i.e., the GHG inventory) and systematically identifying the actions for change (i.e., climate action planning), local and regional governments can influence the trajectory for community GHG emissions into the future. Land-use planning decisions made today will have environmental and socio-economic impacts over the next 100 years. In the case of infrastructure investments and land-use planning decisions, the impacts can "lock in" development patterns and GHG emissions that limit options to transform the current situation and increase costs in the future. In the context of climate change, planning decisions regarding longer-term investments are among the most urgent.

In addition to planning policy, local and regional governments can take on multiple roles that support GHG emissions reductions, including acting as:

- **A mobilizer:** Local governments can engage people, municipalities, and other organizations around a vision, goals, objectives, and targets. For example, local governments can lead community engagement programs or bulk purchasing of renewable energy on behalf of citizens;
- **An innovator:** Local governments can directly or indirectly support innovation through targeted investments, partnerships, and/or policies that support low-carbon projects or enterprises, reducing risk for investors, partners, and community members. For example, local governments can develop electric vehicle (EV) infrastructure to support EV adoption;
- **A collaborator:** There are multiple opportunities for collaboration in the energy transition, including with other levels of government, transit authorities, utilities, businesses, non-profit organizations, neighborhoods, and governments in other parts of the region, state, and world. Collaboration can take the form of shared targets, policies, joint projects, and investments;

- **An investor:** Local governments can use access to low-interest capital to make investments directly in building retrofits and renewable energy technologies. Alternatively, or in tandem, local governments can enable investments by third parties. For example, local governments can levy local improvement charges as a way to finance building retrofits;
- **An implementer:** Through policies and incentives, local governments can support businesses and households in making the clean energy transition. For example, local governments can amend building code requirements to mandate or incentivize Passive House construction; and
- **An incubator:** Local governments can cultivate the development of new technologies or applications that enable the low-carbon economy by supporting and attracting new and existing businesses and creating a hub, or ecosystem, in which the businesses and organizations support each other. Examples include a low-carbon business park or incentives for different levels of building performance that stimulate innovation by builders.

1.4 Approach to Developing the Priority Climate Action Plan: A Framework for Climate Action Planning

"Reduce, Switch, Produce, and Offset and Sequester" is a simple mantra to follow in performing energy and emissions planning. Adapted from similar approaches such as Reduce-Reuse-Recycle (from the waste sector) and Avoid-Shift-Improve[3] (from the transportation sector), it provides guidance on an overall approach to community energy and emissions planning.

The logic of this sequential approach (Figure 1) is to prioritize reductions in energy consumption and to decrease the need to generate new renewable energy that is more costly and logistically complex. The second priority is to identify opportunities to switch to local renewable energy production that maximizes local economic benefits and the resilience of the electricity system. The third priority is to ensure new renewable energy is produced locally. The fourth priority is to offset and sequester remaining emissions. This last opportunity is relatively limited in terms of its potential to reduce absolute GHG emissions; however, it provides several co-benefits, such as improved air quality and well-being.

In addition, prioritizing reductions in energy consumption by identifying opportunities for improving energy efficiency can reduce total energy costs and per-unit energy costs by decreasing the demand for build-out of the electricity system and the capital investments required.

[3] *GIZ. "Sustainable Urban Transport: Avoid-Shift-Improve," 2011. http://www.sutp.org/files/contents/documents/resources/E_Fact-Sheets-and-Policy-Briefs/SUTP_GIZ_FS_Avoi d-Shift-Improve_EN.pdf.*

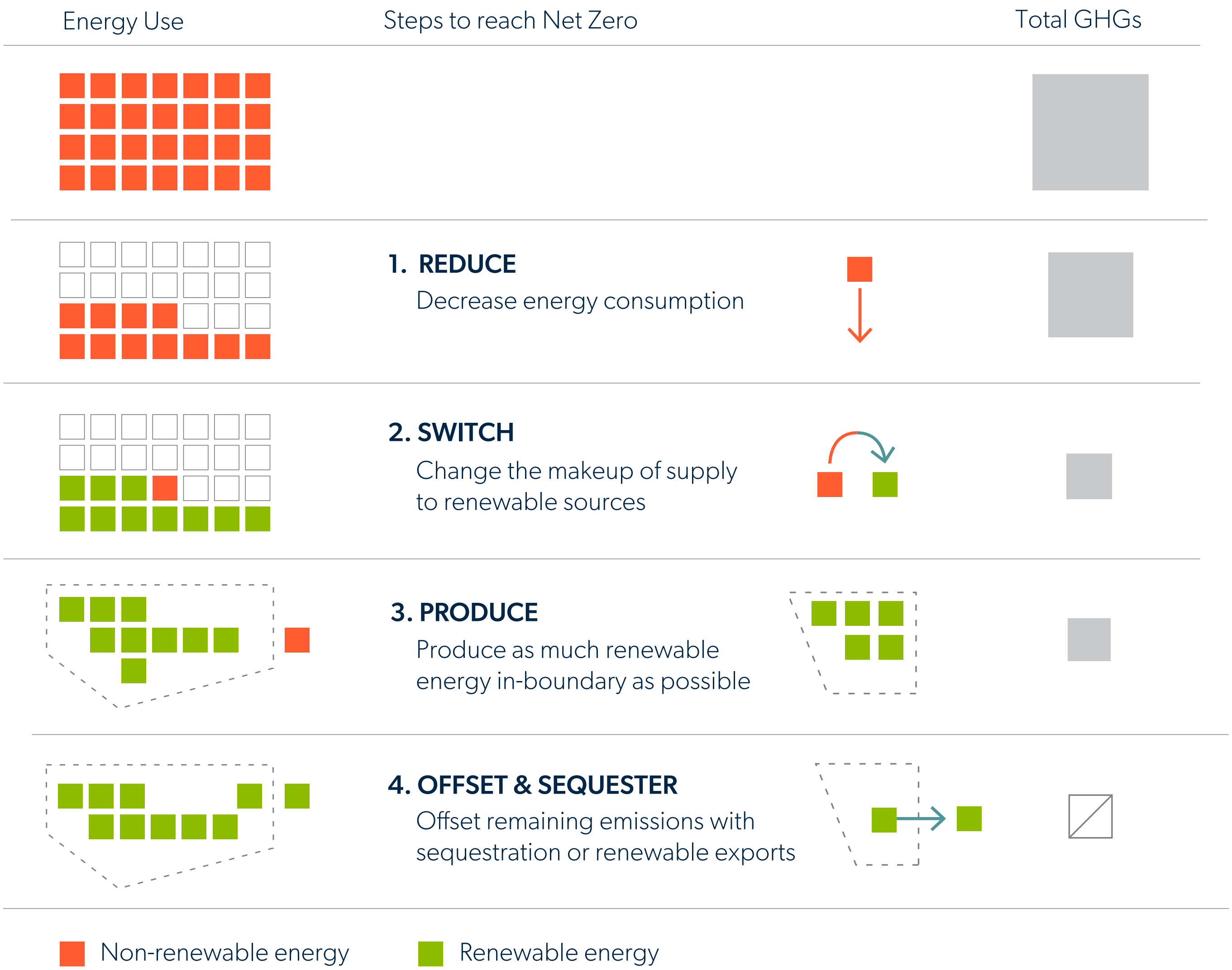

Figure 1. "Reduce, Switch, Produce, and Offset and Sequester"—a systematic approach to reducing GHG emissions.

A key consideration for prioritizing climate actions under this approach is to ask the question: Which investments will lock in rigidity rather than flexibility over the long term? Many energy-related investments encase patterns of development, transportation options, behavior, and ongoing capital and operating investments. For example, land-use planning and infrastructure policies and investments influence the density of development, the mix of land uses, the energy supply infrastructure, and transportation choices. In addition, major production processes, including industrial processes and energy-using equipment such as transit vehicles, motors, appliances, and HVAC systems, are key influencers of behavior and choice of transportation modes, building, and site design.

Coupled with prioritizing investments and actions that avoid high-carbon, energy-intensive lock-in, the systematic approach of reduce-switch-produce-offset/sequester guided the identification and prioritization of the MSA's PCAP actions.

1.5 Climate Action Is Economic Development

Climate action planning directly influences and creates new economic development opportunities. Decarbonizing transportation, buildings, and energy requires new investments and innovations, providing entrepreneurial opportunities. Investments in energy efficiency result in energy-cost savings that can also stimulate innovation and new businesses. Climate action investments also require new workers and new skills to install heat pumps, retrofit homes, and build infrastructure. The scale of these investments and the work opportunities created require a climate action plan that also serves as an economic development strategy for the MSA.

1.6 Priority Climate Action Plan Scope and Process

The PCAP's geographic scope is the Baton Rouge MSA. This includes 10 parishes (Ascension, Assumption, East Baton Rouge, East Feliciana, Iberville, Livingston, Pointe Coupee, St. Helena, West Baton Rouge, and West Feliciana) and 38 municipalities. The PCAP and CCAP will target GHG emissions reductions in the highest emitting sectors (i.e., industry, electricity production, residential, and transportation). The approach will follow the federal environmental justice mandates (e.g., Justice40 Initiative) to ensure outcomes for the region's LIDACs and other residents and to help mitigate the historical disproportionate impacts of pollution and climate that have overburdened low-income, racial, and disadvantaged communities.

The PCAP planning process will build upon and reference the Louisiana Department of Transportation and Development's (LADOTD) Climate Action Plan (2022), the City of Gonzalez's Climate Action and Resiliency Plan (2023), Baton Rouge MPO's transportation planning and programming efforts (Carbon Reduction Programs), and the sustainability and resilience goals and strategies of the MSA's Long Range Transportation Plan (MOVE 2046 for a Changing Region).

The process used to develop the Baton Rouge MSA PCAP (Figure 2) included four streams of activities: 1) Policy and socio-economic context analysis, 2) Technical analysis, 3) LIDAC analysis, and 4) Identification of prioritized measures/actions and benefits and outcomes.

Climate action measures were identified based on our synthesis of findings from the context review, GHG inventory, and LIDAC benefits analysis. We prioritized measures based on criteria that integrate the state's local and regional priorities with the EPA's evaluation criteria for the CPRG program's phase 2 grants for implementation planning. The CRPC's MPO served as the key decision-making and advisory body over the development of the PCAP.

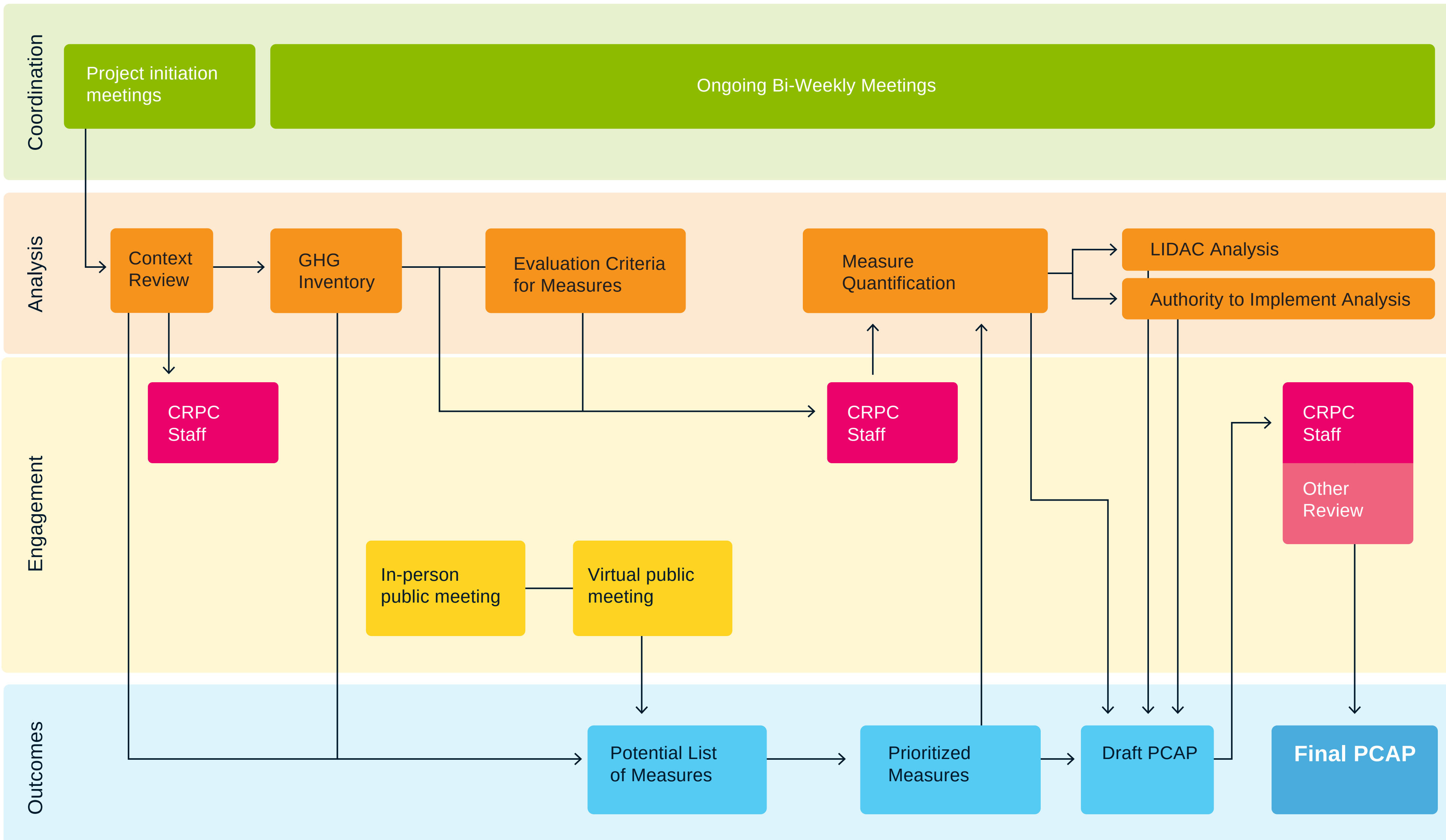

Figure 2. Baton Rouge MSA PCAP process.

2 Background

2.1 Climate Change Impacts and Risks

Human activities such as burning fossil fuels, industrial processes, deforestation, agriculture, and other activities are emitting large amounts of carbon dioxide, methane, nitrous oxide, and other gases that trap heat in the atmosphere, contributing to the greenhouse effect.[4] As a result, humans are increasing the concentrations of GHGs in the atmosphere, which is rapidly changing the Earth's climate. The average temperature of the planet has increased about 2°F (1.1°C) since the late 1800s.[5]

In order to curtail the rate and extent of increases in global temperature, the 2015 Paris Agreement, a legally binding international treaty on climate change, called for limiting temperature increase to well below 2°C (3.6°F) above pre-industrial levels and ideally to 1.5°C.[6] Since then, the Intergovernmental Panel on Climate Change (IPCC) has stressed that crossing the 1.5°C (2.7°F) threshold will have increasingly severe impacts on human communities, and on the current global trajectory of GHG emissions, this limit will be exceeded.

Temperatures across the U.S. have risen faster than the global average, with an average increase of 2.5°F relative to pre-industrial levels. Each increment of global warming leads to larger increases in temperature. At a global warming level of 2°C (3.6°F), for example, the average temperature in the United States is very likely to increase between 4.4°F and 5.6°F (2.4°C and 3.1°C), and for every additional 1°C of global warming, the average U.S. temperature is projected to increase an additional 2.5°F (1.4°C).[7]

Climate change is a particularly complex challenge for people to grasp and respond to because it occurs over a long timescale, with impacts that vary from region to region (Box 1). For example, GHGs remain in the atmosphere for significant periods of time, contributing to long-term changes in the climate that vary in terms of their Global Warming Potential (GWP), a measurement developed to compare the relative potency of a GHG equivalent to carbon dioxide (i.e., CO_2e). Equally complex are its solutions. Climate actions that reduce GHG emissions require rapid changes to energy, building standards, industrial processes, infrastructure planning and construction, and transportation systems that will transform all aspects of human life within a short time frame.

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[4] *USGCRP, 2023: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023*

[5] *USGCRP, 2023: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023*

[6] *UNFCCC, 2015. "The Paris Agreement," https://unfccc.int/process-and-meetings/the-paris-agreement, accessed Feb 25, 2024*

[7] *USGCRP, 2023: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023*

The Impacts of Climate Change for the Southeast Region

Selected excerpts from the Fifth National Climate Assessment[9]

- The population is growing and is expected to continue growing especially in metropolitan areas and along coastlines in the Southeast U.S. This growth exposes more people to increasingly severe climate-related risks. This growth has also resulted in the loss of natural land cover resulting in a decrease in natural buffers and resilience to severe weather events such as floods, hurricanes, and extreme heat.
- Decision-makers frequently use outdated and/or limited information on climate-related risks to inform adaptation plans; and, efforts tend to be concentrated in wealthier communities, leaving under-resourced and more rural communities, communities of color, and Tribal Nations at increasing risk. A long history of systemic and structural racism and slavery has resulted in many BIPOC communities located in neighborhoods experiencing disproportionate exposures to environmental risks, pollution, health disparities, and fewer resources to prepare and address them.
- The Southeast has more Black residents than any other NCA region and health-related challenges faced by communities with majority Black populations differ from those with majority White, Hispanic, or Asian populations. Communities with majority Black populations tend to have even lower life expectancies and less access to resources and opportunities that promote health, such as grocery stores, safe places to exercise, economic prosperity, employment opportunities, quality education, and quality healthcare than whiter and wealthier populations.
- Key climate change-related impacts include rising air temperatures and sea surface temperatures; changes in precipitation patterns; sea level rise and associated flooding events; increases in extreme heat events and heat-related mortality. Changes in temperature, drought, extreme rainfall, and sea levels are threatening the Southeast's agriculture and other food-related systems, which are expected to worsen with every increment of global warming, disproportionately harm farmers and small-scale operations, and increase the competition between urban and rural communities for valuable resources such as water and land.
- Rural and place-based economies that rely on the region's ecosystems are particularly at risk from current and future climate changes. Global warming is expected to worsen climate-related impacts on economic systems, labor, and regional supply chains in the Southeast, with disproportionate effects on frontline communities. A coordinated approach that recognizes present-day inequities and the interdependencies between rural and urban communities will be necessary to secure the region's economic vitality.
- Increasing intensity of climate stressors in the Southeast include extreme heat, extreme precipitation events, drought persistence and strength, sea level change, and tropical cyclones. The region is generally inadequately prepared to deal with the impacts of the warming climate, which has been demonstrated in the responses to hurricanes over the past years; Including Katrina, Florence and Ida.

[9] *Hoffman, J.S., S.G. McNulty, C. Brown, K.D. Dello, P.N. Knox, A. Lascurain, C. Mickalonis, G.T. Mitchum, L. Rivers III, M. Schaefer, G.P. Smith, J.S. Camp, and K.M. Wood, 2023: Ch. 22. Southeast. In: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023.CH22*

- In the 1980s, the U.S. experienced, on average, one (inflation-adjusted) billion-dollar disaster every four months. Now, there is one, on average, every three weeks. Between 2018 and 2022, the U.S. experienced 89 billion-dollar events. Extreme events cost the U.S. close to $150 billion each year—a conservative estimate that does not account for loss of life, healthcare-related costs, or damages to ecosystem services. The Southeast has historically experienced more billion-dollar disaster events than the rest of the country and has weathered numerous hurricanes since 2018.
- Further, climate change impacts interact with other stressors, such as the access to public health, environmental degradation, poverty, and lack of adequate housing that disproportionately impact overburdened communities. Flood risk in the Southeast is inequitably distributed due to stressors such as increases in rainfall, temperatures, sea level, and land cover change, which exacerbate flood risks; and by non-climate stressors such as social and economic policies (institutional investments and disinvestments) that differentially shape risk, vulnerability, and exposure to flooding and other climate-related impacts.
- The risk of two or more extreme events occurring simultaneously or in quick succession in the same region—known as compound events—is increasing. Climate change is also increasing the risk of multiple extremes occurring simultaneously in different locations that are connected by complex human and natural systems. For instance, simultaneous record back-to-back Atlantic hurricanes in 2020 caused unprecedented demand on federal emergency response resources.
- With additional global warming, more North Atlantic hurricanes are expected to strengthen to at least Category 4 intensity and to undergo rapid intensification, sea level rise is expected to worsen storm surge inundation, and tropical cyclone–related rainfall is expected to increase. Extreme rainfall coinciding with ocean water inundating populated areas due to high tides or storm surges during hurricanes creates compound flooding events that result in damaged properties, infrastructure, and roadway obstructions that can hinder first responders.
- The Southeast's economy relies on the region's ports, rivers, rail, air, and road networks, which are at risk from sea level rise, flooding, extreme heat, drought, and other climate-related hazards. If proactive adaptation action is taken, this can offset potential future climate-related damage costs substantially.
- Indigenous communities have long faced displacement from and loss of cultural and desirable lands from settlers and government. Indigenous communities experience substandard housing and infrastructure, as well as limited insurance coverage, which increases their vulnerability to climate stressors.

2.1.2 Impacts and Risks in the Capital Region

The Fifth National Climate Assessment outlined the major challenges that Louisiana is already facing —sea level rise (16 to 23 inches by 2025), an increase in high-tide flooding, and more saltwater intrusion—all which threaten natural and man-made infrastructure and public health. Analysis by the United States Geological Survey (USGS) shows that Louisiana's coast has declined by approximately 25% since 1932;[10] and Louisiana's Coastal Protection and Restoration Authority (CPRA) anticipates that sea levels will rise between 5.5 and 38.7 inches within 50 years. In addition, much of Louisiana, including the Capital Region, is expected to see 20 to 30 more extreme heat days by 2050, combined with worsening air quality and threats of smog and wildfire smoke.[11]

The Baton Rouge MSA, like most of South Louisiana, has experienced major climate impacts related to extreme precipitation, flooding, and extreme heat. In 2016, historic non-tropical rain events caused extreme flooding and damage. The most significant precipitation occurred around Baton Rouge, peaking with a record three-day rainfall of 25.5 inches in Livingston Parish, followed by widespread flash flooding and river overflows. Emergency officials reported that 30,000 individuals were rescued; 10,600 people sought refuge in shelters; over 60,000 homes were damaged; and there were at least 13 fatalities. The American Red Cross identified the event as the most devastating natural disaster to strike the U.S. since the impact of Superstorm Sandy in 2012.[12]

Crises like the flooding of 2016 demonstrate the extreme weather hazards already negatively impacting the Baton Rouge MSA. The Federal Emergency Management Agency's (FEMA) National Risk Index rates East Baton Rouge, Livingston, and Ascension Parishes as "relatively high risk" based on expected annual loss, social vulnerability, and community resilience metrics (Figure 3).[13]

[10] *Couvillion, Brady R., Holly Beck, Donald Schoolmaster, and Michelle Fischer. "Land Area Change in Coastal Louisiana (1932 to 2016)." Scientific Investigations Map 3381. U.S. Geological Survey. https://pubs.usgs.gov/publication/sim3381*

[11] *"Fifth National Climate Assessment," U.S. Global Change Research Program, last modified 2023, accessed February 10, 2024, https://nca2023.globalchange.gov*

[12] *Abstract, "Rapid attribution of the August 2016 flood-inducing extreme precipitation in south Louisiana to climate change," European Geosciences Union, using https://hess.copernicus.org/articles/21/897/2017/*

[13] *FEMA National Risk Index, Risk Index, using https://hazards.fema.gov/nri/map*

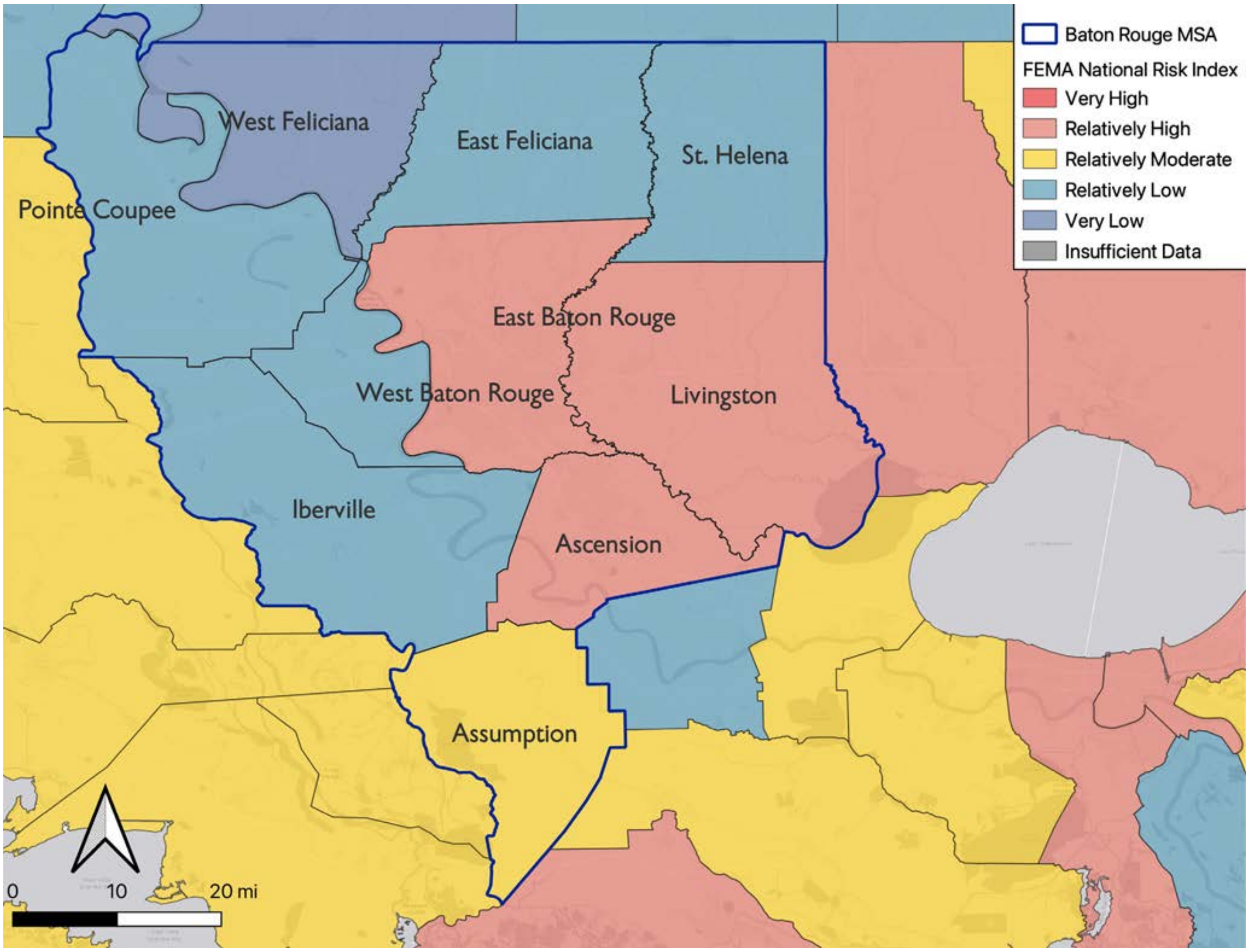

Figure 3. FEMA National Risk Index ratings for the Baton Rouge MSA.[14]

Similarly, the 2023 East Baton Rouge (EBR) Parish's Multi-Jurisdictional Hazard Mitigation Plan developed a Priority Risk Index (PRI) Vulnerability Analysis, which illustrates the level of composite risk associated with natural hazards (Table 2). This PRI ranks multiple hazards as high risk for the EBR with flooding and tropical cyclones as the highest climate-related risks in terms of expected annual loss, social vulnerability, community resilience, and overall risk rating (e.g., less than 2.0 is low risk, 2.0 to 2.4 is medium risk, and 2.5 and higher is high risk).[15]

[14] *FEMA National Risk Index, Risk Index, using https://hazards.fema.gov/nri/map*

[15] *East Baton Rouge Parish. "2023 East Baton Rouge Parish Multi-Jurisdictional Hazard Mitigation Plan" Accessed February 15, 2024. https://www.brla.gov/DocumentCenter/View/18636/2023-EBR-HM-Plan-FINAL-?bidId=.*

Table 2. East Baton Rouge Parish Multi-Jurisdictional Hazard Mitigation Plan, PRI Vulnerability Analysis.[16]

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Overall Risk
Dam Failure	1	2	1	2	2	1.85
Drought	3	2	4	3	3	2.8
Flooding	4	4	3	3	3	3.65
Levee Failure	1	2	1	2	2	1.85
Thunderstorms—Hail	4	2	3	1	1	2.7
Thunderstorms—Lightning	4	2	2	1	1	2.5
Thunderstorms—Wind	4	2	3	1	1	2.7
Tornadoes	3	3	2	3	3	2.95
Tropical Cyclones	3	4	4	4	4	3.3
Wildfires	1	3	4	2	2	2.25
Winter Weather	3	3	4	2	2	2.75

The Baton Rouge MSA has been preparing to address climate-related risks by implementing initiatives such as the creation of the Louisiana Watershed Initiative. This initiative includes efforts to: 1) mitigate flood risks using strategies such as expanding green space and nature-based solutions and 2) encourage housing that is affordable in low-income, high-flood-risk areas, especially where populations are increasing. For example, the Greauxing Resilience at Home adaptation toolkit provides five housing and nature-based solution goals including:[17]

1. Greaux nature-based solutions for community resilience.
2. Greaux flood mitigation solutions through targeted infrastructure planning and investments.
3. Greaux resilient, urban affordable housing options.
4. Greaux resilient, rural affordable housing options.
5. Greaux implementation and capacity-building efforts to increase resilience.

Other adaptation and resilience planning efforts in the region include the City of Baton Rouge Comprehensive Plan (FUTUREBR) and a Climate Adaptation Manual to support flood mitigation,[18] and the City of Gonzales Climate Action and Resilience Plan.[19]

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[16] *East Baton Rouge Parish. "2023 East Baton Rouge Parish Multi-Jurisdictional Hazard Mitigation Plan" Accessed February 15, 2024. https://www.brla.gov/DocumentCenter/View/18636/2023-EBR-HM-Plan-FINAL-?bidId=.*

[17] *Capital Region Planning Commission and Georgetown Climate Center. 2022. "Greauxing Resilience at Home: A Regional Vision." Georgetown Climate. https://www.georgetownclimate.org/adaptation/toolkits/greauxing-resilience-at-home-a-regional-vision/goal-one-greaux-nature-based-solutions-for-community-resilience.html*

[18] *"Climate Change Adaptation Manual for Louisiana," Center for Planning Excellence, 2019, Accessed February 12, 2024, https://www.cpex.org/resilient-communities*

[19] *City of Gonzales. "Gonzales Climate Action & Resilience Plan." Last modified February 2023. https://gonzalesla.com/wp-content/uploads/2023/02/gonzalescarp_final.pdf.*

2.2 Baton Rouge Metropolitan Statistical Area Overview

2.2.1 Geography

The Baton Rouge MSA comprises the 10 parishes surrounding the state capital of Baton Rouge: Ascension Parish, Assumption Parish, East Baton Rouge Parish, East Feliciana Parish, Iberville Parish, Livingston Parish, Pointe Coupee Parish, St. Helena Parish, West Baton Rouge Parish, and West Feliciana Parish. The MSA sprawls across nearly 4,200 square miles of the southeastern portion of the state, spans both sides of the Mississippi River, and is adjacent to the Lafayette, New Orleans, and Hammond MSAs.

The topography of the MSA is mostly flat with occasional gentle undulations that remain relatively close to sea level, and it is woven through by waterways and wetlands and speckled with lakes and smaller bodies of water. The climate is classified as humid subtropical. Summers are extremely hot and humid, with average temperatures often exceeding 90°F, while winters are mild, with temperatures rarely dipping below freezing. The region's topography and climate are typical of the Mississippi Alluvial Plain, which provides a lush habitat for the region's distinct flora and fauna as well as fertile ground and water for hunters and fishers.

The predominant geographic feature of the region is the Mississippi River, which bisects the MSA region from north to south and snakes alongside Baton Rouge. The river powers the Port of Baton Rouge, located about 230 miles from the Gulf of Mexico, and the Port of New Orleans, further south, which together comprise one of the largest port systems in the world.[20] The western side of the MSA includes part of the Atchafalaya Basin, the largest wetland, swamp, and floodplain forest in the United States.

The Mississippi River, the Atchafalaya Basin, and countless rivers and bayous serve as critical environmental and economic assets for the Baton Rouge MSA. The region's coastal wetlands provide essential flood mitigation buffers and water storage. However, the ongoing impacts of human development, including oil and gas infrastructure, homebuilding, and climate change, are causing coastal erosion, saltwater intrusion, and loss of wetlands, which exacerbate the region's vulnerability to climate-related hazards, and contribute to the increasing costs for the region.

2.2.2 Population and Demographics

Since 2000, when the population was about 705,973, the MSA has grown by 13.7%. According to the most recent census, the total population of the MSA was 870,569 in 2020. Between 2010 and 2020, the Ascension, West Baton Rouge, Livingston, and East Baton Rouge parishes experienced population growth, whereas the populations in other parishes declined.[21]

East Baton Rouge Parish is the most populated area in the MSA, with around 456,780 residents. Livingston Parish is the second-most populated, with a population of 142,280 people, and Assumption Parish is the least populated, with just over 20,000 residents (Table 3).[22]

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[20] *Port of Greater Baton Rouge (2023). Fast Facts. The Port of Greater Baton Rouge. Retrieved from: https://www.portgbr.com/fast-factsfaqs*

[21] *U.S. Census Bureau; Decennial Census 2010 and 2020, Table P1; using data.census.gov; <https://data.census.gov/>*

[22] *Ibid.*

The distribution of population and trends in growth are important for climate change planning. As population concentrates in specific areas, it indicates where vulnerabilities to climate impacts may be higher and where efforts to reduce GHG emissions should be focused. In addition, population trends across parishes may affect how resources are distributed in the future.

Table 3. Population of MSA parishes.[23]

Population of MSA Parishes, 2020	
Baton Rouge MSA Parish	**Population**
Ascension Parish	126,500
Assumption Parish	21,039
East Baton Rouge Parish	456,781
Livingston Parish	142,282
Iberville Parish	30,241
Pointe Coupee Parish	20,758
West Baton Rouge Parish	27,199
East Feliciana Parish	19,539
West Feliciana Parish	15,310
St. Helena Parish	10,920
Total MSA Population	**870,569**

[23] *Ibid.*

2.2.3 Race, Ethnicity, and Age

In 2020, 54% of the Baton Rouge MSA population identified as White, 35% identified as Black, 6% identified as Hispanic or Latino, 2% identified as American Indian or Alaskan Native, 2% identified as Asian, and 3% identified as other (Table 4). The proportion of ethnicity and race diversity varies across the MSA. In East Baton Rouge Parish, the population is 47% Black and 47% White, whereas the population in Livingstone Parish is 87% White, 10% Black, and 5% Hispanic or Latino (Figure 4).[24] The MSA population is predominantly young with 19% children or young adolescents, 66% of working age, and 15% over the age of 65 (Figure 5).[25]

Table 4. Racial demographics of combined MSA parish populations, 2020.

Hispanic or Latino	6%
White Alone (not Hispanic or Latino)	54%
Black Alone (not Hispanic or Latino)	35%
American Indian or Alaskan Native Alone (Not Hispanic or Latino)	2%
Asian Alone (Not Hispanic or Latino)	2%
Native Hawaiian and Other Pacific Islander Alone (Not Hispanic or Latino)	0%
Other Race Alone or Two or More Races	3.2%

[24] *Ibid.*

[25] *U.S. Census Bureau (2022). American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S0101. Retrieved from: https://data.census.gov/*

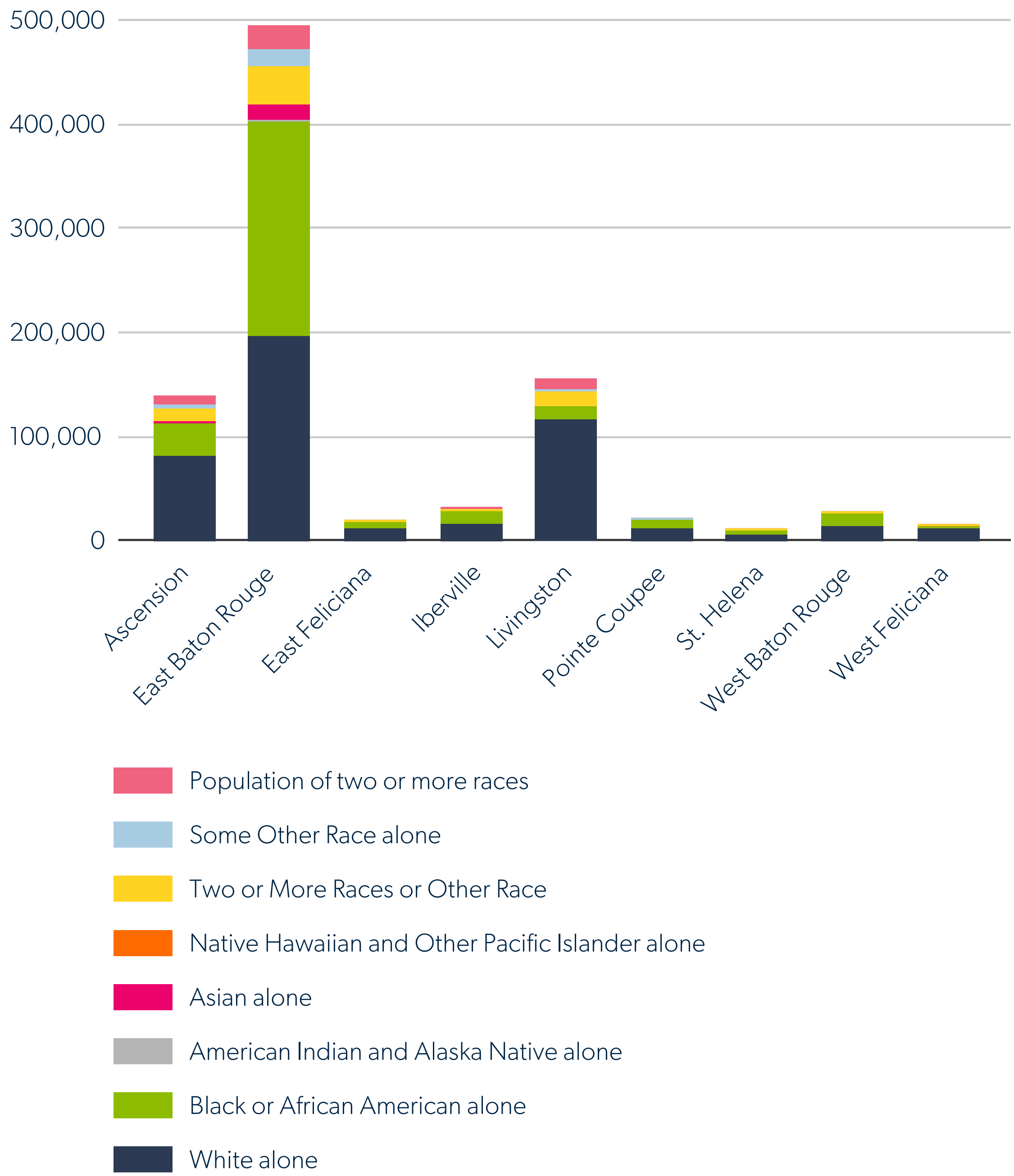

Figure 4. Population of MSA parishes by race and ethnicity.[26]

[26] *U.S. Census Bureau. Decennial Census 2010 and 2020, Table P1. Retrieved from: data.census.gov, https://data.census.gov/,*

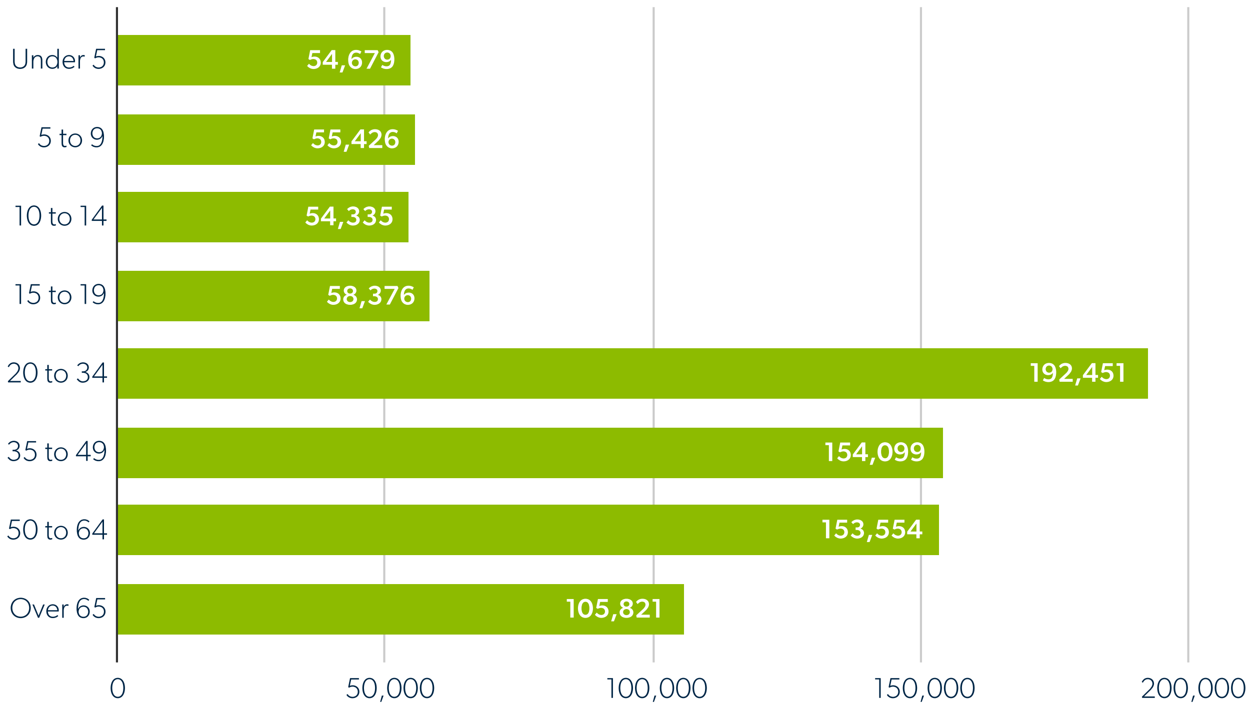

Figure 5. MSA population by age range.[27]

[27] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S0101; using data.census.gov; <https://data.census.gov/>*

2.2.4 Income and Poverty

In 2022, the MSA had a median income of $67,979 and a poverty rate of 15.5%.[28] [29] Figure 6 illustrates the median household income across the MSA, with 38% of households at an income of $49,999 or less and 34% of households having an income of $100,000 or more.[30] Ascension Parish has the highest median household income of $93,800, and St. Helena and Assumption have the lowest with $46,402 and $47,023, respectively.[31] Similarly, Ascension Parish has the lowest poverty rate of 10%, and St. Helena has the highest poverty rate of 28%.[32]

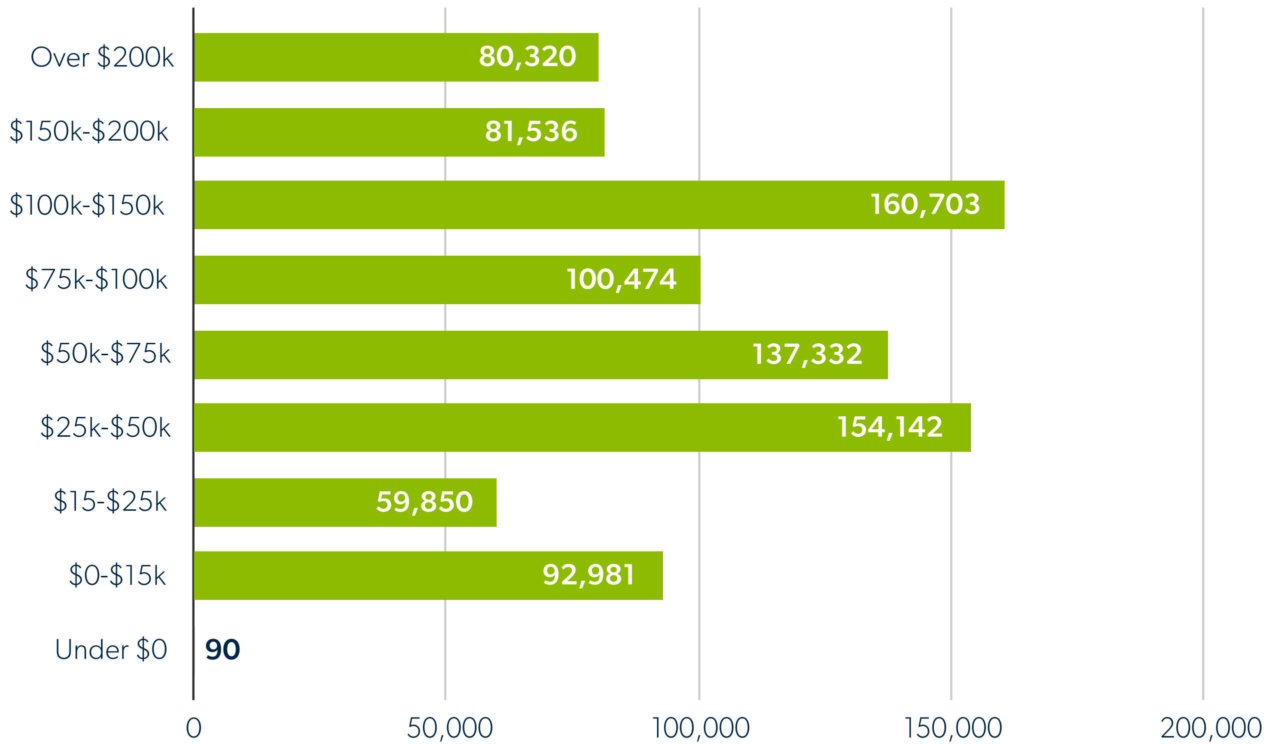

Figure 6. MSA median household income (2022 dollars).[33]

[28] *Ibid.*

[29] *Ibid.*

[30] *Ibid.*

[31] *Ibid.*

[32] *Ibid.*

[33] *Source: U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S1901; using data.census.gov; <https://data.census.gov/>*

Figure 7 shows the change in household income between 2017 and 2022 by parish. The majority of the MSA has seen an increase in median household income with the exception of Assumption Parish where there has be a decline.[34]

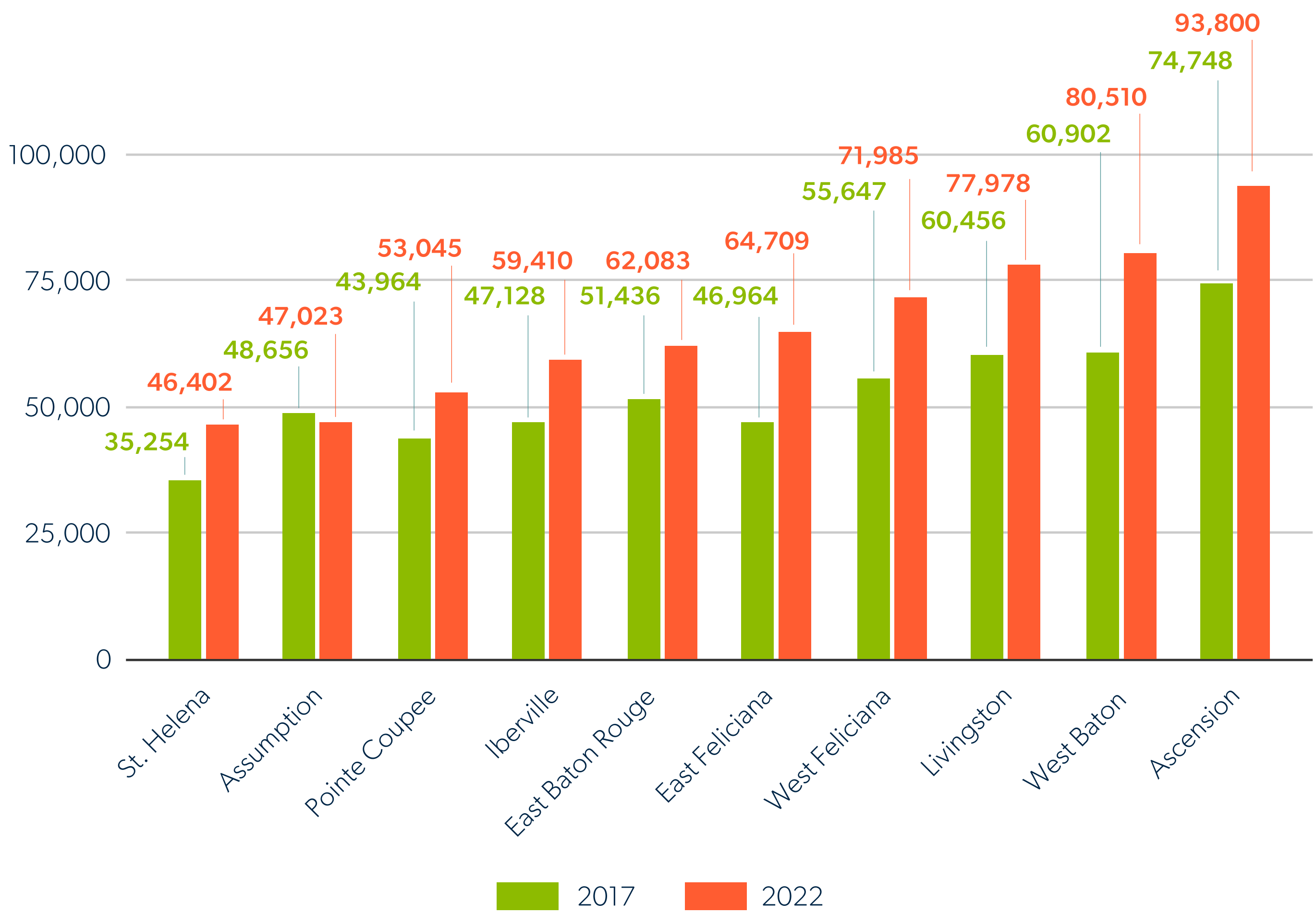

Figure 7. Household income by parish, Baton Rouge MSA.[35]

[34] *Ibid.*

[35] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S1901 and S1701; using data.census.gov; <https://data.census.gov/>*

Poverty declined in most parishes between 2017 and 2022, with the exception of Pointe Coupee, St. Helena, and West Feliciana where poverty rates have increased (Figure 8).[36]

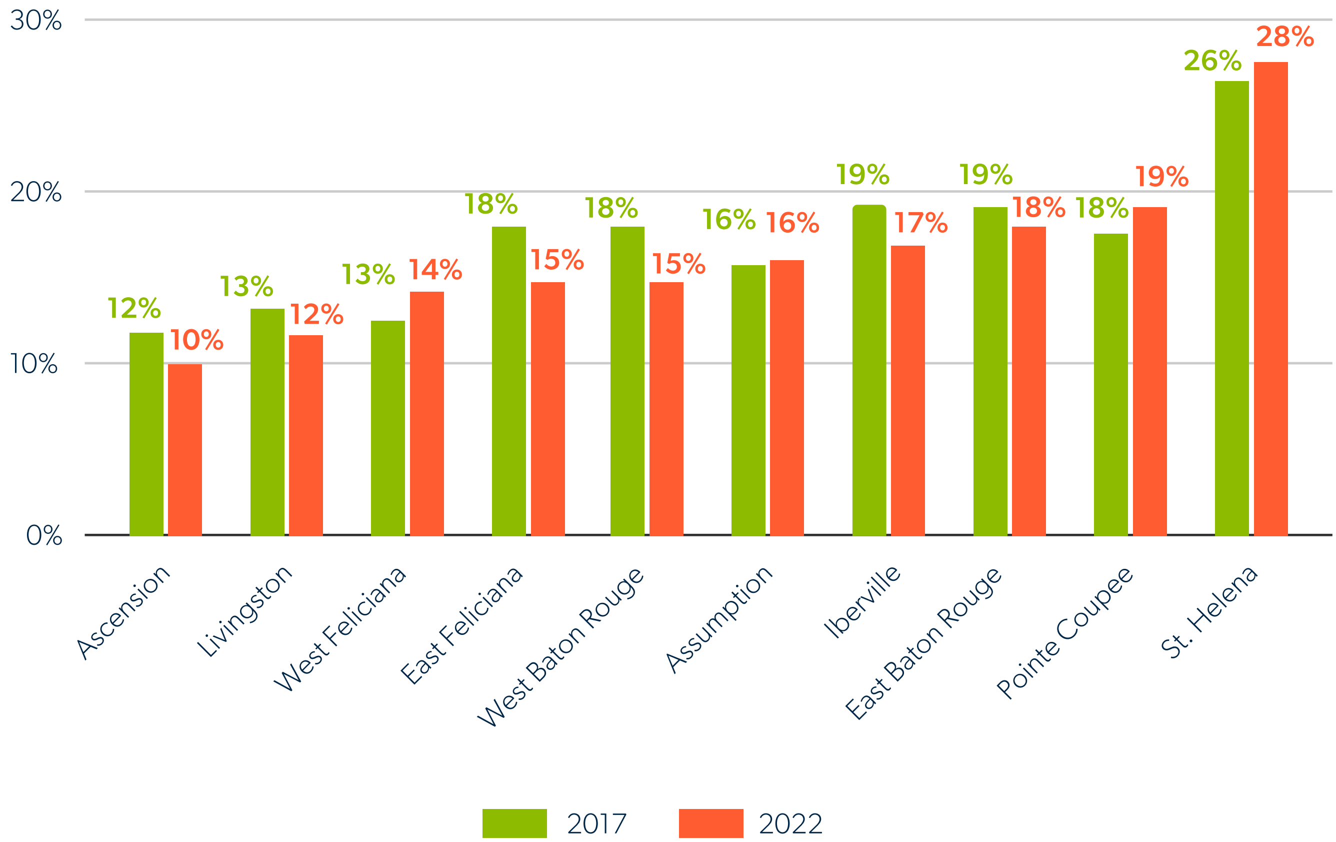

Figure 8. Poverty rate by parish, Baton Rouge MSA.[37]

[36] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S1901; using data.census.gov; <https://data.census.gov/>*

[37] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S1901 and S1701; using data.census.gov; <https://data.census.gov/>*

2.2.5 Economy

Baton Rouge has a large deep-water port, which can accommodate both ocean-going vessels and river barges. The Capital Region has an industrial sector including chemical plants, oil refineries, and other manufacturing facilities.

In 2022, the MSA's gross domestic product (GDP) was $63 billion, an increase from $57.3 billion in 2021.[38] The total workforce in 2023 was 432,000 with a total unemployment rate of 3.3%. The dominant employment sectors include trade, transportation and utilities, government and education, and health services (Figure 9).

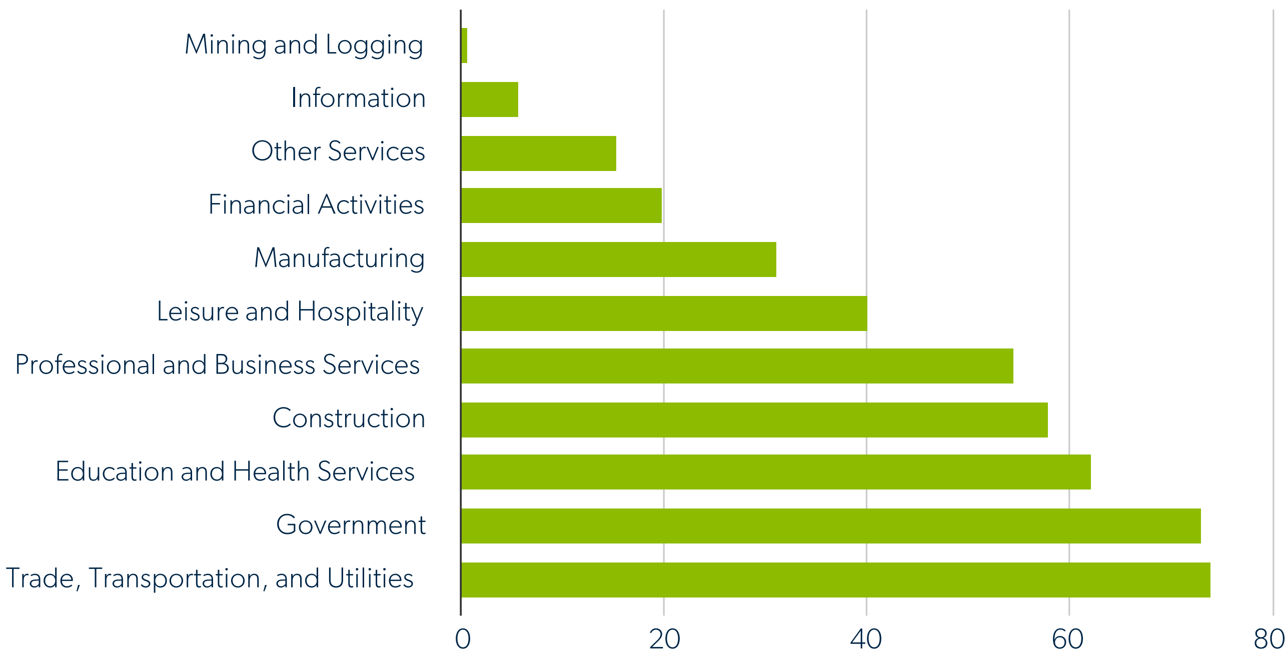

Figure 9. Number of employees per sector, Baton Rouge MSA.[39]

The economy has been growing post-COVID, with increases in the number of jobs, businesses, and wages. Despite this growth, the region has experienced net-negative migration, which has been most prevalent among the 25–44 years old cohort.[40] The Baton Rouge Area Chamber's (BRAC) strategic plan (Bring It!) focuses on economic diversification, including renewable and clean energy, and creating a more inclusive economy.[41]

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[38] *U.S. Bureau of Economic Analysis, Total Gross Domestic Product for Baton Rouge, LA (MSA) [NGMP12940], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/NGMP12940, February 21, 2024.*

[39] *US Bureau of Labor Statistics 2024. Economy at a Glance- Baton Rouge, LA. Retrieved from: https://www.bls.gov/eag/eag.la_batonrouge_msa.htm*

[40] *Baton Rouge Area Chamber 2023. BRAC's 2024 Economic Outlook. Retrieved from: https://brac.org/download/2023-economic-outlook-2/?wpdmdl=126566&refresh=65d763ec031001708614636*

[41] *Baton Rouge Area Chamber. Bring It! 2026. Strategy Plan. Retrieved from: https://brac.org/bringit/*

2.2.6 Housing

There are 870,000 homes in the Baton Rouge MSA, of which 73% are single-family homes, and nearly three quarters of households own their own homes (Figures 10 and 11).

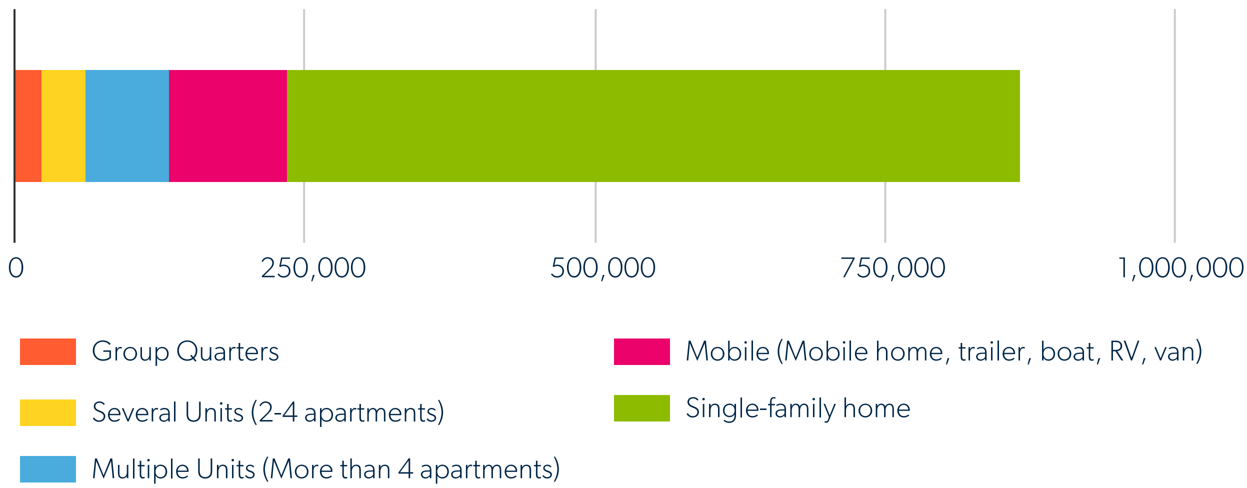

Figure 10. Dwellings by type, Baton Rouge MSA.[42]

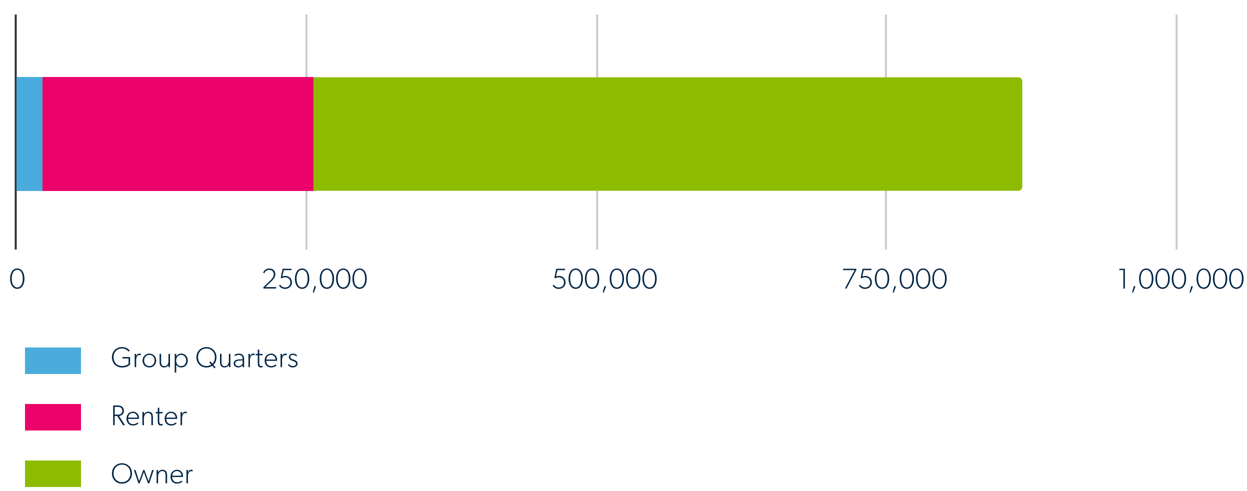

Figure 11. Dwellings by ownership, Baton Rouge MSA.[43]

Home ownership and vacancy rates vary across the MSA. The Ascension and Assumption parishes have the highest homeownership rates (83%), whereas East Baton Rouge's is much lower (60%).[44] Pointe Coupee and West Feliciana have vacancy rates of 25%, whereas Ascension's vacancy rate is very low at 7.9% (Figure 12).[45]

[42] *ReplicaHQ. Baton Rouge MSA Study Area. Retrieved from: https://studio.replicahq.com/places/studies/kl6hab6/map*

[43] *Ibid.*

[44] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table S2502; using data.census.gov; <https://data.census.gov/>*

[45] *U.S. Census Bureau; American Community Survey, 2022 American Community Survey 5-Year Estimates, Table B25002; using data.census.gov; <https://data.census.gov/>*

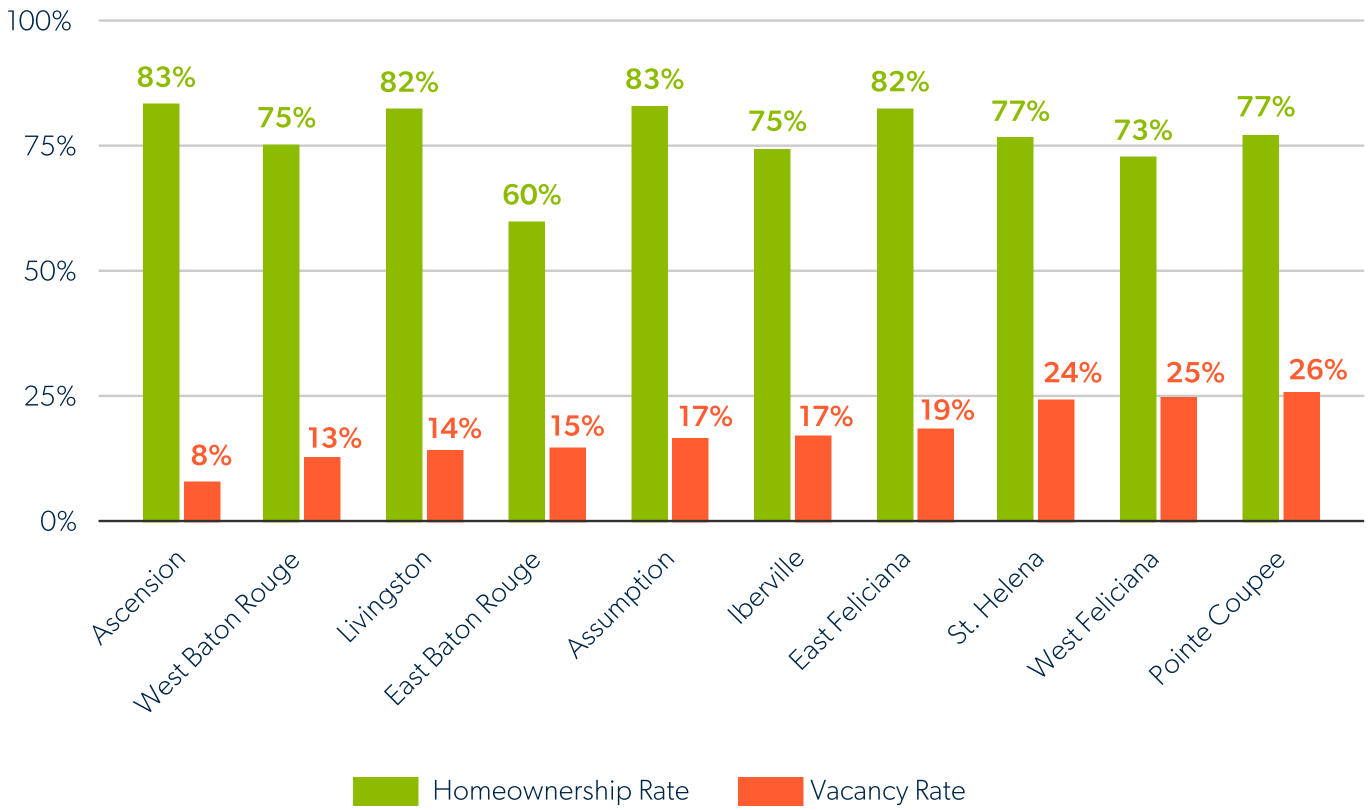

Figure 12. Homeownership and vacancy by parish, Baton Rouge MSA.[46]

Housing challenges including high housing costs, high energy costs, and low housing standards are prevalent across the MSA (Box 2). Figure 13 illustrates the number of households with severe housing challenges (e.g., absence of a kitchen or plumbing facilities; overcrowding with more than one person per room; and/or housing cost burden exceeding 50% of household income). In East Baton Rouge over 25,000 households (~14%) demonstrate severe housing challenges and in Pointe Coupee 16% of its households grapple with these severe problems. Livingston, East Feliciana, and West Feliciana parishes demonstrate lower incidences, each recording less than 10% of households with severe housing difficulties.[47]

[46] *U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates.*

[47] *The Comprehensive Housing Affordability Strategy (CHAS) Database. Washington, D.C. :U.S. Dept. of Commerce, Bureau of the Census, Data User Services Division, 2016 - 2020 data, using huduser.gov; <https://www.huduser.gov/portal/datasets/cp.html>*

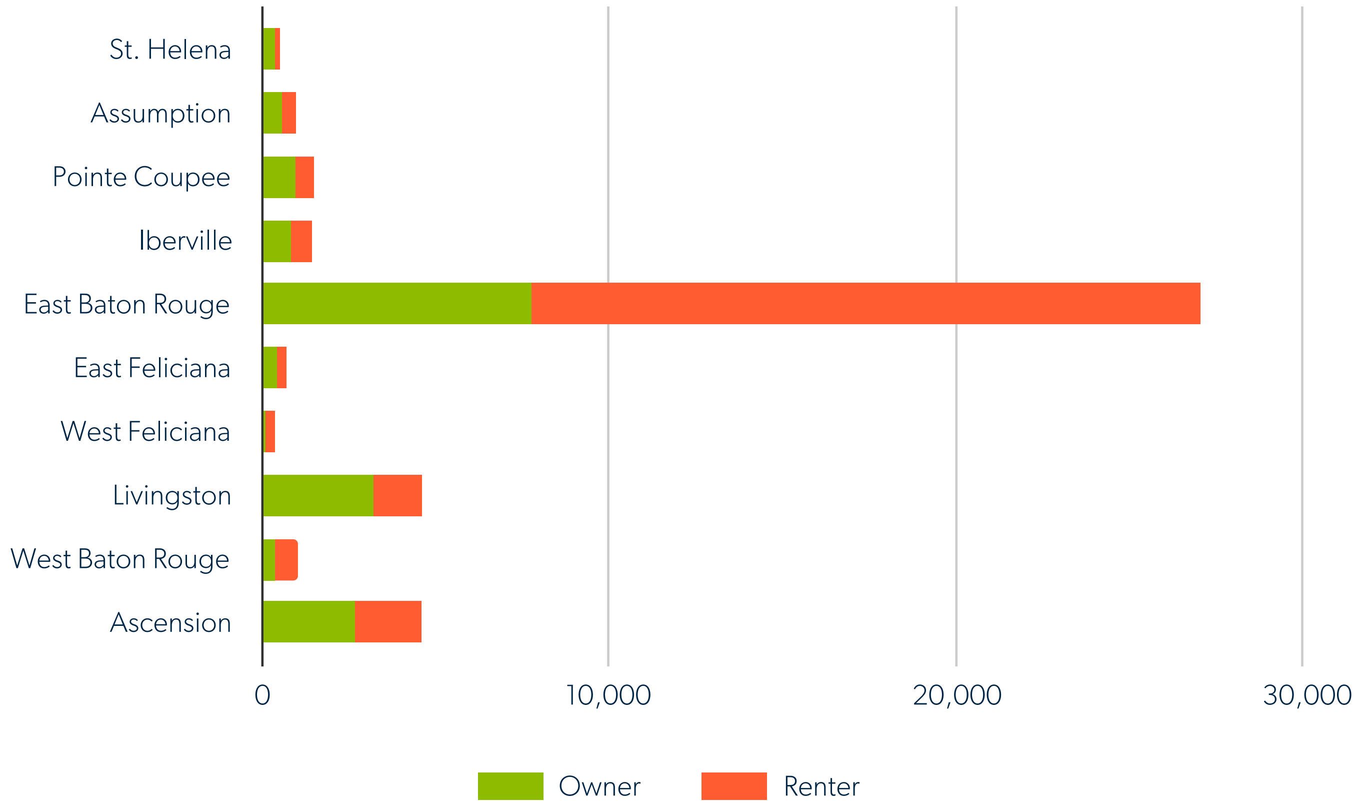

Figure 13. Total households with severe housing challenges, Baton Rouge MSA.[48]

[48] *Ibid.*

Energy Insecurity in the South[50]

- The South has the lowest electric rates in the contiguous United States, but the highest residential bills.
- 53% of all residential buildings in the South were built before the nation's first energy codes, which require builders to meet minimum acceptable standards for comfort and efficiency.
- On average, low income energy burdens are three times higher than energy burdens for higher-income households.
- One out of three people in the South struggles to pay their bills month to month.
- 7.5 million households in the South (17% of all) are estimated to have received disconnection or stop service notices. Paying utility bills is one of the leading reasons people take out exploitative high-interest payday loans.
- 5 million households in the South (11% of all) have had to leave their home at an unhealthy temperature because of the cost of energy.
- 3.9 million households in the South (9% of all) are estimated to lack access to working cooling equipment in their homes, putting them at an elevated risk for heat-related illness.

[50] *Southeast Energy Efficiency Alliance (2023). Energy Insecurity in the South. Retrieved from: https://www.seealliance.org/initiatives/energy-insecurity/*

Housing across the MSA is poorly insulated and heating and cooling costs are high despite relatively low electricity rates. For example, nearly 50% of the homes in Louisiana have no insulation in the walls and less than 6% have a medium level of insulation (Figure 14). Furnaces are the primary heating source (78%) for Louisiana homes, while air-source heat pumps constitute a small portion of the heating equipment stock (~5%). Nearly all dwellings in the state have air conditioning (Figure 15).

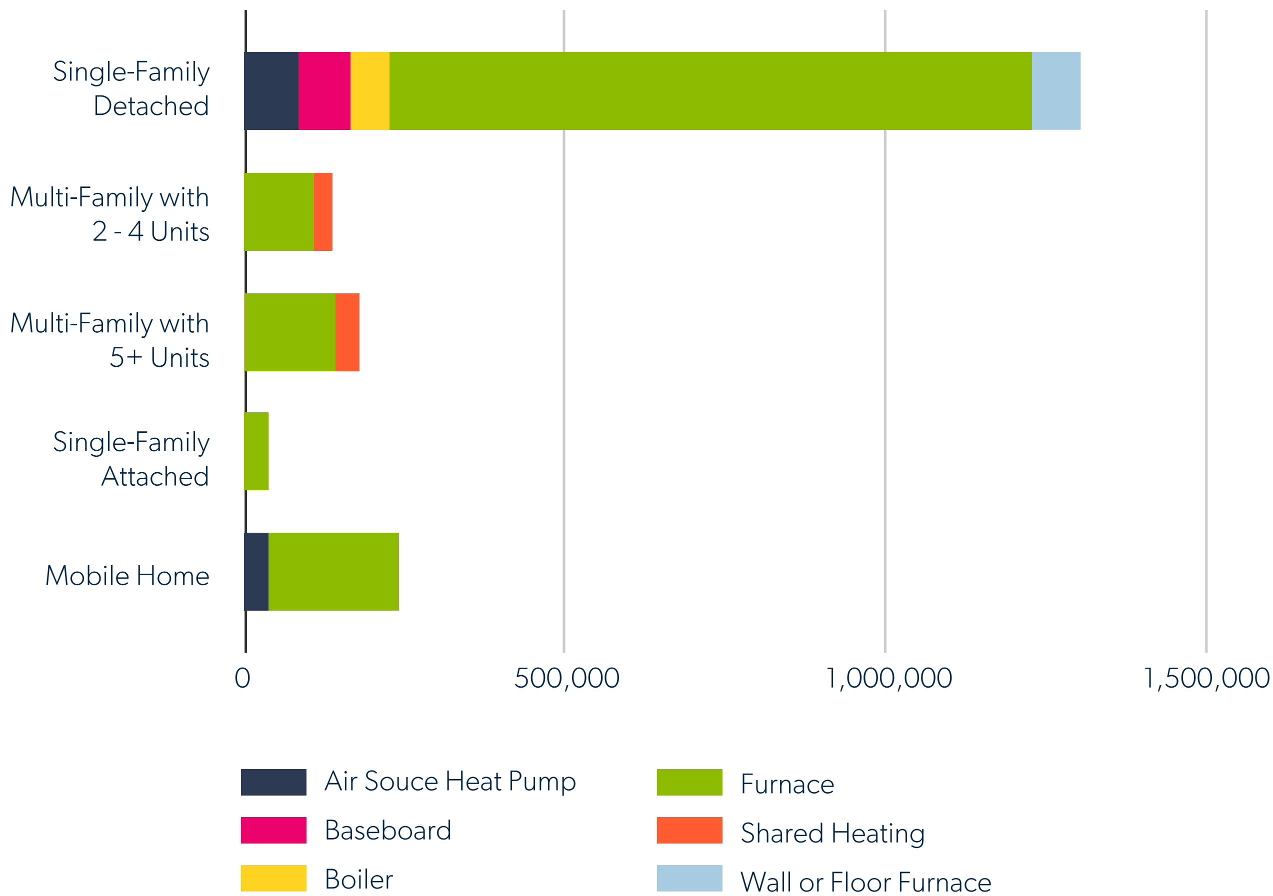

Figure 14. Dwelling types and level of insulation in the walls in Louisiana, 2023.[51]

[51] *Ibid.*

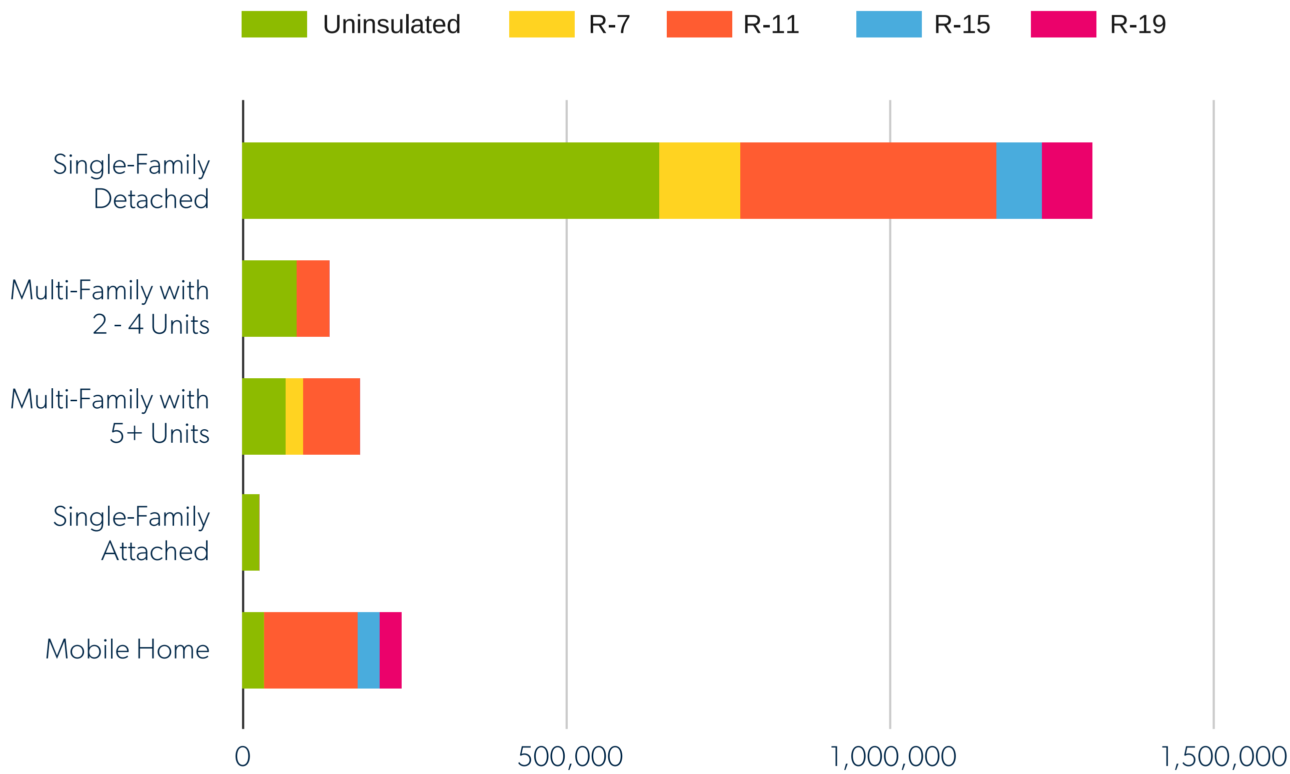

Figure 15. Dwelling types and heating systems, Louisiana.[52]

[52] *Brossman, Jes, Lixi Liu, Ben Polly, Elaina Present, Jenny Erwin. 2023. "State Level Residential Building Stock and Energy Efficiency & Electrification Packages Analysis". Tableau Dashboard. Golden, CO: National Renewable Energy Laboratory.*

2.2.7 Transportation

The predominant mode of transportation across the MSA is personal vehicle. On average, there were 3.1 million trips per day across the MSA in 2023. Eighty-seven percent of these trips were by personal vehicle (as a passenger or driver), while 10% were walking, 1% were biking, and less than 1% of trips were by transit (Figure 16). Seventy percent of households have two or more vehicles, while 28% of households have three or more vehicles (Figure 17).

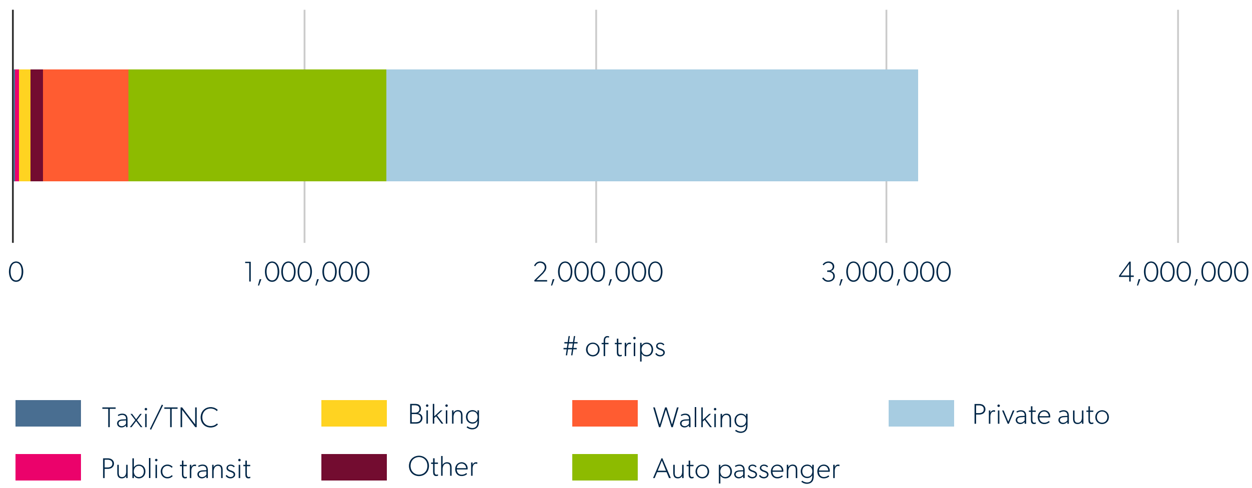

Figure 16. Trips by mode, Baton Rouge MSA.[53]

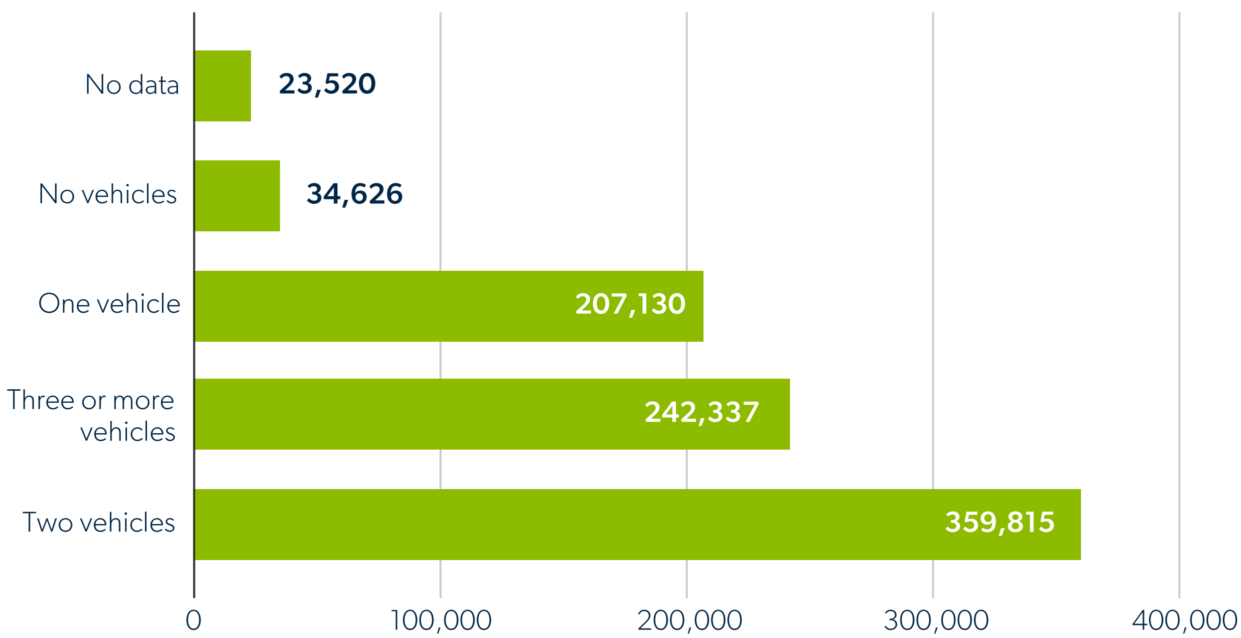

Figure 17. Number of vehicles per household, Baton Rouge MSA.[54]

[53] *ReplicaHQ. Baton Rouge MSA Study Area. Retrieved from: https://studio.replicahq.com/places/studies/kl6hab6/map*

[54] *Ibid.*

Most of the trips taken were to travel to home, work, or for shopping (Figure 18). The majority of trips were less than 20 minutes and nearly all trips were less than 80 minutes (Figure 19).

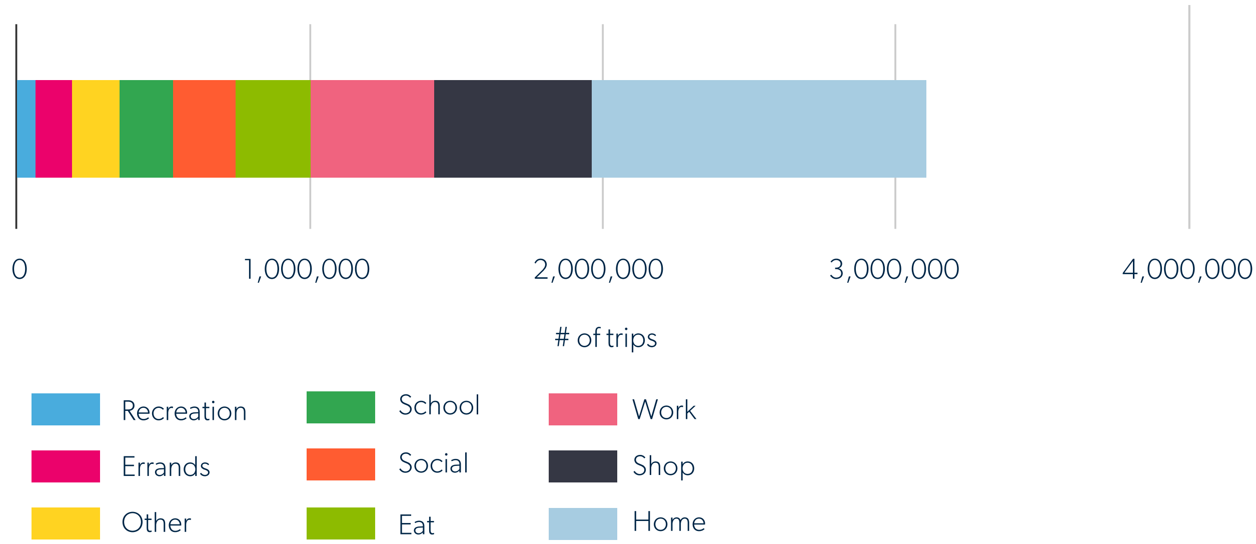

Figure 18. Trips by purpose, Baton Rouge MSA.[55]

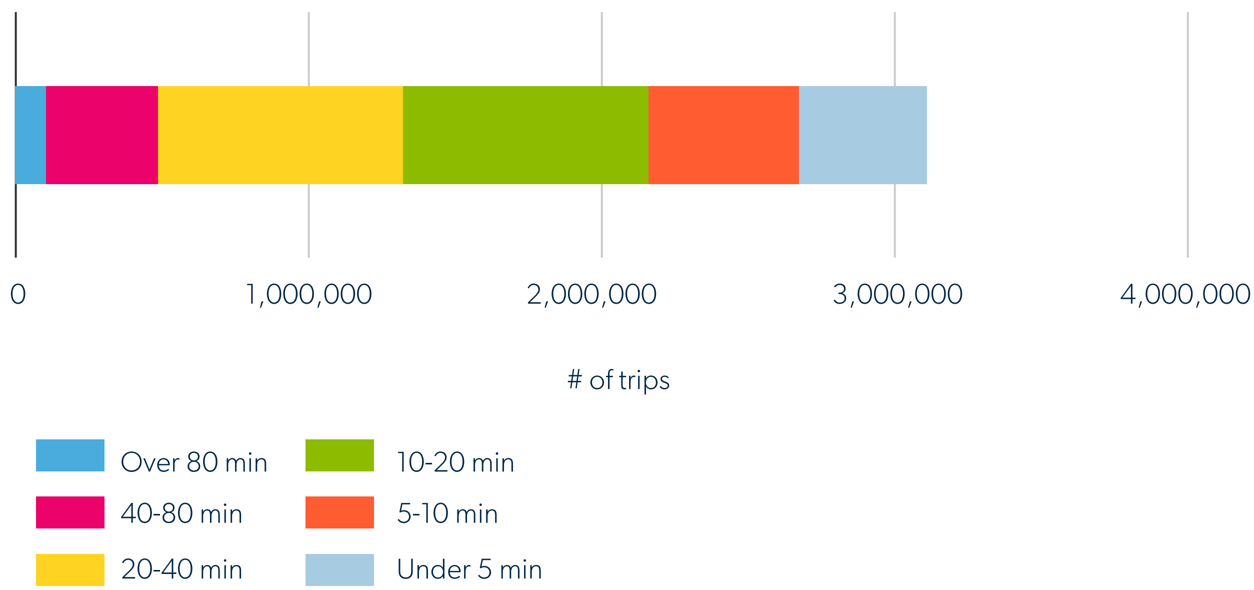

Figure 19. Trips by length, Baton Rouge MSA.[56]

[55] *Ibid*
[56] *Ibid*

On average, rural households drive about two to four times more each day than urban households, with an average of 31 to 63 vehicle miles traveled (VMT) daily per rural resident (Figure 20).

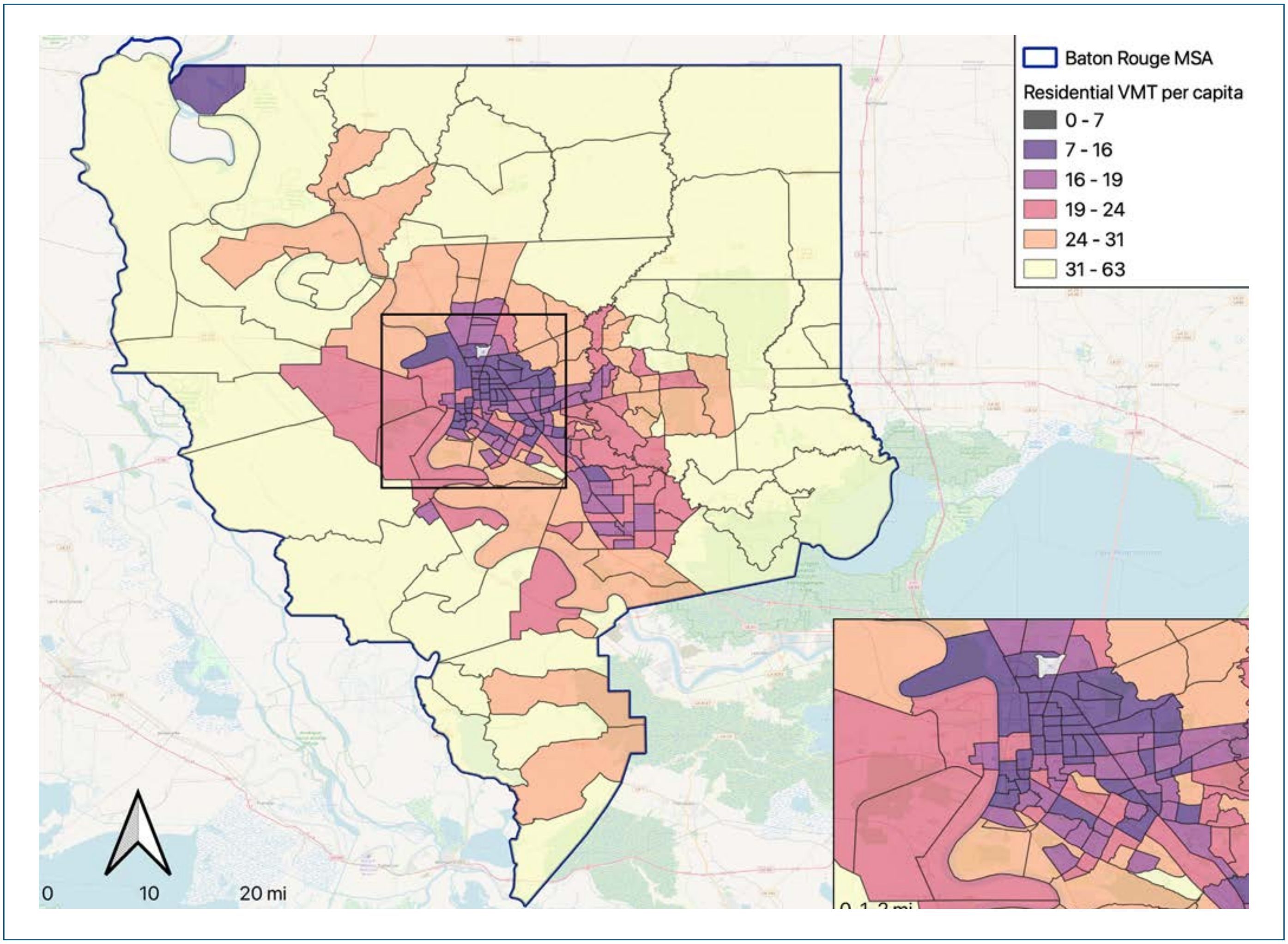

Figure 20. Daily residential vehicle miles traveled (VMT) by census tract, Baton Rouge MSA.[57]

[57] *Ibid.*

2.2.8 Energy Systems and Clean Energy Potential

Louisiana is a major natural gas producer, ranking third in the U.S., with about 7% of the nation's natural gas reserves.[58] The primary source for the electricity grid is natural gas, followed by nuclear and coal (Figure 21), and its emissions intensity is average relative to other states (Figure 22). The state has the highest per capita residential electricity consumption in the nation with seven of 10 households using electric heating and nearly all households using air conditioning. Per-capita expenditures on energy are the fourth highest in the U.S. ($7,839).[59] It is also the state with the second-highest per-capita overall consumption of energy in the U.S., largely because of energy-intensive chemical, petroleum, and natural gas industries.[60]

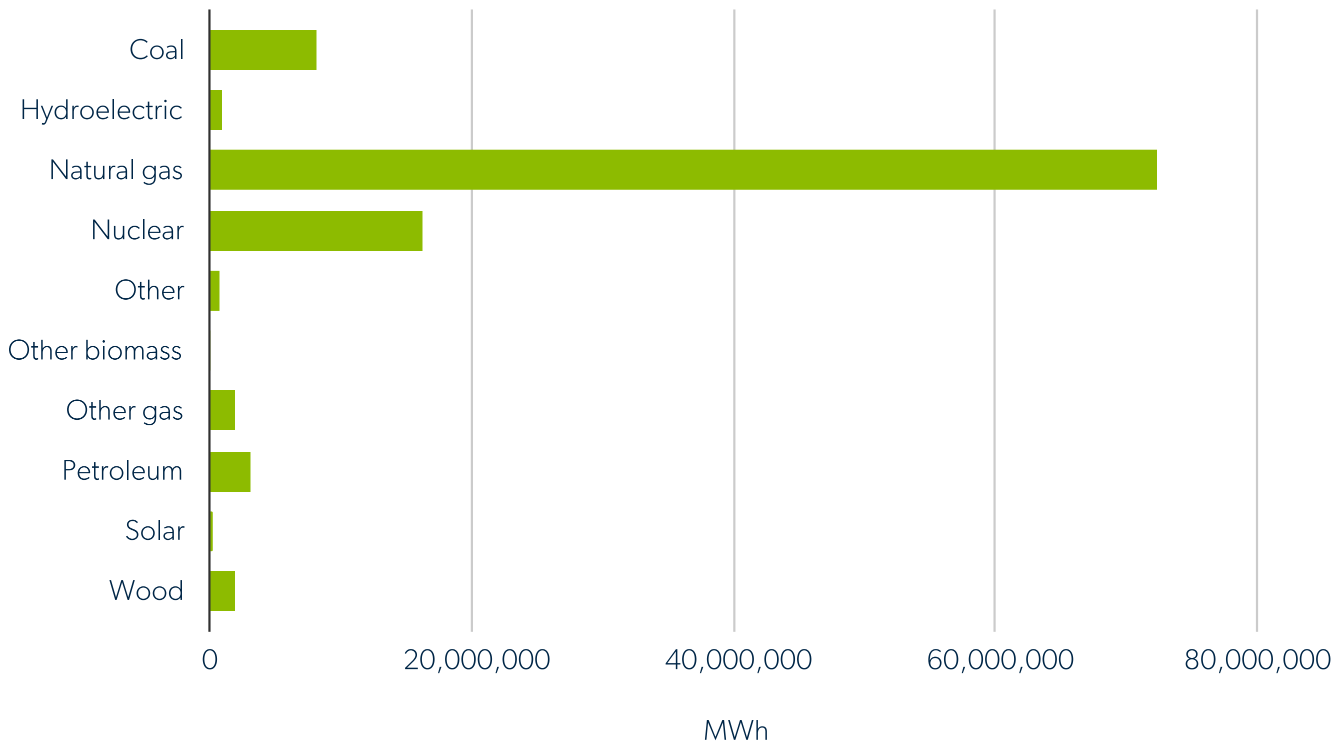

Figure 21. Energy sources for grid electricity in Louisiana, 2022.[61]

[58] *EIA (2023). Louisiana State profile and Energy Estimates. Retrieved from: https://www.eia.gov/state/?sid=LA*

[59] *EIA (n.d.). State Total Energy Rankings, 2021. Retrieved from: https://www.eia.gov/state/*

[60] *EIA (n.d.). Rankings: Total Energy Consumed per Capita, 2021. Retrieved from: https://www.eia.gov/state/rankings/?sid=LA#series/12*

[61] *EIA, Form EIA-860, Annual Electric Generator Report, U.S. Energy Information Administration, Form EIA-861, Annual Electric Power Industry Report, U.S. Energy Information Administration, Form EIA-923, Power Plant Operations Report and predecessor forms.*

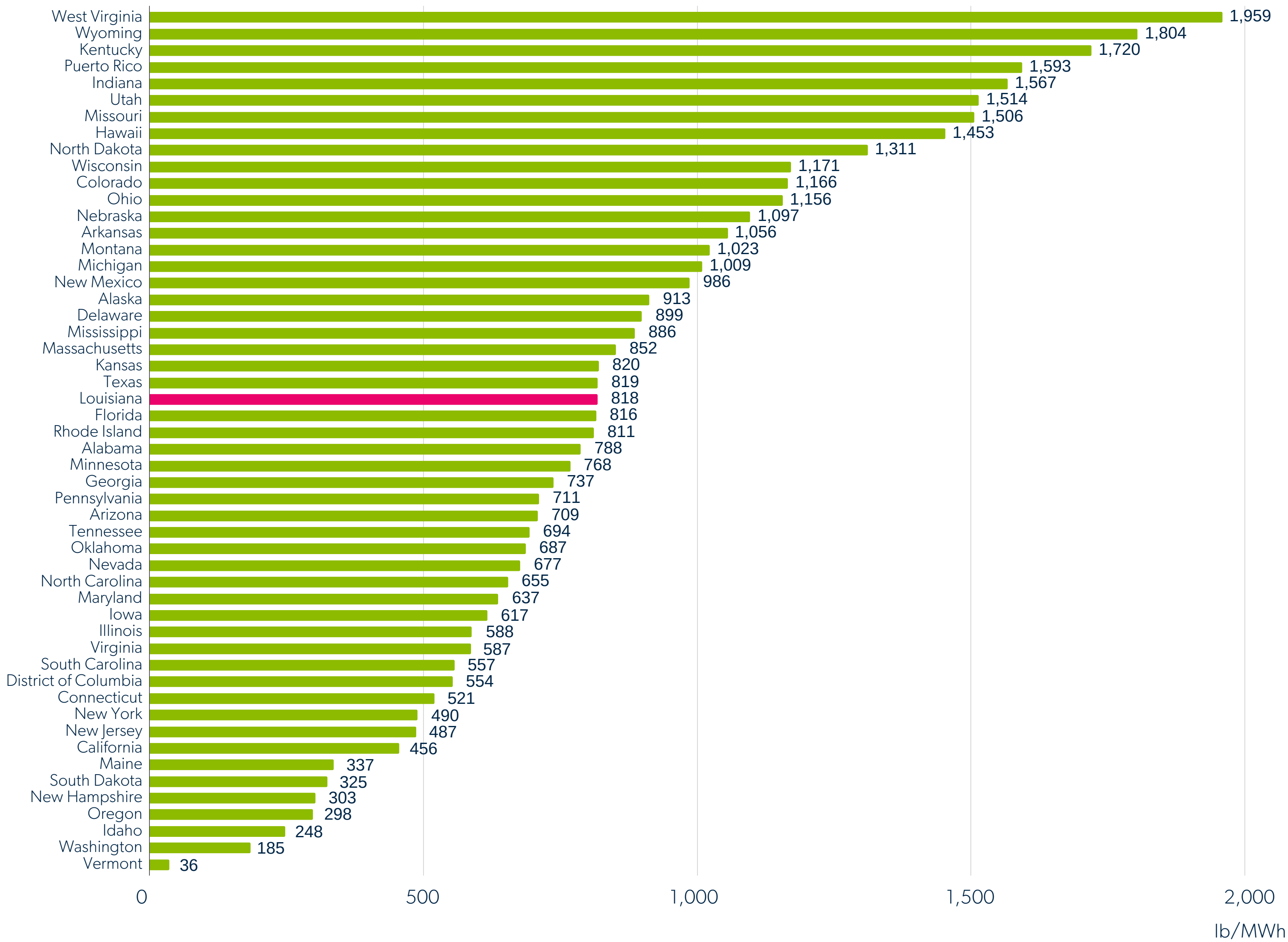

Figure 22. GHG emissions intensity of electricity in Louisiana relative to other states.[62]

[62] *EPA (2024). eGRID Data Explorer. Retrieved from: https://www.epa.gov/egrid/data-explorer*

In terms of the cost of energy, electricity prices continue to increase across the state; however, as Figure 23 illustrates, heat pumps can generate savings for households.

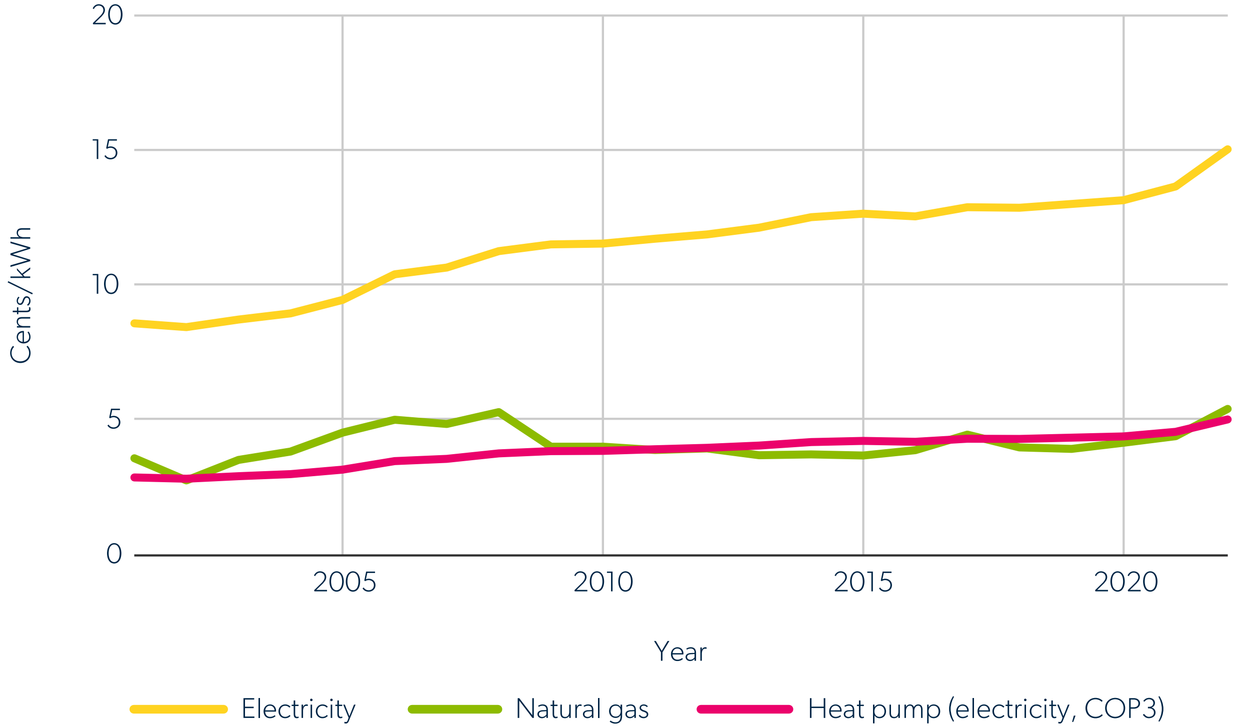

Figure 23. Cost of energy in Louisiana.[63]

[63] *EIA (2023). Louisiana State profile and Energy Estimates. Retrieved from: https://www.eia.gov/state/?sid=LA*

Louisiana has a net metering program for solar PV installations on residential and commercial buildings; however, the growth in installations has slowed over the past few years (Figure 24).

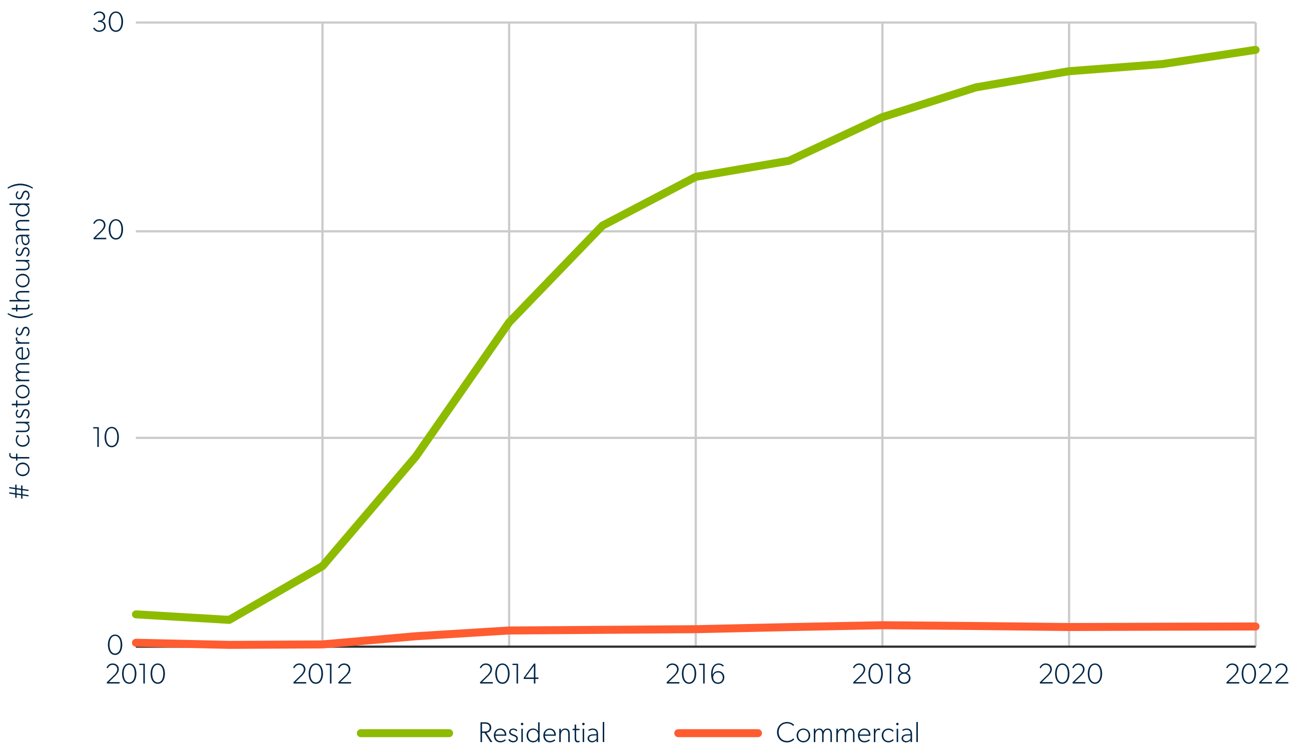

Figure 24. Number of solar installations by year in Louisiana.[64]

[64] *Ibid.*

2.2.8.1 Renewable Energy Initiatives

The Baton Rouge MSA is developing initiatives to support the transition towards renewable energy, with a focus on reducing GHG emissions while fostering economic growth. These initiatives include significant efforts in clean hydrogen fuel production, wind energy, and solar energy development that are bolstered by state and federal funding.

Hydrogen Fuel Production

In Louisiana, the industrial sector accounts for 66% of the state's emissions. Excluding large power generation facilities, Louisiana’s top 20 industrial facilities emit approximately 61 million metric tons (MMt) of CO_{2e} annually, with ammonia production and oil refineries being the highest emitters. The H2 the Future project is set to decarbonize these emissions through clean hydrogen energy development. The project is aimed at transforming the Baton Rouge MSA and surrounding parishes along the Mississippi River into a hub for clean hydrogen energy, with significant investments and developments in hydrogen production, transportation, and storage infrastructure. This initiative seeks to leverage the region's industrial base, including its ammonia and methanol production facilities and its extensive pipeline networks, to reduce carbon emissions and foster economic growth through clean energy jobs. Air Products and Linde Inc. are both identified as potential partners in the project, with facilities in East Baton Rouge Parish and Ascension Parish. The project claims a potential reduction of 68% of GHG emissions from the facilities. The project has federal and state funding, including a notable $50 million grant from the U.S. Economic Development Administration’s (EDA) Build Back Better Regional Challenge, matched with $24.5 million from the state government.[65]

Wind and Solar Energy Development

Oxbow Solar (formerly known as Ventress Solar), the largest solar farm in Louisiana, is under construction in Pointe Coupee Parish. The farm covers 1,800 acres and provides 345 MW of energy. The Baton Rouge Area Chamber estimates $200 million in economic impact from the project, including construction and revenues for local government agencies.

Transitioning Fleets in the Capital Region

According to Louisiana's 2021 GHG Inventory, the transportation sector ranks as the second-largest source of GHG emissions, exceeding 49 $MMtCO_2e$ in 2018 but down from a peak of more than 60 $MMtCO_2e$ in 2000. This marks a stabilization of emissions levels, which have remained relatively unchanged over the past decade (2008–2018). In a strategic move in 2019, the state collaborated with Louisiana Clean Fuels to designate a number of its interstates as corridors for alternative fuels. This was followed by the introduction of a DC Fast Charging Master Plan in 2023, which aims to enhance electric vehicle infrastructure.

[65] *Greater New Orleans, Inc. "H2 the Future Strategic Asset Report." January 2024. https://gnoinc.org/wp-content/uploads/sites/2/2024/01/H2theFuture_Strategic_Asset_Report_FINAL.pdf*

Orphaned Oil and Gas Wells

According to the Louisiana Department of Energy and Natural Resources (LDENR), Louisiana has more than 4,600 documented orphaned oil and gas wells, which affect air quality, water resources, and public health. Of these orphaned wells, 141 are located in the Baton Rouge MSA, including 68 in Iberville Parish alone.[66] In 2021, the Louisiana Legislature passed Senate Bill 245 to give LDENR more flexibility in how much it can spend to plug and restore abandoned wells. This has enabled LDENR to address a greater number of abandoned wells for remediation.

By 2030, the State is expected to secure over $100 million for sealing orphaned wells. LDENR has already been allocated an initial $25 million. This funding is designated for developing systems to monitor and track contamination in groundwater and surface water, as well as for setting up methane detection facilities. These efforts are targeted at pinpointing wells at a heightened risk of emitting methane.

2.2.8.2 Building Retrofits

The Baton Rouge MSA's residents will benefit from building retrofits and updates to building codes. Louisiana has adopted the 2021 International Codes, and the Louisiana State Uniform Construction Code Council (LSUCCC) has established an Energy Code Commission. The Commission is working to incorporate the 2021 International Energy Conservation Code (IECC) and the 2021 International Residential Code (IRC) into the state's construction code.

The State has engaged in the Building Codes Implementation for Efficiency and Resilience Program, securing $1.6 million for the development of better standards designed to withstand hurricanes and improve energy efficiency. Additionally, the State has outlined plans to allocate $212.5 million in formula funding specifically for home energy, performance-based, whole-house rebate allocations and high-efficiency electric home rebate allocations.

[66] *Louisiana Department of Energy and Natural Resources, Office of Conservation, Oilfield Site Restoration Program. "Orphaned Well Sites." Accessed February 16, 2024. https://sonlite.dnr.state.la.us/ords/f?p=108:12050.*

2.3 Climate Policies, Actions, and Programs in Baton Rouge Capital Region

2.3.1 Louisiana State Climate Action Planning

The Louisiana Climate Action Plan (2022) and the updated Louisiana Priority Climate Action Plan (2024) provide details on state-level actions that could have significant effects in the Capital Region for direct GHG emissions reductions and significant economic benefits for the hub of the administrative state.

In August 2020, Louisiana Governor John Bel Edwards signed an Executive Order that created the Climate Initiatives Task Force to develop strategies and actions to address climate change and identify the opportunities for the low-carbon energy transition.[67] The Task Force developed the Louisiana 2020 Climate Action Plan, with three key policy pillars to achieve net zero by 2050: 1) Renewable electricity generation, 2) industrial electrification, and 3) Industrial fuel switching to low- and no-carbon hydrogen. These three pillars need to be implemented simultaneously in order to reach the state's net-zero target. In particular, reductions in emissions through electrification with renewable energy sources will be essential to address the high percentage of GHG emissions from industrial sources (66% of total state emissions).[68]

The Louisiana Climate Action Plan consists of 28 strategies and 84 actions for a decarbonized future, including, but not limited to:

- Clean energy transition;
- Industrial decarbonization;
- Actively managed methane emissions;
- Transportation, development, and the built environment;
- Natural and working lands and wetlands;
- An inclusive, low-carbon economy;
- Collaboration and partnership to ensure successful implementation; and
- Accountability and adaptability to ensure lasting success.

Measures in the Louisiana Climate Action Plan that directly apply to the Baton Rouge MSA include investments in regional transit, such as the proposed high-speed intercity rail between New Orleans and Baton Rouge (BR-NOLA). The plan proposes federal investment through LADOTD, local MPOs, rural governments, and municipalities, and it identifies funding for passenger rail in the federal Infrastructure Investment and Jobs Act (IIJA).[69]

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[67] *"State of Louisiana Climate Initiatives Task Force: Recommendations to the Governor, 2022. Louisiana Climate Action Plan," State of Louisiana, 2022, https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/Climate_Action_Plan_FINAL_3.pdf*

[68] *"State of Louisiana Climate Initiatives Task Force: Recommendations to the Governor, 2022. Louisiana Climate Action Plan," State of Louisiana, 2022, https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/Climate_Action_Plan_FINAL_3.pdf*

[69] *"State of Louisiana Climate Initiatives Task Force: Recommendations to the Governor, 2022. Louisiana Climate Action Plan," State of Louisiana, 2022, https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/Climate_Action_Plan_FINAL_3.pdf*

Building on the Climate Action Plan, Louisiana completed a PCAP under the CPRG program. The PCAP identifies 13 focus areas that support the three main pillars to achieve net zero:

- Offshore wind;
- Community solar;
- Community resilience hubs;
- Transmission planning;
- Industrial decarbonization;
- Methane emissions;
- Fleet transition;
- Clean ports;
- Regional transit;
- Built environment retrofits;
- Community forestry and greening;
- Sustainable agriculture; and
- Land protection and restoration.

2.3.2 Capital Region Transportation Planning and Programming Efforts

The CRPC convenes local governments to establish transportation, planning, and economic development priorities for the Capital Region. They develop the region's long-term transportation plan, transportation improvement programs, congestion management, and non-motorized transportation planning. The CRPC also facilitates the federally-funded Carbon Reduction Program (CRP), approximately $2 million per year until 2026.[70] The program provides funds for projects and programs designed to reduce transportation emissions and improve air quality such as zero-emissions vehicles (ZEVs), energy-efficient street lighting, charging stations, congestion pricing, traffic monitoring, or control facilities. Funding can also be used for public transit projects such as dedicated bus lanes or bus rapid transit corridors; sidewalks, bike lanes, and trails development; and bike shares.[71]

[70] *"Carbon Reduction Program Overview," Capital Region Planning Commission, Accessed February 12, 2024, https://static1.squarespace.com/static/54cbd54fe4b047a0380cae54/t/657c7d0682cd2c00b2359f69/1702657286747/CRP_BRMPO_Detailed_Program_Overview.pdf*

[71] *"Carbon Reduction Program Overview," Capital Region Planning Commission, Accessed February 12, 2024, https://static1.squarespace.com/static/54cbd54fe4b047a0380cae54/t/657c7d0682cd2c00b2359f69/1702657286747/CRP_BRMPO_Detailed_Program_Overview.pdf*

2.3.3 City of Gonzalez's Climate Action and Resiliency Plan (2023)

The City of Gonzales (Ascension Parish) developed a Climate Action and Resilience Plan—the second local GHG reduction plan in Louisiana—in 2023. The City developed a Climate Action Committee consisting of city staff, leadership, and community representatives to provide direction on outreach and public engagement, identify community assets and challenges, and develop implementation strategies to reduce the city's carbon footprint.[72]

The City identified emissions from major sectors for reduction, primarily the transportation and energy use sectors. Emission reduction strategies include: reduce VMT, use renewable energy, increase energy efficiency, reduce waste, and increase green spaces. Major sustainability goals include supporting passenger rail between Baton Rouge and New Orleans to reduce vehicle miles traveled, increasing renewable energy production through the conversion of a wastewater plant to solar, supporting energy efficiency programs, updating HVAC systems in city buildings, and increasing tree canopy cover and green infrastructure such as bioswales.[73]

2.4 Other Climate-Related Policies, Actions, and Programs

2.4.1 Move 2046, Baton Rouge's Metropolitan Transportation Plan

MOVE 2046 is the long-range transportation plan for the Baton Rouge MSA. It establishes a shared vision for the future of transportation in the region and develops goals, strategies, and projects for that vision over the next 25 years.[74] The MSA's MOVE 2046 goals include:

- Improve and expand transportation choices;
- Improve safety and security;
- Provide reliable and high-performing transportation;
- Consider the relationship of transportation and environment;
- Support the economic vitality of the region; and
- Provide an equitable transportation system.

The plan aims to redesign key corridors and intersections to be safer, more efficient, and more accessible; expand biking and walking infrastructure; improve and expand public transit; and reduce congestion, all of which are strategies that can help reduce emissions.

72 *"Gonzales Climate Action and Resilience Plan," City of Gonzales, Accessed February 12, 2024, https://gonzalesla.com/wp-content/uploads/2023/02/gonzalescarp_final.pdf*

73 *"Gonzales Climate Action and Resilience Plan," City of Gonzales, Accessed February 12, 2024, https://gonzalesla.com/wp-content/uploads/2023/02/gonzalescarp_final.pdf*

74 *"Long Range Transportation Plan," Capital Region Planning Commission, Accessed February 12, 2024, https://crpcla.org/mtp*

2.4.2 FUTUREBR, City of Baton Rouge Comprehensive Plan

FUTUREBR is the comprehensive master plan for the City of Baton Rouge and East Baton Rouge Parish. Plan elements include land use, transportation, community design and neighborhoods, housing, environment and conservation, parks and recreation, infrastructure, economic development, and public services.[75] Strategies identified in the plan that may provide tools for reducing GHG emissions include prioritizing infill development and transit-oriented development, incorporating a "Complete Streets" approach for future transportation improvements, funding public transit, improving biking and walking opportunities, preserving tree canopy, and developing sustainable public buildings.[76]

2.4.3 Louisiana Statewide Transportation Plan

The LADOTD is developing its Statewide Transportation Plan, scheduled to be completed in 2025.[77] The Plan will establish a multi-modal transportation system that is safe, efficient, and equipped for the future.

2.4.4 Louisiana Economic Development

Louisiana Economic Development (LED) is an agency in Baton Rouge responsible for strengthening the State's business environment and economy.[78] The LED website provides information on financial incentive programs for businesses such as Louisiana Quality Jobs, which offers a rebate to eligible companies that create well-paid jobs and promote economic development, and Louisiana's Enterprise Zone, which is a jobs incentive program that provides tax credits to qualified businesses that create new jobs.[79]

2.4.5 BRING IT! 2026 Strategic Plan, Baton Rouge Area Chamber

BRING IT! Baton Rouge is the five-year strategic plan for the Baton Rouge Area Chamber (BRAC). The BRAC is an economic development organization that aims to accelerate economic opportunities in the Baton Rouge area. The BRING IT! strategy includes four goals:

- Bolster our talent pipeline;
- Create a more inclusive economy;
- Diversify our industry base and job opportunities; and
- Enhance our region's liveability.

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[75] *"FUTUREBR Update" City of Baton Rouge and Parish of East Baton Rouge, Accessed February 12, 2024, https://www.brla.gov/futurebr-5-year-update*

[76] *Ibid.*

[77] *"Shaping Louisiana's Future: Your Journey, Our Priority," Louisiana Department of Transportation and Development, Accessed February 12, 2024, https://latransportationplan.la.gov/*

[78] *"About LED," Louisiana Economic Development. Accessed February 12, 2024, https://www.opportunitylouisiana.gov/about-led*

[79] *"Louisiana Business Incentives," Louisiana Economic Development. Accessed February 12, 2024,https://www.opportunitylouisiana.gov/incentives*

One of BRAC's strategies to meet these goals focuses on nurturing and attracting companies in life sciences, renewable energy, and water.[80]

2.4.6 Louisiana Super Region Rail Authority Passenger Rail Plan

The Louisiana Super Region Rail Authority is a formal collaboration of local governments that empowers the region to pursue, finance, and operate its rail and transportation priorities in coordination with state, regional, and municipal entities.[81] A feasibility study in 2014 commissioned by the Baton Rouge Area Foundation detailed the Baton Rouge to New Orleans corridor passenger rail route. The regional passenger rail would provide safe, efficient, and reliable alternative transportation along the corridor, increase energy efficiency and environmental quality, and provide increased connectivity and access to jobs and essential services.[82]

2.4.7 Climate Change and Resilience, Center for Planning Excellence

The Center for Planning Excellence (CPEX) is a non-profit organization that coordinates urban, rural, and regional planning efforts in Louisiana and provides best-practice planning models, innovative policy ideas, and technical assistance to individual communities on transportation and infrastructure needs, environmental issues, and quality design for the built environment.[83] The organization provides resources and tools for climate change mitigation and resilience, including a Coastal Community Resilience Planning Guide and a Climate Change Adaptation Manual for Louisiana.

CPEX provides additional resources that may be useful in implementing local decarbonization strategies, such as the Street Smart Neighborhood Connectivity Plan and Complete Streets Toolkit, which are resources for advocates and communities interested in creating walkable, safe neighborhoods with multi-modal transportation options.[84]

2.4.8 Utility Energy Efficiency Standards, Louisiana Public Service Commission

In 2014, the Louisiana Public Service Commission began a voluntary energy efficiency program for utilities called the Energy Efficiency Quick Start Program. The Program introduced a set of residential energy efficiency programs to identify areas of energy efficiency improvement for the home, such as energy- efficient light bulbs, power strips, and room air conditioning units.[85]

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[80] *"BRING IT! Baton Rouge, 2026 Regional Strategic Plan," Baton Rouge Area Chamber, Accessed February 12, 2024, https://brac.org/wp-content/uploads/20220106-BRINGIT-Strategy.pdf*

[81] *"Louisiana Super Regional Rail Authority Role," Louisiana Super Regional Rail Authority, Accessed February 12, 2024, https://www.lsrra.org/role*

[82] *"Passenger Rail Baton Rouge to New Orleans," Louisiana Super Region Rail Authority, Accessed February 12, 2024, https://static1.squarespace.com/static/55c3a31ee4b044158f9e0553/t/55f86cc0e4b03eacc669bd4a/1442344128860/LSRRA_one_pager_final.pdf*

[83] *"Mission," Center for Planning Excellence, Accessed February 12, 2024, https://www.cpex.org/mission*

[84] *"Resources," Center for Planning Excellence, 2019, Accessed February 12, 2024, https://www.cpex.org/resources*

[85] *Nussbaum, P, "Phase 1 of the LPSC Statewide Energy Efficiency Program," Louisiana Department of Natural Resources/Technology Assessment Division, January 2015, Accessed February 12, 2024, https://www.dnr.louisiana.gov/assets/TAD/newsletters/2015/2015-01_topic_1.pdf*

In 2023, the Louisiana Public Service Commission provided new energy efficiency rules to transition the Quick Start Program to a comprehensive, statewide mandatory energy efficiency program for all jurisdictional utilities.[86] The program identifies the minimum requirements for administrators and/or contractors when planning, designing, and implementing energy efficiency programs on behalf of the Commission.

2.4.9 East Baton Rouge Pedestrian and Bike Master Plan

The LADOTD and the Recreation and Park Commission for the Parish of East Baton Rouge (BREC) published the East Baton Rouge Pedestrian and Bike Master Plan in March of 2020. The Plan outlines the challenges and opportunities for pedestrian-focused development in East Baton Rouge Parish, and presents recommendations for projects, policies, and practices that the city–parish government and local community can implement to expand pedestrian and bicycle infrastructure. The Plan proposes 17 recommendations, including several that relate directly to measures proposed in this PCAP, such as prioritize opportunities to create a complete transportation network; create dedicated funding set aside for pedestrian and bicycle projects; provide funding to support local planning for active, walkable, bikeable, and transit-oriented development; continue support for Complete Streets and Vision Zero initiatives; improve connectivity among transit infrastructure; incorporate equity into all planned projects; and cultivate a local culture that supports walking and bicycling.[87]

2.4.10 Capital Region Bicycle and Pedestrian Plan

In 2022, the Capital Region Planning Commission (CRPC) published the Capital Region Bicycle and Pedestrian Plan, which sets forth goals, priorities, and strategies to encourage pedestrian and bicyclist activity across the Capital Region and within its local jurisdictions. The Plan expands on earlier work by the CRPC, local governments, and organizations and includes an analysis of current conditions and public feedback regarding bicycling in the Capital Region; a comprehensive recommended bikeway and trail network; a strategic list of priority projects; and recommended strategies for policies, programs, design, and implementation. The Plan proposes 14 projects, policies, and strategies for implementation in the Capital Region, including parish-level adoption of Complete Streets policies; plans for improvement, maintenance, and expansion of bicycle infrastructure; design and regulatory frameworks to increase connectivity and safety of cyclist and pedestrian pathways; support for Active Transportation infrastructure, public awareness campaigns, and equitable enforcement of policies; and opportunities for accessing and assisting with navigating federal aid to support proposed initiatives.[88]

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[86] *"Document Details, Notice of Final Phase II Energy Efficiency Rules Issued by Executive Counsel Kathryn H. Bowman," Louisiana Public Service Commission, 2023, Accessed February 12, 2024, https://lpscpubvalence.lpsc.louisiana.gov/portal/PSC/DocumentDetails?documentId=168007*

[87] *Louisiana Department of Transportation and Development and Recreation and Park Commission for the Parish of East Baton Rouge. 2020. "East Baton Rouge Pedestrian and Bike Master Plan." City of Baton Rouge / East Baton Rouge Parish. https://www.brla.gov/DocumentCenter/View/9411/East-Baton-Rouge-Pedestrian-and-Bicycle-Master-Plan-PDF.*

[88] *Capital Region Planning Commission. 2022. "The Capital Region Bicycle and Pedestrian Plan." https://acrobat.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3A11fbca0b-42b3-3ad5-b82d-0713455f66fe.*

2.5 Observations

2.5.1 The Capital Region has experienced severe climate impacts, and projections indicate that the trend will continue.

Due to its location on the Gulf Coast, its topography, intensifying extreme weather, and a variety of built environment and socio-economic factors, the Capital Region has experienced devastating climate-related impacts (e.g., 2016 extreme flooding). Global, national, and local projections indicate that these events will continue to impact the region and will increase in severity and impact.

The East Baton Rouge, Livingston, and Ascension parishes are categorized as relatively high risk with flooding and tropical cyclones ranking as the highest climate risks. The Fifth NCA projects that the region will experience sea level rise, an increase in high-tide flooding and saltwater intrusion, increases in extreme heat days, wetland erosion, and air pollution over the near term. These climate-related impacts pose ongoing risks to the health and welfare of the MSA's residents, its infrastructure, and the natural environment. It will be critical to Integrate resilience and adaptation into climate change action planning and the measures designed to mitigate GHG emissions.

2.5.2 The Baton Rouge MSA industrial sector is among the top emitters of GHGs and highest consumer of electricity in the U.S.

Louisiana is one of the highest emitters of GHG emissions in the U.S. with most emissions attributable to its chemical, petroleum, and natural gas industries. For example, the industrial sector emits 80% of emissions in the Baton Rouge MSA (see Section 3).

The Capital Region and its jurisdictions could take advantage of new tax incentives available for industry, businesses, government, individuals and households to implement innovative strategies, including:

- Incentivizing and encouraging increased green energy and hydrogen production;
- Diversifying the portfolio of energy sources used by industry, buildings, and infrastructure and prioritizing transition to renewable energy sources;
- Upgrading electrical grids for increased efficiency and renewable energy integration;
- Supporting renewable energy projects at various scales to help develop a local clean energy market and encourage local buy-in; and
- Increasing energy efficiency and energy conservation.

2.5.3 Renewable energy is a key opportunity.

Louisiana's grid has limited renewable energy capacity, and residential solar PV installations have slowed despite increased costs for natural gas while solar PV prices continue to decline. This decrease in solar PV costs combined with federal IRA incentives, creates an opportunity for stimulating the residential and commercial solar PV sectors. In addition, community solar programs that provide storage can provide climate resilience benefits. Large-scale installations of solar and wind (onshore and offshore) can also help reduce the variability of electricity costs over the long run. Renewable electricity is also critical to developing green hydrogen to support the decarbonization of industry.

2.5.4 Buildings in the Capital Region are poorly insulated and expensive to heat and cool.

Louisiana has the highest per-capita residential electricity consumption in the U.S. due to residential and commercial reliance on air conditioning and electric heating. In the Capital Region, residential buildings consume about 28% of overall electricity, while commercial and institutional buildings consume 16%.

The dominance of electric heating and cooling offers a major opportunity for the uptake of heat pumps, which can cut electricity consumption by one third or more reducing overall electricity consumption. As nearly one half of households are uninsulated, retrofits can increase further energy conservation particularly for low-income households, providing savings for residents.

2.5.5 Decarbonization of transportation can be accelerated.

Transportation emissions account for 54% of the MSA's non-industrial emissions, as most vehicles currently use emissions-heavy gasoline and diesel as fuel. EV uptake has been relatively slow, with less than 1,000 EVs on the road as of spring 2023 in Baton Rouge.[89] There are plans for transportation infrastructure that could be transformative, notably, investments in bike paths and pedestrian paths; a redesign of CATS; the addition of the Plank-Nicholson BRT Project; and microtransit, the BR-NOLA Rail, and the improvement of rural transit. Additional investments in EV charging stations and the availability of new EV models will likely stimulate additional uptake of EVs across the region.

2.5.6 The expansion of the Capital Region's population and development footprint has the potential to increase the MSA's exposure to climate hazards.

Intensifying flood, heat, and tropical storms events demonstrate that extreme weather hazards are already impacting the Capital Region. At the same time, the MSA is experiencing significant population growth in Ascension, West Baton Rouge, and Livingston parishes. These population increases correspond to the emergence of Baton Rouge as the eighth-fastest growing metro area economy in the country in 2023.[90] Simultaneously, new construction is booming throughout the region as developers build housing, commercial spaces, infrastructure, and other projects to keep up with the growing demand.

These economic and population surges are beneficial to the region, but without adequate planning, new development can expand into areas at high risk of flooding and other climate hazards. Additionally, population growth increases the strain on electrical grids, sewerage and drainage systems, roadways, public services, etc. and can cause damage to the local natural environment by exacerbating erosion, wetland loss, and air and water pollution.

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[89] *ReplicaHQ. Baton Rouge MSA Study Area. Retrieved from: https://studio.replicahq.com/places/studies/kl6hab6/map*

[90] *Baton Rouge Listed as Top 10 Fastest Growing Metro Economy | Baton Rouge Area Chamber (BRAC)*

3 Greenhouse Gas (GHG) Inventory

3.1 Emissions by Sector

The total GHG emissions for the Baton Rouge MSA in 2021 were 49 MMtCO_2e. The majority of emissions come from the industrial sector (38.9 MMtCO_2e; 80%), and the remainder are spread out over the transportation (5.4 MMtCO_2e; 11%), residential (2.4 MMtCO_2e; 5%), commercial and institutional (1.4 MMtCO_2e; 3%), and solid waste and wastewater (0.8 MMtCO_2e; 1%) sectors (Figure 25).

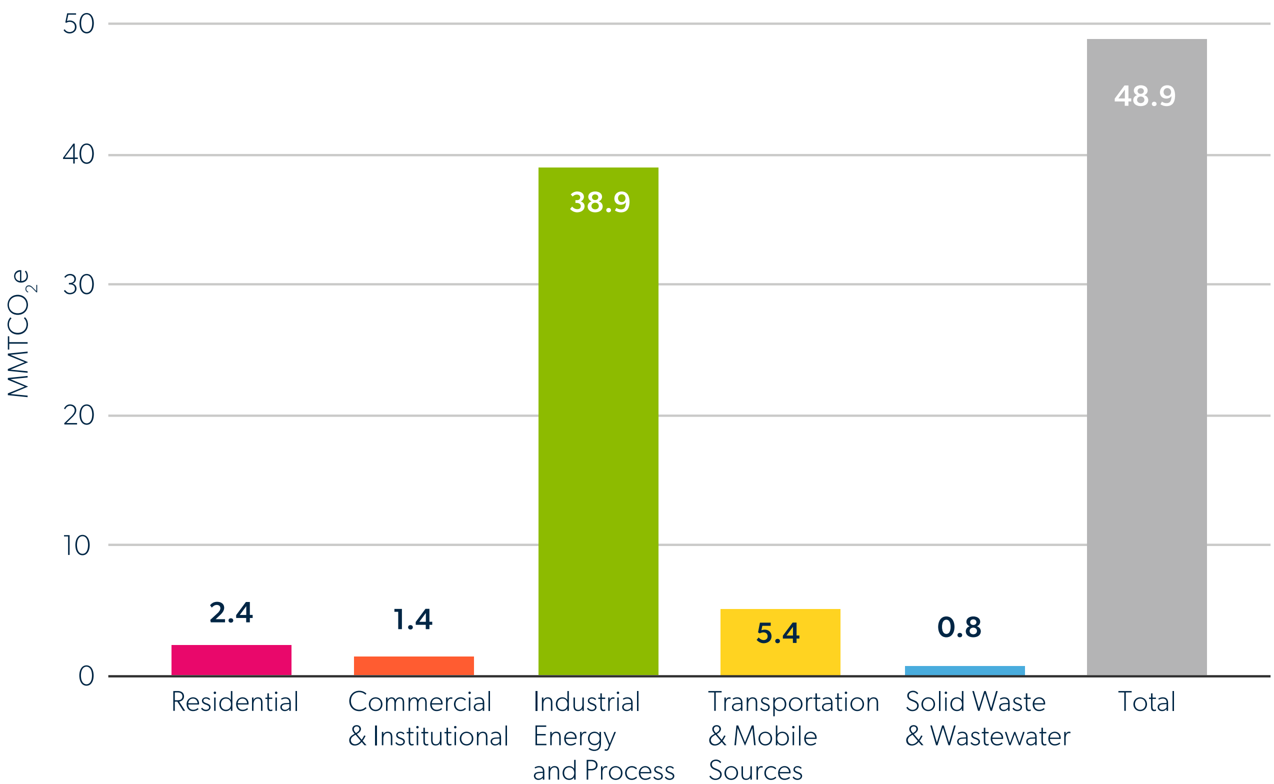

Figure 25. GHG emissions by sector for Baton Rouge MSA, 2021. Source: SSG analysis.

Figure 26 shows the MSA's GHG emissions by source, excluding industrial emissions, to provide a visual of the proportional GHG impact of non-industrial sectors. The transportation sector predominates non-industrial emissions (54%), followed by residential energy (24%), commercial (14%), and solid waste (8%).

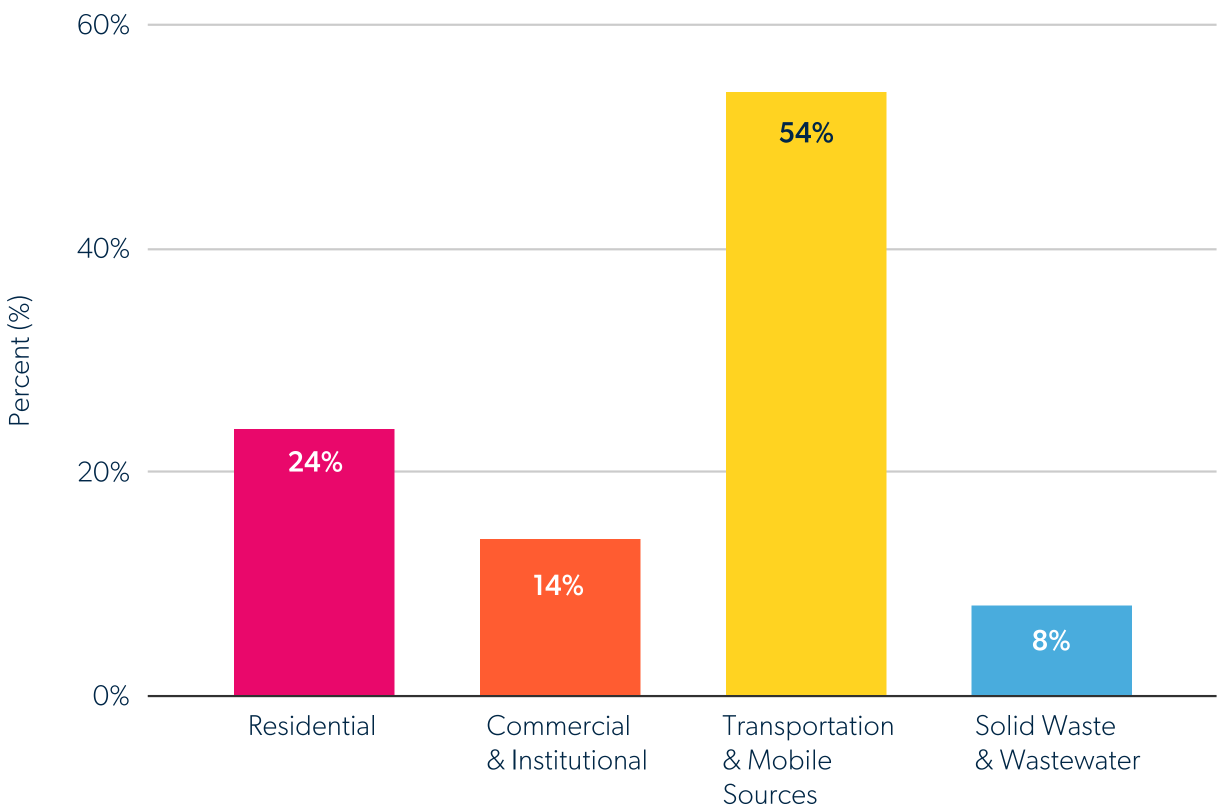

Figure 26. Percent of non-industrial GHG emissions by sector for Baton Rouge MSA, 2021 (excludes industrial emissions). Source: SSG analysis

GHG emissions in the industrial sector are dominated by emissions from fossil fuels, including natural gas (40%), industrial and agricultural processes (36%), liquified petroleum gas (13%), and electricity (11%) (Figure 27). Emissions from transportation are predominantly from gasoline, and emissions from the commercial, institutional, and residential sectors are mainly from electricity (Figure 27).

According to the EPA's Emissions & Generation Resource Integrated Database (eGRID 2021), the Mississippi Valley region's grid electricity is generated from a variety of sources, including natural gas (59%), nuclear power (25%), and coal (11%).[91]

[91] *US EPA. eGRID Summary Tables 2021. Subregion Output Emission Rates. Retrieved from: https://www.epa.gov/egrid/summary-data*

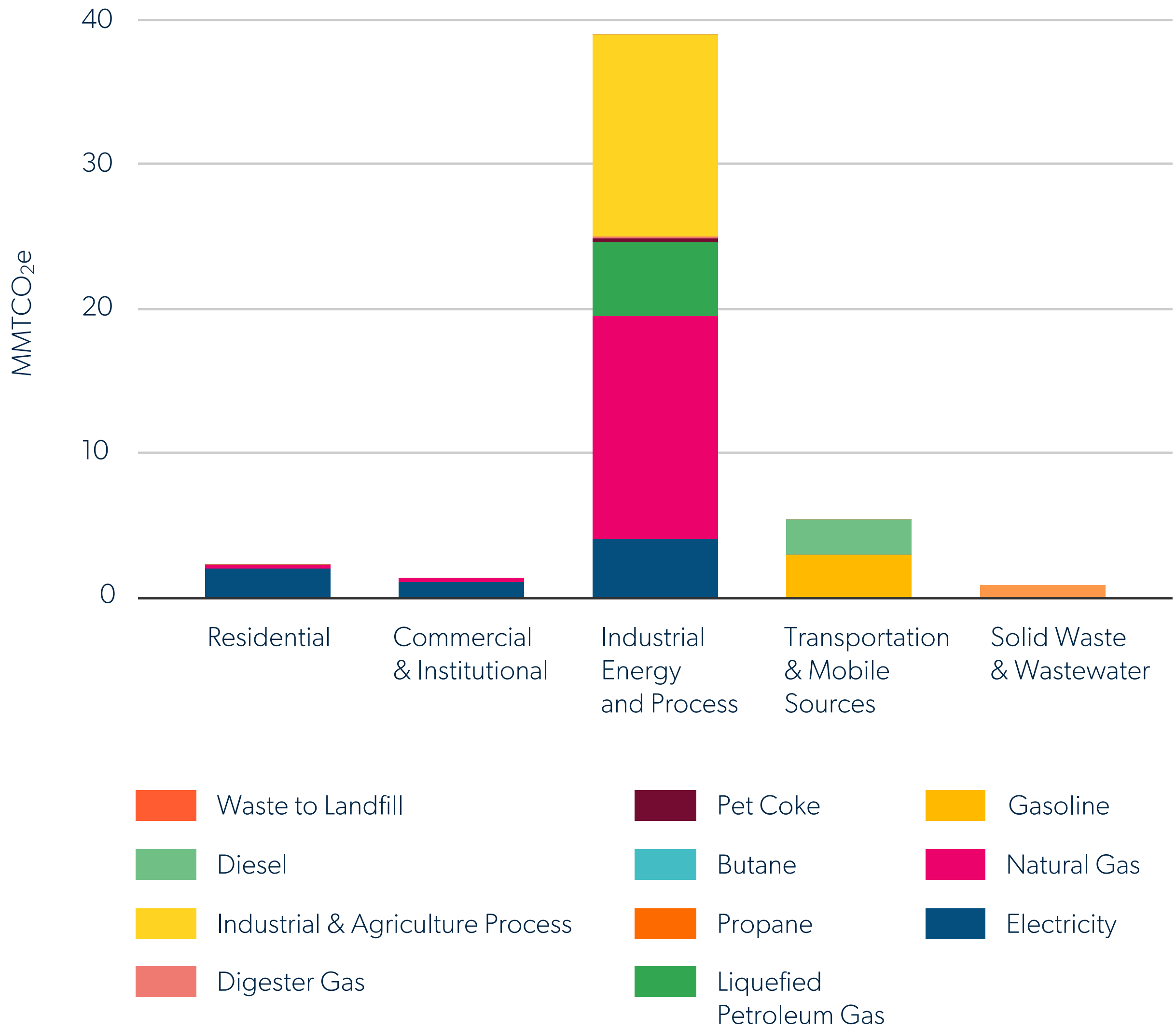

Figure 27. GHG emissions by sector and fuel type for Baton Rouge MSA, 2021.
Source: SSG analysis.

GHG emissions by fuel source from non-industrial sectors are shown in Figure 28. Transportation emissions account for 46% of the non-industrial emissions, and most vehicles currently use emissions-heavy gasoline and diesel as fuel. GHG emissions from residential and commercial buildings account for 45% of the non-industrial emissions, with most emissions from electricity used in buildings because the electricity grid draws on generation from burning coal and natural gas. Emissions from the waste sector result from the biodegradation of organic materials in landfills, where anaerobic digestion of organic materials produces methane and smaller amounts of CO_2.

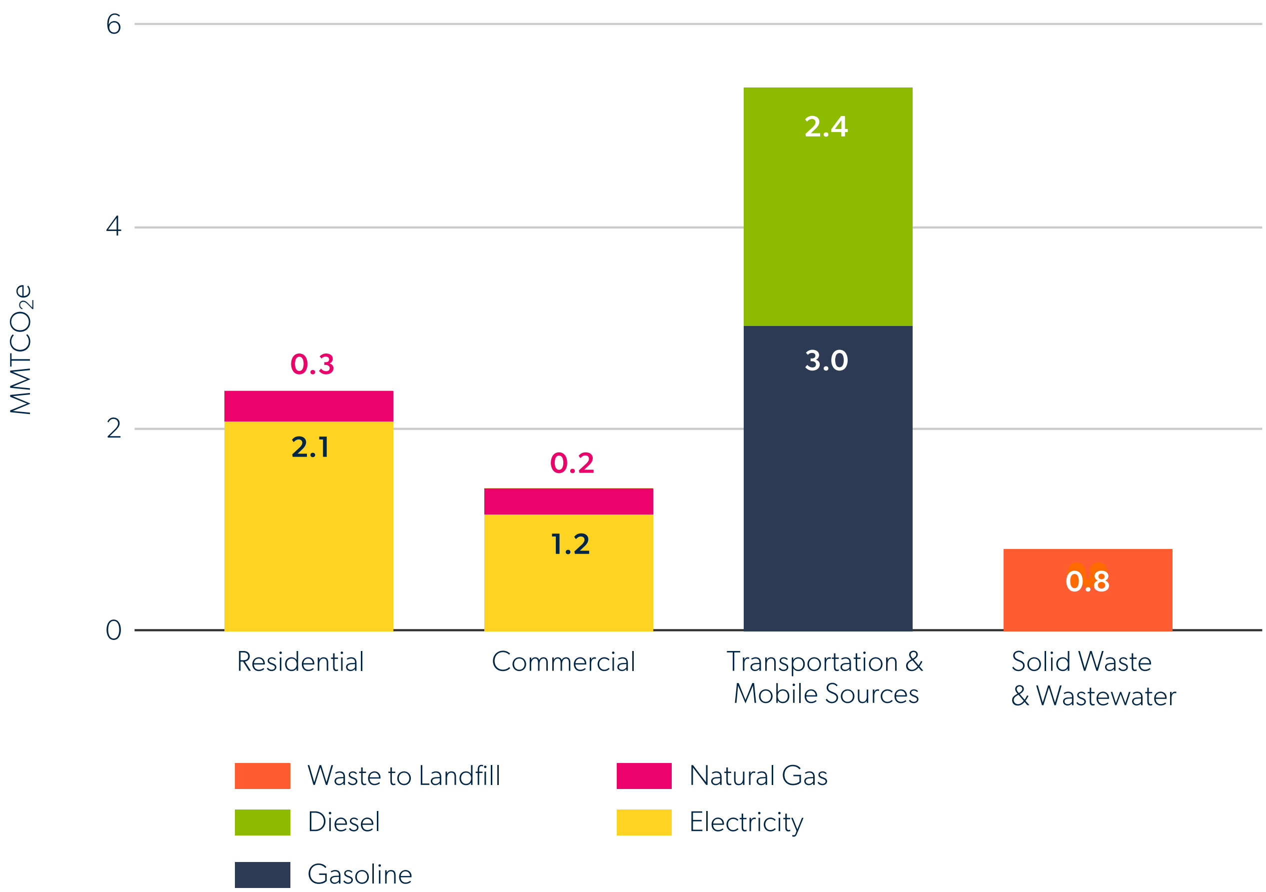

Figure 28. .Non-industrial GHG emissions by sector and fuel type for Baton Rouge MSA, 2021 (excludes industry emissions). Source: SSG analysis.

3.2 Emissions by Source

Using analysis of the MSA's emissions by source identifies stationary combustion as the major source of GHG emissions (44%), followed by industrial process emissions (25%), electricity (15%), and transportation (11%). Agriculture, land management, solid waste, and wastewater treatment represent about 5% of the total emissions and urban forestry provides sequestration of -0.3 $MMtCO_2e$ (Figure 29). Decarbonizing stationary combustion would cut the MSA's GHG emissions by 21.4 $MMtCO_2e$ (44% of total).

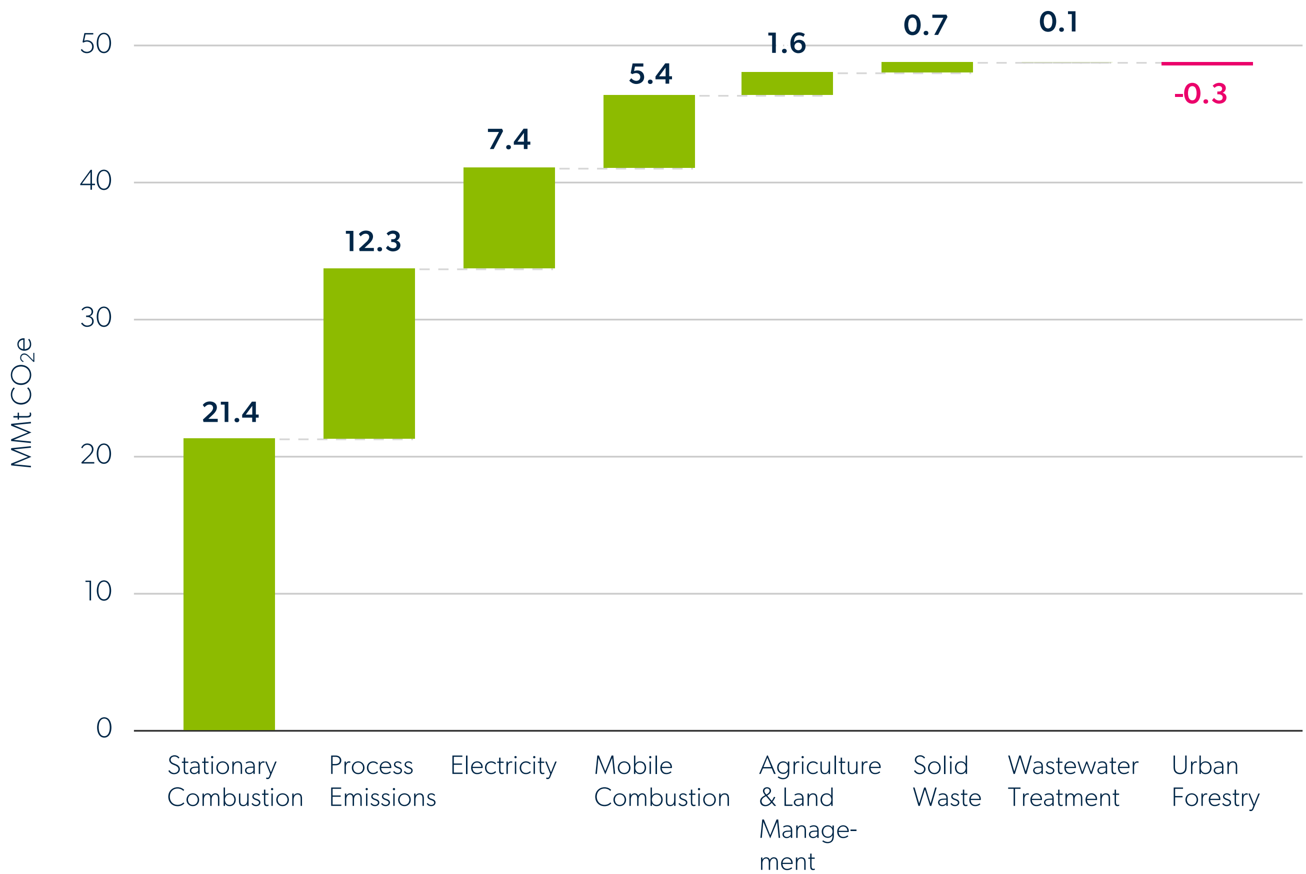

Figure 29. GHG emissions by activity source for Baton Rouge MSA, 2021. Source: SSG analysis.

3.3 Emissions by Scope

GHG emissions are often categorized and reported by scope. Scope 1 refers to emissions released directly from sources within the boundaries of the MSA; scope 2 emissions are from electrical grid-supplied energy sources within the MSA; and scope 3 refers to the emissions occurring outside the MSA but resulting from activities that occur within the MSA (Table 5; Figure 30).

Table 5. Reporting sectors.

Scope	Definition
Scope 1	GHG emissions from sources located within the boundary of the MSA.
Scope 2	GHG emissions occur as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the boundary of the MSA.
Scope 3	All other GHG emissions that occur outside the MSA boundary as a result of activities taking place within the boundary of the MSA.

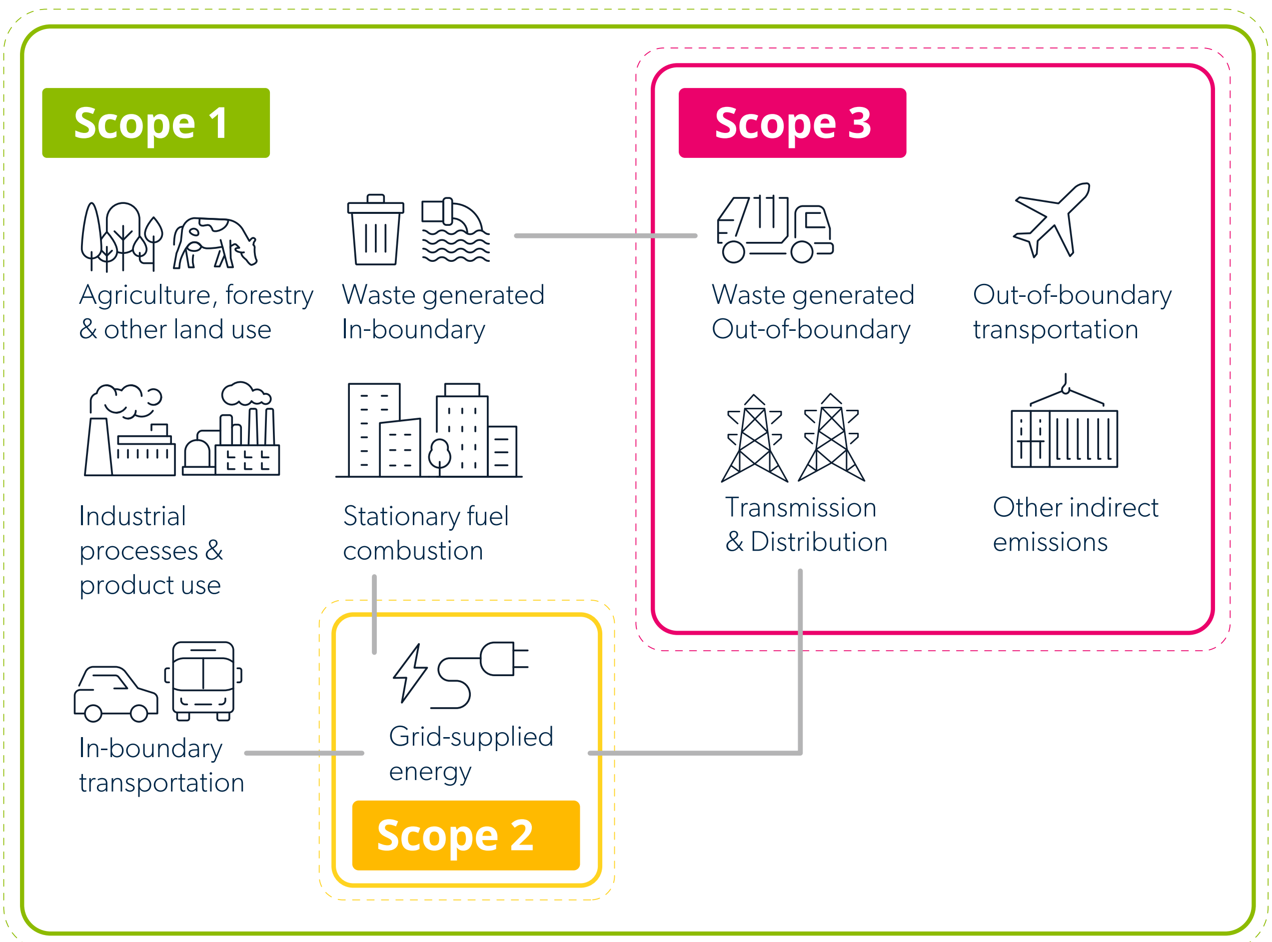

Figure 30. Illustration of Scopes. Source: SSG own elaboration.

The Baton Rouge MSA's scope 1 GHG emissions dominate the inventory, with a total of 41.5 $MMtCO_2e$ (88%) representing stationary fuel combustion, industrial processes and product use, in-boundary transportation, agriculture, forestry and land use, and in-boundary waste and wastewater; whereas scope 2 emissions, which are from grid-supplied electricity, contribute 7.4 $MMtCO_2e$ (12%). This inventory does not include scope 3 GHG emissions (Figure 31).

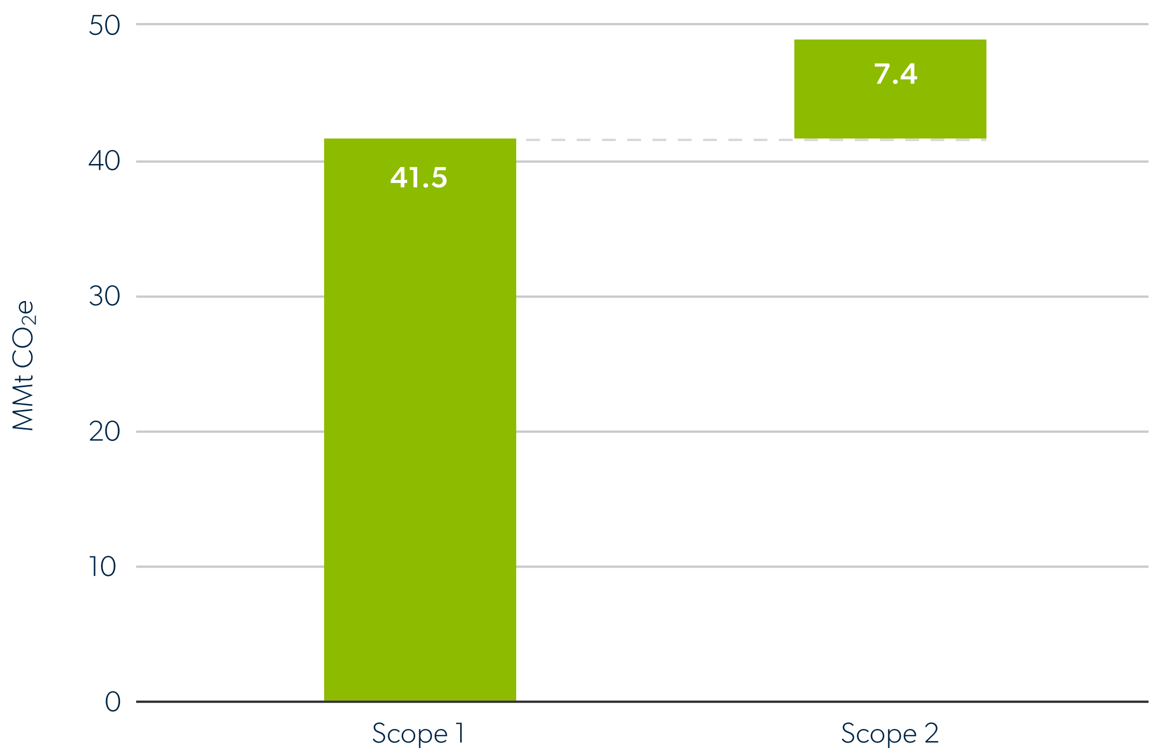

Figure 31. GHG emissions for Baton Rouge MSA by scope 1 and 2, 2021. Source: SSG analysis.

3.4 Emissions by GHG Type

When all the GHG emissions have been normalized to carbon dioxide equivalents (CO_2e), 88% of the MSA's GHG emissions are carbon dioxide (CO_2; 43 MMtCO_2e), 12% are methane (CH4; 5.6 MMtCO_2e), and 0.2% are nitrous oxide (N20; 0.1MMtCO_2e) (Figure 32).

CO_2 emissions are generally directly correlated to the combustion of fossil fuels such as natural gas, LPG, gasoline, and diesel. In the case of the Baton Rouge MSA, 8.4 MMt of the total CO_2 (19%) is emitted from industrial processes (e.g., production of ammonia, petrochemicals, etc.) (Figure 32).

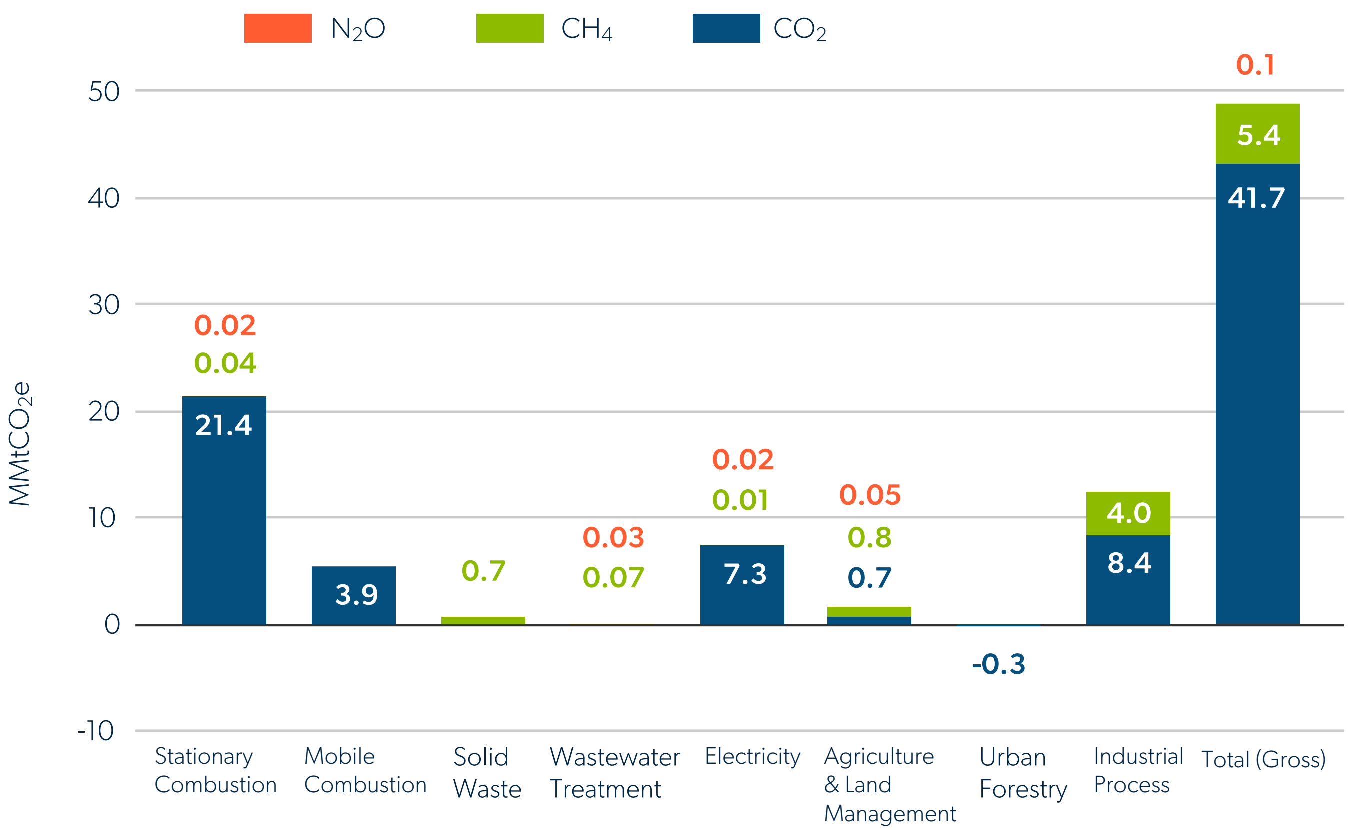

Figure 32. GHG emissions by GHG type, Baton Rouge MSA, 2021. Source: SSG analysis.

Methane emissions (CH_4) in the MSA are mostly emitted by industrial processes (70%), agriculture and land management (15%), and solid waste (12%) (Figure 33). Methane is a more potent GHG and therefore causes more warming than CO_2, especially in the near term. This is due to its impact in the atmosphere. Methane's GWP is 85 times more potent than CO_2 over a 20-year period, and its GWP over a 100-year period is 30 times more than CO_2. The potency and impact of methane on global warming over the next 20 years is crucial given the short time frame required to reduce GHG emissions by 50% by 2030 so that we can limit the average global temperature increase to a less damaging range (i.e., IPCC's limit of 1.5°C).

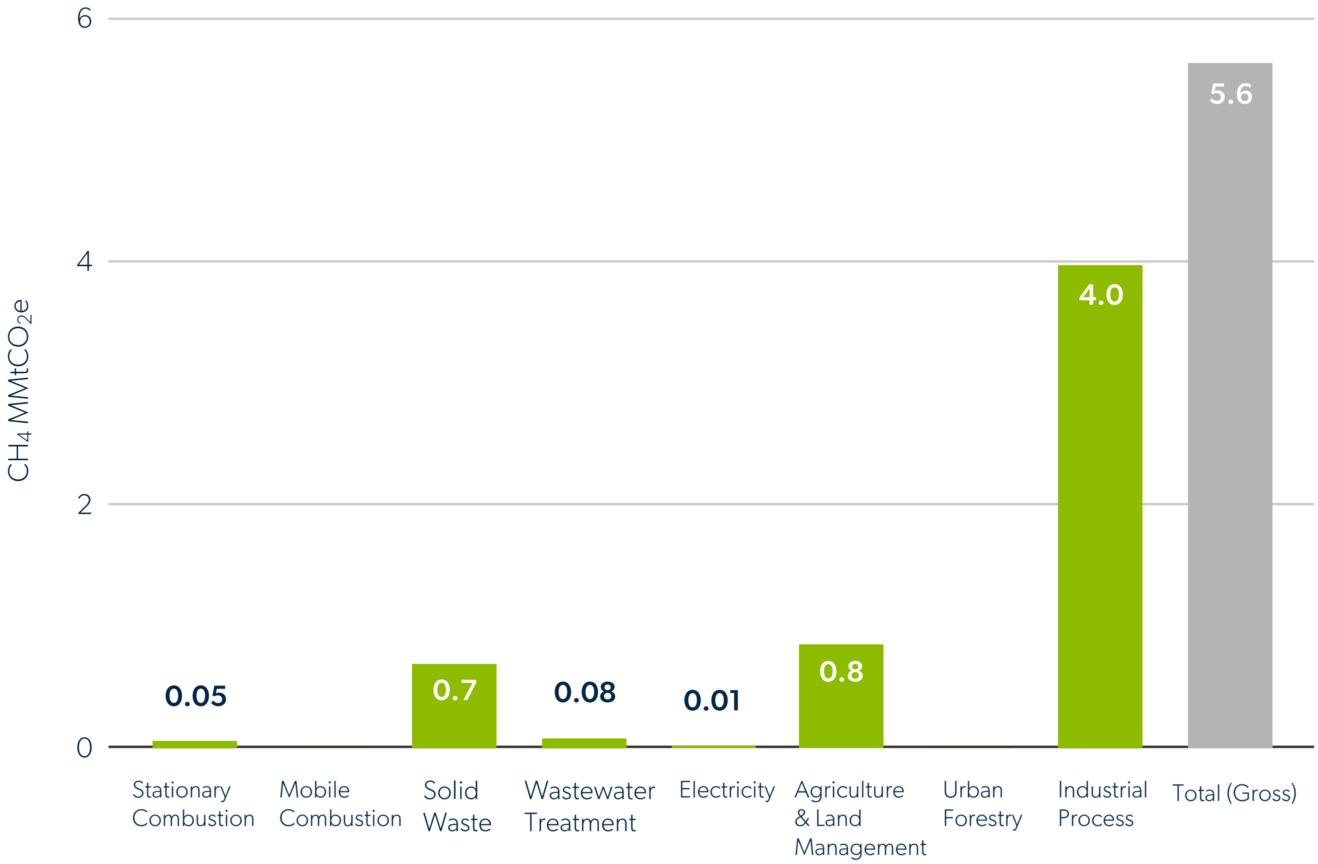

Figure 33. GHG emissions, methane (CH4), 2021, Baton Rouge MSA. Source: SSG analysis.

Relative to CO_2, nitrous oxide (N_20) emissions have an even higher impact on global warming. Its GWP over 100 years is 300. N_20 emissions across the MSA are primarily from agriculture, land management, wastewater treatment, stationary combustion, and electricity generation (Figure 34).

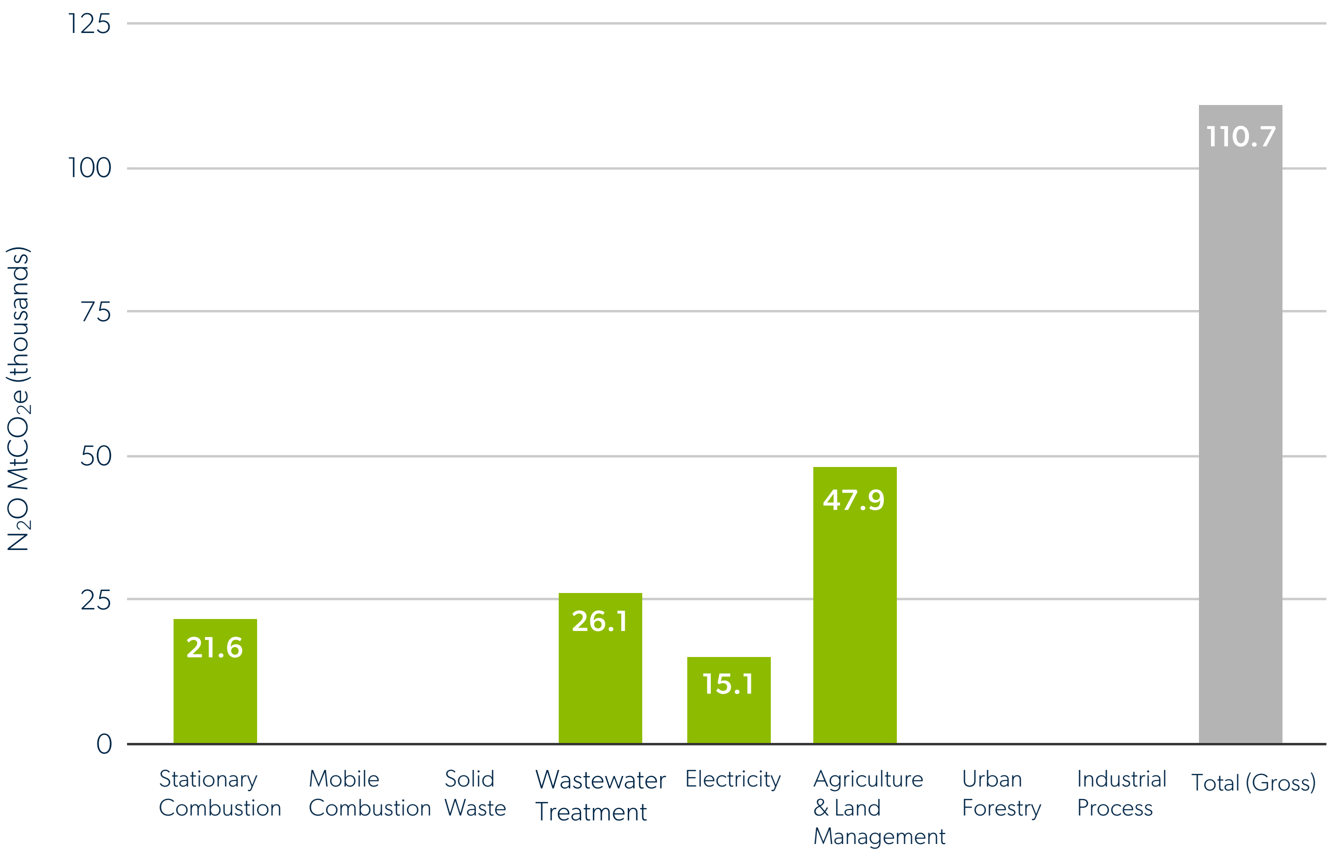

Figure 34. GHG emissions, nitrous oxide (N_2O), 2021, Baton Rouge MSA. Source: SSG analysis. (Note: Scale is thousands).

3.5 Energy Use Versus Emission Shares

The burning of fossil fuels accounts for 90% of the total energy used and 78% of the total GHGs emitted across the Baton Rouge MSA, illustrating the large potential for GHG emissions reductions through switching from fossil fuels to renewable energy sources across all sectors. In addition, electricity currently accounts for 14% of energy use and 22% of total emissions, demonstrating the opportunity for decarbonizing electricity generation.

3.6 Total Energy Use

The total energy use across the Baton Rouge MSA is 528.5 million MMBTU. The industrial sector uses the most energy (441.7 million MMBTU; 78%) of the total energy consumed, followed by residential (69.1 million MMBTU; 13%), and the commercial and institutional sector at 9% (47.7 million MMBTU) (Figure 35).

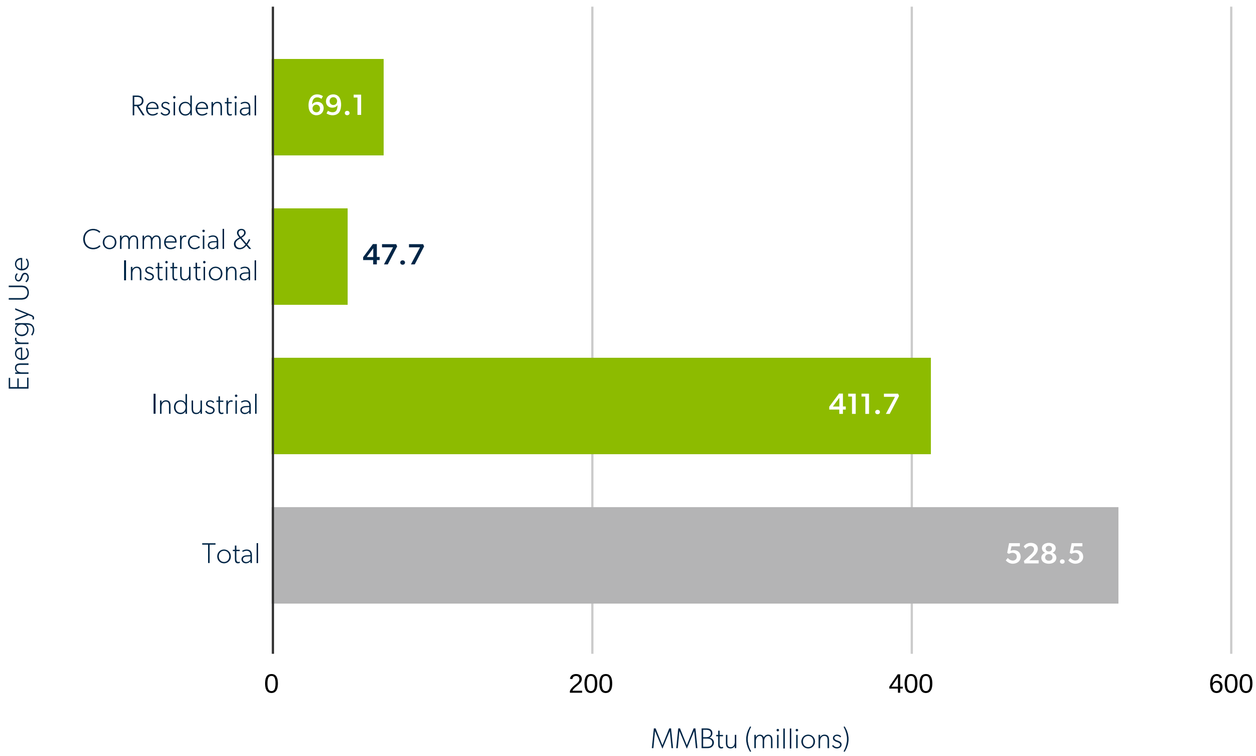

Figure 35. Energy consumption within the Baton Rouge MSA by sector, 2021.
Source: SSG analysis.

3.7 Electricity Consumption

As reported above, electricity use accounts for 14% of total energy use and 22% of total GHGs emitted across the MSA. The total electricity consumed is 71.4 million MMBTU, of which 56% is industrial use, 28% is residential use, and 16% is commercial/institutional use (Figure 36).

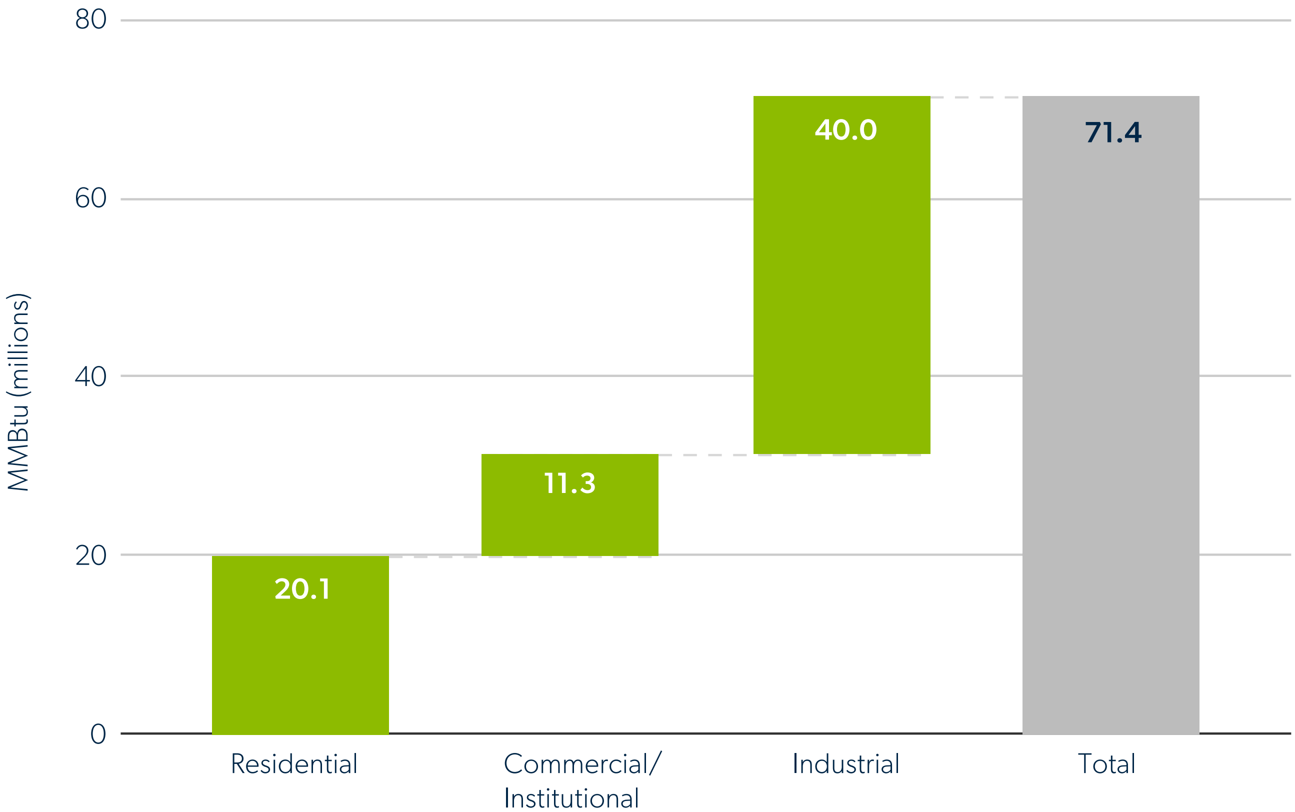

Figure 36. Electricity consumption within the Baton Rouge MSA by Sector, 2021.
Source: SSG analysis.

3.8 Business-as-Usual Projections

SSG modeled the Baton Rouge MSA's GHG emissions to create business-as-usual (BAU) GHG emission projections from 2021 to 2050. This analysis incorporates population projections from the ICF State Projection Tool and energy emissions factors from NREL (National Renewable Energy Laboratory).[92] According to the BAU model, total GHG emissions are projected to increase from 48.6 $MMtCO_2e$ in 2021 to 50.1 $MMtCO_2e$ in 2050 (Figure 37). The MSA's economy and population will continue to grow and without significant actions to reduce GHG emissions, they will continue to increase.

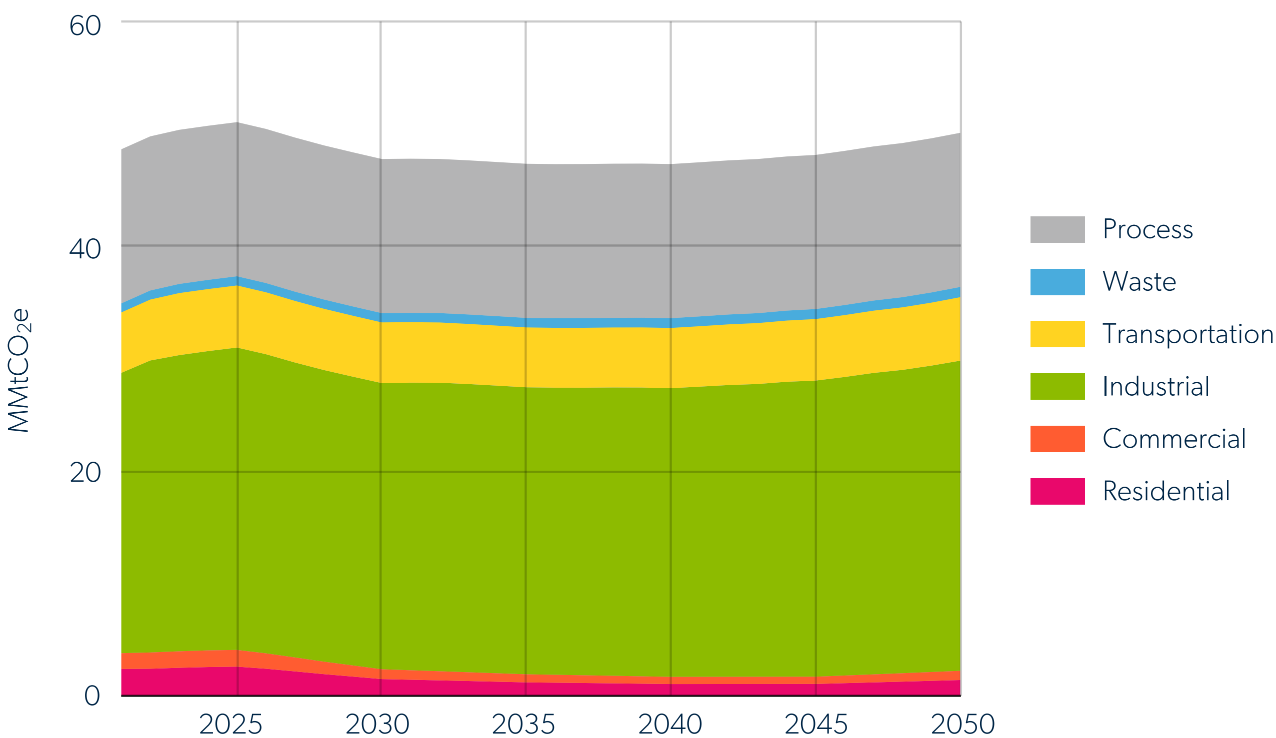

Figure 37. Total BAU GHG emissions by sector for Baton Rouge MSA, 2021–2050. Source: SSG analysis.

[92] *Data is projected from the year 2021. The current population is from the U.S. Census Data. Population projections were scaled for the MSA based on projections from the State Projection Tool (e.g., used annual population growth rate for Louisiana and applied to Baton Rouge MSA current population to generate projections 2025–2050). Also applied growth rate to project fuel use (e.g., natural gas and electricity rates to increase). Retrieved from: https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool and https://scenarioviewer.nrel.gov/*

In the BAU, the electricity grid becomes cleaner over the modeled period, decreasing from 7.4 MMtCO_2e in 2021 to 3.7 MMtCO_2e in 2050; however, significant additional GHG emissions reductions can be obtained through further actions and changes to how electricity is generated and used across the MSA. The bulk of the GHGs continue to be emitted by the industrial sector (e.g., natural gas, still gas, petroleum coke, hydrocarbon gas liquids (HGL), feedstock, and electricity) (Figure 38). These emissions can also be reduced through actions to reduce process emissions and stationary combustion emissions by switching from fossil fuels to renewable energy and hydrogen sources.

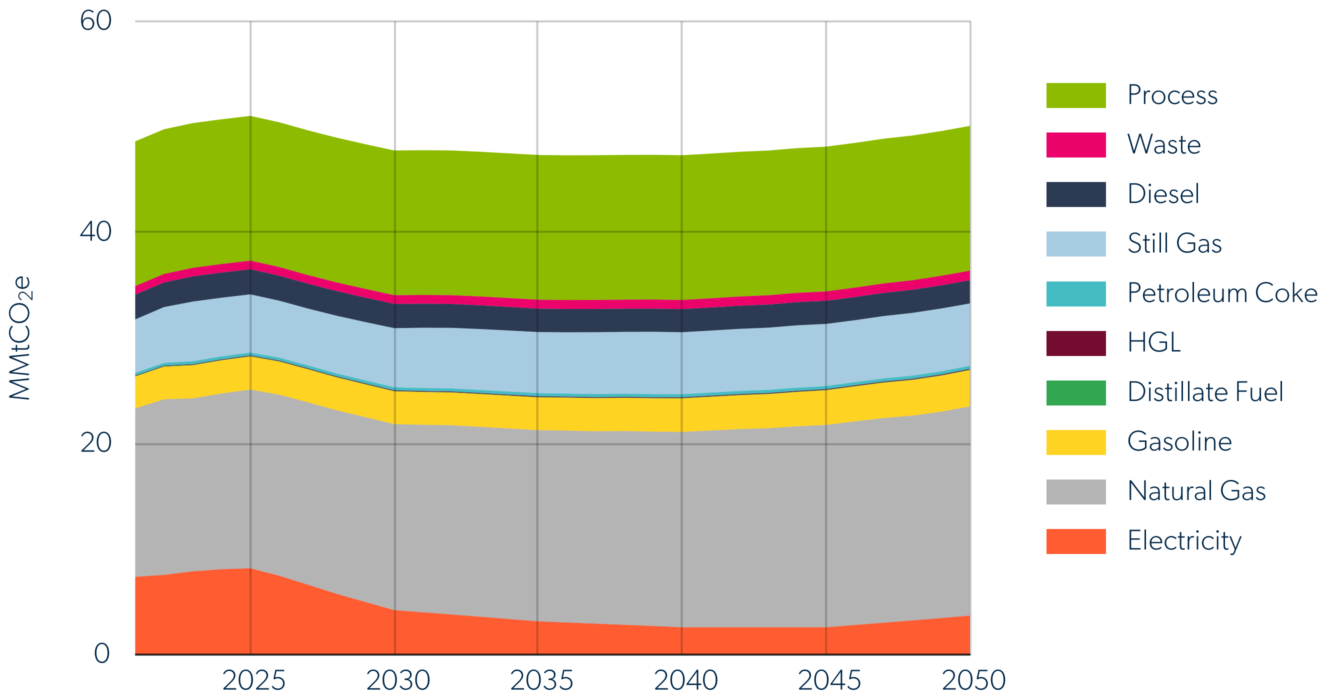

Figure 38. BAU GHG emissions by fuel and non-fuel sources, 2021 to 2050, for Baton Rouge MSA. Source: SSG analysis.

3.9 Observations

The primary opportunity to reduce GHG emissions in the Baton Rouge MSA is through decarbonization of the industrial sector, which emits 80% of the MSA's total GHG emissions. From the lens of end uses, the opportunities include reducing GHG emissions from stationary combustion (44%, or 21.4 $MMtCO_2e$), process emissions (25%, or 12.3 $MMTtCO_2e$), electricity (15%, or 7.4 $MMtCO_2e$), agriculture and land management (3%, or 1.6 $MMtCO_2e$), and solid waste and wastewater (1.6% or 0.8 $MMtCO_2e$). Reductions will include fuel switching from natural gas to renewables for stationary combustion, using clean hydrogen and other clean energy for industrial processes, cleaning the electricity grid for transitioning fossil fuel use to clean electrification, and reducing emissions from agricultural and waste sources.

Opportunities in the residential, commercial, and transportation sectors include retrofitting buildings and electrifying vehicles, using heat pumps for heating and cooling, and increasing walking, cycling and transit. Investments in GHG emission reductions in the industrial, transportation, and residential sectors will stimulate new employment opportunities. Programs in the residential and transportation sectors can also improve the quality of housing, air quality, public transit, and the affordability of transportation and housing across the region. Maximizing energy efficiencies minimizes the need for additional electrical capacity, which, in turn, reduces the overall net-zero transition costs. Increases in efficiency also reduce the energy costs and burdens for households and businesses. These savings can provide a revenue stream to finance the investments required.

4 Low-Income and Disadvantaged Communities Analysis

4.1 Methodology

The CPRG program will advance the goals of the federal Justice40 Initiative (Executive Order 14008), which aims to provide 40% of benefits delivered through federal investments to low-income and disadvantaged communities (LIDACs). The Environmental Justice Screening and Mapping Tool (EJScreen), and the Climate and Economic Justice Screening Tool (CEJST) were used to identify LIDACs within the Baton Rouge MSA parishes. These tools provide information at a census-tract level according to different categories and thresholds. The categories, thresholds, and descriptions are provided in Table 6 and Table 7.[93]

Table 6. Categories and thresholds in the CEJST and their corresponding descriptions.

Categories	Type of Burden	Description
Climate change	Expected agriculture loss rate	Expected agricultural value at risk from losses due to the following natural hazards: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather.
	Expected building loss rate	Expected building value at risk from losses due to the following natural hazards: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather.
	Expected population loss rate	Expected fatalities and injuries due to the following natural hazards: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather.
	Projected flood risk	Number of properties at risk of floods occurring in the next 30 years (projected from a high-precision climate model) from tides, rain, and riverine and storm surges, or a 26% risk total over the 30-year time horizon.

[93] *Council on Environmental Quality (n.d.). Climate and Economic Justice Screening Tool. Retrieved from: https://screeningtool.geoplatform.gov/en/*

Categories	Type of Burden	Description
Climate change	Projected wildfire risk	A model projecting the wildfire exposure for any specific location in the contiguous U.S. today and with future climate change. The risk of wildfire is calculated from inputs associated with fire fuels, weather, human influence, and fire movement.
Energy	Energy cost	Average household annual energy cost in dollars divided by the average household income.
	PM2.5 in the air	Fine inhalable particles with 2.5 or smaller micrometer diameters. The percentile is the weight of the particles per cubic meter.
Health	Asthma	Share of people who answer "yes" to both of these questions: "Have you ever been told by a health professional that you have asthma?" and "Do you still have asthma?"
	Diabetes	Share of people ages 18 years and older who have been told by a health professional that they have diabetes other than diabetes during pregnancy.
	Heart disease	Share of people ages 18 years and older who have been told by a health professional that they had angina or coronary heart disease.
	Low life expectancy	Average number of years people have left in their lives.
Housing	Historic underinvestment	Census tracts that experienced historic underinvestment based on redlining maps between 1935 and 1940.
	Housing cost	Share of households that are both earning less than 80% of Housing and Urban Development's Area Median Family Income and are spending more than 30% of their income on housing costs (here onwards, also mentioned as housing burden).
	Lack of green space	Share of land with developed surfaces covered with artificial materials like concrete or pavement, excluding crop land used for agricultural purposes.
	Lack of indoor plumbing	Housing without indoor kitchen facilities or complete plumbing facilities.
	Lead paint	Share of homes built before 1960, which indicates potential lead paint exposure.
Legacy pollution	Abandoned mine land	Presence of an abandoned mine left by legacy coal mining operations.

Categories	Type of Burden	Description
Legacy pollution	Formerly used defense sites	Properties that were owned, leased, or possessed by the United States under the jurisdiction of the Secretary of Defense, prior to October 1986.
	Proximity to hazardous waste facilities	Number of hazardous waste facilities (treatment, storage, and disposal facilities and large quantity generators) within 5 kilometers.
	Proximity to Superfund sites	Number of proposed or listed Superfund or National Priorities List (NPL) sites within 5 kilometers.
	Proximity to Risk Management Plan facilities	Count of Risk Management Plan (RMP) facilities within 5 kilometers.[94]
Transportation	Diesel particulate matter exposure	Mixture of particles in diesel exhaust in the air, measured as micrograms per cubic meter.
	Transportation barriers	Average relative cost and time spent on transportation relative to all other tracts.
	Traffic proximity and volume	Number of vehicles (average annual daily traffic) at major roads within 500 meters.
Water and wastewater	Underground storage tanks and releases	Weighted formula of the density of leaking underground storage tanks and the number of all active underground storage tanks within 1,500 feet of the census tract boundaries.
	Wastewater discharge	Risk-Screening Environmental Indicators (RSEI) modeled toxic concentrations at stream segments within 500 meters.
Workforce development	Linguistic isolation	Share of households where no one over age 14 speaks English very well.
	Low median income	Low median income calculated as a share of the area's median income.
	Poverty	Share of people living at or below 100% of the federal poverty level.
	Unemployment	Number of unemployed people as a share of the labor force.

[94] *These facilities are mandated by the Clean Air Act to file RMPs because they handle substances with significant environmental and public health risks.*

Census tract IDs are classified as disadvantaged when they exceed one of these burdens and are categorized as at or above the 65th percentile for low income. These communities face socio-economic disparities in addition to environmental, climate, health, and other burdens. Census tracts are considered disadvantaged by the CEJST if they are at or above the 65th percentile for the number of low-income households and at or above the 90th percentile for one of the data indicators. In the case of workforce development, a community is classified as disadvantaged when one of the described burdens is exceeded (90th percentile for each indicator) and more than 10% of the population are 25 years or older with less than a high school diploma.

The EPA's Environmental Justice Screening and Mapping Tool[95] (Version 2.2) was used to complement the CEJST analysis. The EJScreen contains environmental and demographic indicators similar to the CEJST (Table 7).

Table 7. The EPA's EJScreen environmental and socio-economic indicators.

Environmental Indicators	Socioeconomic Indicators
Particulate matter 2.5	People of color
Ozone	Low income
Diesel particulate matter	Unemployment rate
Air toxics cancer risk	Limited English speaking
Air toxics respiratory hazard index	Less than high school education
Toxic releases to air	Under age 5
Traffic proximity and volume	Over age 64
Lead paint	
Superfund proximity	
Risk management plan facility proximity	
Hazardous waste proximity	
Underground storage tanks and releases	
Wastewater discharge	

[95] *EPA (2024). EJScreen: Environmental Justice Screening and Mapping Tool. Retrieved from: https://www.epa.gov/ejscreen*

The EJScreen is an environmental justice screening and mapping tool that provides access to high-resolution environmental and demographic information for locations across the U.S. It is used by the EPA, the government, partners, and the public to help identify areas with people of color and/or low-income populations and environmental burdens and combinations of environmental and demographic burdens. The EJScreen includes two indexes: 1) the Demographic Index based on the average of the percent low-income households and percent people of color and 2) the Supplemental Demographic Index is based on the average of five indicators: percent of low-income, percent unemployed, percent who are limited English-speaking, percent with less than high school education, and percent with a low life expectancy.

The EJScreen uses these demographic indexes to create overall indexes—13 EJ indexes and 13 Supplemental EJ indexes (Table 7 above). These indexes are a combination of the environmental indicators and the Demographic Index or the Supplemental Demographic Index, and they provide narrative information as to how a selected geographic area scores in relation to state and national averages.

In order to categorize communities as disadvantaged according to the EJScreen tool, the EPA defines them according to:

- Any census tract that is included as disadvantaged in CEJST;
- Any census block group at or above the 90th percentile for any of EJScreen's Supplemental Indexes when compared to the nation or state; and/or
- Any geographic area within Tribal lands, as included in EJScreen, including:
- Alaska Native Allotments
- Alaska Native Villages
- American Indian Reservations
- American Indian Off-reservation Trust Lands
- Oklahoma Tribal Statistical Areas

Using these two sources of information to identify disadvantaged communities, the following section describes LIDACs in the 10-parish Baton Rouge MSA and communities impacted by the GHG reduction measures. Maps were prepared that assess the potential benefits of each GHG reduction measure.

4.2 Identification

This section identifies the LIDACs in the Baton Rouge MSA by CEJST category (see Table 6). Understanding the existing LIDAC burdens provides a basis for assessing vulnerability to, and the potential impacts of, climate change. In general, LIDACs that are overburdened with environmental, economic, and social disparities and underserviced, are more vulnerable to the impacts of climate change. The assessment of current burdens is used to evaluate how LIDACs could benefit from the PCAP's proposed GHG reduction measures. This evaluation will inform the prioritization of PCAP measures (Section 5) for implementation.

The Baton Rouge MSA region has LIDACs in all 10 parishes. East Baton Rouge is the parish that has accumulated the most burdens, with some areas affected by all eight CEJST burden categories (Figure 39). In particular, the Baton Rouge neighborhoods of Legion Village, Delmont Place, Istrouma, and North Baton Rouge, as well as the city of Donaldsonville and its surroundings, are the most heavily burdened in the MSA.

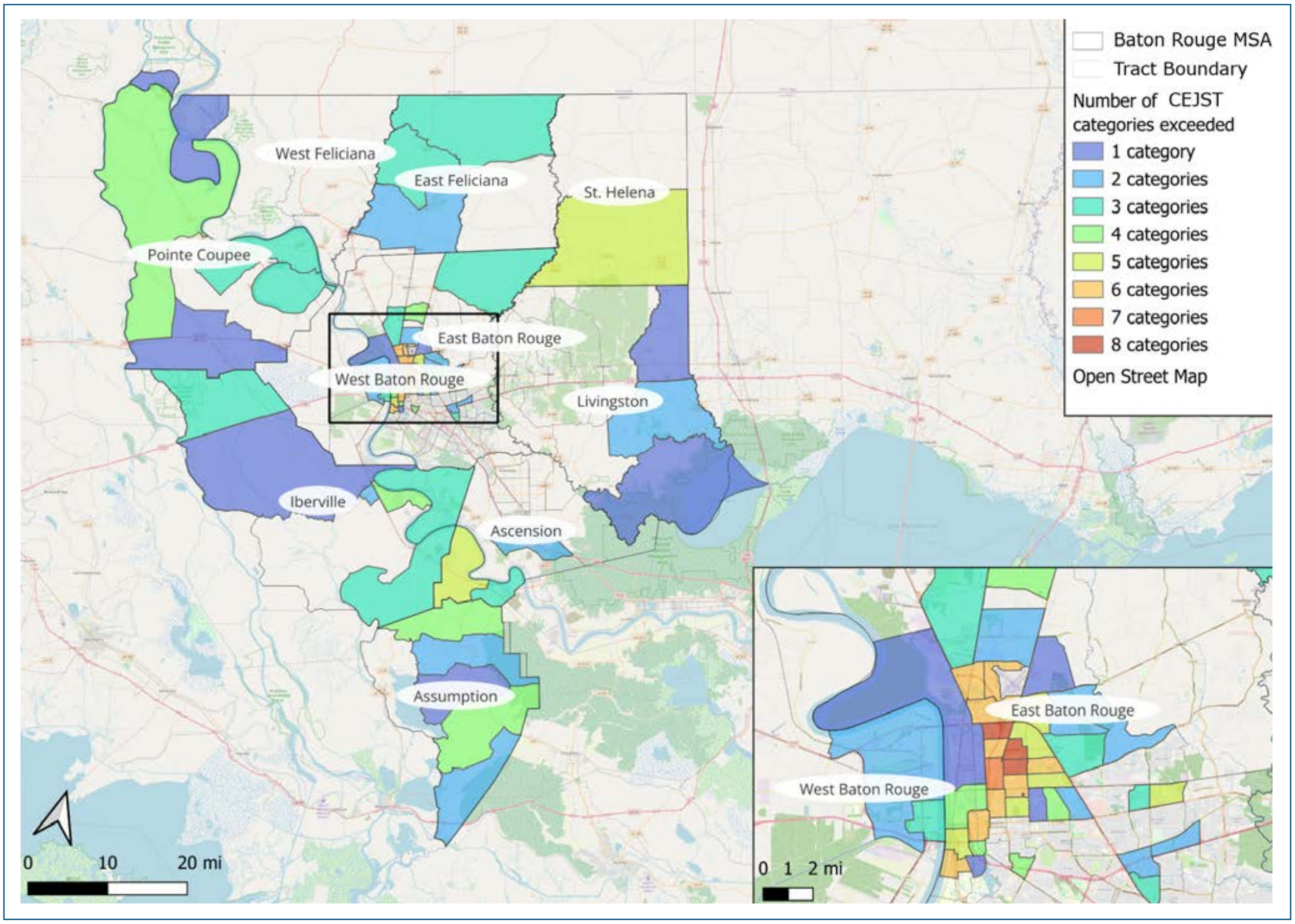

Figure 39. Map of the LIDACs and the number of categories exceeded in the Baton Rouge MSA according to the CEJST tool. Source: Adapted from Council on Environmental Quality, 2022.

Table 8 presents the number of LIDAC tracts in each parish, the total population of the LIDACs, and the percentage of the parish's total population living in LIDACs. East Baton Rouge is the most populous parish and the one with the most disadvantaged people (almost 150,000 people); however, they represent only 32% of the parish's total population. Conversely, in Iberville and Assumption, 83% and 81% of the population, respectively, are affected by at least one category of burden. The least burdened parishes in terms of percent of population are Ascension, Livingston, West Feliciana, and West Baton Rouge. A list of all LIDAC tracts is presented in Table 24 in Appendix C.

Table 8. Distribution of LIDAC census tracts for the 10 parishes of Baton Rouge MSA, adapted from the CEJST tool. Source: Council on Environmental Quality, 2022.

	Number of LIDAC Tracts	Total Population in LIDACs	Percentage of Parish Population in LIDACs
Ascension Parish	3	17,041	14%
Assumption Parish	5	18,266	81%
East Baton Rouge Parish	39	143,255	32%
East Feliciana Parish	3	13,787	71%
Iberville Parish	6	27,371	83%
Livingston Parish	3	21,711	16%
Pointe Coupee Parish	4	15,683	71%
St. Helena Parish	1	6,756	66%
West Baton Rouge Parish	2	7,600	29%
West Feliciana Parish	1	3,780	25%
TOTAL	**67**	**275,250**	**32%**

4.3.1 Distribution of burdened census tracts across Baton Rouge MSA

- **Ascension Parish** has a population of 125,289. 33% of residents are people of color, 23% of whom are Black and 6% who are Hispanic. 22% of residents are considered low-income and 14% are persons with disabilities. As compared to state and national averages, Ascension Parish ranks high for many of the EPA indexes for pollution, including particulate matter, ozone, diesel particulate matter, air toxics cancer risk, toxic releases to air, and wastewater discharge. The parish contains both Justice40 and EPA IRA disadvantaged communities.

- **Assumption Parish** has a population of 21,366. 35% of residents are people of color, 30% of whom identify as Black and 3% who are Hispanic. In Assumption Parish, unemployment is 8%, 23% of residents have less than a high school education, and 18% are persons with disabilities. Compared to state and national averages, Assumption Parish ranks high for ozone. The parish also contains six brownfields, and is at 34% for flood risk, higher than state and national averages. Assumption Parish contains both Justice40 and EPA IRA disadvantaged communities.

- **East Baton Rouge Parish** has a population of 455,447. 56% of residents are people of color, 45% of whom are Black and 4% who are Hispanic. When compared to state and national averages, the parish ranks very high for the following EPA Indexes for pollution: particulate matter, ozone, diesel particulate matter, toxic releases to air, and wastewater discharge. The parish has two Superfund sites, 112 brownfields, and contains both Justice40 and EPA IRA disadvantaged communities.

- **East Feliciana Parish** has a population of 19,588. 46% of residents are people of color (42% Black, 2% Hispanic, 1% American Indian). 30% of residents are considered low-income, 14% are persons with disabilities, and 19% have less than a high school education. When compared to state and national averages in the EPA indexes for pollution,, the parish ranks very high for ozone and wastewater discharge. East Feliciana Parish contains both Justice40 and EPA IRA disadvantaged communities.
- **Iberville Parish** has a population of 30,651. 53% are people of color (47% Black and 3% Hispanic). 38% of residents are considered low-income, 16% percent are persons with disabilities, 8% are unemployed, and 20% have less than a high school education. The parish has a lower life expectancy than state and national averages. When compared to state and national averages on the EJ Indexes for pollution, Iberville Parish ranks high for ozone, air toxics cancer risk, toxic releases to the air, proximity to RMP facilities, and wastewater discharge. There are two brownfields in the parish and the parish contains both Justice40 and EPA IRA disadvantaged communities.
- **Livingston Parish** has a population of 141,057. 14% are people of color (7% identify as Black and 4% as Hispanic). 27% of residents are low-income and 14% are persons with disabilities. Compared to state and national averages, Livingston Parish ranks high on the following EJ indexes for pollution: particulate matter and ozone. Compared to state and national averages, the parish ranks high for flood risk and wildfire risk as well. There is one Superfund site within the parish and the parish contains both Justice40 and EPA IRA disadvantaged communities.
- **Pointe Coupee Parish** has a population of 20,951. 40% are people of color (34% Black and 3% Hispanic). 38% of residents are considered low-income and 19% have less than a high school education. Compared to state and national averages, the parish has a much higher rate of heart disease, cancer, and persons with disabilities (28% of residents). The parish contains two brownfields and has both Justice40 and EPA IRA disadvantaged communities.
- **St. Helena Parish** has a population of 10,881 residents. 56% identify as people of color (51% Black and 2% Hispanic). 48% of residents are considered low-income, 23% have less than a high school education, and 28% are persons with disabilities. Compared to state and national averages, the unemployment rate in St. Helena Parish is very high, at 26%. The parish ranks very high in comparison to the rest of the state and average in comparison to the nation for ozone. The parish contains both Justice40 and EPA IRA disadvantaged communities.
- **West Baton Rouge Parish**has a population of 27,064 residents. 45% identify as people of color (41% Black and 3% Hispanic). 31% of residents are considered low-income and 13% are persons with disabilities. When compared to state and national averages on the EJ Indexes for pollution, West Baton Rouge Parish ranks high for particulate matter, ozone, diesel particulate matter, air toxics cancer risk, toxic releases to the air, proximity to Superfund sites, proximity to RMP facilities, and wastewater discharge.
- **West Feliciana Parish** has a population of 15,334 residents. 48% identify as people of color, of which 44% are Black, 2% are Hispanic, and 1% is Asian. 28% of residents are considered low-income and 17% have less than a high school education. Compared to national averages, the parish has a relatively high unemployment rate at 10%. The parish contains both Justice40 and EPA IRA disadvantaged communities.

4.3 Disproportionate Climate Impacts and Risks

4.3.1 Socio-economic Burden

Workforce development is a LIDAC category that includes communities with a high percentage of either linguistic isolation (90th percentile and above), low median income, poverty or unemployment, and more than 10% of people without a high school education. This LIDAC category is present in all 10 parishes, with the highest concentration in the downtown of the city of Baton Rouge (Figure 40). LIDACs in this category could benefit from opportunities for education and employment.

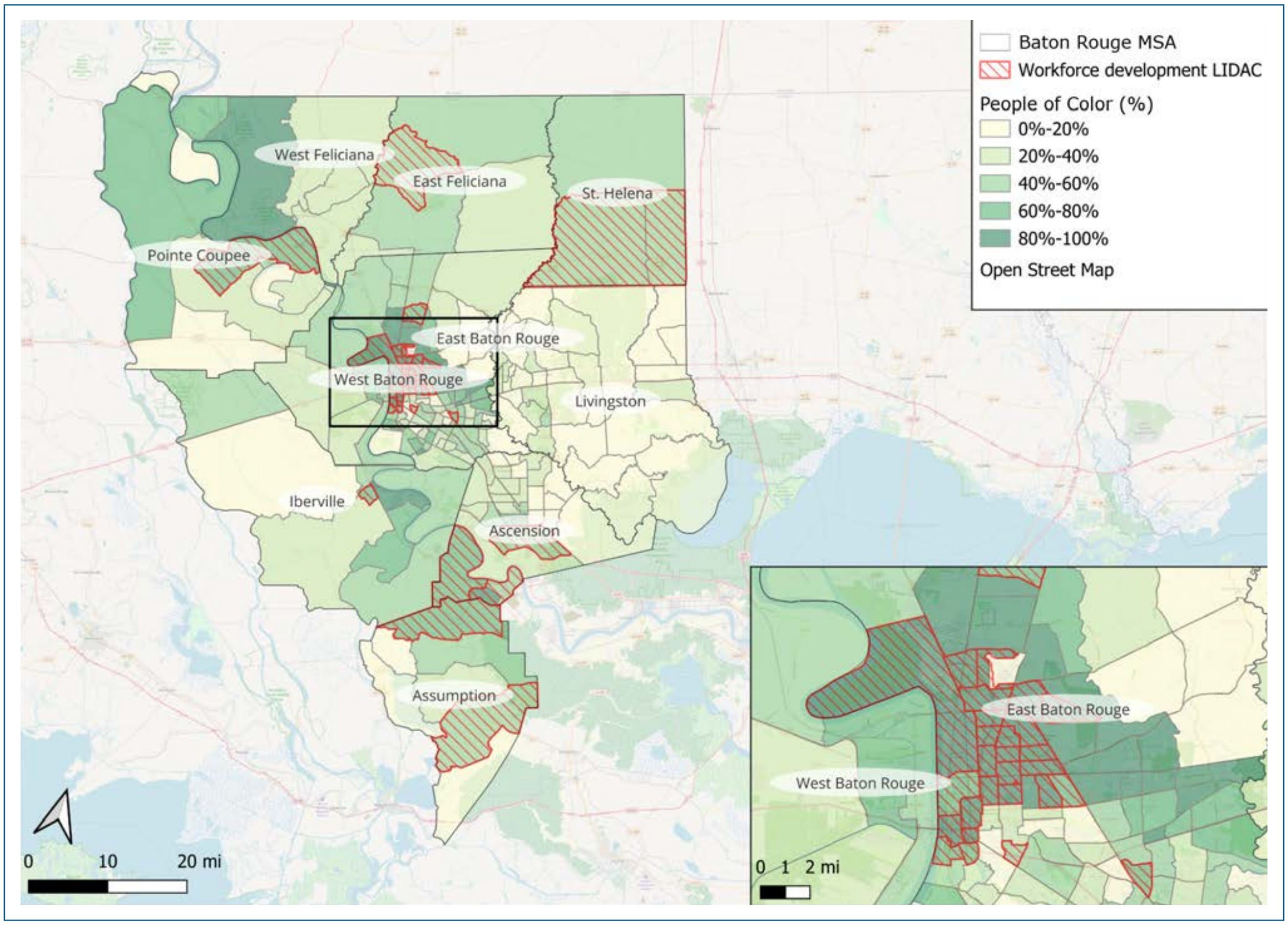

Figure 40. .Map of the people of color percentage by tracts and LIDAC neighborhoods exceeding the workforce development category burdens. Source: Adapted from Council on Environmental Quality, 2022.

4.3.2 Health and Environmental Burdens

There are three health and environment burden categories: 1) health (asthma, diabetes, heart disease, or low life expectancy), 2) legacy pollution (tracts that contain or are close to a former or active site that pose a risk of disseminated pollution like a Superfund, hazardous waste site, etc.), and 3) water and wastewater discharge (underground storage tanks and releases or wastewater discharge). Tracts that carry these burdens and are over the 65th percentile for low income are considered LIDACs.

Similar to the workforce development burden category, the health-burdened areas are concentrated in low- income communities. For example, the water and wastewater burdens
and the legacy pollution burdens are concentrated in East Baton Rouge (Figure 41).

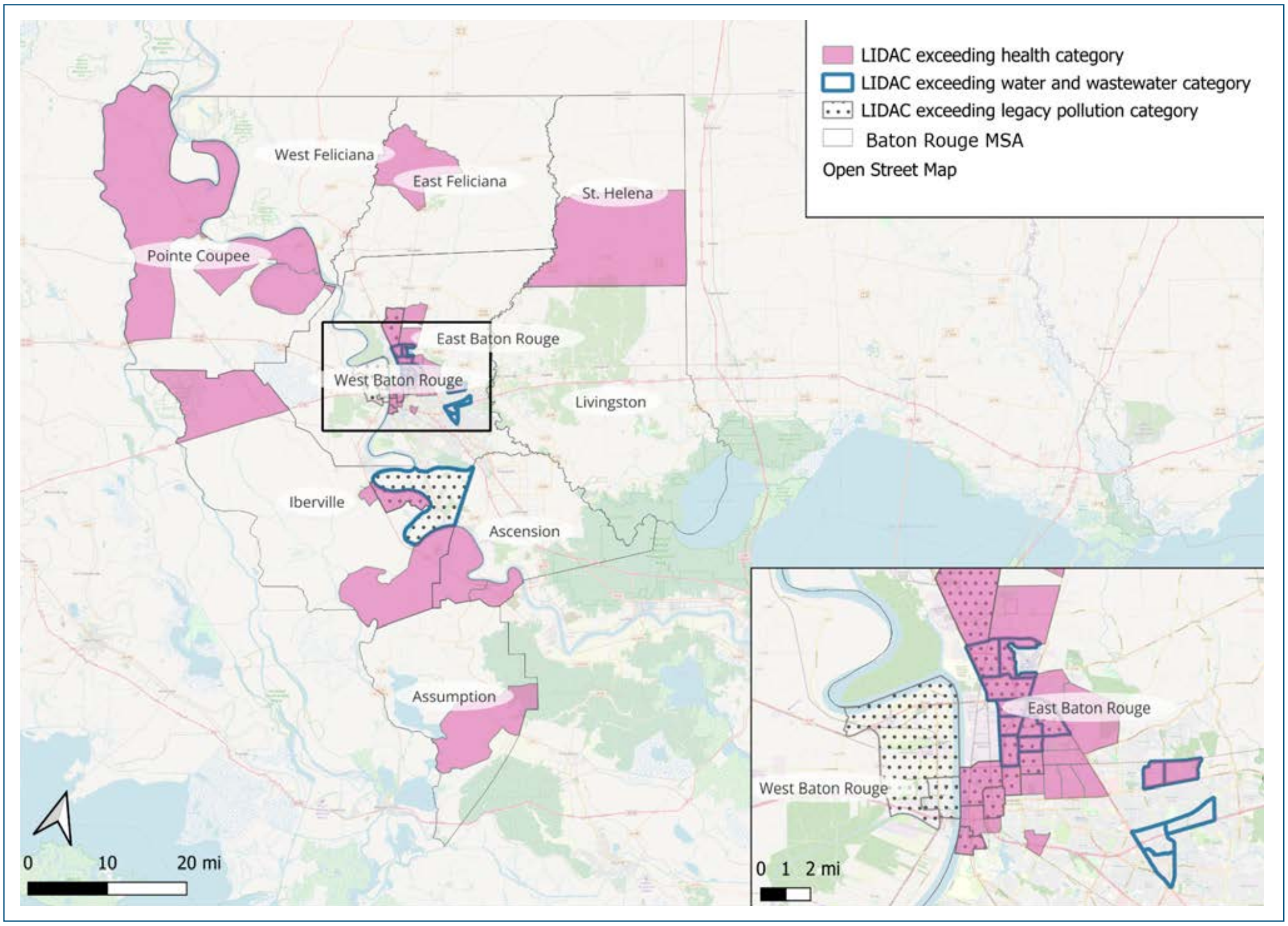

Figure 41. Map presenting LIDACs that exceed the criteria for health, legacy pollution, and water and wastewater discharge categories. Source: Adapted from Council on Environmental Quality, 2022.

The MSA is one of the worst regions in the country for the release of toxic air pollution. Toxic air pollutants affect almost 100% of the following six parishes: West Baton Rouge, East Baton Rouge, Iberville, Livingston, Ascension, and Assumption. High levels of diesel particulate matter are concentrated in the most densely populated areas of Baton Rouge (Figure 42).

Wastewater pollutant discharges are concentrated in the city of Baton Rouge, Iberville, East Baton Rouge, and East Feliciana, and there are high concentrations along the Mississippi River in Ascension, Iberville, East Baton Rouge, and East Feliciana. RMP facilities are distributed along the Mississippi River in four parishes: Ascension, Iberville, West Baton Rouge, and East Baton Rouge (Figure 42). PCAP measures that reduce industrial, wastewater, and transportation air contaminants will benefit most of the MSA.

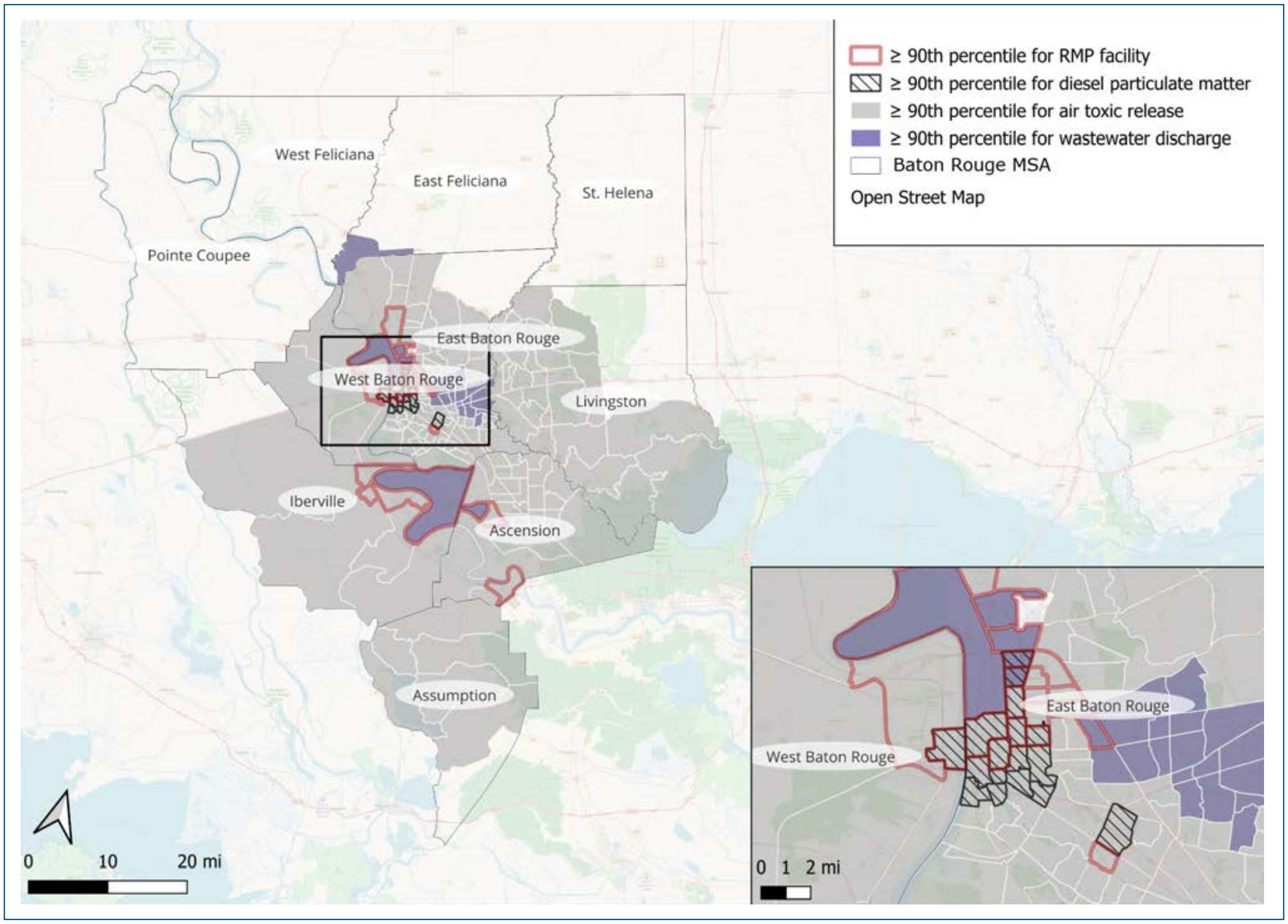

Figure 42. Map of environmental pollution burdens in the Baton Rouge MSA. Source: Adapted from Council on Environmental Quality, 2022.

Many of the Capital Region's large emitters are located in areas where LIDACs are in close proximity (Figure 43). Measures taken to reduce pollutant emissions will reduce the environmental pollution burdens across the MSA and in particular for heavily-burdened LIDACs.

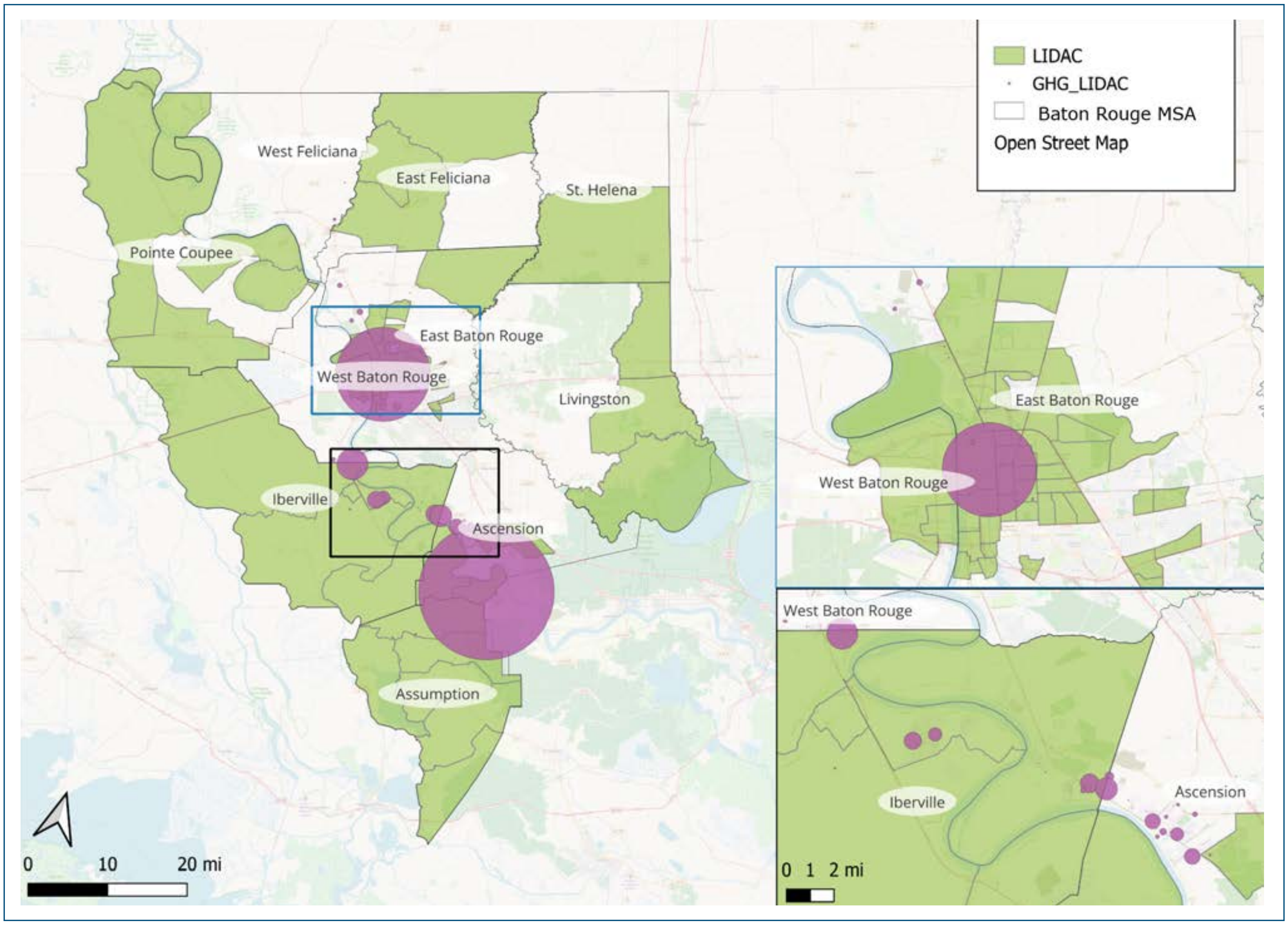

Figure 43. GHG emissions (MMtCO2e) of large facilities (in 2021) and disadvantaged census tracts in Baton Rouge MSA.[96]

[96] *EPA (2021). 2021 Greenhouse Gas Emissions from Large Facilities. Facility Level Information on Greenhouse Gases Tool (FLIGHT). Retrieved from: https://ghgdata.epa.gov/ghgp/main.do*

4.3.3 Housing and Energy Burdens

CEJST evaluates housing and energy burdens as a proportion of income, and as a result, these burdens are mostly located in low-income communities. Figure 44 shows the distribution of these burdens and the percentage of people of color to illustrate the high correlation of these burdens with BIPOC communities. Housing burdens are most predominant in the city of Baton Rouge, the southern part of Ascension Parish, and the northern part of Assumption Parish. Energy burdens are located in the city of Baton Rouge and in the northern parishes of the MSA, including Pointe Coupee, East Feliciana, and St.Helena. PCAP measures that result in energy cost reductions (i.e., electricity bill reductions) and create high-quality jobs will help communities experiencing housing and energy burdens.

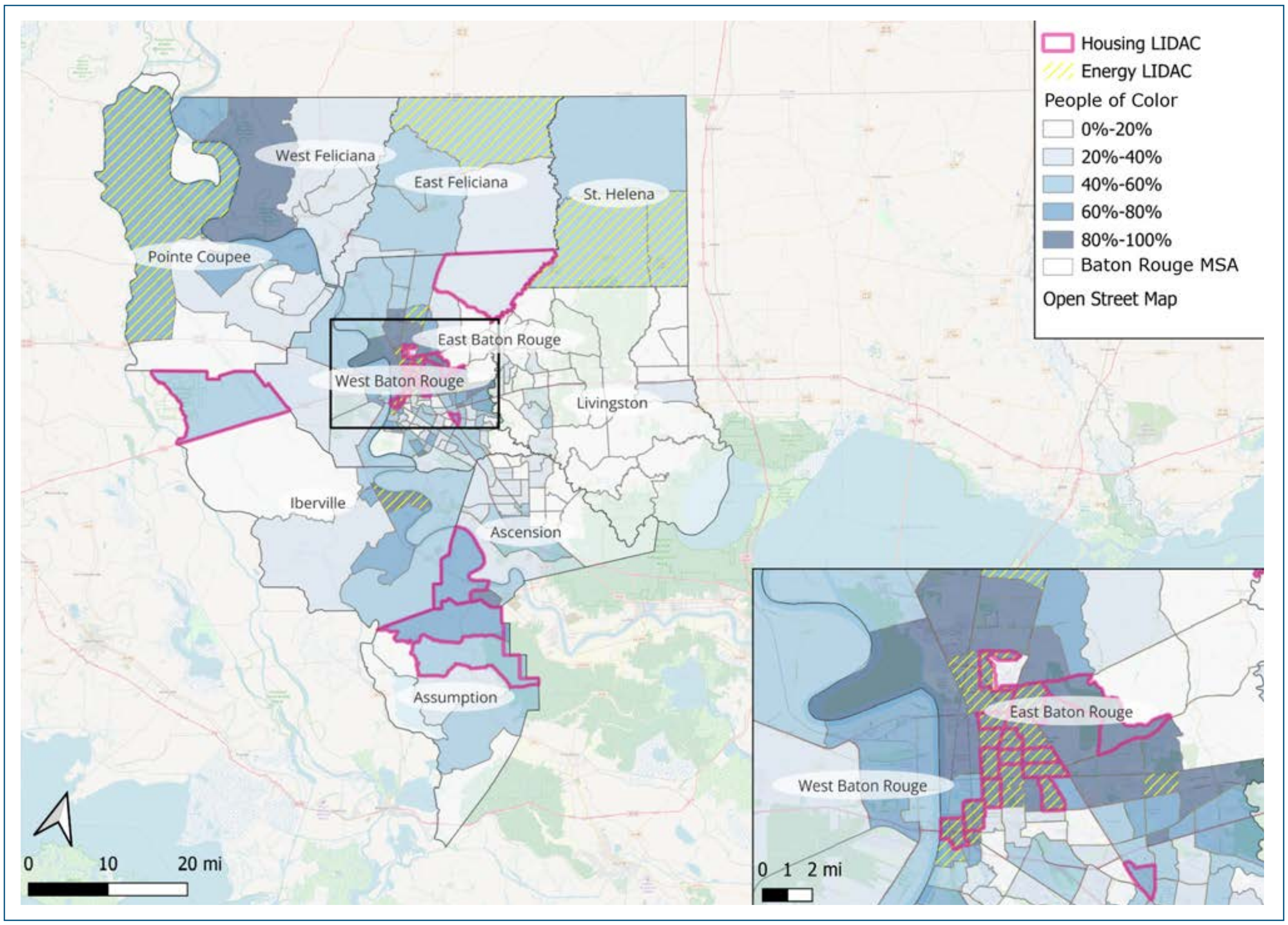

Figure 44. Map of housing and energy burdens and the percentage of people of color in Baton Rouge MSA. Source: Adapted from Council on Environmental Quality, 2022.

4.3.4 Transportation

Travel barriers refer to the amount of time and money lost due to transportation, relative to the rest of the United States. Figure 45 shows that travel barriers are prevalent across all of the MSA's parishes, especially in the north MSA. Central neighborhoods of the city of Baton Rouge are impacted by traffic proximity, which refers to the number of vehicles (average annual daily traffic) at major roads within 500 meters. Diesel particulate matter affects mostly urban regions of the MSA.

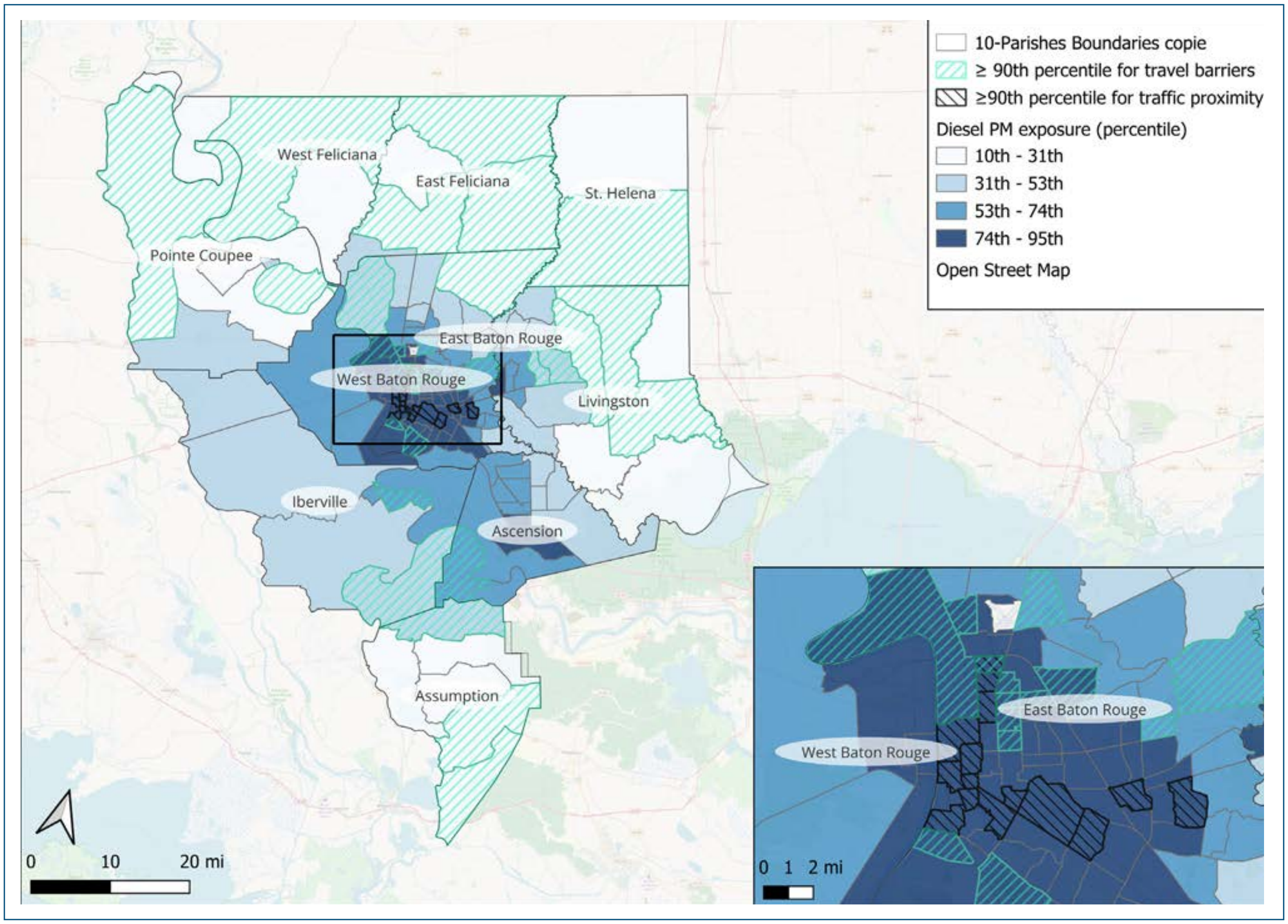

Figure 45. Map of the transportation category factors: diesel particulate matter by percentile, traffic barrier, and traffic proximity. Source: Adapted from Council on Environmental Quality, 2022.

4.4 Climate Impacts and Risks

As presented in Section 2.1, the Capital Region's parishes are prone to climate change impacts, with relatively high flood risks. Figure 46 presents the exposure of LIDACs in relation to the MSA's 100-year floodplain from the EJScreen tool. Due to high climate change risks across the Baton Rouge MSA, all LIDACs are subject to this risk.

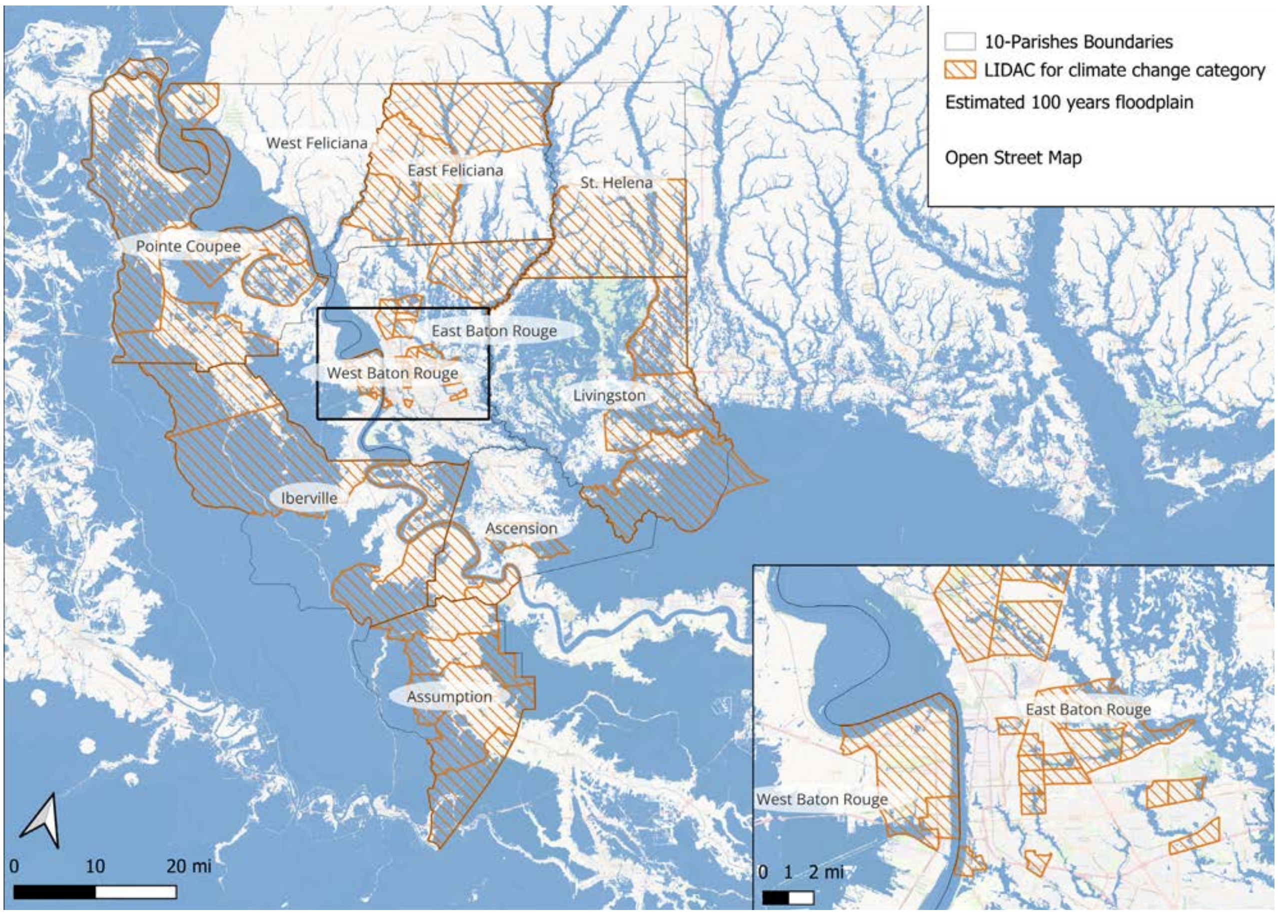

Figure 46. Map of the 100-year floodplain and LIDACS burdened by the climate change impact category.[97][98]

[97] *EPA (2024). EJScreen: Environmental Justice Screening and Mapping Tool. Retrieved from: https://www.epa.gov/ejscreen*

[98] *Council on Environmental Quality (n.d.). Climate and Economic Justice Screening Tool. Retrieved from: https://screeningtool.geoplatform.gov/en/*

5 Priority Greenhouse Gas Reduction Measures

5.1 Priority Measures

The following measures were identified based on existing initiatives that reduce GHG emissions in the near term, are implementation-ready, and provide benefits for LIDACs. Each of the following measures include modeled estimates of GHG emission reductions, estimates of air pollutant reductions (where applicable), implementation authority, metrics for tracking progress, quantitative cost/benefits analysis, and LIDAC benefits analysis. The modeled GHG impact of the measures is based on our technical analysis, and the calculations are provided in a separate document.

Table 9. List of Priority Measures

Measure #1:	Active Transportation Infrastructure
Measure #2:	Redesign CATS and Expand Bus Rapid Transit
Measure #3:	BR-NOLA Rail
Measure #4:	Implement Other Transit Systems
Measure #5:	Restore wetlands and other natural spaces
Measure #6:	Enhance the Parish's Tree Canopy
Measure #7:	Develop Net Zero Neighborhoods on Brownfield sites
Measure #8:	Baton Rouge Clean Cars 4 All and EV Charging Infrastructure
Measure #9:	Low Interest Loans for Energy Retrofits Program
Measure #10:	High Efficiency New Buildings
Measure #11:	Develop Community Solar Projects
Measure #12:	Develop Microgrids
Measure #13:	Industrial Decarbonization

5.1.1 PCAP Measure #1: Active Transportation Infrastructure

Measure #1: *Active Transportation Infrastructure*	
Description	Implement and expand the East Baton Rouge Parish Bicycle and Pedestrian Master Plan, which includes 100 miles of on-road bike paths and 250 miles of sidepaths.[99] Establish bicycle and pedestrian mode-share targets of 2% for 2025 and 4% for 2030. Expansion of network connections should provide active transportation routes and improved access to transit for LIDACs.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 205,111MtCO₂e 2025–2050: 815,471 MtCO₂e
Estimate of the quantifiable criteria air pollutant emissions reductions (e.g., through 2030 and 2050)	(see table below)
Implementing agency or agencies	City of Baton Rouge, East Baton Rouge Parish (BREC), CRPC, with potential expansion to other parishes in the MSA
Milestones for obtaining implementing authority	None required
Implementation schedule and milestones	2025: Establish bicycle and pedestrian mode share goal of 2% 2030: Establish bicycle and pedestrian mode share goal of 4%
Geographic location	East Baton Rouge
Additional funding sources	Federal Transit Administration, Highway Safety Improvement Program, Carbon Reduction Program (FHWA); Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program, CRPC, LADOTD

Type[100]	2024–2030 (kg)	2024–2050 (kg)
HC	53,829	327,228
CO	816,470	4,894,342
NOx	26,663	135,885
PM 2.5	2,258	14,980

[99] *East Baton Rouge Paris (2020). Pedestrian and Bicycle Master Plan. Retrieved from: https://www.brla.gov/DocumentCenter/View/9411/East-Baton-Rouge-Pedestrian-and-Bicycle-Master-Plan-PDF*

[100] *HC = hydrocarbons; CO = carbon monoxide; NOx = nitrogen oxides; PM2.5 = particulate matter with diameter <= 2.5 micrometers*

Measure #1: *Active Transportation Infrastructure*	
Metrics for tracking progress	• # of vehicular trips shifted to walking or cycling • Annual miles walked or cycled • # of miles of walking paths added • # of miles of protected bike lanes added
Applicable sector	Transportation
Cost estimates	2025–2030: $276 million 2025–2050: $276 million
LIDAC benefit analysis	Active transportation is a low-cost and zero-emissions transportation alternative. It can significantly decrease the energy burden of a household. Using active transportation also means traffic reduction, noise reduction, and in many cases, shorter transit time. In addition to the reduction of air pollution, active transportation is good for health, reducing heart diseases and increasing life expectancy. Figure 47 presents the existing and projected bike and pedestrian facilities in East Baton Rouge. When complete, this project will link all the neighborhoods of East Baton Rouge Parish with a dense, safe, and user-friendly network of bicycle and pedestrian paths. This network will enable a paradigm shift in favor of microtransit and citizen mobility.

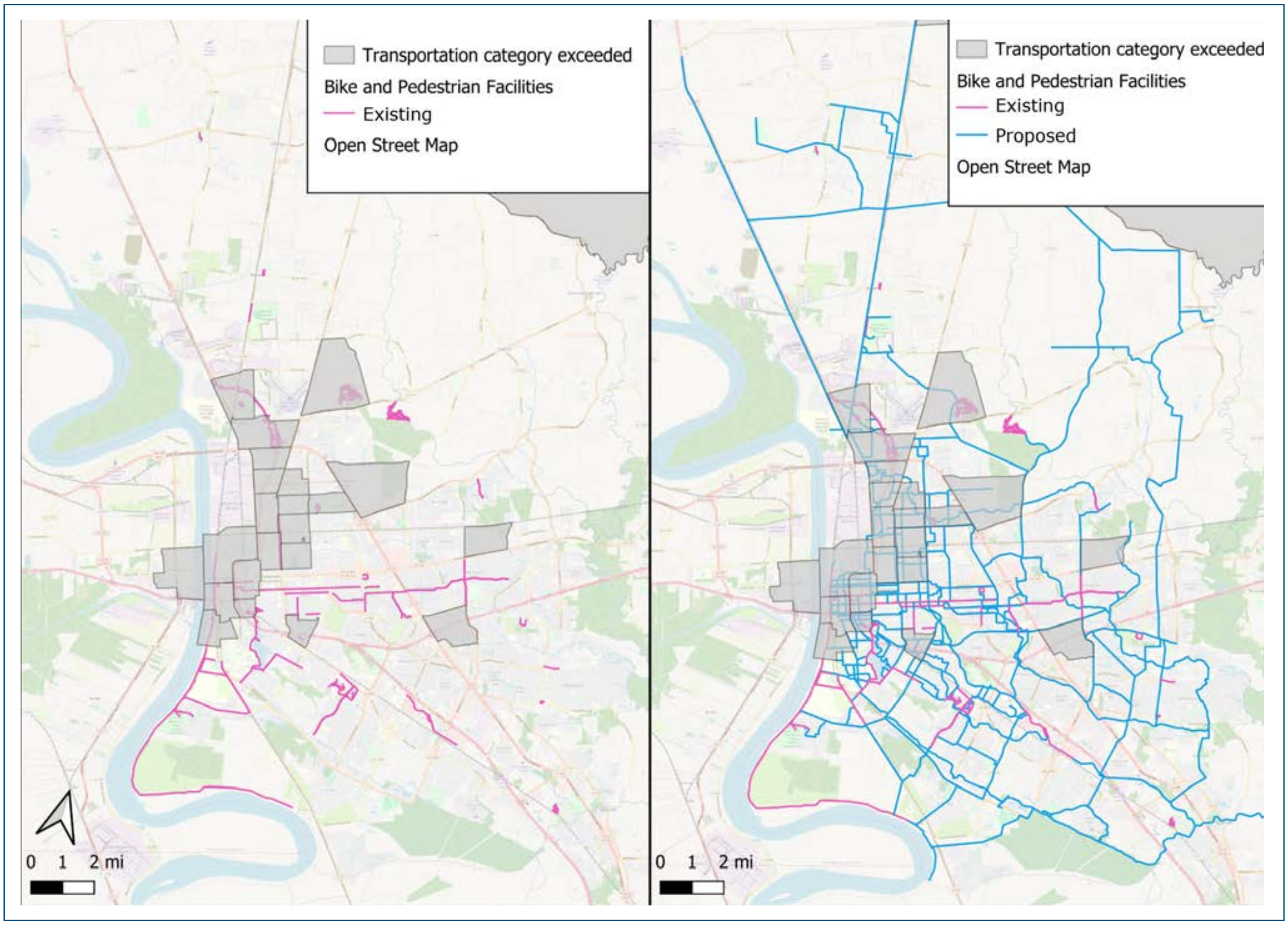

Figure 47. East Baton Rouge Parish existing and proposed bike and pedestrian facilities and all tracts exceeding the transportation category (traffic proximity or travel barrier or diesel particulate matter).

5.1.2 PCAP Measure #2: Redesign CATS and Expand Bus Rapid Transit

Measure #2: Redesign CATS and *Expand Bus Rapid Transit*	
Description	Redesign the services offered by the Capital Area Transit System (CATS) within the city of Baton Rouge and the city of Baker[101] and further expand the Plank-Nicholson Bus Rapid Transit (BRT) Project.[102] This includes a system redesign with route modifications and frequency adjustments and potential introduction of new mobility options such as microtransit. Implementing the Plank-Nicholson BRT project will provide frequent and reliable service along a regionally significant corridor that will become the spine for a regional transit system.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 29,851 $MtCO_2e$ 2025–2050: 253,735 $MtCO_2e$
Estimate of the quantifiable criteria air pollutant emissions reductions (e.g., through 2030 and 2050)	(see table below)
Implementing agency or agencies	CRPC/City of Baton Rouge/Parish of East Baton Rouge
Milestones for obtaining implementing authority	None required
Implementation schedule and milestones	2025: Plank-Nicholson BRT Project and expansion 2025–2026: Capital Area Transit System redesign
Geographic location	City of Baton Rouge, City of Baker, and East Baton Rouge Parish

Type[103]	2024–2030 (kg)	2024–2050 (kg)
HC	18,108	118,392
CO	274,519	1,770,305
NOx	8,916	48,979
PM 2.5	762	5,429

[101] *CRPC (2022). Move 2046: Baton Rouge MPA's 2046 Metropolitan Transportation Plan. Retrieved from: https://static1.squarespace.com/static/54cbd54fe4b047a0380cae54/t/6239c0e66502856fbe6faf59/1647952114989/00_FINAL_MOVE_2046_Main_Report_030922.pdf*

[102] *MoveBR (2024). Plank-Nicholson Bus Rapid Transit (BRT) Project Page. Retrieved from: https://movebr.brla.gov/form/baton-rouge-bus-rapid-transit-project-page*

[103] *HC = hydrocarbons; CO = carbon monoxide; NOx = nitrogen oxides; PM2.5 = particulate matter with diameter <= 2.5 micrometers*

Measure #2: Redesign CATS and *Expand Bus Rapid Transit*	
Additional funding sources	Carbon Reduction Program (FHWA) and Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program
Metrics for tracking progress	• # jobs created • # of yearly passengers • # of km traveled by buses
Applicable sector	Transportation
Quantitative cost estimates	2025–2030: $73.6 million 2025–2050: $270 million
LIDAC Benefit Analysis	The ongoing BRT project aims to provide a frequent and reliable service to the communities that are most affected by energy and transportation burdens. The BRT route begins at the Louisiana State University, travels north up to the downtown area, then east to the CATS Terminal, before going northeast through the neighborhoods of Fairefields, Istrouma, Delmont Village, North Highlands, and Woodlawn, which are all LIDACs. Its route ends at the North Transfer Center, integrating the existing transit infrastructures. The route is embedded into the LIDACs of East Baton Rouge and will act as a spinal bus route for the expansion project, which will target the LIDACs of Baton Rouge and Baker in order to connect them to downtown and the State University. This project will have a direct effect on the various burdens that LIDAC communities experience, primarily the transportation burden, by reducing traffic proximity, travel barriers, diesel particulate matter, energy cost, and PM 2.5. This project will create new job opportunities.

5.1.3 PCAP Measure #3: BR-NOLA Rail

Measure #3: BR-NOLA Rail	
Description	Implement an intercity passenger rail service between Baton Rouge and New Orleans that will provide a highly-visible, reliable alternative to driving between the two cities and foster the development of one super region. A feasibility study was updated for the latest projections of costs and ridership.[104]
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2026–2030: 2,208 $MtCO_2e$ 2026–2050: 16,928 $MtCO_2e$
Estimate of the quantifiable criteria air pollutant emissions reductions (e.g., through 2030 and 2050)	(see table below)
Implementing agency or agencies	Louisiana Department of Transportation and Development
Milestones for obtaining implementing authority	2025: NEPA environmental assessment complete
Implementation schedule and milestones	2026: Engineering complete 2026: Construction begins 2028: Service begins
Geographic location	East Baton Rouge to New Orleans
Additional funding sources	The plan proposes federal investment through LADOTD, local MPOs, rural governments, and municipalities, and it identifies funding for passenger rail in the federal Infrastructure Investment and Jobs Act (IIJA).[106]

Type[105]	2024–2030 (kg)	2024–2050 (kg)
HC	995	7,332
CO	15,076	109,587
NOx	443	2,974
PM 2.5	44	339

[104] *DOTD (2023). Baton Rouge-New Orleans Intercity Passenger Rail Feasibility Study 2023*

[105] *HC = hydrocarbons; CO = carbon monoxide; NOx = nitrogen oxides; PM2.5 = particulate matter with diameter <= 2.5 micrometers*

[106] *"State of Louisiana Climate Initiatives Task Force: Recommendations to the Governor, 2022. Louisiana Climate Action Plan," State of Louisiana, 2022, https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/Climate_Action_Plan_FINAL_3.pdf*

Measure #3: BR-NOLA Rail	
Metrics for tracking progress	• # of trains per day • # or passengers per day • Reductions in personal vehicle trips along route
Applicable sector	Transportation
Quantitative cost estimates	2025–2030: Capital costs: $289 million Operating costs: $19.4 million 2025–2050: Capital costs: $289 million Operating costs: $148.6 million
LIDAC Benefit Analysis	The BR-NOLA Rail project aims to provide an affordable and cleaner alternative to the car between Baton Rouge and New Orleans. Recommended train stops are downtown and at the Health District in Baton Rouge, Gonzales, LaPlace, Louis Armstrong New Orleans International Airport, and at the Union Passenger Terminal in New Orleans. The LIDACs with the highest travel barrier in Ascension Parish will benefit from the stop in Gonzalez city. The overall region will benefit from the reduction of diesel PM that is most present in this part of the MSA (see Section 4.3.6). This project will reduce the energy burden of LIDACs, increase employment opportunities, and reduce noise and traffic around the I-10 highway.

5.1.4 PCAP Measure #4: Implement Other Transit Systems

Measure #4: Implement Other Transit Systems	
Description	Implement other transit systems across the metropolitan planning area, including rural and specialized transit systems, in five parishes (East and West Baton Rouge, Ascension, Iberville, and Livingston).[107] Improving and coordinating these services will ensure more people have access to transportation options, relying less on personal vehicles. Decarbonizing the vehicles used for these transit systems will improve air quality along the transit routes and reduce the maintenance and operations costs associated with these vehicles.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 12,338 $MtCO_2e$ 2025–2050: 53,463 $MtCO_2e$
Estimate of the quantifiable criteria air pollutant emissions reductions (e.g., through 2030 and 2050)	See table below
Implementing agency or agencies	CRTC, CATS
Milestones for obtaining implementing authority	To be determined
Implementation schedule and milestones	Stage 1: 2024–2027 Stage 2: 2028–2036 Stage 3: 2037–2046
Geographic location	East and West Baton Rouge, Livingston, Ascension, and Iberville

Type[108]	2024–2030 (kg)	2024–2050 (kg)
HC	5,822	22,756
CO	88,517	341,105
NOx	2,965	9,730
PM 2.5	240	1,028

[107] *CRPC (2022). Move 2046: Baton Rouge MPA's 2046 Metropolitan Transportation Plan. Retrieved from: https://static1.squarespace.com/static/54cbd54fe4b047a0380cae54/t/6239c0e66502856fbe6faf59/1647952114989/00_FINAL_MOVE_2046_Main_Report_030922.pdf*

[108] *HC = hydrocarbons; CO = carbon monoxide; NOx = nitrogen oxides; PM2.5 = particulate matter with diameter <= 2.5 micrometers*

Measure #4: Implement Other Transit Systems	
Additional funding sources	TBD
Metrics for tracking progress	• # of miles traveled by bus • # of yearly passengers
Applicable sector	Transportation
Quantitative cost estimates	Stage 1: $22.2 million Stage 2: $33.5 million Stage 3: $44.9 million
LIDAC Benefit Analysis	This measure will be important to reduce the travel barriers for the parishes outside the city of Baton Rouge, especially in Iberville Parish, where 100% of the population is considered part of an LIDAC. Modal shift from cars to buses will also have the benefit of enhancing air quality, reducing energy burden, and increasing employment opportunities. This measure can provide support for elderly and sick people that have no other means of transportation in rural areas. It will also reduce the energy burden of these communities.

5.1.5 PCAP Measure #5: Restore Wetlands and Other Natural Spaces

Measure #5: Restore wetlands and *other natural spaces*	
Description	Restore and enhance wetlands and natural features. This measure can include floodplain restoration, riparian vegetation restoration, wetland, prairie, and forest restoration. The objective is to restore 200 acres per year for 10 years, assuming 7 tons of CO_2e sequestered per acre per year of restored wetland.[109] Note that some wetlands can actually increase emissions. CRPC is currently developing a watershed plan, which will focus on nature-based solutions, including identifying areas with a high potential for restoration or preservation[110] of natural areas and micro-grid implementations.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 29,400 $MtCO_2e$ 2025–2050: 299,400 $MtCO_2e$
Implementing agency or agencies	CRPCLA, Amite River Basin Commission
Milestones for obtaining implementing authority	None required Louisiana Watershed Initiative
Implementation schedule and milestones	Acres Restored with Wetland Year 1: Program development Year 2: 200 acres Year 3: 200 acres Year 4: 200 acres Year 5: 200 acres Year 6: 200 acres Year 7: 200 acres Year 8: 200 acres Year 9: 200 acres Year 10: 200 acres
Geographic location	Baton Rouge Parishes

[109] *Tierra Resources and the Climate Trust (2014). Carbon Market Opportunities for Louisiana's Coastal Wetlands. Retrieved from: https://tierraresourcesllc.com/wp-content/uploads/2014/01/Final-report-for-official-release.pdf*

[110] *Nature Conservancy and RTI International (n.d.). NBS Opportunity Map Viewer. Retrieved from here: https://tnc.maps.arcgis.com/apps/instant/sidebar/index.html?appid=8b351a041ab643fabeac373765b394e9*

Measure #5: Restore wetlands and *other natural spaces*	
Funding sources	U.S. Fish and Wildlife Service (Service) Coastal Program, Inflation Reduction Act Community Change Grants Program, Bureau of Land Management State Threatened and Endangered Species Program Funding, Bureau of Land Management State Aquatic Resource Management Program Funding, National Fish Passage Program BIL: Restoring River, Floodplain, and Coastal Connectivity and Resiliency, Supporting Underserved and Small-Acreage Forest Landowner Participation in Emerging Private Markets
Metrics for tracking progress	• Acres of wetland restored • Carbon sequestered
Applicable sector	Natural Spaces
Quantitative cost estimates	2025–2030: $24 million 2025–2050: $40 million
LIDAC Benefit Analysis	In addition to sequestering carbon, wetlands reduce the risk of flooding, which is the primary climate risk for LIDACs in the Baton Rouge MSA. Wetlands are also important ecosystems for biodiversity and provide ecosystem services such as cleaning air and water. The restoration of wetlands and the development of naturalized parks provide access to green space for recreation, including for LIDACs.

5.1.6 PCAP Measure #6: Enhance the Parish's Tree Canopy

Measure #6: Enhance the *Parish's* Tree Canopy	
Description	Enhance the tree canopy across the parishes of the Baton Rouge MSA, prioritizing the areas that will provide the maximum benefits for LIDACs (see LIDAC benefits analysis below). Increasing urban tree cover by 1,235 acres per year will expand urban tree canopy, providing additional carbon sequestration and improved air quality, as well as cooler spaces, reducing urban-heat-island effects.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 84,583 $MtCO_2e$ 2025–2050: 864,583 $MtCO_2e$
Estimate of the quantifiable criteria air pollutant emissions removals (e.g., through 2030 and 2050)	Not quantified
Implementing agency or agencies	Parishes and municipalities
Milestones for obtaining implementing authority	None required
Implementation schedule and milestones	Year 1: None (program design) Year 2: 1,235 acres Year 3: 1,235 acres Year 4: 1,235 acres Year 5: 1,235 acres
Geographic location	Urban areas in all parishes will benefit from this measure, with an emphasis on the city of Baton Rouge.
Funding sources	Urban and Community Forestry Program
Metrics for tracking progress	• Number of trees planted • Percent canopy cover increase across the parish • Survival rate of trees by age class

Measure #6: Enhance the *Parish's* Tree Canopy	
Applicable sector	Natural Spaces
Quantitative cost estimates	To be determined
LIDAC Benefit Analysis	Tree canopy is an important factor of urban-heat-island reduction. Natural land cover encourages active transportation, enhances air and life quality, and increases biodiversity in cities. Tree canopy also increases the value of residential buildings for homeowners. This measure can easily target the LIDACs that would benefit from enhanced urban tree canopy in their communities (Figure 48). The following areas could be prioritized in terms of maximizing benefits for LIDACs: New roads (Pointe Coupee), Baker and the north of Baton Rouge (East Baton Rouge), Port Allen (West Baton Rouge), Plaquemine and St. Gabriel (Iberville), Albany and Springfield (Livingston), Donaldsonville and south of Gonzales (Ascension), Paintcourtville, Supreme, and Labadieville (Assumption).

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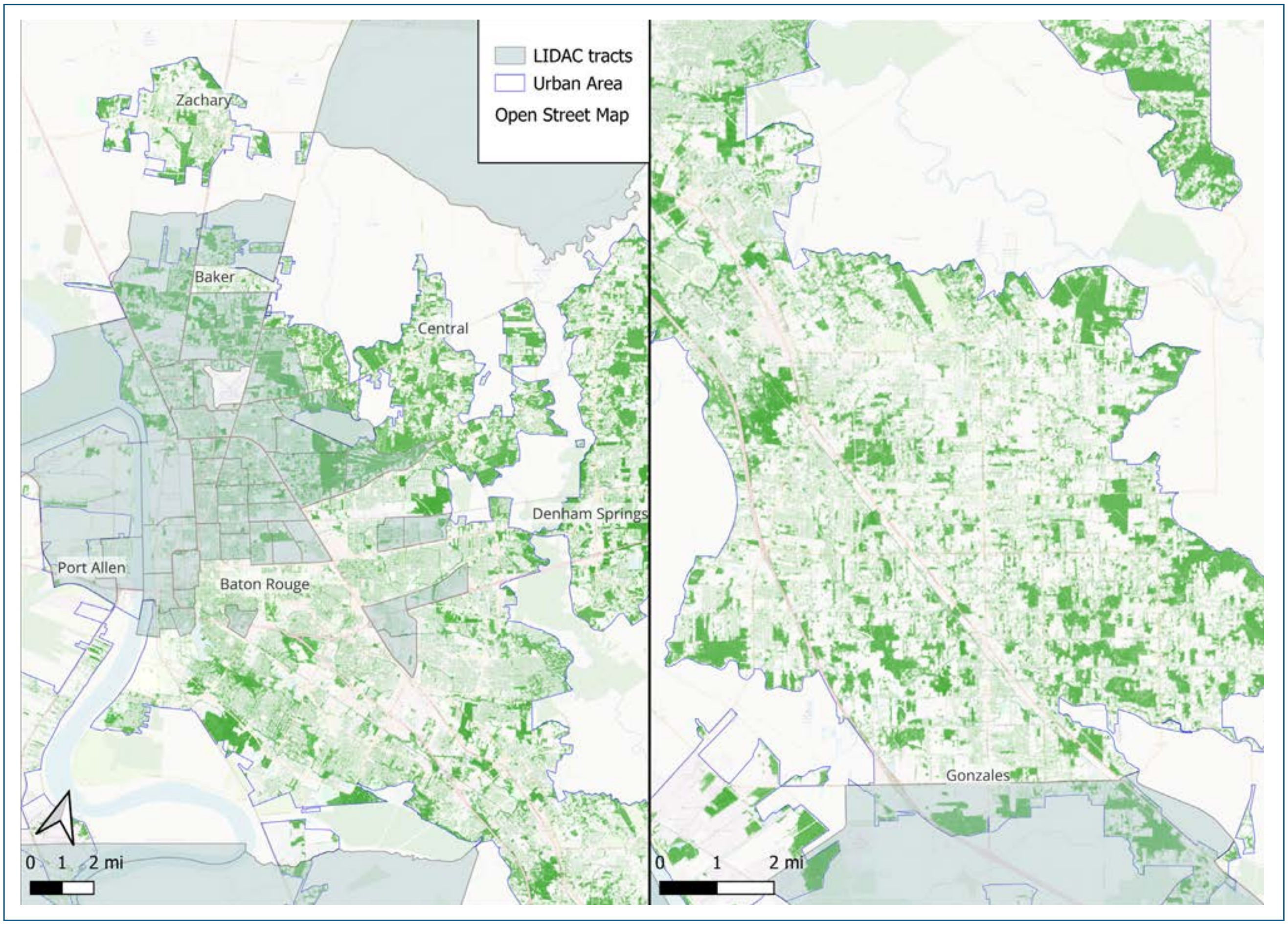

Figure 48. Map of the tree canopy in urban areas in Baton Rouge agglomeration (Baker, Central, Derham Springs; left image) and Prairieville and Gonzales (right image) and LIDAC tracts.

5.1.7 PCAP Measure #7: Develop Net-Zero Neighborhoods on Brownfield sites

Measure #7: Develop Net Zero Neighborhoods on Brownfield sites	
Description	Expand the City of Baton Rouge-Parish of East Baton Rouge Planning Commission Brownfields Program to build 2,000 new net-zero dwelling units by 2034, (i.e., an additional 200 units per year for 10 years and 200 units per brownfield). These can include a variety of home types, including attached homes and multi-family homes, with some single-family homes.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 1,902 $MtCO_2e$ 2025–2050: 32,710 $MtCO_2e$
Implementing agency or agencies	City of Baton Rouge, Parish of East Baton Rouge Planning Commission, and Partners Southeast
Milestones for obtaining implementing authority	To be determined
Implementation schedule and milestones	Year 1: Program design 2025–2034: 200 units/brownfield/year repeated for 10 years, 2000 units total
Geographic location	Baton Rouge MSA, but mostly in East Baton Rouge Parish
Additional funding sources	EPA provides many types of grants for brownfield projects, such as: • Assessment Grants; • Cleanup Grants; • Multi-purpose Grants; • Revolving Loan Fund (RLF) Grant; • Job Training Grants; and • Technical Assistance Grants.
Metrics for tracking progress	• MWh of clean electricity generated annually • # of new net-zero homes developed in infill locations • Direct jobs created • Indirect jobs created

Measure #7: Develop Net Zero Neighborhoods on Brownfield sites	
Applicable sector	Residential
Quantitative cost estimates	2025–2030: Capital costs: $5.7 million for improved buildings and heat pumps 2025–2050: Capital costs: $13.9 million for improved buildings and heat pumps
LIDAC Benefit Analysis	The brownfield program is an efficient way of removing potentially harmful contaminants while bringing energy-efficient housing to the LIDAC neighborhoods. It is an opportunity to create a net-zero neighborhood with accessible services, transportation alternatives, enhanced tree canopy, and resilient housing and infrastructures. Compact, complete communities limit urban sprawl and reduce vehicular travel barriers, traffic noise, and exposure to air pollution. As illustrated in Figure 49, most of the listed brownfield sites are already in a LIDAC tract, indicating that this measure will directly benefit these communities.

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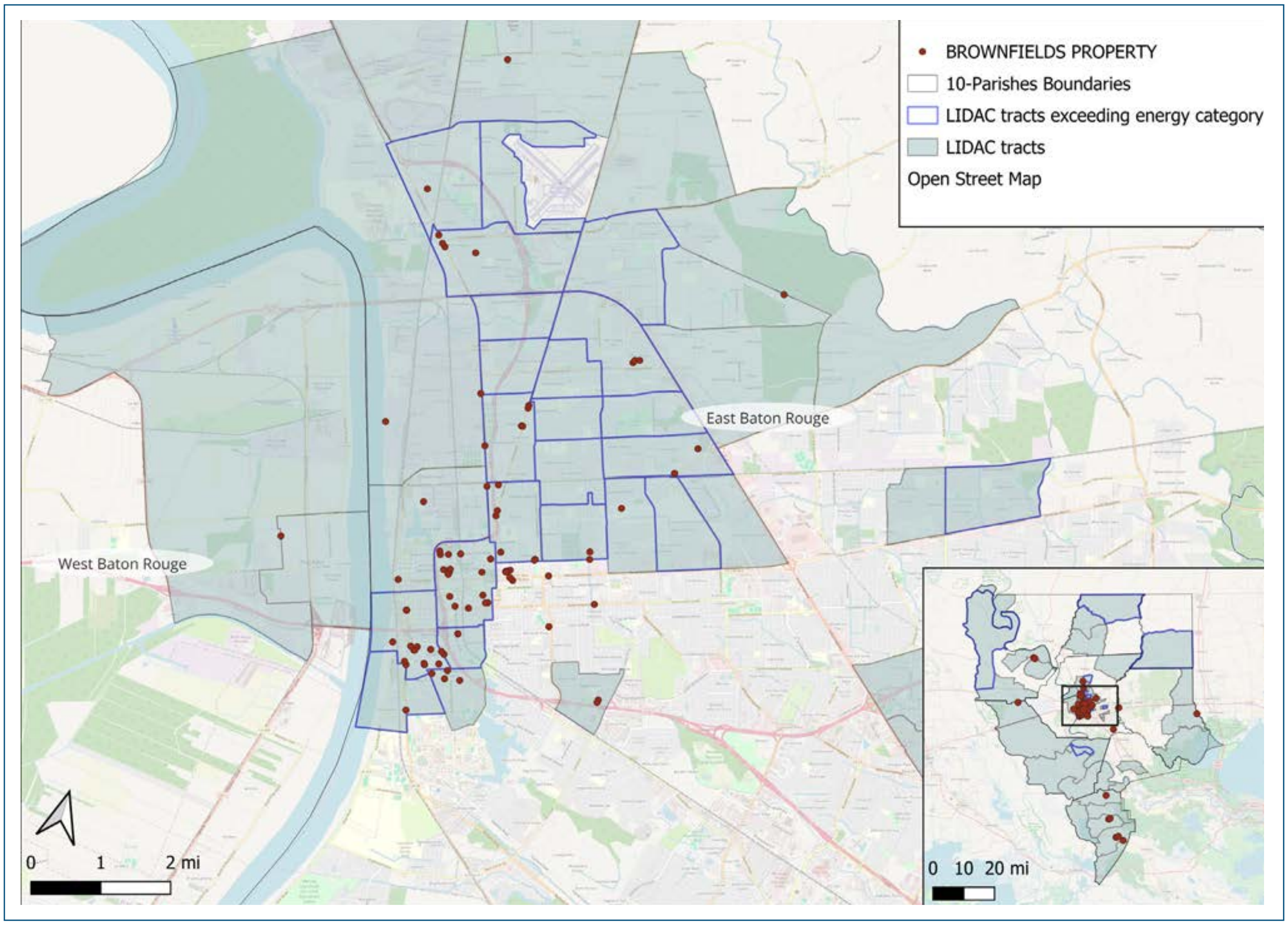

Figure 49. Location of the existing brownfields in the city of Baton Rouge and the MSA, along with the LIDAC tracts and, more specifically, the ones exceeding the energy burden category.

5.1.8 PCAP Measure #8: Baton Rouge Clean Cars 4 All and EV Charging Infrastructure

Measure #8: Baton Rouge *Clean Cars 4 All and EV Charging Infrastructure*	
Description	Establish a Clean Cars 4 All program that provides incentives to help lower-income consumers living in priority populations replace their old higher-polluting vehicles with newer and cleaner transportation. Participants have the option to purchase or lease a new or used hybrid, Plug-in Hybrid EV, or ZEV replacement vehicle or an alternative mobility option such as an e-bike, a voucher for public transit, or a combination of clean transportation options. Additionally, buyers of PHEVs and BEVs would also be eligible for home charger incentives or prepaid charge cards if home charger installation is not an option. The program could include: • Lease-to-own programs, rebates, and low- or no-interest financing, bulk purchases and preferred parking spots for EVs; • Incentives to help low-income people replace old polluting vehicles with a new or used hybrid or EV; purchase an e-bike; • A voucher for public transit and benefitting from home charger incentives and prepaid charge cards. • Regional or statewide EV car-sharing cooperatives or services • EV-charging infrastructure in disadvantaged communities and areas without EV-charging at home (e.g., multi-family apartments), workplaces, and public spaces such as parks and parking lots. The Clean Cars 4 All incentives can be integrated with implementation of the Baton Rouge Electric Vehicle Strategic Plan to support the growth of EVs throughout the Baton Rouge City-Parish and the rest of the MSA. (e.g., expand EV charging infrastructure, encourage and incentivize privately owned charging infrastructure, and support long-term planning around the placement of EV charging infrastructure).
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030**:** 11,991MtCO$_2$e 2025–2050: 119,284 MtCO$_2$e

Measure #8: Baton Rouge *Clean Cars 4 All and EV Charging Infrastructure*

Estimate of the quantifiable criteria air pollutant emissions reductions (e.g., through 2030 and 2050)	see table below

Type[111]	2024–2030 (kg)	2024–2050 (kg)
HC	7,291	69,749
CO	118,867	1,126,984
NOx	3,440	30,181
PM 2.5	355	3,534

Implementing agency or agencies	CRPC/Baton Rouge City-Parish
Milestones for obtaining implementing authority	None required
Implementation schedule and milestones	EV Vehicles (Total of 1700 vehicles 2027 to 2030) Year 1 (2027): 200 EVs Year 2 (2028): 500 EVs Year 3 (2029): 500 EVs Year 4 (2030): 500 EVs
Geographic location	City of Baton Rouge City and Parish of East Baton Rouge (City-Parish)
Additional funding sources	Clean Vehicle Tax Credit (Treasury); Environmental and Climate Justice Block Grants (EPA); Neighborhood Access and Equity Grant Program (DOT); Tax Credit For Alternative Refueling Property (Treasury); Tax Credit for Previously Owned Clean Vehicles (Treasury)
Metrics for tracking progress	• # of EVs • # of EV charging locations • # of daily charges
Applicable sector	Transportation
Quantitative cost estimates	To be determined

[111] *HC = hydrocarbons; CO = carbon monoxide; NOx = nitrogen oxides; PM2.5 = particulate matter with diameter <= 2.5 micrometers*

Measure #8: Baton Rouge *Clean Cars 4 All and EV Charging Infrastructure*	
LIDAC Benefit Analysis	The EV car transition is a transformative measure for the Baton Rouge MSA region. The gradual switch from fossil fuel cars to electric cars will reduce air pollution, especially in urban areas and along I-10 and I-12. The EV infrastructure plan will make sure that at least 40% of LIDACs benefit from this measure. This measure will be important to enhance air quality, reduce traffic stress and noise, and increase employment opportunities. Incentives for low-income households could make EVs more accessible.

5.1.9 PCAP Measure #9: Low-Interest Loans for Energy Retrofits Program

Measure #9: Low Interest Loans for Energy Retrofits Program	
Description	Create a program that provides low-interest loans for home energy efficiency retrofits, with zero-interest loans for eligible low-income households. The programs should target to scale up to 1% annual retrofits by 2030, 2% annual retrofits by 2035, and 5% annual retrofits by 2040, and continue from 2040 out to 2050 (the program will retrofit 50% of building stock in its final 10 years).
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 12,708 $MtCO_2e$ 2025–2050: 1,360,698 $MtCO_2e$
Implementing agency or agencies	Parishes and municipalities, Louisiana Housing Corporation, Partners Southeast, East Baton Rouge Parish Housing Authority
Milestones for obtaining implementing authority	None required
Implementation schedule and milestones	Year 1: Program development Targets: • 1% of homes retrofit annually by 2030 • 2% of homes retrofit annually by 2050 • 5% of homes retrofit annually by 2040 through to 2050
Geographic location	Baton Rouge MSA
Additional new funding sources	Louisiana Housing Corporation's Weatherization Assistance Program, The Green and Resilient Retrofit Program (HUD); Additional funding can be leveraged from IRA Tax Credits including the New Energy Efficient Home Tax Credit, Residential Energy Efficiency Tax Credit, High Efficiency Electric Home Rebate Program, HOMES Program Rebate, Home Energy Efficiency Contractor Training, Residential Clean Energy Tax Credit, Clean Electricity Production Tax Credit

Measure #9: Low Interest Loans for Energy Retrofits Program	
Metrics for tracking progress	• MWh of clean electricity generated annually • # of homes retrofit • # of small businesses retrofit • Average energy savings per retrofit • Direct jobs created • Indirect jobs created
Applicable sector	Residential
Cumulative cost and savings estimates	2025–2030: Operations: Savings of $14.4 million in fuel cost reductions Capital costs: $64.4 million 2025–2050: Operations: Savings of $1.7 billion in fuel cost reductions Capital costs: $1 billion
LIDAC Benefit Analysis	This measure can be very effective considering the high proportion of homeowners in the Baton Rouge MSA (about 75%), even within LIDACs. The installation of a heat pump or enhancing insulation can increase comfort, lower costs, and reduce exposure to air pollution. This will benefit LIDACs impacted with housing and energy burdens. As presented in Section 4.3.4, LIDACs in Baton Rouge MSA suffer from housing and/or energy burdens. Co-benefits include employment opportunities, reduction of air pollution, and, most importantly, this measure is very efficient for enhancing resilience in front of extreme temperatures.

5.1.10 PCAP Measure #10: High-Efficiency New Buildings

Measure #10: *High* Efficiency *New* Building*s*	
Description	Create development incentives (e.g., density bonuses, reduced parking requirements) for projects that encourage high-efficiency building performance standards and technologies. By 2030, 40% of new single-detached homes will be compact single-family homes that achieve 25% reduction in thermal energy and 25% reduction in non-thermal energy with heat pumps.
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 16,759 $MtCO_2e$ 2025–2050: 148,654 $MtCO_2e$
Implementing agency or agencies	Parishes or municipalities
Milestones for obtaining implementing authority	Not required
Implementation schedule and milestones	Year 1: Program development By 2030, 40% of new single-detached homes will be compact single-family homes that achieve a25% reduction in thermal energy and 25% reduction in non-thermal energy with heat pumps.
Geographic location	Baton Rouge MSA
Additional funding sources	Assistance for Latest and Zero Building Energy Code Adoption Grants (DOE)
Metrics for tracking progress	• Direct jobs created • Indirect jobs created
Applicable sector	Residential Buildings

Measure #10: *High* Efficiency *New* Buildings	
Cumulative quantitative costs and savings estimates	2025–2030: Operations: Savings of $1.7 million in fuel cost reductions Capital costs: $56.2 million 2025–2050: Operations: Savings of $16.6 million in fuel cost reductions Capital costs: $56.2 million
LIDAC Benefit Analysis	As discussed in Section 2, real-estate assets are often poorly, if at all, insulated in many neighborhoods of Baton Rouge MSA. The construction of high-efficiency new buildings will enable the region to grow in population and economically without increasing its energy demand in fossil fuels for housing. This results in reduction of energy and housing burdens and enhanced resilience. This measure will affect all buildings, including the new builds in LIDAC tracts. The co-benefits for LIDACs also include the increase in employment opportunities.

5.1.11 PCAP Measure #11: Develop Community Solar Projects

Measure #11: Develop Community Solar Projects	
Description	Develop community solar projects that will increase solar energy capacity by 50 MW/year by 2030 and by 75 MW per year by 2040 (and continue at this rate to 2050). This project aligns with the Community Solar Action in the Louisiana PCAP (p. 9).
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 31,268 $MtCO_2e$ 2025–2050: 1.4 $MMtCO_2e$
Implementing agency or agencies	Parishes and cities, Madison Energy Investments, Entergy Louisiana
Milestones for obtaining implementing authority	Pass a municipal council resolution on community solar generating facilities. Design the project. Apply for approval for an interconnection agreement. Standard offer power purchase agreement. Secure subscribers. The Louisiana Public Service Commission needs to increase the minimum size from 300 kW to 5 MW.
Implementation schedule and milestones	2025: Program development 2026: 1 project (1 MW) 2027: 2 projects (5 MW) 2028: 5 projects (25 MW) 2029: 10 projects (50 MW) 2030: 10 projects (50 MW) Targets beyond 2030: 75 MW per year by 2040 and out to 2050
Geographic location	Baton Rouge MSA
Additional funding sources	Solar for All Grant Program (EPA); Environmental and Climate Justice Block Grants (EPA); Low-Income Communities Bonus Credit (Treasury); Clean Electricity Investment Tax Credit (Treasury); Clean Electricity Production Tax Credit (Treasury)

Measure #11: Develop Community Solar Projects	
Metrics for tracking progress	• MWh of clean electricity generated annually • GHG emissions avoided • Air pollution avoided • Direct jobs created • Indirect jobs created
Applicable sector	Residential/Commercial/Institutional/Industrial
Quantitative cost estimates	2025-2030: $184.7 million 2025–2050: $1.2 billion
LIDAC Benefit Analysis	Community solar provides an alternative to fossil fuels by providing sufficient electricity to shut down furnaces for heating houses and reducing the consumption of fossil fuelled electricity while reducing energy bills. This measure will create job opportunities for LIDACs and reduce air pollution.

5.1.12 PCAP Measure #12: Develop Microgrids

Measure #12: Develop Microgrids	
Description	Develop a 10-year program that establishes two microgrids per year in LIDACs within the Baton Rouge MSA. The target is to establish two pilot microgrids in LIDACs in the Baton Rouge MSA each year over 10 years. Each microgrid will consist of 4 MW of new capacity (based on an example of 2 MW of rooftop and carport solar PV and 1.7 MW legacy solar PV • 440 kW/900 kWh new energy storage: hybrid configuration of li-ion and flow batteries). This project aligns with the Community Resilience Hubs action in the Louisiana PCAP (p.15).
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)	2025–2030: 4,958 $MtCO_2e$ 2025–2050: 67,763 $MtCO_2e$
Implementing agency or agencies	City of Baton Rouge/City of Gonzales, Together Louisiana, Entergy Louisiana
Milestones for obtaining implementing authority	To be determined
Implementation schedule and milestones	2025: Program development 2026: Microgrid #1 installed 2027: Microgrid #2 installed 2028: Microgrid #3 installed 2029: Microgrid #4 installed 2030: Microgrid #5 installed 2031: Microgrid #6 installed 2032: Microgrid #7 installed 2033: Microgrid #8 installed 2034: Microgrid #9 installed 2026: Microgrid #10 installed
Geographic location	City of Baton Rouge, City of Gonzales

Measure #12: Develop Microgrids

Funding sources	Solar for All Grant Program (EPA); Environmental and Climate Justice Block Grants (EPA); Low-Income Communities Bonus Credit (Treasury); Clean Electricity Investment Tax Credit (Treasury), Clean Electricity Production Tax Credit (Treasury), Hubs for Energy Resilient Operations (HERO) project, Grid Resilience and Innovation Partnerships (GRIP) Program; Underserved and Indigenous Community Microgrid.
Metrics for tracking progress	• MWh of clean electricity generated annually • GHG emissions avoided • Air pollution avoided • Direct jobs created • Indirect jobs created
Applicable sector	Renewable Energy
Quantitative cost estimates	2025–2030: $39.5.0 million 2025–2050: $79.0 million
LIDAC Benefit Analysis	Microgrid projects will enable citizens to produce their own solar energy, which can lower their use of grid-supplied electricity and drastically reduce their energy costs. Moreover, microgrids enable neighborhoods to enhance their energy resilience in the context of a major shutdown, which is more likely to happen due to climate change. This measure responds to the needs of LIDACs in terms of energy costs, which are particularly high in Louisiana. It will also increase employment opportunities and reduce air pollution.

5.1.13 PCAP Measure #13: Industrial Decarbonization

Measure #13: Industrial Decarbonization	
Description	Industrial GHG emissions represent 80% of the GHG emissions for the Baton Rouge MSA, a total of 39 $MMtCO_2e$, and therefore the sector provides the largest opportunity for emission reductions. For example, electrifying ammonia and methanol production and decarbonizing stationary combustion in the industrial sector will reduce GHGs. This measure envisions creating an alliance among parishes in the MSA's industrial region with the state government on joint projects to implement transformative projects to decarbonize industrial energy use and process emissions. This project would align with the Industrial Decarbonization measure in Louisiana State's PCAP (p. 20).
Estimate of the quantifiable GHG emissions reductions (e.g., through 2030 and 2050)[112]	• Increase on-site renewable and clean electricity generation, including energy storage and grid integration, to 20% of industrial facilities by 2030: GHG reductions of 13.3 $MMtCO_2e$ annually (statewide) • Switch 25% of total hydrogen to clean hydrogen for use in ammonia and refining production by 2030: GHG reductions of 18.4 $MMtCO_2e$ annually (statewide) • Electrify 15% of all low- and medium-heat processes, with the goal of 100% of all new and replacement boilers and process heaters being electric by 2040: GHG reductions of 8 $MMtCO_2e$ annually (statewide) • Enhance energy efficiency in chemical and refining facilities by an average of 10% by 2030: 7 $MMtCO_2e$ annually (statewide)
Implementing agency or agencies	CRPC-LA, State of Louisiana
Milestones for obtaining implementing authority	To be determined
Implementation schedule and milestones	To be determined
Geographic location	Parishes with major industrial facilities

[112] *The GHG reductions in this action are based on the totals in: State of Louisiana (2024). Draft Louisiana Priority Climate Action Plan. Retrieved from: https://infrastructure.la.gov/media/50olrm5b/111523_draft-pcap.pdf*

Measure #13: Industrial Decarbonization

Funding sources	Department of Energy Industrial Efficiency & Decarbonization Office (multiple funding streams), DOE Hydrogen Program, Energy Earthshots (Department of Energy), industrial Decarbonisation Program (Department of Energy),
Metrics for tracking progress	• MWh of clean electricity generated annually • GHG emissions avoided • Air pollution avoided • Direct jobs created • Indirect jobs created
Applicable sector	Industrial GHG emissions
Quantitative cost estimates	To be determined
LIDAC Benefit Analysis	Many of the industrial facilities in the Baton Rouge MSA are in close proximity to LIDACs. Reducing or eliminating GHG emissions through electrification will also reduce air pollutants that are hazardous to people and the ecosystem. The required investments will stimulate new job opportunities in clean technologies, which if combined with workforce development, can generate new opportunities for local jobs.

5.2 Project Prioritization

SSG undertook an assessment of the PCAP measures using the criteria to evaluate projects for CPRG's phase 2 implementation grants (Table 23).

Table 10. Criteria weights used for evaluating the prioritization of measures.

Criteria	Assigned weighting	Analysis
GHG reduction	5	How much GHG emissions does the measure reduce?
Demonstrated funding need	2	Is there funding available for this type of measure from a different funding stream?
Transformational impact	3	Is the measure something that would be applicable to other jurisdictions and that has a transformative impact?
Environmental benefits	1	What environmental benefits does the measure achieve beyond GHG emissions reductions?
LIDAC benefits	4	What benefits does the measure provide for LIDACs?
Feasibility	2	What is the political, social, and economic feasibility of the project? Has it been done before in this form or in another form?

Each PCAP measure was scored against the criteria based on the analysis of the measure's GHG impacts and LIDAC findings. Other criteria were assessed subjectively based on the consulting team's expertise. The highest scoring measure is the Industrial Decarbonization measure, followed by the Energy Retrofits and the Community Solar measures (Figure 50).

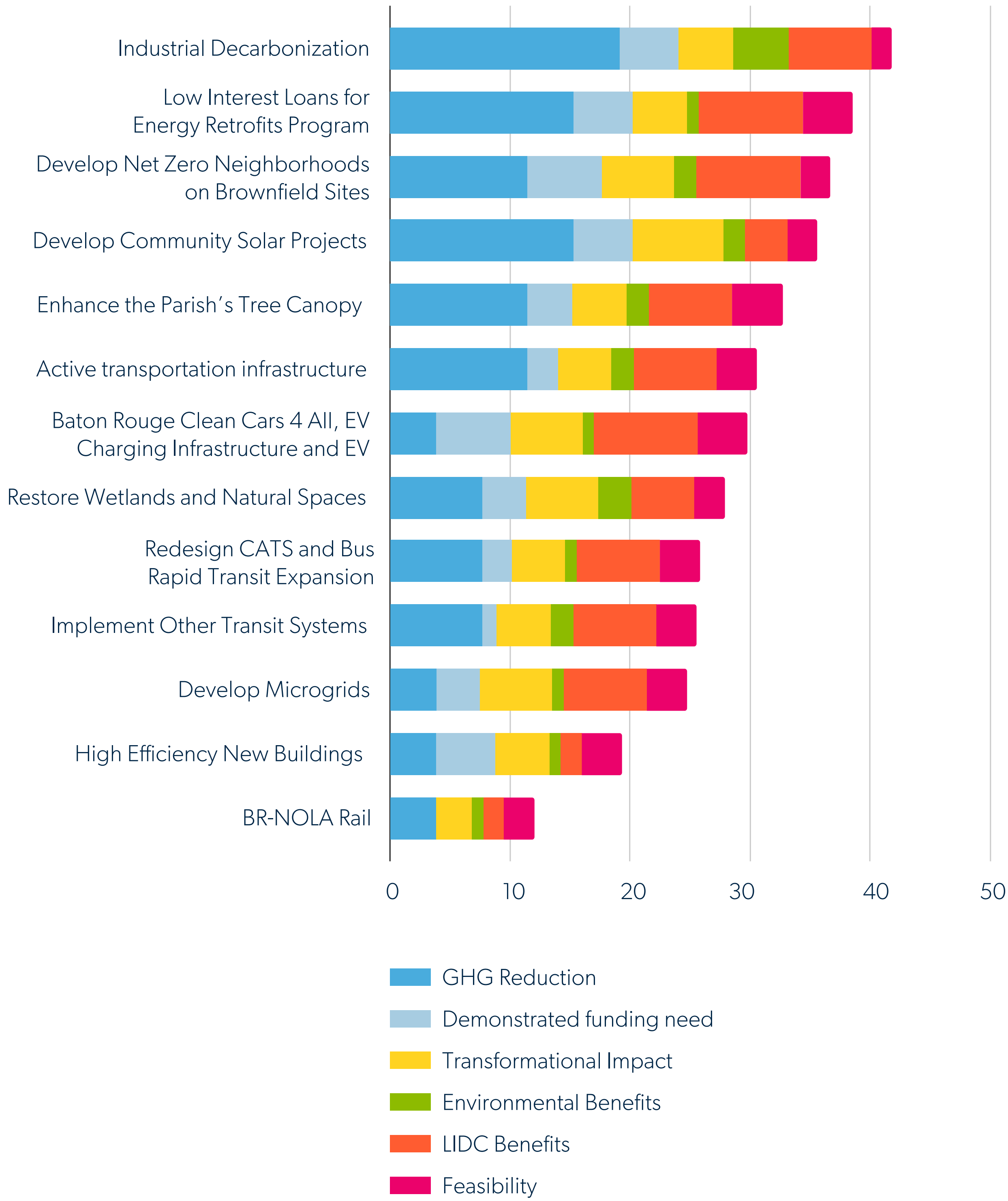

Figure 50. GHG measures prioritized according to their score against the weighted criteria.

6 Next Steps

The PCAP provides a foundation for more detailed analysis in the CCAP, including on projected energy and emissions across the region and within specific geographies. The CCAP will provide a detailed decarbonization pathway for Baton Rouge and additional, detailed insights on how specific actions can benefit LIDAC neighborhoods both directly and indirectly.

6.1 Recommendations for the Technical Analysis

While the PCAP evaluated the impact of specific measures, the CCAP will construct a model of the Baton Rouge MSA and systematically evaluate actions and policies and their GHG impacts, financial impacts, and implementation mechanisms, supported by an extensive engagement process.

Based on the technical analysis in the PCAP, recommendations for the CCAP include the following:

1. Evaluate the decarbonization pathways for industries in the Baton Rouge MSA.
2. Evaluate the opportunities for clean electricity using net metering and community solar across the MSA.
3. Evaluate the compounding and integrated benefit of electrification combined with clean energy on GHG reductions for key measures.
4. Identify mechanisms to specifically target LIDAC neighborhoods through policies, incentives, and investments.
5. Directly involve LIDAC representatives in designing policies and mechanisms.
6. Identify transportation options for rural areas, given the relatively heavy reliance on vehicles.
7. Evaluate mechanisms to scale building weatherization or retrofits across the region.
8. Evaluate a scenario for concentrated development across the region as a strategy to systematically transform transportation in the Baton Rouge MSA given the rate of population and employment growth.

7 Appendices

7.1 Appendix A. GHG Inventory Method

(External document)

7.2 Appendix B. Priority Actions Details

(External document)

7.3 Appendix C. List of total LIDACs according to the CEJST in the project area

Table 11. List of LIDAC tract numbers according to the CEJST in the Baton Rouge MSA.

Parishes	Tracts number
Ascension Parish	22005030600
	22005030900
	22005031000
Assumption Parish	22007050100
	22007050200
	22007050300
	22007050400
	22007050500
	22007050600
East Baton Rouge Parish	22033000100
	22033000200
	22033000300
	22033000400
	22033000500
	22033000601

Parishes	Tracts number
East Baton Rouge Parish	22033000602
	22033000701
	22033000702
	22033000900
	22033001000
	22033001102
	22033001103
	22033001104
	22033002200
	22033002400
	22033002500
	22033002700
	22033003000
	22033003101
	22033003103

Parishes	Tracts number
East Baton Rouge Parish	22033003201
	22033003300
	22033003400
	22033003501
	22033003504
	22033003505
	22033003603
	22033003604
	22033003904
	22033003909
	22033003910
	22033004201
	22033004203
	22033004204
	22033004700
East Baton Rouge Parish	22033005100
	22033005200
	22033005300
East Feliciana Parish	22037951300
	22037951400
	22037951502

Parishes	Tracts number
Iberville Parish	22047952600
	22047952700
	22047952900
	22047953000
	22047953101
	22047953102
	22047953200
Livingston Parish	22063040100
	22063040901
	22063040902
Pointe Coupee Parish	22077951900
	22077952000
	22077952200
	22077952400
St. Helena Parish	22091951200
West Baton Rouge Parish	22121020100
	22121020200
West Feliciana Parish	22125951702

February 2024

Data Methods and Assumption Manual

This appendix describes the data, methodologies and assumptions used to calculate emissions reductions related with all measures. As well as the uncertainty related to the methodology used.

Transportation

Electric Vehicle Adoption

The calculation for Electric Vehicle (EV) adoption and its impact on emissions reduction involves several steps, each leveraging specific data points to quantify the net emissions reduction achieved by transitioning from conventional vehicles to EVs. Here's a detailed explanation of the process, including the relevant equations:

VMT to Shift

This step calculates the total miles that will be transitioned by type of vehicle from gasoline or diesel to electric vehicles:

$$VMT\ to\ shift\ (miles) = Number\ of\ Vehicles\ to\ shift \times Annual\ VMT\ per\ vehicle\ (miles)$$

This equation multiplies the number of vehicles by type being transitioned to EVs by the annual vehicle miles traveled (VMT) per vehicle, giving the total miles that will now be covered by EVs instead of conventional vehicles.

Gross Emissions Reduction

Gross emissions reduction quantifies the total potential reduction in emissions if the shifted VMT were no longer contributing to greenhouse gas (GHG) emissions from conventional vehicle tailpipes.

$$Gross\ Emissions\ Reduction\ (MT\ CO2e)\ = \\ VMT\ to\ shift\ (miles) \times Emission\ Factor\ (MT\ CO2e/miles)$$

The emission factor (MT CO2e/mile) represents the amount of CO2e emissions produced per mile by conventional vehicles. Multiplying this factor by the VMT to shift gives the total emissions that could be avoided by switching to EVs.

Emissions from EVs

Emissions attributed to the electricity consumed EVs for the shifted VMT, considering the average electricity consumption by type of EV and the emission factor for electricity generation is calculated by:

$$Emissions\ EVs\ (MT\ CO2e)\ = VMT\ to\ shift\ by\ type\ of\ EV\ (miles) \times \\ Average\ Electricity\ consumption\ by\ Type\ of\ EV\ (GWh/miles) \times \\ Emission\ Factor\ Electricity\ (MT\ CO2e/GWh)$$

This equation takes into account the average electricity consumption (GWh/mile) by the type of EV for the shifted VMT and multiplies it by the emission factor for electricity (MT CO2e/GWh), reflecting the emissions associated with generating the electricity consumed by EVs.

Net Emission Reduction

The net emissions reduction is the difference between the gross emissions reduction (potential emissions savings from not using conventional vehicles) and the emissions attributable to the electricity used by EVs.

$$Net\ Emission\ Reduction\ (MT\ CO2e)\ = \\ Gross\ Emissions\ Reduction\ (MT\ CO2e)\ -\ Emissions\ EVs\ (MT\ CO2e)$$

This final step provides the overall emissions reduction benefit of transitioning to EVs, taking into account the emissions from electricity generation for EV charging.

Capital Costs

Cost for EV Infrastructure and Incentives program TBD.

Mode shift

The calculation for mode shift involves estimating the reduction in vehicle miles traveled (VMT) as a result of shifting transportation modes from personal gasoline-powered vehicles to alternative modes such as public transit, biking, or walking. The formula provided calculates the reduction in VMT attributable to such a mode shift, expressed in million VMT:

VMT Reductions

$$VMT\ reduction\ (Million\ VMT) = Total\ VMT\ with\ Gasoline\ (Million\ VMT) - (Total\ VMT\ with\ Gasoline\ (Million\ VMT)) \times \frac{Share\ of\ VMT\ by\ auto\ Baseline\ (\%)}{Share\ of\ VMT\ by\ auto\ After\ action\ (\%)}$$

Total VMT with Gasoline (Million VMT): This represents the total miles traveled by gasoline-powered vehicles before any action is taken to encourage a mode shift. It serves as the baseline against which the reduction in VMT is measured.

Share of VMT by auto After action (%): This percentage reflects the projected share of total VMT that is covered by gasoline-powered vehicles after specific actions or policies have been implemented to promote the use of alternative transportation modes.

Share of VMT by auto Baseline (%): This is the baseline share of total VMT covered by gasoline-powered vehicles before any interventions to encourage a mode shift.

The equation subtracts the adjusted VMT (considering the action-induced change in the share of VMT by auto) from the baseline total VMT with gasoline to calculate the reduction in VMT due to the mode shift, quantifying how much vehicle travel has been avoided by shifting away from gasoline-powered vehicles toward more sustainable modes of transportation.

Emission Reductions

The emission reductions from a transportation mode shift are calculated by multiplying the reduction in vehicle miles traveled (VMT) by the emission factor, yielding the total emissions avoided in metric tons of CO2 equivalent (MT CO2e). The formula is as follows:

$$Emission\ Reduction\ (MT\ CO2e) = VMT\ reduction\ (Million\ VMT) \times Emission\ factor\ (MT\ CO2e\ /\ Million\ VMT)$$

This equation translates VMT reduction into greenhouse gas emissions savings, providing a clear measure of the environmental benefits of shifting away from gasoline-powered vehicles towards more sustainable transportation modes.

Capital Costs

The capital costs of the active transportation mode shift are calculated by multiplying the miles of infrastructure required by the cost per mile. The capital costs of a public transportation mode shift are calculated by multiplying the number of additional bus routes by the cost per bus route. Finally there are the reported rail upgrade and other transit systems capital cost listed in existing studies. The formulas for the first two are as follows:

$$Capital\ Cost\ (USD) = Miles\ of\ infrastructure\ (mile) \times Costs\ per\ mile\ (USD/mile)$$

$$Capital\ Cost\ (USD) = Number\ of\ bus\ routes\ (routes) \times Costs\ per\ route\ (USD/route)$$

Co-pollutants Reduction Calculations

For the transportation sector, the calculation of emissions reductions for co-pollutants entails analyzing the decrease in vehicle miles traveled (VMT) and applying designated emissions rates for various vehicle types. The co-pollutants in focus—Total Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Oxides (NOx), and Particulate Matter (PM2.5)—are evaluated for their emissions impact. The formula to calculate the emissions reductions for each co-pollutant is given by:

$$Emissions\ Reductions\ per\ co-pollutant\ (metric\ ton) = VMT\ reduction\ (miles) \times Emissions\ Rates\ per\ Vehicle\ Type\ (metric\ ton/mile)$$

In this context:

VMT reduction (miles) denotes the decrease in vehicle miles traveled, achieved through increased adoption of electric vehicles (EVs), greater use of public transit, and encouragement of biking or walking.

Emissions Rates per Vehicle Type (metric ton/mile) specifies the rate at which each vehicle type emits HC, CO, NOx, and PM2.5 per mile. These rates vary by vehicle type and fuel used, reflecting the different contributions to air pollution.

Buildings

To accurately quantify the emissions reduction from residential building retrofits and upgraded new residential building code, the methodology utilizes equations to recalculate the consumption of electricity and natural gas post-retrofit or post building code upgrade, alongside the subsequent reductions. Targeting a percentage of reduction in both energy and thermal energy consumption, these calculations enable the assessment of emissions mitigation across electricity and natural gas sectors, measured in MT CO2e. These estimations incorporate emission factors specific to each type of energy consumption.

This analysis integrates comprehensive data, including retrofitting or upgrading a specific number of units of residential buildings by type with respect to the baseline energy consumption by the end use and type of building of natural gas and electricity.

Emissions Reduction:

Electricity Emissions (MT CO2e) are calculated by multiplying the energy use of electricity (in MMBTU) by the emission factor of the grid (in MT CO2e/MMBTU). The equation below shows the formula:

$$Electricity\ Emissions\ (MT\ CO2e) = Energy\ Use\ of\ Electricity\ (MMBTU) \times Emission\ Factor\ of\ the\ Grid\ (MT\ CO2e/MMBTU)$$

Natural Gas Emissions (MT CO2e) for a given year are determined by the energy use of natural gas (MMBTU) multiplied by the emission factor for natural gas (in MT CO2e/MMBTU). The equation below shows the formula:

$$Natural\ Gas\ Emissions\ (MT\ CO2e) = Energy\ Use\ of\ Natural\ Gas\ (MMBTU) \times Emission\ Factor\ of\ Natural\ Gas\ (MT\ CO2e/MMBTU)$$

Total Emission Reduction (MT CO2e) is the sum of electricity and natural gas emissions for a given year.

$$Total\ Emission\ Reduction\ (MT\ CO2e) = Electricity\ Emissions\ (MT\ CO2e) + Natural\ Gas\ Emissions\ (MT\ CO2e)$$

To quantify the overall impact, the difference between baseline emissions and post-retrofit or post-building-code-upgrade emissions is calculated, providing the net emissions reduction achieved through the retrofitting or upgrade efforts:

$$Net\ Emissions\ Reduction\ (MT\ CO2e)\ =$$

$$Total\ Emission\ Reduction\ from\ Baseline\ -\ Total\ Emission\ Reduction\ after\ Retrofit$$ or Upgrade

Energy Use

For Electricity

Electricity use (MMBTU) is determined by applying the energy reduction percentage to the baseline electricity consumption of buildings:

$$Electricity\ (MMBTU)\ =\ (1\ -\ Energy\ Reduction\ \%)\times Electricity\ of\ Baseline\ Buildings\ (MMBTU)$$

In the case of heating with heat pumps, electricity use is calculated by adjusting for thermal energy reduction and the coefficient of performance (COP) of the heat pump, alongside the electricity reduction for baseline consumption. The following equation shows the formula:

$$Electricity\ for\ Heating\ (MMBTU)\ =\ (1\ -\ Thermal\ Energy\ Reduction\ \%)\times$$
$$Natural\ Gas\ of\ Baseline\ Buildings\ (MMBTU)/COP\ \ +\ (1\ -\ Energy\ Reduction\ \%)\times$$
$$Electricity\ of\ Baseline\ Buildings\ (MMBTU)$$

For Natural Gas

The new use of natural gas (MMBTU) is determined by applying the energy reduction percentage to the baseline natural gas consumption:

$$Natural\ Gas\ Energy\ (MMBTU)\ =$$
$$(1\ -\ Energy\ Reduction\ \%)\times Natural\ Gas\ Energy\ of\ Baseline\ Buildings\ (MMBTU)$$

For heating, the calculation adjusts for thermal energy reduction in natural gas consumption based on baseline figures. The following equation shows the formula:

$$Natural\ Gas\ for\ Heating\ (MMBTU)\ =\ (1\ -\ Thermal\ Energy\ Reduction\ \%)\times$$

$$\quad Natural\ Gas\ Energy\ of\ Baseline\ Buildings\ (MMBTU)$$

Capital Costs

The capital costs of retrofitting or upgrading a building can consist of two main actions. The first addresses the thermal envelope of the building, affecting the heating/cooling required to keep the building comfortable. The depth of the thermal retrofit or upgrade dictates the cost of this action. The formulas for calculating retrofit or upgrade capital costs for residential and non-residential buildings is as follows:

$$Residential\ Thermal\ Envelope\ Capital\ Cost\ (USD)\ =$$
$$\quad number\ of\ dwelling\ units \times Costs\ for\ Percent\ Energy\ Reduction\ (USD/unit)$$

The second action addresses the equipment used to heat/cool the building. Electric air source heat pumps are the primary technology used to displace fossil fuels in buildings. Capital costs are calculated by applying a unit cost to the number of units being installed as follows:

$$Space\ Conditioning\ Capital\ Cost\ (USD)\ =$$
$$\quad number\ of\ installed\ units \times unit\ cost\ (USD/unit)$$

Energy Costs

Changing the fuel used to heat and cool buildings results in a difference in energy costs when operating the buildings. Actions such as retrofitting the thermal envelope of the building will reduce energy consumption, also affecting energy costs. The formula for calculating energy costs is a follows:

$$Energy\ Cost\ (USD)\ =$$
$$Change\ is\ energy\ consumption\ by\ fuel\ (MMBTU)\ \ *\ \ Cost\ by\ fuel\ (USD/MMBTU)$$

Energy Systems

To accurately assess the emissions reduction attributed to solar installations, the methodology incorporates capacity factors for the state provided by the NREL. These factors are critical in estimating the energy generation potential of solar installations, taking into account geographical and climatic variations that affect solar irradiance and, consequently, energy production.

The emissions reduction potential of these installations is calculated by considering the grid's emission factor, which is obtained from the EPA eGRID database. This factor represents the average emissions intensity of electricity generation and distribution on the grid, providing a baseline against which the impact of renewable generated electricity can be measured. Additionally, projections of emission factors based on NREL's Cambium 2022 MidCase scenario are used to anticipate future changes in the grid's carbon intensity.

Annual Generation

The annual electricity generation from installed renewable systems is calculated using the formula:

$$Annual\ Generation\ (GWh)\ =\ Installed\ Capacity\ (GWh) \times 8760 \times Capacity\ Factor$$

This equation multiplies the installed capacity (in gigawatt-hours, GWh) by the total number of hours in a year (8760) and the capacity factor, providing an estimate of the total energy produced by solar installations annually.

Emissions Reduction

The reduction in emissions resulting from the generated renewable electricity is quantified as follows:

$$Emissions\ Reduction\ (MT\ CO2e)\ =\ Emission\ Factor\ (MT\ CO2e/GWh) \times Annual\ Generation\ (GWh)$$

This calculation applies the emission factor (in metric tons of CO2 equivalent per gigawatt-hour, MT CO2e/GWh) to the annual generation from renewable energy installations, estimating the total emissions avoided by displacing grid electricity with renewable energy.

Capital Costs

The capital costs of renewable energy is dependent on the installed capacity and technology. The formulas for calculating renewable energy capital costs is as follows:

$$Renewable\ Energy\ Capital\ Cost\ (USD)\ =\ Generation\ Capacity\ (kW) \times Costs\ (USD/kw)$$

Energy Costs

In cases, such as rooftop solar, electricity demand is displaced by renewable energy generation. In this circumstance energy savings may be realized. The formula for calculating energy savings is a follows:

$$Energy\ Cost\ (USD)\ =\ Change\ in\ energy\ consumption\ by\ fuel\ (MMBTU)\ *\ Cost\ by\ fuel\ (USD/MMBTU)$$

Restore Landscapes and Sequester Carbon

The methodology for calculating carbon sequestration from wetland restoration and tree planting initiatives incorporates emission sequestration intensities from a study by Tierra Resources on carbon sequestration opportunities for Louisiana's Wetlands and the Urban Forestry tab of EPA's Local Greenhouse Gas Inventory Tool respectively. These sources allow us to align with the physical characteristics of the trees being planted and landscapes being restored.

Emissions Reduction

The emissions reduction is quantified by using the carbon sequestration potential of urban forests and restored wetlands per acre. The formula to estimate the emissions reduction in metric tons of CO2 equivalent (MT CO2e) is as follows:

Urban Tree Planting

$$Emissions\ Reduction\ (MT\ CO2e)\ = \quad number\ of\ acres\ of\ urban \times Carbon\ Sequestration\ Factor\ (MT\ CO2e/acre)$$

In this formula:

Carbon Sequestration Factor (MT CO2e/acre) indicates the amount of CO2 that can be sequestered per acre per year, reflecting the capacity of urban tree canopies to absorb CO2 from the atmosphere.

Wetland restoration

$$Emissions\ Reduction\ (MT\ CO2e)\ = \quad number\ of\ acres\ of\ restored\ wetland\ \times Carbon\ Sequestration\ Factor\ (MT\ CO2e/acre)$$

In this formula:

Carbon Sequestration Factor (MT CO2e/sqft) indicates the amount of CO2 that can be sequestered per acre per year, reflecting the capacity of the restored wetlands to absorb CO2 from the atmosphere.

Data Sources

This table describes the data obtained and the related sources used for the calculations outlined above.

Table 1: Data Sources

Source	Data Set
Federal Highway Administration	Vehicle Miles Traveled (VMT) data by vehicle type[1]
NREL's Cambium 2022 scenarios	Grid emission factor projections for the Mississippi Valley[2]
Replica	Detailed mode-specific transportation data, including trip numbers, lengths, and occupancy rates by county[3]
U.S. Department of Energy's resources, Alternatives Fuel Data Center and 2023 Fuel Economy Guide	Vehicle mileage and fuel consumption rates [4]
American Council for an Energy-Efficient Economy and average vehicle emissions	Heavy-duty vehicle fuel consumption[5]

[1] Federal Highway Administration. "Vehicle Miles Traveled (VMT) data by vehicle type." Policy Information, Statistics 2020. https://www.fhwa.dot.gov/policyinformation/statistics/2020/.
[2] National Renewable Energy Laboratory. "Cambium 2022" https://scenarioviewer.nrel.gov/?project=82460f06-548c-4954-b2d9-b84ba92d63e2&mode=download&layout=Default.
[3] Replica. "Detailed Mode-Specific Transportation Data, Including Trip Numbers, Lengths, and Occupancy Rates by County." https://studio.replicahq.com/.
[4] U.S. Department of Energy. "2023 Fuel Economy Guide." Published January 2024. https://fueleconomy.gov/feg/pdfs/guides/FEG2023.pdf.
[5] Nadel, Steven, and Eric Junga. "Electrifying Trucks: From Delivery Vans to Buses to 18-Wheelers." An ACEEE White Paper, January 2020. https://www.aceee.org/sites/default/files/pdfs/electric_trucks_1.pdf.

rates from the U.S. Department of Transportation	
United States Department of Transportation, National Transportation Statistics	Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel[6]
Capital Region Planning Commission	Transit plan scopes[7]
Louisiana Department of Transportation and Development	Trails and bike lanes[8]
Louisiana Department of Transportation and Development	BR - NO Intercity Passenger Rail annual passenger miles[9]
Energy Information Administration (EIA) forms 861 and 176	Electricity and natural gas consumption data for both residential and non-residential buildings[10][11]
US Census Bureau	Dwelling units by building type[12]
National Renewable Energy Laboratory's (NREL) ResStock and ComStock databases	Residential and commercial buildings' energy use by type and end-use

[6] United States Department of Transportation. "Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel." National Transportation Statistics. https://www.bts.gov/product/national-transportation-statistics.
[7] Capital Region Planning Commission. "Baton Rouge MPA's 2046 Metropolitan Transportation Plan". https://static1.squarespace.com/static/54cbd54fe4b047a0380cae54/t/6239c0e66502856fbe6faf59/1647952114989/00_FINAL_MOVE_2046_Main_Report_030922.pdf
[8] Louisiana Department of Transportation and Development. "East-Baton-Rouge-Pedestrian-and-Bicycle-Master-Plan". https://www.brla.gov/DocumentCenter/View/9411/East-Baton-Rouge-Pedestrian-and-Bicycle-Master-Plan-PDF
[9] Louisiana Department of Transportation and Development. "BR - NO Intercity Passenger Rail Feasibility Study" https://www.dropbox.com/scl/fi/lg9tsssdm9278isw60c2a/BR-NO-Intercity-Passenger-Rail-Feasibilty-Study-2023.pdf?rlkey=og5uehmjkxr2py2icu0vgmxoi&e=2&dl=0
[10] U.S. Energy Information Administration. "Electricity Sales." https://www.eia.gov/electricity/data/eia861m/.
[11] U.S. Energy Information Administration. "Natural Gas Consumption." https://www.eia.gov/naturalgas/data.php.
[12] U.S. Census Bureau. "Population and Housing Unit Estimates Datasets." https://www.census.gov/programs-surveys/popest/data/data-sets.html.

EPA National Emissions Inventory (NEI)	Co-pollutants emissions by Natural gas combustion in residential and commercial/ institutional buildings[13]
U.S. Energy Information Administration 2023 Building Sector Appliance and Equipment Costs and Efficiencies	Residential and commercial heat pump capital costs[14]
Environmental Protection Agency's (EPA) inventory tool	eGRID electricity and fossil fuel emission factors[15]
NREL Rooftop Solar Photovoltaic Technical Potential	Energy production potential of solar rooftop installations[16]
State of Michigan, Clean Energy Future Plan, Senate Bills 271, 273, 277, 502 and 519	Electricity Grid Emission Factor projections
Pembina Institute	Residential and Non-residential Building Envelope Retrofit Incremental Costs[17]
NREL System Advisory Model (SAM)	Capacity Factor for Photovoltaic Plants and Wind Farms[18]
NREL 2021 Electricity Annual Technology Baseline	Solar and Wind Renewable Electricity Production Capacity Capital Costs[19]

[13] Environmental Protection Agency. "2020 National Emissions Inventory (NEI) Data." https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data.
[14] U.S. Energy Information Administration. “Building Sector Appliance and Equipment Costs and Efficiencies, 2023”. https://www.eia.gov/analysis/studies/buildings/equipcosts/
[15] Environmental Protection Agency. "Emissions & Generation Resource Integrated Database (eGRID)." https://www.epa.gov/egrid.
[16] National Renewable Energy Laboratory. "Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment - Table 6. Total Estimated Technical Potential (All Buildings) for Rooftop PV by State." https://www.nrel.gov/docs/fy16osti/65298.pdf.
[17] Pembina Institute. “Building Energy Retrofit Potential in B.C.”. https://www.pembina.org/docs/event/netzeroforum-backgrounder-2016.pdf
[18] National Renewable Energy Laboratory. "System Advisory Model (SAM) 2023.12.17, SSC 288." https://sam.nrel.gov.
[19] National Renewable Energy Laboratory. “ 2021 Electricity Annual Technology Baseline”. https://atb.nrel.gov/electricity/2021/data

Tierra Resources	Wetlands sequestration potential[20]
U.S. Environmental Protection Agency	Urban Forestry Sequestration Potential[21]

Uncertainty

The quantification of GHG emissions is largely the result of applying emissions factors, as measured in metric tons per unit of activity, to an estimated amount of activity, as measured in MMBTU, kWhs, vehicle miles traveled, etc. Different methodologies and assumptions used in determining these emissions factors can introduce uncertainty into the process. To mitigate this, when possible we have used emission factors derived from EPA tools and calculations, ensuring that our calculations align with the EPA.

The projected transformation of the modeled activity also introduces uncertainties to the calculations. An assumption that crosses all action is the rate of adoption of various technologies or behaviors. We assume uniform adoption rates for zero emission vehicles (ZEVs), building retrofits, renewable energy, etc, which may not align with real-world market dynamics, consumer behavior, or policy shifts. The projected actions also simplifies the logistical and technical challenges involved in its deployment, such as spatial planning, required workforce, materials and electrical grid impacts. Furthermore, the methodology might not accurately capture the dynamic effects on emissions one action has on another action, for example, overlooking how increased use of one mode (e.g., biking) affects others (e.g., public transit). These technical limitations underscore the need for cautious interpretation of projected emissions reductions, highlighting the complexity of decarbonization.

Additionally, aggregating or averaging, such as the application of uniform capacity factors across counties, can create uncertainty. In reality local variations in rooftop orientations would allow for different levels of energy generation.

Finally when dealing with natural working lands and green infrastructure, the methodologies may not fully account for the variability in tree species' survival rates and carbon sequestration capacities or the long-term maintenance and potential risks to planted trees. Additionally, assumptions of linear growth and sequestration rates do not accurately reflect the dynamic growth patterns of trees. The potential indirect effects on local ecosystems and the lack of a robust framework for verification and ongoing monitoring of sequestration outcomes also pose challenges.

[20] Tierra Resources. “Carbon Market Opportunities for Louisiana’s Coastal Wetlands.” 2014. https://tierraresourcesllc.com/wp-content/uploads/2014/01/Final-report-for-official-release.pdf
[21] U.S. Environmental Protection Agency. ”Local Greenhouse Gas Inventory Tool” https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool