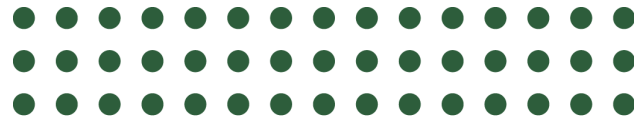




# CENTRAL INDIANA COMPREHENSIVE CLIMATE ACTION PLAN

**Indianapolis-Carmel-Anderson  
Metropolitan Statistical Area**

**DECEMBER 2025**



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# Acknowledgements

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## CIRDA BOARD

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# Acronyms and Abbreviations

Acronyms	Description
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CH <sub>4</sub>	Methane
CIRDA	Central Indiana Regional Development Authority
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CPRG	Climate Pollution Reduction Grants
EIA	US Energy Information Administration
EJScreen	Environmental Justice Screening and Mapping Tool
EOY	End of year
EPA	US Environmental Protection Agency
EV	Electric vehicle
FLIGHT	Facility Level Information on Greenhouse Gases Tool
GHG	Greenhouse gas
GHG Inventory	Greenhouse gas inventory
HFC	Hydrofluorocarbons
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IMPO	Indianapolis Metropolitan Planning Organization
INDOT	Indiana Department of Transportation

IU	Indiana University
kW	Kilowatt
kWh	Kilowatt-hours
LIDAC	Low-income and disadvantaged communities
MMBtu	One million British thermal units
MSA	Metropolitan statistical area
MT	Metric tons
MW	Megawatt
MWh	Megawatt-hours
NO <sub>x</sub>	Nitrous oxides
OED	Office of Energy Development
PCAP	Priority Climate Action Plan
PFC	Perfluorochemicals
PM	Particulate matter
PV	Photovoltaics
RNG	Renewable natural gas
SLOPE	National Renewable Energy Laboratory's State and Local Planning for Energy
SO <sub>2</sub>	Sulfur Dioxide
USDA	US Department of Agriculture
VMT	Vehicle miles traveled
VOCs	Volatile Organic Compounds
WWTP	Wastewater treatment plant





# 1. Introduction

## CLIMATE POLLUTION REDUCTION GRANT OVERVIEW

Central Indiana Regional Development Authority (CIRDA) was awarded a \$1 million planning grant from the U.S. Environmental Protection Agency (EPA) to develop regional plans for Central Indiana focused on strategies to reduce greenhouse gas (GHG) emissions and other harmful air pollution. The grant is part of EPA's Climate Pollution Reduction Grants (CPRG) program.<sup>1</sup>

The CPRG program provides flexible support to states, local governments, tribes, and territories for climate planning. Planning grant recipients must design climate action plans that incorporate a variety of measures to reduce GHG emissions from across their economies in the following key sectors: electricity generation, industry, transportation, buildings, agriculture, natural and working lands, and waste management. All planning grantees must submit the following deliverables to EPA:

- Priority Climate Action Plan (PCAP) – A PCAP is a narrative report that includes a focused list of near-term, high-priority, and implementation-ready measures to reduce GHG pollution. The Central Indiana PCAP<sup>2</sup> was published in February 2024.
- Comprehensive Climate Action Plan (CCAP) – A CCAP is a narrative report that provides an overview of the grantees' significant GHG sources/sinks and sectors, establishes near-term and long-term GHG emission reduction targets, and provides strategies and identifies measures that address the highest priority sectors to help the grantees meet those goals. CCAPs for states and MSAs are due to EPA in December 2025.

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<sup>1</sup> U.S. Environmental Protection Agency (EPA). 2023. "Climate Pollution Reduction Grants." Modified 5 February 2024. Retrieved from: <https://www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants>

<sup>2</sup> CIRDA. February 2024. "Central Indiana Priority Climate Action Plan." Accessed September 10, 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

- Status Report – A Status Report should include the implementation status of the quantified GHG reduction measures included in the CCAP. Status Reports are due to EPA at the end of the 4-year grant period (approximately end of year 2027) for state and MSA grantees.

## CENTRAL INDIANA REGIONAL DEVELOPMENT AUTHORITY

Comprised of municipal executives, including mayors, town council presidents, or county commissioners, from 32 Central Indiana communities, CIRDA was established as an integrative regional entity to align the public sector on key initiatives and drive economic development and grant opportunities within Central Indiana. CIRDA works collaboratively with communities across the region to support efforts that enhance quality of life and sustainability, boost support for local businesses and innovation, and ensure Central Indiana is an attractive place where all residents benefit from growing economic opportunity and equitable development in the coming decades. Monthly CIRDA board member meetings are an opportunity to build consensus on key issues affecting the region's growth, including opportunities to address climate change. CIRDA relies on the professional staff of member communities, who are well-versed in administering federal grants; CIRDA administered \$21 million in federal funds during the last 2 years,<sup>3</sup> while CIRDA's members have administered nine federal grants totaling more than \$770 million.<sup>4</sup>

With funding from EPA's CPRG Phase 1 planning grant, CIRDA is leading the development of the Central Indiana Environmental Action Plan, inclusive of both the short-term PCAP and the long-term CCAP, that reflects input from stakeholders across the region and positions Central Indiana as a leader in public health, innovation, and economic opportunities. This regional plan is focused on strategies to reduce GHG emissions across the Indianapolis-Carmel-Anderson MSA. CIRDA represents more than 80 percent of the population in the Central Indiana MSA and approximately a quarter of the state's population. While many municipalities in the region have engaged in climate action planning and comprehensive community planning within the past decade, including the City of Indianapolis' recent plan *Thrive Indianapolis*,<sup>5</sup> this is the first time a plan has been developed representing the interests and priorities of the entire Central Indiana region.

## COMPREHENSIVE CLIMATE ACTION PLAN OVERVIEW

The CCAP was developed to build on the work initiated in the PCAP with the intention to improve Central Indiana's understanding of current and future environmental impacts, develop a set of region-specific strategies to reduce emissions, set emissions reduction targets to drive tangible action, identify community co-benefits, and evaluate workforce planning and funding needs, while practicing

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<sup>3</sup> CIRDA administered a \$1 million EPA planning grant and \$20 million of American Rescue Plan Act (APRA) funds through the state's Regional Economic Acceleration and Development Initiative (READI) program.

<sup>4</sup> CIRDA members' grants administered include Hamilton County (\$134,000,000); Greenwood (\$3,300,000); Bargersville (\$1,000,000); Indianapolis (\$610,471,575); Martinsville (\$7,013,791); Beech Grove (\$5,950,000); Speedway (\$2,230,000); Fishers (\$1,245,574); and Plainfield (\$5,700,000).

<sup>5</sup> Indianapolis Office of Sustainability. 2018. "Thrive Indianapolis." Accessed January 2024. Retrieved from: <https://www.thriveindianapolis.com/>



meaningful engagement throughout the planning process to ensure this plan is reflective of the unique and varied needs of stakeholders across the Indianapolis-Carmel-Anderson MSA.

The emissions reduction strategies outlined in this CCAP target the highest emitting sectors to drive meaningful emissions reductions and community co-benefits, while enhancing opportunities for economic growth and improved quality of place within the region. The following sections in this report describe the approach CIRDA and its partners undertook to develop this regional plan, the results of the regional GHG inventory and business-as-usual GHG emissions projections, descriptions of the GHG reduction measures and quantified GHG emission reductions, an assessment of the potential benefits and disbenefits to residents, co-pollutant emissions analysis, workforce planning analysis, review of implementation authority, and an overview of the next steps in the CPRG program and the regional planning process.

## CENTRAL INDIANA CONTEXT

Central Indiana is a job center and an economic hub for the state. This regional plan seeks to reduce GHG emissions and improve public health while creating vibrant places that attract and retain high caliber talent to the region and to the state. By engaging a diverse set of public, private, and nonprofit stakeholders, this plan is reflective of regional priorities and leverages opportunities for GHG reductions across a range of sectors.

The Indianapolis-Carmel-Anderson MSA consists of 11 counties (Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Putnam, and Shelby) with a population of over 2.1 million people (see Figure 1).<sup>6</sup> Residents across the MSA identify as 76 percent White, 16.6 percent Black (alone), 7.6 percent Hispanic, 4.2 percent Asian (alone), 2.6 percent as two or more race groups.<sup>7</sup> Per capita annual income averaged \$68,719 in 2022, with two-thirds of residents living in owner-occupied housing and one-third of residents living in rental housing in the region.<sup>8</sup> The distribution of environmental and structural burdens varies greatly for different communities across the region. Categories of burdens include air quality, climate change, energy, environmental hazards, health, housing, legacy pollution, transportation, water and wastewater, and workforce development.<sup>9</sup>

Over one-third of the census tracts in the MSA are considered low-income and disadvantaged communities (LIDAC).<sup>10</sup> This regional plan adapts EPA's definition, which identifies LIDAC communities

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<sup>6</sup>U.S. Census Bureau. 2022. *American Community Survey 1-year estimates*. Accessed January 2024. Retrieved from: <https://censusreporter.org/profiles/31000US26900-indianapolis-carmel-anderson-in-metro-area/>

<sup>7</sup> STATS Indiana. 2023. "Indianapolis-Carmel-Anderson, IN Metro Area". Accessed January 2024. Retrieved from: [http://www.stats.indiana.edu/profiles/profiles.asp?scope\\_choice=b&county\\_changer2=Rmetro:26900](http://www.stats.indiana.edu/profiles/profiles.asp?scope_choice=b&county_changer2=Rmetro:26900)

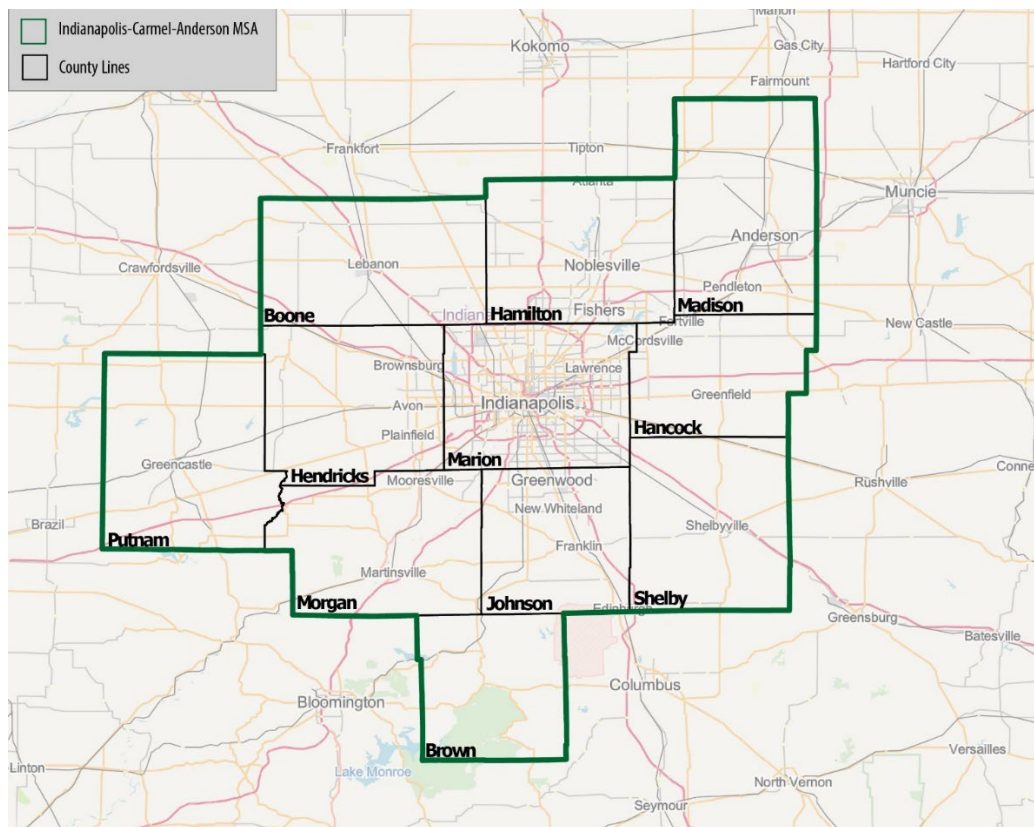
<sup>8</sup> STATS Indiana. 2023. "Indianapolis-Carmel-Anderson, IN Metro Area". Accessed January 2024. Retrieved from: [http://www.stats.indiana.edu/profiles/profiles.asp?scope\\_choice=b&county\\_changer2=Rmetro:26900](http://www.stats.indiana.edu/profiles/profiles.asp?scope_choice=b&county_changer2=Rmetro:26900)

<sup>9</sup> 560 out of 1446 Census tracts in the MSA qualify as LIDAC; U.S. EPA. 2024. "Socioeconomic Indicators." Modified 4 January 2024. Retrieved from: <https://www.epa.gov/ejscreen/ejscreen-map-descriptions#soci>

<sup>10</sup> U.S. Environmental Protection Agency (EPA). 2024. "EJScreen: Environmental Justice Screening and Mapping Tool." Modified 24 January 2024. Retrieved from: <https://www.epa.gov/ejscreen>

as any community that meets at least one of the following characteristics: identified as disadvantaged by the Climate and Economic Justice Screening Tool (CEJST); any census block group that is at or above the 90th percentile for any of EPA’s Environmental Justice Screening and Mapping Tool’s (EJScreen) Supplemental Indexes when compared to the nation or state; and/or any geographic area within Tribal lands as included in EJScreen.<sup>11</sup>

**Figure 1. Indianapolis-Carmel-Anderson Metropolitan Statistical Area**



<sup>11</sup> U.S. Environmental Protection Agency (EPA). 2023. “Climate Pollution Reduction Grants: Low Income/Disadvantaged Communities (LIDAC) Benefits Analysis.” Accessed January 2023. Retrieved from: <https://www.epa.gov/system/files/documents/2023-08/Low%20Income%20Disadvantaged%20Communities%20Benefits%20Analysis.pdf>



## 2. CCAP Planning & Meaningful Engagement Process

### PLANNING PROCESS OVERVIEW

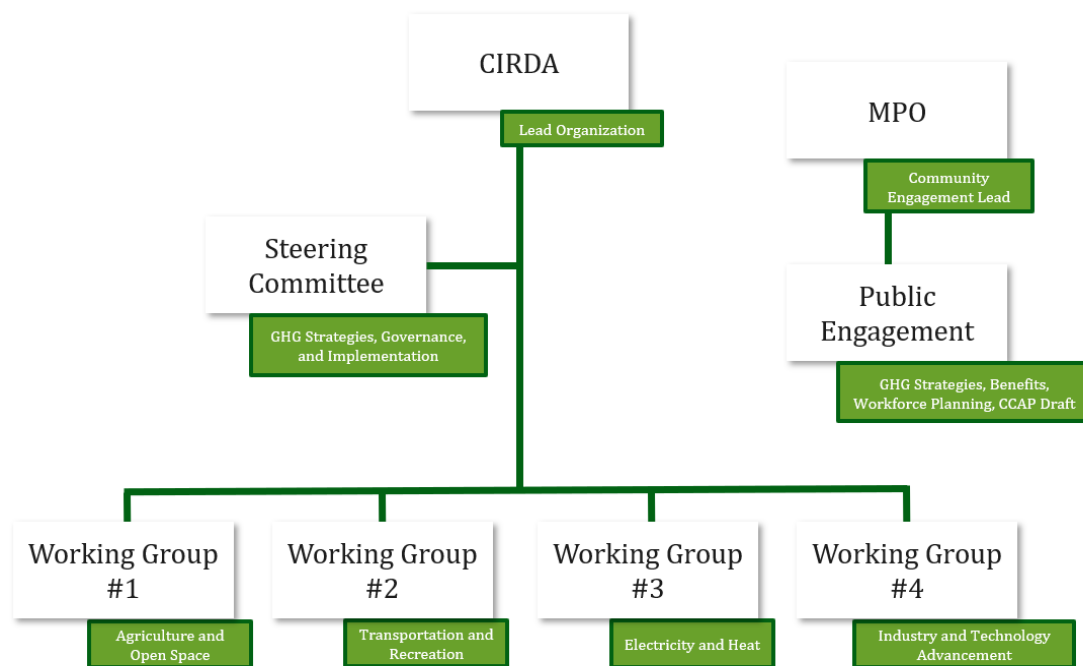
Comprised of the municipal executives from 32 Central Indiana communities, CIRDA is the lead grantee for the regional planning process. CIRDA is working in collaboration with the Indianapolis Metropolitan Planning Organization (IMPO), the lead partner spearheading community engagement. Representatives from CIRDA, including the City of Fishers and the City of Indianapolis, served on the Project Team alongside IMPO and the consultant.

The regional planning process included multiple overlapping efforts conducted over a span of two years from August 2023 to August 2025 to ensure the regional plan meets EPA's criteria and is reflective of the community priorities. The approach to developing this CCAP built on extensive effort and engagement from the development of the PCAP. CCAP planning included performing additional stakeholder outreach to the public, regional subject matter experts, and local governments, assessing benefits to low-income and disadvantaged communities, developing a regional GHG inventory and business-as-usual GHG emission projections through 2050, quantifying a set of GHG reduction measures unique to the Central Indiana region, developing a workforce planning analysis to support the emissions reduction measures outlined in the CCAP, and identifying implementation authority, as described in the following subsections.

CIRDA led the development of this regional plan by engaging a diverse set of public, private, and non-profit stakeholders throughout Central Indiana, building on the extensive stakeholder engagement work the project team led in developing the PCAP. Figure 2 provides an overview of the stakeholder engagement approach to developing the regional plan.



**Figure 2. CCAP Stakeholder Engagement Approach**



## COMMUNITY ENGAGEMENT

Public engagement is critical to understanding the wants and needs of local communities and residents of Central Indiana in coupling economic growth with climate action and sustainability. Feedback from public engagement during the PCAP and CCAP planning processes were integrated into the final list of GHG reduction strategies and assessment of community co-benefits and disbenefits put forth in this plan. A complete description of public engagement feedback can be found in Appendix A. CCAP Public Engagement Report.

The Indianapolis MPO identified LIDAC areas as well as locations around the region to conduct engagement. Events and locations were selected to lower barriers to participate in the planning process for LIDAC communities and members of the public around the region. IMPO utilized an assortment of advertisement methods to reach a variety of audiences including circulation advertisements, digital ads, flyers, and an ad at a local drive-in. IMPO also employed the use of virtual and in-person open houses to allow a multitude of opportunities for the public to participate in the planning process. IMPO also attended community events such as farmers markets or local festivals to engage residents.

During the PCAP planning process, IMPO led the development of two public surveys and attended 15 in-person events and four virtual meetings from September 2023 through February 2024. Engagement centered on both gathering input from communities and reporting updates for the planning process.

The Indianapolis MPO conducted two public surveys during the CCAP planning process. To identify survey responses in LIDAC areas, IMPO employed the same methodology as the PCAP. Zip codes with 50 percent or more of their land area in census tracts designated as LIDAC by EPA were considered LIDAC. Responses from these zip codes were considered responses from LIDAC areas.

The first public survey was available from April 20, 2024, through July 21, 2024. The survey included a display of potential greenhouse gas reduction measures with questions seeking to understand if any measures were missing from the provided list. There were 170 responses to the first survey, which asked respondents to review draft emissions reduction strategies and provide input on any missing strategies. Of the 170 responses, 33% were from zip codes in LIDAC areas. When asked about local government action, the public most desired adding or preserving green space, reducing reliance on automobiles, better land use decisions and increased education. LIDAC respondents desired the addition of green spaces, reduced reliance on automobiles, waste reduction, increased education, and use of green infrastructure.

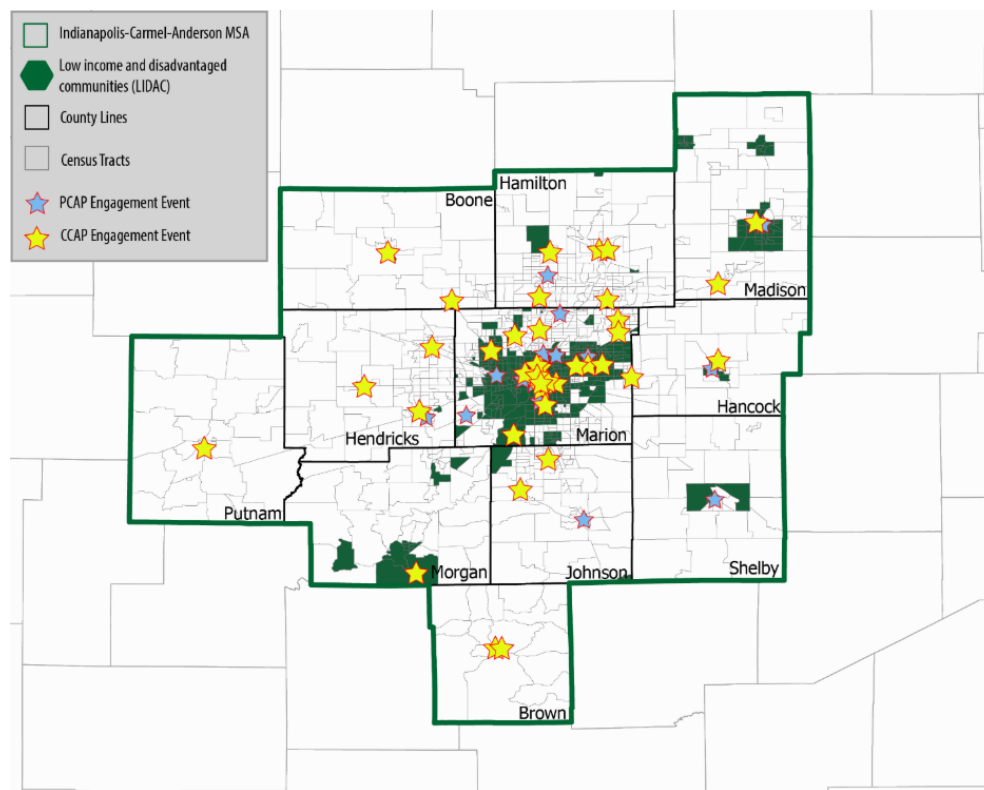
The second public survey was available from August 13, 2024, through November 27, 2024. The second survey asked respondents a series of tradeoff questions related to types of projects to reduce emissions, an open-ended question about measures to reduce emissions, and a ranking question asking participants to indicate the top three barriers to a green workforce. The second survey received 160 responses. Of the 160 responses, 31% were from LIDAC zip codes.

When asked about preferences, members of the public favored greenhouse gas reduction measures that were regional in nature (as opposed to municipal level) and took more time to establish but had greater impact on emissions overall (instead of projects requiring shorter set up time but with fewer impacts on emissions). Members of the public wanted emissions reductions targeted at both government-owned assets as well as privately owned with roughly equal responses for each. When asked about local government action, the most common responses included additional biking infrastructure, public transit, pedestrian infrastructure, reduced reliance on automobiles, and better land use decisions. Responders from LIDAC areas desired public transit, bike infrastructure, pedestrian infrastructure, and reduced reliance on automobiles in that order. Respondents ranked lack of awareness in the sustainability field, low wages, and lack of job availability as the top three barriers of the sustainability fields in Central Indiana. Other options included lack of awareness of existing green jobs, lack of skills taught in trade schools, high education requirements, lack of transportation to existing jobs, lack of child or elder care, and lack of apprenticeship opportunities.

The streamlined CCAP was available for public review and feedback from September 20 – October 31, 2025. A list of all submitted public comments is included in Appendix A: CCAP Public Engagement Report. Throughout the CCAP planning process, IMPO attended community events and festivals, hosted virtual open houses, conducted one-on-one stakeholder interviews, ran print and digital advertisements, and hosted in-person open houses around the region. The location of all community engagement events, conferences, and in-person open houses is displayed in Figure 3. Following the completion of the CCAP, IMPO will have conducted:

- 30 in-person community festival/event tabling sessions
- 20 one-on-one stakeholder interviews
- 7 virtual open houses (public meetings)
- 11 in-person open houses (public meetings)

**Figure 3. Map of Community Engagement Events**



### STEERING COMMITTEE AND SUBCOMMITTEE

The Steering Committee was developed to oversee the execution of the CPRG grant and drive intergovernmental and interagency coordination. Co-chaired by CIRDA and IMPO, Steering Committee members included representatives from municipalities across the MSA. The Subcommittee was formed to work under the direction and guidance of the Steering Committee and Project Team to support the development of key planning deliverables. Members consisted of state agency and academic representatives.

Throughout the regional PCAP planning process, the Steering Committee was responsible for providing input on the development of plan deliverables, including the regional GHG inventory, GHG priority actions, and public surveys. Members attended four meetings from September 2023 to February 2024, including a formal kickoff meeting to introduce the CPRG opportunity and planning process, and give an opportunity for members to engage. All the meetings included virtual participation. The Project Team also engaged in one-on-one discussions with Steering Committee members during the planning process to delve deeper into specific ideas for implementation-ready GHG reduction measures that were submitted to the Project Team.

The role of the Subcommittee throughout the PCAP planning process was to support the development of the GHG inventory and GHG reduction measures by providing data and regional insights. Subcommittee members attended three meetings from September 2023 to November 2023, including the formal kickoff meeting with the Steering Committee and Project Team. Members were also invited to provide input on the GHG reduction measures, with some crossover in participation with the sector-specific Working Groups.



The Steering Committee and Subcommittee convened in November 2024 to discuss which GHG reduction measures are most applicable, feasible, and generally supported within Central Indiana to be included in the CCAP planning process. The feedback of the Steering Committee was integral to the final selection of the GHG reduction measures presented in this plan. Meeting attendees included the following:

- Indiana Department of Environmental Management
- Indiana Department of Transportation
- Indiana Office of Energy Development
- Indiana University
- Urban Land Institute Indiana
- Indiana University – Environmental Resilience Institute
- City of Carmel
- City of Noblesville
- City of Fishers
- Town of Plainfield

The Steering and Subcommittee spent time discussing existing efforts in solar energy and battery storage within the Central Indiana region, from small scale solar on public and private infrastructure to utility-scale clean energy projects. Additionally, meeting attendees discussed the expansion of wastewater treatment plant renewable gas capture, which currently exist and are supported in the region. Furthermore, there was widespread support for electric vehicle adoption and fleet electrification, distinguishing between light and heavy-duty vehicles, and considering electric school buses. Finally, members expressed an interest in residential energy saving measures, including energy efficiency and small-scale renewable energy, but noted that there is a lack in funding.

## **WORKING GROUPS**

The Working Groups were formed to support the development of GHG reduction measures, evaluate existing initiatives within the region, identify potential barriers and challenges to implementation, and assess community benefits. The Project Team invited a diverse set of stakeholders to participate in the four Working Groups. Each Working Group consisted of 14 to 18 sector-specific subject matter experts from private companies, community organizations, academia, and government agencies.

Members in each Working Group participated in two meetings from November 2023 to December 2023 to support PCAP planning, with both in-person and virtual participation. The Project Team convened a total of eight meetings across all the Working Groups. Members were asked to consider the types of GHG reduction strategies they have had success deploying; promising GHG reduction strategies for the region to consider; and potential community and sector-specific benefits resulting from identified GHG reduction strategies. Members also provided input on the development of the regional GHG inventory and reviewed results from the first public survey.

For the CCAP planning process, the Project Team convened all individual Working Groups for a single meeting in December 2024 to discuss strategies that would offer significant emissions reductions, barriers to implementation, and community benefits that are applicable to the Central Indiana region.

The insights gained from these meetings were utilized to develop the final set of GHG reduction measures and community benefits presented in this CCAP.

For electricity and heat, Working Group members discussed the potential for battery storage and renewable energy within the region, focusing on solar energy and different avenues of funding. Additionally, members discussed energy efficiency as a priority for residential buildings, and energy benchmarking requirements for buildings across the Central Indiana region. For transportation and recreation, members discussed challenges in public transit related to workforce availability despite support for expansion to outer counties, existing initiatives to increase micromobility access, pedestrian and bike safety, transportation mode shift incentives, fleet electrification and electric vehicle adoption, and public EV charging infrastructure. For industry and technology advancement, members discussed energy efficiency for industrial facilities and warehouses. For agriculture and open space, members discussed anaerobic digesters, waste stream reduction, and the potential for renewable fuel production from waste.

Additionally, IMPO conducted select one-on-one meetings from July through August 2025 to discuss the set of GHG reduction measures presented in this plan to gather any indication of logistical issues in workforce planning or implementation. Twenty organizations participated in interviews.

- City of Carmel
- City of Franklin
- City of Noblesville
- Duke Energy
- Energy Systems Network
- Friends of White River
- Hamilton County Tourism
- Indiana Department of Environmental Management
- Indiana Department of Transportation
- Indiana Office of Energy Development
- Indiana University – Paul H. O’Neill School for Public and Environmental Affairs
- Indiana University- Environmental Resilience Institute
- Indiana University Health
- Indianapolis Office of Sustainability
- Indianapolis Motor Speedway
- Indianapolis Zoo
- Solar United Neighbors
- Town of McCordsville
- Town of Plainfield
- Visit Indy

During one-on-one conversations, stakeholders focused on different aspects of the measures often aligned with their industry. Stakeholders received a short presentation on the plan as well as a description of all GHG reduction measures. IMPO asked a series of questions to solicit feedback from

stakeholders including the alignment of the measures with organizational goals, needs and gaps for implementation, and workforce development.

A common theme among stakeholders was the desire for data and information in a digestible format. Many stakeholders represented organizations that had the desire to reduce emissions but lacked the knowledge and information to quantify costs and benefits. Many stakeholders had started to implement reduction measures that were within their jurisdiction such as promoting electric vehicle ownership, including universal curbside recycling in waste contracts, and advancing building efficiency work. Stakeholders identified funding as a barrier to implementation with the lack of return-on-investment data to encourage collaboration or higher upfront expense contributing. Stakeholders identified interest in sustainability from potential implementers like business owners, residents, and government offices, but noted the information and financial barriers to implementation.

Several stakeholders were concerned with the possibility of data center expansion in Central Indiana, which would increase net emissions. Some stakeholders identified coordination and communication with private sector utility providers to achieve a reduction in emissions from energy production and consumption. Some stakeholders provided specific feedback based on their industry such as the production of methane from wastewater treatment plants.

Stakeholders generally felt there was interest in sustainability at the administrative workforce level. Stakeholders did not feel well-positioned to respond to workforce challenges for field roles, but many noted the general decrease in trade school enrollment. Several stakeholders identified programs working to address sustainability fields at the collegiate level. Some stakeholders noted high schools are working to encourage a variety of career paths that are not exclusively pursuing a collegiate degree, but that progress was slow.



## 3. Greenhouse Gas Inventory

### SCOPE

The Project Team used the EPA Local GHG Inventory Tool<sup>12</sup> to calculate Scope 1, Scope 2, and Scope 3 emissions. Scope 1 emissions included stationary combustion, mobile combustion, landfills, and wastewater emissions within the region. Scope 2 emissions included electricity consumption. Scope 3 emissions included imported water, agricultural and land management, urban forestry, and waste disposed outside the MSA. To ensure comprehensiveness, working land soil sinks were calculated for the CCAP. Additional emissions sources were also included in the GHG inventory and can fall into Scope 1, 2, or 3 depending on the source.

As mentioned in Section 1, CIRDA encompasses the entire Indianapolis-Carmel-Anderson MSA, which includes eleven counties in central Indiana. For this GHG inventory, emissions were calculated at a county and MSA-level. Data was collected at a county level for the emission sources and then aggregated for the MSA, using a baseline year of 2022.

### METHODOLOGY

#### DATA

Data sources for this GHG Inventory are summarized by emissions source category as defined in EPA's Local GHG Inventory Tool.<sup>13</sup> The Project Team relied on a mix of data sources to develop the Indianapolis-Carmel-Anderson MSA GHG inventory. Additional data and information included county-level values from verified and reliable national online databases. Local community and climate plans were also reviewed to identify any current GHG reduction methodologies used within the MSA.

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<sup>12</sup> U.S. Environmental Protection Agency (EPA). 2024. "Local Greenhouse Gas Inventory Tool." Modified 5 February 2024. Retrieved from: <https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool>

<sup>13</sup> Ibid.

The Project Team conducted three Steering Committee and Subcommittee meetings with representatives from municipalities, along with state agencies and academic institutions across the MSA, to help inform the development of the GHG inventory. Members were tasked with providing county-level data by sector to assist the Project Team with developing the GHG inventory. Additionally, members of both the Steering Committee and Subcommittees reviewed the GHG inventory and provided feedback. The Project Team also conducted meetings with a set of four sector-specific Working Groups, comprised of subject matter experts representing different sectors in the GHG inventory, who provided additional information to inform the GHG inventory.

**Table 1. GHG Inventory Data Sources**

Category	Data Source
Stationary Combustion	NREL SLOPE – Natural gas consumption by county EPA FLIGHT – Industrial fuel consumption (excl. natural gas) by county US Census Bureau – Number of households by fuel use & county EIA – CE4.6.LP.ST Annual household site propane, CE4.6.FO.ST Annual household site fuel oil or kerosene Citizens Energy – Marion County natural gas consumption
Mobile Combustion	Indiana Department of Transportation Indiana Office of Energy Development
Solid Waste/Landfills	Indiana Department of Environmental Management EPA FLIGHT – Landfill operations
Electricity Use	NREL SLOPE – Electricity consumption by county AES Electricity – Marion County electricity consumption
Wastewater	Indiana Department of Environmental Management EPA FLIGHT – Wastewater treatment plant operations
Agriculture	US Geological Survey – Fertilizer consumption data
Urban Forestry	Tree Equity Score – Urban tree cover (%) by county US Census Bureau – Urban area by county
State Parks & Forests	Yellowwood State Forest & Brown County State Park – Websites Indiana Department of Natural Resources – Park histories
Working Land Soils	Indiana Agriculture Census 2022 COMET Planner Central Indiana Emission Reduction Factors
Additional GHG Sources	EPA FLIGHT – Industrial operations Indianapolis Airport Authority – Indianapolis airports & helipad



## GHG INVENTORY METHODS AND PROTOCOLS

The inventory uses the Greenhouse Gas Protocol's Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.<sup>14</sup> The Project Team used EPA's Local Greenhouse Gas community-wide inventory module to calculate a baseline GHG inventory across the MSA's eleven counties. This spreadsheet tool enables communities to evaluate GHG emissions from their largest emissions sources, including stationary combustion, mobile combustion, solid waste, wastewater, electricity consumption and generation, imported water, exported waste, agriculture and land management, urban forestry, and additional emission sources. The tool is programmed with default emission factors, global warming potentials, and system assumptions approved by the EPA.

This inventory also utilized COMET-Farm to evaluate the carbon sequestration potential of Yellowwood State Forest and Brown County State Park.<sup>15</sup> The analysis from this tool used location-specific spatial data on climate and soil conditions for Central Indiana. Additionally, this tool allows the user to detail historical land management practices and the age and type of the forest, which improves the accuracy of the estimated carbon sequestration potential for the inventory. This inventory utilized COMET-Planner and the 2022 Census of Agriculture County Data for Indiana<sup>16,17</sup> to evaluate the carbon sequestration potential of working land soils within Central Indiana.<sup>18</sup>

## RESULTS

GHG emissions were reported in metric tons (MT) of carbon dioxide equivalent (CO<sub>2</sub>e) and include estimated values for the following GHGs: CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorochemicals (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). GHG emissions were estimated for the following sectors: industry, transportation, commercial and residential buildings, agriculture, natural and working lands, waste and materials management, and electricity generation.

Each sector included within this analysis is composed of the following emissions sources and sinks:

**Industry:** Stationary combustion, electricity use, and industrial emissions from FLIGHT not covered by stationary combustion or electricity.

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<sup>14</sup> Fong, W.K, M. Sotos, M. Doust, S. Schultz, A. Marques, and C. Deng-Beck. 2022. *Global Protocol for Community-Scale Greenhouse Gas Inventories, An Accounting and Reporting Standard for Cities, Version 1.1*. Online posting. GHG Protocol. Accessed January 2024. Retrieved from: [https://ghgprotocol.org/sites/default/files/standards/GPC\\_Full\\_MASTER\\_RW\\_v7.pdf](https://ghgprotocol.org/sites/default/files/standards/GPC_Full_MASTER_RW_v7.pdf)

<sup>15</sup> U.S. Department of Agriculture (USDA). 2024. "COMET Farm, Whole Farm and Ranch Carbon and Greenhouse Gas Accounting System." Modified 30 January 2024. Retrieved from: <https://comet-farm.com/Home>

<sup>16</sup> USDA, National Agriculture Statistics Service. 2022. "2022 Census of Agriculture – Table 1." Retrieved from: [https://www.nass.usda.gov/Publications/AgCensus/2022/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Indiana/st18\\_2\\_001\\_001.pdf](https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_001_001.pdf)

<sup>17</sup> USDA, National Agriculture Statistics Service. 2022. "2022 Census of Agriculture – Table 41." Retrieved from: [https://www.nass.usda.gov/Publications/AgCensus/2022/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Indiana/st18\\_2\\_041\\_044.pdf](https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_041_044.pdf)

<sup>18</sup> U.S Department of Agriculture. 2025. "COMET-Planner Evaluate Potential Carbon Sequestration and Greenhouse Gas Reductions from Adopting NRCS Conservation Practices." Retrieved from: <https://comet-planner.com/>



**Transportation:** Mobile combustion, including vehicles and airplanes.

**Commercial & Residential Buildings:** Stationary combustion and electricity use.

**Agriculture:** Fertilizer practices.

**Natural & Working Lands:** Urban forestry, large parks, and working land soils.

**Waste & Materials Management:** Solid waste, waste generated and treated outside the MSA, and wastewater treatment.

**Electricity Generation:** Fossil fuels consumed for electricity production within the region.

Table 2 summarizes GHG emission results by sector and gas, as well as total net GHG emissions across. Electricity generation emissions are not included in the total to avoid double counting of emissions from electricity use in industry and commercial and residential buildings and electricity generation within the MSA. This concept is explained in greater detail in Energy Consumption.

**Table 2. GHG Emissions by Sector and Gas (MT CO<sub>2</sub>e)**

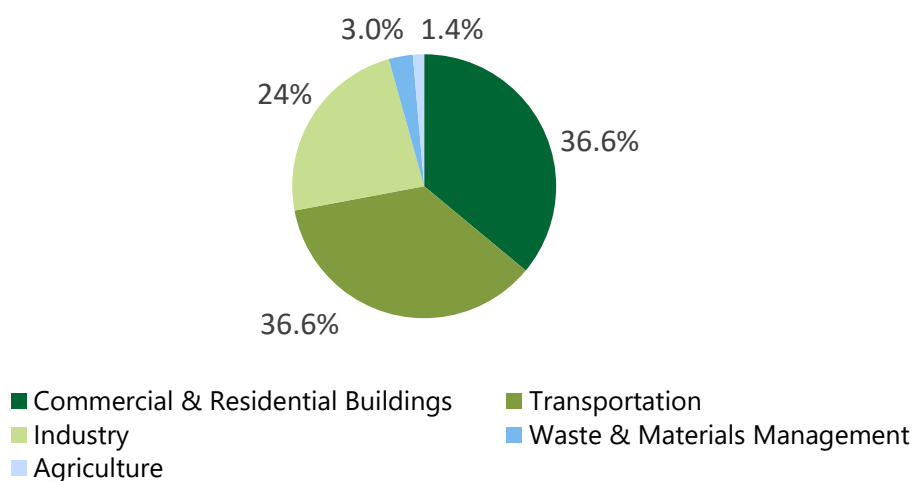
Sector	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	Total
Agriculture	-	-	481,251	-	-	-	481,251
Comm & Res Buildings	12,306,812	30,911	31,612	-	-	-	12,369,335
Industry	7,791,829	30,863	28,235	-	-	251,256	8,102,183
Natural and Working Lands	(931,203)	-	(38,156)	-	-	-	(969,359)
Transportation	11,978,553	120,119	280,151	-	-	-	12,378,822
Waste and Materials	-	956,520	70,838	-	-	-	1,027,358
Electricity Generation*	3,362,135	1,561	1,860	-	-	-	3,365,556
<b>Total Emissions (Net)</b>	<b>31,145,991</b>	<b>1,138,413</b>	<b>853,931</b>	<b>-</b>	<b>-</b>	<b>251,256</b>	<b>33,389,592</b>

## EMISSIONS BY SECTOR

Total net GHG emissions in the Indianapolis-Carmel-Anderson MSA totaled 33,389,592 MT CO<sub>2</sub>e, with most emissions from commercial and residential buildings (36.6%), transportation (36.6%), and

industry (24%) sectors as shown in Figure 4.<sup>19</sup> As depicted in Figure 5, net GHG emissions across all sectors totaled 33,389,592 MT CO<sub>2</sub>e. Carbon sinks reduced a total of 969,359 MT CO<sub>2</sub>e, due to the carbon sequestration capabilities of working land soils, woodlands, and protected natural habitat across Central Indiana. Most residential emissions were a result of gasoline and diesel consumption in transportation, followed by upstream production of electricity that was utilized in Central Indiana buildings. The main source of emissions across the commercial and industrial sectors was electricity use, followed by stationary fuel combustion.

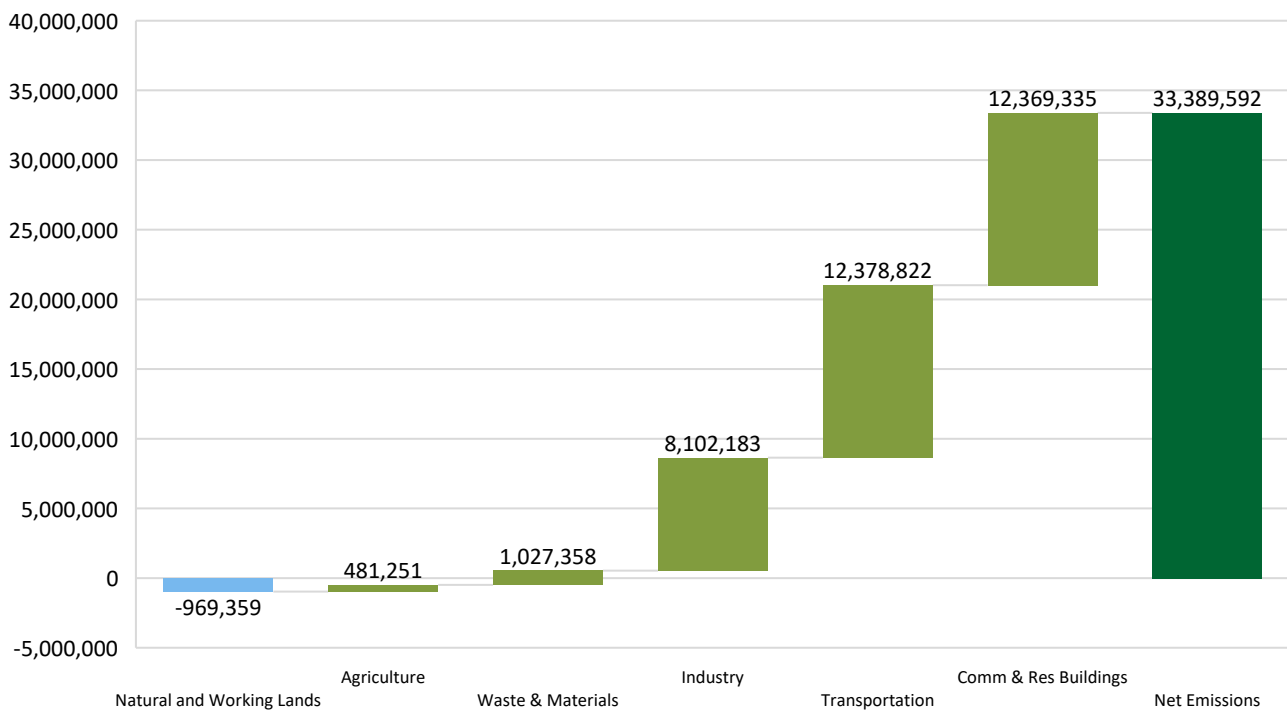
**Figure 4. Relative GHG Emissions by Sector, excluding Power Generation**



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<sup>19</sup> This inventory assumes all power generated within the region is consumed within the region. Emissions from power generation are accounted for within electricity use for commercial & residential buildings and industry. Per GHG Protocol guidelines for community-scale GHG inventories, this inventory reports both power generation and electricity use emissions separately to avoid double counting.

**Figure 5. Total Net GHG Emissions (MT CO<sub>2</sub>e)**



### EMISSIONS BY GAS

Across the Indianapolis-Carmel-Anderson MSA, the sectors with the highest CO<sub>2</sub> emissions included industry, transportation, and commercial and residential buildings, due to electricity use and fossil fuel consumption. The sector with the highest methane emissions was waste and materials management, due to landfills and wastewater treatment facilities. The sectors with the highest nitrous oxide emissions were agriculture, due to fertilizer application practices, and transportation, due to gasoline and diesel combustion. Refer to Table 3 for further analysis of sub-sector emissions.

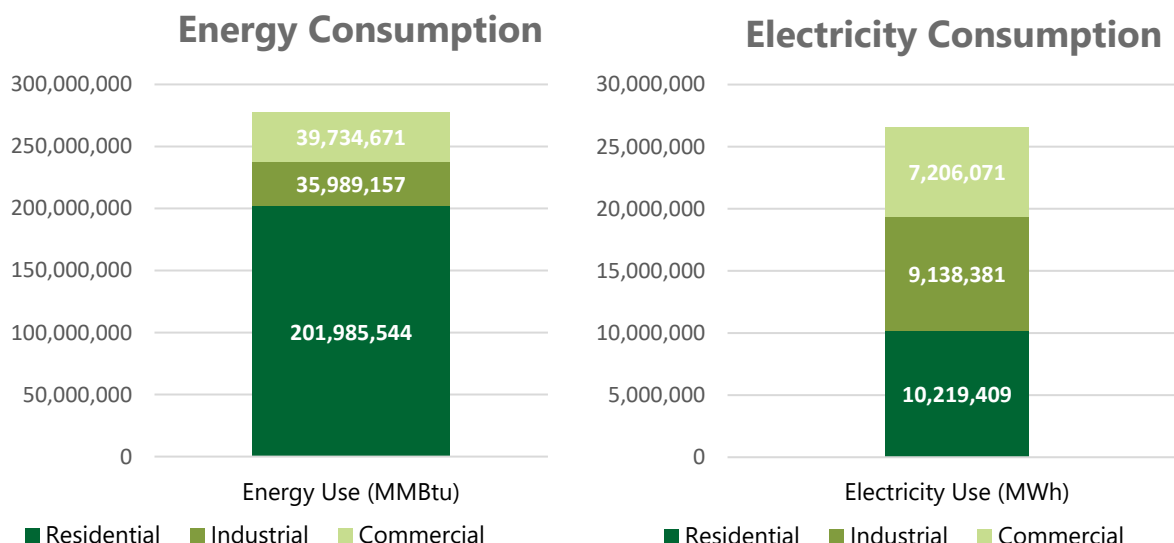
**Table 3. GHG Emissions by Sub-Sector and Gas (MT CO<sub>2</sub>e)**

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	Total
Stationary Combustion	5,945,199	14,615	3,263	-	-	-	5,963,077
Mobile Combustion	11,668,129	119,802	279,903	-	-	-	12,067,834
Electricity (Location Based)	12,605,017	32,051	44,702	-	-	-	12,681,770
Solid Waste	-	299,190	-	-	-	-	299,190
Wastewater Treatment	-	325,010	70,838	-	-	-	395,848
Water	-	-	-	-	-	-	-
Ag. & Land Management	-	-	481,251	-	-	-	481,251
Urban Forestry & Large Parks	(580,821)	-	-	-	-	-	(580,821)
Working Land Soils	(350,382)	-	(38,156)	-	-	-	(388,538)
Exported Waste	-	332,320	-	-	-	-	332,320
Other	1,858,849	15,425	12,130	-	-	251,256	2,137,661
<b>Gross Emissions</b>	<b>32,077,195</b>	<b>1,138,413</b>	<b>892,087</b>	<b>-</b>	<b>-</b>	<b>251,256</b>	<b>34,358,951</b>
<b>Net Emissions</b>	<b>31,145,991</b>	<b>1,138,413</b>	<b>853,931</b>	<b>-</b>	<b>-</b>	<b>251,256</b>	<b>33,389,592</b>

## ENERGY CONSUMPTION

Across all sectors, fuel consumption (energy consumption) and electricity use (from power sources located within and outside the MSA) contributed to the largest amount of GHG emissions within the Indianapolis-Carmel-Anderson MSA. The residential sector consumed the most electricity and energy of all sectors. Total energy consumption was 277,709,372 MMBtu, and total electricity consumption was 26,563,861 megawatt-hours (MWh). A detailed analysis of energy and electricity consumption by sector is shown below.

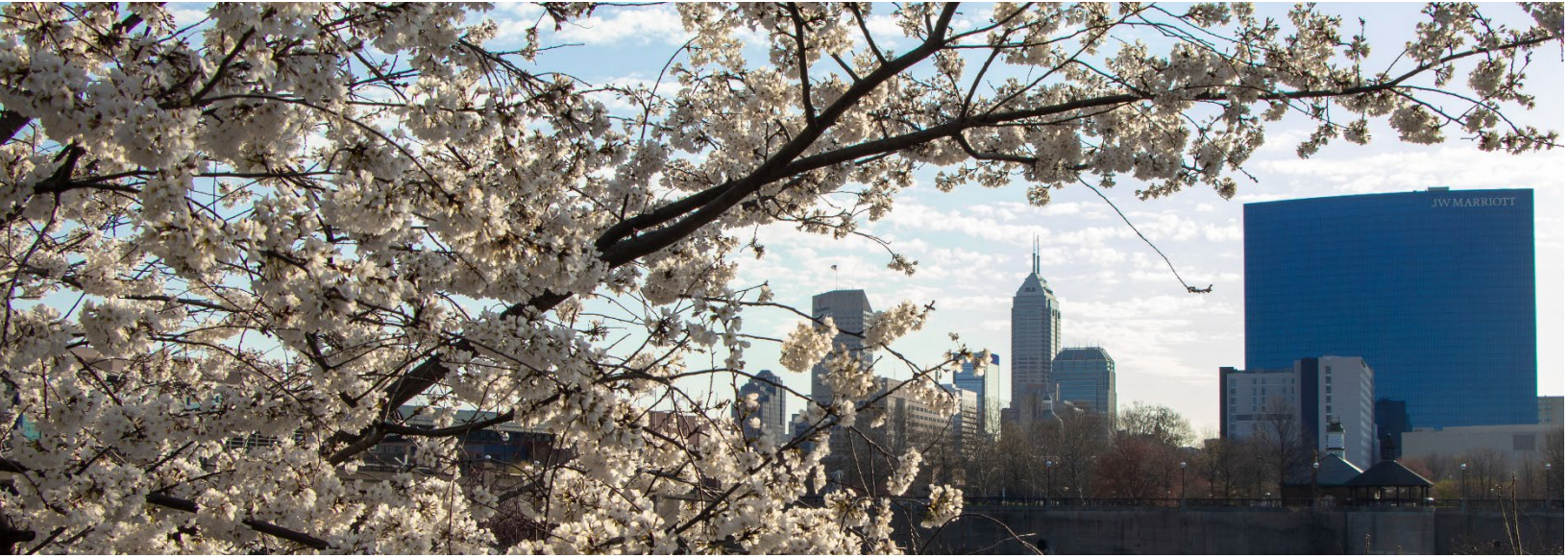
**Figure 6. Energy and Electricity Consumption**



Central Indiana is a net electricity importer, meaning the region consumes more electricity than it produces. When calculating a greenhouse gas inventory, it is important to ensure accuracy in emissions reporting. Since emissions from upstream electricity generation are accounted for in commercial & residential buildings and industry electricity use, the value of emissions from electricity generated in Central Indiana is not included in the total GHG inventory. Table 4 summarizes total emissions from electricity use separated by those resulting from electricity generated within the Indianapolis-Carmel-Anderson MSA and electricity imported from outside the MSA. Total emissions resulting from electricity generation within the MSA were 3,365,556 MT CO<sub>2</sub>e.

**Table 4. Energy Usage and Generation GHG Emissions (MT CO<sub>2</sub>e)**

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	Total
Imported Electricity Usage	9,242,882	30,490	42,842	-	-	-	9,316,214
Electricity Generation in MSA	3,362,135	1,561	1,860	-	-	-	3,365,556
<b>Electricity Total Emissions</b>	<b>12,605,017</b>	<b>32,051</b>	<b>44,702</b>	-	-	-	<b>12,681,770</b>



## 4. Business-as-Usual Greenhouse Gas Emissions Projections

### OVERVIEW

This business-as-usual (BAU) greenhouse gas (GHG) emissions scenario represents a forecast of emissions through 2050 based on existing trends, assuming there are no major shifts in current policies, practices, or technological innovations aimed at reducing emissions. This scenario serves as a baseline for evaluating the effectiveness of different mitigation strategies and illustrating the advantages of implementing measures to lower GHG emissions.

The BAU GHG emissions scenario models emissions reductions from Central Indiana's baseline 2022 GHG inventory through 2050. The following sectors are included in the scenario projections: agriculture, commercial and residential buildings, electricity generation, industry, natural and working lands, transportation, waste and materials management.

### METHODOLOGY

The county-level GHG emissions inventories were used as the basis for calculating emissions projections for the CIRDA region for 2022-2050. Sector-specific emissions for all of Indiana were determined using EPA's State Projection Tool (SPT)<sup>20</sup>, utilizing default data inputs, and the 2022 GHG Inventory. The emissions trajectories by sector were normalized to 2022 values, and applied to CIRDA's 2022 baseline emissions, generated by combining the county-level GHG inventories, as described in the previous section. The exception is the Natural and Working Lands sector, which is not covered by the SPT, and whose emissions are assumed to be unchanged through 2050 in the BAU scenario. Soils emissions were projected using the same methodology and data as described in Section 3.

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<sup>20</sup>U.S. Environmental Protection Agency (EPA) 2024. "State Inventory and Projection Tool." Accessed November 2024. Retrieved from: [State Inventory and Projection Tool | US EPA](#)

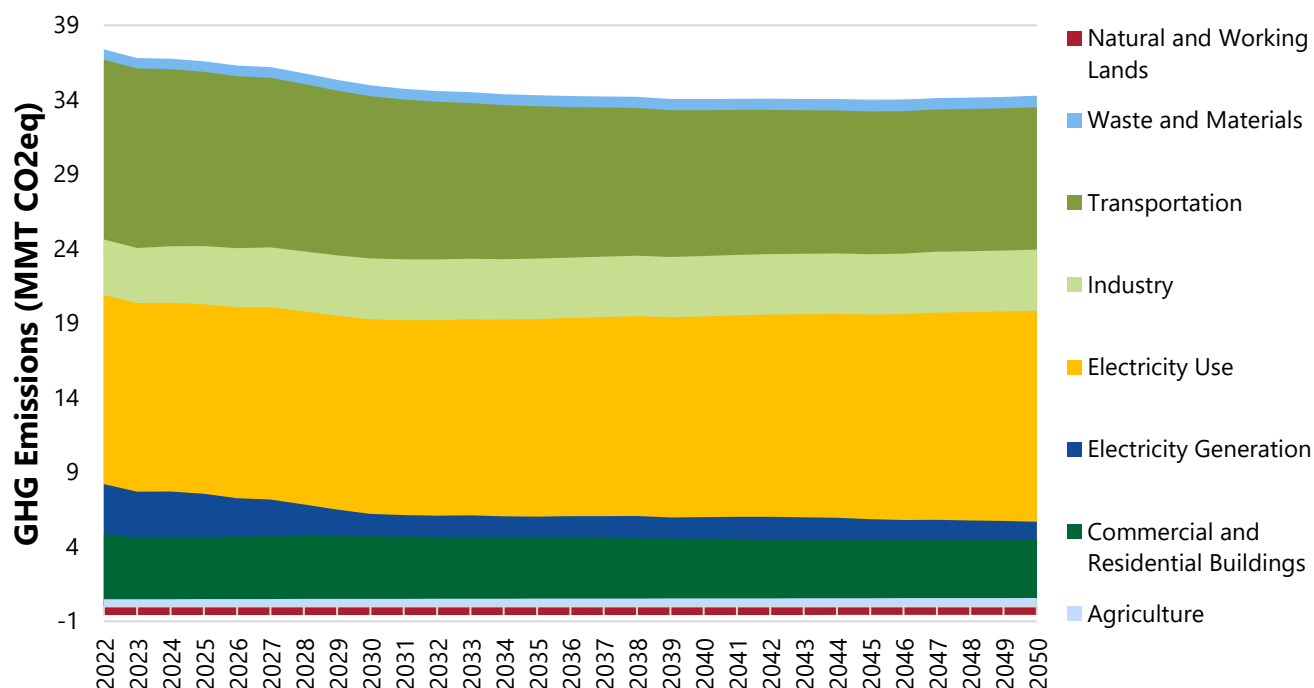


## RESULTS

As shown in Figure 7, CIRDA's GHG emissions are projected to decrease slightly from 2022 to 2050, primarily because of relatively few reductions in electricity generation, transportation, and building emissions, as compared to increases in emissions from all other sectors. Reductions from electricity generation are likely to be due to coal plants within the region reaching the end of life and converting to a less carbon intensive fuel source. Transportation and building emissions reductions are likely due to a slightly cleaner grid supplying electricity to these sectors in addition to a reduction in fossil fuel consumption with electric vehicles and commercial and residential buildings. Electricity use remains the highest source of emissions. Electricity use emissions increase slightly, despite an anticipated increase in electricity consumption from data centers, likely due to the integration of clean energy into the broader MISO-C grid.

The BAU scenario serves as a reference case, showing what emissions might look like without additional interventions, and it is the foundation for evaluating the emissions impact of proposed GHG emissions reduction measures as shown in Section 5. The GHG emission reduction measures were developed through extensive stakeholder engagement and designed to reflect projected trends from the BAU scenario. BAU GHG emissions projection data by county and sector is summarized in Appendix B. Business-as-Usual GHG Emissions Projection Data.

**Figure 7. BAU GHG Emissions Projection by Sector**





## 5. Emission Reduction Strategies & Measures

This report includes a set of ten GHG reduction measures, comprising a comprehensive set of strategies most suited to Central Indiana to meaningfully reduce GHG emissions across the region. Each of the measures addresses the most important benefits identified by communities throughout the planning process, including improved air quality, public health, alternative transportation, green space, and waste management, to name a few. These measures also foster economic opportunities for all jurisdictions across the region, inclusive of both urban centers and rural communities, which are outlined in the tables below.

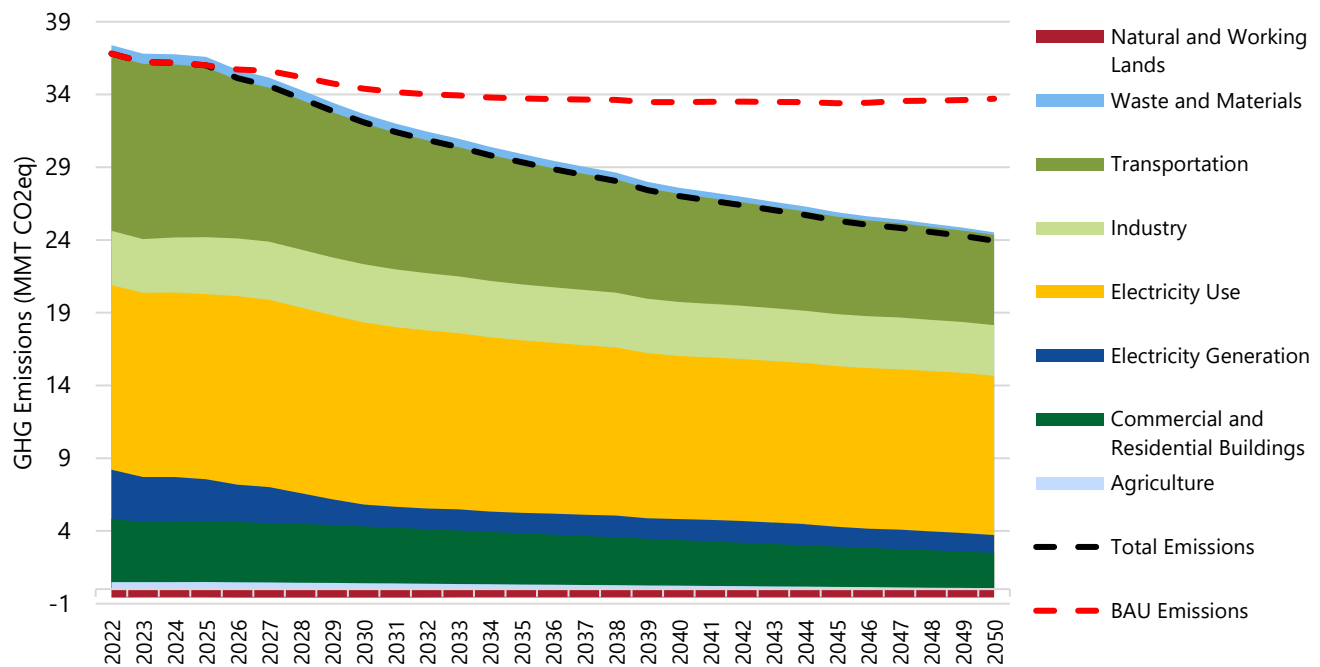
The strategies set forth in this report were selected through a rigorous decision-making process informed by an analysis of highest emitting sectors, potential community co-benefits, feasibility of implementation, an evaluation of regional support, and feedback from engagement with the public and regional subject-matter experts. The Project Team designed a process for identifying and prioritizing GHG reduction measures that integrated extensive research with stakeholder feedback and a thorough analysis to shape the final list of GHG reduction measures, which is described in Figure 8.

**Figure 8. Process to Develop the Priority List of GHG Reduction Measures**



Through the GHG reduction measures outlined in this plan, Central Indiana aims to reduce greenhouse gas emissions by 20% relative to a 2022 baseline by 2035, and 35% relative to a 2022 baseline by 2050. This planned implementation GHG emissions reduction scenario is outlined in Figure 9 below.

**Figure 9. GHG Emissions Reduction Scenario**



Most emissions reductions are projected to occur in the transportation sector, due to the expansion of charging infrastructure for light, medium, and heavy-duty vehicles in the public network and public fleet conversion to EVs. Additionally, the integration of additional clean energy into local power sources will reduce electricity generation emissions as the need for fossil fuel combustion power in the region decreases. However, GHG emission reductions are limited for electricity use, because the clean energy produced in the Central Indiana region is not enough to offset the coal and natural gas combustion power produced outside of the region that feeds the electric grid Central Indiana utilizes. Therefore, it is critical for the region to prioritize efforts to increase local clean energy production and collaboration with utilities to source clean energy, as electrification of transportation and buildings are key strategies to reduce emissions that rely on a clean grid. Emissions reductions and total costs through 2050 for each measure are summarized in Appendix C. Annual GHG Reductions and Total Implementer Costs for Each Measure (2026-2050) and a detailed methodology is included in Appendix I. GHG Reduction and Cost Methodology Details.

Emissions reductions are also expected to occur in the agriculture and natural and working lands sectors due to soil conservation practices and expansion of green spaces. Additionally, landfill diversion initiatives for waste-to-energy facilities, recycling, and composting will reduce emissions in the waste and materials management and electricity generation sectors.

Efforts to reduce emissions in industry centers around energy efficiency and alternative fuels, including hydrogen, which will likely not be brought to market in the region until around 2040, resulting in limited GHG emissions reductions.

The following ten GHG reduction measures outlined in this section, ordered alphabetically by sector, seek to build capacity for sustained action on climate change mitigation that is unique to the Central Indiana region and supports the emissions reduction projection outlined in the figure above.

## REDUCE NUTRIENT RUNOFF FROM CROPLANDS

### 5.1



GHG Reduction Measure #1:

#### Reduce Nutrient Runoff from Croplands

Sector	Agriculture
Description	<p>The agriculture sector plays a vital role in Central Indiana's economy, environment, and community life. Central Indiana is a prominent producer of corn and soybeans, amongst other crops. Unfortunately, nutrients and chemicals from crop land can leach into water ecosystems in the central Indiana region. Certain methods of crop production can also emit harmful air pollutants and greenhouse gases into the atmosphere. To reduce impacts on central Indiana's air, soil, and water resources, the strategy set forth in this report promotes methods of fertilizer conservation and soil conservation practices such as low/no till and cover cropping. These efforts will be achieved through educational programs, such as at Conner Prairie, and the expansion of existing economic incentive programs. This measure is intended to be implemented in predominantly rural communities with a significant amount of cropland.</p>
Active Programs	<p>National Water Quality Initiative (NRCS), Conservation Stewardship Program (NRCS), Environmental Quality Incentives Program (NRCS), Conservation Reserve Enhancement Program (ISDA), Clean Water Indiana (ISDA), Clean Water Act Section 319 and 205(j) (IDEM), Cover Cropping Systems Initiative, Clear Choices Clean Water Program (Indianapolis Dept of Public Works), Purdue Extension</p>
GHG Emissions Reductions	<p>Emissions reduced from 2025-2030 (MT CO<sub>2</sub>e): 312,449</p> <p>Emissions reduced from 2025-2050 (MT CO<sub>2</sub>e): 6,765,341</p>
Estimated Implementer Costs	<p>Total costs from 2025-2030 (2025\$): \$3,903,630</p> <p>Total costs from 2025-2050 (2025\$): \$145,908,129</p>
Implementing and Supporting Entities	<p>Local entities with active programs will implement this strategy, including Purdue Extension, County Soil and Water Conservation Districts, Indianapolis Department of Public Works, and Connor Prairie. IDEM and ISDA can provide additional policy, grant, and education assistance.</p>
Metrics to Track Progress	<p>Progress made on this measure can be tracked through the following metrics:</p> <ol style="list-style-type: none"> <li>1. Number of acres of cropland converted to no/low-till, cover cropping, and fertilizer conservation practices</li> <li>2. Number of farms converted to no/low-till, cover cropping, and fertilizer conservation practices</li> <li>3. Amount of incentive funding issued</li> </ol>

## ENERGY EFFICIENCY AND ELECTRIFICATION OF RESIDENTIAL, COMMERCIAL, AND PUBLIC BUILDINGS

### 5.2



GHG Reduction Measure #2:

#### Energy Efficiency for Residential, Commercial and Public Buildings

Sector	Commercial and Residential Buildings
Description	Energy efficiency upgrades provide a wide range of economic and health benefits through lower building energy consumption. Additionally, efficiency improvements are a pathway to greater affordability and equity for LIDACs. To address these regional challenges, this measure incentivizes the installation of electric and hybrid heating systems and energy efficient retrofits for buildings by promoting the Thriving Buildings program energy benchmark for buildings 50,000 sq ft or larger, and encouraging benchmarks for buildings smaller than 50,000 sq ft. Additionally, this strategy proposes to utilize the Indiana Energy Independence Fund to develop localized revolving loan funds for energy efficiency and renewable upgrades, prioritizing low-income areas. This measure is intended to be implemented throughout the Indianapolis MSA.
Active Programs	Indiana Energy Saver Program (OED), Thriving Buildings (City of Indianapolis), Thriving Non-Profits (City of Indianapolis), Indiana Energy Independence Fund, and local government building upgrades
GHG Emissions Reductions	Emissions reduced from 2025-2030 (MT CO <sub>2</sub> e): 823,788 Emissions reduced from 2025-2050 (MT CO <sub>2</sub> e): 3,766,196
Estimated Implementer Costs	Total costs from 2025-2030 (2025\$): \$272,075,225 Total costs from 2025-2050 (2025\$): \$1,360,376,123
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, including the City of Indianapolis Office of Sustainability and the Indiana Energy Independence Fund. Duke Energy, CenterPoint Energy, and AES Indiana can provide support through their programs and Indiana Office of Energy Development can provide policy, grant, and education assistance.
Metrics to Track Progress	Progress made on this measure can be tracked through the following metrics: <ol style="list-style-type: none"> <li>1. Number of buildings benchmarked</li> <li>2. Number of buildings upgraded with renewable systems or energy efficiency</li> <li>3. Amount of funding issued</li> </ol>



## UTILITY-SCALE CLEAN ENERGY

### 5.3



#### GHG Reduction Measure #3: Utility-Scale Clean Energy

Sector	Electricity Generation
Description	<p>Electricity consumption is anticipated to increase across Central Indiana due to population growth, industry, and data centers. In Indiana, coal and natural gas are the primary fuels producing electricity, and the grid covering Central Indiana is not anticipated to reduce its carbon intensity, which contributes significant emissions in the business-as-usual scenario. Therefore, it is critical that Central Indiana explore clean energy solutions to facilitate meaningful emissions reductions through electrified building and transportation strategies. This strategy focuses on enhancing the construction of utility-scale solar, wind, battery storage infrastructure, and small modular reactors by supporting clean power development and working with the Office of Energy Development's (OED) Commercial Solar and Wind Energy Development Center to mitigate barriers to development. It is recommended that restored brownfield sites are prioritized for solar energy system installation to limit land use conflicts. In addition, it is recommended that localities partner with utilities to source renewable energy. This strategy will span throughout the Central Indiana region with solar and wind prioritized for northern counties, and solar for southern counties.</p>
Active Programs	N/A
GHG Emissions Reductions	<p>Emissions reduced from 2025-2030 (MT CO<sub>2</sub>e): 431,250</p> <p>Emissions reduced from 2025-2050 (MT CO<sub>2</sub>e): 1,431,421</p>
Estimated Implementer Costs	<p>Total costs from 2025-2030 (2025\$): \$39,709,024</p> <p>Total costs from 2025-2050 (2025\$): \$161,071,797</p>
Implementing and Supporting Entities	<p>Local entities with active programs will implement this strategy, including the City of Indianapolis Office of Sustainability, IU Environmental Resilience Institute, and local governments and businesses. Duke Energy, AES Indiana, Wabash Valley Power Alliance, Hoosier Energy, and the Indiana Office of Utility Consumer Counselor can provide support through programs and OED can provide policy, grant, and education assistance.</p>
Metrics to Track Progress	<p>Progress made on this measure can be tracked through the following metrics:</p> <ol style="list-style-type: none"> <li>1. Renewable energy capacity installed (MW)</li> <li>2. Number of restored brownfield sites with renewable energy systems</li> <li>3. Amount of renewable energy sourced by local utilities (MW)</li> </ol>



## DISTRIBUTED AND COMMUNITY SOLAR

### 5.4



#### GHG Reduction Measure #4: Distributed and Community Solar

Sector	Electricity Generation
Description	As described in measure #3, the Central Indiana region is anticipating an increase in energy consumption in the coming years. To ensure electricity consumed is low emission, this strategy incentivizes the construction of distributed solar energy and storage infrastructure by carving out funding opportunities through a revolving loan fund and providing resources to building owners to assist in navigating solar cooperatives and bulk purchasing contracts. OED can support communities to earn "commercial renewable energy ready" certifications as part of the Commercial Solar and Wind Energy Development Center. It is recommended that localities collaborate with utilities to provide net metering options or alternative compensation plans for customers, and coordinate with local planners to streamline permitting. Finally, localities can prioritize developing solar in land use saving practices, with agrivoltaics, solar canopies on parking lots and other commercial facilities, and brightfields.
Active Programs	Distributed solar pilot program (Office of Sustainability, Solar United Neighbors, Indianapolis Neighborhood Housing Partnership), Indiana Energy Independence Fund, Indiana Energy Property Tax Exemption
GHG Emissions Reductions	Emissions reduced from 2025-2030 (MT CO <sub>2</sub> e): 37,925 Emissions reduced from 2025-2050 (MT CO <sub>2</sub> e): 180,729
Estimated Implementer Costs	Total costs from 2025-2030 (2025\$): \$110,801,563 Total costs from 2025-2050 (2025\$): \$600,859,537
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, including the Indianapolis Office of Sustainability, IU Environmental Resilience Institute, local governments, businesses, residents, and building owners. OED can provide additional policy, grant, and educational assistance. Duke Energy, AES, Wabash Valley Power Alliance, and Hoosier Energy can provide support as operating utilities.
Metrics to Track Progress	Progress made on this measure can be tracked through the following metrics: <ol style="list-style-type: none"> <li>1. Total renewable energy capacity installed (MW)</li> <li>2. Renewable energy capacity of agrivoltaics, solar canopies, and brightfields (MW)</li> <li>3. Number of buildings with distributed energy resources</li> <li>4. Number of "renewable energy ready" certifications issued</li> </ol>

## INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS

5.5



GHG Reduction Measure #5:

### Industrial Energy Efficiency and Alternative Fuels

Sector	Industry
Description	<p>Central Indiana's industrial sector is reliant on fossil fuels that leave industries vulnerable to price volatilities and emit harmful pollutants into surrounding communities and ecosystems. The region is positioned to be a leader in modernizing the industrial sector through local innovation of alternative fuel technologies and energy efficient operations. To cultivate a greener industrial sector, this measure will incentivize the adoption of energy efficiency retrofits at industrial facilities through the expansion of energy benchmarking programs, such as the Energy Insights Program, and incentivize the adoption of energy efficient machinery or industrial processes with revolving loan funds through the Indiana Energy Independence Fund's green bank. Additionally, this measure supports the production and use of green hydrogen from the Midwest Hydrogen Hub (MachH2) in industrial ethanol production and refining, and cement, glass, and steel production, as well as in aviation and long-haul trucking. Energy Systems Network launched the Hydrogen Industry Alliance in May 2024, which will play a role in commercialization, advocacy, and education to the widescale adoption of hydrogen across central Indiana. This is a longer-term strategy, which will likely not begin operation until around 2040.</p>
Active Programs	Purdue Industrial and Assessment Center, Indiana Energy Independence Fund, Midwest Hydrogen Hub (MachH2), and Energy Insights Program (currently paused)
GHG Emissions Reductions	<p>Emissions reduced from 2025-2030 (MT CO<sub>2</sub>e): 309,237</p> <p>Emissions reduced from 2025-2050 (MT CO<sub>2</sub>e): 1,543,639</p>
Estimated Implementer Costs	<p>Total costs from 2025-2030 (2025\$): \$2,469,795</p> <p>Total costs from 2025-2050 (2025\$): \$13,644,958</p>
Implementing and Supporting Entities	Energy Systems Network, Purdue Industrial and Assessment Center, Indiana Energy Independence Fund
Metrics to Track Progress	<p>Progress made on this measure can be tracked through the following metrics:</p> <ol style="list-style-type: none"> <li>1. Number of buildings benchmarked</li> <li>2. Number of buildings upgraded with energy efficiency or alternative fuel technologies</li> <li>3. Amount of incentive funding issued</li> </ol>

## ENHANCE GREEN SPACES

### 5.6



GHG Reduction Measure #6:  
**Enhance Green Spaces**

Sector	Natural and Working Lands
Description	<p>In Central Indiana, rapid development can strain natural resources and minimize the prevalence of natural landscapes. Green spaces—including parks, urban forests, and wetlands—are vital to the health and resilience of communities. Preserving and expanding green spaces not only protects biodiversity and removes environmental pollutants, but can also strengthen the region’s resilience to severe weather events and enable communities to maintain a high quality of life. This strategy promotes the reclamation and revitalization of wetlands and forested lands across suburban and rural central Indiana through the expansion of incentive and educational programs. In urban areas, impactful urban tree planting to reduce urban heat island effect and green spaces to LIDAC communities should be prioritized. Additionally, green infrastructure should be incorporated into planning, such as with permeable pavements, rain gardens, tree boxes, and green roofs, for new infrastructure. This measure will span throughout the entire central Indiana region.</p>
Active Programs	Urban Wildlife Habitat Cost Share Program (DNR), 30,000 Trees (Indy Dept of Public Works), Wetlands Mitigation Monitoring (IDEM), 1 Million Trees (Land Trust), Keep Beautiful Branches (Indianapolis, Hamilton County, etc.), Project Greenspace
GHG Emissions Reductions	<p>Emissions reduced 2030 (MT CO<sub>2</sub>e): 918</p> <p>Emissions reduced 2050 (MT CO<sub>2</sub>e): 24,221</p>
Estimated Implementer Costs	<p>Total costs 2030 (2025\$): \$864,824</p> <p>Total costs 2050 (2025\$): \$5,040,523</p>
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, including the Central Indiana Land Trust, Indianapolis Department of Public Works, County Soil and Water Conservation Districts, local governments, businesses, residents and building owners. IDEM, DNR and INDOT can provide additional policy, grant, and education assistance.
Metrics to Track Progress	<p>Progress made on this measure can be tracked through the following metrics:</p> <ol style="list-style-type: none"> <li>1. Total wetland area restored (acres)</li> <li>2. Total forested land restored (acres)</li> <li>3. Amount of permeable pavement and green roofing installed</li> <li>4. Number of rain gardens and tree boxes installed</li> </ol>

## ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES

5.7




GHG Reduction Measure #7:

### Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies

Sector	Transportation
Description	Emissions from gasoline and diesel vehicles contribute significantly to localized air pollution. Electric vehicles (EVs) offer a less impactful alternative to traditional fossil fuel powered vehicles, producing zero tailpipe emissions, which can improve local air quality and public health. Central Indiana is positioned to become a hub for EV innovation with manufacturing companies fueling job growth and technological advancement, coupled with its strong automotive legacy and skilled workforce. This measure incentivizes the adoption of EVs by installing charging infrastructure along high-traffic highways, roads, freeways, and exits. It is also recommended that public fleets convert to electric vehicles upon end of life. Recognizing that Central Indiana is a highly trafficked freight corridor, this strategy also incentivizes alternative fuel charging infrastructure for low emissions goods movement technologies. This measure will span throughout the entire central Indiana region.
Active Programs	NEVI Indiana EV Deployment Plan (INDOT), CIRCLE 2050 Metropolitan Transportation Plan (IMPO), Go EV IN (Drive Clean Indiana), Regional Freight Plan (IMPO), Transportation Technology Pilots (INDOT), AES Indiana's Electric Vehicle (EV) plan
GHG Emissions Reductions	Emissions reduced from 2025-2030 (MT CO <sub>2</sub> e): 2,109,172 Emissions reduced from 2025-2050 (MT CO <sub>2</sub> e): 20,244,841
Estimated Implementer Costs	Total costs from 2025-2030 (2025\$): \$622,154,149 Total costs from 2025-2050 (2025\$): \$3,599,350,460
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, the Indianapolis Zoo, AES Indiana, local governments, vehicle businesses, residents, and building owners. INDOT and Indiana Economic Development can provide additional policy, grant, and education assistance.
Metrics to Track Progress	Progress made on this measure can be tracked through the following metrics: <ol style="list-style-type: none"> <li>1. Number of AC charging stations installed</li> <li>2. Number of DCFC charging stations installed</li> <li>3. Public electric fleet conversion (number of cars)</li> </ol>

## TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS, AND MOBILITY DEVICES

5.8 	GHG Reduction Measure #8: <b>Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>
Sector	Transportation
Description	Bikes, pedestrian walkways, and mobility devices are essential for building a more inclusive, sustainable, and connected transportation system in Central Indiana. As the region continues to grow, these modes of travel offer affordable and low-emission alternatives to driving, helping reduce traffic congestion and improve air quality. This strategy incentivizes the use of transportation alternatives by supporting the enhancement of biking infrastructure, expanding the regional bikeway network and the use of walking and biking trails through trail-oriented development (TrOD), and providing resources and support for regional micromobility programs, particularly in communities outside of the urban core and LIDACs. This measure will span throughout the central Indiana region.
Active Programs	CIRCLE 2050 Metropolitan Transportation Plan (IMPO), Regional Active Transportation Plan (IMPO), Central Indiana Transit Plan (IMPO), Nickel Plate Trail, Eagle Creek Trail, Monon Trail, B&O Trail
GHG Emissions Reductions	Emissions reduced from 2025-2030 (MT CO <sub>2</sub> e): 10,610 Emissions reduced from 2025-2050 (MT CO <sub>2</sub> e): 68,174
Estimated Implementer Costs	Total costs from 2025-2030 (2025\$): \$12,973,193 Total costs from 2025-2050 (2025\$): \$64,865,965
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, including IMPO, CIRT, the Indianapolis Zoo, local governments including Franklin, Plainfield, Indianapolis Parks and Recreation and Department of Public Works, and Carmel, businesses, residents, and building owners. INDOT can provide additional policy, grant, and education assistance.
Metrics to Track Progress	<p>Progress made on this measure can be tracked through the following metrics:</p> <ol style="list-style-type: none"> <li>1. Regional bikeway network constructed (miles)</li> <li>2. Biking and walking trails constructed (miles)</li> <li>3. Number of micromobility programs</li> </ol>

## WASTE TO ENERGY

5.9



GHG Reduction Measure #9:  
**Waste to Energy**

Sector

Waste and Materials Management

Description

Waste-to-energy (WTE) facilities at landfills and wastewater treatment plants are increasingly important for Central Indiana as the region seeks sustainable solutions to waste management and energy production. These facilities capture methane and other biogases from the breakdown of waste and wastewater, which is then converted into usable electricity or heat. To reduce air, soil, and water pollution, this strategy supports the development of waste-to-energy facilities across landfills and wastewater treatment plants in the Indianapolis MSA. This strategy also includes programs that collect leftover food waste from events, restaurants, and grocery stores, and transport to a local digester. The digesters should produce RNG and/or electricity, providing renewable energy to businesses and fleets in the central Indiana area. This measure is intended to span throughout the Central Indiana region and is anticipated to be more of a long term strategy.

Active Programs

Indianapolis Area Renewable Energy and Waste Reduction Operation (IMS, ADA, Newtrient), Noblesville, Carmel, Speedway, Shelbyville

GHG Emissions  
Reductions

Emissions reduced from 2025-2030 (MT CO<sub>2</sub>e): 38,059  
Emissions reduced from 2025-2050 (MT CO<sub>2</sub>e): 1,243,160

Estimated  
Implementer Costs

Total costs from 2025-2030 (2025\$): \$104,682,853  
Total costs from 2025-2050 (2025\$): \$633,093,136

Implementing and  
Supporting Entities

Local entities with active programs will implement this strategy, including IMS, American Dairy Association, Newtrient, local governments such as Noblesville, Carmel, Shelbyville, Speedway, Indianapolis, and other cities with larger wastewater treatment plants and landfills. IDEM can provide additional policy, grant, and education assistance.

Metrics to Track  
Progress

Progress made on this measure can be tracked through the following metrics:

1. Number of WTE facilities constructed
2. Amount of gas captured (scf)
3. Amount of electricity produced (kW)
4. Amount of waste diverted from landfill (tons)



## LANDFILL WASTE REDUCTION AND DIVERSION

5.10



GHG Reduction Measure #10:

### Landfill Waste Reduction and Diversion

Sector	Waste and Materials Management
Description	Over the next 25 years, population, urban and industrial activity in Central Indiana will lead to an increase in municipal solid waste generation. This waste is likely to end up in landfills, which can contribute to soil and groundwater contamination if leachate systems are overwhelmed, especially during periods of heavy rainfall. Additionally, landfills are a source of criteria and hazardous air pollutant emissions. To safeguard local water sources, ecosystems and local communities, this strategy diverts waste from landfills, increasing composting, reuse and recycling. This can be achieved by promoting trash contracts to expand city-wide recycling services for residents across the Central Indiana region and partnering with composting service providers to expand subscription composting, as described in Thrive Indianapolis. This measure will span throughout the Indianapolis MSA and greater Central Indiana region.
Active Programs	Recycling Program (Indy Dept of Public Works), Indiana Thriving Schools and Students (Earth Charter Indiana) Indiana Office of Sustainability, Castaway Compost, Earth Mama Compost, Green with Indy, Indy Go Green, City Leaf Composting, local governments implementing residential curbside recycling, Indianapolis Zoo, and RecycleForce
GHG Emissions Reductions	Emissions reduced from 2025-2030 (MT CO <sub>2</sub> e): 136,172 Emissions reduced from 2025-2050 (MT CO <sub>2</sub> e): 5,689,885
Estimated Implementer Costs	Total costs from 2025-2030 (2025\$): \$11,480,049 Total costs from 2025-2050 (2025\$): \$325,471,393
Implementing and Supporting Entities	Local entities with active programs will implement this strategy, including the City of Indianapolis Office of Sustainability, Indianapolis Department of Public Works, Earth Charter, local governments including cities with landfills, residents, and businesses. IDEM can provide additional policy, grant, and education assistance.
Metrics to Track Progress	Progress made on this measure can be tracked through the following metrics: <ol style="list-style-type: none"> <li>1. Amount of waste diverted from landfill (tons)</li> <li>2. Amount of waste recycled (tons)</li> </ol>



## 6. Assessing Community Impacts and Benefits

### OVERVIEW

As Central Indiana works to advance its climate action goals, it is essential to understand how the strategies proposed in this plan will impact the people who live and work here. This section of the plan evaluates how climate initiatives such as clean energy, energy efficiency, transportation alternatives, composting and recycling, and green infrastructure can enhance public health, economic opportunities, and overall quality of life across Central Indiana. This section highlights the potential for climate action to reduce criteria and hazardous air pollutants, lower energy costs, create local jobs, and improve access to nature and mobility options, especially for low income and disadvantaged communities (LIDACs). By centering community well-being and economic prosperity, this plan ensures that Central Indiana's progress to a low-carbon future benefits all residents and strengthens the resilience of the region's communities.

This section of the plan includes four key components. First, it identifies existing climate risks, impacts and vulnerabilities among communities across Central Indiana, laying the foundation for climate-related challenges communities are facing. Second, it presents a baseline inventory of criteria and hazardous air pollutants for Central Indiana in the year 2020, offering a snapshot of air quality conditions across all major pollutants. Third, it provides a projection of criteria air pollutant emissions through 2050 under a business-as-usual (BAU) scenario, illustrating Central Indiana's future co-pollutant emissions profile. Finally, this section summarizes the potential community benefits and disbenefits associated with each climate strategy outlined in this plan, highlighting how these measures may impact public health, economic development, and environmental resilience across Central Indiana communities.

### EXISTING ENVIRONMENTAL RISKS, IMPACTS, AND CLIMATE VULNERABILITIES

Indiana is particularly vulnerable to increased flood risk and exposure to extreme temperatures. Over the next 30 years, climate change is projected to increase average temperatures in Indiana by about 5

to 6 degrees Fahrenheit.<sup>21</sup> The frequency, duration, and intensity of heat waves are expected to rise, affecting communities most vulnerable, including low-income communities, communities of color, residents who lack air conditioning or are experiencing homelessness, and outdoor workers.<sup>22</sup> In addition to heat waves, Central Indiana communities are also at higher risk of experiencing cold waves and heavy snowfall,<sup>23</sup> impacting residents without adequate heating systems and infrastructure. Counties in Central Indiana are also particularly vulnerable to river-line flooding from the increasing probability of heavy rain events in the future,<sup>24</sup> which puts residents and critical infrastructure at risk of damage.

LIDAC residents in Central Indiana are exceptionally vulnerable to several climate and other environmental risks and impacts compared to residents across the rest of the region. In the Midwest, low-income individuals are 10 percent more likely to live in areas with the highest projected labor hour losses for weather-exposed workers due to extreme temperatures.<sup>25</sup> Additionally, minorities and individuals without a high school diploma in the Midwest are eight to 10 percent more likely to currently live in areas with the highest projected inland flooding damages.<sup>26</sup> Within Central Indiana, there are several tracts identified as disadvantaged in EPA's CJEST where the risk of flooding is above the 70<sup>th</sup> percentile across the state. Main regions of concern include multiple census tracts in Marion, Morgan, Shelby, and Madison Counties.<sup>27</sup>

Additionally, several LIDAC tracts within Marion County are subject to air pollution burden above the 95<sup>th</sup> national percentile, with LIDAC tracts in surrounding counties above the 80<sup>th</sup> national percentile.<sup>28</sup> While greenhouse gases (GHGs) are the primary focus of climate action plans due to their impact on the climate, criteria air pollutants (CAPs), including ammonia, particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOCs), and carbon monoxide, and hazardous air pollutants (HAPs), including benzene, mercury, and lead compounds, pose an immediate risk to public health, infrastructure, and environmental quality, directly impacting communities within the Central Indiana region. Some CAPs and HAPs are known or suspected of causing cancer, while others may lead to problems like birth defects, respiratory issues, cardiovascular diseases, or damage to the

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<sup>21</sup> Indiana University Environmental Resilience Institute. 2024. "Extreme Heat in Indiana." Accessed November 2024. Retrieved from: <https://eri.iu.edu/resources/fact-sheets/extreme-heat-in-indiana.html>

<sup>22</sup> Indiana University Environmental Resilience Institute. 2024. "Extreme Heat in Indiana." Accessed November 2024. Retrieved from: <https://eri.iu.edu/resources/fact-sheets/extreme-heat-in-indiana.html>

<sup>23</sup> Environmental Defense Fund, Texas A&M, Darkhorse Visualization. "The U.S. Climate Vulnerability Index." Accessed November 2025. Retrieved from: [https://map.climatevulnerabilityindex.org/report/cc\\_extreme\\_events/marion-county-indiana?mapBoundaries=County&mapFilter=0&reportBoundaries=County&geoContext=State](https://map.climatevulnerabilityindex.org/report/cc_extreme_events/marion-county-indiana?mapBoundaries=County&mapFilter=0&reportBoundaries=County&geoContext=State)

<sup>24</sup> Ibid

<sup>25</sup> U.S. Environmental Protection Agency (EPA). 2021. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. Accessed January 2024. Retrieved from: [https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability\\_september-2021\\_508.pdf](https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf)

<sup>26</sup> Ibid

<sup>27</sup> Public Environmental Data Partners. "EJScreen: Environmental Justice Screening and Mapping Tool (V2.3)." Accessed November 2025. Retrieved from: <https://pedp-ejscreen.azurewebsites.net/https://www.epa.gov/ejscreen>

<sup>28</sup> Ibid

reproductive system.<sup>29,30</sup> Tracking these pollutants is important because even small amounts can have big impacts, especially for children, older adults, and people with existing health conditions. Additionally, research from NIEHS indicates there are ethnic and socioeconomic disparities in air pollution emissions,<sup>31</sup> indicating that individuals earning less than \$70,000 annually are expected to see smaller reductions in emissions than those with higher incomes, pointing to an environmental justice issue.

## CO-POLLUTANT BASELINE INVENTORY

Establishing a co-pollutant baseline inventory is a critical step in understanding the full scope of air quality conditions Central Indiana communities face. By documenting the levels and sources of CAPs and HAPs, this inventory provides a foundation to evaluate how the measures outlined in this plan may reduce harmful emissions. It can also help to identify communities disproportionately impacted by poor air quality, ensuring that the strategies in this plan are designed to deliver equitable health and environmental benefits across Central Indiana.

## METHODOLOGY

This inventory utilized the U.S Environmental Protection Agency (EPA) National Emissions Inventory (NEI) database<sup>32</sup> to produce a 2020 base year inventory of CAP and HAP emissions across the Central Indiana region. Co-pollutant emissions within this inventory include those from Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Putnam, and Shelby counties.

## RESULTS

The largest source of CAP emissions across nearly all counties was carbon monoxide from the transportation sector, as shown in Figure 10. Table 5 summarizes CAP emissions across the Central Indiana region by sector and pollutant type. Table 26 and Table 27 in Appendix D. Co-Pollutant 2020 Baseline Inventory Data provide a full list of all CAPs and HAPs for the base year inventory by pollutant, sector, and county.

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<sup>29</sup> U.S. EPA. What are Hazardous Air Pollutants? November 21, 2024. Accessed October 2025. Retrieved from: <https://www.epa.gov/haps/what-are-hazardous-air-pollutants>

<sup>30</sup> National Institute of Environmental and Health Sciences. Air Pollution and Your Health. Accessed October 2025. Retrieved from: <https://www.niehs.nih.gov/health/topics/agents/air-pollution>

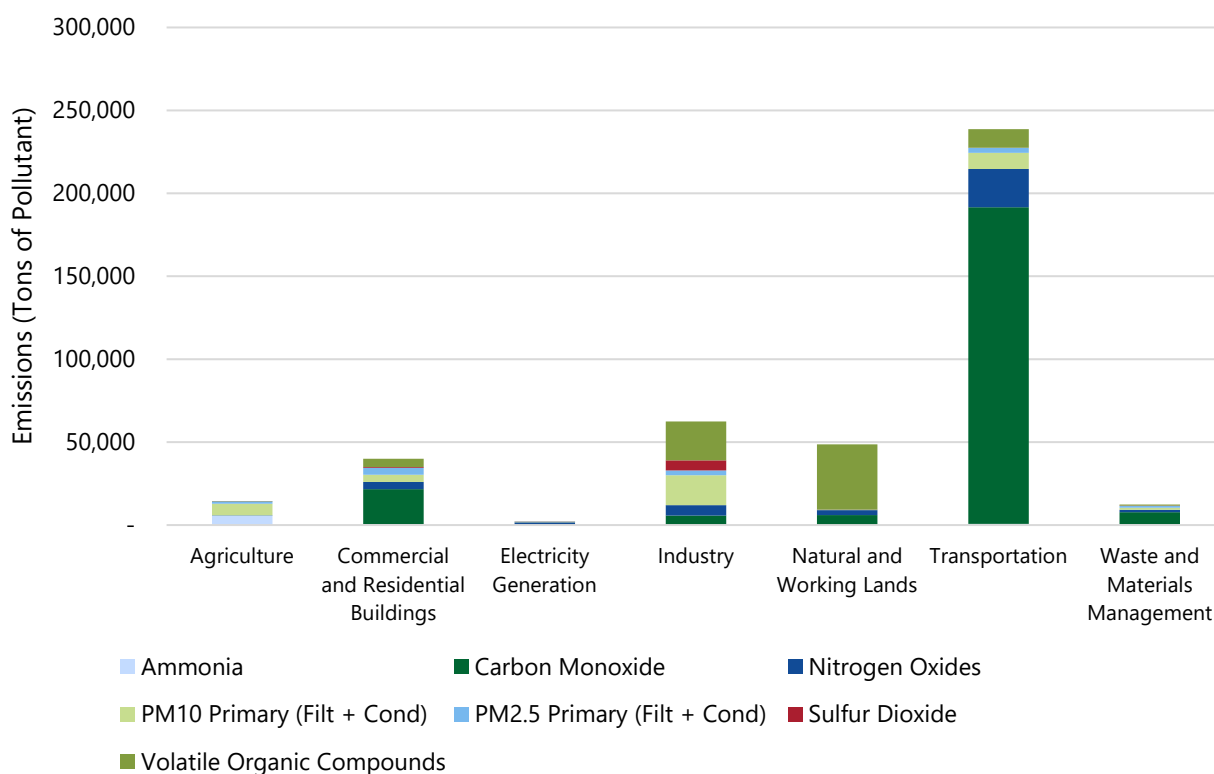
<sup>31</sup> National Institute of Environmental and Health Sciences. Air Pollution and Your Health. Accessed October 2025. Retrieved from: <https://www.niehs.nih.gov/health/topics/agents/air-pollution>

<sup>32</sup> U.S EPA. National Emissions Inventory. Accessed 10.29.25. Retrieved from: <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

**Table 5. Central Indiana Criteria Air Pollutants – Base Year Inventory (2020)**

Pollutant (Tons of Pollutant)	Agriculture	Commercial and Residential Buildings	Electricity Generation	Industry	Natural and Working Lands	Transportation	Waste and Materials Management	Grand Total
Ammonia	5,829	529	0.19	270	19	716	439	<b>7,802</b>
Carbon Monoxide	53	21,112	380	5,511	5,995	190,887	7,315	<b>231,253</b>
Nitrogen Oxides	1.25	4,315	1,286	6,183	2,984	23,076	1,461	<b>39,306</b>
PM10 Primary (Filt + Cond)	7,032	4,367	178	18,065	134	9,694	1,240	<b>40,710</b>
PM2.5 Primary (Filt + Cond)	1,381	4,166	178	2,914	116	3,037	1,097	<b>12,889</b>
Sulfur Dioxide	0.23	446	19	6,086	12	82	190	<b>6,836</b>
Volatile Organic Compounds	228	5,012	80	23,381	39,416	11,227	616	<b>79,961</b>
<b>Grand Total</b>	<b>22,922</b>	<b>46,967</b>	<b>2,351</b>	<b>82,973</b>	<b>48,677</b>	<b>248,180</b>	<b>14,617</b>	

**Figure 10. 2020 Baseline Criteria Air Pollutants by Sector**





## BUSINESS-AS-USUAL CO-POLLUTANT PROJECTION

The BAU analysis of critical air pollutants is a method of estimating future air quality conditions in the Central Indiana region based on current trends and policies, assuming no new regulations, technologies, and behavioral shifts. This analysis can support scientists, policymakers, and the public in understanding how different sectors of the economy impact regional air quality. By projecting co-pollutant emissions from vehicles, industries, buildings, and other sources under existing conditions, this analysis can provide a baseline scenario that can be used to compare the impact of potential interventions or policy changes. It is a critical tool for guiding informed decision-making at the local and regional levels.

## METHODOLOGY

This analysis utilized the U.S EPA's NEI 2022 database, which provides future co-pollutant emission estimates through 2038 by county.<sup>33</sup> Non-point, non-road, and on-road mobile co-pollutant emissions data was gathered from the "County Level" tab, and point source co-pollutant emissions data was extracted from the "Facility Data" tab. Additionally, the analysis utilized co-pollutant data from the 2011<sup>34</sup> and 2017<sup>35</sup> NEI inventories. These data sets were compiled together and analyzed to ensure there is no double counting of emissions between data sets. Utilizing these sets of historical and future projection data, co-pollutant emissions were projected linearly through 2050.

## RESULTS

Co-pollutant emissions within the Central Indiana region are expected to decrease through 2050, as shown in Figure 11. Over the next 25 years, it is anticipated that there will be a shift towards purchasing low-carbon fuel automobiles as a replacement for conventional gasoline and diesel passenger vehicles, which will decrease CO and NO<sub>x</sub> emissions from the transportation sector. Additionally, co-pollutant emissions are anticipated to decrease across the electricity generation sector due to fossil fuel powered facilities reducing coal consumption and shifting to less carbon intense power sources, such as natural gas and renewable energy. Furthermore, co-pollutant emissions from industry are anticipated to increase slightly due to economic growth within Central Indiana, despite a potential shift towards the use of cleaner fuels used in industrial processes. Additionally, waste sector co-pollutant emissions are anticipated to decrease slightly due to the sunset of waste combustion incinerators over the next 25 years. Finally, commercial and residential buildings co-pollutant emissions are anticipated to grow slightly, which is aligned with anticipated population growth

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<sup>33</sup> U.S EPA. 2022 National Emissions Inventory Data Retrieval Tool. Accessed October 2025. Retrieved from: <https://awsedap.epa.gov/public/single/?appid=a2771e5d-51cf-4af8-a237-b521f789b8eb&sheet=5d3fdda7-14bc-4284-a9bb-cfd856b9348d&opt=ctxmenu,currse>

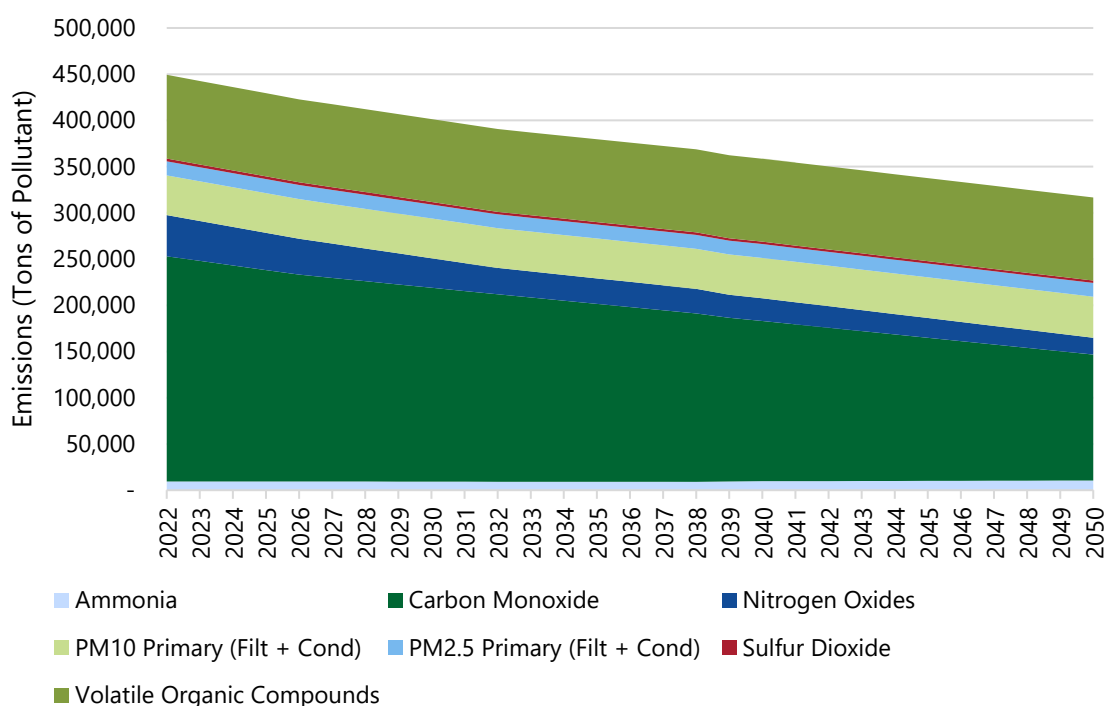
<sup>34</sup> U.S EPA 2011 National Emissions Inventory. Accessed October 2025. Retrieved from: <https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data>

<sup>35</sup> U.S EPA 2017 National Emissions Inventory. Accessed October 2025. Retrieved from: <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data>

projections. All CAP emissions data projected through 2050 are summarized by sector in Appendix E. Business-as-Usual Co-Pollutant Projections Data.

For this range of emissions reductions and increases, there will be regional community benefits across Central Indiana. The reduction of transportation sector emissions suggests that the air quality for communities surrounding major highways or thoroughfares will improve, as less NO<sub>x</sub> and CO will be emitted, resulting in less ground-level ozone production. Additionally, communities surrounding electric power plants and waste combustion incinerators may anticipate a reduction in noxious gases (NO<sub>x</sub> and SO<sub>2</sub>). Furthermore, communities residing near heavy industry facilities will experience higher emissions in particulate matter, ammonia, and volatile organic compounds.

**Figure 11. Business-as-Usual Co-Pollutant Emissions Projections, All Sectors (2022-2050)**



## COMMUNITY CO-BENEFITS AND POTENTIAL DRAWBACKS

Incorporating an evaluation of community co-benefits and potential disbenefits into a climate action plan is a critical step toward building equitable and resilient climate strategies. Climate initiatives have the potential to deliver a wide range of positive outcomes, from cleaner air and improved public health to economic opportunities and stronger social cohesion. However, they can also have unintended impacts and create new challenges if not carefully considered. By assessing both the advantages and potential drawbacks of proposed actions, we can ensure that the climate solutions included in this plan are responsive to local needs, inclusive of diverse voices, and aligned with broader goals of communities that face additional barriers or burdens. This approach not only strengthens community engagement but also enhances the long-term success of climate efforts.

The following section outlines air pollution reductions, additional community benefits, and potential drawbacks associated with each measure included in this plan. Co-pollutant reductions were calculated using the following four methods:

1. **AP 42 Chapter 1.4:** For energy efficiency and electrification measures (2,5), criteria air pollutant emissions from stationary combustion of natural gas were calculated using emission factors from U.S. EPA's Compilation of Air Pollutant Emissions Factors from Stationary Sources (AP-42, Chapter 1.4).<sup>36</sup>
2. **Avoided Emissions and Generation Tool (AVERT):** For clean energy and energy efficiency related measures (2,3,4,5), criteria air pollutant reductions were calculated using the U.S. EPA's AVERT tool.<sup>37</sup> Emissions reductions were calculated by the tool for avoided electricity consumption due to energy efficiency installation and clean energy capacity expansion through 2050.
3. **National Transportation Statistics:** For transportation-related measures (7,8), criteria air pollutant emissions reductions were estimated using emissions factors from the Bureau of Transportation Statistics, projected out through 2050.<sup>38</sup>
4. **NEI Proportion Method:** For the remaining measures, criteria and hazardous air pollutant emissions reductions were calculated using HAP data from the 2020 NEI database<sup>39</sup> and CAP data from the 2022 NEI database.<sup>40</sup> As recommended in the Technical Reference Document from EPA,<sup>41</sup> this method calculates the proportion of CAPs and HAPs from the 2020 or 2022 NEI to total 2020 or 2022 GHG emissions from the sector associated with each measure. This proportion value is then multiplied by the annual GHG emissions reductions for each measure to estimate annual co-pollutant reductions. This method assumes that the proportion of co-pollutant to GHG emissions from the baseline inventories stays constant through 2050. For the agriculture and waste measures (1,9,10), the proportion was calculated annually using the BAU co-pollutant and GHG projections in place of NEI data.

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<sup>36</sup> U.S. EPA. AP-42: Compilation of Air Emissions Factors from Stationary Sources, Chapter 1.4. Accessed October 2025. Retrieved from: <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources>

<sup>37</sup> U.S. EPA. AVERT. Accessed October 2025. Retrieved from: <https://www.epa.gov/avert>

<sup>38</sup> Bureau of Transportation Statistics. Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric. Accessed October 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and>

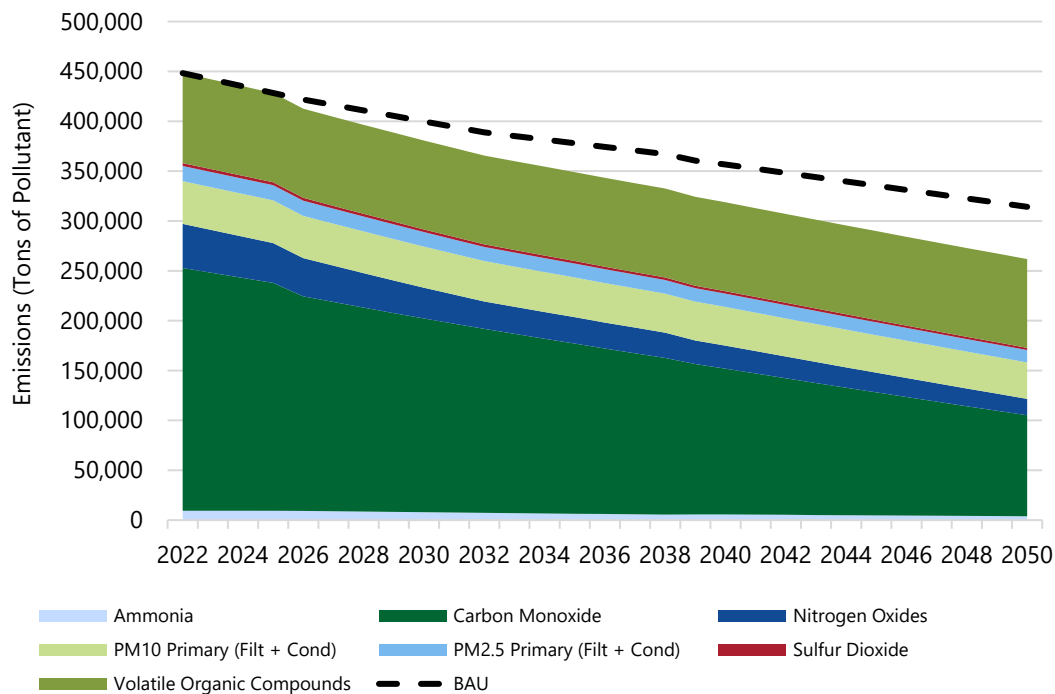
<sup>39</sup> U.S. EPA. National Emissions Inventory. Accessed 10.29.25. Retrieved from: <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

<sup>40</sup> U.S. EPA. 2022 National Emissions Inventory Data Retrieval Tool. Accessed October 2025. Retrieved from: <https://awsedap.epa.gov/public/single/?appid=a2771e5d-51cf-4af8-a237-b521f789b8eb&sheet=5d3fdda7-14bc-4284-a9bb-cfd856b9348d&opt=ctxmenu,currsl>

<sup>41</sup> U.S. EPA. Climate Pollution Reduction Grants Program: Technical Reference Document, Benefits Analysis – Co-Pollutant Impacts. May 30, 2023. Accessed October 2025. Retrieved from: [https://www.epa.gov/system/files/documents/2023-05/Technical\\_Reference\\_Doc\\_Copollutant\\_Assessment\\_FINAL\\_TO\\_POST.pdf](https://www.epa.gov/system/files/documents/2023-05/Technical_Reference_Doc_Copollutant_Assessment_FINAL_TO_POST.pdf)

CAP reductions for the Central Indiana region for all measures are displayed in Figure 12. Total HAP and CAP reductions for each measure are displayed in Appendix F. Co-Pollutant Reductions Data.

**Figure 12. Co-Pollutant Reductions - CCAP Implementation Scenario**



## MEASURE 1 – REDUCE NUTRIENT RUNOFF FROM CROPLANDS

### Co-Pollutant Reductions

To estimate co-pollutant emission reductions, the proportion of co-pollutant emissions from the BAU scenario was compared to annual GHG emissions from the agriculture sector from the BAU GHG projection. This proportion was then applied to the annual GHG reductions expected from nutrient runoff mitigation measures, producing estimates of annual reductions in associated air pollutants.

The primary pollutants that are reduced through this measure include ammonia and PM. Ammonia generally is emitted during fertilizer application and manure management processes. PM<sub>2.5</sub> and PM<sub>10</sub> can be generated from agricultural activities and the secondary formation of ammonia.<sup>42</sup> Both originate from cropland nutrient management practices and fossil fuel use in agricultural operations.<sup>43</sup>

<sup>42</sup> Wyer, K. E., Kelleghan, D. B., Blanes-Vidal, V., Schauburger, G., & Curran, T. P. (2022). Ammonia emissions from agriculture and their contribution to fine particulate matter: A review of implications for human health. *Journal of Environmental Management*, 323(116285), 116285. <https://doi.org/10.1016/j.jenvman.2022.116285>

<sup>43</sup> Ibid.

For ammonia, approximately 3,865 tons are anticipated to be reduced between 2025 and 2030, and 81,599 tons by 2050. Ammonia is a major contributor to fine PM formation, which can impact lung health and visibility. PM<sub>2.5</sub> decreases by 861 tons in the near term and 17,488 tons by 2050, while PM<sub>10</sub> reductions reach 4,399 tons by 2030 and 89,638 tons by 2050.

Lower particulate matter levels result in cleaner air and reduced risks of asthma, heart disease, and other health conditions.<sup>44</sup> These reductions represent significant improvement in air quality, particularly in counties with intensive agricultural activity. Benefits from these reductions will primarily occur in rural areas with extensive cropland, where nutrient runoff reduction measures are implemented. These areas often experience higher exposure to ammonia and PM due to their proximity to agricultural operations.<sup>45</sup>

### **Additional Benefits and Potential Disbenefits**

Central Indiana's intensive corn-soybean systems and tile-drained fields make nutrient runoff, primarily nitrogen and phosphorus, a critical challenge for water quality, climate mitigation, and public health.<sup>46</sup> Implementing nutrient management and runoff reduction strategies offers multiple co-benefits, from cleaner air and water to improved agricultural resilience.

These reductions highlight the dual benefit of agricultural mitigation strategies: addressing climate change while improving public health and environmental quality. Lower concentrations of fine particles reduce risks of respiratory illnesses, cardiovascular disease, and asthma, particularly for vulnerable populations such as children and older adults.<sup>47</sup> Reports estimate that ambient outdoor pollution, largely via fine particles, caused roughly 4.2 million premature deaths globally in 2019.<sup>48</sup> Cleaner air therefore means fewer healthcare costs, reduced disease burden, and improved quality of life.

Ammonia acts as a precursor to the formation of secondary fine particulate matter and reduce nitrogen deposition in soils and waterways.<sup>49</sup> By limiting ammonia emissions, agricultural mitigation strategies can also help restrain PM<sub>2.5</sub> formation, reduce harmful algal blooms from nitrogen overload and deposition, improve soil and water health, and enhance broader ecosystem function.<sup>50</sup>

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<sup>44</sup> US EPA. (2021, September 17). *Air Pollution and Cardiovascular Disease Basics*. Wwww.epa.gov. <https://www.epa.gov/air-research/air-pollution-and-cardiovascular-disease-basics>

<sup>45</sup> Schultz, A. A., Peppard, P., Gangnon, R. E., & Malecki, K. M. C. (2019). Residential proximity to concentrated animal feeding operations and allergic and respiratory disease. *Environment International*, 130, 104911. <https://doi.org/10.1016/j.envint.2019.104911>

<sup>46</sup> Frankenberger, J., & Klavivko, E. (2020). *Indiana Agricultural Drainage Guide*. Purdue.edu. <https://engineering.purdue.edu/SafeWater/Drainage/drainintro.htm>

<sup>47</sup> Aithal, S. S., Sachdeva, I., & Kurmi, O. P. (2023). Air Quality and Respiratory Health in Children. *Air Quality and Respiratory Health in Children*, 19(2), 230040–230040. <https://doi.org/10.1183/20734735.0040-2023>

<sup>48</sup> World Health Organization. (2024, October 24). Ambient (outdoor) Air Quality and Health. World Health Organization. [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)

<sup>49</sup> EPA. (2017). *Agricultural Air Quality Conservation Measures Reference Guide for Poultry and Livestock Production Systems*. [https://gaftp.epa.gov/ap42/ch09/s04/references/ref21\\_c09s04\\_2024.pdf](https://gaftp.epa.gov/ap42/ch09/s04/references/ref21_c09s04_2024.pdf)

<sup>50</sup> Ti, C., Xia, L., Chang, S. X., & Yan, X. (2019). Potential for mitigating global agricultural ammonia emission: A meta-analysis. *Environmental Pollution*, 245, 141–148. <https://doi.org/10.1016/j.envpol.2018.10.124>



The co-benefits also extend beyond health and ecosystem services. Lower PM levels also contribute to better visibility, benefiting natural landscapes and outdoor recreation. Improved air quality can reduce wear on infrastructure by limiting particulate buildup on buildings and transportation systems.<sup>51</sup> Healthier communities may experience increased productivity and reduced absenteeism, creating indirect economic benefits.<sup>52</sup>

However, implementing nutrient runoff and ammonia emission reduction measures is not without challenges. Adopting nutrient runoff reduction measures may require investments in new technologies, equipment, or changes in farming practices.<sup>53</sup> These costs could pose challenges for smaller agricultural operations. Changes in fertilizer applications or land management could initially reduce crop yields or require additional labor and training, creating short-term economic impacts.<sup>54</sup> Ensuring consistent implementation and verifying emissions reductions may require expanded monitoring systems, adding administrative complexity and cost.

## MEASURE 2 – ENERGY EFFICIENCY AND ELECTRIFICATION OF RESIDENTIAL, COMMERCIAL AND PUBLIC BUILDINGS

### Co-Pollutant Reductions

CAP reductions from electricity savings were evaluated using the U.S. EPA's AVERT tool. An annual average energy efficiency savings value, derived from the GHG analysis, was entered into AVERT to calculate emissions reductions for the region. These annual reductions were multiplied across the projection period to estimate cumulative benefits. CAP reductions for avoided natural gas combustion were calculated using emissions factors from AP 42 Section 1.4 and annual natural gas savings estimated in the GHG analysis. HAP reductions were estimated using the proportional method: co-pollutant emissions from commercial and residential natural gas combustion (based on 2020 NEI) were compared to total GHG emissions from building fuel consumption in the GHG inventory. This ratio was applied to annual GHG reductions from avoided coal and natural gas use to estimate annual HAP reductions.

Improving energy efficiency and transitioning buildings from fossil fuels to electricity not only lowers GHG emissions but also limits harmful air pollutant emissions that affect health and environmental

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<sup>51</sup> Hodan, W., & Barnard, W. (n.d.). Evaluating the Contribution of PM2.5 Precursor Gases and Re-entrained Road Emissions to Mobile Source PM2.5 Particulate Matter Emissions Prepared by MACTEC Under Contract to the Federal Highway Administration. Retrieved November 4, 2025, from [https://gaftp.epa.gov/air/nei/ei\\_conference/EI13/mobile/hodan.pdf](https://gaftp.epa.gov/air/nei/ei_conference/EI13/mobile/hodan.pdf)

<sup>52</sup> EPA. (2017). Agricultural Air Quality Conservation Measures Reference Guide for Poultry and Livestock Production Systems. [https://gaftp.epa.gov/ap42/ch09/s04/references/ref21\\_c09s04\\_2024.pdf](https://gaftp.epa.gov/ap42/ch09/s04/references/ref21_c09s04_2024.pdf)

<sup>53</sup> Waste Managed. (2024, May 9). *Regenerative Farming: Reducing Waste by Mimicking Nature*. Waste Management Services | Recycling | WasteManaged. <https://www.wastemanaged.co.uk/our-news/agriculture/regenerative-farming/>

<sup>54</sup> Sun, S. (2025). *Welcome To Zscaler Directory Authentication*. Sciencedirect.com. <https://www.sciencedirect.com/science/article/abs/pii/S0301479716301591>

quality.<sup>55</sup> PM reductions are notable for improving indoor and outdoor air quality conditions.<sup>56</sup> PM<sub>2.5</sub> will decrease by about 8 tons by 2030 and up to 46 tons by 2050, reducing risks of asthma and heart disease. PM is emitted from fossil fuel combustion for electricity and heating purposes.<sup>57</sup> Though smaller in quantity (0.6 tons by 2030; 11 tons by 2050), ammonia reductions help prevent secondary particle formation and protect ecosystems. The largest reduction occurs in NO<sub>x</sub> and carbon monoxide (CO) which are major contributors to smog and poor air quality.<sup>58</sup> Carbon monoxide is projected to be reduced by 177 tons by 2030 and 883 tons by 2050. Produced during incomplete combustion of fossil fuels, CO reductions will improve indoor and outdoor air quality.<sup>59</sup> Within these projections, significant reductions in nitrogen oxides are also present, with 212 tons by 2030 and 1,092 tons by 2050, helping limit smog and respiratory problems from the combustion of natural gas and coal. Lastly, SO<sub>2</sub> and VOCs are emitted from coal combustion and fuel handling. These reductions can improve visibility and reduce ozone formation.

Benefits will primarily occur in urban and suburban areas where residential, commercial, and public buildings are concentrated. These communities often experience higher exposure to pollutants from building energy use and local power generation.<sup>60</sup> The increasing adoption of electrification and efficiency improvements in turn reduce the reliance on fossil fuels, leading to cleaner air in densely populated neighborhoods, and areas with older building stock.

### **Additional Benefits and Potential Disbenefits**

Cleaner air in residential, commercial, and public buildings leads to fewer respiratory and cardiovascular health issues for building occupants, lower healthcare costs, and improved overall comfort and well-being.<sup>61</sup> Additionally, better air quality supports property value and enhances the appeal of buildings as safe, sustainable spaces.

For Indiana specifically, state programs including the Home Efficiency Rebates<sup>62</sup> and the Indiana Energy Efficiency Fund<sup>63</sup> demonstrate how upgraded policies for buildings can lower utility costs, spur job creation, and strengthen local economic resilience. Region specific data also illuminates that targeted retrofit opportunities across buildings can dramatically reduce site energy use and emissions

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<sup>55</sup> World Health Organization. (2024, October 24). Ambient (outdoor) Air Quality and Health. World Health Organization. [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)

<sup>56</sup> Ibid.

<sup>57</sup> Ibid.

<sup>58</sup> United States Environmental Protection Agency. (2016, July 13). *Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution* / US EPA. US EPA. <https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution>

<sup>59</sup> Ibid.

<sup>60</sup> Environmental Protection Agency. (2019, March 14). *Progress Cleaning the Air and Improving People's Health* / US EPA. United States Environmental Protection Agency. <https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health>

<sup>61</sup> Wang, C., Wang, J., & Norbäck, D. (2022). A Systematic Review of Associations between Energy Use, Fuel Poverty, Energy Efficiency Improvements and Health. *International Journal of Environmental Research and Public Health*, 19(12), 7393. <https://doi.org/10.3390/ijerph19127393>

<sup>62</sup> OED. (2025, May 13). *Home Energy Rebates*. OED. <https://www.in.gov/oed/grants-and-funding-opportunities/homeowner-incentives/>

<sup>63</sup> OED. (2024, June 4). *Energy Efficiency Fund*. OED. <https://www.in.gov/oed/grants-and-funding-opportunities/energy-efficiency-fund/>

while revitalizing building performance and value.<sup>64</sup> These energy efficiency upgrades can simultaneously reduce indoor air pollutants, which has a positive impact on public health. Finally, renewable energy and efficiency can reduce reliance on grid electricity, thereby enhancing regional grid stability.<sup>65</sup> Deploying a strategic and multifaceted plan across Central Indian can thus raise living standards, reduce health risks, stimulate economic opportunity, and contribute meaningfully to the region's decarbonization trajectory.

There is a financial risk of potential high upfront costs to building owners, limited access to financing for low-income households, and potential inequities if incentives disproportionately benefit wealthier property owners. There is also a potential for strain on the grid if electrification outpaced infrastructure upgrades. Additionally, there is a risk of workforce displacement in fossil fuel-based heating and appliance sectors.

## MEASURE 3 – UTILITY-SCALE CLEAN ENERGY

### Co-Pollutant Reductions

To estimate CAP reductions from utility-scale clean energy deployment, an annual average of newly added renewable energy capacity (in megawatts) was calculated and entered into the U.S. EPA's AVERT tool. AVERT provided Central Indiana-specific estimates of emissions reductions resulting from decreased fossil fuel-based electricity generation. To estimate HAPs, the proportional method was applied: co-pollutant emissions from fossil fuel electricity generation (based on 2020 HAPs in the NEI) were compared to total GHG emissions from electricity generation in the 2022 GHG inventory. This ratio was then multiplied by annual GHG reductions from reduced fossil fuel use to estimate annual co-pollutant reductions.

Nitrogen oxides, primarily emitted from coal and natural gas combustion in power plants, represent the most substantial projected reductions under this measure, contributing to the decline of ground-level ozone and smog formation. The calculations reflect the central role of fossil fuel combustion in NO<sub>x</sub> emissions from about 4 tons in 2030, to 81 tons by 2050. Reductions in PM<sub>2.5</sub> from 0.6 tons in 2030 to 13 tons in 2050, and SO<sub>2</sub> with 0.1 tons in 2030 to 1 ton in 2050, while smaller in scale, are critical to improving ambient air quality as a large part of their environmental impact. Ammonia and VOCs also have significant measurable projected reductions, with ammonia at 0.9 tons in 2030 to 20 tons in 2050, and VOCs calculated at 0.2 tons in 2030 to 5 tons by 2050. These pollutants originate from large scale fossil fuel electricity generation facilities, so reducing the need for fossil fuel power will reduce air pollutants at the source. The benefits of these reductions are expected to be most

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<sup>64</sup> U.S. Department of Energy. (2025). *Understanding Commercial Building Energy Use in the Central Gulf Coast Area: Building Stock Segmentation for Retrofit Planning*. Nrel.gov. <https://docs.nrel.gov/docs/fy25osti/91971.pdf>

<sup>65</sup> Zhan, G. C., Zhou, H., Ge, Y., Magabed, S. M., Abas, M., Pan, X., Ponnore, J. J., Hamd Asilza, Liu, J., & Yang, Y. (2024). Enhancing On-Grid Renewable Energy Systems: Optimal Configuration and Diverse Design Strategies. *Renewable Energy*, 121103–121103. <https://doi.org/10.1016/j.renene.2024.121103>

pronounced in rural areas where utility-scale renewable projects are hosted and in regions currently hosting fossil fuel power plants.<sup>66</sup>

Expanding utility-scale clean energy reduces air pollutants that are harmful to human health and ecosystems. As fossil fuel-based electricity is displaced by zero-emission sources like solar and wind, co-pollutant emissions decline simultaneously. These reductions occur as fossil fuel-based electricity generation is replaced with zero-emission sources.<sup>67</sup> It should be noted that although co-pollutant reductions in Central Indiana are relatively low, fossil fuel power is being displaced at a much larger scale across the entire MISO grid, benefiting communities outside the region as well as within.

### **Additional Benefits and Potential Disbenefits**

The expansion of clean energy resources offers significant economic and environmental benefits, particularly for LIDACs. These benefits include reduced energy costs for residents and businesses, land reuse and revitalization, and job creation in the clean energy sector.<sup>68</sup> Such developments can enhance energy affordability and equity, especially in communities historically burdened by high energy costs and pollution. Utility-scale renewable energy projects can revitalize areas affected by the decline of the fossil fuel industry by generating employment opportunities and increasing local tax revenues.<sup>69</sup> In rural and remote regions, these projects can reduce electricity costs, mitigate vulnerability to fuel price volatility, and improve grid reliability and resilience.<sup>70</sup> Strategically locating renewables in these areas can also alleviate pressure on remote grids and help preserve natural landscapes.

Replacing fossil-fuel power plants with zero-emission alternatives also significantly improves local air quality by reducing harmful pollutants such as coal ash and leachates, which are linked to respiratory and cardiovascular illnesses.<sup>71</sup>

However, large-scale renewable deployment is not without challenges. Infrastructure and transmission upgrades can introduce costs, disruptions, and reliability concerns, often impacting rural communities. There is also the risk of siting projects in sensitive natural habitats, potentially affecting wildlife and migratory corridors. Community opposition may arise due to concerns over land use, property values, and whether the economic benefits of these projects will be equitably distributed. Ensuring that local communities receive tangible benefits requires intentional planning and the implementation of

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<sup>66</sup> Saha, D., & Cyrs, T. (2021). 5 Graphics that Explain Clean Energy Jobs in Rural America. *Www.wri.org*. <https://www.wri.org/insights/clean-energy-jobs-rural-communities-us-5-graphics>

<sup>67</sup> Millstein, D., O'Shaughnessy, E., & Wiser, R. (2024). Climate and air quality benefits of wind and solar generation in the United States from 2019 to 2022. *Cell Reports Sustainability*, 1(6), 100105–100105. <https://doi.org/10.1016/j.crsus.2024.100105>

<sup>68</sup> Climate Policy Initiative. (2024). *Harnessing the transformative potential of the GHG Reduction Fund*. [https://www.climatepolicyinitiative.org/wp-content/uploads/2024/01/CPI\\_GGRF-Assessment-Report.pdf](https://www.climatepolicyinitiative.org/wp-content/uploads/2024/01/CPI_GGRF-Assessment-Report.pdf)

<sup>69</sup> U.S. Department of Energy. (2025a). *Energy Improvement in Rural or Remote Areas*. Energy.gov. <https://www.energy.gov/oced/era>

<sup>70</sup> Ibid.

<sup>71</sup> U.S. Energy Information Administration. (2021, December 6). *Electricity and the environment - U.S. Energy Information Administration (EIA)*. Eia.gov; U.S. Energy Information Administration. <https://www.eia.gov/energyexplained/electricity/electricity-and-the-environment.php>

community benefit mechanisms, including affordable access programs for clean energy and effective stakeholder engagement and decision making in project design.

## MEASURE 4 – DISTRIBUTED AND COMMUNITY SOLAR

### Co-Pollutant Reductions

An annual average of newly added renewable energy capacity, measured in megawatts, was calculated and entered the U.S. EPA's AVERT tool. The tool produced Central Indiana-specific estimates of CAP emissions reductions resulting from decreased fossil fuel-based electricity generation. A proportional allocation method was then applied using these emissions factors and the total megawatts of renewable capacity added to estimate annual CAP reductions. To estimate reductions of HAPs and other co-pollutants, the proportion of emissions from fossil fuel-based electricity generation, based on the 2020 HAPs and 2022 CAPs NEI, was compared to total GHG emissions from electricity generation in the 2022 GHG inventory. This proportion was then multiplied by the annual GHG emissions reductions from decreased fossil fuel use to calculate annual co-pollutant reductions.

The analysis indicates relatively small reductions for this measure compared to others, with NO<sub>x</sub> projected to have the largest reduction from 0.1 tons by 2030 to 0.4 by 2050. These values reflect the impact of distributed and community solar efforts for Central Indiana, likely due to smaller fossil fuel displacement compared to utility-scale clean energy, and the larger scale of impacts to the broader MISO grid region as this measure reduces reliance on grid electricity.

Benefits will be primarily localized to the project sites, which will range from rural spaces to urban centers. While reductions are modest, they still contribute to incremental improvements in air quality for communities near the affected sources. Similar to measure #3, it is important to note that benefits from this measure extend beyond the boundaries of Central Indiana throughout the entire MISO grid region, as this measure reduces reliance on grid electricity.

### Additional Benefits and Potential Disbenefits

The expansion of distributed and community solar presents a powerful opportunity for Central Indiana to advance climate goals, improve public health, and stimulate local economic development, particularly for LIDACs. These systems can lower utility costs, generate income through renewable energy sales, and support a growing clean energy workforce.<sup>72</sup> By increasing local energy generation, distributed solar energy enhances community ownership of energy resources and reduces dependence on fossil fuels.<sup>73</sup> It also diversifies the regional energy portfolio, improving grid reliability, reducing transmission losses, and strengthening resilience to extreme weather events.

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<sup>72</sup> PowerFlex. (2024). *Guide to How Community Solar Works* | PowerFlex. Powerflex.com. <https://www.powerflex.com/downloads/guide-to-community-solar>

<sup>73</sup> ARKA. (2025). *How Solar Energy Can Help Achieve Energy Independence For Communities*. Arka360.com. <https://arka360.com/ros/solar-energy-community-energy-independence>



Environmental and public health gains are substantial. Distributed solar displaces fossil-fuel-based generation, reducing GHG emissions and harmful air pollutants such as NO<sub>x</sub>, SO<sub>2</sub>, and PM.<sup>74</sup> This leads to fewer respiratory and cardiovascular illnesses and lowers the burden on healthcare systems. Community solar also expands access to clean energy for households unable to install rooftop systems, such as renters or those in multi-family housing.<sup>75</sup> In Indiana, where enabling policies for independent solar communities are still evolving, advocates emphasize its potential to democratize energy access. For example, the Hoosier Environmental Council estimates that community solar subscribers could save 10–15% on energy bills, freeing up household income for other needs, and gives residents more influence over rate changes.<sup>76,77</sup> Economically, these projects support local contractors and businesses, retain investment within the region, and create jobs in installation and maintenance.

However, several challenges must be addressed to ensure equitable and sustainable deployment. Indiana lacks fully enabled community solar frameworks for major investor-owned utilities.<sup>78</sup> Without clear rules on crediting, subscriptions, metering, and consumer protections, benefits may be uneven or captured disproportionately by developers. Additionally, upfront costs, credit requirements, and lack of targeted policies can exclude low-income households. Without deliberate inclusion of renters and disadvantaged communities, solar benefits risk concentrating among wealthier populations. Poorly aligned zoning or siting on prime agricultural land or sensitive habitats can reduce deployment potential and provoke community opposition. Indiana's shift from full retail net metering to lower-value credit structures may reduce returns for solar participants. If participation lags, system-wide benefits diminish, and cost-shifting concerns may arise, where non-participants bear higher fixed costs.

## MEASURE 5 – INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS

### Co-Pollutant Reductions

Co-pollutant reductions were estimated for reduced industrial electricity and natural gas consumption. Electricity savings were evaluated using the U.S. EPA's AVERT tool. An annual average value for energy efficiency savings, derived from the GHG analysis, was entered into the tool. The resulting emissions reductions for the Central Indiana region were then multiplied by each year of the projection period to estimate cumulative benefits. To estimate reductions in criteria air pollutants from avoided natural gas

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<sup>74</sup> Harvard T.H. Chan School of Public Health. (2025, July 30). *Increasing solar power could lead to significant cuts in CO2 emissions* | Harvard T.H. Chan School of Public Health. Harvard T.H. Chan School of Public Health; HSPH. <https://hsph.harvard.edu/news/increasing-solar-power-could-lead-to-significant-cuts-in-co2-emissions/>

<sup>75</sup> U.S. Department of Energy . (2024). *Community Solar Basics*. Energy.gov. <https://www.energy.gov/eere/solar/community-solar-basics>

<sup>76</sup> Indiana Office of Utility Consumer Counselor. (2020, September 24). *AES Indiana Rates*. OUCC. <https://www.in.gov/oucc/electric/key-cases-by-utility/ipl-rates/>

<sup>77</sup> The Hoosier Environmental Council. (2023, December 13). *Community Solar for Indiana - Hoosier Environmental Council*. Hoosier Environmental Council - All. Together. Now. <https://www.hecweb.org/community-solar-for-indiana/>

<sup>78</sup> Environmental Law & Policy Center. (2018). *Indiana Wind Power & Solar Energy Supply Chain Businesses: Good for Manufacturing Jobs, Good for Economic Growth and Good for Our Environment*. <https://elpc.org/wp-content/uploads/2020/05/2018-ELPCPublication-IndianaCleanEnergySupplyChain-1.pdf>

combustion, emissions factors from AP 42 Section 1.4 were applied. Annual natural gas savings were multiplied by these factors to quantify avoided emissions from industrial fuel use. The proportion of co-pollutant emissions from industrial stationary combustion and industrial processes, based on the 2020 HAPs and 2022 CAPs inventories, was compared to total GHG emissions from these sources in the 2022 GHG inventory. This ratio was then applied to the annual GHG emissions reductions from avoided fuel use to estimate annual reductions in HAPs.

This measure delivers substantial air quality benefits by reducing emissions from industrial stationary combustion and fuel-based processes. Key pollutants addressed include PM<sub>2.5</sub> and PM<sub>10</sub>, ammonia, CO, NO<sub>x</sub>, SO<sub>2</sub>, and VOCs. These pollutants are typically emitted during the combustion of natural gas and other industrial fuels. Over the 2026-2050 period, the measure is projected to reduce, 1,104 tons of NO<sub>x</sub> and 470 tons of CO, reflecting the high emissions intensity of industrial fuel combustion. Additionally, 28 tons of PM<sub>2.5</sub> and 21 tons of PM<sub>10</sub>, contributing to improved air quality and public health. Additional reductions include 11 tons of ammonia, 4 tons of SO<sub>2</sub>, and 34 tons of VOCs. These reductions are mostly pronounced in NO<sub>x</sub> and CO, which are critical for mitigating smog formation and respiratory health risks.<sup>79</sup>

Benefits will primarily occur in industrial corridors and surrounding communities, which often experience elevated exposure to pollutants from manufacturing and fuel combustion. These areas may include semi-urban and rural regions with concentrated industrial activity.

### **Additional Benefits and Potential Disbenefits**

In Central Indiana, the industrial and manufacturing sectors account for a substantial share of energy consumption, GHG emissions, and air pollution.<sup>80</sup> Nationally, industry contributes approximately 23% of direct GHG emissions, and nearly 30% when electricity use is included.<sup>81</sup> This makes industrial decarbonization a critical pathway for climate mitigation, public health improvement, and economic resilience. Switching to lower-carbon alternative fuels, such as biomass, hydrogen, and biogas, can further reduce emissions in high-temperature processes that are difficult to electrify.<sup>82</sup>

These reductions additionally help public health outcomes, quality of life, and economic opportunities for areas like Central Indiana. Lower fossil fuel combustion translates into fewer harmful pollutants, reducing respiratory and cardiovascular illnesses and easing health system burdens.<sup>83</sup> In Central

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<sup>79</sup> U.S. EPA. (2024, December 11). *GHG Reduction Measures with Co-Pollutant Benefits* | US EPA. US EPA. <https://www.epa.gov/inflation-reduction-act/ghg-reduction-measures-co-pollutant-benefits>

<sup>80</sup> U.S. Energy Information Administration. (2016). *Indiana - State Energy Profile Analysis - U.S. Energy Information Administration (EIA)*. Eia.gov. <https://www.eia.gov/state/analysis.php?sid=IN>

<sup>81</sup> Center for Climate and Energy Solutions. (2018, October 30). *Controlling Industrial GHG Emissions* | Center for Climate and Energy Solutions. Center for Climate and Energy Solutions; Center for Climate and Energy Solutions. <https://www.c2es.org/content/regulating-industrial-sector-carbon-emissions/>

<sup>82</sup> Boretti, A., & Pollet, B. G. (2024). Hydrogen economy: Paving the path to a sustainable, low-carbon future. *International Journal of Hydrogen Energy*, 93, 307–319. <https://doi.org/10.1016/j.ijhydene.2024.10.350>

<sup>83</sup> IEA. (2021). *Net Zero by 2050 A Roadmap for the Global Energy Sector*. [https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector\\_CORR.pdf](https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector_CORR.pdf)

Indiana, where industrial facilities may be located near residential and low-income communities, these improvements are especially important for environmental justice and community well-being. Efficiency upgrades and fuel-switching also stimulate local investment, create jobs, and enhance industrial competitiveness.<sup>84</sup> These measures also foster innovation in low-carbon technologies and help build a clean energy workforce.

Alternatively, there are tradeoffs associated with implementing fuel alternatives and energy efficient strategies. High upfront capital costs for retrofits (e.g., heat recovery systems, smart controls) and fuel transitions can be a barrier.<sup>85</sup> There's also potential for production disruptions during upgrades, compatibility issues with existing infrastructure, and uncertainty around long-term fuel supply chains and market stability. Without careful planning, costs may be passed on to residential customers through increased rates. While promising, alternative fuels also face constraints in feedstock availability, production costs, lifecycle emissions (e.g., methane leakage, land-use change), and technical feasibility.<sup>86</sup> They may only meet a portion of fossil fuel demand and are often less cost-effective than electrification in standard settings.<sup>87</sup> Additionally, there may be increased complexity in regulatory compliance and reporting and uncertainty around long-term fuel supply chains and market stability.

## MEASURE 6 – ENHANCE GREEN SPACES

### Co-Pollutant Reductions

While co-pollutant reduction calculations from land-use change and forestry activities are to be excluded per EPA guidance,<sup>88</sup> this measure still delivers meaningful benefits. Dilution of air pollutants complements climate mitigation efforts by delivering localized air quality improvements, particularly in areas where vegetation buffers industrial or transportation corridors. Benefits will primarily occur in areas where green space expansion is implemented, such as urban neighborhoods and regions adjacent to transportation corridors or industrial activity. These locations often experience elevated levels of ozone precursors (NO<sub>x</sub> and VOCs) and CO, so reductions in these pollutants can improve local air quality, mitigate smog formation, and provide health co-benefits for nearby communities.<sup>89</sup>

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<sup>84</sup> US Department of Energy. (2023). *Job Creation and Economic Growth*. Energy.gov; U.S. Department of Energy. <https://www.energy.gov/eere/job-creation-and-economic-growth>

<sup>85</sup> U.S. Energy Information Administration. (2016). *Indiana - State Energy Profile Analysis - U.S. Energy Information Administration (EIA)*. Eia.gov. <https://www.eia.gov/state/analysis.php?sid=IN>

<sup>86</sup> Huyett, C., & Peltier, M. (2025, January 17). *Chemistry in Transition: Charting solutions for a low-emissions chemical industry*. RMI. <https://rmi.org/chemistry-in-transition-charting-solutions-for-a-low-emissions-chemical-industry/>

<sup>87</sup> Ibid.

<sup>88</sup> U.S. EPA. CPRG Technical Reference Document – Benefits Analysis: Co-Pollutant Impacts. May 30, 2023. Accessed November 2025. Retrieved from: [https://www.epa.gov/system/files/documents/2023-05/Technical\\_Reference\\_Doc\\_Copollutant\\_Assessment\\_FINAL\\_TO\\_POST.pdf](https://www.epa.gov/system/files/documents/2023-05/Technical_Reference_Doc_Copollutant_Assessment_FINAL_TO_POST.pdf)

<sup>89</sup> Bikis, A. (2023). Urban air pollution and greenness in relation to public health. *Journal of Environmental and Public Health*, 2023(8516622), 1–18. <https://doi.org/10.1155/2023/8516622>

## Additional Benefits and Potential Disbenefits

Expanding access to green infrastructure and green spaces such as parks, tree-lined streets, pocket gardens, and community-managed open areas, can deliver wide-ranging benefits for environmental resilience, public health, and community well-being. This strategy is particularly impactful for LIDACs, which face heightened risks from urban heat, flooding, and limited recreational access.<sup>90</sup> Green spaces help mitigate urban heat island effects through shading and evapotranspiration, aiding utility burdens.<sup>91</sup> Green spaces also reduce stormwater runoff by decreasing impervious surface area, enhancing resilience to flooding and extreme weather events.<sup>92</sup> Additionally, green infrastructure supports native biodiversity and contributes to broader climate adaptation goals by filtering air pollutants and improving local air quality, as described above.<sup>93</sup> Access to green spaces is also linked to improved mental health, reduced symptoms of anxiety and depression, increased physical activity, and lower cardiovascular disease risk.<sup>94</sup> These spaces offer venues for recreation, social interaction, and stress relief, contributing to overall community health and cohesion.<sup>95</sup>

At the same time, benefits from green spaces depend on their accessibility, quality, and periodic upkeep. There may be temporary noise and disruption from landscaping, grading, and installation activities. There is risk of siting in areas with limited accessibility or conflicting land uses, potential disturbance to existing ecosystems or soil conditions, and potential for community concerns over displacement of other amenities. While generally beneficial, green space expansion can lead to gentrification and displacement if rising property values are not managed. Wetland conversions, if not carefully managed, may also increase methane emissions.<sup>96</sup>

## MEASURE 7 – ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES

### Co-Pollutant Reductions

Reductions in air pollutants were estimated by applying emissions factors from the Bureau of Transportation Statistics to the total gallons of diesel and gasoline avoided. This calculation provided

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<sup>90</sup> United States Environmental Protection Agency. (2022, March 21). *Climate Change and the Health of Socially Vulnerable People*. [Www.epa.gov](https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people); United States Environmental Protection Agency. <https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people>

<sup>91</sup> US EPA. (2016). *Using Trees and Vegetation to Reduce Heat Islands*. 19january2017snapshot.epa.gov. <https://19january2017snapshot.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands.html>

<sup>92</sup> Liu, N., & Zhang, F. (2025). Urban green spaces and flood disaster management: toward sustainable urban design. *Frontiers in Public Health*, 13. <https://doi.org/10.3389/fpubh.2025.1583978>

<sup>93</sup> United States Environmental Protection Agency Office of Air and Radiation. (2023). *Climate Pollution Reduction Grants Program*. [https://www.epa.gov/system/files/documents/2023-05/Technical\\_Reference\\_Doc\\_Copollutant\\_Assessment\\_FINAL\\_TO\\_POST.pdf](https://www.epa.gov/system/files/documents/2023-05/Technical_Reference_Doc_Copollutant_Assessment_FINAL_TO_POST.pdf)

<sup>94</sup> Keith, R. J., Hart, J. L., & Bhatnagar, A. (2024). Greenspaces And Cardiovascular Health. *Circulation Research*, 134(9), 1179–1196. <https://doi.org/10.1161/circresaha.124.323583>

<sup>95</sup> Keith, R. J., Hart, J. L., & Bhatnagar, A. (2024). Greenspaces And Cardiovascular Health. *Circulation Research*, 134(9), 1179–1196. <https://doi.org/10.1161/circresaha.124.323583>

<sup>96</sup> Xiong, J., Sheng, X., Wang, M., Wu, M., & Shao, X. (2022). Comparative study of methane emission in the reclamation-restored wetlands and natural marshes in the Hangzhou Bay coastal wetland. *Ecological Engineering*, 175, 106473. <https://doi.org/10.1016/j.ecoleng.2021.106473>

annual CAP reductions associated with decreased on-road fuel consumption. To estimate reductions in hazardous air pollutants, the proportion of co-pollutant emissions from on-road transportation, based on the 2020 HAPs inventory, was compared to total GHG emissions from the transportation sector in the 2022 GHG inventory. This ratio was then multiplied by the annual GHG emissions reductions to estimate annual co-pollutant reductions from transportation fuel savings.

Transitioning to electric vehicles and improving freight efficiencies significantly reduces emissions from on-road combustion sources.<sup>97</sup> This measure addresses key pollutants that impact air quality and public health, including PM<sub>2.5</sub>, CO, and NO<sub>x</sub>. For PM<sub>2.5</sub>, projections estimate a reduction of 1,816.51 tons by 2050, reducing fine particulate exposure linked to respiratory and cardiovascular health risks. For CO, projections estimate a reduction of 507,279 tons by 2050, with early reductions of 55,075 tons by 2030, reflecting the elimination of tailpipe emissions from gasoline and diesel vehicles. Lastly, NO<sub>x</sub> could be reduced by 12,140 tons over the full period, mitigating ozone formation and smog. All co-pollutants show a large reduction potential between 2030-2035, thus representing one of the most impactful co-benefits of transportation electrification. Benefits will be concentrated in urban corridors and freight routes, where vehicle emissions have historically contributed to elevated pollution levels.<sup>98</sup>

### **Additional Benefits and Potential Disbenefits**

Transitioning to electric vehicles, expanding charging infrastructure, and improving freight logistics offers a powerful pathway to reduce GHG emissions, improve public health, and stimulate economic growth. These strategies also support urban livability and regional resilience when deployed equitably and with thoughtful planning, especially for areas like Central Indiana where passenger vehicles, commercial fleets, and freight corridors are central to mobility and emissions.

Reducing the use of gasoline and diesel vehicles can improve local air quality and reduce particulate matter and tailpipe emissions.<sup>99</sup> Cleaner air from reduced vehicle emissions leads to fewer respiratory and cardiovascular illnesses, lowering healthcare burdens.<sup>100</sup> EVs and modern freight technologies also reduce noise pollution, contributing to quieter, safer streets and industrial zones.<sup>101</sup>

Potential drawbacks from this method include initial upfront investments and temporary hinderances to daily life. Installing widespread charging infrastructure, especially fast-charging freight and public fleets, requires coordination among utilities, governments, developers, and site hosts, along with

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<sup>97</sup> US EPA. (2025, January 9). *Transportation Sector Emissions* | US EPA. US EPA. <https://www.epa.gov/ghgemissions/transportation-sector-emissions>

<sup>98</sup> Clean Air Fund. (2025). *Cities and air pollution*. Clean Air Fund. <https://www.cleanairfund.org/theme/cities/>

<sup>99</sup> US Energy Information Administration. (2024, March 14). *Diesel fuel and the environment - U.S. Energy Information Administration (EIA)*. Eia.gov; U.S. Energy Information Administration. <https://www.eia.gov/energyexplained/diesel-fuel/diesel-and-the-environment.php>

<sup>100</sup> Guo, C., Becky, Feng, K., Gao, H. O., & Zhang, K. (2024). Fifteen Pathways between Electric Vehicles and Public Health: A Transportation–Health Conceptual Framework. *Environment & Health*. <https://doi.org/10.1021/envhealth.4c00156>

<sup>101</sup> Ibid.

significant costs.<sup>102</sup> There is also a risk of temporary noise, increased traffic and localized emissions during the construction, installation, and upgrades processes. As EV adoption grows, electricity demand increases, potentially straining local grids. Additionally, benefits may concentrate among wealthier households or businesses able to afford EVs and charging installations. There is also a risk of siting infrastructure in environmentally sensitive areas, potentially disturbing urban ecosystems or green corridors.

## MEASURE 8 – TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS AND MOBILITY DEVICES

### Co-Pollutant Reductions

Reductions in air pollutants were estimated by applying emissions factors from the Bureau of Transportation Statistics to the total gallons of diesel and gasoline avoided. This calculation provided annual CAP reductions associated with decreased on-road fuel consumption. To estimate reductions in hazardous air pollutants, the proportion of co-pollutant emissions from on-road transportation, based on the 2020 HAPs inventory, was compared to total GHG emissions from the transportation sector in the 2022 GHG inventory. This ratio was then multiplied by the annual GHG emissions reductions to estimate annual co-pollutant reductions from transportation fuel savings.

Expanding non-motorized transportation options, such as bicycles, pedestrian walkways, and mobility devices, reduces reliance on gasoline and diesel vehicles, thereby lowering emissions from on-road combustion.<sup>103</sup> This measure addresses key pollutants that impact air quality and health, including PM<sub>2.5</sub>, CO, and NO<sub>x</sub>. Early reductions for these three co-pollutants are modest, with CO at 1,242 tons, NO<sub>x</sub> at 33 tons, and PM<sub>2.5</sub> at 1 ton by 2030, but scale over time as adoption of active transportation grows. By 2050, CO is projected to be reduced by 4,763 tons due to avoided fuel combustion. NO<sub>x</sub> is projected to be 94 tons by 2025, which can reduce ozone formation and smog. Lastly, PM<sub>2.5</sub> will be reduced by 7 tons, improving respiratory health outcomes. The benefits of this measure will be most visible in highly trafficked walking and biking corridors.

### Additional Benefits and Potential Disbenefits

Promoting walking, cycling, micromobility (e.g., e-scooters, e-bikes), and accessible pedestrian infrastructure in Central Indiana offers a powerful strategy to reduce reliance on personal vehicles, improve public health, and foster community vitality. Active transportation reduces traffic congestion and air pollution, while promoting physical activity. This leads to lower risks of cardiovascular disease, type 2 diabetes, and premature mortality.<sup>104</sup> It also enhances mental health, social interaction, and

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<sup>102</sup> Russo, S., & Spiller, B. (2025). *Leveraging Investments in Electric Vehicle Charging Stations to Maximize Public Benefits*. Resources for the Future. <https://www.resources.org/common-resources/leveraging-investments-in-electric-vehicle-charging-stations-to-maximize-public-benefits/>

<sup>103</sup> Biggar, M. (2020). Non-motorized Transport: Walking and Cycling. *Encyclopedia of the UN Sustainable Development Goals*, 428–437. [https://doi.org/10.1007/978-3-319-95717-3\\_1](https://doi.org/10.1007/978-3-319-95717-3_1)

<sup>104</sup> Green, S., Sakuls, P., & Levitt, S. (2021). Cycling for health: Improving health and mitigating the climate crisis. *Canadian Family Physician*, 67(10), 739–742. <https://doi.org/10.46747/cfp.6710739>



community cohesion.<sup>105</sup> For residents of LIDACs, these improvements are especially meaningful, offering safer, low-cost transportation options and better access for people who do not drive such as children, seniors, and individuals using mobility devices. These modes also support compact, mixed-use development, which lowers vehicle miles traveled, curbs sprawl, and mitigates climate change.<sup>106</sup> Additionally, this measure increases community well-being by enhancing community connectivity, walkability, public space utilization, urban aesthetics, and access to safe, low-cost transportation options.<sup>107</sup> Well-designed infrastructure can also increase property values, stimulate local retail activity, and improve access to jobs and services, especially for those without personal vehicles.

However, this measure can potentially include disbenefits. Building active mobility infrastructure may temporarily increase noise, traffic congestion, and emissions. There is also a risk of disturbing green spaces and local habitats during installation. Additional disbenefits include reduced safety for pedestrians/cyclists if conflict points with vehicles are not designed to increase safety for non-car users. If infrastructure is concentrated in affluent or central areas, LIDACs may be bypassed, exacerbating mobility and health disparities. Poorly maintained or inadequately lit infrastructure can pose safety risks, and mobility devices may require technological access that excludes some users. There are also additional changes to traffic flow and loss of parking, or unfamiliar infrastructure, which may provoke resistance.

## MEASURE 9 – WASTE TO ENERGY

### Co-Pollutant Reductions

To estimate reductions in criteria air pollutants, the proportion of co-pollutant emissions from the business-as-usual co-pollutant projection was compared to total GHG emissions from the waste and materials management sector in the BAU GHG projection. This proportion was then applied to the annual GHG emissions reductions to estimate annual CAP reductions. For hazardous air pollutants, the proportion of co-pollutant emissions from landfilled waste, based on the 2020 HAPs and 2022 CAPs NEI, was compared to total GHG emissions from landfilled waste in the 2022 GHG inventory. This ratio was then multiplied by the annual GHG emissions reductions associated with avoided landfilled waste to estimate annual HAP reductions.

Implementing waste-to-energy strategies significantly reduces emissions from landfilled waste and associated combustion processes. This measure addresses pollutants that impact air quality and health, including PM<sub>2.5</sub>, PM<sub>10</sub>, ammonia, CO, NO<sub>x</sub>, SO<sub>2</sub>, and VOCs. The projected reductions over the long term are substantial, where early reductions from 2026–2030 are modest but scale significantly as waste diversion and energy recovery expand. By 2050, PM<sub>2.5</sub> will be reduced by 1,871 tons and PM<sub>10</sub> by 2,121 tons, improving respiratory health outcomes. CO is projected to be reduced by 12,309.97

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<sup>105</sup> Ibid.

<sup>106</sup> World Health Organization. (2022, June 7). *Cycling and walking can help reduce physical inactivity and air pollution, save lives and mitigate climate change*. World Health Organization. <https://www.who.int/europe/news/item/07-06-2022-cycling-and-walking-can-help-reduce-physical-inactivity-and-air-pollution--save-lives-and-mitigate-climate-change>

<sup>107</sup> Ibid.

tons, reflecting avoided combustion emissions. NO<sub>x</sub> will be reduced by 1,456 tons, reducing smog and ozone formation. Additional reductions include 748.22 tons of ammonia, 625 tons of SO<sub>2</sub>, and 1,360 tons of VOCs.

These co-benefits will be most visible near landfills, waste processing facilities, and adjacent communities, where exposure to combustion-related pollutants has historically been high.

### **Additional Benefits and Potential Disbenefits**

As municipal solid waste volumes continue to grow in Central Indiana, and landfiling remains the dominant disposal method, Waste to Energy technologies offer a dual opportunity: divert waste from landfills and recover energy. This strategy has economic benefits, where infrastructure supports job creation in construction, operations, and maintenance while stabilizing waste management costs for municipalities. Waste to Energy reduces reliance on remote landfills and long-haul transport, lowering logistical and environmental burdens, in addition to increasing local energy generation capacity.<sup>108</sup> Waste to Energy can also reduce odors, long-haul truck traffic, and uncontrolled methane release that are usually associated with landfills.<sup>109</sup> Furthermore, reducing landfilled waste can enhance local air quality and reduce local methane emissions and risk of groundwater contamination from leachate and toxic substances, which disproportionately impact LIDACs.<sup>110</sup> Lastly, by recovering energy, electricity or heat, from waste that would otherwise be discarded, this measure offsets fossil fuel use and supports local energy generation.<sup>111</sup>

In contrast, despite modern controls, Waste to Energy facilities can still emit pollutants such as NO<sub>x</sub>, SO<sub>2</sub>, dioxins, furans, and heavy metals.<sup>112</sup> Ash residuals and leachate must be carefully managed to avoid environmental harm.<sup>113</sup> The magnitude of benefits depends on waste composition, technology efficiency, and the energy source being displaced. This strategy poses a risk of noise, traffic, and emissions from facility construction and operations. Additionally, there is risk of siting new facilities in LIDACs or environmentally sensitive areas that can disrupt nearby habitats, ecosystems, and communities. Finally, this measure may discourage upstream waste reduction and recycling efforts.

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<sup>108</sup> Farooq, A., Haputta, P., Silalertruksa, T., & Gheewala, S. H. (2021). A Framework for the Selection of Suitable Waste to Energy Technologies for a Sustainable Municipal Solid Waste Management System. *Frontiers in Sustainability*, 2.

<https://doi.org/10.3389/frsus.2021.681690>

<sup>109</sup> Abubakar, I. R., Maniruzzaman, K. M., Dano, U. L., AlShihri, F. S., AlShammari, M. S., Ahmed, S. M. S., Al-Gehlani, W. A. G., & Alrawaf, T. I. (2022). Environmental sustainability impacts of solid waste management practices in the global south. *International Journal of Environmental Research and Public Health*, 19(19), 12717. <https://doi.org/10.3390/ijerph191912717>

<sup>110</sup> Garland, E., Alves, O., & Wu, Y. (2025, June 27). *5 Ways to Cut Landfill Methane Pollution: How Local Governments Can Lead*. RMI. <https://rmi.org/5-ways-to-cut-landfill-methane-pollution-how-local-governments-can-lead/>

<sup>111</sup> Traven, L. (2023). Busting the myth: waste-to-energy plants and public health. *Archives of Industrial Hygiene and Toxicology*, 74(2), 142–143. <https://doi.org/10.2478/aiht-2023-74-3733>

<sup>112</sup> NIH. (2012). *Incineration Processes and Environmental Releases*. Nih.gov; National Academies Press (US). <https://www.ncbi.nlm.nih.gov/books/NBK233627/>

<sup>113</sup> Ibid.

## MEASURE 10 – LANDFILL WASTE REDUCTION AND DIVERSION

### Co-Pollutant Reductions

To estimate reductions in criteria air pollutants, the proportion of co-pollutant emissions from the BAU co-pollutant projection was compared to total GHG emissions from the waste and materials management sector in the BAU GHG projection. This proportion was then applied to the annual GHG emissions reductions to calculate annual CAP reductions. For hazardous air pollutants, the proportion of co-pollutant emissions from landfilled waste, based on the 2020 HAPs and 2022 CAPs NEI, was compared to total GHG emissions from landfilled waste in the 2022 GHG inventory. This ratio was then multiplied by the annual GHG emissions reductions associated with avoided landfilled waste to estimate annual HAP reductions.

Reducing and diverting landfill waste delivers significant air quality benefits by avoiding emissions from decomposing waste and associated combustion processes. For the targeted co-pollutants, this measure again sees modest early reductions from 2026-2030, but scale dramatically as landfill diversion expands. PM<sub>2.5</sub> reduces from 213 tons by 2030, to 8,557 tons by 2050. PM<sub>10</sub> has a similar reduction increase from 244 tons by 2030 to 9,703 tons by 2050. Both PM reductions contribute to improving respiratory health outcomes. CO reduces in the long term by 56,302 tons, reflecting avoided combustion emissions. Additionally, NO<sub>x</sub> is projected to reduce by 6,592 tons by 2050, reducing ozone formation and smog. Other projected reductions include 3,423 tons of ammonia, 2,852 tons of SO<sub>2</sub>, and 6,225 tons of VOCs by 2050. Co-benefits of landfill waste reduction and diversion will be most visible in communities near landfills and waste management facilities, as well as environmental justice areas historically burdened by waste-related emissions, improving air quality and health outcomes.

### Additional Benefits and Potential Disbenefits

As Central Indiana experiences population growth and rising material consumption, reducing landfill dependency through waste diversion strategies, such as recycling, composting, reuse, and recovery, offers a powerful pathway to climate mitigation, environmental protection, public health improvement, and economic resilience. This measure is also a way for residents to be directly involved in climate action.

Diverting waste from landfills reduces methane emissions, a potent GHG produced by decomposing organic matter. It also limits leachate and toxic runoff, improving water quality and protecting local ecosystems.<sup>114</sup> As a result, living near landfills has been linked to elevated risks of respiratory illnesses, adverse birth outcomes, and other health effects due to exposure to methane, VOCs, particulates, and odors.<sup>115</sup> Waste diversion strategies reduce the need for large disposal facilities near residential areas, lowering exposure to environmental hazards and improving quality of life. These strategies also

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<sup>114</sup> American Public Health Association. (2022, November 7). *Advancing Environmental Health and Justice: A Call for Assessment and Oversight of Health Care Waste*. American Public Health Association. <https://www.apha.org/policy-and-advocacy/public-health-policy-briefs/policy-database/2023/01/18/health-care-waste>

<sup>115</sup> Ibid.

promote active civic engagement and healthier lifestyles through reuse and repair initiatives.<sup>116</sup> Waste diversion also supports job creation in recycling, composting, and materials recovery sectors, while stimulating local businesses and circular economy innovation.<sup>117</sup> This measure can also significantly decrease landfill dependency and expand circular economic initiatives.<sup>118</sup>

Like all other proposed measures, there are a few potential disbenefits to landfill waste reduction and diversion. This strategy poses a risk of noise and emissions from construction and operation of diversion facilities and increased local traffic and fuel use from expanded waste transport routes. There is a risk of placing infrastructure in disadvantaged or ecologically sensitive areas, potentially disrupting wildlife corridors and local habitats. Public resistance may arise due to concerns about odors, pests, visual impacts, or contamination from improperly sorted waste streams.<sup>119</sup>

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<sup>116</sup> Sustainability Directory. (2025, February 11). *How Can Local Communities Improve Waste Management Practices?* → Question. Pollution → Sustainability Directory. <https://pollution.sustainability-directory.com/question/how-can-local-communities-improve-waste-management-practices/>

<sup>117</sup> United States Environmental Protection Agency. (2025, May 14). *Recycling Basics and Benefits*. [www.epa.gov; EPA. https://www.epa.gov/recycle/recycling-basics-and-benefits](https://www.epa.gov/recycle/recycling-basics-and-benefits)

<sup>118</sup> Ibid.

<sup>119</sup> Vaverková, M. D. (2019). Landfill Impacts on the Environment— Review. *Geosciences*, 9(10). <https://doi.org/10.3390/geosciences9100431>





## 7. Building a Strong, Sustainable Workforce

### OVERVIEW OF CENTRAL INDIANA LABOR MARKET

Central Indiana stands at a pivotal moment in its economic evolution, where strategic workforce development is essential to sustaining growth, enhancing regional competitiveness, and ensuring equitable access to opportunity. As industries across the region continue to transform, so must the systems that prepare and support the local workforce. This analysis explores the current landscape of workforce development in Central Indiana, identifying key trends, potential challenges, and opportunities for collaboration among employers, educators, government agencies, and community organizations. By aligning talent development with the region's economic priorities, Central Indiana can build a resilient, inclusive workforce ready to meet the demands of the future and key climate mitigation measures outlined in this plan.

Central Indiana represents a dynamic and diverse labor market that accounts for nearly one third of Indiana's total workforce. This region of the state employs urban dwellers in Indianapolis, as well as suburban and rural residents in sprawling communities. The region has an unemployment rate of 3.1%<sup>120</sup>, with most jobs in transportation and warehousing, retail and sales, food and accommodation service, manufacturing, and healthcare sectors.

The Indiana Department of Workforce Development anticipates growth in key occupational fields—including architecture and engineering, life and physical sciences, construction, and installation and repair (see Figure 13). Figure 14 illustrates the estimated number of jobs expected to be available across eight relevant occupational categories, aligned with ten key sustainability measures outlined in the plan. These sectors are essential for advancing the sustainability measures outlined in this report, and their expansion signals strong alignment between workforce trends and climate action goals. Central Indiana's emphasis on scientific and professional services can facilitate the expansion of green jobs, particularly for energy efficiency, renewable energy, and sustainable infrastructure. These trends

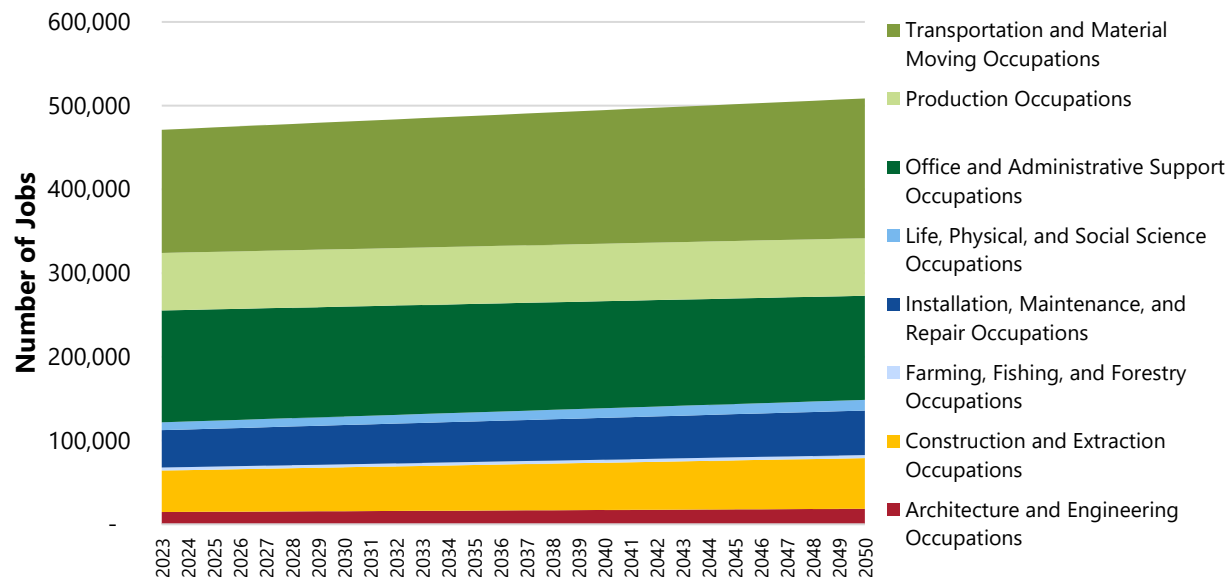
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<sup>120</sup> Hoosiers by the Numbers. Economic Growth Region 5 Analysis. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/region5.asp>

suggest that Central Indiana is not only maintaining a strong labor market but is also gravitating towards a future-ready workforce suitable for green jobs.

The values displayed in Figure 13 and Figure 14 were estimated by the project team utilizing job market data projections for 2023-2033 from the Indiana Department of Workforce Development,<sup>121</sup> and linearly projecting the values through 2050 for each occupation and job category.

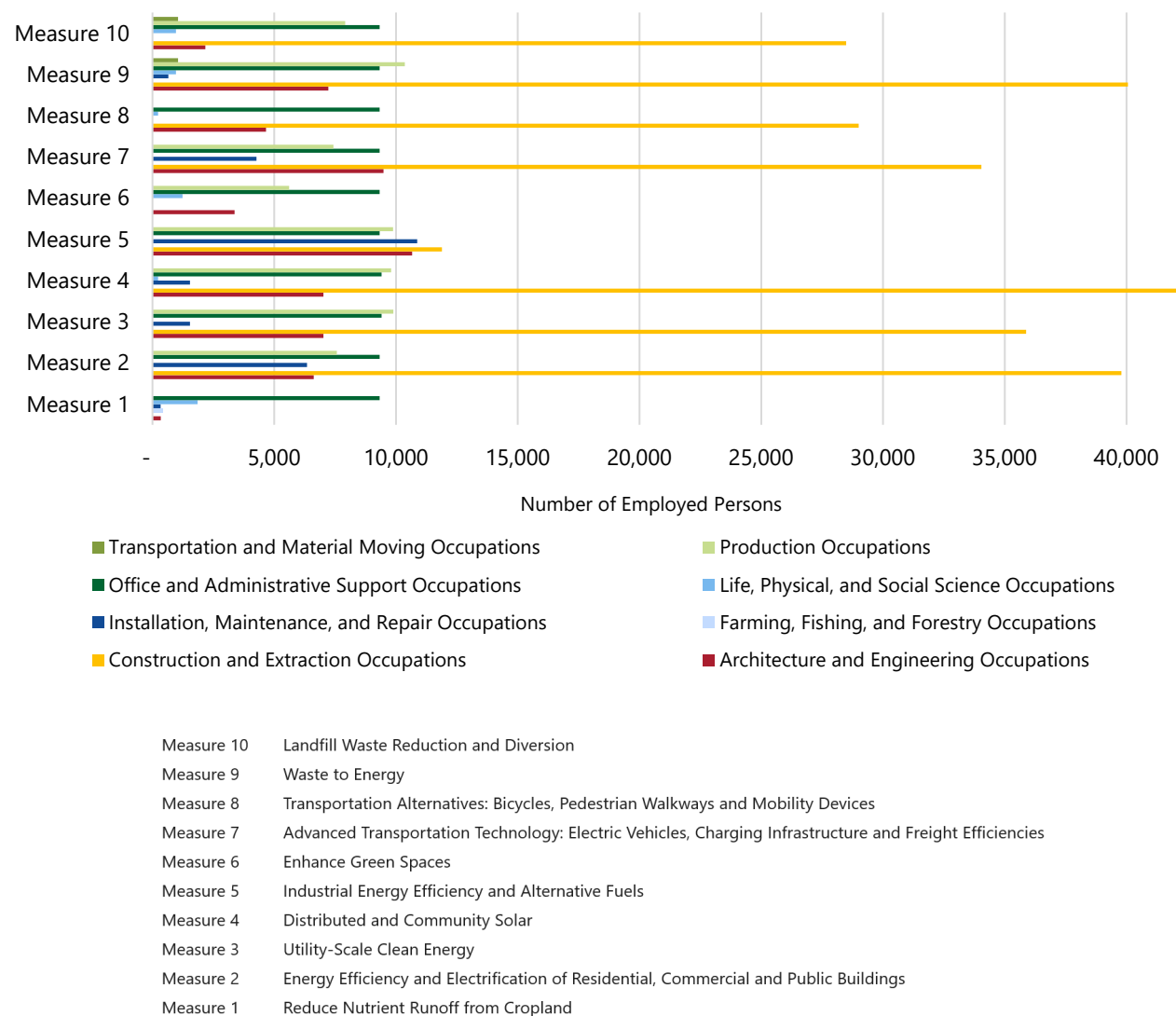
**Figure 13. Job Market Projection for Key Sectors (2023-2050)**



<sup>121</sup> Occupational Projections (2023-2033), Region 5. Indiana Department of Workforce Development. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/infographics/occupational-projections.asp>



**Figure 14. Projected Job Availability by Occupation Category and Mitigation Measure (2050)**



### ANALYSIS OF WORKFORCE REQUIREMENTS

This analysis examines the workforce requirements necessary to implement the set of climate mitigation measures outlined in this plan, including clean energy infrastructure development, building energy efficiency and weatherization retrofits, sustainable transportation, composting and recycling, ecosystem-conscious agriculture methods, and natural climate solutions. By identifying the skills, occupations, and training pathways essential to scaling these interventions, the analysis aims to support strategic workforce planning that aligns climate goals with economic opportunity and equity.

The cumulative number of jobs required to implement the measure, average number of annual jobs, and the maximum number of jobs required in a single year are outlined in the tables within each section.

## MEASURE 1 – REDUCE NUTRIENT RUNOFF FROM CROPLANDS

This measure involves the expanded adoption of soil conservation practices, such as no/low till and cover cropping, on agricultural lands in Central Indiana. This measure will utilize existing local and state programs to incentivize the adoption of climate-smart agricultural practices.

Soil conservation and agronomy professionals are needed to support the implementation of soil conservation practices through educational or advisory programs for farmers on low/no-till and cover cropping techniques. Additionally, this measure will require agriculture equipment operations professionals to administer the educational programs through workshops, field demonstrations and outreach campaigns. Further, program administrators and technical assistance providers will be required to support the expansion of existing programs to oversee funding, compliance, and reporting requirements. It should be noted that, considering that this measure targets predominantly rural/semi-rural areas, workforce development must focus on recruiting and training individuals from these communities.

A summary of existing occupations relevant to this measure is presented for measure 1 in Table 29 in the Appendix. 2024 and estimated 2033 workforce data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>122</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 6. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>123</sup> to GDP<sup>124</sup> for the Indianapolis MSA region.

**Table 6. Measure 1 - Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Agricultural and Environmental Specialists	749	30	62
Program Administrators	296	12	25

<sup>122</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>123</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>124</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

## MEASURE 2 – ENERGY EFFICIENCY FOR RESIDENTIAL, COMMERCIAL AND PUBLIC BUILDINGS

This measure involves the expansion of existing programs and revolving loan funds to incentivize the installation of energy efficient HVAC systems and appliances in residential, commercial, and public buildings across Central Indiana. Additionally, these upgrades will be further incentivized by the promotion of a voluntary energy benchmark for all buildings in the Indianapolis MSA.

The implementation of this measure will require a robust and specialized workforce. Skilled HVAC and weatherization technicians/installers are essential for installing electric and hybrid HVAC systems and performing insulation upgrades. Additionally, electricians and retrofit specialists are required to handle any lighting, HVAC, and smart energy system upgrades. Furthermore, energy auditors and building assessors are needed to evaluate building performance, identify opportunities for retrofits, and ensure compliance with Thriving Buildings<sup>125</sup> benchmarks. From an administrative perspective, loan fund administrators and program managers are needed to oversee financing, outreach, and implementation of existing programs. Finally, it would be beneficial to include education and outreach coordinators to support public awareness and engagement of existing programs, enabling building owners to understand the benefits of energy efficiency and how to access existing programs.

A summary of existing occupations relevant to this measure is presented for measure 2 in Table 30 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>126</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 7. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>127</sup> to GDP<sup>128</sup> for the Indianapolis MSA region.

**Table 7. Measure 2 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Building Energy Assessors, Efficiency, Electrification, and Insulation Installers and Assemblers	7,534	301	301

<sup>125</sup> Thriving Buildings. Indianapolis Office of Sustainability. Accessed October 2025. Retrieved from: <https://www.indy.gov/activity/benchmarking-and-transparency>

<sup>126</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>127</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>128</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

## MEASURE 3 – UTILITY-SCALE CLEAN ENERGY

This measure involves scaling clean energy solutions, such as solar, wind, battery storage, and small modular reactors, through public support of clean power initiatives and collaboration with the Office of Energy Development’s Commercial Solar and Wind Energy Development Center to promote clean energy projects.

Implementing the measure will require solar installers, project developers, environmental scientists, wind turbine and nuclear technicians, and battery system engineers to install, operate, and maintain clean energy systems. Additionally, grid modernization analysts and strategists and procurement specialists will be required to manage smart grid integration and source materials for the projects, alongside permitting and zoning analysts and authorities. Energy storage technicians are required to support battery deployment. Finally, scaling clean energy requires technical training, permitting education, stakeholder engagement, and coordination with utilities. This measure therefore requires technical instructors to support the continued learning of the installers, engineers, and technicians and community engagement specialists to ensure smooth communication and integration of the new technology into the community. The community engagement specialists will work with relevant stakeholder groups to navigate the issues scaling clean energy may pose to the local community.

A summary of existing occupations relevant to this measure is presented for measure 3 in Table 31 in the Appendix. 2024 and estimated 2033 workforce data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>129</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 8. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>130</sup> to GDP<sup>131</sup> for the Indianapolis MSA region.

**Table 8. Measure 3 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
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<sup>129</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>130</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>131</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

Solar Installers, Clean Energy Technicians and Instructors, and Battery System Engineers	867	35	45
Program Administrators and Outreach Coordinators	171	7	9

## MEASURE 4 – DISTRIBUTED AND COMMUNITY SOLAR

This measure supports the construction of distributed solar energy systems through a revolving loan fund and resources to navigate solar cooperatives and bulk purchasing. Local governments are encouraged to collaborate with utilities on net metering or alternative compensation, streamlining permitting, and prioritizing land-efficient solar development such as agrivoltaics, solar canopies, and brightfields.

To implement this measure, electricians, solar photovoltaic (PV) installers, energy auditors, site assessors, and interconnection specialists will be required to design, plan, and construct distributed and community solar systems. Solar outreach coordinators will support community engagement alongside program facilitators and permitting staff trained in distributed energy systems. Regulatory affairs specialists may also be needed to navigate regulations concerning community solar PV installation and management.

A summary of existing occupations relevant to this measure is presented for measure 4 in Table 32 in the Appendix. 2024 and estimated 2033 workforce data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>132</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 9. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>133</sup> to GDP<sup>134</sup> for the Indianapolis MSA region.

**Table 9. Measure 4 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
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<sup>132</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>133</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>134</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

Solar PV Installers, Energy Auditors, Site Assessors, and Interconnection Specialists	3,233	129	141
Program Administrators and Outreach Coordinators	639	26	28

## MEASURE 5 – INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS

This strategy promotes industrial modernization through energy efficiency retrofits and alternative fuels, supported by existing industrial efficiency programs and hydrogen produced at the Midwest Hydrogen Hub.

Implementing this measure will require specialized training for energy managers and energy efficiency analysts, retrofit specialists, hydrogen fuel technicians, and process engineers. Additional roles may include industrial automation specialists and hydrogen infrastructure engineers. Loan distribution officers will be required to handle the revolving loan funds that will finance energy efficiency initiatives and alternative fuel demonstrations and deployments. Workforce development should include certification in energy auditing, hydrogen safety, and retraining for workers displaced from the fossil fuel industry.

A summary of existing occupations relevant to this measure is presented for measure 5 in Table 33 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>135</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 10. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>136</sup> to GDP<sup>137</sup> for the Indianapolis MSA region.

**Table 10. Measure 5 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Energy Managers and Energy Efficiency Analysts, Retrofit Specialists, Hydrogen Fuel	2,569	103	119

<sup>135</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>136</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>137</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>



Technicians, and Industrial  
Process Engineers

Program Administrators,  
Loan Officers, and Outreach  
Coordinators

305

12

14

## MEASURE 6 – ENHANCE GREEN SPACES

This measure promotes wetland and forest revitalization in suburban and rural areas through incentives and education, while prioritizing urban tree planting and green space access for low income and disadvantaged communities (LIDACs). It also encourages integrating green infrastructure—such as permeable pavements, rain gardens, and green roofs—into regional planning across the entire Central Indiana region.

Implementation of this measure will require landscape technicians, arborists, and ecological restoration specialists. Geospatial information systems (GIS) analysts and urban planners will be required to map green infrastructure, and environmental educators will be needed to teach the community how to cultivate and extend the green spaces. Additionally, stormwater management technicians will be required for maintenance. However, this analysis only estimates the workforce required to facilitate the incentive and education programs.

A summary of existing occupations relevant to this measure is presented for measure 6 in Table 34 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>138</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 11. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>139</sup> to GDP<sup>140</sup> for the Indianapolis MSA region.

**Table 11. Measure 6 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
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<sup>138</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>139</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>140</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

Arborists, Urban Planners, Technicians, Engineers, and Educators	26	1	2
Program Administrators and Outreach Coordinators	11	1	1

## MEASURE 7 – ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES

This strategy supports Central Indiana’s transition away from reliance on gasoline and diesel vehicles, which contribute significantly to local air pollution. It positions Central Indiana as a hub for EV innovation by incentivizing EV adoption, expanding charging infrastructure across major corridors, converting public fleets, and supporting low-emission freight technologies throughout the region.

This measure will require EV technicians, charging station installers, logistics analysts, and fleet managers. Additional roles include EV infrastructure planners, battery recycling technicians, and telematics specialists to optimize fleet performance. Training of workers should involve EV maintenance, electrical safety, and freight logistics education.

A summary of existing occupations relevant to this measure is presented for measure 7 in Table 35 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>141</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 12. Projected jobs by job category were estimated using data from an International Council on Clean Transportation study on electric vehicle charging infrastructure jobs<sup>142</sup>.

**Table 12. Measure 7 – Workforce Requirements (Number of FTE Personnel)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
EV Infrastructure Installers	184	7	28

<sup>141</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>142</sup> Anh Bui, Logan Pierce, Pierre-Louis Ragon, Arijit Sen, and Peter Slowik (ICCT), Taylor Waites (IBEW). The International Council on Clean Transportation. *Charging Up America: The growth of United States electric vehicle charging infrastructure jobs*. January 2024. Retrieved from: <https://theicct.org/wp-content/uploads/2024/01/ID-28-%E2%80%93-U.S.-infra-jobs-report-letter-70112-ALT-v6.pdf>

EV Infrastructure Maintenance & Repair Workers	432	17	23
Charger Assembly Personnel	54	2	8
EV Infrastructure Site Construction Workers	86	3	13
Software Maintenance and Repair Workers	665	27	35
Planning and Design Personnel	132	5	21
Administrative & Legal Personnel	773	31	41

## MEASURE 8 – TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS, AND MOBILITY DEVICES

As Central Indiana grows, bikes, pedestrian walkways, and mobility devices offer inclusive, low-emission alternatives that reduce traffic and improve air quality. This measure supports regional expansion of biking infrastructure, trail-oriented development, and micromobility programs—especially in LIDACs and communities outside the main metropolitan area.

Implementing this measure will require trail construction workers, micromobility coordinators, urban designers, and mobility device technicians. The measure will require mobility data analysts to evaluate usage and equity, bikeshare system technicians to conduct maintenance, and accessibility coordinators to ensure inclusive design. As different mobility elements become ready for public use, it will be important to bring in safety coordinators to teach the public about how to utilize different forms of transport safely alongside cars.

A summary of existing occupations relevant to this measure is presented for measure 8 in Table 36 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana Department of Workforce Development and STATS Indiana,<sup>143</sup> which was used to project key occupations and job sectors through 2050.

<sup>143</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

Implementing this measure fully will require the number of workers in each job category as listed in Table 13. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>144</sup> to GDP<sup>145</sup> for the Indianapolis MSA region.

**Table 13. Measure 8 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Construction Workers, Micromobility Coordinators, Urban Designers, and Mobility Device Technicians	333	13	13
Program Administrators, Educators and Outreach Coordinators	132	5	5

**MEASURE 9 – WASTE TO ENERGY**

Waste-to-energy facilities at landfills and wastewater treatment plants offer Central Indiana a sustainable way to manage waste while generating renewable energy by capturing methane and converting it into electricity or heat. This measure supports expanding these facilities across the region and includes food waste collection programs that feed digesters to produce renewable natural gas or electricity for local businesses and fleets.

Implementing the measure will require anaerobic digester operators and waste-to-energy plant technicians for ongoing operation, maintenance and repair. Additional roles include circular economy strategists to design reuse systems, materials recovery facilities (MRF) engineers to optimize sorting, and environmental compliance officers to ensure regulatory adherence. Energy specialist professionals will also be required to oversee construction and operation of waste-to-energy facilities and analyze data. Educators will also be required to teach the community how and where to contribute to the public food waste collection programs.

A summary of existing occupations relevant to this measure is presented for measure 9 in Table 37 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana

<sup>144</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>  
<sup>145</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

Department of Workforce Development and STATS Indiana,<sup>146</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 14. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>147</sup> to GDP<sup>148</sup> for the Indianapolis MSA region.

**Table 14. Measure 9 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Anaerobic Digester and WWTP Operators and Technicians, Construction Workers, Design and Planning Personnel, Energy Professionals	3,567	143	1,435*
Administrators, Educators and Outreach Coordinators	251	10	60*

*\*Several large WWTP waste to energy systems are anticipated to be installed by 2035. Therefore, a larger workforce is required than in typical years.*

**MEASURE 10 – LANDFILL WASTE REDUCTION AND DIVERSION**

As Central Indiana’s population and industrial activity grow, landfill waste poses increasing risks to soil, water, and air quality. This measure reduces those impacts by expanding composting, reuse, and recycling programs—such as city-wide recycling contracts and subscription composting partnerships—to divert waste from landfills across the region.

Implementing this measure will require recycling sorters, compost facility operators, reuse program managers, and municipal waste planners. Adding MRF engineers, behavioral change strategists, community outreach specialists, and compliance officers will also support integration of sustainable waste disposal into communities. Training and workforce development should focus on equitable access to waste services and community education.

A summary of existing occupations relevant to this measure is presented for measure 10 in Table 38 in the Appendix. 2024 and estimated 2033 data for Central Indiana was gathered from the Indiana

<sup>146</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>  
<sup>147</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>  
<sup>148</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>

Department of Workforce Development and STATS Indiana,<sup>149</sup> which was used to project key occupations and job sectors through 2050.

Implementing this measure fully will require the number of workers in each job category as listed in Table 15. Required workforce projections were calculated using implementation cost estimations compared to the ratio of workers<sup>150</sup> to GDP<sup>151</sup> for the Indianapolis MSA region.

**Table 15. Measure 10 – Workforce Requirements (Number of Persons)**

Job Category	Total Jobs (2026-2050)	Average Annual Jobs	Max. Annual Jobs
Construction Workers, Recycling Sorters, Compost Facility Operators, Reuse Program Managers, MRF Engineers, and Municipal Waste Planners	1,736	69	143
Program Administrators, Educators and Outreach Coordinators	405	16	33

**WORKFORCE CHALLENGES**

This analysis has revealed three key workforce challenges that could significantly impact the successful rollout of the plan:

- 1. Shortages of specialized talent in clean energy trades
- 2. Ability to upskill and retain the clean energy workforce
- 3. Access to workforce development opportunities across regions and LIDACs

Job market projections through 2050 indicate a modest rise in employment suited to the clean energy initiatives outlined in this plan, as depicted in Figure 13. Yet, conversations with stakeholders reveal that demand is already outpacing supply in several critical areas, including clean energy (solar, wind, nuclear) installers and operators, building retrofit installers for energy efficiency, insulation, hybrid/electric HVAC systems, and electric vehicle infrastructure installers. In addition, stakeholders noted a lack of awareness of the sustainability field in trades programs. To meet the anticipated

<sup>149</sup> Hoosiers by the Numbers. Indiana Department of Public Works & STATS Indiana. August 2025. Accessed October 2025. Retrieved from: <https://www.hoosierdata.in.gov/index.asp>

<sup>150</sup> Federal Reserve Bank of St. Louis. Employed Persons in Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Retrieved from: <https://fred.stlouisfed.org/series/LAUMT182690000000005>

<sup>151</sup> Federal Reserve Bank of St. Louis. Total Gross Domestic Product for Indianapolis-Carmel-Anderson, IN (MSA). Dec 4, 2024. Accessed October 10, 2025. Retrieved from: <https://fred.stlouisfed.org/series/NGMP26900>



growth in demand for these services, targeted training and upskilling programs focused on clean energy retrofit, installation, and construction will be essential.

As the clean energy sector evolves, many workers may not yet have the technical skills needed to thrive in emerging green jobs. To meet this challenge, targeted training programs will be essential to equip the workforce with the capabilities required to deliver on this plan, and to ensure that the workers are employed in roles that offer long-term, high-quality career paths. Attracting and retaining talent in clean energy is a critical priority, and creating meaningful opportunities for those investing in upskilling will be key to building a resilient and sustainable workforce.

It is important to build a strong and diverse workforce to support the measures outlined in this plan. Many of the jobs tied to this plan's measures are region-specific, presenting a unique opportunity to engage individuals from LIDACs in delivering locally tailored solutions and driving innovation through diverse perspectives. This is essential to increase program engagement and participation by building trust in communities that may have been previously negatively impacted by industrial development.

## RECOMMENDED SOLUTIONS AND PARTNERSHIPS

To address the challenges outlined in the previous section, this analysis recommends the following actions to build a robust, diverse, and sustainable workforce that can effectively and efficiently implement the measures in this plan:

Potential Challenge	Impacted Measures	Recommended Solution
Shortages of specialized talent in clean energy fields	2, 3, 4, 5, 7	<ol style="list-style-type: none"> <li>1. Expand targeted training and certification programs for high-demand roles catered at the high school and secondary education levels.</li> <li>2. Leverage existing industry expertise for workforce transition pathways.</li> <li>3. Expand education around the sustainability field in trades programs.</li> </ol>
Ability to upskill and retain the clean energy workforce	2, 3, 4, 5, 7	<ol style="list-style-type: none"> <li>1. Invest in long-term career pathways and job quality.</li> <li>2. Foster public-private partnerships for workforce development.</li> </ol>
Access to workforce development opportunities across regions and LIDACs	1, 2, 3, 4, 6, 7, 8, 9	<ol style="list-style-type: none"> <li>1. Localize training and hiring efforts.</li> <li>2. Provide financial and logistical support for participation.</li> <li>3. Build inclusive partnerships with community organizations.</li> </ol>

College graduates are increasingly taking an interest in sustainability, which can help with administrative and policy jobs. However, this analysis identified the risk of a shortage of specialized trades talent for clean energy systems, electric vehicle infrastructure, energy efficiency, and

weatherization. It is critical to develop and expand workforce development programs tailored to the technical requirements of emerging occupations that are delivered through community colleges, trade schools, and union partnerships. Furthermore, education around clean energy and sustainability in trades programs would provide the individuals engaged in these programs with the knowledge needed to pursue this line of work. Additionally, it would be beneficial for legacy industries such as utilities and construction companies to offer retraining and upskilling programs to repurpose the existing skills of their existing workforce.

In addition to expanding training programs to encourage upskilling in the existing workforce, it is also important to ensure retention and sustainability of a high quality, skilled workforce. It is recommended that industries take steps to offer high-quality clean energy jobs with advancement opportunities, benefits, and stability to retain workers who invest in upskilling. Companies should also take responsibility for developing the workforce their growth depends on. Public-private partnerships between corporates and government agencies or non-profits can fund training centers, apprenticeships, and mentorship programs to support the development of a robust and sustainable talent pipeline.

Ensuring equitable access to workforce development programs, especially those designed for LIDACs, is critical to building a strong, inclusive workforce needed for this plan. Programs should be designed to recruit and train individuals from LIDACs and for region-specific roles. For instance, Measure 1 – Reduce Nutrient Runoff from Croplands, focuses on rural and semi-rural areas, making it essential to recruit and train talent directly from these communities. Similarly for Measure 2 – Energy Efficiency for Residential, Commercial, and Public Buildings, outreach coordinators and program administrators should come from LIDACs, helping build trust and drive participation in areas that can be burdened by energy costs. Additionally, the career choices of many individuals are driven by financial factors. To reduce financial roadblocks for LIDAC participation in training programs, government agencies, corporates, and non-profits can offer training stipends, transportation assistance, or childcare support. Finally, building partnerships with community organizations can increase participation in workforce training programs by building lasting and trusting relationships with underserved communities.

Table 16 highlights a range of promising partnership opportunities to support green job workforce development across Central Indiana.

**Table 16. Partnerships for Workforce Development**

Category	Organization / Program	Counties Served	Value to CCAP Implementation
<b>Workforce Boards &amp; Job Centers</b>	WorkOne Central ( <a href="#">Region 5</a> )	Boone, Hamilton, Hancock, Hendricks, Johnson, Madison, Morgan, Shelby	Regional workforce board that connects employers and jobseekers. Could provide clean energy training and apprenticeship program expansion. Ideal organization for green skills pipeline development.
	WorkOne Indy ( <a href="#">Region 12</a> )	Marion	
	WorkOne Western ( <a href="#">Region 7</a> )	Putnam	

	WorkOne South Central ( <a href="#">Region 8</a> )	Brown	
<b>University Certificates and Secondary Education</b>	<a href="#">Ivy Tech Community College</a>	All counties (via campus network)	Offers various green job certificates and supports employer partnerships.
	<a href="#">Indiana Tech</a>	All counties (serves Central Indiana online)	Offers the NABCEP PV Installation Professional Program.
	<a href="#">Purdue Extension</a>	All counties	Offers applied energy programs, technical assistance to local employers, and agriculture-energy crossover education.
	<a href="#">IU Indianapolis</a>	Marion, Hamilton, Hancock	Offers undergraduate program in Energy Engineering.
	<a href="#">IU O'Neill School</a>	Regional	Offers graduate programs for planning, sustainability and policy.
	<a href="#">University of Southern Indiana</a>	All counties (online)	Offers a NABCEP Certification for PV installation professionals.
<b>Registered Apprenticeship &amp; Trades Training</b>	<a href="#">Apprenticeship Indiana</a>	All counties	Supports clean-energy trades in electrical, HVAC and construction.
	<a href="#">Electrical Training Institute (ETI)</a>	Regional	Can provide electrician apprenticeships focused on energy efficiency
<b>Weatherization &amp; Energy-Efficiency Workforce Partners</b>	<a href="#">Intelligent Weatherization Indiana Skills Verification Program</a>	All counties	Provides IREC-accredited Intelligent Weatherization training to 22 Community Action Agencies in Indiana.
	<a href="#">Indiana Office of Energy Development &amp; Dept of Workforce Development</a>	All counties	Offers training for Residential Energy Contractors (TREC) program to train EE contractors.
<b>Electric Vehicle Infrastructure Workforce Partners</b>	<a href="#">Electric Vehicle Infrastructure Training Program (EVITP)</a>	All counties	Provides an Electric Vehicle Charging Systems course to prepare electrical workers for the EVITP Certification Exam.
<b>Non-Profit Workforce Inclusion Programs</b>	<a href="#">Goodwill Career &amp; Technical Academy (Goodwill of Central and Southern Indiana)</a>	All counties	Provides skilled trades courses in construction and electrical knowledge. Could offer trades courses for energy efficiency and weatherization skills.

	<a href="#">Foster Success</a>	All counties	Connects young adults to postsecondary and career pathways through their Workforce Readiness and Educational Success programs. Could connect young people to apprenticeships in sustainability-related fields.
	<a href="#">Hendricks County Workforce Coalition</a>	Hendricks	Local convening body links employers and education. Focuses on housing and transportation, which could offer opportunities for energy efficiency, green construction jobs, and EV infrastructure.
<b>Economic Development &amp; Employer Conveners</b>	<a href="#">Indy Chamber</a>	Indianapolis MSA	Indy Partnership focuses on regional talent development. Regional Skills Analysis will provide resources for upskilling.
	County Economic Development Offices & Chambers	All counties	Can coordinate employer engagement, workforce grants, and local incentives for green job trainings.
<b>K-12 &amp; Career Technical Education (CTE)</b>	Regional Career Centers (e.g., <a href="#">Brown County Career Resource Center</a> )	All counties	Provide pre-apprenticeships and vocational training in HVAC, construction, and electrical work, which are foundations for clean energy pathways.



## 8. Evaluation of Funding Opportunities

### OVERVIEW

Each of the GHG reduction measures assessed in section five of this report will require funding from external sources to proceed effectively. To support these efforts, the project team explored local, state, and federal funding sources upon which Central Indiana could draw to fund these measures. Funding sources exist for all ten measures, though the number of programs and the amount of funding vary depending on the measure. Additionally, the availability of a large portion of federal funding – allocated to Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA) programs – remains unclear, as they have been targeted for repeal or adjustment by the One Big Beautiful Bill Act (OBBB) and Trump Administration executive orders.<sup>152</sup>

### APPROACH

The project team researched existing funding opportunities at the federal, state, and local level, as well as from key non-profit and private organizations that could potentially support the priority GHG reduction measures. This research was aligned with the grants and other funding opportunities utilized to evaluate GHG reductions and program implementation costs for each measure. For example, research on funding opportunities for Measure 1 – Reduce Nutrient Runoff from Croplands aimed to identify programs that incentivized the adoption and continued usage of practices to reduce nutrient runoff, including cover cropping, low/no-till agriculture, and fertilizer management. Key federal and state agencies on which the project team focused included: the US Departments of Energy, Agriculture, Transportation, Housing and Urban Development, the Internal Revenue Service, and the Environmental Protection Agency, as well as the Indiana Departments of Natural Resources, Agriculture, Environmental Management, and Transportation, Indiana Offices of Energy Development and

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<sup>152</sup> White House. (2025, July). Ending market-distorting subsidies for unreliable foreign-controlled energy sources [Presidential Action]. The White House. <https://www.whitehouse.gov/presidential-actions/2025/07/ending-market-distorting-subsidies-for-unreliable-foreign%E2%80%91controlled-energy-sources/>  
U.S. Congress. (2025). H.R.1 — 119th Congress (2025–2026). Congress.gov. <https://www.congress.gov/bill/119th-congress/house-bill/1/text>



Community & Rural Affairs, and both the Indiana Energy Independence Fund and Indiana Economic Development Corporation. While these were not the only potential funding sources on which the project team focused, they were the sources that were able to offer the most funding for the selected measures. One area of research utilized heavily in Central Indiana's Priority Climate Action Plan – the Inflation Reduction Act Guidebook – was not utilized as it has been removed by the Trump Administration. Various IRA funding sources posted elsewhere have been included with the disclaimer that those funding sources may or may not be available due to the changes instituted by the OBBB and various executive orders. A brief breakdown of key funding sources for each measure has been provided below. Note that a total value of available funding has not been provided for each measure, as funding sources take various forms, including loans and loan guarantees, lump sum grant funding, tax credits, cost-sharing, and per-acre payments.

A full list of all identified funding sources broken down by measure can be found in Appendix H. List of Funding Opportunities.

## **FUNDING OPPORTUNITIES FOR EACH MEASURE**

### **MEASURE 1 – REDUCE NUTRIENT RUNOFF FROM CROPLANDS**

Measure 1 has a high quantity of funding sources available, covering a range of nutrient runoff reduction practices including fertilizer management, low/no-till agriculture, and cover-cropping. Key funding sources include the USDA's Conservation Stewardship Program (CSP) and Environmental Quality Incentive Program (EQIP), which provide incentive payments on a per-acre or per-award basis for cover-cropping, no-till agriculture, various fertilizer management practices, and other related practices. USDA also provides financial and technical assistance support for priority watersheds via the National Water Quality Initiative. At least one priority watershed – Cicero Creek - is located within the Central Indiana Region.<sup>153</sup> Indiana's State Departments of Agriculture and Environmental Management provide additional funding opportunities via Clean Water Indiana and Clean Water Act §319(h) grants.

### **MEASURE 2 – ENERGY EFFICIENCY AND ELECTRIFICATION OF RESIDENTIAL, COMMERCIAL AND PUBLIC BUILDINGS**

There are a wide variety of funding sources available for measure 2, providing rebates and cost sharing for both residential and commercial properties. Covering both residential and commercial buildings, Indiana's Office of Energy Development provides rebates and cost sharing via the HOMES and HEAR programs. The Indiana Energy Independence Fund provides additional loans and grants to both commercial and residential properties. Other programs can be drawn from the Indiana Energy Efficiency Fund's loans and grants, the US Department of Energy – particularly State and Community Energy Programs (SCEP) office grants - as well as through IRS tax deductions. The last program to highlight here is the Energy Efficiency and Conservation Block Grant (EECBG), which has already been

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<sup>153</sup> USDA Natural Resources Conservation Service. National Water Quality Initiative. Accessed November 2025. Retrieved from: <https://experience.arcgis.com/experience/6e01c2d7ebc04dd08df67f77b7631995/page/National-Water-Quality-Initiative/>



awarded to various Central Indiana counties and municipalities in amounts ranging from \$70,000-150,000.

### MEASURE 3 – UTILITY-SCALE CLEAN ENERGY

A major driver of utility-scale clean energy incentives are tax credits – particularly the Clean Energy Investment Credit – offered by the IRS. However, this credit, as well as the Renewable Energy Production Tax Credit, is being targeted for repeal, with the executive order *Ending Market Distorting Subsidies For Unreliable, Foreign Controlled Energy Sources* specifically calling for its termination.<sup>154</sup> Another area of opportunity can be found via loans and loan guarantees from the U.S. Department of Energy’s Loan Programs Office (LPO), which provides these services to clean energy projects and can finance up to 80% of project costs, even up into the billions of dollars. However, LPO’s original funds were repealed by OBBB, with new funding appropriated and aimed at “energy dominance” rather than clean energy projects. It remains to be seen how exactly LPO will approach its new mandate and how much it could provide Central Indiana to help it achieve climate goals.<sup>155</sup> Lastly, the Indiana Office of Energy Development’s Energy Efficiency and Conservation Block Grant program provides grants of \$100,000 to \$200,000 for the implementation of measures to improve energy efficiency and install renewable energy.

### MEASURE 4 – DISTRIBUTED AND COMMUNITY SOLAR

Funding sources for measure 4 largely mirror measure 3. However, there are a few key differences. For Central Indiana’s rural areas, the Rural Energy for America Program (REAP) can provide grants of up to 50% of eligible costs for the installation of distributed renewable energy. This program is currently under review by the Trump Administration, so it remains to be seen whether its availability will continue.<sup>156</sup> The IEIF, which is also available for measure 2 projects, can provide loans to support renewables installation on both commercial and residential properties. Lastly, for residential installations of solar, the Residential Clean Energy Credit provides a credit of 30% of the costs of new clean energy installations installed between 2022 and 2032, with no annual or lifetime limit.

### MEASURE 5 – INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS

Many of the programs described in measure 5 involve technical assistance, energy efficiency assessments, and follow-on investments based on those initial assessments. The US Department of Energy has partnered with the Midwest Energy Efficiency Alliance to provide technical assistance to small and medium manufacturers looking to improve energy efficiency in their operations. Similarly,

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<sup>154</sup> White House. (2025, July). Ending market-distorting subsidies for unreliable foreign-controlled energy sources [Presidential Action]. The White House. <https://www.whitehouse.gov/presidential-actions/2025/07/ending-market-distorting-subsidies-for-unreliable-foreign%E2%80%91controlled-energy-sources/>

<sup>155</sup> Holland & Knight LLP. (2025, August). How the One Big Beautiful Bill Act reshapes DOE loan programs. Holland & Knight Insights. <https://www.hklaw.com/en/insights/publications/2025/08/how-the-one-big-beautiful-bill-act-reshapes-doe-loan-programs>  
U.S. Congress. (2025). H.R.1 — 119th Congress (2025–2026). Congress.gov. <https://www.congress.gov/bill/119th-congress/house-bill/1/text>

<sup>156</sup> U.S. Department of Agriculture, Rural Development. (n.d.). Rural Energy for America Program (REAP). <https://www.rd.usda.gov/inflation-reduction-act/rural-energy-america-program-reap>

the Purdue Industrial Assessment Center (PIAC) partners with businesses to provide assessments of energy efficiency and consumption. PIAC can also provide follow-on grants to help with the implementation of recommendations that stem from the original assessment. Other potential funding sources include the Advanced Energy Project Credit from the US DOE and the Energy Efficient Commercial Buildings Tax Credit from the IRS. Lastly, DOE's Industrial Demonstrations Program (IDP) and DOE Industrial Efficiency & Decarbonization FOA both have funded demonstrations and pilot programs for industrial decarbonization technologies. While these programs are not currently open for applications, future releases of funding through these programs could supplement funding through the Indiana Energy Insights program or the other programs mentioned above.<sup>157</sup>

## MEASURE 6 – ENHANCE GREEN SPACES

Measure 6 requires a variety of funding opportunities to support the restoration of wetlands, reforestation efforts, and the improvement of green spaces in Central Indiana communities. For wetland restoration, a key source of funding is the USDA's Wetland Reserve Easements (WRE) portion of the Agricultural Conservation Easement Program, which provides grants equal to 50% to 100% of total restoration costs, and has \$1.4 billion in overall funding available through 2031. For reforestation, EQIP – previously mentioned under measure 1 – provides \$247 per acre for woodland restoration. Agencies providing significant funding beyond the USDA include the Indiana Department of Natural Resources (DNR), and the US EPA, DOE, and Department of Transportation.

## MEASURE 7 – ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES

Measure 7 funding sources are generally derived from the US Department of Transportation (DOT), or from the Indiana Department of Transportation (INDOT) in collaboration with the US DOT. US DOT's Federal Highway Administration (FHWA) provides EV charging infrastructure funding through the National Electric Vehicle Infrastructure program (NEVI). This grant program's funds remain available through FY2026, though new guidance has been issued by FHWA in August and should be considered as funding options are explored.<sup>158</sup> Additionally, while no future NOFO release date has been set yet, the Charging and Fueling Infrastructure Discretionary Grant Program may be another option for EV charging infrastructure.<sup>159</sup> For public vehicle fleet electrification, a key funding source that could be

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<sup>157</sup> U.S. Department of Energy, Office of Clean Energy Demonstrations. (n.d.). Industrial Demonstrations Program.

<https://www.energy.gov/oced/industrial-demonstrations-program-0>

U.S. Department of Energy, Industrial Efficiency and Decarbonization Office. (n.d.). Industrial Efficiency and Decarbonization Funding Opportunity Announcement. <https://www.energy.gov/eere/iedo/industrial-efficiency-and-decarbonization-funding-opportunity-announcement>

<sup>158</sup> Federal Highway Administration. (2025, August 11). National Electric Vehicle Infrastructure (NEVI) Formula Program interim final guidance [PDF]. U.S. Department of Transportation. <https://www.fhwa.dot.gov/environment/nevi/resources/NEVI-Interim-Final-Program-Guidance-8-11-2025.pdf>

<sup>159</sup> Federal Highway Administration. (n.d.). Carbon Reduction Program: Charging and Fueling Infrastructure (CFI). U.S. Department of Transportation. <https://www.fhwa.dot.gov/environment/cfi/>

utilized is 5339(c),<sup>160</sup> which has set aside \$1.1 billion for low- or no-emissions bus and bus facility purchases and upgrades. Another key source could be the EPA Clean School Bus program, which offers public school districts and tribal schools up to \$375,000 in grant funding per school bus, as well as covering bus charging equipment.

## MEASURE 8 – TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS, AND MOBILITY DEVICES

Funding sources for measure 8 include both state funding sources like Indiana DNR's Indiana Trails Program (ITP), which funds up to 80% of trail project costs from \$100,000 to \$400,000, as well as US DOT funding sources. INDOT sources include the Community Crossing Matching Grant program for improvements to roads and bridges.<sup>161</sup> US DOT sources include competitive BUILD grants (Better Utilizing Investments to Leverage Development Funding), as well as the US DOT's Safe Streets for All (SS4A) program, which still has approximately \$3 billion available for future funding. The SS4A 2025 funding opportunity looks to have proceeded as normal, so while there remains some uncertainty regarding funding availability in 2026, SS4A grants could represent a promising opportunity.

## MEASURE 9 – WASTE TO ENERGY

Funding opportunities for measure 9 are buoyed by its status as both an energy generation measure while also involved in waste, wastewater, and materials management. This makes projects related to measure 9 eligible for energy-related programs like REAP, Section 45Z Clean Fuel Production Credit, and other similar programs, as well as waste-related funding sources like the Indiana Wastewater and Drinking Water State Revolving Fund. This Fund provides low interest loans for wastewater facility upgrades. Another waste-related grant that could be utilized to fund measure 9 is the Solid Waste Infrastructure for Recycling Grants for Political Subdivisions (SWIRG), which provides funding for improvements to local waste management systems with the aim of building a circular economy. The continued availability of SWIRG funding is not guaranteed, however.<sup>162</sup>

## MEASURE 10 – LANDFILL WASTE REDUCTION AND DIVERSION

Two highly applicable funding sources for Measure 10 are Indiana Department of Environmental Management (IDEM)'s Community Recycling Grant Program (CRG) and its Recycling Market Development Program (RMDP). CRG provides grants supporting recycling education, composting, and collection and disposal. RMDP provides grants to further expand recycling markets and processing capacity. While these are not the only relevant funding sources – the previously mentioned SWIRG program being another relevant funding source – they are specific to Indiana and could be utilized by

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<sup>160</sup> Federal Transit Administration. Low or No Emission Grant Program 5339(c). Accessed November 2025. Retrieved from: <https://www.transit.dot.gov/lowno>

<sup>161</sup> Indiana Department of Transportation. Community Crossing Matching Grant Program. Accessed November 2025. Retrieved from: <https://www.in.gov/indot/doing-business-with-indot/local-public-agency-programs/community-crossing-matching-grant-program/>

<sup>162</sup> U.S. Environmental Protection Agency. (n.d.). Solid Waste Infrastructure for Recycling Grants for Political Subdivisions. U.S. EPA Circular Economy. <https://www.epa.gov/circulareconomy/solid-waste-infrastructure-recycling-grants-political-subdivisions#04>

Central Indiana to drive growth in recycling and composting. Both CRG and RMDP are annual grant programs, while it remains unclear whether SWIRG will continue after the recent completion of its second round of funding.<sup>163</sup>

## SUMMARY OF OPPORTUNITIES AND RECOMMENDATIONS

While there remains significant uncertainty regarding the status of a large portion of potential federal funding sources, funding remains available for each of the ten identified decarbonization measures. Measures in or adjacent to the agricultural and lands sectors – namely Measure 1 and Measure 6 – face the least risk of shifts in funding availability. Considering the current uncertainty surrounding federal funding opportunities, Central Indiana should prioritize seeking out grants and loan options that are specific to Indiana. Additionally, it may be beneficial to repurpose federal funds that have already been allocated, such as those from the NEVI program, the EECBG program, and the 5339(c) Low- and No-Emissions Bus grants, to support future decarbonization efforts.

For federal sources that have not been obligated, the Project Team’s research indicated that a large portion of IRA funding sources will be available through FY2026 or FY2027. While many IRA programs have been delayed, repealed, or are under review, ensuring that IRA programs that remain available are taken advantage of could provide further critical funding to drive the implementation of the measures outlined in this plan.

Collaborative efforts such as public-private partnerships, partnerships with non-profits, or cross-jurisdictional partnerships between municipalities, counties, or other government entities - either of the same or varying level – could generate enhanced coordination, additional funding, or a stronger application for funding. Central Indiana has seen this at work through Indianapolis’ residential solar pilot program, as well as through state and federal collaboration on initiatives like EV charging infrastructure expansion.<sup>164</sup> While the most effective form of collaboration will depend upon the requirements of a funding opportunity or the specifics of a given project, the pursuit of partnerships could drive further implementation of Central Indiana’s GHG reduction measures. Utilizing collaborative partnerships while focusing on Indiana-specific funding opportunities, as well as repurposing already-obligated federal funds, should allow Central Indiana to take advantage of available resources to most effectively pursue its environmental goals.

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<sup>163</sup> Ibid.

<sup>164</sup> Gibson, London. 2019. IndyStar: A New City Program Will Provide Free Solar Installations for Low-Income Homes in 2020. Retrieved from: [A new city program will provide free solar installations for low-income homes](#)  
INDOT. Electric Vehicle Infrastructure Plan. 2024 Update. Accessed August 2025. Retrieved from: [https://chargingthecrossroads.com/wp-content/uploads/2024/11/INDOT\\_NEVI\\_-2024\\_Annual\\_Plan\\_Update.pdf](https://chargingthecrossroads.com/wp-content/uploads/2024/11/INDOT_NEVI_-2024_Annual_Plan_Update.pdf)



## 9. Review of Implementation Authority

This section provides an overview of the process to verify implementation authority in municipal and state code for the GHG reduction measures. The Project Team conducted a review of existing statutory or regulatory authority to implement for each of the 10 GHG reduction measures outlined within Section 5 of this report. GHG reduction measures with verified implementation authority have completed all mandatory approval steps, whereas the remainder require some additional milestones (e.g., permits) to be obtained for implementation.

An in-depth, state and local regulatory review of implementation authority that was conducted for the Central Indiana Priority Climate Action Plan (PCAP)<sup>165</sup> was leveraged to complete the review of implementation authority for this comprehensive plan. Noting the state's Executive Order 25-49,<sup>166</sup> state agencies are not involved in the implementation of the strategies outlined in this plan but can provide certain grant and regulatory assistance from existing programs.

### MEASURE 1 – REDUCE NUTRIENT RUNOFF FROM CROPLANDS

Implementing agencies include local entities with active programs and initiatives, including Purdue Extension, Indiana Farmland Trust, Indianapolis Department of Public Works, and Connor Prairie. As these organizations already have existing programs, they do not require any additional authority to implement.

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<sup>165</sup> Central Indiana Priority Climate Action Plan. Central Indiana Regional Development Authority. February 2024. Accessed November 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>166</sup> State of Indiana Executive Department. Executive Order 25-49. April 10, 2025. Retrieved from: <https://www.in.gov/gov/files/EO-25-49.pdf>



## **MEASURE 2 – ENERGY EFFICIENCY AND ELECTRIFICATION OF RESIDENTIAL, COMMERCIAL AND PUBLIC BUILDINGS**

Implementing entities for building upgrades incentive programs include the Indiana Energy Independence Fund, Duke Energy, AES Indiana, and others with existing programs. Therefore, program implementation will not require additional authority to implement. However, public facilities might require additional permits to perform building upgrades, such as McCordsville Town Hall and Crispus Attucks High School, as described in the PCAP – Measure 1, Pilot Projects #2 and #6. Private residences, non-profit entities and industrial facilities will likely not require additional authority to implement energy efficiency upgrades as they are in their capacity as private residences and companies; however, larger scale projects might require local permits, such as those described for the Indianapolis Arts Center in the PCAP – Measure 1, Pilot Project #7.

The Indianapolis Office of Sustainability has authority to implement the Thriving Buildings Program and Thriving Nonprofits Program; however, any adjustments to the programs would likely need to undergo city approval.

## **MEASURE 3 – UTILITY-SCALE CLEAN ENERGY**

This measure involves the expansion of existing programs to support the development of utility-scale energy infrastructure. While the incentive programs won't require any additional authority to implement, construction of utility-scale clean energy projects will be required to undergo several permitting steps to ensure that the project meets local, state, and federal requirements. First, the project must secure local zoning and land use approvals with the county or township. Second, building and electrical permits will be required to ensure the construction meets safety codes. Third, depending on size and location, a project might require several environmental permits. Fourth, connecting the project to the electric grid will require approval from the local utility and possibly the Midcontinent Independent System Operator (MISO). Fifth, if the project includes wind turbines, it will require clearance from local aviation authorities and the Federal Aviation Administration to ensure they will not interfere with air traffic. Finally, a project might need to also conduct cultural and historical reviews to ensure compliance with the National Historic Preservation Act. Each project is unique, so the exact permits can be varied based on location, project size, and clean energy technology.

Note that several counties within the Central Indiana region have active ordinances that may limit the adoption of certain clean energy technologies. It is encouraged that these counties reconsider certain ordinances to promote the adoption of large-scale clean energy resources in Central Indiana. Boone County has an ongoing moratorium on large scale solar, wind, and battery storage projects within the county, which will expire on April 15, 2026, or whenever a new County Comprehensive Plan and updated County Zoning Ordinance are adopted.<sup>167</sup> Hancock County adopted an ordinance for special

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<sup>167</sup> Boone County Board of Commissioners. Ordinance No. 2024-06: An Ordinance Establishing a Development Moratorium on Commercial or Large-Scale Solar and Wind Alternative Energy Generation and Storage Facilities, Projects, or Systems. April 15, 2024. Retrieved from: <https://boonecounty.in.gov/wp-content/uploads/2024/04/Solar-and-Wind-Moratorium.pdf>



exception wind energy projects.<sup>168</sup> Hendricks County requires several additional approvals be obtained for large scale solar<sup>169</sup> and wind<sup>170</sup> power projects. Madison County has a provision in their solar energy ordinance that states battery storage of electrical energy requires a separate permit than those required for solar infrastructure.<sup>171</sup> Madison County also has an active moratorium on new wind farms. Johnson County has issued a three-year moratorium on commercial wind farm projects that will be in effect from November 2024-2027.<sup>172</sup>

## **MEASURE 4 – DISTRIBUTED AND COMMUNITY SOLAR**

This measure involves the expansion of existing programs to support funding opportunities for distributed solar energy and battery storage infrastructure. Since this will be implemented through existing programs, there is no additional authority required. Refer to Measure 3 for additional permits and approvals required for clean energy infrastructure development.

## **MEASURE 5 – INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS**

Industrial facilities are authorized in their capacity as private companies to implement energy efficiency updates. Energy Systems Network, in its capacity as a non-profit organization, is authorized to implement the Energy Insights Program designed to support and incentivize implementation of energy efficiency measures in industry. Since this is an expansion of the Energy Independence Fund Green Bank, no additional authority is required to implement.

Future planning for hydrogen infrastructure will require permits and regulatory approvals from federal organizations including PHMSA, EPA, OSHA, and DOE. Additionally, obtaining state permits from IDEM and IEDC and local zoning, building code, and fire safety permits will be required. Additional coordination between industry partners, workforce training entities, local utilities and transport companies will be needed to move implementation forward.

## **MEASURE 6 – ENHANCE GREEN SPACES**

Existing programs that incentivize protection of natural landscapes will not require additional authority for implementation. However, implementing entities will need to obtain permission from their respective county governments, zoning permits, or drainage easements to expand and restore certain

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<sup>168</sup> Hancock County. Ordinance No. 2024-100. October 15, 2024. Retrieved from:

<https://www.hancockin.gov/DocumentCenter/View/1595/Ordinance-2024-10D-Amending-WECS>

<sup>169</sup> Hendricks County. Ordinance No. TZA 01-21-04. February 23, 2021. Retrieved from:

[https://www.co.hendricks.in.us/egov/documents/1619619585\\_99816.pdf](https://www.co.hendricks.in.us/egov/documents/1619619585_99816.pdf)

<sup>170</sup> Hendricks County. Ordinance No. 2024-16. April 23, 2024. Retrieved from:

[https://www.co.hendricks.in.us/egov/documents/1724428331\\_67136.PDF](https://www.co.hendricks.in.us/egov/documents/1724428331_67136.PDF)

<sup>171</sup> Ken de la Bastide. Indiana Economic Digest. "Madison County Plan Commission approves new solar ordinance and sends it to commissioners." November 15, 2023. Retrieved from: <https://indianaeconomicdigest.net/MobileContent/Most-Recent/Madison/Article/Madison-County-Plan-Commission-approves-new-solar-ordinance-and-sends-it-to-commissioners/31/201/115183#:~:text=Battery%20storage%20of%20electrical%20energy%20will%20require,can%20be%20used%20for%20solar%20energy%20facilities.>

<sup>172</sup> Elissa Maudlin. Daily Journal. "Johnson County Commissioners OK wind farms moratorium." November 5, 2025. Retrieved from: <https://dailyjournal.net/2024/11/05/johnson-county-commissioners-ok-wind-farms-moratorium/>

natural habitats, such as is outlined for Measure 2, Pilot Projects #4 and #5 – Connor Prairie Reforestation and Wetland Enhancement in the Central Indiana PCAP. Large-scale green infrastructure construction might also require additional permits from the county.

### **MEASURE 7 – ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES**

This measure involves incentivizing the construction of electric vehicle charging infrastructure through existing programs; therefore, additional implementation authority is not required. However, the construction of charging infrastructure will require electrical and building permits issued by local municipalities, local zoning and land use approvals, special use permits or site plan reviews (if required), environmental permits, and utility coordination to secure grid connection and load assessments. Utility approvals might also include necessary transformer upgrades or metering changes. Additionally, for new EV purchases, municipalities may require approval from their purchasing department or through city budget planning. Private businesses and residents are in their own authority to purchase electric vehicles.

### **MEASURE 8 – TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS, AND MOBILITY DEVICES**

Local entities will require jurisdictional approval from municipalities to construct pedestrian and bike trails, bridges, and walkways, as described for Measure 2, Pilot Projects #2 and #3 – Nickel Plate Pedestrian Bridge and Grassy Creek Trail in the PCAP. Operators looking to administer a mobility program like the Pacers Bikeshare program will require several approvals. First, operators will require an operating license and municipal operating agreement with the city. Second, operators must obtain zoning and land use approval for station placement, ensuring ADA compliance and safety and equipment standards are met. Third, operators must coordinate with the Department of Public Works to ensure public right-of-way use.

### **MEASURE 9 – WASTE TO ENERGY**

Waste to energy (WTE) projects at wastewater treatment plants (WWTPs), landfills, and farms require a range of permits and regulatory approvals. WTE projects at WWTPs may require a National Pollutant Discharge Elimination System (NPDES) permit, air quality permits, solid waste handling permit, local building and zoning approvals, and potentially undergo environmental impact assessments (CEQA/NEPA). WTE projects at landfills will require a solid waste facility permit issued by the Indiana Department of Environmental Management (IDEM) under Title 329 IAC, landfill gas recovery system approval for RNG or electricity generation from landfill gas, air permits and methane management plan, compliance with the Clean Water Act for leachate management and stormwater runoff, local zoning and utility interconnection approvals for energy systems tied to the grid, and potential other environmental impact assessments. WTE projects on farms (anaerobic digesters and biogas systems) may require registration as a biomass facility through IDEM, certain air and water permits for emissions and wastewater discharge for odor control and nutrient runoff management, solid waste processing permit if non-agricultural waste is used (food waste), and local building and zoning approvals for new construction or expansion. An in-depth analysis of implementation authority for the Indianapolis Area Renewable Energy and Waste Reduction Operation can be found in the PCAP as GHG Reduction Measure #3.

## MEASURE 10 – LANDFILL WASTE REDUCTION AND DIVERSION

To expand city-wide recycling services and subscription composting services to Central Indiana residents, several steps are required to achieve full implementation authority. For recycling, municipal collaboration is required to approve recycling contracts and regional coordination is recommended with county-level Solid Waste Management Districts to expand outreach. Typically, facilities that collect, sort or process recyclables must obtain a solid waste facility permit or registration with IDEM's Office of Land Quality.<sup>173</sup> Additionally, operations may be required to obtain air and water permits if the facility emits pollutants or discharges wastewater and be subject to environmental assessment.

For composting, facility operators must register with IDEM and meet the requirements in Indiana Code 13-20-10 before beginning composting activities.<sup>174</sup> Composting facilities must also comply with local zoning laws and setback requirements, which may require municipalities to pass ordinances to support composting. Municipalities may also wish to partner with private composting services to offer subscription-based curbside pickup, which generally requires memorandums of understanding or service agreements.

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<sup>173</sup> Indiana Department of Environmental Management. Permits Registrations Approvals and Closures. Accessed November 2025. Retrieved from: <https://www.in.gov/idem/waste/resources/permits-registrations-approvals-and-closures/>

<sup>174</sup> Indiana General Assembly. Title 13, Article 20, Chapter 10: Registration of Facilities for Composting Certain Vegetative Matter. Accessed November 2025. Retrieved from: <https://iga.in.gov/laws/2020/ic/titles/13#13-20-10>



## 10. Next Steps

In 2027, CIRDA will publish a Status Report that details implementation progress for measures included in the PCAP and CCAP, any relevant updates to PCAP and CCAP analyses, and next steps and future budget and staffing needs to continue implementation of CCAP measures.

As Central Indiana charts a path toward a more sustainable and resilient future, this Comprehensive Climate Action Plan represents a collaborative step forward. Grounded in data, shaped by community voices, and driven by regional priorities, the plan outlines actionable strategies to reduce greenhouse gas emissions, bolster the local economy, improve public health, and create vibrant, equitable communities across the Indianapolis-Carmel-Anderson Metropolitan Statistical Area. With the support of local governments, businesses, nonprofits, and residents, Central Indiana is poised to lead by example, proving that climate action and economic growth can go hand in hand. Together, we can build a region where all Hoosiers thrive in a cleaner, healthier environment.

If you have questions about this CCAP report or upcoming Status Report, contact CIRDA at [info@centralindianarda.org](mailto:info@centralindianarda.org).

# Appendix A. CCAP Public Engagement Report

Public engagement is critical to understanding the wants and needs of local communities and residents of Central Indiana. The planning team integrated feedback from public engagement during the PCAP and CCAP planning processes for the final CCAP document. Supporting CIRDA, the Indianapolis MPO (IMPO) worked to attend or host an event in each of the eleven counties and in LIDAC areas throughout the course of the CCAP planning process.

IMPO used a variety of methods to engage the public including virtual advertisements, print advertisements, in-person open houses, virtual open houses, and community festival/events. During the development of the CCAP, IMPO deployed two public surveys and made the streamlined CCAP draft available for public review. The first survey (available April 20, 2024, through July 21, 2024) sought to identify any potential greenhouse gas reduction measures not previously identified in the early stages of the CCAP planning process. The second survey (available August 13, 2024, through November 27, 2024) was a more in-depth survey to gather feedback on workforce challenges, project type preferences and scale, and another opportunity to identify potential reduction measures. The project team developed a streamlined CCAP including business-as-usual projections, emissions reduction measures, associated benefits and disbenefits, and projected emission reduction quantities per measure. The streamlined CCAP was available for public review and feedback from September 20 – October 31, 2025.

## By the Numbers

IMPO completed 19 events for the PCAP and 48 for the CCAP for a total of 67 events between September 2023 through October 2025. Figure 3 displays the location of all community engagement events, conferences, and in-person open houses. Table 17 displays event details for all engagement events for the PCAP and CCAP. Over the course of the two surveys and public comment period, IMPO engaged 2,086 individuals at community festivals, in-person open houses, virtual open houses, and conferences. Participation by survey is identified in each survey section below. As part of the CCAP planning process, IMPO hosted 7 virtual open houses, 10 in-person open houses, and attended 30 community events.

TABLE 17. COMMUNITY ENGAGEMENT EVENTS 2023-2025

Event	Date	Address	City	Audience	Content	Plan
Garfield Park Farmer Market	9.16.2023	2345 Pagoda Dr.	Indianapolis	LIDAC	Promoting Survey 1	PCAP
Partners for Pollution Prevention and Trade Show	9.20.2023	3645 River Crossing Parkway	Indianapolis	Sustainability Professionals	Promoting Survey 1	PCAP
Car Free Day Indy	9.22.2023	1 Monument Circle	Indianapolis	Public	Promoting Survey 1	PCAP
Indiana Latino Expo	9.23.2023	1202 E. 38 <sup>th</sup> St.	Indianapolis	LIDAC	Promoting Survey 1	PCAP

Anderson Farmers' Market	9.30.2023	1102 Central Ave.	Anderson	LIDAC	Promoting Survey 1	PCAP
Street Team - Greenfield Public Library	10.5.2023	900 McKenzie Rd.	Greenfield	LIDAC	Promoting Survey 1	PCAP
Shelbyville First Friday	10.6.2023	25 Public Sq.	Shelbyville	LIDAC	Promoting Survey 1	PCAP
Street Team - Franklin	10.7.2023	25 N. Main St.	Franklin	LIDAC	Promoting Survey 1	PCAP
Street Team - Carmel	10.8.2023	14390 Clay Terrace Blvd	Carmel	Public	Promoting Survey 1	PCAP
Street Team - Plainfield	10.10.2023	1120 Stafford Rd	Plainfield	Public	Promoting Survey 1	PCAP
Street Team - Speedway	10.12.2023	1255 N. Main St.	Speedway	LIDAC	Promoting Survey 1	PCAP
Far East Side Community Council Meeting	11.28.2023	Virtual	Virtual	LIDAC	Promoting Survey 2 and Public Meetings	PCAP
Indiana Environmental Conference	12.7.2023	2544 Executive Drive	Indianapolis	Sustainability Professionals	Promoting Survey 2 and Public Meetings	PCAP
United Northeast Community Development Corporation	12.13.2023	3908 Meadows Drive	Indianapolis	LIDAC	Promoting Survey 2 and Public Meetings	PCAP
Central Indiana Drinking Water Collaborative	12.14.2023	Virtual	Virtual	Sustainability Professionals	Promoting Survey 2 and Public Meetings	PCAP
Virtual Public Meeting #1	1.8.2028	Virtual	Virtual	Public	Promoting Survey 2	PCAP
Virtual Public Meeting #2	1.9.2024	Virtual	Virtual	Public	Promoting Survey 2	PCAP
Indiana Sustainability and Resilience Conference	2.9.2024	420 University Blvd.	Indianapolis	Public; Sustainability Professionals	Update on the planning process	PCAP
Far East Side Community Council Meeting	2.27.2024	Virtual	Virtual	Environmental Justice population	Update on the planning process	PCAP
Earth Day Mud Creek	4.20.2024	8605 Sargent Rd.	Indianapolis	Public	CCAP Survey 1- Google forms	CCAP



Earth Day at Children Museum	4.20.2024	3000 N. Meridian St.	Indianapolis	LIDAC	CCAP Survey 1-Google forms	CCAP
Zionsville Greenfest	4.27.2024	165 N. Elm Street	Zionsville	Public	CCAP Survey 1-Google forms	CCAP
Carmel Children Festival	4.27.2024	1 Civic. Square	Carmel	Public	CCAP Survey 1-Google forms	CCAP
Earth Day at JCC	5.19.2024	6701 Hoover Rd	Indianapolis	Public	CCAP Survey 1-Google forms	CCAP
Far East Side Community Festival	7.27.2024	8902 E. 38th St.	Indianapolis	LIDAC	General info-no survey	CCAP
Virtual Public Meeting	9.18.2024	Virtual	Virtual	Public	CCAP Survey 2-MQ	CCAP
Car Free Day	9.19.2024	1 Monument Circle	Indianapolis	Public	CCAP Survey 2-MQ	CCAP
Open House-Hancock Co Library	9.19.2024	900 W McKenzie Rd	Greenfield	LIDAC	CCAP Survey 2-MQ	CCAP
Virtual Public Meeting	9.24.2024	Virtual	Virtual	Public	CCAP Survey 2-MQ	CCAP
Open House- West Perry	9.25.2024	6650 S. Harding St.	Indianapolis	LIDAC	CCAP Survey 2-MQ	CCAP
Virtual Public Meeting	10.3.2025	Virtual	Virtual	Public	CCAP Survey 2-MQ	CCAP
Greencastle First Friday	10.4.2024	1 Courthouse Square	Greencastle	Public	CCAP Survey 2-MQ	CCAP
Open House- Michigan Road	10.22.2024	6201 Michigan Rd	Indianapolis	LIDAC	CCAP Survey 2-MQ	CCAP
Far East Side Community Council Meeting	10.22.2024	3039 N. Post Rd	Indianapolis	LIDAC	CCAP Survey 2-MQ	CCAP
DePauw University-Class Presentation	10.28.2024	Virtual	Virtual	Public	CCAP Survey 2-MQ	CCAP
Open House Brown County Library	10.29.2024	205 Locust Ln	Nashville	Public	CCAP Survey 2-MQ	CCAP
Open House Fishers Public Library	10.30.2024	5 Municipal Dr	Fishers	Public	CCAP Survey 2-MQ	CCAP
Fort Ben TIP/STIP Open House	4.10.2025	9330 E. 56th St.	Lawrence	Public	CCAP - no survey	CCAP
Earth Day at Children Museum	4.26.2025	3000 N. Meridian St.	Indianapolis	LIDAC	CCAP - no survey	CCAP
Bike Fest	5.4.2025	1701 Gent Ave	Indianapolis	LIDAC	CCAP - no survey	CCAP
Bike to Work Day-Pop UP	5.16.2025	1221 E. Brookside Ave.	Indianapolis	LIDAC	CCAP - no survey	CCAP

Earth Fest IN - Earth Day IN	5.31.2025	2432 Conservatory Dr.	Indianapolis	LIDAC	CCAP - no survey	CCAP
IMPO SERVE Committee	6.17.2025	5420 E. 38th Street	Indianapolis	LIDAC	CCAP - no survey	CCAP
Cumberland Farmers Market	7.12.2025	11501 E. Washington Street	Indianapolis	Public	CCAP - no survey	CCAP
Brownsburg Farmers Market	7.17.2025	61 N. Green Street	Brownsburg	Public	CCAP - no survey	CCAP
Far East Side Festival	7.26.2025	8902 E. 38th St.	Indianapolis	LIDAC	CCAP - no survey	CCAP
Martinsville Farmers Market-Community Day	8.9.2025	460 S. Main St.	Martinsville	LIDAC	CCAP - no survey	CCAP
Climate Leadership Summit	9.5.2025	50 W. Fall Creek Pkwy N. Dr	Indianapolis	LIDAC	CCAP - no survey	CCAP
Plainfield Quaker Days	9.20.2025	105 S. East St.	Plainfield	Public	Draft CCAP for review	CCAP
Bargersville Harvest Moon Fall Festival	9.20.2025	24 N. Main St.	Bargersville	Public	Draft CCAP for review	CCAP
Lebanon City Market	9.23.2025	105 N Meridian St	Lebanon	Public	Draft CCAP for review	CCAP
Indianapolis Farmer Market	9.24.2025	1 Monument Circle	Indianapolis	LIDAC	Draft CCAP for review	CCAP
Open House - Anderson Library	9.26.2025	111 E. 12th St.	Anderson	LIDAC	Draft CCAP for review	CCAP
Open House - Danville Library	9.29.2025	101 S. Indiana St.	Danville	Public	Draft CCAP for review	CCAP
Virtual Open House	10.1.2025	Virtual	Virtual	Public	Draft CCAP for review	CCAP
Lawrence Farmers' Market	10.2.2025	8920 Otis Ave	Lawrence	Public	Draft CCAP for review	CCAP
Pendleton Pride	10.4.2025	460 Falls Park Dr	Pendleton	Public	Draft CCAP for review	CCAP
Nashville Farmers' Market	10.5.2025	51 State Road 46	Nashville	Public	Draft CCAP for review	CCAP
Virtual Open House	10.7.2025	Virtual	Virtual	Public	Draft CCAP for review	CCAP
Open House - Central Library	10.8.2025	40 E. St. Clair St.	Indianapolis	LIDAC	Draft CCAP for review	CCAP
Virtual Open House	10.9.2025	Virtual	Virtual	Public	Draft CCAP for review	CCAP
Noblesville Farmers' Market	10.11.2025	175 Logan St.	Noblesville	Public	Draft CCAP for review	CCAP
Cottage Home Block Party	10.11.2025	714 North Highland Ave	Indianapolis	Public	Draft CCAP for review	CCAP

Greenwood Monster Mash	10.17.2025	10 E Smith Valley Rd	Greenwood	Public	Draft CCAP for review	CCAP
Open House - Noblesville Library	10.23.2025	1 Library Plaza	Noblesville	Public	Draft CCAP for review	CCAP
Westfield Trick or Treat	10.24.2025	225 S. Union St.	Westfield	Public	Draft CCAP for review	CCAP
Virtual Open House	10.28.2025	Virtual	Virtual	Public	Draft CCAP for review	CCAP
Open House - Eagle Branch	10.29.2025	3905 Moller Rd	Indianapolis	LIDAC	Draft CCAP for review	CCAP

## Survey 1

The first public survey was available from April 20, 2024, through July 21, 2024. The IMPO attended 5 community events/festivals during the survey period. The IMPO also ran a digital advertising campaign, generating 1,003 link clicks. The first survey sought to identify any potential greenhouse gas reduction measures that had not yet been considered. The public had been asked about potential reduction measures in multiple surveys over the course of the PCAP and the CCAP. With the CCAP serving as a more comprehensive document than the PCAP, the survey was designed to gather all ideas for reduction measures. The survey included a graphic of potential reduction measures divided by sector that had arisen during the PCAP planning process (provided in the next table). Respondents were asked if anything was missing from the list and their zip code. There were 170 responses to the first survey. Of the 170 responses, 106 provided potential measures to add. Of the 106, 37 responses were from zip codes in LIDAC areas (35%).

Survey respondents viewed sample reduction measures in Table 18 below. Respondents were then asked:

1. Is anything missing from this list?
2. If yes, what is missing from this list?
3. What is your zip code?

TABLE 18. LIST OF POTENTIAL GHG REDUCTION MEASURES

Sector	Potential Reduction Measures
Agriculture and Open Space	<ul style="list-style-type: none"> <li>• Protect old growth forests</li> <li>• Preserve existing forests, parks, and wetlands</li> <li>• Expand forests, parks, and wetlands</li> <li>• Improve fertilizer practices</li> <li>• Increase availability of urban agriculture</li> <li>• Reduce resource-intensive agriculture such as confined animal feedlot operations (CAFOs)</li> <li>• Rehabilitate degraded lands (e.g. brownfields)</li> </ul>

	<ul style="list-style-type: none"> <li>• Increase native biodiversity</li> <li>• Electrify agriculture equipment</li> </ul>
Waste	<ul style="list-style-type: none"> <li>• Increase access to recycling</li> <li>• Increase access to composting</li> <li>• Improve the creation, use, and disposal pipeline for goods</li> </ul>
Buildings and Energy	<ul style="list-style-type: none"> <li>• Increase access to energy efficiency upgrades</li> <li>• Increase access to renewable energy</li> <li>• Improve access to battery storage technology for energy</li> <li>• Decentralize power generation</li> <li>• Increase use of sustainable building materials</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• Increase quality of public transportation</li> <li>• Increase availability of public transit</li> <li>• Increase safe walking infrastructure</li> <li>• Increase safe biking infrastructure</li> <li>• Increase electric vehicle charging infrastructure</li> <li>• Increase share of electric vehicles on the road</li> </ul>
Planning	<ul style="list-style-type: none"> <li>• Lower barriers to environmental education</li> <li>• Lower barriers to training for sustainability jobs</li> <li>• Develop climate plans</li> <li>• Integrate climate action goals into each government department</li> <li>• Reduce taxes</li> <li>• Create incentives for sustainability</li> <li>• Convert parking to housing</li> <li>• Locate buildings, homes, and recreational areas closer together</li> <li>• Create more community building spaces (such as restaurants, theatres, etc.) outside of home and work</li> <li>• Develop energy efficient reuse of vacant lots and buildings</li> </ul>

Original responses to Survey #1 of the CCAP are listed below in Table 19. Responses have not been edited.

TABLE 19. ALL COMMENTS – CCAP SURVEY #1

Comment	LIDAC?
More community gardens; education & assistance for starting home gardens. More native flowers on road medians instead of mowing grass	No
We should allow the construction of point-access block buildings like the rest of the world for better housing, and we should be removing means testing from social welfare programs to remove wasted spending	No
All good	No
Free use of water for property owners who have wells and septic. Versus threatening and commanding them to hook up to water when they have water in the property they now own. Also, the fact that the state will take their water away from them and force them to hook up at expenses, they cannot afford.	No

Allow existing houses with HOA restrictions to install solar panels.	No
A clear emphasis to making the education and tools available in multiple languages. Also making sure that the funds are being used equitably and not to further perpetuate white centered investments.	No
There should be less spraying of weed killer and pesticides.	No
This is all AGENDADA 21 bullshit that you elite govment lackeys are forcing on patriots and cuasing inflation while benefiting CHINA where all the solar panels are made. i hate to brake it to you but the earth has been warming and cooling since it was formed and theres not a godam thing humans can do about it. get your head out of your ass and stop pretending you are god. why dont hogshitt fix the roads AND STOP mAKING IT HaRDER TO DRIVE EVERYWEAR.	No
Protecting green space and flood plain/way from developers so communities are protected from flooding	No
Create a network of green (and blue) infrastructure	No
Increasing city and county green space	No
Electric vehicle charging in roads.	No
Promote no till regenerative agriculture	No
Reducing pesticide use, increasing landscaping with native plants, removing invasive species	No
Increasing democratic institutions	No
Reduce the use of fertilization. Use soil testing to determine the need to augment soil. Natural will help with the contribution of diverse species. White roofing requirements in building development. Spurt roof top planting and rain irrigation. Educate and fund environmental specific planting education. Rain gardens to help with water collection. Rain water collection on rooftops. Funding support to lower barrier to accessing batteries and other environmental tools that are available but not always accessible	No
Decrease the average number of miles traveled to access work, food, etc via zoning reform that encourages mixed use development and empowers small developers; increase the number of street trees, urban greenery, & micro parks	No
Planting native plants in parks, forests and around interstate intersections.	No
Water conservation and pollution.	No
Storm drains , some are 1 foot high in trash.	No
Impacts of air pollution on climate. Emissions, county open burning policies not properly enforced.	No
Public safety: all areas, but especially police, sheriff and courts	No
Increase access to toxic chemical disposal. The lines are long and the process frustrating. I have leaking 5 gallon buckets of tractor lubricants because I don't know where to take them.	No
Reduce plastic and styrofoam use.	No
Stop the sale of farm land for industrialized solar projects. Crop production enhances oxygen production, slows/prevents erosion, lowers temperature. Large numbers of solar panels create an area of warmer temps, weed growth under panels, excess water runoff.	No
Economic impact, practicality and desirability of these strategies and the damage caused by them.	No
Educate children of the community through hands on means like hiking, camping Ect.	Yes
Within the Planning category, there should also be specific inclusion of creating a climate refugee action and mitigation plan. Greater attention is needed to mitigating effects of climate change on poor households in historically redlined areas, which will more greatly impacted by climate change and GHG than over-resourced communities	Yes
Removal of invasive species in parks and natural areas	Yes

Cease building or expanding highways. Cap highways. Convert highways to high density boulevards served by frequent transit. Lower taxes? I don't see how that's possible with the sprawling mess Central Indiana has made. All of the infrastructure maintenance is not going to be cheap.	Yes
Under transportation, reduce VMT, and reduce proportion of single occupancy vehicles. Expanding other options is great, but we need to put downward pressure on the number of trips made by car in general to encourage the other strategies to work.	Yes
The fact that it's not needed	Yes
Ban single use plastics	Yes
Include a focus on housing. incentivize density in housing options would directly create more sustainable communities, and cut down on sprawl development	Yes
Upgrade and strengthen energy distribution systems ("the grid")	Yes
Create more green space, plant more trees, and have more permeable pavement in low income communities	Yes
Anaerobic digesters, and intersectionality/equity in climate planning.	Yes
Protecting the watershed	Yes
Replace traditional hard cover with permeable pavement	Yes
Focus future development closer to the urban core, especially developing downtown parking lots. Falls under placing buildings closer together, increasing availability to transit, walkability infrastructure, and combating the heat island effect.	Yes
- Increase waste diversion from construction/demolition projects. - Quality public transportation should include increased affordability and, specifically, shaded bus stops. -de-paving incentives, parking maximums, EV charging incentives for developers	Yes
Increase the use of green infrastructure along transportation corridors	Yes
Enforcement of zoning-required landscaping, particularly tree requirements that would greatly enhance CO2 uptake in underserved areas.	Yes
wildlife habitat expansion, moral courage by officials, wetlands protection, water conservation in part via significant reductions in turfgrass. Also: including my 2022 comments on the CED which pertain to environment. Thank you. <b>*remaining comment removed for length but available for review by contacting <a href="mailto:info@indympo.gov">info@indympo.gov</a></b>	Yes
Educational and media campaigns to teach people how they can use transit/walk/bike infrastructure; teach the tools to navigate the existing built environment in this manner. Getting people out of their cars and into the world is the first step toward empowering self-discovery of what in their own community and sphere of influence can be improved environmentally	Yes
Wetland protection	Yes
Great list! The public transport and sidewalks is probably more important but traffic optimization might be good too, if people are going to drive, make it so vehicles are more efficient.	Yes
; Protect significant younger forests, not just the old growth forests. Demand side management for transportation.	Yes
Actual additional funding by the city budget for example: old growth forest & parks.	Yes
Expand water-level monitoring network	Yes
Clean up PFAS forever chemicals, encourage buying local from sustainable humane farmers, boost awareness with ad campaigns, local signs, etc.	No
More education on how to recycle, what can be recycled and how to properly keep it from being mixed. Also I am not sure why buildings and housing need to be closer together? need to be	Yes
Increase traffic calming measures	Yes



It seems like a good start but not sure of definitions. ex. "Convert parking to housing"???	Yes
Reduce waste generation	Yes
Increase yard waste pick up dates so yard waste isn't thrown in trash.	No
Efficient redevelopment of abandoned or under utilized urban space i.e. malls and surrounding neighborhoods, incentives - how will you encourage support and participation? Big question - how do you intend to reduce taxes if you're presenting such an ambitious plan???	Yes
Teaching respect for interconnectedness	Yes
Storm drains , some are 1 foot high in trash.	Yes
Encourage use of existing industrial buildings instead of building on agricultural lands as the IEDC courts new businesses. There are office parks and factories standing empty while they waste money building on airable land. Require land surveys and find incentives for corporafiins to use existing buildings, or restrict using airable lands. And keep an accessible database of airable lands vs. nonairable lands for developers and coirdinate with IEDC so they don't guide corporations where they shouldn't be. It will require liaisons.	Yes
Encourage/Replace grass lawns with small flower ground cover. Helps the bees, less to mow so less emissions & gas used.	No
Decrease high maintenance grass with "no mow" native grasses	No
Directing efforts to communities that are most affected by long ago uses that continue to harm children and residents. This is a plan that does not seek to aid Marion County or speak to the harms of the present day discriminatory acts of waste that continue to hurt.	No
Wet land protection	No
Prioritize natural/eco friendly water management infrastructure	No
Keep traffic moving and reduce congestion.	Yes
Give more consideration to hybrid vehicles	Yes
Better environmental impact study about EV battery production and disposal	Yes
Reduce taxes should be raise taxes, because we taxpayers will be paying for all of this	No
Make housing energy more renewable	No
Replacing trees lost to construction and open space.	Yes
Clearing barriers to property owners allowing their land to be a prairie or lay unmowed. If there were a "pro-prairie" awareness campaign including the ability for property owners to register part of their land as wildlife habitat without getting fined for not mowing, a clear definition with the county of what plants/features/maintenance is required for an area to be designated, then we'd have less ghg emissions from unnecessary mowing, more plant life filtering both water and air (prairie grasses are great at this). Your plan is also missing wildlife corridors - if you're wanting to increase and preserve wooded areas wetlands etc, that is going to increase wildlife, which poses a risk to traffic etc. It is important to incorporate wildlife corridors into your urban planning so that decreasing ghg in the city doesn't increase wildlife collision incidents. It would be convenient to plan this at the same time as similar infrastructure projects such as biking paths and sidewalks.	No
I would like to see a bit more focus on the "native biodiversity ". Help support, educate, and promote native plants in yards and to HOA/city rules.	No
Recycling & making it convenient & \$\$\$ rewarding	No
Protect wetlands. Create more bike paths or wider roads for bike lanes. More solar energy. Plant more NATIVE	No
Researching how much fuel it takes 2 run battery operated vehicles & facilities. Researching how 2 B environmentally safe w/the disposal of batteries since their usage is projected to increase	No

exponentially. Research who is going to pay 4 all these transportation "improvements" & reduce taxes @ the same time. The government has no money w/o taxing its people & we're already paying taxes on taxes. Every elected official, esp @ the federal level, needs to take a pay cut that's the best way to reduce taxes! Quick picking on farmers in animal husbandry...farming & farm animals have been w/mankind from the beginning of time. Do some REAL research...not just pie in the sky "good old boys". Look @ the big picture.

More oil production to lower prices	No
Create more walkable communities, increase urban tree cover to reduce heat island effect, protect existing forests also means removing invasive species from those forests	No
No	No
Make it safer for bus riders, walkers, and bus riders. Have buses drop off and pick up at stores and businesses in both directions so people don't have to walk across busy streets like East Washington. Make pick up of recycling and compost included with regular trash pickup for everyone. Change storm drains to the basket type that can be cleaned out so small animals can be retrieved and trash and liquids don't go into our waters. For Heaven sake, build the promised animal care services building. Stop killing our pets. Make our city safer and humane.	#Unknown
Light rail system would greatly benefit and reduce car usage.	No
Food and nutrition security	No
Quit Making it so easy to destroy wetlands via legislation.	No
Incentivizing or helping homeowners convert non-native grass lawns to native wildlife habitats	No
Senior Housing 30% income for all 60 +	No
More recycling drop off	No
Create more solar panels by the falls on top of schools and government buildings. And on neighborhood shared open space, like at community centers	No
Keeping people better informed on what changes will occur in order for them to have informed input into proposed changes in land use.	#Unknown
Make it easier for ordinary citizens to participate in planning and implementing these goals.	Yes
common sense and affordable energy for the working man	No
Intelligent people that deal in reality not fantasy	No
Reduce synthetic fertilizers or eliminate them. Also it can be add support transition from conventional agriculture to organic agriculture	No
Eliminate parking minimums/mandates	No
Reduce fugitive methane emissions. Reduce food waste at the industrial, commercial, and residential levels. Shift the goal about improving the "disposal pipeline" to focus on reducing waste overall through circular design and more opportunities for reuse.	No
The public need to be better informed of land use proposals. In St Joseph County a significant project in our neighborhood is underway. Removal of trees, installation of high power lines feet from our front door, and spraying of herbicide is underway. W	#Unknown
The constant visible particle matter since trash plants on 67 is illegal, the park at Tobbs and 67 had to be closed and trees died in the area, but what measures have been taken to test and protect residents? The debris and air quality in that whole area is ridiculous compared to what it was when it was a lake	#Unknown
Indigenous flora and fauna	#Unknown
What incentives for sustainability? Please clarify	#Unknown
Trails that connect especially in Marion County	#Unknown

Looks good	#Unknown
Walkability and eliminating Asian honeysuckle	#Unknown
Encouraging native plants and how we can do it at our house	#Unknown
I like all the points on here	#Unknown
Looks great	#Unknown

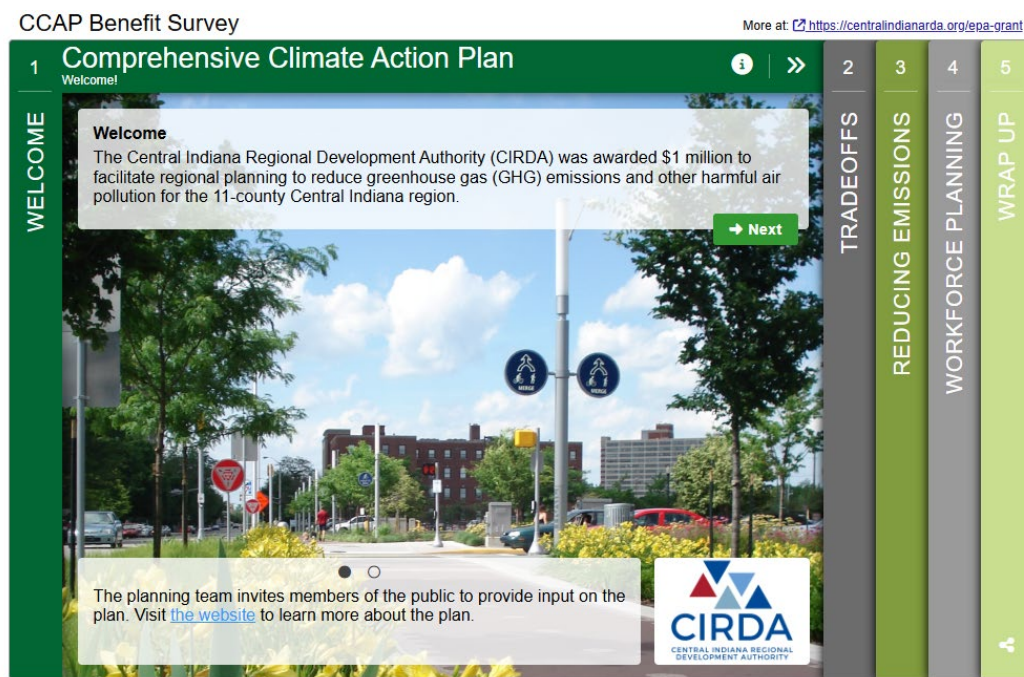
## Survey 2

The second public survey was available from August 13, 2024, through November 27, 2024. The second survey asked respondents a series of tradeoff questions related to types of projects to reduce emissions, an open-ended question about measures to reduce emissions, and a ranking question asking participants to indicate the top three barriers to a green workforce. The second survey received 160 responses. Of the 160 responses, 49 were from LIDAC zip codes (31%).

The IMPO hosted 5 in-person open houses, 3 virtual open houses, and attended 4 community events/festivals during the second survey period. In-person open-house responses are also included below. The IMPO conducted a digital advertising campaign to promote the second survey, generating 938 link clicks.

Survey 2 included five screens through the MetroQuest interactive platform. Four screens included questions for participants. On each screen, respondents could provide general comments or comments specific to their responses. The first slide was a welcome slide, which explained the planning effort. Respondents could also click provided links to learn more about the plan and visit the website.

FIGURE 15. SURVEY 2, WELCOME SCREEN



## Tradeoffs Question

The second screen offered three tradeoffs. Respondents could select five different arrow buttons to convey their preference in the tradeoff, including a “neutral” button. For readability, results of the tradeoff are listed directly below questions to easily understand results of the “far left, left, neutral, right, and far right” arrow buttons.

FIGURE 16. SURVEY 2, TRADEOFFS QUESTION 1

CCAP Benefit Survey

More at: <https://centralindianarada.org/epa-grant>

2 Tradeoffs

WELCOME TRADEOFFS

Location Investment Length Asset Area

Location

Where should the region focus time and resources to reduce emissions?

Projects in my specific neighborhood (ex., local tree planting in the neighborhood park)

Projects in the region (ex., regional green revolving loan fund for energy efficiency)

Navigation buttons: << < Neutral > >>

REDUCING EMISSIONS WORKFORCE PLANNING WRAP UP

FIGURE 17. SURVEY 2 RESULTS, TRADEOFFS QUESTION 1

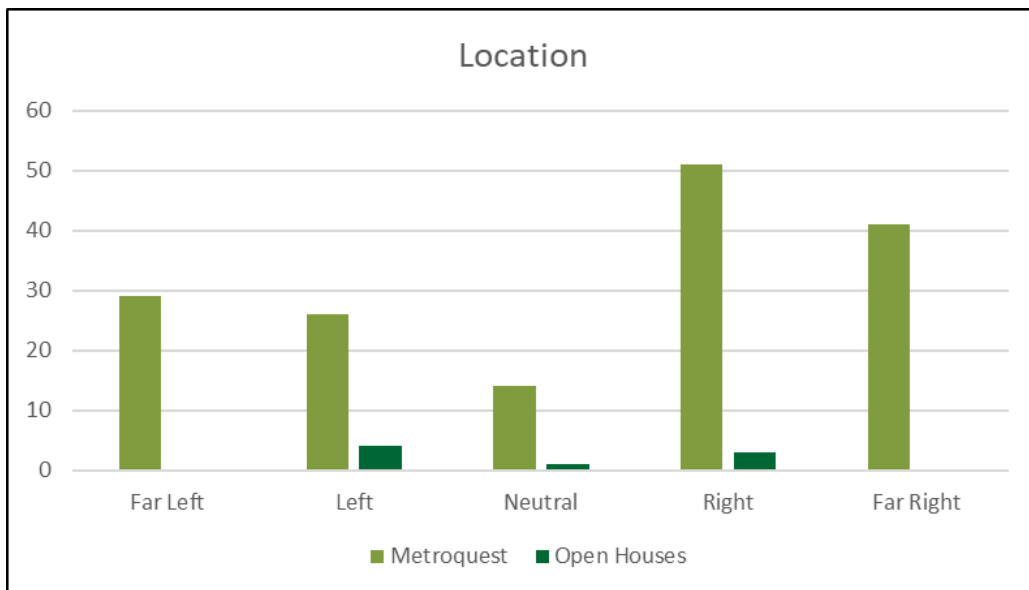


FIGURE 18. SURVEY 2, TRADEOFFS QUESTION 2

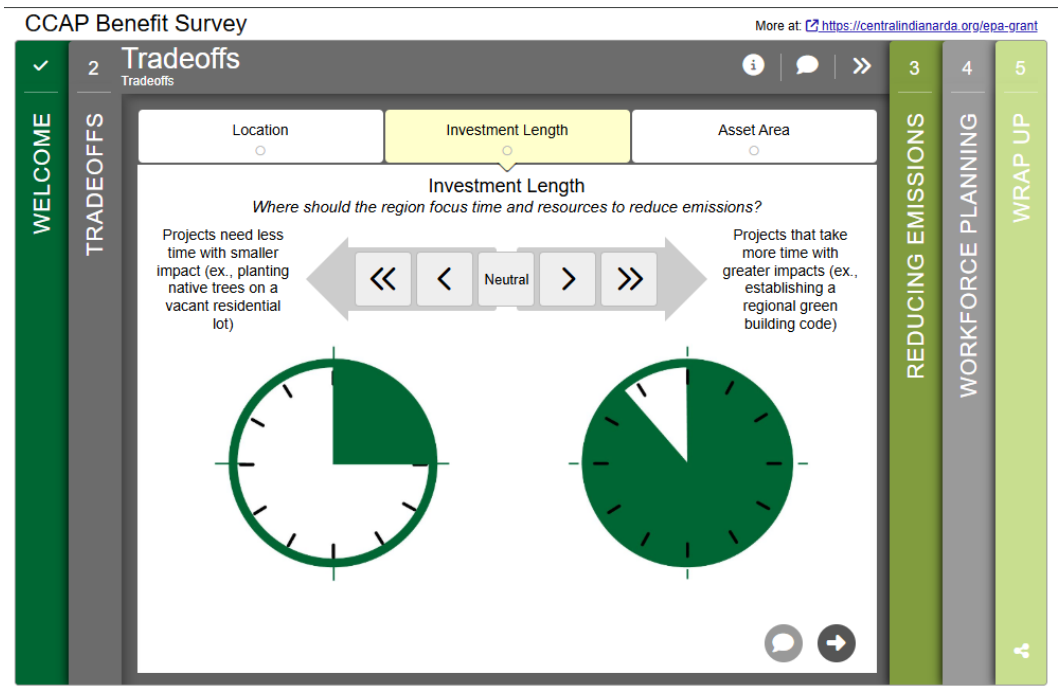


FIGURE 19. SURVEY 2 RESULTS, TRADEOFFS QUESTION 2

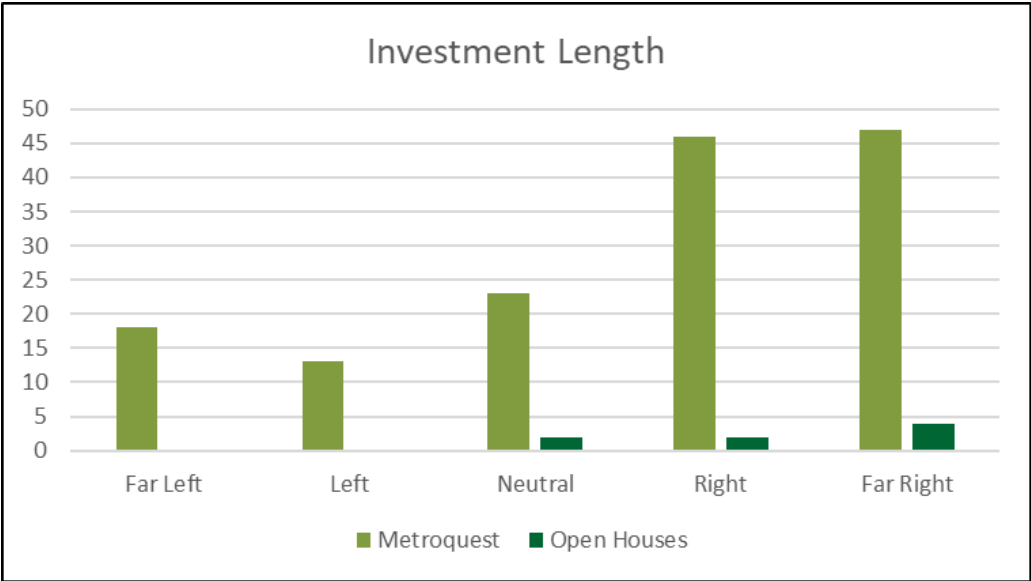


FIGURE 20. SURVEY 2, TRADEOFFS QUESTION 3

CCAP Benefit Survey More at: <https://centralindianarda.org/epa-grant>

WELCOME

TRADEOFFS

REDUCING EMISSIONS

WORKFORCE PLANNING

WRAP UP

Location
Investment Length
Asset Area

**Asset Area**  
*Where should the region focus time and resources to reduce emissions?*

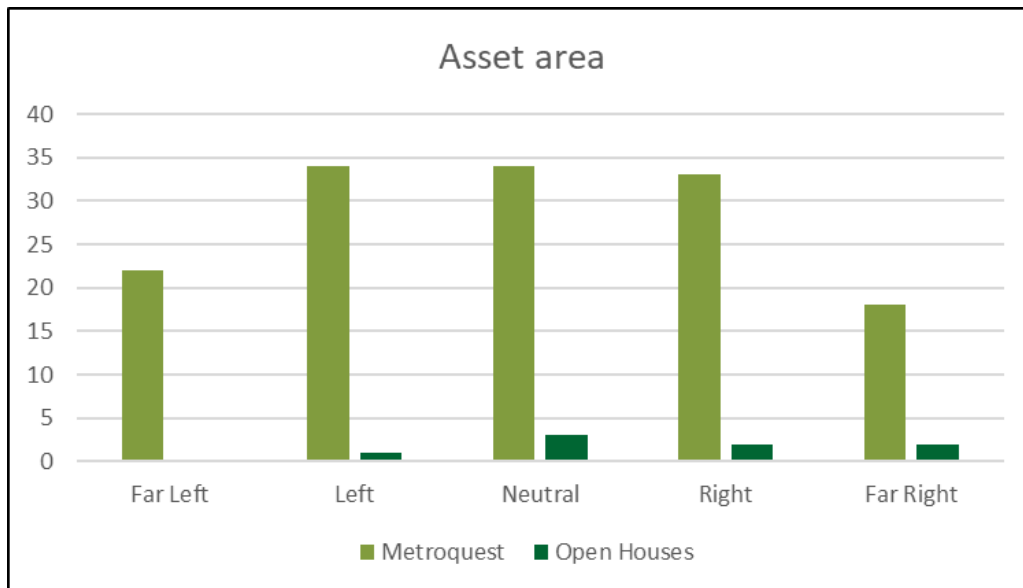
Government-owned assets (ex. energy retrofiting of town halls)

<<
<
Neutral
>
>>

Company-owned or citizen-owned assets (ex. a private organic waste to fuel converter)

🗨️
➡️

FIGURE 21. SURVEY 2 RESULTS, TRADEOFFS QUESTION 3



When asked about location of projects, respondents generally favored regional projects (far right) over local projects (far left). When asked about level of investment, respondents generally favored projects with longer completion times but larger impacts to emissions (far right) over the opposite. When asked about type of asset, respondents did not skew strongly toward private assets or public assets.



## Reducing Emissions Question

FIGURE 22. SURVEY 2, REDUCING EMISSIONS QUESTION

CCAP Benefit Survey More at <https://centralindianarda.org/epa-grant>

1 WELCOME 2 TRADEOFFS 3 Reducing Emissions 4 WORKFORCE PLANNING 5 WRAP UP

What is the single most important action your local government should take to reduce greenhouse gas emissions?

Type... 0/500

Submit Next

City skyline image

The public has been asked about potential reduction measures in multiple surveys over the course of the PCAP and the CCAP. The written question was, “what is the single most important action your local government should take to reduce greenhouse gas emissions?” On the third screen of the second survey, respondents were asked this question with a blank space offered for written responses.

Original responses to the third screen question of Survey #2 are listed below in Table 20. Responses have not been edited.

TABLE 20. SURVEY 2, REDUCING EMISSIONS SCREEN – ALL COMMENTS

Comment	LIDAC?
Focus on agriculture and reduce CAFOS; increase access to recycling	#Unknown
Statewide divestment from coal-powered energy; infrastructure and education shift toward human powered transportation (walking and biking)	#Unknown
More opportunities for education/open forums for public	#Unknown
More parks and less parking lots	#Unknown
City planning for walkability, recycling/composting, carbon sequestration, education, jobs	#Unknown
Increase electric vehicles on road	#Unknown
transportation is very important; ag and open space	#Unknown

Focusing on electrifying existing buildings and creating the structures to ensure future buildings are built using sustainable methods would have a big impact given that building account for around 40% of emissions.	No
Develop and implement a comprehensive residential recycling program for both household and green wastes.	No
In highly populated areas.	No
Managing emissions from factories and companies more closely	Yes
Provide (more) incentives to develop mixed-use developments along transit lines - Notably IndyGo's BRT lines	No
Continue efforts to reduce development sprawl, which will naturally make development more compact and dense, thus reducing needs on roadways. This also means smaller lot sizes where there is water and sewer.	No
Alternatives to cars: expanded bike infrastructure for local connectivity and regional rail connections for intra-city transportation.	Yes
At the local level, encouragement of roof-top solar is my highest priority. Tree-planting and replacement of asphalt in schoolyards and parks are also important.	No
Setting standards for greenhouse gas emissions and providing solutions to those who need assistance	No
Update building code	Yes
Reducing dependence on automobiles, continuing to enforce environmental standards that may be stripped under a Trump presidency	Yes
Make it easier to walk bike and take transit. Eliminate parking minimums and single family zoning.	Yes
Promote alterNative transportation options	No
##UNKNOWN	#Unknown
Public transportation and bike access	No
Fewer vehicles, more convenient public transport, and more trees	Yes
Support for low carbon fuels and charging/fueling infrastructure for ZEVs (commercial vehicles and pass cars)	No
Better access to electric vehicle chargers	Yes
Create a robust composting initiative to keep orgánics from releasing methane in landfills.	Yes
do Nothing. government just makes things more expensive and complicated too often we're putting the cart before the horse. We don't research ecoNomic and environmental benefits positive and negative consequences of jumping into the green initiative bandwagon	No
Simple example is the Non-recyclability of EV cars and their batteries the amount energy it takes to produce one of these vehicles amount of fossil fuels it takes to create energy for them windmills and their bad impact on environment	
Incentivize business to reduce their emissions	No
Encourage more plant based eating. Less animal consumption to reduce the need for land to grow animals.	No

Concentrate on clean air and water.	No
Incentivize greener techNologies through subsidies, sales, infrastructure; and disincentivize emissions through targeted taxes (e.g for vehicles or gas) that go directly back to sustainability efforts.	No
Go electric.	No
Do Nothing. The government should protect us from enemies without and especially within, coin our money and mildly regulate innerstate commerce. And do Nothing more!!!!	No
Road diets that create space for walking,,cycling, public transit, and housing/retail.	Yes
Personal transportation is one of the single greatest sources of CO2 emissions. We need to build a robust network of express public transit connections across the Indy metro area. For example, regional connections between Fishers and other ring cities and Indy as well as between ring cities (like between Fishers and Carmel). It needs to be fast and convenient eNough to compete with driving in. This would Not only remove cars from the road and reduce CO2 emissions, but would save on road maint.	No
More recycling options. Our local station is open VERY limited days/times. Our local trash company charges twice as much and picks up half as often for recycling vs trash.	Yes
I am Not sure	No
Making communities walkable/bikable/transitable with safety, trees, and public transit in mind	Yes
Transition to renewable energy sources for all facets of life.	Yes
Holding businesses accountable for their part.	No
Safe, inclusive, and convenient alternative transportation options. EVs are expensive and Not everyone can drive, so infrastructure that allows for people to choose greener transportation methods would be impactful.	No
Widespread communication about progress would also be helpful, along with positive messaging around the progress you make. When good work gets done, it builds public confidence to hear about it!	No
Bring back annual car inspections.	No
Transportation	#Unknown
Reduce methane gas production	No
Let it be	Yes
Nationalize utilities is the single moat important action.	Yes
Emission producing industries should be required to reduce the amount of emission they create and also fund mitigation projects.	Yes
Pushing alternatives to single car use	Yes
Require everyone who drives a car to get it inspected Yesarly for emissions. Have a plan of action in place for helping people get their cars up to the standard. Don't just tell them to get it fixed, give them a printout of what's wrong to give to a mechanic. Have a folllow up program that works, or its a waste of time.	No
probably stop making endless suburbs and focus on closer knit communities with less space dedicated to roads ect	Yes

Preservation and restoration of natural areas. Reuse already developed spaces and stop destroying undeveloped land. Zoning, zoning, zoning. Stop with the variances and exceptions. Wouldn't need to plant trees if developers just stopped cutting them down. Value residents over builders.	No
Invest heavily in quickly building a multi-modal transportation network (i.e. bike, public transit, and pedestrian infrastructure), which is prioritized over private vehicles to make the network the most efficient and effective it can be. See Paris, France as an example. It does Not need to be perfect but right Now, these networks are disconnected and unsafe because maintaining the flow of cars was prioritized over safety for other road users.	Yes
Corporate oversight and regulations	No
Focus on BRT	No
Institute robust public transportation	Yes
tax polluting companies	Yes
Better timing of stop lights to reduce car idling, replace intersections with roundabouts	No
Public transportation. Energy efficient high speed trains.	No
Robust public transit!! Indygo is severely lacking, even with current improvements. Rapid trains and commuter lines between large cities of Indiana and connections to places like Chicago, Louisville, St. Louis, and Cincinnati will be an eNormous investment into the longevity of the state and will be much more environmentally sustainable.	Yes
Reduce construction over rural areas and adjoining woods and wetlands	No
Installing EV chargers in more remote areas to allow EV owners the use of their vehicle over longer distances.	No
Protect wetlands, public greenspaces, and other carbon sinks. Increase public transit coverage and consistency (the 3 line should be every 15 minutes all week long. We need more transit coverage on the weekends, too. pacers games end around 9 and then there's Not aNother bus til 10:30 pm). Stop using some of the most fertile soil in the world for a never-ending cycle of inedible corn and soybeans, we should be using our climatic and terrestrial advantages to produce more locally.	Yes
Incentivize building retrofitting for energy efficiency & increased use of renewable energy	Yes
Encourage transit	#Unknown
Switch to renewable energy: Replace fossil fuels like coal and oil with clean energy sources like solar, wind, geothermal, and hydropower.	No
Stop development on already open land like White River areas.	No
Get rid of coal burning in Marion County	No
Retire fossil fuel powered generators.	No
Eliminating daylight savings time. A study done after we started DST showed DST added Millions of extra tons of green house gases.	No
Air	Yes
Creating sustainability codes for the built environment that hold developers to a higher standard. Give credits for reuse of existing buildings.	Yes
Climate change is a hoax! We shpuld have LESS goverment action and initiatives.	No

Increase public transportation. Possibly electric trains. More bike paths.	No
Plan road construction projects more strategically through INDOT...several projects overlap where alternate routes are also blocked - this causes everyone to unnecessarily have to sit in traffic/idling for long periods of time - I imagine this leads to wasteful emissions.	Yes
Improve bike lanes and connectivity between dense living areas downtown and major employers (SalesForce, Lilly, Allison). Due to unsafe roads for biking, I and many others are forced to drive to work all the time.	
Continue to build and improve greenways in the city. The cultural trail encourages walking and cycling.	Yes
Implement clean and efficient energy. Pass laws that make it easier to regulate. Hold companies accountable.	Yes
Lowering emissions in automobiles, freight shipment and public transportation	No
Incentives and subsidies for conversion to low impact energy use in homes and other buildings	Yes
Inner city, Marion County.	#Unknown
Require businesses with heavy greenhouse gas emissions to reduce sharply	No
I believe it's important to act on the largest polluters as much as possible, beginning with industry and transportation. Enact and enforce auto emission standards statewide, as a starting point.	No
More native trees and plants to clean the air. Factory emissions cleaner. Less road congestion so less car emissions.	No
Invest in public transportation. Invest in dedicated, protected bike lanes. Invest in pedestrian infrastructure. Invest in busses, metro, and trams. Public transportation will reduce emissions by cars and make the city so much more beautiful	Yes
Reduce the amount of car-centric transportation infrastructure to reduce the amount of pavement, repairs, and crashes. Invest in protected bike infrastructure, dedicated bus lanes, and pedestrian infrastructure.	Yes
Build more reliable public transit like trains	Yes
VMT reduction strategies	No
Start with property owners who might do more to improve their homes & land to support the environment	Yes
Creating a functioning and efficient public transportation system	Yes
Building walkable communities and changing code to encourage sustainable practices such as solar panels on new builds.	No
Identify industries/activities of high emissions and invest in improving infrastructural efficiencies	No

### Workforce Planning Question

The fourth screen asked participants to rank the top three barriers to green jobs from a provided list of nine potential barriers. Respondents could click each barrier for more information.

FIGURE 23. SURVEY 2, WORKFORCE PLANNING QUESTION

TABLE 21. SURVEY 2, WORKFORCE PLANNING QUESTION RESULTS

Item	Ranking Average*	# Inputs	Open House Inputs
Lack of awareness of the field	1.74	62	4
Wages too low	1.85	41	1
Lack of job availability	1.92	40	1
Lack of awareness of available jobs	1.98	59	
Lack of skills taught in trade schools	2.09	41	
Education requirements too high	2.14	7	
Lack of transportation to existing jobs	2.16	24	
Lack of child or elder care	2.26	26	
Lack of apprenticeship opportunities	2.28	32	1

\*The lower the ranking average, the higher the importance.

Respondents consistently ranked the lack of awareness of the fields in green jobs as the largest barrier in Central Indiana. Low wages, lack of job availability, and the existence of green jobs but lack of awareness of the opportunities followed closely behind in the ranking of top barriers.

The final slide and question for respondents was their zip code. The IMPO used the submitted zip code to determine LIDAC status.

### Wrap Up Question



FIGURE 24. SURVEY 2, WRAP UP QUESTION

CCAP Benefit Survey

More at: <https://centralindianarda.org/epa-grant>

Wrap Up  
Tell us a bit about yourself!

Final Questions (Optional)

> What is your zip code?

12345

Thank you for participating!

Finish

Thank You!

Thank you for your participation!

Project Partners

Project Site

Click below to share this survey.

f X in

### Streamlined Comprehensive Climate Action Plan for Public Review

The streamlined draft of the CCAP was available for public review and comment from September 20 – October 31, 2025. The draft plan and corresponding survey to collect comments was posted to [www.indympo.gov/CPRG](http://www.indympo.gov/CPRG). The Indianapolis MPO attended community events and hosted in-person and virtual open houses to promote the public comment period and streamlined draft.

The IMPO attended 11 community events and festivals during the public review and comment period. The hosted 5 in-person open houses and 4 virtual open houses to provide feedback. The IMPO conducted multiple digital advertising campaigns during the public comment period, generating 3,188 link clicks.

#### Structure – Public Review and Comment Period

Members of the public could review the Draft Streamlined CCAP and submit feedback via a SurveyMonkey form. The form included 4 questions:

- Do you have comments on the emissions reductions measures/projects?
- Do you have any other feedback?
- What is your home zip code?
- How did you hear about this?
  - Newspaper, Magazine, Facebook/Instagram, Nextdoor, Event or Open House Attendance, Other (please specify)

## Results- Public Review and Comment Period

There were 47 comments received via the SurveyMonkey. Some participants provided feedback on both the first and second question. Two additional comments were received after the comment period had closed but are included below for record. Of the 47 total comments, 18 were from LIDAC zip codes (38%).

A summary of the comments received at the in-person and virtual open houses is below in Table 22:

- One attendee noted they supported the recommendations of the industry experts and those familiar with climate science.
- Emergency management planning and climate planning should include seniors. Heat poses a serious threat to seniors, and there are barriers to cooling shelters and transportation access for seniors.
- There were questions about implementation, implementation authority, next steps, funding availability, and future timelines.
- One individual asked specific questions about the greenhouse gas inventory for the agricultural sector.
- Renewable energy in the region and county level is achievable. Battery storage technology is not a limiting factor.
- There were several questions and comments regarding data centers in the region, including a comment to revise the business-as-usual projections to account for data center placement by increasing projections.
- One attendee provided neighborhood contacts for community engagement.
- There were also questions about better land use decisions.

TABLE 22. PUBLIC COMMENTS RECEIVED VIA SURVEYMONKEY

Responses	Question Number	LIDAC?	Note:
-----------	-----------------	--------	-------

I would like to see a stacked bar chart that shows the ten selected measures' contributions to GHG reductions and how close that gets the region to the stated 2030 and 2050 goals.

I am concerned that public transit is not addressed in these selected measures. Transportation is tied for the largest contribution to emissions. Vehicle electrification will reduce emissions as long as the grid shifts to renewables...a process that has slowed in the past two years. However, electrification will not address the MSA's significant congestion issues.

I am also concerned about the inclusion of Enhanced Green Space. While there are many benefits, specifically around protecting ecosystems and mitigating flood and heat emergencies, the emissions reductions are laughably low.

For the waste to energy action, I suggest highlighting in the description that this action is NOT recommending thermal (i.e., incineration, gasification, and pyrolysis) technologies - something that Indy-area residents have long been concerned about.

Aside from my above notes, these seem like the right mix of actions for impact, feasibility, and broad applicability across this region.

1

No

Received  
after Oct.  
31

Not really	1	No
What measures will be put in place to reduce the negative effects of solar panel fuels and windmills on birds?	1	Yes
Only emissions to measure is what's in the sky being sprayed over Indiana and how it effects people / soil	1	Yes
Mostly false findings Been disproved by many scientist and others. We all know if you say something enough the population starts to believe and not us their common sense.	1	No
Lots of buzzwords and generalities. This is a scam to get money. For what purpose, I do not know.	1	No
forwarding a link to a sobering "planet-on-the-brink" news report. All hands on deck!	1	Yes
Clarke Kahlo Indianapolis		

The agriculture emissions are over estimated due to not factoring in the reduction in emissions associated with conservation practice implementation like cover crops. The CIRDA region has a high uptake of cover crops, and the reduction in emissions could easily be factored in using data from the USDA COMET-Planner tool. Much like you used the COMET-Farm tool to estimate the carbon sink potential of urban forest and state park areas, you need to do the same for the ag sector.

1 No

- 
- Each Implementing and Supporting Entities section should include steps for regional local governments to take, even if it's just "enact similar policies/programs to the City of Indianapolis." CIRDA, IU ERI, or some other entity needs to continue to be a convener and educator for those local governments that don't have sustainability offices or officers. A regional convening entity should be listed in each of these sections. Instead of stating "local governments" specifically list them.
  - For energy efficiency - each local government in the MSA could adopt green requirements for developments receiving city tax incentives/abatements. Landscaping, building design, heat pumps, white roofs, solar-ready roofs, EV chargers, etc could all be considered.
  - For Utility-Scale Clean Energy, the utilities should be the implementers while the local governments are the supporters. If the local government doesn't own the utility, it feels unfair to put the onus of implementation on the municipality.
  - County Soil and Water Conservation Districts should be able to assist with the issues of runoff and green spaces.
  - 5.8 specifies Indy Parks and Rec but should really include Indy DPW as well. Pacers Bikeshare as well.
  - 5.10 description includes THRIVE Indianapolis. Thrive is not capitalized. The active programs section lists Thrive Indiana Schools (Office of Sustainability) should be changed to Indiana Thriving Schools and Students (Earth Charter Indiana).

1 Yes

---

Any effective climate action plan needs to address water management as extreme rains and increased temperatures are the biggest threat to Indiana. When Westfield got 2" of rain in an hour a couple years ago, my backyard turned into a lake! If we get more, my house will be underwater.

1 No

It looks like there are a lot of good initiatives going on! I'm probably preaching to the choir, but personally, I see making the cities and state less car-dependent and protecting/creating green spaces, and lands from being developed as core issues. Specifically, wetlands at that. I was lucky enough to go on a study abroad trip to Sweden and Denmark to look at their sustainability initiatives there, and I'd highly suggest looking into their models. The Coppenhill waste-to-energy facility was a very interesting trip, and I imagine it might do well if something similar were built here. Additionally, a book full of a treasure trove of small business wins and city planning insight that could be useful is The Natural Step for Communities: How Cities and Towns Can Change to Sustainable Practices by Sarah James and Torbjorn Lahti may be a good resource to have as a suggestion for businesses that could implement circular models.

1 No

Need public transportation to help emission reduction.	1	No
Yes	1	No

I've experienced discolored water. Have ruined a few loads of laundry before realizing it was the water and not a build up of residue in places we couldn't see in our washer plus it was kinda old. We bought a new washer only for it to happen again. At others times I smell bleach. We used to drink the water prior to this think it was safe. Both my husband and I have stomach issues. I have gerd so I have to take a stomach pill every day now. Now I wonder if it was caused from the contaminated water. Also our air outside stinks from time to time. Have had to close our doors and windows or we'd have to come inside from enjoying the nice weather. Don't know what's causing that. So we have both water and air problems! It's ridiculous!

1 Yes

This is a waste of money and it thst much to do with climate, but more about low income projects of which there are plenty of programs already exsisting.

1 No

VMT should be used as a metric to be reduced. More focus on public transportation development, housing density, and complete streets programs. Perhaps using density measures and miles of trails, sidewalks, and bike lanes as a metric.

1 Yes

I am submitting several comments and am happy to connect 1:1 to discuss in detail if helpful.

1. On page 8, the document references the the funding coming from CPRG grants. However, with the current administration's recent cuts to similar programs, it would be helpful to specify what funding opportunity is still available at present as well as how the PCAP will be supported if these funds are no longer available.

2. We appreciate the reference to solar with battery storage, and the PCAP team's commitment to reducing barriers to implementation. Page 16 references funding issues. However, it seems that funding is not quite as much of an issue as siting. Does the implementation of this CAP require or include advocacy at the local level through zoning boards?

3. There are several places where the document references that energy generation will continue to be carbon intensive. We understand there are limitations to the CAP implementer's ability to impact the MISO grid, but we would encourage the implementers to think about advocating for policies that would reduce emissions from electricity generated within the state. Currently, in this plan, electricity is such a high source of emissions and does not have a plan for reduction to the same degree as other economic sectors, and we believe this is a missed opportunity.

4. On a similar vein, the efficiency strategy in this CAP relies heavily on programs like the Thriving Buildings program, but there is an effort at the Statehouse to preempt the implementation of this ordinance. Does the PCAP have a role in promoting the protection of this ordinance through legislative advocacy?

1 Yes

5. Page 30 references energy efficiency rebates. It might be worth mentioning that CenterPoint also has rebates available in the service territory covered by this CAP. Though they only have gas service in this region, they still provide rebates for furnaces, insulation, and other energy saving measures that could reduce emissions in gas-heated homes.

6. As it relates to solar development, page 31 specifies prioritizing development on Brownfields. While we have no opposition to development of solar on Brownfields, it is important not to preclude solar development on other land or on rooftops.

7. On page 31, this sentence could be modify to emphasize the impact on human communities as well as wildlife. "Additionally, there is a risk of siting in LIDACs and natural habitats, which could disrupt local wildlife and migratory corridors."

8. We appreciate the strategies related to distributed resources and community solar. We are hopeful that there is an opening at the Statehouse to make community energy more available, especially in the



context of increasing utility rates. As it relates to the net metering recommendation, it would be helpful to understand the CAP's proposed strategy to making this option available again.

9. As it relates to increasing solar generation, page 32 states "There is financial risk of passing on initial costs to consumers." New generation would need to be paid for, regardless of whether it is wind, solar, or a fossil fuel generation plan. While it is true that customers will pay for that, is it clear or empirically demonstrable that -- if additional solar development were implemented --customers would pay a net greater amount compared to new generation infrastructure for other kinds of assets?

10. We appreciate the approach to charging infrastructure included on page 35.

11. We appreciate the focus on bike and pedestrian infrastructure as part of both environmental impacts and quality of life.

In section 5, there are no actions targeted at "Electricity Use" though this is one of the largest chunks of the overall emissions in our region. What is the rationale for not including any actions against Electricity Use? I could have missed the reasoning within the report, so I'm sorry in advance if so.

I am a big supporter of proposed action 5.6, especially in urban areas where there are vacant/abandoned parcels and unused paved parking lots. I am also a big supporter of action 5.8 especially within central Indianapolis where population density is so high!

1 Yes

Regarding proposed action 5.7, are there any initiatives or active programs related to increasing the use of trains for freight transport rather than semi-trucks? Trains are generally much more efficient for moving a given amount of freight than semi-trucks. Indiana is absolutely obsessed with its roads, and it definitely feels like there are more semi-trucks on our roads than ever before...we need this trend to reverse its course in favor of trains, I think.

Yes I believe that we need to steer away from burning fossil fuels. This would be very hard to do in the transportation industry but I feel we can make great almost immediate changes in electrical generation. An increase in wind and solar generation could make a major difference in less than 5 years. I am not for increased nuclear generation. I feel we have made good progress toward safe nuclear, but most past nuclear failures have been caused by human error. The solution to that is not full automation, that would worry me more. The big problem with nuclear is when it does fail it fails big. That problem does not exist with wind and solar.

1 No

I WANT TO KNOW WHAT YOU ARE GOING TO DO ABOUT THE POLLUTION IN OUR SKIES CALLED "CHEM TRAILS?" THIS IS WHAT SHOULD BE FOCUSED ON! I AM HAVING TO BUY A FACE MASK TO TRY AND SAVE MY LUNGS!! THERE IS NO FRESH AIR!!!!!!

1 No

Continue to create pedestrian friendly infrastructure in Indianapolis. We need to reduce our dependency on cars.

1 No

I had no idea that ag runoff had such a significant role in GHG emissions. I'm really excited about measures 2, 4, 7, and 8

1 Yes

Yes, the data centers are the most non green environmentally destructive devices being pushed while we're told we need to cut back and pollute less, meanwhile the elite are major polluters.

1 No

Consumers must be able to calculate a difference in emission from a gasoline vehicle vs hybrid vs EV compared with the equivalent power generation via coal or natural gas. If the latter is higher than a personal vehicle, there will not be movement to EV's.	1	No	
Pg 26/28 - Although projections are only 18ish months old, I worry it does not reflect the dramatic growth in data center interest we've seen in the past year and how that is shifting coal plant retirement plans. Readers could misinterpret the BAU as "not that bad". The emissions reduction projections could be incorrect as well. I would add brief text to caveat what BAU and reduction models did and did not consider, especially as very recent but significant shifts in expectations won't be included in these models.	2	No	Received after Oct. 31
This project has been a big lift! It's not easy to get from hundreds of possible actions down to only ten, and incredibly challenging to engage community members across such a massive region, while navigating such a broad set of industries and attitudes. Congrats to the project team for nearing the finish line!			
None at this time	2	No	
No	2	Yes	
There is no climate crisis, can you stop wasting time/money?	2	Yes	
You know this has been proven not fractural, right. Just a money grab from the U.S. citizens. Even if true we cannot change it now.	2	No	
You have a lot of nerve.	2	No	
<a href="https://www.msn.com/en-us/news/other/global-warming-is-pushing-the-planet-to-the-brink-says-un-secretary-general/ar-AA1OY7xB?ocid=msedgdhp&amp;pc=U531&amp;cvid=d88fde721104475cf5f49d6e711c42f6&amp;ei=23">https://www.msn.com/en-us/news/other/global-warming-is-pushing-the-planet-to-the-brink-says-un-secretary-general/ar-AA1OY7xB?ocid=msedgdhp&amp;pc=U531&amp;cvid=d88fde721104475cf5f49d6e711c42f6&amp;ei=23</a>	2	Yes	
I do not want to see any policies implemented that will infringe on people's rights or make the cost of goods and services increase. I'm sure most would agree that being responsible with our environment is positive if it is conducted within reason.	2	No	

I would recommend changing the sector names so that "working lands" is with agriculture, i.e., it should be "agriculture and working lands" (which refers to farms AND ranches), rather than as you currently have it listed under the urban forestry designation.

Additionally, I would encourage you to incorporate farmland protection into the goals for GHG Reduction Measure #2, as strategically protecting prime farmland is CRITICAL to the landscape level goal of open lands connectivity. I recommend you look at the work that American Farmland Trust is doing in the Midwest, including here in Indiana.

Related to agriculture, I also noticed that the report doesn't touch at all on the aspect of food security and how it intersects with GHG emissions reductions; this is again tied into the necessity of protecting prime farmland near our urban centers. A key benefit of farmland protection near growing urban centers like Indianapolis is that by protecting farmland, you ensure the land base is there for future food production, i.e. long term food security and fewer food miles traveled from farm to fork.

2

No

Lastly, I noticed in the responses to Public Survey #1 that there does not appear to be any kind of statistical significance or natural breaks analysis conducted on the data. By simply selecting the top five items that got the highest number responses by count, you have unfortunately overlooked that the items that received the most votes in position #4 through #6 are within a two point difference of one another, and likely within the margin of random variation that occurs within your sample. In particular, I would encourage you to include an analysis with item #6 included, as it gets at strategic land use planning as a key concern of respondents in the CIRDA region. The high number of respondents who identified this issue as the #1 issue they see is again why I am drawing attention to the need to incorporate prime farmland protection into your GHG Emissions Reduction Goal #2. Relatedly, from Survey #2 results, 20% and 17% of respondents identified air and water quality (respectively) as the greatest benefits from working to reduce GHG emissions in the study area, which again are directly addressed by securing prime farmland and implementing conservation practices on the land.

You might also look at the CILTI and Conservation Fund Report that was put out around 2010 and which identified a network of green infrastructure areas that would be top priority for restoration to natural habitat. The correlary being that protecting farmland adjacent to those

areas is a complementary and necessary action to deliver the desired GHG and landscape level resiliency the region needs moving forward.

<p>- I don't know if I'd refer to Thrive Indianapolis as "recent." It was developed in 2018, and lots of the benchmark data is from 2016 so it is almost a decade old.</p> <p>- The engagement feedback on page 14 would lend itself really well to graphics/visuals. Maybe that is in the works. If not, bold the takeaways.</p> <p>- Confusing why Yellowwood State Forest and Brown County State Park's carbon sequestration potential were examined instead of state parks that are located in Central Indiana.</p>	2	Yes
<p>Please contact the Indiana Watershed Leadership Academy at Purdue about including them.</p> <p><a href="https://engineering.purdue.edu/watersheds/academy.html">https://engineering.purdue.edu/watersheds/academy.html</a> Indiana &amp; National Wildlife Federations also work to protect watersheds, including a multi-state coalition to restore the Ohio River basin. Also support any effort to deploy rail transit in Indiana.</p>	2	No
<p>As someone who works in the landscaping industry, I think putting regulations or taxes on gas-powered machines in order to encourage electric machines would be helpful. Especially on days when there are air quality advisories. Thanks for doing the work you do!</p>	2	No
No	2	No
<p>I have lived in Lapel for 15 years and the water has just gotten worse. Especially the last year. All of my pipes were replaced from my house to the main when my house was remodeled. Most days, my water is yellow. When it's really bad, the water is brown. When it's "clear" it smells so strongly of bleach or chemicals. The water ruins everything. Laundry, dishes, all of my major appliances have been replaced 2 if not 3 times already. I've also had a lot of health issues over the last year that may be related to the water. I will not drink it nor will I even let my dog drink it. I have to shower in it. I see what it does to everything it touches, so what is it doing to the inside of my body?! We use bottled water to brush our teeth and cook as well. It just eats away at the laundry. I know the water in Lapel cannot be safe.</p>	2	No
No	2	Yes

I am not at all in support of this!!	2	No
We're not going to work towards goals of reducing GHG if we keep expanding roads and highways. IMPO needs to take a stronger public stance on building out the public transportation network, and make explicit how local and state level politics against public transit are adversely affecting climate goals. It's hard to take this seriously when City's/towns that have opposed public transportation are making steering decision related to climate change, as they actively build out to become more car dependent. IMPO needs to be clear about the science and transportation economics related to these City-level decisions.	2	Yes
Thank you for taking the time to complete this project. We appreciate the efforts to reduce emissions across Central Indiana.	2	Yes
Thank you for assembling this data and your time to write the report! I'd love there to be as many public eyes on this project as possible! This is great information, and I'd suggest to engage with local news television stations or publications (such as Urban Times) to get the word out about public comments.	2	Yes
We have a problem with zoning at county levels for wind and solar. A few people campaign very hard for no wind and solar using scare and worry tactics, click bait topics taken out of context. If they succeed then the tide changes to nuclear energy. If the citing of a wind or solar farm is hard consider how hard it is going to be to site a modular reactor (SMR) near anything. We need to develop wind and solar and look to ways to develop better and safer electrical storage means. We are not where we should be on electrical storage that is safe.	2	No
Ban the chen trails over Indiana!!	2	No
No	2	No
Would appreciate some sort of comparison to make the MT CO2e numbers more accessible. Like, an emissions reduction of 99,173 MT CO2e is the equivalent of taking 21,559 cars off the road for a year. Really appreciate the co-benefits, as well as the potential disbenefits.	2	Yes
Yes we need to regulate the real polluters and greenhouse emitters the ultra wealthy.	2	No



Local solar projects must have the ability to give power back to the grid in an equitable manner. Data for individuals considering solar panels must be available to weigh cost vs future savings.

2

No

# Appendix B. Business-as-Usual GHG Emissions Projection Data

TABLE 23. BUSINESS-AS-USUAL GHG EMISSIONS PROJECTION (2022-2050, MILLION METRIC TONS CO2E)

Million Metric Tons CO2e	Boone County	Brown County	Hamilton County	Hancock County	Hendricks County	Johnson County	Madison County	Marion County	Morgan County	Putnam County	Shelby County	Total
<b>2022</b>	<b>1.4</b>	<b>0.1</b>	<b>4.6</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.5</b>	<b>2.5</b>	<b>2.0</b>	<b>1.3</b>	<b>36.8</b>
Agriculture	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.3	0.3	2.2	0.1	0.0	0.1	4.4
Electricity Generation	-	-	0.6	-	-	-	-	1.2	1.5	-	-	3.4
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.3	0.3	0.3	0.5	12.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.2	0.1	1.2	0.2	3.7
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.7	0.6	1.0	0.9	0.6	5.5	0.4	0.3	0.4	12.1
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2023</b>	<b>1.3</b>	<b>0.1</b>	<b>4.5</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.2</b>	<b>2.4</b>	<b>2.0</b>	<b>1.3</b>	<b>36.2</b>
Agriculture	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.6	-	-	-	-	1.1	1.4	-	-	3.1
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.3	0.3	0.3	0.5	12.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.2	0.1	1.2	0.2	3.7
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.7	0.6	1.0	0.9	0.6	5.5	0.4	0.3	0.4	12.0

Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2024</b>	<b>1.3</b>	<b>0.1</b>	<b>4.5</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.2</b>	<b>2.4</b>	<b>2.0</b>	<b>1.3</b>	<b>36.2</b>
Agriculture	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.6	-	-	-	-	1.1	1.4	-	-	3.1
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.3	0.3	0.3	0.5	12.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.2	0.1	1.2	0.2	3.8
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.7	0.5	1.0	0.9	0.6	5.4	0.4	0.3	0.4	11.9
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2025</b>	<b>1.3</b>	<b>0.1</b>	<b>4.5</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.1</b>	<b>2.3</b>	<b>2.0</b>	<b>1.3</b>	<b>36.0</b>
Agriculture	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.5	-	-	-	-	1.1	1.3	-	-	2.9
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.3	0.3	0.3	0.5	12.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	3.9
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.7	0.5	0.9	0.9	0.6	5.3	0.4	0.3	0.4	11.7
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2026</b>	<b>1.3</b>	<b>0.1</b>	<b>4.4</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.0</b>	<b>2.1</b>	<b>2.0</b>	<b>1.3</b>	<b>35.7</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5

Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.2	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.5	-	-	-	-	0.9	1.2	-	-	2.6
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.4	0.3	0.4	0.5	12.8
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.0
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.6	0.5	0.9	0.8	0.6	5.2	0.4	0.3	0.4	11.5
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2027</b>	<b>1.3</b>	<b>0.1</b>	<b>4.4</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>16.0</b>	<b>2.1</b>	<b>2.1</b>	<b>1.3</b>	<b>35.6</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.2	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.5	-	-	-	-	0.9	1.1	-	-	2.5
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.4	0.3	0.4	0.5	12.9
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.0
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.6	0.5	0.9	0.8	0.6	5.2	0.4	0.3	0.4	11.4
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2028</b>	<b>1.3</b>	<b>0.1</b>	<b>4.3</b>	<b>1.2</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>15.8</b>	<b>1.9</b>	<b>2.1</b>	<b>1.3</b>	<b>35.2</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.3	0.3	2.2	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.4	-	-	-	-	0.8	1.0	-	-	2.1
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.5	0.3	0.4	0.5	13.0

Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.0
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.6	0.5	0.9	0.8	0.6	5.1	0.4	0.3	0.4	11.2
Waste and Materials Management	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2029</b>	<b>1.3</b>	<b>0.1</b>	<b>4.2</b>	<b>1.1</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>15.7</b>	<b>1.7</b>	<b>2.1</b>	<b>1.3</b>	<b>34.8</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.2	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.3	-	-	-	-	0.6	0.8	-	-	1.8
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.5	0.3	0.4	0.5	13.0
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.6	0.5	0.9	0.8	0.6	5.0	0.4	0.3	0.4	11.1
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2030</b>	<b>1.3</b>	<b>0.1</b>	<b>4.1</b>	<b>1.1</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>15.5</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>34.4</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.2	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.5	0.3	0.4	0.5	13.1
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.6	0.1	1.5	0.5	0.9	0.8	0.6	5.0	0.4	0.3	0.4	10.9

Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.7
<b>2031</b>	<b>1.3</b>	<b>0.1</b>	<b>4.1</b>	<b>1.1</b>	<b>3.0</b>	<b>1.9</b>	<b>2.3</b>	<b>15.4</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>34.2</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.4
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.5	0.3	0.4	0.5	13.1
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.5	0.5	0.9	0.8	0.6	4.9	0.4	0.3	0.4	10.7
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2032</b>	<b>1.3</b>	<b>0.1</b>	<b>4.1</b>	<b>1.1</b>	<b>2.9</b>	<b>1.9</b>	<b>2.3</b>	<b>15.4</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>34.0</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.2
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.6	-	-	1.4
Electricity Use	0.5	0.1	1.5	0.4	1.3	0.7	0.7	6.5	0.3	0.4	0.5	13.1
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.5	0.5	0.9	0.8	0.6	4.8	0.4	0.2	0.4	10.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2033</b>	<b>1.3</b>	<b>0.1</b>	<b>4.1</b>	<b>1.1</b>	<b>2.9</b>	<b>1.9</b>	<b>2.3</b>	<b>15.3</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.9</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5



Commercial and Residential Buildings	0.2	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.6	0.3	0.4	0.5	13.2
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.5	0.5	0.8	0.8	0.5	4.8	0.4	0.2	0.3	10.5
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2034</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.3</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.8</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.6	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.6	0.3	0.4	0.5	13.2
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.5	0.5	0.8	0.8	0.5	4.7	0.4	0.2	0.3	10.3
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2035</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.7</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.6	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.6	0.3	0.4	0.5	13.3

Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.5	0.5	0.8	0.8	0.5	4.7	0.4	0.2	0.3	10.2
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2036</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.6</b>	<b>2.0</b>	<b>1.3</b>	<b>33.7</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.6	0.3	0.4	0.5	13.3
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.5	0.8	0.7	0.5	4.6	0.4	0.2	0.3	10.1
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2037</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.7</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.1
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.7	0.3	0.4	0.5	13.4
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.5	0.8	0.7	0.5	4.6	0.4	0.2	0.3	10.0

Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2038</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.2</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.6</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.7	0.3	0.4	0.6	13.4
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.5	0.8	0.7	0.5	4.5	0.4	0.2	0.3	9.9
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2039</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.5</b>	<b>2.0</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.6	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.7	0.7	6.7	0.3	0.4	0.6	13.4
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.5	0.8	0.7	0.5	4.5	0.4	0.2	0.3	9.8
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2040</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.6</b>	<b>2.0</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5

Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.7	6.7	0.3	0.4	0.6	13.5
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.5	0.4	0.2	0.3	9.8
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.7
<b>2041</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.6</b>	<b>2.0</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.1	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.7	6.7	0.3	0.4	0.6	13.5
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.4	0.4	0.2	0.3	9.7
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2042</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.6</b>	<b>2.0</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.0	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.8	0.3	0.4	0.6	13.6

Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.4	0.4	0.2	0.3	9.7
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2043</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.0	0.1	0.0	0.1	4.0
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.8	0.3	0.4	0.6	13.6
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.4	0.4	0.2	0.3	9.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2044</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.6</b>	<b>2.1</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.5
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.7	-	-	1.5
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.8	0.3	0.4	0.6	13.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.4	0.4	0.2	0.3	9.6

Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2045</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.2</b>	<b>15.1</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.4</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.3	-	-	-	-	0.5	0.6	-	-	1.4
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.8	0.3	0.4	0.6	13.7
Industry	0.0	0.0	0.1	0.0	0.2	0.0	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.4	0.4	0.2	0.3	9.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2046</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.1</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.4</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.4	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.2	-	-	-	-	0.5	0.6	-	-	1.3
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.9	0.3	0.4	0.6	13.8
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.3	0.4	0.2	0.3	9.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2047</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.1</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.5</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6

Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.3	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.2	-	-	-	-	0.5	0.6	-	-	1.3
Electricity Use	0.5	0.1	1.6	0.4	1.4	0.8	0.8	6.9	0.3	0.4	0.6	13.9
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.3	0.4	0.2	0.3	9.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2048</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.6</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.3	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.2	-	-	-	-	0.5	0.6	-	-	1.3
Electricity Use	0.6	0.1	1.6	0.4	1.4	0.8	0.8	7.0	0.3	0.4	0.6	14.0
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.3	0.3	0.2	0.3	9.5
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2049</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>2.9</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.6</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.3	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.2	-	-	-	-	0.5	0.6	-	-	1.3
Electricity Use	0.6	0.1	1.7	0.5	1.4	0.8	0.8	7.0	0.3	0.4	0.6	14.1



Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.3	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.3	0.3	0.2	0.3	9.5
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8
<b>2050</b>	<b>1.3</b>	<b>0.1</b>	<b>4.0</b>	<b>1.1</b>	<b>3.0</b>	<b>1.8</b>	<b>2.3</b>	<b>15.2</b>	<b>1.5</b>	<b>2.1</b>	<b>1.3</b>	<b>33.7</b>
Agriculture	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.6
Commercial and Residential Buildings	0.1	0.0	0.6	0.1	0.3	0.2	0.3	2.0	0.1	0.0	0.1	3.9
Electricity Generation	-	-	0.2	-	-	-	-	0.4	0.6	-	-	1.2
Electricity Use	0.6	0.1	1.7	0.5	1.5	0.8	0.8	7.1	0.3	0.4	0.6	14.2
Industry	0.0	0.0	0.1	0.0	0.2	0.1	0.6	1.4	0.1	1.3	0.3	4.1
Natural and Working Lands	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)	(0.0)	(0.0)	(0.0)	(0.6)
Transportation	0.5	0.1	1.4	0.4	0.8	0.7	0.5	4.3	0.4	0.2	0.3	9.6
Waste and Materials Management	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.0	0.8

BAU Projections for working lands soil carbon sequestration were not calculated by county and are not included in Table 23, but are summarized in the table below:

Year	Working Land Soils GHG Reductions (MT CO <sub>2</sub> e)
2022	388,538
2023	387,641
2024	386,746
2025	385,854
2026	384,963
2027	384,075

2028	383,188
2029	382,304
2030	381,421
2031	380,541
2032	379,662
2033	378,786
2034	377,912
2035	377,039
2036	376,169
2037	375,301
2038	374,434
2039	373,570
2040	372,708
2041	371,848
2042	370,989
2043	370,133
2044	369,279
2045	368,426
2046	367,576
2047	366,727
2048	365,881
2049	365,036
2050	364,194

# Appendix C. Annual GHG Reductions and Total Implementer Costs for Each Measure (2026-2050)

TABLE 24. CUMULATIVE GHG REDUCTIONS (METRIC TONS CO2E)

Year	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7	Measure 8	Measure 9	Measure 10
2026	20,833	168,490	103,177	7,679	-	27	304,891	1,952	27	(9,247)
2027	62,496	333,308	184,577	15,185	76,528	132	679,349	3,997	3,792	(478)
2028	124,988	497,281	267,141	22,716	153,203	316	1,108,767	6,125	11,342	26,532
2029	208,306	661,017	351,129	30,313	230,730	578	1,585,622	8,331	22,723	72,007
2030	312,449	823,788	431,250	37,925	309,237	918	2,109,172	10,610	38,059	136,172
2031	437,414	985,208	509,537	45,521	377,038	1,338	2,676,396	12,963	57,318	219,251
2032	583,200	1,149,226	586,769	53,389	446,463	1,835	3,253,371	15,387	80,547	321,469
2033	749,804	1,312,539	656,291	61,284	513,901	2,412	3,860,573	17,879	107,792	443,049
2034	937,224	1,473,725	726,180	69,098	581,765	3,067	4,508,646	20,436	139,100	584,217
2035	1,145,459	1,633,058	792,481	76,848	648,473	3,800	5,194,019	23,056	175,033	745,197
2036	1,374,506	1,789,456	855,760	84,447	712,859	4,612	5,935,027	25,735	215,122	926,212
2037	1,624,363	1,944,628	913,808	92,026	779,060	5,502	6,705,177	28,471	259,411	1,127,488
2038	1,895,029	2,098,620	970,608	99,589	842,779	6,471	7,501,556	31,262	307,949	1,349,249
2039	2,186,501	2,244,178	1,027,585	106,552	902,601	7,518	8,430,249	34,105	360,780	1,591,720
2040	2,498,777	2,384,731	1,066,790	113,181	960,739	8,644	9,450,223	36,997	418,379	1,855,124
2041	2,831,856	2,524,937	1,103,480	119,841	1,019,097	9,848	10,488,732	39,937	480,365	2,139,686
2042	3,185,734	2,665,040	1,140,344	126,552	1,076,526	11,131	11,538,325	42,922	546,783	2,445,631
2043	3,560,412	2,805,043	1,177,752	133,311	1,134,212	12,493	12,594,735	45,949	617,681	2,773,182
2044	3,955,885	2,944,624	1,214,955	140,096	1,190,655	13,933	13,660,314	49,018	693,104	3,122,565
2045	4,372,153	3,083,972	1,252,152	146,921	1,247,219	15,451	14,727,227	52,125	773,098	3,494,003
2046	4,809,214	3,223,065	1,289,238	153,785	1,308,648	17,048	15,791,655	55,269	857,711	3,887,722
2047	5,267,065	3,361,007	1,325,541	160,615	1,372,610	18,724	16,871,474	58,448	946,961	4,303,945

2048	5,745,704	3,498,087	1,361,369	167,434	1,428,900	20,478	17,958,229	61,659	1,040,922	4,742,897
2049	6,245,130	3,634,312	1,396,605	174,240	1,484,910	22,310	19,049,570	64,902	1,139,639	5,204,802
2050	6,765,341	3,766,196	1,431,421	180,729	1,543,639	24,221	20,244,841	68,174	1,243,160	5,689,885

TABLE 25. CUMULATIVE IMPLEMENTER COST (USD, 2025)

Year	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7	Measure 8	Measure 9	Measure 10
2026	240,733	54,415,045	8,305,573	21,769,219	-	29,685	6,207,094	2,594,639	20,137,328	342,544
2027	722,164	108,830,090	16,424,608	43,735,044	20,838,755	238,470	160,193,857	5,189,277	40,669,390	1,649,877
2028	1,444,259	163,245,135	24,361,824	65,896,412	41,840,652	447,255	314,180,621	7,783,916	61,601,074	3,933,943
2029	2,406,984	217,660,180	32,121,808	88,252,268	63,110,840	656,040	468,167,385	10,378,554	82,937,266	7,206,686
2030	3,903,630	272,075,225	39,709,024	110,801,563	84,796,298	864,825	622,154,149	12,973,193	104,682,853	11,480,050
2031	5,934,162	326,490,270	47,127,813	133,543,255	103,704,222	1,073,610	770,909,411	15,567,832	126,842,722	16,765,978
2032	8,498,547	380,905,314	54,382,395	156,476,313	122,713,966	1,282,395	919,674,507	18,162,470	149,421,759	23,076,416
2033	11,596,751	435,320,359	61,476,879	179,599,708	141,271,402	1,491,179	1,068,449,619	20,757,109	172,424,851	30,423,306
2034	15,228,740	489,735,404	68,415,259	202,912,424	160,228,054	1,699,964	1,217,234,929	23,351,747	195,856,885	38,818,592
2035	19,394,481	544,150,449	75,201,422	226,413,448	179,110,985	1,908,749	1,366,030,624	25,946,386	219,722,748	48,274,220
2036	24,093,940	598,565,494	81,839,149	250,101,777	197,730,785	2,117,534	1,514,836,896	28,541,025	244,027,327	58,802,132
2037	29,327,083	652,980,539	88,332,117	273,976,413	217,049,471	2,326,319	1,663,653,937	31,135,663	268,775,507	70,414,272
2038	35,093,877	707,395,584	94,683,906	298,036,365	235,808,453	2,535,104	1,812,481,945	33,730,302	293,972,177	83,122,585
2039	41,394,289	761,810,629	100,897,996	322,280,652	254,608,964	2,743,889	1,961,321,121	36,324,940	319,622,222	96,939,014
2040	48,228,285	816,225,674	106,977,777	346,708,297	273,642,844	2,952,674	2,110,171,670	38,919,579	345,730,530	111,875,504
2041	55,595,833	870,640,719	112,926,545	371,318,331	292,803,816	3,161,459	2,259,033,800	41,514,217	372,301,988	127,943,998

2042	63,496,898	925,055,764	118,747,507	396,109,791	311,676,189	3,370,244	2,407,907,723	44,108,856	399,341,481	145,156,440
2043	71,931,449	979,470,809	124,443,786	421,081,722	330,648,763	3,579,029	2,556,793,656	46,703,495	426,853,897	163,524,775
2044	80,899,452	1,033,885,853	130,018,418	446,233,174	349,278,722	3,787,814	2,705,691,819	49,298,133	454,844,123	183,060,946
2045	90,400,874	1,088,300,898	135,474,361	471,563,206	367,984,838	3,996,599	2,854,602,435	51,892,772	483,317,045	203,776,897
2046	100,435,683	1,142,715,943	140,814,491	497,070,882	388,343,883	4,205,384	3,003,525,734	54,487,410	512,277,550	225,684,572
2047	111,003,846	1,197,130,988	146,041,611	522,755,273	409,750,414	4,414,169	3,152,461,946	57,082,049	541,730,525	248,795,916
2048	122,105,329	1,251,546,033	151,158,444	548,615,455	428,728,518	4,622,954	3,301,411,310	59,676,688	571,680,856	273,122,871
2049	133,740,101	1,305,961,078	156,167,645	574,650,513	447,751,955	4,831,739	3,450,374,067	62,271,326	602,133,431	298,677,382
2050	145,908,129	1,360,376,123	161,071,797	600,859,537	468,476,896	5,040,524	3,599,350,460	64,865,965	633,093,136	325,471,394

# Appendix D. Co-Pollutant 2020 Baseline Inventory Data

TABLE 26. CENTRAL INDIANA CRITERIA AIR POLLUTANT INVENTORY- BASE YEAR (2020)

	Boone	Brown	Hamilton	Hancock	Hendricks	Johnson	Madison	Marion	Morgan	Putnam	Shelby	Total
<b>Agriculture</b>	<b>3,232.6</b>	<b>599.8</b>	<b>1,993.0</b>	<b>3,085.7</b>	<b>2,126.3</b>	<b>1,870.8</b>	<b>3,085.0</b>	<b>389.3</b>	<b>2,079.8</b>	<b>2,130.3</b>	<b>2,329.3</b>	<b>22,922.0</b>
Ammonia	477.3	288.5	374.1	1,252.3	457.9	490.6	491.2	224.0	535.0	698.4	540.3	<b>5,829.3</b>
Carbon Monoxide				8.8	8.8				8.8	8.8	17.6	<b>52.9</b>
Nitrogen Oxides				0.2	0.2				0.2	0.2	0.4	<b>1.3</b>
PM10 Filterable	1,143.8	126.2	672.8	739.7	685.5	568.4	1,075.9	66.1	633.5	582.3	728.5	<b>7,022.6</b>
PM10 Primary (Filt + Cond)	1,143.8	126.2	672.8	741.2	687.0	568.4	1,075.9	66.1	635.0	583.9	731.6	<b>7,031.8</b>
PM2.5 Filterable	227.0	23.4	134.3	132.9	135.5	112.3	213.6	13.5	125.0	113.2	144.2	<b>1,374.7</b>
PM2.5 Primary (Filt + Cond)	227.0	23.4	134.3	134.0	136.6	112.3	213.6	13.5	126.1	114.3	146.4	<b>1,381.5</b>
Sulfur Dioxide				0.0	0.0				0.0	0.0	0.1	<b>0.2</b>
Volatile Organic Compounds	13.9	12.2	4.9	76.6	14.8	18.9	14.9	6.1	16.3	29.2	20.2	<b>227.8</b>
<b>Commercial and Residential Buildings</b>	<b>2,047.3</b>	<b>1,165.2</b>	<b>7,973.8</b>	<b>2,288.8</b>	<b>4,257.6</b>	<b>3,985.1</b>	<b>3,714.6</b>	<b>15,713.1</b>	<b>2,529.2</b>	<b>1,629.0</b>	<b>1,663.7</b>	<b>46,967.5</b>
Ammonia	18.7	5.1	88.3	22.9	43.3	44.8	42.2	223.9	19.1	8.8	11.9	<b>528.9</b>
Carbon Monoxide	1,019.8	627.0	3,645.2	1,156.2	1,999.4	1,869.1	1,817.7	6,023.2	1,291.3	830.5	832.4	<b>21,111.8</b>
Lead	0.1		0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	<b>0.5</b>
Nitrogen Oxides	131.4	25.9	649.1	138.1	303.9	283.1	236.2	2,299.1	103.2	61.9	83.3	<b>4,315.3</b>
PM Condensable	40.0	10.4	232.9	38.7	106.2	103.4	74.2	775.0	32.3	20.3	25.1	<b>1,458.5</b>
PM10 Filterable	134.9	91.5	522.5	155.8	290.5	261.9	253.5	747.5	188.5	119.1	114.1	<b>2,879.8</b>
PM10 Primary (Filt + Cond)	177.3	101.9	758.4	197.0	397.5	367.5	329.4	1,536.0	220.9	139.9	140.7	<b>4,366.5</b>

PM2.5 Filterable	129.4	90.6	490.0	150.6	275.9	248.9	244.4	639.8	184.8	116.7	111.0	<b>2,682.3</b>
PM2.5 Primary (Filt + Cond)	171.4	101.0	725.5	191.5	382.8	354.2	320.0	1,427.5	217.2	137.4	137.4	<b>4,165.9</b>
Sulfur Dioxide	13.2	3.5	71.0	12.2	32.2	25.7	19.1	244.3	9.4	7.0	7.9	<b>445.5</b>
Volatile Organic Compounds	211.1	108.3	790.9	225.7	425.9	426.6	377.8	1,796.5	262.4	187.4	199.8	<b>5,012.5</b>
<b>Electricity Generation</b>		<b>74.5</b>						<b>1,250.9</b>	<b>750.3</b>		<b>274.8</b>	<b>2,350.6</b>
Ammonia								0.2	0.0			<b>0.2</b>
Carbon Monoxide								51.2	244.9		84.4	<b>380.5</b>
Lead								0.0	0.0			<b>0.0</b>
Nitrogen Oxides			70.7					951.6	109.7		153.6	<b>1,285.6</b>
PM Condensible								48.4	76.8		1.6	<b>126.8</b>
PM10 Filterable								17.7	30.4		3.1	<b>51.2</b>
PM10 Primary (Filt + Cond)								66.1	107.2		4.7	<b>178.0</b>
PM2.5 Filterable								17.7	30.4		3.1	<b>51.2</b>
PM2.5 Primary (Filt + Cond)								66.1	107.2		4.7	<b>178.0</b>
Sulfur Dioxide			3.8					5.2	10.0		0.1	<b>19.1</b>
Volatile Organic Compounds								26.8	33.6		19.5	<b>79.9</b>
<b>Industry</b>	<b>2,758.2</b>	<b>225.5</b>	<b>11,535.1</b>	<b>2,024.0</b>	<b>5,399.2</b>	<b>3,412.4</b>	<b>3,190.4</b>	<b>40,234.7</b>	<b>4,733.4</b>	<b>4,628.9</b>	<b>4,832.3</b>	<b>82,974.0</b>
Ammonia	2.9	0.2	7.7	3.3	8.5	5.3	3.8	52.5	2.1	1.6	181.8	<b>269.6</b>
Carbon Monoxide	93.3	5.0	250.8	107.9	1,299.1	169.8	123.7	2,475.7	215.1	277.3	493.7	<b>5,511.3</b>
Lead	0.0		0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	<b>0.6</b>
Nitrogen Oxides	116.9	6.2	312.5	134.0	561.6	212.5	162.7	2,098.2	558.8	1,758.9	260.3	<b>6,182.8</b>
PM Condensible	2.8	0.1	7.4	3.5	39.8	5.2	3.6	87.4	65.9	33.3	157.0	<b>406.1</b>
PM10 Filterable	645.9	31.6	3,372.2	215.6	549.3	559.3	567.8	9,700.4	617.7	684.2	710.3	<b>17,654.3</b>



PM10 Primary (Filt + Cond)	648.6	31.8	3,379.6	219.1	593.1	564.5	571.7	9,788.5	683.6	717.5	867.3	<b>18,065.3</b>
PM2.5 Filterable	77.8	3.7	370.5	31.5	98.5	74.7	72.0	1,204.7	93.3	169.8	306.4	<b>2,502.8</b>
PM2.5 Primary (Filt + Cond)	80.6	3.8	377.8	35.0	142.1	79.9	75.9	1,292.8	159.2	203.2	463.4	<b>2,913.7</b>
Sulfur Dioxide	167.3	8.9	446.1	178.0	441.5	296.9	219.5	2,444.1	1,439.3	238.7	206.0	<b>6,086.2</b>
Volatile Organic Compounds	922.2	134.2	3,010.5	1,096.2	1,665.6	1,444.4	1,389.5	11,090.2	898.2	544.3	1,186.3	<b>23,381.5</b>
<b>Natural and Working Lands</b>	<b>3,181.4</b>	<b>7,978.9</b>	<b>3,201.3</b>	<b>2,949.3</b>	<b>3,576.6</b>	<b>3,726.9</b>	<b>3,729.6</b>	<b>3,164.3</b>	<b>6,419.6</b>	<b>6,987.6</b>	<b>3,761.2</b>	<b>48,676.6</b>
Ammonia	0.5	4.9	0.1	0.3	0.5	2.3	0.2	0.3	3.6	5.0	1.3	<b>19.0</b>
Carbon Monoxide	440.1	770.3	390.8	376.3	453.2	530.2	460.5	372.7	733.3	925.0	542.4	<b>5,994.7</b>
Lead		0.0				0.0			0.0	0.0		<b>0.0</b>
Nitrogen Oxides	358.1	63.5	288.3	279.2	312.4	253.2	339.5	169.5	230.3	334.6	355.5	<b>2,984.1</b>
PM10 Primary (Filt + Cond)	3.8	32.7	1.6	2.7	4.2	14.1	3.6	2.3	24.2	33.9	11.1	<b>134.3</b>
PM2.5 Primary (Filt + Cond)	3.4	27.7	1.6	2.4	3.8	12.0	3.5	1.9	20.8	29.2	10.0	<b>116.2</b>
Sulfur Dioxide	0.3	3.1	0.2	0.2	0.4	1.1	0.3	0.2	2.1	2.9	1.0	<b>11.8</b>
Volatile Organic Compounds	2,375.3	7,076.6	2,518.7	2,288.1	2,802.3	2,914.0	2,921.8	2,617.4	5,405.3	5,657.0	2,839.9	<b>39,416.5</b>
<b>Transportation</b>	<b>13,597.9</b>	<b>2,760.0</b>	<b>37,356.3</b>	<b>10,469.0</b>	<b>18,804.8</b>	<b>16,665</b>	<b>15,975.4</b>	<b>107,507</b>	<b>10,988.0</b>	<b>6,397.1</b>	<b>7,659.2</b>	<b>248,180</b>
Ammonia	43.0	4.5	111.5	31.7	64.4	50.9	45.4	294.7	26.9	19.7	23.5	<b>716.2</b>
Carbon Monoxide	10,138.3	1,970.5	29,111.1	7,513.5	14,100.6	12,522.2	12,061.6	85,771.5	8,203.5	4,090.1	5,403.5	<b>190,887</b>
Nitrogen Oxides	1,612.5	189.9	2,959.6	1,317.7	1,980.8	1,573.7	1,611.5	8,376.9	1,144.3	1,139.9	1,169.6	<b>23,076.4</b>
PM10 Filterable	427.6	143.3	1,218.1	395.6	633.4	617.4	510.4	2,676.5	375.6	318.6	252.2	<b>7,568.7</b>
PM10 Primary (Filt + Cond)	544.2	160.5	1,547.3	492.7	806.0	760.6	636.0	3,589.7	455.3	379.5	322.3	<b>9,694.1</b>
PM2.5 Filterable	106.9	35.8	304.5	98.9	158.3	154.4	127.6	669.1	93.9	79.7	63.1	<b>1,892.2</b>
PM2.5 Primary (Filt + Cond)	179.6	46.9	487.3	155.6	246.0	227.9	198.2	1,123.7	144.8	118.3	108.4	<b>3,036.7</b>

Sulfur Dioxide	4.8	0.5	13.4	3.7	7.2	5.8	4.9	33.9	3.0	2.4	2.7	<b>82.4</b>
Volatile Organic Compounds	541.1	208.0	1,603.4	459.6	808.0	752.1	779.8	4,971.2	540.7	249.0	313.9	<b>11,226.7</b>
<b>Waste and Materials Management</b>	<b>790.7</b>	<b>611.5</b>	<b>2,783.7</b>	<b>844.7</b>	<b>1,704.1</b>	<b>1,803.5</b>	<b>677.9</b>	<b>2,280.9</b>	<b>1,878.9</b>	<b>793.6</b>	<b>447.5</b>	<b>14,617.0</b>
Ammonia	25.0	19.3	114.5	26.5	62.8	70.0	15.7	8.5	65.2	22.9	8.6	<b>439.0</b>
Carbon Monoxide	430.1	331.7	1,635.7	458.3	956.7	1,033.6	331.5	454.3	1,052.6	417.7	212.5	<b>7,314.8</b>
Lead								0.1				<b>0.1</b>
Nitrogen Oxides	14.4	11.2	42.8	15.4	28.4	29.0	14.1	1,248.2	32.5	15.2	9.8	<b>1,460.9</b>
PM Condensible								77.5				<b>77.5</b>
PM10 Filterable	74.6	58.1	219.4	80.1	146.8	149.2	74.3	60.8	168.1	79.2	51.6	<b>1,162.3</b>
PM10 Primary (Filt + Cond)	74.6	58.1	219.4	80.1	146.8	149.2	74.3	138.3	168.1	79.2	51.6	<b>1,239.7</b>
PM2.5 Filterable	68.0	52.8	200.0	73.0	133.9	136.0	67.7	16.1	153.0	72.0	47.1	<b>1,019.6</b>
PM2.5 Primary (Filt + Cond)	68.0	52.8	200.0	73.0	133.9	136.0	67.7	93.6	153.0	72.0	47.1	<b>1,097.1</b>
Sulfur Dioxide	4.5	3.4	16.6	4.8	9.8	10.5	3.6	119.6	10.8	4.4	2.3	<b>190.3</b>
Volatile Organic Compounds	31.6	24.0	135.3	33.6	85.0	89.9	29.0	64.0	75.5	31.0	16.8	<b>615.7</b>
<b>Grand Total</b>	<b>25,608.2</b>	<b>13,340.9</b>	<b>64,917.7</b>	<b>21,661.4</b>	<b>35,868.6</b>	<b>31,464</b>	<b>30,372.9</b>	<b>170,50</b>	<b>29,379.3</b>	<b>22,566.6</b>	<b>20,968</b>	<b>466,688</b>

TABLE 27. CENTRAL INDIANA HAZARDOUS AIR POLLUTANT INVENTORY- BASE YEAR (2020)

	Boone	Brown	Hamilton	Hancock	Hendricks	Johnson	Madison	Marion	Morgan	Putnam	Shelby	Grand Total
<b>Agriculture</b>	<b>2.0</b>	<b>0.8</b>	<b>0.9</b>	<b>3.9</b>	<b>1.6</b>	<b>4.0</b>	<b>2.5</b>	<b>2.7</b>	<b>2.0</b>	<b>4.7</b>	<b>5.2</b>	<b>30.3</b>
1,3-Butadiene				0.0	0.0				0.0	0.0	0.0	0.0
1,4-Dichlorobenzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2,2,4-Trimethylpentane				0.0	0.0				0.0	0.0	0.0	0.0
2-Methylnaphthalene	0.0	0.0	0.0						0.0			0.0
Acetaldehyde	0.2	0.2	0.0	1.2	0.2	0.2	0.2	0.1	0.2	0.4	0.4	3.3

Acetamide	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Acetonitrile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	0.0	0.0	0.0	0.3	0.0	0.0	0.0		0.0	0.1	0.1	0.6
Carbon Disulfide	0.0	0.0	0.0		0.0				0.0	0.0	0.0	0.0
Chlorobenzene						0.0			0.0	0.0		0.0
Chloroform	0.0	0.0	0.0		0.0				0.0		0.0	0.0
Ethyl Benzene				0.0	0.0				0.0	0.0	0.0	0.0
Ethyl Chloride	0.0	0.0	0.0		0.0				0.0	0.0	0.0	0.0
Formaldehyde				0.0	0.0				0.0	0.0	0.1	0.3
Hexane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Methanol	0.9	0.3	0.6	0.5	0.6	2.0	1.2	1.5	0.8	2.1	2.5	12.9
Methyl Isobutyl Ketone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
o-Cresol	0.6	0.1	0.2	0.2	0.3	1.5	0.9	1.1	0.5	1.4	1.8	8.6
Phenol	0.2	0.2	0.0	1.3	0.2	0.2	0.2	0.0	0.2	0.3	0.2	2.8
Propionaldehyde				0.0	0.0				0.0	0.0	0.0	0.1
p-Xylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Styrene				0.0	0.0				0.0	0.0	0.0	0.0
Toluene	0.1	0.1	0.0	0.4	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.2
Xylenes (Mixed Isomers)				0.0	0.0				0.0	0.0	0.0	0.0
<b>Commercial and Residential Buildings</b>	<b>70.2</b>	<b>40.9</b>	<b>274.5</b>	<b>79.7</b>	<b>152.5</b>	<b>139.2</b>	<b>130.4</b>	<b>518.4</b>	<b>92.3</b>	<b>57.8</b>	<b>58.4</b>	<b>1,614</b>
1,3-Butadiene	1.1	0.8	3.9	1.3	2.2	2.1	2.0	6.5	1.5	1.0	1.0	23.2
1-Methylnaphthalene	0.1	0.1	0.3	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	1.7
1-Methylphenanthrene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4
2,2,4-Trimethylpentane	0.4	0.1	1.3	0.3	0.3	0.4	0.4	3.6	0.4	0.1	0.1	7.4
2-Methylnaphthalene	0.1	0.1	0.5	0.2	0.3	0.2	0.2	0.7	0.2	0.1	0.1	2.7
2-Methylphenanthrene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Acenaphthene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Acenaphthylene	0.2	0.1	0.6	0.2	0.3	0.3	0.3	0.6	0.2	0.2	0.1	3.1
Acetaldehyde	15.3	11.1	55.1	17.5	34.7	29.3	29.1	75.0	22.1	14.6	14.0	317.8
Acetophenone	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6

Acrolein	0.6	0.4	2.0	0.7	1.1	1.1	1.1	4.5	0.8	0.5	0.6	13.3
Anthracene	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6
Arsenic								0.0				0.0
Benzo[a]Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	3.7	2.6	13.2	4.2	7.4	6.8	6.6	18.4	5.2	3.2	3.1	74.3
Benzo(a)Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo(g,h,i)Fluoranthene			0.0					0.0				0.0
Benzo[a]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Benzo[b]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo[e]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo(g,h,i)Perylene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo[k]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzyl Chloride			0.0					0.0				0.0
Biphenyl			0.0		0.0	0.0		0.0				0.0
Cadmium								0.0				0.0
Catechol	2.6	2.0	9.2	3.0	5.4	4.8	5.0	10.1	3.9	2.5	2.3	50.8
Chromium III								0.0				0.0
Chrysene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cresol/Cresylic Acid (Mixed Isomers)	3.9	3.0	13.9	4.6	8.1	7.3	7.5	15.3	5.9	3.8	3.5	76.5
Cumene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cyanide			0.0		0.0	0.0	0.0	0.0				0.0
Dibenzo(a,h)Anthracene			0.0		0.0	0.0		0.0				0.0
Ethyl Benzene	0.3	0.2	1.0	0.3	0.5	0.5	0.5	1.6	0.4	0.2	0.2	5.5
Ethylene Glycol	14.0	3.1	69.7	16.1	35.1	32.5	26.2	195.5	14.3	7.6	9.1	423.1
Fluoranthene	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5
Fluorene	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.8
Formaldehyde	11.0	7.7	40.3	12.6	22.7	21.1	20.6	67.4	15.3	9.8	9.7	238.0
Glycol Ethers	2.7	0.6	13.5	3.1	6.8	6.3	5.1	37.8	2.8	1.5	1.8	81.8
Hexane	0.5	0.1	1.7	0.4	0.5	0.5	0.5	4.5	0.5	0.1	0.2	9.4
Hydrochloric Acid	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.8	0.1	0.0	0.0	1.6

Hydrogen Fluoride			0.0		0.0	0.0	0.0	0.0				0.0
Hydroquinone	0.1	0.1	0.5	0.2	0.3	0.3	0.3	0.6	0.2	0.1	0.1	2.8
Indeno[1,2,3-c,d]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead	0.1		0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.5
Manganese			0.0		0.0			0.0				0.0
Mercury	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Methanol	1.3	0.2	3.8	1.0	2.1	2.9	2.1	12.5	1.2	1.5	1.9	30.4
Methyl Isobutyl Ketone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Methylchrysene								0.0				0.0
Methylene Chloride	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4
Methylhydrazine								0.0				0.0
m-Xylene	0.5	0.4	1.8	0.6	1.1	1.0	1.0	2.1	0.8	0.5	0.5	10.1
Naphthalene	2.0	1.5	7.0	2.4	4.0	3.7	3.8	8.8	2.9	1.9	1.8	39.7
Nickel	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
o-Xylene	0.2	0.1	0.6	0.2	0.4	0.3	0.3	1.0	0.2	0.2	0.1	3.6
Perylene			0.0		0.0	0.0	0.0	0.0	0.0			0.0
Phenanthrene	0.1	0.1	0.5	0.2	0.3	0.3	0.3	0.6	0.2	0.1	0.1	2.7
Phenol	4.4	3.4	15.5	5.1	9.1	8.2	8.4	17.8	6.6	4.2	3.9	86.5
Phenyl Cellosolve	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.6
Polycyclic aromatic compounds (includes 25 specific compounds)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Propionaldehyde	2.5	1.7	9.5	2.8	5.3	5.0	4.8	15.6	3.5	2.3	2.3	55.4
p-Xylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Pyrene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Selenium								0.0		0.0		0.0
Styrene	0.0		0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
Toluene	1.9	1.2	6.5	2.0	3.3	3.1	3.1	10.4	2.4	1.4	1.4	36.6
Triethylamine	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.6
Xylenes (Mixed Isomers)	0.4	0.1	1.4	0.4	0.5	0.6	0.5	4.0	0.4	0.1	0.2	8.5
<b>Electricity Generation</b>			<b>5.3</b>				<b>0.0</b>	<b>11.3</b>	<b>0.8</b>		<b>12.6</b>	<b>30.0</b>
1,1,2,2-Tetrachloroethane								0.0			0.0	0.0

1,1,2-Trichloroethane			0.0		0.0	0.0
1,3-Butadiene			0.0		0.1	0.1
1,3-Dichloropropene			0.0		0.0	0.0
2,2,4-Trimethylpentane			0.0		0.1	0.1
2-Methylnaphthalene			0.0		0.0	0.0
Acenaphthene			0.0		0.0	0.0
Acenaphthylene			0.0		0.0	0.0
Acetaldehyde	0.2	0.0	0.3	0.0	1.3	1.9
Acrolein	0.0	0.0	0.3	0.0	1.1	1.4
Anthracene			0.0		0.0	0.0
Arsenic			0.0	0.0		0.0
Benz[a]Anthracene			0.0		0.0	0.0
Benzene	0.1	0.0	0.1	0.0	0.2	0.4
Benzo[a]Pyrene			0.0		0.0	0.0
Benzo[b]Fluoranthene			0.0		0.0	0.0
Benzo[e]Pyrene			0.0		0.0	0.0
Benzo[g,h,i]Perylene			0.0		0.0	0.0
Benzo[k]Fluoranthene			0.0		0.0	0.0
Biphenyl			0.0		0.0	0.0
Cadmium			0.0	0.0		0.0
Carbon Tetrachloride			0.0		0.0	0.0
Chlorobenzene			0.0		0.0	0.0
Chloroform			0.0		0.0	0.0
Chromium (VI)			0.0	0.0		0.0
Chromium III			0.0	0.0		0.0
Chrysene			0.0		0.0	0.0
Cobalt			0.0	0.0		0.0
Ethyl Benzene	0.2	0.0	0.1	0.0	0.0	0.3
Ethyl Chloride			0.0		0.0	0.0
Ethylene Dibromide			0.0		0.0	0.0

Ethylene Dichloride							0.0			0.0		0.0
Ethylidene Dichloride							0.0			0.0		0.0
Fluoranthene							0.0			0.0		0.0
Fluorene							0.0			0.0		0.0
Formaldehyde	3.8					0.0	4.0	0.6		9.0		17.4
Hexane							5.7	0.0		0.1		5.9
Indeno[1,2,3-c,d]Pyrene							0.0			0.0		0.0
Lead							0.0	0.0				0.0
Manganese							0.0	0.0				0.0
Mercury						0.0	0.0			0.0		0.0
Methanol							0.1			0.4		0.5
Methylene Chloride							0.0			0.0		0.0
Naphthalene	0.0					0.0	0.0	0.0		0.0		0.0
Nickel							0.0	0.0				0.0
Perylene							0.0			0.0		0.0
Phenanthrene							0.0			0.0		0.0
Phenol							0.0			0.0		0.0
Propylene Dichloride							0.0			0.0		0.0
Propylene Oxide							0.0					0.0
Pyrene							0.0			0.0		0.0
Styrene							0.0			0.0		0.0
Tetrachloroethylene										0.0		0.0
Toluene	0.7					0.0	0.3	0.1		0.1		1.2
Vinyl Chloride							0.0			0.0		0.0
Xylenes (Mixed Isomers)	0.3					0.0	0.1	0.1		0.0		0.6
<b>Industry</b>	<b>102</b>	<b>15</b>	<b>385</b>	<b>214</b>	<b>206</b>	<b>187</b>	<b>198</b>	<b>1,319</b>	<b>87</b>	<b>88</b>	<b>480</b>	<b>3,281</b>
1,3-Butadiene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1-Bromopropane							17.1			0.0		17.1
1-Methylnaphthalene	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
1-Methylphenanthrene								0.0				0.0



2,2,4-Trimethylpentane	2.3	0.3	4.7	1.6	3.4	2.4	3.1	15.8	1.4	1.4	1.2	37.6
2,4-Dichlorophenoxy Acetic Acid	5.0	0.0	2.7	3.8	3.3	2.7	4.5	0.3	2.3	2.4	4.9	31.9
2,4-Toluene Diisocyanate	0.0		0.0	0.1	0.0		0.0	0.5	0.0	0.0	0.0	0.6
2-Methylnaphthalene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
2-Methylphenanthrene								0.0				0.0
4,4'-Methylenediphenyl Diisocyanate											0.0	0.0
Acenaphthene					0.0		0.0	0.0	0.0			0.0
Acenaphthylene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acetaldehyde	0.0	0.0	0.1	0.0	0.8	0.1	3.6	2.6	0.0	0.0	0.1	7.5
Acetonitrile								6.8		0.1		7.0
Acetophenone			0.0					0.0		0.0		0.0
Acrolein	0.0		0.0	0.0	0.2	0.0	0.4	0.9	0.0	0.0	0.0	1.5
Acrylic Acid	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.4	0.0	0.0	0.0	1.0
Acrylonitrile										0.0		0.0
Anthracene					0.0		0.0	0.0	0.0			0.0
Antimony								0.0	0.0	0.0		0.0
Arsenic	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Benz[a]Anthracene					0.0		0.0	0.0	0.0			0.0
Benzene	0.7	0.1	1.4	1.0	1.0	0.6	0.9	5.7	0.3	0.4	0.3	12.4
Benzo[a]Pyrene					0.0		0.0	0.0				0.0
Benzo[b]Fluoranthene					0.0		0.0	0.0				0.0
Benzo[g,h,i]Perylene					0.0		0.0	0.0		0.0		0.0
Benzo[k]Fluoranthene					0.0		0.0	0.0				0.0
Benzyl Chloride	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beryllium	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biphenyl	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Bis(2-Ethylhexyl)Phthalate										0.0		0.0
Bromoform								0.0				0.0
Cadmium	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Captan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
Carbaryl	0.3	0.0	0.2	0.2	0.2	0.2	0.3	0.0	0.2	0.2	0.3	2.1
Carbon Disulfide										0.2		0.2
Carbon Tetrachloride										0.0		0.0
Catechol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Chlorine								0.2				0.2
Chlorobenzene										0.0		0.0
Chloroform			0.0					0.0		0.0		0.0
Chromium (VI)			0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Chromium III	0.0		0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.4
Chrysene					0.0		0.0	0.0	0.0			0.0
Cobalt				0.0	0.0	0.0		0.1	0.0	0.0	0.0	0.1
Cresol/Cresylic Acid (Mixed Isomers)	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.2	0.0	0.7
Cumene	0.1	0.0	0.3	0.3	0.2	0.1	0.1	0.9	0.1	0.2	0.0	2.2
Cyanide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Dibenzo(a,h)Anthracene					0.0		0.0	0.0				0.0
Dibutyl Phthalate	1.2	0.0	4.9	18.8	1.7	0.1	2.6	169.2	0.3	0.3	3.5	202.5
Diethanolamine	0.2	0.0	1.0	0.2	0.5	0.5	0.4	2.9	0.2	0.1	0.1	6.2
Dimethyl Phthalate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Dimethyl Sulfate								0.0				0.0
Ethyl Benzene	4.2	0.7	16.3	5.0	8.5	8.3	7.0	48.5	3.8	2.6	2.8	107.8
Ethyl Chloride								0.0				0.0
Ethylene Dichloride	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ethylene Glycol	8.2	1.8	40.6	9.4	20.4	18.9	15.8	114.8	8.3	4.5	5.3	248.1
Fluoranthene				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Fluorene			0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Formaldehyde	0.1	0.0	0.3	0.1	2.4	0.2	0.7	3.6	0.1	0.1	2.0	9.6
Glycol Ethers	1.6	0.3	8.0	2.0	4.0	3.7	3.8	24.4	1.6	1.6	1.1	52.2
Hexamethylene Diisocyanate										0.2		0.2
Hexane	6.2	1.0	19.1	5.4	13.5	8.7	10.8	59.9	4.2	3.9	263.7	396.4

Hydrochloric Acid								3.4	1.7	12.6		17.7
Hydrogen Fluoride								0.0	0.2			0.2
Hydroquinone	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Indeno[1,2,3-c,d]Pyrene					0.0		0.0	0.0	0.0			0.0
Lead	0.0		0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.6
Manganese	0.0		0.1	0.0	0.3	0.0	0.1	0.2	0.0	0.1	0.0	0.8
Mercury					0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Methanol	3.0	0.5	11.8	3.2	6.1	5.8	5.5	38.3	2.4	2.6	32.9	112.0
Methyl Chloroform	0.8		0.5	0.4	0.1	0.2	0.6	2.0	0.0	0.1	0.2	4.9
Methyl Isobutyl Ketone	0.9	0.1	4.5	1.5	2.1	2.1	3.0	14.8	0.9	5.0	4.9	39.8
Methyl Methacrylate	0.1	0.0	0.4	0.1	0.2	0.2	0.1	1.1	0.1	0.6	0.1	2.9
Methyl Tert-Butyl Ether								0.4		0.1		0.5
Methylene Chloride	0.7	0.1	2.9	0.7	1.4	1.4	1.0	8.9	0.6	0.4	0.4	18.4
Methylhydrazine	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
m-Xylene	2.8	0.6	13.9	3.5	7.0	6.5	5.2	39.0	2.8	1.5	1.8	84.6
N,N-Dimethylformamide										0.0		0.0
Naphthalene	4.2	0.5	10.2	4.0	5.8	5.3	4.9	40.3	3.1	2.5	2.8	83.4
Nickel	0.0		0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.6
o-Xylene	3.4	0.7	16.7	4.1	8.4	7.8	6.3	47.0	3.4	1.8	2.2	101.9
PAH, total								0.0				0.0
p-Dioxane										0.0		0.0
Phenanthrene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenol	0.0	0.0	0.1	0.0	0.1	3.2	0.0	0.4	0.0	0.2	10.7	14.8
Phenyl Cellosolve	0.2	0.0	0.9	0.2	0.4	0.4	0.3	2.5	0.2	0.1	0.1	5.3
Phthalic Anhydride	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.4	0.0	0.0	0.0	0.8
Polycyclic aromatic compounds (includes 25 specific compounds)	3.1	0.4	7.5	2.6	4.3	3.9	3.6	29.6	2.2	1.5	2.0	60.7
Propionaldehyde	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.8
Propylene Oxide								6.5				6.5
p-Xylene	1.1	0.2	5.2	1.3	2.6	2.4	2.0	14.6	1.1	0.6	0.7	31.8
Pyrene				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Selenium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Styrene	2.7	0.6	17.5	79.2	6.7	6.2	5.0	42.8	2.7	1.7	95.3	260.3
Tetrachloroethylene	0.3	0.0	1.4	0.2	0.5	0.9	0.4	9.2	0.2	0.1	0.1	13.4
Toluene	32.4	5.4	129.3	36.8	67.4	63.0	57.3	384.1	28.7	27.9	29.2	861.5
Trichloroethylene	0.1	0.0	0.4	0.1	0.2	0.2	0.2	1.4	0.1	0.2	0.1	3.1
Triethylamine	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Trifluralin	0.9	0.0	0.4	0.6	0.5	0.4	0.8	0.1	0.4	0.2	0.9	5.2
Vinyl Acetate	0.1	0.0	0.5	5.6	0.3	0.2	0.2	1.4	0.1	0.1	0.1	8.5
Xylenes (Mixed Isomers)	15.0	1.9	60.3	21.7	30.6	29.8	29.5	171.0	13.1	10.2	10.4	393.6
<b>Natural and Working Lands</b>	<b>361.5</b>	<b>424.9</b>	<b>337.1</b>	<b>317.0</b>	<b>372.8</b>	<b>346.9</b>	<b>392.1</b>	<b>307.2</b>	<b>467.1</b>	<b>568.1</b>	<b>408.2</b>	<b>4,303.0</b>
1,3-Butadiene	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.4	0.1	1.5
Acetaldehyde	44.8	54.4	42.3	39.6	46.5	44.1	48.8	39.4	58.3	71.0	51.0	540.2
Acetonitrile	0.0	0.5	0.0	0.0	0.0	0.2		0.0	0.3	0.4	0.1	1.6
Acrolein	0.0	0.8	0.0	0.0	0.0	0.3		0.1	0.5	0.7	0.1	2.6
Acrylic Acid	0.0	0.1	0.0	0.0	0.0	0.0		0.0	0.1	0.1	0.0	0.4
Anthracene	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0
Benzo[a]Anthracene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Benzene	0.1	0.7	0.0	0.0	0.1	0.3	0.0	0.0	0.5	0.6	0.2	2.4
Benzo(a)Fluoranthene		0.0				0.0		0.0	0.0	0.0	0.0	0.0
Benzo(c)phenanthrene	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0
Benzo[a]Pyrene		0.0				0.0			0.0	0.0	0.0	0.0
Benzo[e]Pyrene		0.0				0.0		0.0	0.0	0.0	0.0	0.0
Benzo[g,h,i]Perylene	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0
Benzo[k]Fluoranthene		0.0				0.0		0.0	0.0	0.0	0.0	0.0
Benzo[fluoranthenes	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0
Carbonyl Sulfide		0.0				0.0			0.0	0.0		0.0
Chrysene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Ethyl Benzene	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Fluoranthene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Formaldehyde	59.4	71.6	55.2	51.7	61.0	58.0	64.0	51.2	76.5	92.4	67.0	707.7

Hexane	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4
Indeno[1,2,3-c,d]Pyrene	0.0	0.0				0.0		0.0	0.0	0.0	0.0	0.0
Lead		0.0				0.0			0.0	0.0		0.0
Methanol	257.0	293.9	239.5	225.6	265.0	243.2	279.3	216.3	329.2	400.5	289.3	3,038.8
Methyl Chloride	0.0	0.2	0.0	0.0	0.0	0.1		0.0	0.1	0.2	0.0	0.6
Methylanthracene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Methylbenzopyrene		0.0				0.0		0.0	0.0	0.0	0.0	0.0
Methylchrysene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Naphthalene	0.0	0.8	0.0	0.0	0.0	0.3		0.0	0.5	0.6	0.1	2.4
o-Xylene	0.0	0.1	0.0	0.0	0.0	0.0		0.0	0.1	0.1	0.0	0.4
Phenanthrene	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0
Pyrene	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Styrene	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.5
Toluene	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.5	0.1	1.8
Xylenes (Mixed Isomers)	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.1	1.1
<b>Transportation</b>	<b>163.6</b>	<b>64.2</b>	<b>488.2</b>	<b>136.3</b>	<b>236.0</b>	<b>220.5</b>	<b>228.6</b>	<b>1,471.1</b>	<b>159.4</b>	<b>71.7</b>	<b>91.0</b>	<b>3,330.6</b>
1,3-Butadiene	2.0	0.7	6.2	1.6	2.6	2.5	2.6	17.7	1.9	0.8	1.0	39.6
2,2,4-Trimethylpentane	24.0	13.8	73.8	18.1	27.1	27.8	30.0	197.6	23.7	7.3	9.7	453.1
Acenaphthene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.6
Acenaphthylene	0.1	0.0	0.3	0.1	0.1	0.1	0.1	0.7	0.1	0.0	0.1	1.7
Acetaldehyde	7.3	1.4	19.4	6.1	10.2	8.6	8.7	52.6	5.6	4.1	4.9	128.8
Acrolein	1.1	0.2	2.6	0.8	1.4	1.1	1.1	6.6	0.7	0.6	0.7	16.9
Anthracene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4
Arsenic	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Benz[a]Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Benzene	13.4	4.8	41.9	11.0	19.2	17.9	18.2	123.1	12.6	5.5	7.2	274.7
Benzo[a]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Benzo[b]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Benzo[g,h,i]Perylene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5
Benzo[k]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Chrysene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Dibenzo(a,h)Anthracene								0.0				0.0
Ethyl Benzene	8.7	3.7	26.0	7.2	12.6	11.9	12.5	80.1	8.7	3.6	4.6	179.6
Fluoranthene	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.6
Fluorene	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.4	0.1	0.0	0.0	1.1
Formaldehyde	14.3	2.3	36.3	11.3	18.2	15.0	15.7	93.4	9.7	8.3	9.7	234.2
Hexane	9.2	3.5	29.5	8.7	16.9	15.5	15.4	99.4	10.2	4.7	5.9	219.0
Indeno[1,2,3-c,d]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Manganese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Mercury			0.0					0.0				0.0
Naphthalene	1.0	0.3	2.7	0.8	1.3	1.2	1.3	7.7	0.9	0.5	0.6	18.5
Nickel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Phenanthrene	0.1	0.0	0.4	0.1	0.2	0.2	0.2	1.0	0.1	0.1	0.1	2.4
Propionaldehyde	1.1	0.2	2.8	0.9	1.5	1.2	1.3	6.9	0.7	0.7	0.8	18.0
Pyrene	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.3	0.0	0.0	0.0	0.8
Styrene	0.8	0.4	2.6	0.6	0.8	0.9	0.9	6.7	0.8	0.2	0.3	15.0
Toluene	48.1	19.8	146.7	42.0	76.5	72.0	74.2	477.7	51.2	21.6	27.9	1,057.6
Xylenes (Mixed Isomers)	32.1	13.2	96.4	26.8	46.9	44.3	45.9	297.6	32.3	13.4	17.3	666.2
<b>Waste and Materials Management</b>	<b>8.0</b>	<b>6.1</b>	<b>11.7</b>	<b>8.7</b>	<b>67.5</b>	<b>11.3</b>	<b>12.4</b>	<b>97.5</b>	<b>14.2</b>	<b>9.7</b>	<b>10.4</b>	<b>257.6</b>
1,2,4-Trichlorobenzene			0.0					0.0	0.0	0.0		0.0
1,3-Butadiene	0.2	0.2	0.2	0.3	0.3	0.2	0.4	0.1	0.4	0.3	0.3	2.8
1,4-Dichlorobenzene	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
2,4,6-Trichlorophenol	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
2,4-Dinitrotoluene			0.0					0.0	0.0			0.0
2-Methylnaphthalene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Acenaphthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acenaphthylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Acetaldehyde	0.7	0.5	0.6	0.8	1.0	0.7	1.1	0.2	1.2	0.9	0.8	8.5
Acetonitrile	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Acetophenone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Acrolein	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.5
Acrylonitrile	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Allyl Chloride								0.0				0.0
Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arsenic								0.0				0.0
Benz[a]Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	1.6	1.3	1.3	1.8	2.1	1.6	2.5	0.6	2.8	2.0	1.9	19.5
Benzo[a]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo[b]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo[g,h,i]Perylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzo[k]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biphenyl			0.0				0.0	0.0				0.0
Bis(2-Ethylhexyl)Phthalate	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.5
Cadmium								0.0				0.0
Carbon Disulfide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Carbon Tetrachloride	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Chlorobenzene	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Chloroform	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3
Chloroprene								0.0				0.0
Chromium (VI)								0.0				0.0
Chromium III								0.0				0.0
Chrysene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cobalt								0.0				0.0
Cresol/Cresylic Acid (Mixed Isomers)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.1	0.1	1.4
Cumene	0.0	0.0	0.1	0.0	0.1	0.1	0.0		0.1	0.0	0.0	0.4
Dibenzo(a,h)Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Dibenzofuran	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Dibutyl Phthalate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Ethyl Benzene	0.4	0.3	0.7	0.4	0.7	0.6	0.6	0.3	0.8	0.5	0.4	5.6
Ethylene Oxide	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0



Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Fluorene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Formaldehyde	0.7	0.6	0.6	0.8	47.6	0.7	1.1	0.2	1.3	0.9	0.9	55.3
Glycol Ethers	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.5
Hexane								0.0				0.0
Hydrochloric Acid	0.4	0.3	0.3	0.5	6.1	0.4	0.7	83.8	0.8	0.5	0.5	94.4
Hydrogen Cyanide	0.7	0.6	0.6	0.8	1.0	0.7	1.1	0.2	1.2	0.9	0.9	8.6
Indeno[1,2,3-c,d]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Isophorone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Lead								0.1				0.1
Manganese								0.0				0.0
Mercury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Methanol	0.0	0.0	2.2	0.0	2.1	2.1	0.1	0.3	0.0	0.0	0.0	6.7
Methyl Chloride	0.3	0.2	0.2	0.3	0.4	0.3	0.4	0.1	0.5	0.3	0.3	3.2
Methyl Chloroform	0.0		0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Methyl Isobutyl Ketone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Methyl Methacrylate	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Methyl Tert-Butyl Ether			0.0				0.0	0.0				0.0
Methylene Chloride	0.0	0.0	0.1	0.0	1.2	0.0	0.1	1.7	0.1	0.0	1.0	4.3
N,N-Dimethylaniline	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Naphthalene	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5
Nickel								0.0				0.0
p-Dioxane								0.0				0.0
Phenanthrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Phenol	0.4	0.3	1.2	0.5	0.8	0.8	0.4	0.1	1.0	0.5	0.3	6.3
Polychlorinated Biphenyls					0.0		0.0		0.0	0.0		0.0
Propionaldehyde	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.3	0.2	0.2	2.2
Propylene Dichloride								0.0				0.0
Propylene Oxide	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Styrene	1.1	0.8	1.7	1.2	1.7	1.4	1.5	0.3	2.1	1.3	1.1	14.1
Tetrachloroethylene	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.9	0.0	0.0	0.5	2.0
Toluene	0.6	0.5	0.6	0.7	0.8	0.6	1.0	4.9	1.1	0.8	0.7	12.3
Trichloroethylene	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Vinyl Acetate			0.0				0.0	0.0				0.0
Vinylidene Chloride	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Xylenes (Mixed Isomers)	0.1	0.1	0.5	0.1	0.2	0.2	0.4	2.9	0.2	0.1	0.1	5.0
<b>Grand Total</b>	<b>707</b>	<b>552</b>	<b>1,502</b>	<b>760</b>	<b>1,036</b>	<b>909</b>	<b>964</b>	<b>3,727</b>	<b>823</b>	<b>800</b>	<b>1,066</b>	<b>12,847</b>

# Appendix E. Business-as-Usual Co-Pollutant Projections Data

TABLE 28. BAU CO-POLLUTANT PROJECTIONS (2022-2050)

	Ammonia	Carbon Monoxide	Nitrogen Oxides	PM10 Primary (Filt + Cond)	PM2.5 Primary (Filt + Cond)	Sulfur Dioxide	Volatile Organic Compounds
<b>Agriculture</b>	<b>192,437.49</b>	<b>511.74</b>	<b>12.12</b>	<b>203,892.90</b>	<b>39,815.44</b>	<b>2.25</b>	<b>7,450.73</b>
2022	6,056.44	17.65	0.42	6,997.34	1,371.37	0.08	231.26
2023	6,079.96	17.65	0.42	7,015.34	1,374.62	0.08	233.14
2024	6,103.47	17.65	0.42	7,033.34	1,377.86	0.08	235.02
2025	6,126.99	17.65	0.42	7,051.33	1,381.10	0.08	236.90
2026	6,150.50	17.65	0.42	7,069.33	1,384.34	0.08	238.78
2027	6,174.00	17.65	0.42	7,080.01	1,386.12	0.08	240.66
2028	6,197.50	17.65	0.42	7,090.69	1,387.90	0.08	242.54
2029	6,221.00	17.65	0.42	7,101.37	1,389.68	0.08	244.42
2030	6,244.50	17.65	0.42	7,112.04	1,391.46	0.08	246.30
2031	6,268.00	17.65	0.42	7,122.72	1,393.23	0.08	248.18
2032	6,291.50	17.65	0.42	7,133.40	1,395.01	0.08	250.06
2033	6,315.03	17.65	0.42	7,129.46	1,393.87	0.08	251.95
2034	6,338.57	17.65	0.42	7,125.52	1,392.72	0.08	253.83
2035	6,362.10	17.65	0.42	7,121.58	1,391.58	0.08	255.71

2036	6,385.64	17.65	0.42	7,117.64	1,390.43	0.08	257.60
2037	6,409.17	17.65	0.42	7,113.70	1,389.29	0.08	259.48
2038	6,432.70	17.65	0.42	7,109.76	1,388.14	0.08	261.36
2039	6,797.01	17.65	0.42	7,015.10	1,368.69	0.08	262.32
2040	6,868.47	17.65	0.42	7,002.78	1,365.85	0.08	264.07
2041	6,939.93	17.65	0.42	6,990.47	1,363.01	0.08	265.83
2042	7,011.38	17.65	0.42	6,978.15	1,360.17	0.08	267.58
2043	7,082.84	17.65	0.42	6,965.83	1,357.32	0.08	269.33
2044	7,154.30	17.65	0.42	6,953.52	1,354.48	0.08	271.08
2045	7,225.76	17.65	0.42	6,941.20	1,351.64	0.08	272.84
2046	7,297.22	17.65	0.42	6,928.89	1,348.80	0.08	274.59
2047	7,368.68	17.65	0.42	6,916.57	1,345.95	0.08	276.34
2048	7,440.14	17.65	0.42	6,904.25	1,343.11	0.08	278.09
2049	7,511.60	17.65	0.42	6,891.94	1,340.27	0.08	279.84
2050	7,583.06	17.65	0.42	6,879.62	1,337.43	0.08	281.60
<b>Commercial and Residential Buildings</b>	<b>15,269.78</b>	<b>662,341.19</b>	<b>141,210.49</b>	<b>90,424.73</b>	<b>88,454.95</b>	<b>6,145.96</b>	<b>165,694.85</b>
2022	566.94	22,517.71	5,118.40	3,094.60	3,030.12	183.81	5,360.86
2023	562.45	22,539.39	5,087.45	3,096.49	3,031.76	186.07	5,388.35
2024	557.96	22,561.06	5,056.51	3,098.38	3,033.39	188.33	5,415.85

2025	553.47	22,582.74	5,025.57	3,100.27	3,035.03	190.58	5,443.34
2026	548.97	22,604.41	4,994.62	3,102.16	3,036.67	192.84	5,470.84
2027	546.98	22,628.21	4,983.57	3,103.77	3,038.03	194.74	5,496.58
2028	544.99	22,652.01	4,972.52	3,105.38	3,039.39	196.64	5,522.32
2029	543.00	22,675.81	4,961.46	3,107.00	3,040.75	198.54	5,548.06
2030	541.00	22,699.61	4,950.41	3,108.61	3,042.12	200.44	5,573.79
2031	539.01	22,723.41	4,939.36	3,110.22	3,043.48	202.34	5,599.53
2032	537.02	22,747.21	4,928.31	3,111.83	3,044.84	204.24	5,625.27
2033	534.59	22,770.34	4,915.38	3,113.35	3,046.13	206.12	5,646.19
2034	532.16	22,793.48	4,902.44	3,114.86	3,047.42	208.00	5,667.11
2035	529.72	22,816.62	4,889.51	3,116.38	3,048.70	209.88	5,688.02
2036	527.29	22,839.75	4,876.58	3,117.89	3,049.99	211.76	5,708.94
2037	524.86	22,862.89	4,863.65	3,119.41	3,051.27	213.63	5,729.86
2038	522.43	22,886.03	4,850.72	3,120.92	3,052.56	215.51	5,750.78
2039	518.85	22,909.01	4,824.09	3,122.98	3,054.32	217.79	5,787.02
2040	516.29	22,932.23	4,809.02	3,124.61	3,055.71	219.75	5,811.49
2041	513.72	22,955.44	4,793.94	3,126.23	3,057.09	221.70	5,835.96
2042	511.16	22,978.66	4,778.86	3,127.86	3,058.48	223.66	5,860.43
2043	508.59	23,001.88	4,763.78	3,129.49	3,059.86	225.61	5,884.89

2044	506.03	23,025.10	4,748.71	3,131.12	3,061.25	227.56	5,909.36
2045	503.46	23,048.32	4,733.63	3,132.75	3,062.63	229.52	5,933.83
2046	500.90	23,071.54	4,718.55	3,134.37	3,064.02	231.47	5,958.30
2047	498.33	23,094.76	4,703.47	3,136.00	3,065.40	233.43	5,982.77
2048	495.77	23,117.98	4,688.40	3,137.63	3,066.79	235.38	6,007.24
2049	493.21	23,141.19	4,673.32	3,139.26	3,068.17	237.34	6,031.70
2050	490.64	23,164.41	4,658.24	3,140.89	3,069.56	239.29	6,056.17
<b>Electricity Generation</b>	<b>2,873.56</b>	<b>15,809.57</b>	<b>24,029.51</b>	<b>3,914.38</b>	<b>3,915.12</b>	<b>581.94</b>	<b>3,044.17</b>
2022	203.10	592.84	2,164.19	287.53	287.52	43.36	157.62
2023	241.46	764.20	2,359.89	324.83	324.82	46.56	172.91
2024	279.82	935.56	2,555.59	362.13	362.12	49.75	188.20
2025	318.18	1,106.92	2,751.29	399.43	399.42	52.94	203.49
2026	356.54	1,278.28	2,947.00	436.72	436.72	56.13	218.78
2027	307.60	1,132.62	2,510.36	375.45	375.41	48.06	196.13
2028	258.67	986.95	2,073.73	314.17	314.09	40.00	173.48
2029	209.74	841.29	1,637.09	252.89	252.78	31.93	150.83
2030	160.81	695.63	1,200.46	191.62	191.47	23.87	128.18
2031	111.88	549.96	763.82	130.34	130.16	15.81	105.53
2032	62.95	404.30	327.19	69.06	68.85	7.74	82.88

2033	54.67	399.87	308.66	66.30	66.11	7.90	81.56
2034	46.38	395.45	290.12	63.53	63.38	8.05	80.24
2035	38.10	391.03	271.59	60.76	60.65	8.21	78.92
2036	29.82	386.61	253.06	58.00	57.91	8.36	77.60
2037	21.54	382.18	234.53	55.23	55.18	8.51	76.28
2038	13.25	377.76	215.99	52.47	52.44	8.67	74.96
2039	13.25	373.34	197.46	49.70	49.71	8.82	73.64
2040	13.25	368.91	178.93	46.94	46.98	8.98	72.32
2041	13.25	364.49	160.40	44.17	44.24	9.13	71.00
2042	13.25	360.07	141.87	41.41	41.51	9.29	69.68
2043	13.25	355.64	123.33	38.64	38.77	9.44	68.36
2044	13.25	351.22	104.80	35.88	36.04	9.60	67.04
2045	13.25	346.80	86.27	33.11	33.31	9.75	65.72
2046	13.25	342.37	67.74	30.35	30.57	9.91	64.40
2047	13.25	337.95	49.20	27.58	27.84	10.06	63.08
2048	13.25	333.53	30.67	24.82	25.10	10.22	61.77
2049	13.25	329.10	12.14	22.05	22.37	10.37	60.45
2050	13.25	324.68	12.14	19.29	19.64	10.53	59.13
<b>Industry</b>	<b>15,284.60</b>	<b>240,172.97</b>	<b>233,171.60</b>	<b>618,446.09</b>	<b>180,908.13</b>	<b>52,351.26</b>	<b>838,885.42</b>

2022	490.43	8,902.58	8,981.54	21,380.39	6,146.19	1,922.40	27,725.83
2023	484.71	8,826.07	8,866.27	21,254.92	6,122.82	1,920.08	27,801.91
2024	479.00	8,749.57	8,751.00	21,129.46	6,099.45	1,917.76	27,878.00
2025	473.29	8,673.06	8,635.73	21,003.99	6,076.09	1,915.44	27,954.08
2026	467.57	8,596.55	8,520.46	20,878.52	6,052.72	1,913.12	28,030.17
2027	469.43	8,567.13	8,428.31	20,933.37	6,069.71	1,898.83	28,097.69
2028	471.28	8,537.72	8,336.16	20,988.22	6,086.70	1,884.53	28,165.21
2029	473.13	8,508.30	8,244.00	21,043.07	6,103.70	1,870.23	28,232.73
2030	474.98	8,478.88	8,151.85	21,097.93	6,120.69	1,855.93	28,300.26
2031	476.83	8,449.47	8,059.69	21,152.78	6,137.68	1,841.64	28,367.78
2032	478.69	8,420.05	7,967.54	21,207.63	6,154.67	1,827.34	28,435.30
2033	482.82	8,412.36	7,979.71	21,255.66	6,182.12	1,822.37	28,549.17
2034	486.95	8,404.67	7,991.88	21,303.70	6,209.57	1,817.41	28,663.04
2035	491.08	8,396.98	8,004.05	21,351.73	6,237.03	1,812.44	28,776.90
2036	495.21	8,389.28	8,016.23	21,399.77	6,264.48	1,807.48	28,890.77
2037	499.35	8,381.59	8,028.40	21,447.80	6,291.93	1,802.51	29,004.64
2038	503.48	8,373.90	8,040.57	21,495.84	6,319.38	1,797.55	29,118.51
2039	544.50	8,166.44	7,898.49	21,390.80	6,278.64	1,777.62	29,205.10
2040	552.87	8,122.61	7,858.89	21,412.50	6,292.12	1,768.42	29,302.56



2041	561.24	8,078.79	7,819.29	21,434.19	6,305.60	1,759.22	29,400.01
2042	569.61	8,034.96	7,779.69	21,455.88	6,319.07	1,750.02	29,497.47
2043	577.98	7,991.14	7,740.08	21,477.57	6,332.55	1,740.82	29,594.93
2044	586.35	7,947.31	7,700.48	21,499.26	6,346.03	1,731.62	29,692.39
2045	594.72	7,903.49	7,660.88	21,520.96	6,359.51	1,722.42	29,789.85
2046	603.08	7,859.66	7,621.28	21,542.65	6,372.98	1,713.22	29,887.31
2047	611.45	7,815.84	7,581.68	21,564.34	6,386.46	1,704.02	29,984.77
2048	619.82	7,772.02	7,542.08	21,586.03	6,399.94	1,694.82	30,082.22
2049	628.19	7,728.19	7,502.48	21,607.72	6,413.41	1,685.62	30,179.68
2050	636.56	7,684.37	7,462.88	21,629.42	6,426.89	1,676.42	30,277.14
<b>Natural and Working Lands</b>	<b>495.51</b>	<b>210,751.15</b>	<b>84,382.34</b>	<b>10,369.17</b>	<b>10,024.32</b>	<b>654.37</b>	<b>1,307,326.81</b>
2022	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2023	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2024	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2025	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2026	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2027	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2028	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2029	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23

2030	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2031	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2032	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2033	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2034	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2035	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2036	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2037	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2038	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2039	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2040	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2041	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2042	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2043	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2044	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2045	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2046	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2047	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2048	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23

2049	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
2050	17.09	7,267.28	2,909.74	357.56	345.67	22.56	45,080.23
<b>No Sector Assigned</b>	<b>1,001.46</b>	<b>17,727.05</b>	<b>11,300.30</b>	<b>4,394.44</b>	<b>3,820.76</b>	<b>1,930.21</b>	<b>10,031.01</b>
2022	1.21	176.65	284.90	109.48	103.69	88.13	305.26
2023	1.22	175.26	281.24	108.27	102.56	86.60	302.91
2024	1.22	173.87	277.57	107.06	101.42	85.08	300.57
2025	1.22	172.48	273.90	105.85	100.29	83.56	298.22
2026	1.22	171.10	270.23	104.65	99.15	82.04	295.87
2027	7.11	245.81	294.15	113.78	105.92	80.38	303.38
2028	13.00	320.52	318.07	122.91	112.70	78.73	310.88
2029	18.89	395.23	341.99	132.04	119.47	77.07	318.38
2030	24.78	469.94	365.91	141.17	126.25	75.41	325.89
2031	30.67	544.65	389.83	150.30	133.02	73.76	333.39
2032	36.55	619.36	413.75	159.43	139.80	72.10	340.89
2033	35.24	608.41	403.96	156.07	136.65	70.77	341.92
2034	33.93	597.46	394.16	152.71	133.51	69.43	342.95
2035	32.62	586.52	384.36	149.35	130.36	68.09	343.98
2036	31.31	575.57	374.57	145.99	127.22	66.76	345.01
2037	29.99	564.62	364.77	142.63	124.07	65.42	346.03

2038	28.68	553.67	354.97	139.27	120.93	64.09	347.06
2039	42.13	712.47	414.25	161.39	138.30	61.97	357.00
2040	44.66	746.20	422.45	164.67	140.49	60.44	360.71
2041	47.19	779.94	430.65	167.96	142.67	58.92	364.41
2042	49.72	813.67	438.84	171.24	144.85	57.39	368.11
2043	52.25	847.40	447.04	174.53	147.04	55.86	371.81
2044	54.78	881.13	455.23	177.81	149.22	54.33	375.52
2045	57.31	914.86	463.43	181.10	151.41	52.80	379.22
2046	59.85	948.59	471.62	184.38	153.59	51.27	382.92
2047	62.38	982.33	479.82	187.67	155.77	49.74	386.62
2048	64.91	1,016.06	488.02	190.95	157.96	48.21	390.33
2049	67.44	1,049.79	496.21	194.24	160.14	46.69	394.03
2050	69.97	1,083.52	504.41	197.52	162.32	45.16	397.73
<b>Transportation</b>	<b>37,251.32</b>	<b>4,096,558.27</b>	<b>297,978.70</b>	<b>290,321.97</b>	<b>77,216.66</b>	<b>4,766.15</b>	<b>249,095.64</b>
2022	1,671.04	196,565.64	22,398.14	9,440.44	2,901.35	156.31	10,985.53
2023	1,620.08	191,468.94	20,924.82	9,481.37	2,882.21	161.82	10,646.41
2024	1,569.13	186,372.24	19,451.51	9,522.30	2,863.07	167.32	10,307.29
2025	1,518.17	181,275.53	17,978.20	9,563.24	2,843.94	172.83	9,968.17
2026	1,467.21	176,178.83	16,504.89	9,604.17	2,824.80	178.33	9,629.05

2027	1,437.01	172,778.45	15,620.64	9,620.96	2,806.63	178.66	9,512.84
2028	1,406.81	169,378.07	14,736.39	9,637.74	2,788.46	178.98	9,396.63
2029	1,376.61	165,977.70	13,852.15	9,654.53	2,770.28	179.31	9,280.42
2030	1,346.40	162,577.32	12,967.90	9,671.31	2,752.11	179.64	9,164.21
2031	1,316.20	159,176.94	12,083.65	9,688.10	2,733.94	179.96	9,048.00
2032	1,286.00	155,776.56	11,199.40	9,704.88	2,715.77	180.29	8,931.79
2033	1,247.14	152,324.15	10,922.91	9,717.07	2,705.01	179.97	8,835.17
2034	1,208.28	148,871.74	10,646.42	9,729.26	2,694.24	179.65	8,738.55
2035	1,169.42	145,419.33	10,369.93	9,741.45	2,683.48	179.33	8,641.93
2036	1,130.56	141,966.92	10,093.44	9,753.64	2,672.72	179.01	8,545.31
2037	1,091.70	138,514.51	9,816.95	9,765.83	2,661.95	178.69	8,448.69
2038	1,052.85	135,062.11	9,540.46	9,778.01	2,651.19	178.37	8,352.07
2039	1,018.65	130,135.50	7,870.80	10,157.12	2,613.64	160.95	8,181.41
2040	1,236.86	126,427.13	7,538.21	10,223.22	2,597.00	158.62	8,067.57
2041	1,231.64	122,718.75	6,957.85	10,289.31	2,580.36	156.29	7,953.73
2042	1,226.41	119,010.38	6,377.48	10,355.40	2,563.72	153.96	7,839.89
2043	1,221.18	115,302.00	5,797.11	10,421.50	2,547.08	151.63	7,726.06
2044	1,215.96	111,593.63	5,216.74	10,487.59	2,530.45	149.31	7,612.22
2045	1,210.73	107,885.25	4,636.37	10,553.69	2,513.81	146.98	7,498.38

2046	1,205.50	104,176.88	4,056.00	10,619.78	2,497.17	144.65	7,384.54
2047	1,200.28	100,468.50	3,475.63	10,685.88	2,480.53	142.32	7,270.70
2048	1,195.05	96,760.12	2,895.26	10,751.97	2,463.89	139.99	7,156.86
2049	1,189.83	93,051.75	2,314.89	10,818.06	2,447.25	137.66	7,043.02
2050	1,184.60	89,343.37	1,734.52	10,884.16	2,430.61	135.33	6,929.18
<b>Waste and Materials Management</b>	<b>13,086.55</b>	<b>217,031.11</b>	<b>38,304.05</b>	<b>37,334.79</b>	<b>32,754.06</b>	<b>11,968.85</b>	<b>23,114.08</b>
2022	447.60	7,533.34	2,689.85	1,290.39	1,125.95	518.02	741.53
2023	447.73	7,541.08	2,691.52	1,292.17	1,127.08	519.91	745.12
2024	447.85	7,548.82	2,693.19	1,293.96	1,128.21	521.81	748.71
2025	447.97	7,556.56	2,694.86	1,295.74	1,129.34	523.70	752.29
2026	448.09	7,564.30	2,696.54	1,297.53	1,130.47	525.60	755.88
2027	448.46	7,546.23	2,384.73	1,294.93	1,128.84	499.79	759.79
2028	448.83	7,528.16	2,072.93	1,292.33	1,127.21	473.97	763.69
2029	449.20	7,510.09	1,761.13	1,289.73	1,125.58	448.16	767.59
2030	449.57	7,492.02	1,449.33	1,287.13	1,123.96	422.35	771.50
2031	449.94	7,473.95	1,137.53	1,284.53	1,122.33	396.54	775.40
2032	450.30	7,455.88	825.73	1,281.93	1,120.70	370.73	779.30
2033	450.54	7,465.65	827.74	1,283.70	1,121.82	371.17	783.91
2034	450.79	7,475.42	829.75	1,285.47	1,122.94	371.61	788.53

2035	451.03	7,485.19	831.76	1,287.24	1,124.06	372.05	793.14
2036	451.27	7,494.96	833.76	1,289.00	1,125.19	372.49	797.75
2037	451.51	7,504.73	835.77	1,290.77	1,126.31	372.93	802.36
2038	451.75	7,514.50	837.78	1,292.54	1,127.43	373.37	806.97
2039	452.11	7,470.13	839.79	1,286.14	1,128.55	373.81	809.28
2040	452.40	7,465.57	841.80	1,285.71	1,129.67	374.25	813.36
2041	452.68	7,461.00	843.81	1,285.29	1,130.79	374.68	817.44
2042	452.97	7,456.43	845.82	1,284.87	1,131.92	375.12	821.52
2043	453.25	7,451.87	847.83	1,284.44	1,133.04	375.56	825.60
2044	453.54	7,447.30	849.84	1,284.02	1,134.16	376.00	829.68
2045	453.82	7,442.73	851.85	1,283.60	1,135.28	376.44	833.76
2046	454.11	7,438.17	853.86	1,283.17	1,136.40	376.88	837.84
2047	454.39	7,433.60	855.87	1,282.75	1,137.53	377.32	841.92
2048	454.68	7,429.04	857.88	1,282.32	1,138.65	377.76	846.00
2049	454.96	7,424.47	859.89	1,281.90	1,139.77	378.20	850.08
2050	455.25	7,419.90	861.90	1,281.48	1,140.89	378.64	854.16

# Appendix F. Co-Pollutant Reductions Data



Measure	Method	Sector	Type	Pollutant	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
1	Proportion	Agriculture	CAP	PM2.5 Primary (Frt + Cond)	58.3	115.7	172.7	229.1	285.0	340.3	397.2	449.2	502.9	556.0	608.7	660.8	709.5	763.5	814.1	864.3	913.9	963.2	1,011.9	1,060.3	1,108.2	1,155.6	1,202.6	1,249.3	1,295.5
1	Proportion	Agriculture	CAP	PM10 Primary (Frt + Cond)	297.8	591.2	882.5	1,171.0	1,456.7	1,739.7	2,030.9	2,297.8	2,572.9	2,845.5	3,115.7	3,383.2	3,633.9	3,910.9	4,171.2	4,429.2	4,684.9	4,938.4	5,189.6	5,438.7	5,685.7	5,930.5	6,173.3	6,414.1	6,652.8
1	Proportion	Agriculture	CAP	Ammonia	259.1	517.1	774.0	1,029.8	1,284.6	1,538.5	1,791.2	2,043.1	2,294.0	2,543.9	2,792.9	3,040.8	3,287.8	3,533.9	3,779.1	4,023.4	4,266.8	4,509.4	4,751.2	4,992.1	5,232.2	5,471.5	5,710.0	5,947.8	6,184.8
2	AP 42	Commercial and Residential Buildings	CAP	Carbon Monoxide	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
2	AP 42	Commercial and Residential Buildings	CAP	Nitrogen Oxides	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
2	AP 42	Commercial and Residential Buildings	CAP	PM10 Primary (Frt + Cond)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
2	AP 42	Commercial and Residential Buildings	CAP	PM2.5 Primary (Frt + Cond)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
2	AP 42	Commercial and Residential Buildings	CAP	Sulfur Dioxide	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2	AP 42	Commercial and Residential Buildings	CAP	Volatile Organic Compounds	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2	Proportion	Commercial and Residential Buildings	HAP	Benzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Proportion	Commercial and Residential Buildings	HAP	Formaldehyde	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Proportion	Commercial and Residential Buildings	HAP	Naphthalene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	AP 42	Commercial and Residential Buildings	CAP	Lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	AVERT	Commercial and Residential Buildings	CAP	Sulfur Dioxide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	AVERT	Commercial and Residential Buildings	CAP	Volatile Organic Compounds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	AVERT	Commercial and Residential Buildings	CAP	Ammonia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	AVERT	Commercial and Residential Buildings	CAP	Nitrogen Oxides	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2	AVERT	Commercial and Residential Buildings	CAP	PM2.5 Primary (Frt + Cond)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	AVERT	Electricity Generation	CAP	Sulfur Dioxide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	AVERT	Electricity Generation	CAP	Nitrogen Oxides	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.3
3	AVERT	Electricity Generation	CAP	PM2.5 Primary (Frt + Cond)	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0
3	AVERT	Electricity Generation	CAP	Volatile Organic Compounds	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
3	AVERT	Electricity Generation	CAP	Ammonia	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6
3	Proportion	Electricity Generation	HAP	Acetaldehyde	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
3	Proportion	Electricity Generation	HAP	Acrolein	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
3	Proportion	Electricity Generation	HAP	Benzene	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
3	Proportion	Electricity Generation	HAP	Ethyl Benzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	Proportion	Electricity Generation	HAP	Formaldehyde	0.5	0.9	1.4	1.8	2.2	2.6	3.0	3.4	3.7	4.1	4.4	4.7	5.0	5.3	5.5	5.7	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.3

	Proportion	Electricity Generation	HAP	Naphthalene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Toluene	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
3	Proportion	Electricity Generation	HAP	Xylenes (Mixed Isomers)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
3	Proportion	Electricity Generation	HAP	Mercury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	1,3-Butadiene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
3	Proportion	Electricity Generation	HAP	Propylene Oxide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	2-Methylnaphthalene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Arsenic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Cadmium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Chromium (VI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Chromium III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Cobalt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Fluorene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Hexane	0.2	0.3	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4	
3	Proportion	Electricity Generation	CAP	Lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Manganese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Nickel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Phenanthrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	1,1,2-Trichloroethane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	1,1,2,2-Tetrachloroethane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	1,3-Dichloropropene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	2,2,4-Trimethylpentane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
3	Proportion	Electricity Generation	HAP	Acenaphthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Acenaphthylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Benzo[a]Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Proportion	Electricity Generation	HAP	Benzo[a]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	



[illegible]

	Proportion	Electricity Generation	HAP	Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[a]Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[a]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[b]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[e]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[g,h,i]Perylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Benzo[k]Fluoranthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Biphenyl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Carbon Tetrachloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Chlorobenzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Chloroform	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Chrysene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Ethyl Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Ethylene Dibromide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Ethylene Dichloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Ethylidene Dichloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Indeno[1,2,3-c,d]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Methanol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Methylene Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Perylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Phenol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Propylene Dichloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Styrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Vinyl Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Proportion	Electricity Generation	HAP	Tetrachloroethylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	AP 42	Industry	CAP	Volatile Organic Compounds	-	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.5	1.3	1.3	1.4
5	AP 42	Industry	CAP	Carbon Monoxide	-	15.3	15.5	15.7	16.0	20.1	20.2	19.8	20.2	20.1	19.8	20.5	20.0	20.0	20.2	20.3	20.1	20.2	19.8	19.9	21.5	22.6	20.2	20.2	21.9
5	AP 42	Industry	CAP	Nitrogen Oxides	-	34.7	35.0	35.4	36.1	45.6	45.7	44.8	45.6	45.4	44.9	46.3	45.2	45.2	45.7	46.0	45.4	45.6	44.8	45.0	48.7	51.1	45.6	45.7	49.6
5	AP 42	Industry	CAP	PM10 Primary (Fit + Cond)	-	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	1.0

	AP 42	Industry	CAP	PM2.5 Primary (Filt + Cond)	-	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	1.0
5	AP 42	Industry	CAP	Sulfur Dioxide	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2
5	Proportion	Industry	HAP	Biphenyl	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Manganese	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Naphthalene	-	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	
5	Proportion	Industry	HAP	Nickel	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Phenanthrene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Arsenic	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Benzyl Chloride	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Chromium III	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Cyanide	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Formaldehyde	-	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Proportion	Industry	CAP	Lead	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Methylhydrazine	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Acetaldehyde	-	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
5	Proportion	Industry	HAP	Benzene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Beryllium	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Cadmium	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Selenium	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Toluene	-	4.3	4.3	4.4	4.5	5.6	5.6	5.5	5.6	5.6	5.5	5.7	5.6	5.6	5.6	5.7	5.6	5.6	5.5	5.6	6.0	6.3	5.6	5.6	6.1			
5	Proportion	Industry	HAP	Xylenes (Mixed Isomers)	-	2.0	2.0	2.0	2.1	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.8	2.9	2.6	2.6	2.8	
5	Proportion	Industry	HAP	1-Methylnaphthalene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	1,3-Butadiene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	2-Methylnaphthalene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Acenaphthylene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Acrolein	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Catechol	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Cresol/Cresylic Acid (Mixed Isomers)	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Proportion	Industry	HAP	Ethyl Benzene	-	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.8	

	Proportion	Industry	HAP	Hydroquinone	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	m-Xylene	-	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7		
5	Proportion	Industry	HAP	o-Xylene	-	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.9	
5	Proportion	Industry	HAP	Phenol	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
5	Proportion	Industry	HAP	Propionaldehyde	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Ethylene Glycol	-	1.5	1.5	1.5	1.5	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2	1.9	1.9	2.1		
5	Proportion	Industry	HAP	Glycol Ethers	-	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4		
5	Proportion	Industry	HAP	Methyl Isobutyl Ketone	-	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
5	Proportion	Industry	HAP	Hexane	-	2.1	2.1	2.1	2.1	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.9	3.0	2.7	2.7	2.9		
5	Proportion	Industry	HAP	Methanol	-	0.6	0.7	0.7	0.7	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.9	1.0	0.9	0.9	0.9	
5	Proportion	Industry	HAP	p-Xylene	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	
5	Proportion	Industry	HAP	Cumene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Dibutyl Phthalate	-	1.2	1.2	1.2	1.2	1.6	1.6	1.5	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.7	1.8	1.6	1.6	1.7	
5	Proportion	Industry	HAP	Methyl Chloroform	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Methylene Chloride	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	
5	Proportion	Industry	HAP	Vinyl Acetate	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
5	Proportion	Industry	HAP	Diethanolamine	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	
5	Proportion	Industry	HAP	Methyl Methacrylate	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Phenyl Cellosolve	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Polycyclic aromatic compounds (includes 25 specific compounds)	-	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
5	Proportion	Industry	HAP	Styrene	-	1.5	1.5	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.0	2.0	2.2		
5	Proportion	Industry	HAP	Trichloroethylene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Tetrachloroethylene	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
5	Proportion	Industry	HAP	2,4-Toluene Diisocyanate	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Phthalic Anhydride	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Triethylamine	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Acrylic Acid	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	Dimethyl Phthalate	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5	Proportion	Industry	HAP	2,4-Dichlorophenoxy Acetic Acid	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3

5	Proportion	Industry	HAP	Captan	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Carbaryl	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Trifluralin	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	2,2,4-Trimethylpentane	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Chloroform	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Acetophenone	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Fluorene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Bromoform	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Chromium (VI)	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Dimethyl Sulfate	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Ethyl Chloride	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Methyl Tert-Butyl Ether	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	1-Methylphenanthrene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	2-Methylphenanthrene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Acenaphthene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Anthracene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Fluoranthene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Pyrene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Cobalt	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Mercury	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	1-Bromopropane	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Proportion	Industry	HAP	Benz(a)Anthracene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Benzo(b)Fluoranthene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Chrysene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Acetonitrile	-	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Proportion	Industry	HAP	Benzo(g,h,i)Perylene	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Antimony	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Hydrogen Fluoride	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Proportion	Industry	HAP	Propylene Oxide	-	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1





[illegible]



	Proportion	Transportation	HAP	Chrysene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8	Proportion	Transportation	HAP	Indeno[1,2,3-c,d]Pyrene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8	Proportion	Transportation	HAP	Manganese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8	Proportion	Transportation	HAP	Nickel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8	Proportion	Transportation	HAP	Mercury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8	Proportion	Transportation	HAP	Dibenzo(a,h)Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
9	Proportion	Waste and Materials Management	CAP	Ammonia	0.0	2.4	4.7	7.1	9.6	12.0	14.4	16.8	19.2	22.0	24.5	27.0	29.5	32.0	34.8	37.4	40.0	42.6	45.2	47.8	50.5	53.2	55.9	58.6	61.3	
9	Proportion	Waste and Materials Management	CAP	Carbon Monoxide	0.3	39.8	79.3	118.8	159.2	198.6	238.0	278.4	319.1	365.4	406.7	448.3	490.4	528.9	574.5	616.0	657.7	699.7	741.8	784.2	826.9	869.5	912.7	956.1	999.7	
9	Proportion	Waste and Materials Management	CAP	Nitrogen Oxides	0.1	12.6	21.8	27.9	30.8	30.2	26.4	30.9	35.4	40.6	45.2	49.9	54.7	59.5	64.8	69.7	74.6	79.6	84.7	89.8	94.9	100.1	105.4	110.7	116.1	
9	Proportion	Waste and Materials Management	CAP	PM10 Primary (Filt + Cond)	0.0	6.8	13.6	20.4	27.4	34.1	40.9	47.9	54.9	62.8	69.9	77.1	84.3	91.1	98.9	106.1	113.3	120.6	127.9	135.3	142.6	150.0	157.5	165.1	172.7	
9	Proportion	Waste and Materials Management	CAP	PM2.5 Primary (Filt + Cond)	0.0	6.0	11.9	17.8	23.9	29.8	35.8	41.8	47.9	54.9	61.1	67.3	73.6	79.9	86.9	93.4	99.8	106.4	113.0	119.6	126.3	133.1	139.9	146.8	153.7	
9	Proportion	Waste and Materials Management	CAP	Sulfur Dioxide	0.0	2.6	5.0	7.1	9.0	10.5	11.8	13.8	15.9	18.2	20.2	22.3	24.4	26.5	28.8	30.9	33.1	35.3	37.5	39.7	41.9	44.1	46.4	48.7	51.0	
9	Proportion	Waste and Materials Management	CAP	Volatile Organic Compounds	0.0	4.0	8.0	12.1	16.4	20.6	24.9	29.2	33.7	38.7	43.3	47.9	52.7	57.3	62.6	67.5	72.5	77.5	82.6	87.9	93.1	98.5	103.9	109.5	115.1	
9	Proportion	Waste and Materials Management	HAP	Ethyl Benzene	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	
9	Proportion	Waste and Materials Management	HAP	Phenol	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	
9	Proportion	Waste and Materials Management	HAP	Styrene	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	
9	Proportion	Waste and Materials Management	HAP	Cumene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1		
9	Proportion	Waste and Materials Management	HAP	Dibenzofuran	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	1,3-Butadiene	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
9	Proportion	Waste and Materials Management	HAP	2-Methylnaphthalene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	2,4,6-Trichlorophenol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Acenaphthene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Acenaphthylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Acetaldehyde	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.3	
9	Proportion	Waste and Materials Management	HAP	Acetophenone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Acrolein	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
9	Proportion	Waste and Materials Management	HAP	Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Benz(a)Anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Proportion	Waste and Materials Management	HAP	Benzene	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.8	2.9	



9	Proportion	Waste and Materials Management	HAP	Carbon Tetrachloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Chlorobenzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Chloroform	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Ethylene Oxide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Glycol Ethers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9	Proportion	Waste and Materials Management	HAP	Methanol	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0
9	Proportion	Waste and Materials Management	HAP	Methyl Chloroform	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Methyl Isobutyl Ketone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Methyl Methacrylate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	N,N-Dimethylaniline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Propylene Oxide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Tetrachloroethylene	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
9	Proportion	Waste and Materials Management	HAP	Trichloroethylene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Vinylidene Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	1,2,4-Trichlorobenzene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	2,4-Dinitrotoluene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Biphenyl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Methyl Tert-Butyl Ether	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Vinyl Acetate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Polychlorinated Biphenyls	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Allyl Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Chloroprene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	p-Dioxane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Propylene Dichloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Arsenic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Cadmium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Chromium (VI)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Chromium III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Proportion	Waste and Materials Management	HAP	Cobalt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

9	Proportion	Waste and Materials Management	HAP	Hexane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
9	Proportion	Waste and Materials Management	CAP	Lead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
9	Proportion	Waste and Materials Management	HAP	Manganese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
9	Proportion	Waste and Materials Management	HAP	Nickel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
10	Proportion	Waste and Materials Management	CAP	Ammonia	(5.8)	5.5	16.9	28.4	40.0	51.6	63.3	75.0	86.8	98.6	110.6	122.6	134.7	146.9	159.2	171.6	184.0	196.6	209.3	222.0	234.9	247.9	260.9	274.1	287.4
10	Proportion	Waste and Materials Management	CAP	Carbon Monoxide	(98.7)	92.8	283.8	474.8	666.2	856.8	1,047.3	1,242.3	1,438.8	1,636.8	1,836.4	2,037.5	2,240.3	2,427.3	2,627.0	2,827.8	3,029.6	3,232.5	3,436.4	3,641.5	3,847.7	4,055.1	4,263.7	4,473.4	4,684.4
10	Proportion	Waste and Materials Management	CAP	Nitrogen Oxides	(35.2)	29.3	78.2	111.3	128.9	130.4	116.0	137.7	159.7	181.9	204.3	226.9	249.8	272.9	296.2	319.8	343.7	367.8	392.1	416.8	441.7	466.9	492.4	518.1	544.1
10	Proportion	Waste and Materials Management	CAP	PM10 Primary (Filt + Cond)	(16.9)	15.9	48.7	81.5	114.4	147.3	180.1	213.6	247.4	281.5	315.8	350.4	385.4	417.9	452.4	487.1	522.0	557.2	592.5	628.0	663.8	699.8	736.0	772.4	809.0
10	Proportion	Waste and Materials Management	CAP	PM2.5 Primary (Filt + Cond)	(14.7)	13.9	42.5	71.2	99.9	128.7	157.4	186.7	216.1	245.8	275.7	305.8	336.1	366.7	397.5	428.6	459.9	491.5	523.3	555.5	587.9	620.5	653.5	686.7	720.3
10	Proportion	Waste and Materials Management	CAP	Sulfur Dioxide	(6.9)	6.1	17.9	28.3	37.6	45.5	52.1	61.8	71.5	81.4	91.3	101.2	111.3	121.5	131.7	142.0	152.4	162.9	173.5	184.2	195.0	205.8	216.8	227.9	239.0
10	Proportion	Waste and Materials Management	CAP	Volatile Organic Compounds	(9.9)	9.3	28.8	48.5	68.6	88.9	109.5	130.4	151.8	173.4	195.5	217.8	240.6	263.0	286.2	309.8	333.8	358.1	382.8	407.9	433.4	459.3	485.5	512.2	539.3
10	Proportion	Waste and Materials Management	HAP	Ethyl Benzene	(0.1)	0.1	0.2	0.4	0.5	0.7	0.8	1.0	1.1	1.3	1.5	1.6	1.8	2.0	2.1	2.3	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.8	3.9
10	Proportion	Waste and Materials Management	HAP	Phenol	(0.1)	0.1	0.2	0.4	0.6	0.8	0.9	1.1	1.3	1.5	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4
10	Proportion	Waste and Materials Management	HAP	Styrene	(0.2)	0.2	0.5	0.9	1.3	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.5	4.9	5.4	5.8	6.2	6.7	7.1	7.6	8.0	8.5	8.9	9.4	9.9
10	Proportion	Waste and Materials Management	HAP	Cumene	(0.0)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
10	Proportion	Waste and Materials Management	HAP	Dibenzofuran	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
10	Proportion	Waste and Materials Management	HAP	1,3-Butadiene	(0.0)	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.9
10	Proportion	Waste and Materials Management	HAP	2-Methylnaphthalene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10	Proportion	Waste and Materials Management	HAP	2,4,6-Trichlorophenol	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Proportion	Waste and Materials Management	HAP	Acenaphthene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Proportion	Waste and Materials Management	HAP	Acenaphthylene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10	Proportion	Waste and Materials Management	HAP	Acetaldehyde	(0.1)	0.1	0.3	0.6	0.8	1.0	1.3	1.5	1.7	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.4	5.7	5.9
10	Proportion	Waste and Materials Management	HAP	Acetophenone	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
10	Proportion	Waste and Materials Management	HAP	Acrolein	(0.0)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
10	Proportion	Waste and Materials Management	HAP	Anthracene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Proportion	Waste and Materials Management	HAP	Benz(a)Anthracene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Proportion	Waste and Materials Management	HAP	Benzene	(0.3)	0.2	0.8	1.3	1.8	2.3	2.9	3.4	4.0	4.5	5.1	5.7	6.2	6.8	7.4	8.0	8.6	9.2	9.8	10.5	11.1	11.7	12.4	13.0	13.7
10	Proportion	Waste and Materials Management	HAP	Benzo(a)Pyrene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Proportion	Waste and Materials Management	HAP	Benzo(b)Fluoranthene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





	Proportion	Waste and Materials Management	HAP	Chloroform	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2		
10	Proportion	Waste and Materials Management	HAP	Ethylene Oxide	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
10	Proportion	Waste and Materials Management	HAP	Glycol Ethers	(0.0)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	
10	Proportion	Waste and Materials Management	HAP	Methanol	(0.1)	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.3	4.5	4.7
10	Proportion	Waste and Materials Management	HAP	Methyl Chloroform	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
10	Proportion	Waste and Materials Management	HAP	Methyl Isobutyl Ketone	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
10	Proportion	Waste and Materials Management	HAP	Methyl Methacrylate	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	N,N-Dimethylaniline	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Propylene Oxide	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Tetrachloroethylene	(0.0)	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4
10	Proportion	Waste and Materials Management	HAP	Trichloroethylene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Vinylidene Chloride	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	1,2,4-Trichlorobenzene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	2,4-Dinitrotoluene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Biphenyl	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Methyl tert-Butyl Ether	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Vinyl Acetate	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Polychlorinated Biphenyls	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Allyl Chloride	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Chloroprene	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	p-Dioxane	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Propylene Dichloride	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Arsenic	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Cadmium	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Chromium (VI)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Chromium III	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Cobalt	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	HAP	Hexane	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Proportion	Waste and Materials Management	CAP	Lead	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

[illegible]

# Appendix G. Workforce Planning Data

TABLE 29. MEASURE 1 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Agricultural Equipment Operators	140	140	140
Agricultural Technicians	60	62	73
Conservation Scientists	110	114	134
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Environmental Engineers	290	301	341
Environmental Science and Protection Technicians	250	259	305
Environmental Scientists and Specialists	540	560	658
Farm Equipment Mechanics and Service Technicians	260	302	331
Farmworkers and Laborers	270	270	270
Geoscientists	170	176	207
Life, Physical & Social Science Technicians	260	270	317
Office & Administrative Support Workers	200	202	194
Secretaries & Administrative Assistants	7,410	7,498	7,201
Soil and Plant Scientists	130	135	159

TABLE 30. MEASURE 2 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775

Architectural and Civil Drafters	730	758	857
Carpenters	4,790	5,578	6,202
Construction and Building Inspectors	940	1,095	1,217
Construction Laborers	9,170	10,679	11,873
Control and Valve Installers and Repairers	210	244	268
Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38
Electrical and Electronics Repairers, Commercial	280	325	357
Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Heating, Air Conditioning, and Refrigeration	3,110	3,613	3,964
Helpers--Construction Trades	90	105	117
Helpers--Carpenters	60	70	78
Helpers--Electricians	520	606	673
Helpers--Installation, Maintenance, and Repair Workers	420	488	535

Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Installation, Maintenance & Repair Workers	730	848	930
Insulation Workers, Floor, Ceiling, and Wall	270	314	350
Mechanical Engineering Technicians	280	291	329
Mechanical Engineers	1,990	2,065	2,337
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Secretaries & Administrative Assistants	7,410	7,498	7,201
Stationary Engineers and Boiler Operators	140	141	141
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208

TABLE 31. MEASURE 3 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Calibration Technologists and Technicians	170	176	200
Cement Masons and Concrete Finishers	1,620	1,887	2,097
Civil Engineering Technicians	400	415	470
Civil Engineers	2,040	2,117	2,395
Construction and Building Inspectors	940	1,095	1,217
Construction Laborers	9,170	10,679	11,873

Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38
Electrical and Electronics Repairers, Commercial	280	325	357
Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical Power-Line Installers and Repairers	700	813	892
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Helpers--Construction Trades	90	105	117
Helpers--Electricians	520	606	673
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Utility Meter Readers	80	81	78
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Power Distributors and Dispatchers	60	60	60

Power Plant Operators	90	91	91
Secretaries & Administrative Assistants	7,410	7,498	7,201
Solar Photovoltaic Installers	480	559	621
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208
Welders, Cutters, Solderers, and Brazers	2,290	2,305	2,306

TABLE 32. MEASURE 4 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Calibration Technologists and Technicians	170	176	200
Carpenters	4,790	5,578	6,202
Cement Masons and Concrete Finishers	1,620	1,887	2,097
Civil Engineering Technicians	400	415	470
Civil Engineers	2,040	2,117	2,395
Construction and Building Inspectors	940	1,095	1,217
Construction Laborers	9,170	10,679	11,873
Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38
Electrical and Electronics Repairers, Commercial	280	325	357

Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical Power-Line Installers and Repairers	700	813	892
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Helpers--Construction Trades	90	105	117
Helpers--Carpenters	60	70	78
Helpers--Electricians	520	606	673
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Utility Meter Readers	80	81	78
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Power Distributors and Dispatchers	60	60	60
Secretaries & Administrative Assistants	7,410	7,498	7,201
Solar Photovoltaic (PV) Installers	480	559	621
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208
Urban and Regional Planners	190	197	232



Welders, Cutters, Solderers, and Brazers	2,290	2,305	2,306
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TABLE 33. MEASURE 5 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Calibration Technologists and Technicians	170	176	200
Chemical Engineers	50	52	59
Control and Valve Installers and Repairers	210	244	268
Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38
Electrical and Electronics Repairers, Commercial	280	325	357
Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Heating, Air Conditioning, and Refrigeration	3,110	3,613	3,964
Helpers--Electricians	520	606	673

Helpers--Installation, Maintenance, and Repair Workers	420	488	535
Industrial Engineering Technicians	710	737	834
Industrial Engineers	2,510	2,605	2,947
Industrial Machinery Mechanics	3,550	4,125	4,525
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Installation, Maintenance & Repair Workers	730	848	930
Insulation Workers, Mechanical	240	279	311
Mechanical Engineering Technicians	280	291	329
Mechanical Engineers	1,990	2,065	2,337
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Secretaries & Administrative Assistants	7,410	7,498	7,201
Stationary Engineers and Boiler Operators	140	141	141
Welders, Cutters, Solderers, and Brazers	2,290	2,305	2,306

TABLE 34. MEASURE 6 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Civil Engineering Technicians	400	415	470
Civil Engineers	2,040	2,117	2,395
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Environmental Engineers	290	301	341

Environmental Science and Protection Technicians	250	259	305
Environmental Scientists and Specialists	540	560	658
Foresters	30	31	37
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Landscape Architects	140	145	164
Office & Administrative Support Workers	200	202	194
Secretaries & Administrative Assistants	7,410	7,498	7,201
Urban and Regional Planners	190	197	232

TABLE 35. MEASURE 7 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Bus & Truck Mechanics & Diesel Engine Specialists	2,840	3,300	3,620
Cement Masons and Concrete Finishers	1,620	1,887	2,097
Civil Engineering Technicians	400	415	470
Civil Engineers	2,040	2,117	2,395
Construction Laborers	9,170	10,679	11,873
Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38

Electrical and Electronics Repairers, Commercial	280	325	357
Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Helpers--Construction Trades	90	105	117
Helpers--Electricians	520	606	673
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Mechanical Engineering Technicians	280	291	329
Mechanical Engineers	1,990	2,065	2,337
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Secretaries & Administrative Assistants	7,410	7,498	7,201
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208

TABLE 36. MEASURE 8 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
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Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Carpenters	4,790	5,578	6,202
Cement Masons and Concrete Finishers	1,620	1,887	2,097
Civil Engineering Technicians	400	415	470
Civil Engineers	2,040	2,117	2,395
Construction Laborers	9,170	10,679	11,873
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Helpers--Construction Trades	90	105	117
Helpers--Carpenters	60	70	78
Landscape Architects	140	145	164
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Paving, Surfacing, and Tamping Equipment Operators	200	233	259
Secretaries & Administrative Assistants	7,410	7,498	7,201
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208
Urban and Regional Planners	190	197	232

TABLE 37. MEASURE 9 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857

Calibration Technologists and Technicians	170	176	200
Carpenters	4,790	5,578	6,202
Chemical Engineers	50	52	59
Construction and Building Inspectors	940	1,095	1,217
Construction Laborers	9,170	10,679	11,873
Electrical and Electronic Engineering Technicians	510	529	599
Electrical and Electronics Drafters	160	166	188
Electrical and Electronics Installers & Repairers	30	35	38
Electrical and Electronics Repairers, Commercial	280	325	357
Electrical and Electronics Repairers, Powerhouse	90	105	115
Electrical Engineers	1,310	1,360	1,538
Electrical, Electronic, and Electromechanical Assemblers	1,810	1,822	1,823
Electricians	4,940	5,753	6,396
Electronic Equipment Installers and Repairers	110	128	140
Eligibility Interviewers, Government Programs	1,990	2,014	1,934
Environmental Engineers	290	301	341
Environmental Science and Protection Technicians	250	259	305
Environmental Scientists and Specialists	540	560	658
Hazardous Materials Removal Workers	480	559	621
Helpers--Construction Trades	90	105	117
Helpers--Carpenters	60	70	78

Helpers--Electricians	520	606	673
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Mechanical Engineering Technicians	280	291	329
Mechanical Engineers	1,990	2,065	2,337
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Operating Engineers and Other Construction Equipment	3,480	4,053	4,506
Refuse and Recyclable Material Collectors	880	983	1,052
Secretaries & Administrative Assistants	7,410	7,498	7,201
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208
Water and Wastewater Treatment Plant and System Operators	620	624	624
Welders, Cutters, Solderers, and Brazers	2,290	2,305	2,306

TABLE 38. MEASURE 10 – KEY JOB PROJECTION SUMMARY

Occupation	Number of Workers (2024)	Estimated Workers (2035)	Estimated Workers (2050)
Architects	660	685	775
Architectural and Civil Drafters	730	758	857
Calibration Technologists and Technicians	170	176	200
Carpenters	4,790	5,578	6,202
Construction and Building Inspectors	940	1,095	1,217
Construction Laborers	9,170	10,679	11,873
Eligibility Interviewers, Government Programs	1,990	2,014	1,934

Environmental Engineers	290	301	341
Environmental Science and Protection Technicians	250	259	305
Environmental Scientists and Specialists	540	560	658
Hazardous Materials Removal Workers	480	559	621
Helpers--Construction Trades	90	105	117
Helpers--Carpenters	60	70	78
Inspectors, Testers, Sorters, Samplers & Weighers	5,570	5,607	5,609
Miscellaneous Construction and Related Workers	130	151	168
Office & Administrative Support Workers	200	202	194
Refuse and Recyclable Material Collectors	880	983	1,052
Secretaries & Administrative Assistants	7,410	7,498	7,201
Supervisors of Construction and Extraction Workers	6,340	7,383	8,208
Welders, Cutters, Solderers, and Brazers	2,290	2,305	2,306



# Appendix H. List of Funding Opportunities

Associated Decarbonization Measure	Title of Funding Opportunity (e.g., specific name of program)	Description of Funding Opportunity (2-3 sentences, including the measures and sectors it applies to)	Funding Entity (e.g., name of local/state/federal agency, or other entity responsible to distributing funds)	Funding Opportunity Amount (e.g., total tax credit, grant amount available, etc.)	Eligible Entities (e.g., denote which types of entities can apply for the funding - local govts, etc.)	Reference (e.g., link to funding source website)
<b>1 – Nutrient Runoff Reduction</b>	Cover Crop Premium Discount Program	Offers a \$5 per acre crop insurance premium discount for verified fall cover crops, encouraging first-time users to adopt soil-conserving practices.	Indiana State Department of Agriculture (ISDA) & USDA Risk Management Agency	Up to \$5 per acre crop insurance premium discount	Farmers with eligible insured crops in Indiana	<a href="https://www.in.gov/isda/divisions/soil-conservation/cover-crop-premium-discount-program/">https://www.in.gov/isda/divisions/soil-conservation/cover-crop-premium-discount-program/</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	Clean Water Act §319(h) Grants	Watershed planning & implementation grants targeting nonpoint source pollution.	IDEM (EPA funds)	Historic Indiana total >\$70M; individual awards vary by project scope.  \$100k-\$1M typical project scale (varies by NOFO); \$100k-\$1M typical project scale (varies by NOFO)	Nonprofits, universities, local/state agencies	<a href="https://www.in.gov/idem/nps/funding/clean-water-act-section-319h-grants/">https://www.in.gov/idem/nps/funding/clean-water-act-section-319h-grants/</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	Clean Water Indiana (CWI) - Cover Cropping	Competitive grants to SWCDs for BMP cost-share, TA, and outreach (nutrient reduction).	Indiana State Department of Agriculture (ISDA)	Multi-year awards; amounts vary by proposal; matching often required.  Typically tens-hundreds of thousands per award \$3,969,388 total available, with \$1,720,115 available for direct distribution	SWCDs; local partners (landowners benefit via cost-share)	<a href="https://www.in.gov/isda/divisions/soil-conservation/clean-water-indiana/">https://www.in.gov/isda/divisions/soil-conservation/clean-water-indiana/</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	Clean Water Indiana (CWI) Grants - Overall	Competitive grants to SWCDs for BMP cost-share, TA, and outreach (nutrient reduction).	Indiana State Department of Agriculture (ISDA)	Multi-year awards; amounts vary by proposal; matching often required. Typically tens-hundreds of thousands per award \$3,969,388 total available, with \$1,720,115 available for direct distribution	SWCDs; local partners (landowners benefit via cost-share)	<a href="https://www.in.gov/isda/divisions/soil-conservation/clean-water-indiana/">https://www.in.gov/isda/divisions/soil-conservation/clean-water-indiana/</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	CSP (Indiana) - Cover Cropping	Annual payments for conservation performance plus one-time payments for additional enhancements (nutrient mgmt, precision, cover crops).	USDA NRCS (Indiana)	Contract-based annual payments; enhancement payment tables determine amounts.; Typically tens-hundreds \$/ac-year depending on enhancement	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program">https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	CSP (Indiana) - Fertilizer Management	Annual payments for conservation performance plus one-time payments for additional enhancements (nutrient mgmt, precision, cover crops).	USDA NRCS (Indiana)	Contract-based annual payments; enhancement payment tables determine amounts.; Typically tens-hundreds \$/ac-year depending on enhancement	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program">https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	CSP (Indiana) - No-Till	Annual payments for conservation performance plus one-time payments for additional enhancements (nutrient mgmt, precision, cover crops).	USDA NRCS (Indiana)	Contract-based annual payments; enhancement payment tables determine amounts.; Typically tens-hundreds \$/ac-year depending on enhancement	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program">https://www.nrcs.usda.gov/programs/initiatives/csp-conservation-stewardship-program/indiana/conservation-stewardship-program</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	EQIP (Indiana) - Cover Cropping	Cost-share & technical assistance for conservation practices (nutrient mgmt, cover crops, drainage water mgmt, precision).	USDA NRCS (Indiana)	State-specific payment schedules; cost-share % varies by practice; year-round signup with ranking dates.; Practice-dependent	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality">https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality</a>  <a href="https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx">https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	EQIP (Indiana) - Fertilizer Management	Cost-share & technical assistance for conservation practices (nutrient mgmt, cover crops, drainage water mgmt, precision).	USDA NRCS (Indiana)	State-specific payment schedules; cost-share % varies by practice; year-round signup with ranking dates.; Practice-dependent	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality">https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality</a>  <a href="https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx">https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx</a>

<b>1 - Reduce Nutrient Runoff from Croplands</b>	EQIP (Indiana) - No-Till	Cost-share & technical assistance for conservation practices (nutrient mgmt, cover crops, drainage water mgmt, precision).	USDA NRCS (Indiana)	State-specific payment schedules; cost-share % varies by practice; year-round signup with ranking dates.; Practice-dependent	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/program-s-initiatives/environmental-quality-incentives-program/indiana/environmental-quality">https://www.nrcs.usda.gov/program-s-initiatives/environmental-quality-incentives-program/indiana/environmental-quality</a> <a href="https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx">https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx</a>
<b>1 - Reduce Nutrient Runoff from Croplands</b>	NWQI (Priority Watersheds)	Targeted T&F assistance to reduce nutrient/sediment in impaired watersheds.	USDA NRCS (with IDEM/EPA alignment)	Watershed-specific allocations; varies by year and plan.	Producers within designated NWQI watersheds	<a href="https://www.nrcs.usda.gov/program-s-initiatives/national-water-quality-initiative">https://www.nrcs.usda.gov/program-s-initiatives/national-water-quality-initiative</a> <a href="https://www.nrcs.usda.gov/sites/default/files/2025-08/2024-NRCS-NWQI-FactSheet.pdf">https://www.nrcs.usda.gov/sites/default/files/2025-08/2024-NRCS-NWQI-FactSheet.pdf</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM	CDBG funds may be used for activities which include, but are not limited to: Acquisition of real property Relocation and demolition Rehabilitation of residential and non-residential structures Construction of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers, and the conversion of school buildings for eligible purposes Public services, within certain limits Activities relating to energy conservation and renewable energy resources Provision of assistance to profit-motivated businesses to carry out economic development and job creation/retention activities	Indiana Office of Community & Rural Affairs US Department of Housing and Urban Development	Planning Grant Max: \$60,000 Public Facility Grant Max: \$500,000	Principal cities of Metropolitan Statistical Areas (MSAs) Other metropolitan cities with populations of at least 50,000 Qualified urban counties with populations of at least 200,000 (excluding the population of entitled cities) States and insular areas	<a href="https://www.hud.gov/program-offices/sustainability-awarded-funds-for-energy-efficiency/">Community Development Block Grant Program   HUD.gov / U.S. Department of Housing and Urban Development (HUD)</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT (EECBG) PROGRAM	Energy Efficiency and Conservation Programs for Buildings and Facilities	US Department of Energy - Office of State and Community Energy Programs	Total Funding for Indianapolis: \$787,000	State, local government, tribes	<a href="https://indianapolisrecorder.com/office-of-sustainability-awarded-funds-for-energy-efficiency/">https://indianapolisrecorder.com/office-of-sustainability-awarded-funds-for-energy-efficiency/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT (EECBG) PROGRAM	Energy Efficiency and Conservation Programs for Buildings and Facilities	Indiana Office of Energy Development	Total Funding for Indiana: \$2.4 million Awarding: \$100,000-\$200,000	State, local government, tribes	<a href="https://www.energyefficiencyandconservationblockgrantprogram.com/">Energy Efficiency and Conservation Block Grant Program   Department of Energy</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Energy Efficiency and Conservation Block Grant Program - Equipment Rebates Program voucher or grant	Equipment rebates can be used for purchasing and installing energy-related equipment that lower fossil fuel use, reduce total energy use, and increase energy efficiency.	Office of State and Community Energy Programs (SCEP) U.S. Department of Energy (DOE)	Johnson County allocation:\$78,180	Local and tribal governments	<a href="https://www.equipmentrebatevoucher.com/">Equipment Rebate Voucher Information (site.com)</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Energy Efficiency and Conservation Block Grant Program - Equipment Rebates Program voucher or grant	Equipment rebates can be used for purchasing and installing energy-related equipment that lower fossil fuel use, reduce total energy use, and increase energy efficiency.	Office of State and Community Energy Programs (SCEP) U.S. Department of Energy (DOE)	Carmel allocation:\$153,650	Local and tribal governments	<a href="https://www.equipmentrebatevoucher.com/">Equipment Rebate Voucher Information (site.com)</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Energy Efficiency and Conservation Block Grant Program - Equipment Rebates Program voucher or grant	Equipment rebates can be used for purchasing and installing energy-related equipment that lower fossil fuel use, reduce total energy use, and increase energy efficiency.	Office of State and Community Energy Programs (SCEP) U.S. Department of Energy (DOE)	Hendricks County allocation: \$80,860	Local and tribal governments	<a href="https://www.equipmentrebatevoucher.com/">Equipment Rebate Voucher Information (site.com)</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Energy Efficiency and Conservation Block Grant Program - Equipment Rebates Program voucher or grant	Equipment rebates can be used for purchasing and installing energy-related equipment that lower fossil fuel use, reduce total energy use, and increase energy efficiency.	Office of State and Community Energy Programs (SCEP) U.S. Department of Energy (DOE)	Noblesville allocation:\$125,610	Local and tribal governments	<a href="https://www.equipmentrebatevoucher.com/">Equipment Rebate Voucher Information (site.com)</a>

<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Energy Efficiency and Conservation Block Grant Program - Equipment Rebates Program voucher or grant	Equipment rebates can be used for purchasing and installing energy-related equipment that lower fossil fuel use, reduce total energy use, and increase energy efficiency.	Office of State and Community Energy Programs (SCEP) U.S. Department of Energy (DOE)	Hancock County allocation: \$77,620	Local and tribal governments	<a href="#">Equipment Rebate Voucher Information (site.com)</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Funding to Address Air Pollution at Schools	To provide funding for grants and other activities to monitor and reduce pollution and greenhouse gas emissions at schools in low-income and disadvantaged communities. To provide technical assistance to schools in low-income and disadvantaged communities to develop school air and environmental quality plans and to identify and mitigate ongoing air pollution hazards.	EPA	Total is \$37.5 million for competitive grants	State, local, Tribal agencies, not for profit organizations and others for projects supporting schools in low-income and disadvantaged communities.	<a href="#">IRA Guidebook, page 92</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Efficiency Fund (IEEF)	Loans & grants for audits, retrofits, energy upgrades.	Indiana OED (IIJA capitalization)	Pool ~ \$9.9M statewide; project awards vary by cycle.; Thousands-millions depending on project	Local govts, nonprofits, businesses	<a href="https://www.in.gov/oed/grants-and-funding-opportunities/energy-efficiency-fund/">https://www.in.gov/oed/grants-and-funding-opportunities/energy-efficiency-fund/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Independence Fund (IEIF) - Commercial	Green bank-style loans for EE/renewables; residential and commercial financing.	IEIF / NEIF partnership	2500-150000; \$500-\$50,000 (residential); commercial varies	businesses, nonprofits, govts	<a href="https://energyindependencefund.org/">https://energyindependencefund.org/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Independence Fund (IEIF) - Residential	Green bank-style loans for EE/renewables; residential and commercial financing.	IEIF / NEIF partnership	\$500-\$50,000; \$500-\$50,000 (residential); commercial varies	Homeowners	<a href="https://energyindependencefund.org/">https://energyindependencefund.org/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Saver – HEAR	Low/mod income appliance rebates (heat pumps, HPWH, panel upgrades).	State of Indiana (OED)	Up to 100% (low-income) or 50% (mod-income) of costs; lifetime cap ~\$14,000.; \$ up to \$14,000 per household	Households under income thresholds via approved contractors	<a href="https://www.in.gov/oed/grants-and-funding-opportunities/homeowner-incentives/">https://www.in.gov/oed/grants-and-funding-opportunities/homeowner-incentives/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Saver – HOMES - Multifamily	Whole-home rebates for measured or modeled energy savings ≥20%.	State of Indiana (OED)	Rebate amount scales with savings & project size; income tiers may apply.; Percentage-based; typically \$1k-\$8k+ depending on savings/home	Homeowners; multifamily owners (per rules)	<a href="https://indianaenergysaver.com/">https://indianaenergysaver.com/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Indiana Energy Saver – HOMES (Single Family)	Whole-home rebates for measured or modeled energy savings ≥20%.	State of Indiana (OED)	Rebate amount scales with savings & project size; income tiers may apply.; Percentage-based; typically \$1k-\$8k+ depending on savings/home	Homeowners; multifamily owners (per rules)	<a href="https://indianaenergysaver.com/">https://indianaenergysaver.com/</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	IRC §179D Deduction	Tax deduction for energy-efficient commercial buildings (retrofit or new).	IRS / U.S. Treasury	Up to \$5.65+/sq ft with PWA; exact value depends on savings % and labor rules.; \$/sq ft up to mid-single dollars; scalable by building size	Commercial building owners; designers of public buildings (allocation)	<a href="https://www.irs.gov/credits-deductions/energy-efficient-commercial-buildings-deduction">https://www.irs.gov/credits-deductions/energy-efficient-commercial-buildings-deduction</a>
<b>2 - Energy Efficiency and Electrification of Residential, Commercial and Public Buildings</b>	Renew America's Schools	To provide competitive grants to make energy efficiency, renewable energy, and alternative fueled vehicle upgrades and improvements at public schools. Eligible projects include energy infrastructure improvements that reduce building operating costs—like new HVAC and ventilation systems, building envelope and lighting projects, and renewable energy technologies. Funding is also available for alternative fueled vehicles and alternative fueled vehicle infrastructure.	DOE Office of Energy Programs	*Based on last round of funding* \$500,000 to \$15,000,000 per project	Public schools, school districts, non-profit learning centers	<a href="#">DOE Website</a>
<b>2 – Energy Efficiency in Buildings</b>	Federal Building Efficiency Tax Credits (IRC §25C and §179D)	Provides tax credits and deductions for residential and commercial energy efficiency upgrades such as insulation, HVAC, and heat pumps, reducing retrofit costs.	Internal Revenue Service (IRS)	Up to \$3,200 annual credit (residential); 179D deduction up to \$5.65/sf (commercial)	Homeowners; commercial building owners; businesses	<a href="https://www.energystar.gov/about/federal-tax-credits">https://www.energystar.gov/about/federal-tax-credits</a>
<b>3 - Utility Scale Clean Energy</b>	Clean Electricity Investment Credit (§48E) / Production Credit (§45Y)	Tech-neutral ITC/PTC with stackable bonus credits (domestic content, energy communities, low-income allocations for §48E(h)).	IRS / U.S. Treasury	Base + bonus credits; §48E(h) low-income allocations competitive each year.; Investment % (ITC) or \$/MWh (PTC); with bonuses can exceed 30% ITC	Project sponsors; some entities eligible for elective pay or transfer	<a href="https://www.irs.gov/credits-deductions/clean-electricity-investment-credit">https://www.irs.gov/credits-deductions/clean-electricity-investment-credit</a>

<b>3 - Utility Scale Clean Energy</b>	DOE LPO Title 17	Loan guarantees for clean energy projects (generation, storage, transmission).	U.S. DOE Loan Programs Office	Can finance up to ~80% of eligible project costs; multi-\$B portfolio.; Up to tens-hundreds of millions per project	Developers, utilities, tribes, public-private entities	<a href="https://www.energy.gov/lpo/title-17-energy-financing">https://www.energy.gov/lpo/title-17-energy-financing</a>
<b>3 - Utility Scale Clean Energy</b>	ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT (EECBG) PROGRAM	Energy Efficiency and Conservation Programs for Buildings and Facilities	Indiana Office of Energy Development	Total Funding for Indiana: \$2.4 million Awarding: \$100,000-\$200,000	State, local government, tribes	<a href="#">Energy Efficiency and Conservation Block Grant Program   Department of Energy</a>
<b>3 - Utility Scale Clean Energy</b>	EPA Brownfields (Brightfields) – Assessment/Cleanup	Support brownfield-to-solar via site assessment & remediation.	U.S. EPA	Assessment up to ~\$500k-\$2M; Cleanup up to ~\$4-5M (year dependent).	Local govts, tribes, nonprofits (cleanup)	<a href="https://www.epa.gov/brownfields/current-and-upcoming-funding-opportunities">https://www.epa.gov/brownfields/current-and-upcoming-funding-opportunities</a>
<b>3 - Utility Scale Clean Energy</b>	Increase in Energy Credit for Solar and Wind Facilities Placed in Service in Connection with Low-Income Communities	Provides an additional investment tax credit for small-scale solar and wind facilities in low-income communities	Department of the Treasury	6% of qualified investment 16% of qualified investment (in LIDAC community)	Solar and wind facilities with a maximum net output of less than 5 MW, including associated energy storage technology.	<a href="https://www.irs.gov/newsroom/increased-energy-investment-credit-for-solar-and-wind-facilities-benefitting-low-income-communities">https://www.irs.gov/newsroom/increased-energy-investment-credit-for-solar-and-wind-facilities-benefitting-low-income-communities</a>
<b>3 - Utility Scale Clean Energy</b>	Renewable Electricity Production Tax Credit	PTC provides a corporate tax credit of up to 1.5 cents/kWh for electricity generated from landfill gas (LFG), open-loop biomass, municipal solid waste resources, and small irrigation power facilities, or up to 2.75 cents/kWh for electricity generated from wind, closed-loop biomass and geothermal resources	IRS	Tax credit - individual amounts vary based on sliding scale	Any producer of renewable electricity  Projects less than 1 MW in size are eligible if construction begins after December 31, 2021, and before January 1, 2025; projects above this size threshold can begin construction on or after January 30, 2023 (60 days after the labor-related guidelines were provided by the IRS) and no later than January 1, 2025.	<a href="#">Renewable Electricity Production Tax Credit Information   US EPA</a>
<b>3 – Utility-Scale Wind and Solar</b>	Powering Affordable Clean Energy (PACE) Loans	Offers partially forgivable loans for renewable projects serving rural communities; rural electric co-ops can leverage these to deploy wind and solar projects.	U.S. Department of Agriculture (USDA)	Loan guarantees up to \$1 billion per project (forgivable portion varies)	Rural electric cooperatives; utilities; developers	<a href="https://www.energy.gov/lpo/articles/handout-title-17-guidance-overview">https://www.energy.gov/lpo/articles/handout-title-17-guidance-overview</a>
<b>4 - Distributed and Community Solar</b>	Business Energy Investment Tax Credit (ITC)	Tax Credit to incentivize the installation of renewable energy systems, including anaerobic digesters	IRS	Tax credit - individual amounts vary based on sliding scale	Commercial, Industrial, Investor-Owned Utility, Local Government, Nonprofit, Cooperative Utilities, Schools, State Government, Agricultural, Institutional	<a href="#">DSIRE</a>
<b>4 - Distributed and Community Solar</b>	Increase in Energy Credit for Solar and Wind Facilities Placed in Service in Connection with Low-Income Communities	Provides an additional investment tax credit for small-scale solar and wind facilities in low-income communities	Department of the Treasury	6% of qualified investment 16% of qualified investment (in LIDAC community)	Solar and wind facilities with a maximum net output of less than 5 MW, including associated energy storage technology.	<a href="#">Increased energy investment credit for solar and wind facilities benefiting low-income communities   Internal Revenue Service</a>
<b>4 - Distributed and Community Solar</b>	Indiana Energy Independence Fund (IEIF) - Commercial	Green bank-style loans for EE/renewables; residential and commercial financing.	IEIF / NEIF partnership	2500-150000; \$500-\$50,000 (residential); commercial varies	businesses, nonprofits, govts	<a href="https://energyindependencefund.org/">https://energyindependencefund.org/</a>
<b>4 - Distributed and Community Solar</b>	Indiana Energy Independence Fund (IEIF) - Residential	Green bank-style loans for EE/renewables; residential and commercial financing.	IEIF / NEIF partnership	\$500-\$50,000; \$500-\$50,000 (residential); commercial varies	Homeowners	<a href="https://energyindependencefund.org/">https://energyindependencefund.org/</a>
<b>4 - Distributed and Community Solar</b>	Indiana Energy Property Tax Deduction (Solar)	Property tax deduction for solar energy systems in Indiana.	Indiana DLGF / County Auditors	Deduction applies to solar system value for property tax purposes.; Deduction (varies by system value)	Property owners installing solar	<a href="#">Untitled Page</a>
<b>4 - Distributed and Community Solar</b>	Renewable Electricity Production Tax Credit	PTC provides a corporate tax credit of up to 1.5 cents/kWh for electricity generated from landfill gas (LFG), open-loop biomass, municipal solid waste resources, and small irrigation power facilities, or up to 2.75 cents/kWh for electricity generated from wind, closed-loop biomass and geothermal resources	IRS	Tax credit - individual amounts vary based on sliding scale	Any producer of renewable electricity  Projects less than 1 MW in size are eligible if construction begins after December 31, 2021, and before January 1, 2025; projects above this size threshold can begin construction on or after January 30, 2023 (60 days after the labor-related guidelines were provided by the IRS) and no later than January 1, 2025.	<a href="#">Renewable Electricity Production Tax Credit Information   US EPA</a>
<b>4 - Distributed and Community Solar</b>	Solar Pilot (residential)	Pilot program to fund residential solar installations	City of Indianapolis, Solar United Neighbors	350000 total	Low/Middle-income Indianapolis homeowners	<a href="#">A new city program will provide free solar installations for low-income homes</a>
<b>4 - Distributed and Community Solar</b>	USDA REAP - Renewable Energy Systems	Grants & loan guarantees for farm/rural solar & EE.	USDA Rural Development	Grants up to 50% of eligible costs; RES grant cap often up to \$1,000,000; loan guarantees available.; 145000000	Ag producers; rural small businesses	<a href="https://www.rd.usda.gov/inflation-reduction-act/rural-energy-america-program-reap">https://www.rd.usda.gov/inflation-reduction-act/rural-energy-america-program-reap</a>

<b>4 – Distributed Solar and Wind</b>	Residential Clean Energy Tax Credit	Provides a 30% tax credit for residential solar PV, wind turbines, and battery storage installations through 2032, reducing up-front investment costs.	Internal Revenue Service (IRS)	30% of total project cost (no dollar cap)	Homeowners; residential property owners	<a href="https://www.irs.gov/credits-deductions/residential-clean-energy-credit">https://www.irs.gov/credits-deductions/residential-clean-energy-credit</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	\$45V Clean Hydrogen Production Credit	Tiered PTC per kg H2 based on lifecycle GHG, with PWA bonus.	IRS / U.S. Treasury	Up to ~\$3/kg (tiered) subject to strict eligibility.; \$/kg hydrogen (up to ~\$3/kg)	Hydrogen producers at qualified facilities	<a href="https://www.irs.gov/credits-deductions/clean-hydrogen-production-credit">https://www.irs.gov/credits-deductions/clean-hydrogen-production-credit</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Advanced Energy Project Credit	Projects that install technology to reduce emissions by 20% or more Tax credit equal to - 30% of qualified investment costs for projects that meet prevailing wage and apprenticeship requirements - 6% for projects that don't meet prevailing wage and apprenticeship requirements	US Department of Energy	6 - 30% of project cost	Project sponsors	<a href="https://www.irs.gov/credits-deductions/advanced-energy-project-credit">Advanced Energy Project Credit   Internal Revenue Service (irs.gov)</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	DOE Industrial Demonstrations Program (IDP)	First-of-a-kind industrial decarb demos in EITE sectors.	U.S. DOE OCED	Total program ~\$6B; individual selections range widely (tens-hundreds of millions).; Millions to hundreds of millions per project	Industrial facilities, consortia	<a href="https://www.energy.gov/oced/industrial-demonstrations-program-0">https://www.energy.gov/oced/industrial-demonstrations-program-0</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	DOE Industrial Efficiency & Decarbonization FOA	Fund R&D and pilots for industrial decarbonization technologies.	U.S. DOE IEDO	Example FOA ~\$104M total; cost share typically required.; Millions per topic area; 20-50% cost share typical	Industry, labs, universities, consortia	<a href="https://www.energy.gov/eere/iedo/industrial-efficiency-and-decarbonization-funding-opportunity-announcement">https://www.energy.gov/eere/iedo/industrial-efficiency-and-decarbonization-funding-opportunity-announcement</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Energy Efficient Commercial Buildings Tax Deduction	Provides a tax deduction for energy efficiency improvements to commercial buildings, such as improvements to interior lighting; heating, cooling, ventilation, and hot water; and building envelope.	Department of the Treasury	up to \$1 per square foot up to \$5 per square foot (if project meets wage and apprenticeship requirements)	Owners and long-term lessees of commercial buildings. Designers of energy efficient building property (architects, engineers). Tax-exempt owners of commercial properties, pending Treasury guidance on deduction allocation.	<a href="#">IRA Guidebook, pg 115</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Energy INsights		Indiana Economic Development Corporation			Minimal information on what the cost of items would be without funding
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Midwest Energy Efficiency Alliance Technical Assistance	Technical assistance for small/medium-size manufacturers aiming to adopt state of the art energy efficiency measures	US Department of Energy, MEEA	Technical Assistance, not direct grant/loan funding; Technical Assistance, not direct grant/loan funding	Small/Medium Manufacturers	<a href="#">Industrial   Midwest Energy Efficiency Alliance</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Purdue Industrial Assessment Center Follow-On grants	Grants to help with the implementation of recommendations made through ITAC and Combined Heat and Power Technical Assistance Partnership (CHP TAP) assessments since 2018, and in recommendations made in equivalent assessments since 2021.	DOE ITAC (Industrial Training and Assessment Centers)	50% cost share, up to 300,000 per recommendation	Qualifying* small and medium-sized US manufacturers, that received an ITAC, Onsite Energy/CHP TAP, or qualified equivalent assessment since 2018	<a href="#">IAC: Indiana University-Purdue University</a>
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	*Federal and state grants in this area are generally only for manufacturers or units of local government. Might be eligible for tax rebates through IEDC funded programs but would have to have a business case for adding additional employees & expanding out of the state - would need to work with IEDC officer (as this program already receives funding from IEDC) to confirm eligibility/amount					
<b>5- Industrial Energy Efficiency and Alternative Fuels</b>	Manufacturing Readiness Grants	Offers up to \$200,000 matching grants for manufacturers adopting energy-efficient or smart manufacturing technologies, supporting industrial decarbonization.	Conexus Indiana / Indiana Economic Development Corporation (IEDC)	Up to \$200,000 per grant (50% matching required)	Indiana manufacturers; small and mid-sized industrial firms	<a href="https://nineteen.us/new-energy-insights-program-in-partnership-with-iedc-and-aws-to-reduce-energy-costs-for-indiana-manufacturers/">https://nineteen.us/new-energy-insights-program-in-partnership-with-iedc-and-aws-to-reduce-energy-costs-for-indiana-manufacturers/</a>

6 - Enhance Green Spaces	Bridge Investment Program	The Bridge Investment Program will support projects to improve bridge and culvert condition, safety, efficiency, and reliability. Relevant for projects to replace or rehabilitate culverts to improve flood control and improve habitat connectivity for aquatic species	Department of Transportation Federal Highway Administration	Total Funding: \$ 9,701,000,000 Award Ceiling: \$80,000,000 Award Floor: \$50,000	1. A State or a group of States; 2. A metropolitan planning organization that serves an urbanized area (as designated by the Bureau of the Census) with a population over 200,000; <b>3. A unit of local government or a group of local governments;</b> 4. A political subdivision of a State or local government; 5. A special purpose district or a public authority with a transportation function; 6. A Federal Land Management Agency; 7. A Tribal government or a consortium of Tribal governments; and 8. A multistate or multijurisdictional group of entities as described above	<a href="https://grants.gov/search-results-detail/351567">grants.gov/search-results-detail/351567</a>
6 - Enhance Green Spaces	Brownfield Assessment Grants	Assessment Grants provide funding for a grant recipient to inventory, characterize, assess, conduct a range of planning activities, develop site-specific cleanup plans, and conduct community engagement related to brownfield sites.	EPA	up to \$500,000	state, county government, Indian Tribe	<a href="#">Website</a>
6 - Enhance Green Spaces	Brownfield Multipurpose Grants	Multipurpose Grant funds provide funding for communities to carry out a range of eligible assessment and cleanup activities, including planning and additional community engagement activities.	EPA	up to \$1,000,000	<a href="#">Eligibility   US EPA</a>	<a href="#">Multipurpose, Assessment, RLF, and Cleanup (MARC) Grant Application Resources   US EPA</a>
6 - Enhance Green Spaces	Community & Urban Forestry Grants	Yearly grant provided to help communities advance urban forestry goals. Projects supported include public tree inventories with urban forestry management plans, urban tree canopy assessments, storm response planning, tree planting, public and/or staff education, program outreach, and the establishment and strengthening of local urban forestry programs. Physical projects must be on public lands or in public rights-of-way.	Indiana Department of Natural Resources from United States Department of Agriculture Forest Service (USFS) Northeastern Area	Tree Inventory or Urban Tree Canopy Assessment <b>\$1,000</b> - \$20,000 Management/Response Plan <b>\$1,000</b> - \$8,000 Education/Training <b>\$1,000</b> - \$5,000 New Tree Planting <b>\$1,000</b> - \$10,000 Community Education/Awareness Events <b>\$1,000</b> - \$5,000	Local units of government or 501(c)(3) non-profit organizations	<a href="#">DNR: Forestry: Community &amp; Urban Forestry Grants (in.gov) Annual</a>
6 - Enhance Green Spaces	Conservation Reserve Program	CRP encourages agricultural producers and landowners to convert highly erodible and other environmentally sensitive acreage to vegetative cover, such as native grasses, trees, and riparian buffers.	USDA FSA	Annual rental payments (10-15 years) and cost share (up to 50%)	Agricultural producers and landowners with environmentally sensitive land that meets specific criteria related to cropping history and environmental characteristics are eligible.	<a href="#">Conservation Reserve Program (CRP)   Farm Service Agency</a>
6 - Enhance Green Spaces	CREP (Indiana)	Buffers/wetlands with annual rental + cost-share + practice incentives.	USDA FSA + ISDA	Annual rental rates + up to 50% cost-share + practice incentives; contract 10-15 yrs.	Farmers & landowners in eligible watersheds	<a href="https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/">https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/</a>
6 - Enhance Green Spaces	CREP (Indiana)	Buffers/wetlands with annual rental + cost-share + practice incentives.	USDA FSA + ISDA	Annual rental rates + up to 50% cost-share + practice incentives; contract 10-15 yrs.	Farmers & landowners in eligible watersheds	<a href="https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/">https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/</a>
6 - Enhance Green Spaces	CREP (Indiana)	Buffers/wetlands with annual rental + cost-share + practice incentives.	USDA FSA + ISDA	Annual rental rates + up to 50% cost-share + practice incentives; contract 10-15 yrs.	Farmers & landowners in eligible watersheds	<a href="https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/">https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/</a>
6 - Enhance Green Spaces	CREP (Indiana)	Buffers/wetlands with annual rental + cost-share + practice incentives.	USDA FSA + ISDA	Annual rental rates + up to 50% cost-share + practice incentives; contract 10-15 yrs.	Farmers & landowners in eligible watersheds	<a href="https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/">https://www.in.gov/isda/divisions/soil-conservation/conservation-reserve-enhancement-program/</a>

<b>6 - Enhance Green Spaces</b>	Environmental and Climate Justice Community Change Grants Program	The Community Change Grants will fund community-driven projects that address climate challenges and reduce pollution while strengthening communities through thoughtful implementation. These grants should also target achieving EPA goals like climate action, air pollution reduction, through measures such as Nature Based Solutions	U.S. Environmental Protection Agency, Office of Environmental Justice and External Civil Rights	Total Funding: \$2 billion Track I Lower Range = \$10,000,000 Track I: Award Ceiling = \$20,000,000 Track II: Award Ceiling = \$3,000,000	(1) a partnership between two community-based nonprofit organizations (CBOs) as defined below, or (2) a partnership between a CBO and one of the following: a federally recognized Tribe, a local government, or an institution of higher education. These	<a href="https://www.epa.gov/grants-and-cooperation/grants-and-cooperation-detail/351071">grants.gov/search-results-detail/351071</a>
<b>6 - Enhance Green Spaces</b>	EQIP (Indiana) - Woodland Restoration	Cost-share & technical assistance for conservation practices (woodland restoration, nutrient mgmt, cover crops, drainage water mgmt, precision).	USDA NRCS (Indiana)	State-specific payment schedules; cost-share % varies by practice; year-round signup with ranking dates.	Any landowner(individual or legal entity) managing land for agricultural, forest, or livestock production who meets AGI provisions	<a href="https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality">https://www.nrcs.usda.gov/programs/initiatives/environmental-quality-incentives-program/indiana/environmental-quality</a> <a href="https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx">https://www.nrcs.usda.gov/sites/default/files/2024-12/FY25%20EQIP%20Practice%20User%20Guide%20for%20Indiana.docx</a>
<b>6 - Enhance Green Spaces</b>	Farmable Wetlands Program	Provides annual rental payments and cost share for the restoration of wetlands	USDA FSA	Annual rental payments (10-15 years) and cost share (up to 50%)	Eligible applicants include farmers and landowners with land suitable for wetland restoration. The land must have been previously cropped and meet specific criteria for enrollment.	<a href="#">Farmable Wetlands Program (FWP)   Farm Service Agency</a>
<b>6 - Enhance Green Spaces</b>	Forest Service Urban and Community Forestry Challenge Cost Share Program	This year's Grant Program will focus on the following goals:  Goal 4 Strategy A: Action 1: Increase the biodiversity, health and resilience of trees in urban and community forests. Goal 5 Strategy A: Support the use of more locally grown, regionally adapted, insect and pest-resistant, and diverse native or site-appropriate species. Action 1: Facilitate funding to promote planting higher quality trees in urban forests with less emphasis on the quantity of trees planted (such as the published International Society of Arboriculture guidelines).	USDA	~\$1,000,000 per project	City or township governments State governments Native American tribal organizations (other than Federally recognized tribal governments) County governments Native American tribal governments (Federally recognized) Nonprofits having a 501(c)(3) status with the IRS, other than institutions of higher education Nonprofits that do not have a 501(c)(3) status with the IRS, other than institutions of higher education Public and State controlled institutions of higher education Special district governments Private institutions of higher education <b>Local governments may apply if their proposal includes other local governments</b>	NOFO
<b>6 - Enhance Green Spaces</b>	Landowner and Wildlife Habitat Assistance	The program reimburses a portion of the expenses incurred by a landowner for developing wildlife habitat as specified in a management plan. The program will reimburse the landowner for habitat development projects based on DFW habitat development reimbursement rates.	IN DNR	Reimbursement up to a limit	Landowner with 5+ acres	<a href="#">DNR: Fish &amp; Wildlife: Landowner and Wildlife Habitat Assistance</a>
<b>6 - Enhance Green Spaces</b>	Wetland Reserve Easements Agricultural Conservation Easement Program (ACEP)	Protection, restoration, and enhancement of wetlands or protection of working farms and ranches through conservation easements. This funding will support easements or interests in land that will most reduce, capture, avoid, or sequester carbon dioxide, methane, or nitrous oxide emissions.	National Resources Conservation Service US Department of Agriculture	Plans vary from 50 - 100% of the restoration costs Total Funding through 2031 is \$1.4 billion	Conservation entities, agriculture producers, farmers, ranchers, and forest landowners	<a href="#">Wetland Reserve Easements   Natural Resources Conservation Service (usda.gov)</a>
<b>6 - Enhance Green Spaces</b>	North American Wetlands Conservation Act (NAWCA) Grants	Competitive grants (up to \$1M) requiring 1:1 non-federal match to protect, restore, or enhance wetlands; applicable to Indiana conservation partnerships.	U.S. Fish & Wildlife Service (USFWS)	Small grants ≤\$250,000; Standard grants up to \$1,000,000; 1:1 match required	Local governments; land trusts; nonprofits; conservation partnerships	<a href="https://www.fws.gov/program/north-american-wetlands-conservation">https://www.fws.gov/program/north-american-wetlands-conservation</a>



<b>6 - Enhance Green Spaces</b>	Next Level Conservation Trust & Lake and River Enhancement (LARE) Program	Provides funding (up to 80% of project cost) for land acquisition and water quality projects including streambank reforestation and wetland restoration.	Indiana Department of Natural Resources (DNR)	Covers up to 80% of total project cost (requires 20% local match)	Local governments; land trusts; watershed groups; nonprofits	<a href="https://iaswcd.org/wp-content/uploads/sites/775/2024/07/LARE-Presentation-SWCD-July-22-2024_D.Nusbaum.pdf">https://iaswcd.org/wp-content/uploads/sites/775/2024/07/LARE-Presentation-SWCD-July-22-2024_D.Nusbaum.pdf</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	Charging and Fueling Infrastructure Discretionary Grant Program	CFI Program investments will make modern and sustainable infrastructure accessible to all drivers of electric, hydrogen, propane, and natural gas vehicles. This program provides two funding categories of grants: (1) Community Charging and Fueling Grants (Community Program); and (2) Alternative Fuel Corridor Grants (Corridor Program)	US Department of Transportation Federal Highway Administration	Total Funding: 700,000,000 Award Floor: 500,000 No ceiling	States or political subdivision of States <b>Metropolitan planning organizations</b> Unit of local governments Special purpose districts or public authorities with a transportation function, including port authorities Indian tribes U.S. Territories Authorities, agencies, or instrumentalities or entities owned by, one or more entities listed above Group of entities listed above State or local authorities with ownership of publicly accessible transportation facilities (applies to Community Program only)	<a href="https://www.fhwa.dot.gov/infrastructure/charging/">CFI - Environment - FHWA (dot.gov)</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT (EECBG) PROGRAM	Energy Efficiency and Conservation Programs for Buildings and Facilities	Indiana Office of Energy Development	Total Funding for Indiana: \$2.4 million Awarding: \$100,000-\$200,000	State, local government, tribes	<a href="https://www.energyefficiencyandconservationblockgrant.org/">Energy Efficiency and Conservation Block Grant Program   Department of Energy</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	FHWA NEVI (INDOT)	80/20 cost share to deploy DCFC along corridors in Indiana.	FHWA / INDOT	Indiana plan invests nearly \$100M across multiple rounds.	Up to 80% federal share; total ~\$100M to Indiana	<a href="https://chargingthecrossroads.com/">https://chargingthecrossroads.com/</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	FTA Low/No Emission (5339(c))	Bus purchase and facility upgrades for zero/low-emission fleets.	U.S. DOT FTA	FY amounts vary; e.g., FY25 joint NOFO ~\$1.5B total (Low-No ~\$1.1B).	Transit agencies; state/local govts; tribes	<a href="https://www.transit.dot.gov/lowno">https://www.transit.dot.gov/lowno</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	GOEVIN Charging Infrastructure Funding Opportunity	Funding for Level 2 Chargers	GOEVIN	3176000	Municipal and regional governments • Non-profit organizations • Public or private transportation providers • Educational institutions • Community-based organizations • Private companies with projects that directly support EV adoption or infrastructure	<a href="https://www.goevin.org/charging-infrastructure-funding-opportunity-selections">8.4.25 - GOEVIN Charging Infrastructure Funding Opportunity Selections</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	GOEVIN Charging Infrastructure Funding Opportunity	Funding for DCFC Chargers	GOEVIN	169000	Municipal and regional governments • Non-profit organizations • Public or private transportation providers • Educational institutions • Community-based organizations • Private companies with projects that directly support EV adoption or infrastructure	<a href="https://www.goevin.org/charging-infrastructure-funding-opportunity-selections">8.4.25 - GOEVIN Charging Infrastructure Funding Opportunity Selections</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	EPA Clean School Bus Program	Provides up to \$375,000 per electric school bus and charger to replace diesel buses nationwide; over \$11M has already supported Indiana school districts.	U.S. Environmental Protection Agency (EPA)	Up to \$375,000 per bus (plus charging equipment)	Public school districts; tribal schools	<a href="https://greaterindiana.com/clean-school-bus-rebates/">https://greaterindiana.com/clean-school-bus-rebates/</a>
<b>7 - Advanced Transportation Technology: Electric Vehicles, Charging Infrastructure, and Freight Efficiencies</b>	Indiana VW Mitigation Trust Program	Funds fleet electrification and EV infrastructure through settlement grants; \$6.15M allocated to expand charging and replace diesel vehicles statewide.	Indiana Department of Environmental Management (IDEM)	Up to 100% of incremental cost of EVs and charging; \$6.15M statewide total	State and local governments; transit agencies	<a href="https://www.4cleanair.org/volkswag-en_settlement_information/">https://www.4cleanair.org/volkswag-en_settlement_information/</a>
<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	Land & Water Conservation Fund (LWCF)	50% match grants for outdoor recreation acquisition/development.	U.S. DOI / Indiana DNR	Award sizes vary by round and state apportionment.; Often hundreds of thousands per project	Cities, towns, counties, park boards, tribes	<a href="https://www.in.gov/dnr/state-parks/recreation/grants/land-and-water-conservation-fund/">https://www.in.gov/dnr/state-parks/recreation/grants/land-and-water-conservation-fund/</a>

8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices	Bridge Investment Program	The Bridge Investment Program will support projects to improve bridge and culvert condition, safety, efficiency, and reliability. Relevant for projects to replace or rehabilitate culverts to improve flood control and improve habitat connectivity for aquatic species	Department of Transportation Federal Highway Administration	Total Funding: \$ 9,701,000,000 Award Ceiling: \$80,000,000 Award Floor: \$50,000	1. A State or a group of States; 2. A metropolitan planning organization that serves an urbanized area (as designated by the Bureau of the Census) with a population over 200,000; <b>3. A unit of local government or a group of local governments;</b> 4. A political subdivision of a State or local government; 5. A special purpose district or a public authority with a transportation function; 6. A Federal Land Management Agency; 7. A Tribal government or a consortium of Tribal governments; and 8. A multistate or multijurisdictional group of entities as described above	<a href="https://www.grants.gov/search-results-detail/351567">grants.gov/search-results-detail/351567</a>
8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices	Neighborhood Access and Equity Grant Program	Grants to implement context-sensitive projects that improve walkability and safety and provide affordable transportation access; mitigate or remediate negative impacts on the human or natural environment from a surface transportation facility in a disadvantaged or underserved community; and to implement planning and capacity building activities in disadvantaged or underserved communities.	Department of Transportation Federal Highway Administration	3205000000	(1) A state, unit of local government, political subdivision of a state, MPO, or U.S. territory; (2) Federally recognized Indian Tribe; (3) A special purpose district or public authority with a transportation function; or (4) A non-profit organization or institution of higher education that partners with an eligible entity described above to compete for grants for planning and capacity building activities in disadvantaged or underserved communities.	<a href="#">IRA Guidebook, pg 88</a>
8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices	Next Level Trails Grant Program	Next Level Trails has invested \$180 million – the largest infusion of State trail funding in Indiana history – toward the development of regionally and locally significant trails throughout Indiana.	Indiana Department of Natural Resources	\$200,000-\$5,000,000	State/Local Government/Tribes	<a href="#">Energy Efficiency and Conservation Block Grant Program   Department of Energy</a>
8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices	Energy Efficiency and Conservation Block Grant Program	Program is meant to <ul style="list-style-type: none"> <li>Reduce fossil fuel emissions in a manner that is environmentally sustainable and, to the maximum extent practicable, maximizes benefits for local and regional communities;</li> <li>Reduce the total energy use of the eligible entities;</li> <li>Improve energy efficiency in the transportation sector, the building sector, and other appropriate sectors;</li> </ul> Can be used for development and implementation of programs to conserve energy used in transportation, including development of infrastructure, such as bike lanes and pathways and pedestrian walkway.	Office of State and Community Energy Programs (DOE)	Indianapolis allocation: \$787,040	States District of Columbia any territory or possession of the United States <b>a unit of local government</b> a public agency or publicly chartered authority established by one or more States a special purpose district or public authority with a transportation function, including a port authority a Federally recognized Indian Tribe or a consortium of such Indian Tribes a transit agency a multi-State or multijurisdictional group of entities that are separately eligible	<a href="#">Revised draft for Front office 11/29 (transportation.gov)</a>

<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	BUILD - Better Utilizing Investments to Leverage Development Funding (DOT)	RAISE grants will be awarded on a competitive basis for planning or constructing surface transportation infrastructure projects that will improve safety; environmental sustainability; quality of life; mobility and community connectivity; economic competitiveness and opportunity including tourism; state of good repair; partnership and collaboration; and innovation. Meant for programs targeting regional transportation that will improve climate and sustainability	Office of the Secretary, US Department of Transportation	Total Funding: \$1.5B Annually Minimum grant award is \$5 million in urban areas and \$1 million in rural areas, maximum is \$25 million	States District of Columbia any territory or possession of the United States a unit of local government a public agency or publicly chartered authority established by one or more States a special purpose district or public authority with a transportation function, including a port authority a Federally recognized Indian Tribe or a consortium of such Indian Tribes a transit agency a multi-State or multijurisdictional group of entities that are separately eligible	<a href="#">Draft for Coordination (1/24)</a>
<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	Indiana Trails Program (ITP)	State grants reimbursing up to 80% of eligible trail project costs.	Indiana DNR	Request min \$100k, max \$400k; 20% local match required.; \$100k-\$400k (80% reimbursement)	Local units of government; eligible entities	<a href="https://www.in.gov/dnr/state-parks/recreation/grants/indiana-trails-program/">https://www.in.gov/dnr/state-parks/recreation/grants/indiana-trails-program/</a>
<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	Transportation Alternatives Program	provides funding for a variety of generally smaller-scale transportation projects such as pedestrian and bicycle facilities; construction of turnouts, overlooks, and viewing areas; community improvements such as historic preservation and vegetation management; environmental mitigation related to stormwater and habitat connectivity; recreational trails; safe routes to school projects; and vulnerable road user safety assessments; as well as shared micromobility projects	US Department of Transportation	Total funding: 1,439,435,472 Previous awards ranged from 5,300,000 - 113,000,000	Local units of government or 501(c)(3) non-profit organizations	<a href="#">Website</a>
<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	Reconnecting Communities and Neighborhoods Grant Program	Intended for planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities.	US Department of Transportation	Total Funding: \$1 billion over 5 years \$50 million for planning (maximum award amount is \$2 million), \$150 million for construction (minimum award amount is \$5 million) available for FY2024	The Facility Owner or Eligible applicants to Planning Grants may submit the application for a Capital Construction Grant, as long as the Owner of the eligible transportation facility is a joint applicant, with evidence of endorsing the application.	<a href="#">Reconnecting Communities and Neighborhoods Grant Program   US Department of Transportation</a>
<b>8 - Transportation Alternatives: Bicycles, Pedestrian Walkways, and Mobility Devices</b>	Safe Streets and Roads for All (SS4A) Grant Program	Implementation Grants target improving roadway safety, which can be done through infrastructure, behavioral, and/or operational activities. This can relate to upgrades/measures to improve pedestrian safety and reduce traffic deaths.	US Department of Transportation	Total Funding: \$5 billion, approx 3 billion left for future funding unclear what max is but projects seem to be between \$200,000 - 1,000,000	Counties, cities, towns, transit agencies, and other special districts that are political subdivisions of a State. Metropolitan planning organizations (MPOs). Federally recognized Tribal governments.	<a href="#">Safe Streets and Roads for All (SS4A) Grant Program   US Department of Transportation</a>
<b>9 - Waste to Energy</b>	Business Energy Investment Tax Credit (ITC)	Tax Credit to incentivize the installation of renewable energy systems, including anaerobic digesters	IRS	Tax credit - individual amounts vary based on sliding scale	Commercial, Industrial, Investor-Owned Utility, Local Government, Nonprofit, Cooperative Utilities, Schools, State Government, Agricultural, Institutional	<a href="#">DSIRE</a>
<b>9 - Waste to Energy</b>	Environmental and Climate Justice Community Change Grants Program	The Community Change Grants will fund community-driven projects that address climate challenges and reduce pollution while strengthening communities through thoughtful implementation. These grants should also target achieving EPA goals like climate action, air pollution reduction, through measures such as Nature Based Solutions	U.S. Environmental Protection Agency, Office of Environmental Justice and External Civil Rights	Total Funding: \$2 billion Track 1 Lower Range = \$10,000,000 Track I: Award Ceiling = \$20,000,000 Track II: Award Ceiling = \$3,000,000	(1) a partnership between two community-based nonprofit organizations (CBOs) as defined below, or (2) a partnership between a CBO and one of the following: a federally recognized Tribe, a local government, or an institution of higher education. These	<a href="https://grants.gov/search-results-detail/351071">grants.gov/search-results-detail/351071</a>
<b>9 - Waste to Energy</b>	EPA Solid Waste Infrastructure for Recycling (SWIFR)	Plan/design/build improvements to recycling & organics infrastructure.	U.S. EPA	Award ceilings vary by track; prior rounds funded multi-million awards. Often \$1M-\$10M per award (track dependent)	States, local govts, tribes, territories	<a href="https://www.epa.gov/circulareconomy/solid-waste-infrastructure-recycling-grant-program">https://www.epa.gov/circulareconomy/solid-waste-infrastructure-recycling-grant-program</a>

<b>9 - Waste to Energy</b>	Indiana Wastewater and Drinking Water State Revolving Fund	Provides low interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructure; includes treatment plant improvements and upgrades	US Environmental Protection Agency Administered by Indiana Finance Authority	No Amount Provided	Cities, towns counties, regional sewer/water districts, conservancy districts and water authorities	<a href="#">About the Clean Water State Revolving Fund (CWSRF)   US EPA</a>
<b>9 - Waste to Energy</b>	Investment Tax Credit for Energy Property	Provides a tax credit for investment in renewable energy projects. Bonus credits for project location within an "energy community" (brownfield site, etc)	Department of the Treasury	6% of qualified investment  16% of qualified investment (in energy community)  30% of qualified investment (energy comm and wage/apprenticeship requirements)	Fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, and combined heat and power properties.	<a href="#">IRA Guidebook, pg 14</a>
<b>9 - Waste to Energy</b>	Production Tax Credit for Electricity from Renewables	Provides tax credit for production of electricity from renewable energy. Bonus credits for project location within an "energy community" (brownfield site, etc)	Department of the Treasury	up to 2.75 cents/kWh, inflation adjusted 2022	Facilities generating electricity from wind, biomass, geothermal, solar, small irrigation, landfill and trash, hydropower, and marine and hydrokinetic renewable energy	<a href="#">IRA Guidebook, pg 13</a>
<b>9 - Waste to Energy</b>	Renewable Electricity Production Tax Credit	PTC provides a corporate tax credit of up to 1.5 cents/kWh for electricity generated from landfill gas (LFG), open-loop biomass, municipal solid waste resources, and small irrigation power facilities, or up to 2.75 cents/kWh for electricity generated from wind, closed-loop biomass and geothermal resources	IRS	Tax credit - individual amounts vary based on sliding scale	Any producer of renewable electricity  Projects less than 1 MW in size are eligible if construction begins after December 31, 2021, and before January 1, 2025; projects above this size threshold can begin construction on or after January 30, 2023 (60 days after the labor-related guidelines were provided by the IRS) and no later than January 1, 2025.	<a href="#">Renewable Electricity Production Tax Credit Information   US EPA</a>
<b>9 - Waste to Energy</b>	Rural Energy for America Program (REAP) Renewable Energy Systems Grants	Funds may be used for the purchase and installation of renewable energy systems, such as: Biomass (for example: biodiesel and ethanol, anaerobic digesters, and solid fuels). Geothermal for electric generation or direct use. Hydropower below 30 megawatts. Hydrogen. Small and large wind generation. Small and large solar generation. Ocean (tidal, current, thermal) generation.	USDA	Up to 75% cost share	Rural small businesses. Agricultural producers.	<a href="#">Rural Energy for America Program Renewable Energy Systems &amp; Energy Efficiency Improvement Guaranteed Loans &amp; Grants   Rural Development</a>
<b>9 - Waste to Energy</b>	Section 45Z Clean Fuel Production Tax Credit	Tax credit that subsidizes the production of any transportation fuel with zero or low lifecycle greenhouse gas (GHG) emissions, including renewable natural gas	IRS	Tax credit - individual amounts vary based on sliding scale	Any producer of clean fuels	<a href="#">The Section 45Z Clean Fuel Production Credit   Congress.gov   Library of Congress</a>
<b>9 - Waste to Energy</b>	Solid Waste Infrastructure for Recycling Grants for Political Subdivisions	Implement the "building a circular economy for all strategy series." Improve local post-consumer materials management programs, including municipal recycling. Make improvements to local waste management systems.	U.S. EPA	275000000	Political subdivisions of states and territories.	<a href="#">Solid Waste Infrastructure for Recycling Grants for Political Subdivisions   US EPA</a>
<b>9 - Waste to Energy</b>	USDA Rural Utilities Service – Electric Program (RUS)	Loans for generation & distribution (can include WTE/RNG interconnects).	USDA RUS	Large federal loan authority; interest & terms vary. Millions to hundreds of millions (loan)	Rural utilities, co-ops	<a href="https://www.rd.usda.gov/programs-services/electric-programs">https://www.rd.usda.gov/programs-services/electric-programs</a>
<b>9 - Waste to Energy</b>	Wastewater and Drinking Water Program	Intended for improving the quality of water and wastewater in Indiana and assisting in financing appropriate water and sewer infrastructure for communities and counties that have planned and set priorities for long-term development.	<a href="#">U.S. Department of Housing and Urban Development – Administered by IN OCRA</a>	<u>Funding range:</u> Projects over \$1 million: \$550,000 - \$700,000 Projects under \$1 million: \$500,000 - \$600,000	Communities	<a href="#">OCRA: Community Development Block Grants: Wastewater and Drinking Water Program</a>
<b>9 - Waste to Energy</b>	State Revolving Fund (SRF) Green Project Reserve	Offers low- or zero-interest loans for wastewater projects with renewable or energy-efficient components, such as anaerobic digesters producing biogas.	EPA / Indiana Finance Authority (IFA)	Low or zero-interest loans; up to 100% of eligible green project cost	Municipal utilities; wastewater utilities; local governments	<a href="https://www.in.gov/ifa/srf/files/SRF-GPR-Fact-Sheet-July-2021-so.pdf">https://www.in.gov/ifa/srf/files/SRF-GPR-Fact-Sheet-July-2021-so.pdf</a>

<b>10 - Landfill Waste Reduction and Diversion</b>	Community Recycling Grant Program	Projects that can be funded under this program include: education and promotion of recycling, source reduction, organics management (including yard waste management and composting), and household hazardous waste (HHW) collection and disposal.	IDEM	In 2022, \$513,593 was awarded total	Public/private businesses, solid waste management districts, local government, higher education institutions, and non-profit organizations located and doing business in Indiana	<a href="#">IDEM: Recycle Indiana: Indiana Community Recycling Grant Program</a>
<b>10 - Landfill Waste Reduction and Diversion</b>	EPA Recycling Education & Outreach (REO)	Education & outreach grants to improve recycling/composting behavior.	Award ceilings vary by round; example ceilings up to ~\$4M.	Up to several million per award	States, local govts, tribes, nonprofits, coalitions	<a href="https://www.epa.gov/circulareconomy/consumer-recycling-education-and-outreach-grant-program">https://www.epa.gov/circulareconomy/consumer-recycling-education-and-outreach-grant-program</a>
<b>10 - Landfill Waste Reduction and Diversion</b>	IDEM Recycling Market Development Program (RMDP)	Grants to expand recycling markets and processing/manufacturing capacity.	Indiana IDEM (RMDP)	\$2,000,000 total award in 2024, with 50,000-500,000 per grant generally	Public/private businesses, solid waste management districts, local government, higher education institutions, and non-profit organizations located and doing business in Indiana	<a href="https://www.in.gov/idem/recycle/recycling-market-development-program/">https://www.in.gov/idem/recycle/recycling-market-development-program/</a>
<b>10 - Landfill Waste Reduction and Diversion</b>	Solid Waste Infrastructure for Recycling Grants for Political Subdivisions	Implement the "building a circular economy for all strategy series." Improve local post-consumer materials management programs, including municipal recycling. Make improvements to local waste management systems.	U.S. EPA	275000000	Political subdivisions of states and territories.	<a href="#">Solid Waste Infrastructure for Recycling Grants for Political Subdivisions   US EPA</a>
<b>10 - Landfill Waste Reduction and Diversion</b>	USDA Composting & Food Waste Reduction (CFWR) Grants	Funds community composting and food waste diversion initiatives; Indiana municipalities can apply for grants between \$90K-\$300K.	U.S. Department of Agriculture (USDA) Office of Urban Agriculture	Typical range \$90,000-\$300,000 per project	Local governments; nonprofits; educational institutions	<a href="https://www.nrdc.org/bio/madeline-keating/usda-grants-food-waste-reduction">https://www.nrdc.org/bio/madeline-keating/usda-grants-food-waste-reduction</a>

# Appendix I. GHG Reduction and Cost Methodology Details

## MEASURE 1 – REDUCE NUTRIENT RUNOFF FROM CROPLANDS

### Greenhouse Gas Analysis

This measure estimates greenhouse gas (GHG) emissions reductions from the total number of crop acres across the Central Indiana region practicing no-till, cover cropping, and fertilizer management from the expansion of incentive programs. To calculate GHG reductions, baseline emissions reductions from current no-till, cover cropping and fertilizer management operations were subtracted from the GHG emissions reductions estimated for the CCAP implementation scenario. This analysis assumed that total cropland in Central Indiana decreases by 0.23% each year from 2022 through 2050, based on a 2024 analysis from The Ohio State University Department of Agricultural, Environmental and Development Economics<sup>175</sup>.

First, a baseline number of crop acres practicing no-till, cover cropping, and fertilizer management practices was calculated utilizing cropland acreage data from the Indiana Agriculture Census<sup>176,177,178</sup>. For the baseline calculation, it was assumed the 2022 proportion of no-till and cover cropping acres remained the same through 2050 but decreased in alignment with the Central Indiana cropland reduction rate described above. Second, this analysis estimated the number of acres practicing no-till and planting cover crops with CCAP implementation, assuming 65% of all planted acres practice no-till and 50% of all planted acres utilize cover crops by 2050, following a linear increase from 2026 values. Additionally, the total number of acres practicing fertilizer management by 2050 were calculated, assuming 50% of all

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<sup>175</sup> Agricultural Land Lost to Development in the Midwest. Mujahidul Islam, Ani Katchova, and Carl Zulauf. *Ohio State University Department of Agricultural, Environmental and Development Economics*. August 5, 2024. Retrieved from: <https://farmdocdaily.illinois.edu/2024/08/agricultural-land-lost-to-development-in-the-midwest.html#:~:text=Of%20the%20agricultural%20land%20in,Anderson%20MSA%20at%2061%2C919%20acres.>

<sup>176</sup> United States Department of Agriculture – Agricultural Statistics Service. 2022 Census of Agriculture – Table 1: County Summary Highlights 2022. Accessed August 2025. Retrieved from: [https://www.nass.usda.gov/Publications/AgCensus/2022/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Indiana/st18\\_2\\_04\\_1\\_001.pdf](https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_04_1_001.pdf)

<sup>177</sup> United States Department of Agriculture – Agricultural Statistics Service. 2022 Census of Agriculture – Table 41: Land Use Practices 2022 and 2017. Accessed August 2025. Retrieved from: [https://www.nass.usda.gov/Publications/AgCensus/2022/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Indiana/st18\\_2\\_04\\_1\\_044.pdf](https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_04_1_044.pdf)

<sup>178</sup> United States Department of Agriculture – Agricultural Statistics Service. 2022 Census of Agriculture – Table 40: Fertilizers and Chemicals Applied 2022 and 2017. Accessed August 2025. Retrieved from: [https://www.nass.usda.gov/Publications/AgCensus/2022/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Indiana/st18\\_2\\_04\\_0\\_040.pdf](https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Indiana/st18_2_04_0_040.pdf)

fertilized acres practice fertilizer conservation by 2050, following a linear increase from 2026 values. Third, the difference in acres practicing no-till, cover cropping and fertilizer management between the baseline and CCAP implementation scenario were calculated. Finally, annual CO<sub>2</sub> and N<sub>2</sub>O emissions reductions from the change in acres practicing no-till, cover cropping, and fertilizer conservation were calculated by multiplying annual changes in acres for each conservation practice by Central Indiana-specific emissions reduction factors from COMET Planner<sup>179</sup>.

## Cost Analysis

The costs for this measure include the cost of programs to incentivize the adoption of cover cropping, no-till agriculture, and fertilizer management practices that decrease nutrient runoff from croplands and reduce CO<sub>2</sub> emissions. The cost analysis only includes total costs incurred by implementing and supporting entities. This does not include the total cost to individual farmers (without incentives) to implement these programs. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify cost estimates for each program, data was gathered on the per-acre costs of similar programs in nearby states and localities. These programs included Clean Water Indiana funding, Iowa Department of Agriculture's Cover Crop Insurance discounts and Cost Share incentives, H2Ohio Best Management Practices funding, – sponsored by the Ohio Department of Agriculture – California's Fertilizer Research and Education Program, the U.S. Department of Agriculture's Environmental Quality Incentive Program (EQIP) and Conservation Stewardship Program (CSP). A reasonable per-acre cost for each program was selected based on the gathered data, and the relevant cost was multiplied by the total acres adopting the corresponding practice as calculated in the Greenhouse Gas Analysis.<sup>180</sup> Administrative costs

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<sup>179</sup> United States Department of Agriculture – Natural Resources Conservation Service & Colorado State University. COMET Planner. Accessed August 2025. Retrieved from: <http://comet-planner.com/>

<sup>180</sup> Building Indiana Business. 2024. Over 1.3 Million Awarded to Indiana Soil Conservation Districts and Organizations. Retrieved from: [Over 1.3 million awarded to Indiana soil conservation districts and organizations - Building Indiana Business](#)

California Department of Food and Agriculture. 2021. Fertilizer Research and Education Program. [Fertilizer Research and Education Program 2021 - California Grants Portal](#)

Clean Water Iowa. n.d. Cover Crop – Crop Insurance Discount Program. Retrieved from [Cover Crop - Crop Insurance Project — Clean Water Iowa](#)

Iowa Department of Agriculture and Land Stewardship. 2025. Secretary Naig Encourages Farmers to Sign-Up for Iowa's Cover Crop Cost-Share Program. Retrieved from: <https://iowaagriculture.gov/news/sign-up-cover-crop-cost-share>

Iowa State Extension Ag Decision Maker. n.d. Financial Support for Conservation Practices: EQIP and CSP. Retrieved from: [Financial Support for Conservation Practices: EQIP and CSP](#)

Natural Resources Conservation Service (NRCS). n.d. Conservation Stewardship Program. Retrieved from: [Conservation Stewardship Program | Natural Resources Conservation Service](#)

were assumed to be 10% of total program costs and have been added to program costs, resulting in the total costs.

## MEASURE 2 - ENERGY EFFICIENCY AND ELECTRIFICATION OF RESIDENTIAL, COMMERCIAL AND PUBLIC BUILDINGS

### Greenhouse Gas Analysis

This measure estimates GHG emissions reductions from the continuation and expansion of the reach of existing Central Indiana's residential, commercial, and public energy efficiency programs through 2050. It was determined that electrification of heating would not be included in the scope of this measure as it would incur a high cost of implementation relative to the associated GHG emissions reductions, due to the high carbon intensity of the regional grid.

NREL's ComStock and ResStock models<sup>181,182</sup> were used to generate the per-building electricity and fossil fuel percentage savings from retrofits, as well as the total Indiana building stock split into residential and commercial buildings. Retrofit savings values were rounded out with data generated from Alazazmeh and Azif (2021)<sup>183</sup>. The total residential and commercial building stock of Central Indiana was estimated by scaling down the total Indiana stock by the proportion of the state's population which resides in Central Indiana.

The buildings which have been covered by existing programs were estimated by dividing the total available funding for retrofits, by the approximate cost of a retrofit, separately for available residential and commercial programs. The retrofit cost was taken from estimates from the Indiana Energy Efficiency Fund<sup>184</sup>. In the modelling, all remaining residential and commercial

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O'Connor, Brian. 2022. No-Till Farmer: USDA to Spend \$1 Billion for Climate Funding, Including No-Till. Retrieved from: [USDA to Spend \\$1 Billion For Climate Funding, Including No-Till](#)

Ohio Department of Agriculture (ODA). 2025. H2Ohio & Agricultural BMPs Update. Retrieved from: [20250702 ODA Ohio DAP Workshop.pdf](#)

State Soil Conservation Board (SSCB). 2024. Board Meeting Packet. March 12, 2024. Retrieved from: [SSCB-packet-3.12.24.pdf](#)

<sup>181</sup> National Renewable Energy Laboratory. ComStock. Retrieved from:

[https://public.tableau.com/app/profile/comstock.nrel/viz/USBuildingTypologySegmentsCommercial\\_17116517041260/Segments](https://public.tableau.com/app/profile/comstock.nrel/viz/USBuildingTypologySegmentsCommercial_17116517041260/Segments)

<sup>182</sup> National Renewable Energy Laboratory. ComStock AMY2018 Release 2. Retrieved from:

[https://data.openei.org/s3\\_viewer?bucket=oedi-data-lake&prefix=nrel-pds-building-stock%2Fend-use-load-profiles-for-us-building-stock%2F2023%2Fcomstock\\_amy2018\\_release\\_2](https://data.openei.org/s3_viewer?bucket=oedi-data-lake&prefix=nrel-pds-building-stock%2Fend-use-load-profiles-for-us-building-stock%2F2023%2Fcomstock_amy2018_release_2)

<sup>183</sup> Alazameh & Asif. Commercial building retrofitting: Assessment of improvements in energy performance and indoor air quality. Case Studies in Thermal Engineering. 2021. Retrieved from:

[https://www.sciencedirect.com/science/article/pii/S2214157X2100109X?ref=pdf\\_download&fr=RR-2&rr=98ad97660a4da31b](https://www.sciencedirect.com/science/article/pii/S2214157X2100109X?ref=pdf_download&fr=RR-2&rr=98ad97660a4da31b)

<sup>184</sup> Indiana Chamber of Commerce. Indiana Energy Efficiency Fund Breakdown. 2024. Retrieved from:

<https://www.indianachamber.com/wp-content/uploads/2024/06/Kelleher.pdf>



buildings would undergo a retrofit before 2050. It is assumed that the savings from a retrofit persist through 2050.

## Cost Analysis

The costs for this measure include the cost for the expansion of existing programs to incentivize the installation of electric and hybrid heating systems and energy efficient retrofits for buildings. The cost analysis only includes total costs incurred by implementing and supporting entities. This does not include the total cost to building owners or tenants (without incentives) to implement these programs. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the cost to incentivize retrofits, this analysis used an existing program (Thriving Nonprofits) as an example for a potential commercial retrofit incentive program. This program provides grants up to \$10,000 along with a free energy assessment.<sup>185</sup> As this program only applies to nonprofit organizations, this per-retrofit cost was assumed to apply only to commercial buildings. For residential buildings, a comparison of total retrofit costs for commercial and residential buildings was conducted, and the \$10,000 commercial grant was adjusted to match the ratio of residential vs. commercial building retrofits.<sup>186</sup> This ultimately resulted in a residential cost-per-retrofit of \$2,708. Additional research was performed to calculate an estimated energy assessment cost for both commercial and residential buildings (\$0.325/sqft for commercial buildings, \$437 per assessment for residential buildings).<sup>187</sup>

Residential and commercial retrofit costs were each calculated by multiplying the relevant cost-per-retrofit by the total number of building retrofits completed in each given year. Residential energy assessment costs were calculated by multiplying the cost per assessment by the number of retrofits, given the assumption that each retrofit is preceded by an assessment. Commercial energy assessment costs were calculated by multiplying the assessment cost per square foot by a weighted average that determined a typical square footage per building. That product was multiplied by the number of buildings retrofitted.

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<sup>185</sup> City of Indianapolis and IFF. May 7, 2025. City of Indianapolis and IFF Launch New Energy Efficiency Program for Nonprofits in Marion County. Thrive Indianapolis. Retrieved from: [RELEASE: City of Indianapolis and IFF Launch New Energy Efficiency Program for Nonprofits in Marion County — Thrive Indianapolis](#)

<sup>186</sup> Ayman Alazazmeh, Muhammad Asif, Commercial building retrofitting: Assessment of improvements in energy performance and indoor air quality, Case Studies in Thermal Engineering, Volume 26, 2021. Retrieved from [Commercial building retrofitting: Assessment of improvements in energy performance and indoor air quality - ScienceDirect](#)

<sup>187</sup> Indiana Office of Energy Development. n.d. Indiana Energy Efficiency Fund Program Overview. Microsoft PowerPoint file.

Retrieved from: [Microsoft PowerPoint - Kelleher](#)

Radcliff, Maddie. August 13, 2025. Angi – How Much Does a Home Energy Audit Cost. Retrieved from: [How Much Does a Home Energy Audit Cost? \[2025 Data\] | Angi](#)

It was assumed that administrative costs for this program were 2% of total costs, and have been added to program costs, resulting in the total costs.

## MEASURE 3 - UTILITY-SCALE CLEAN ENERGY

### Greenhouse Gas Analysis

This measure estimates GHG emissions reductions via the expansion of the deployment of utility-scale solar and wind generation in Central Indiana, with wind generation restricted to the northern counties (Hamilton, Madison, and Boone).

Data on the historical uptake of utility-scale solar and wind in Central Indiana was taken from data reported by the EIA<sup>188</sup>, which provided information on annual installed capacity by county. Although Indiana has had steady growth in wind generation since 2011, there was no historical record of wind installations in the Central Indiana region. As a result, the weighted average annual proportion of solar capacity which was installed in the northern counties was taken as a proxy and combined with the average annual growth of wind in Indiana to determine potential uptake pathways, as described below in greater detail.

Historically (2011-2024), uptake of solar generation in Central Indiana totaled 11.32MW of new installed capacity each year, which has slowed slightly in recent years (2020-2024) to 8.33MW. The recent growth was taken to be the baseline case, with the incremental difference between the historical and recent trends (3MW per year) taken as the “additional” capacity incentivized by the program.

Brownfield sites in Central Indiana were an additional source of new solar capacity, with information on site location and parcel size taken from geospatial data published by the Indiana Department of Environmental Management<sup>189</sup>. A total of 14 parcels were identified in Central Indiana totaling approximately 3,600 square kilometers, with no action or financial support given to convert these into greenfield sites. NREL’s PVWatts tool<sup>190</sup> was used to estimate the available solar generation capacity at each specific brownfield site, which totals nearly 300MW in all Central Indiana. Of all available brownfield sites in Indiana, approximately 68% have been actioned in some way, with 14% having received financial assistance; it was determined that an ambitious 68% total potential brownfield solar capacity (198MW) would be developed in Central Indiana by 2050.

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<sup>188</sup> U.S. Energy Information Administration. EIA-860 data. 2024. Retrieved from: <https://www.eia.gov/electricity/data/eia860/>

<sup>189</sup> Indiana Department of Environmental Management. Brownfields. Updated September 29, 2025. Retrieved from: <https://gisdata.in.gov/portal/apps/mapviewer/index.html?layers=a4b0d447ed0d4835bfbbbc1999c8e099>

<sup>190</sup> National Renewable Energy Laboratory. PVWatts. Accessed from: <https://pvwatts.nrel.gov/>

Historical growth of new utility-scale wind generation in Indiana (2011-2024) totals on average nearly 190MW per year, which has declined in recent years (2021-2024) to 96MW per year. However, as none of this new wind capacity has been built in Central Indiana's northern counties, the percentage of Indiana's solar capacity built in these counties (24.5%) was used as a scaling factor to determine the percentage of new incremental wind capacity that could be developed in the region. As with solar, the recent trend in new installed wind capacity was taken as the baseline growth, with the incremental additional capacity relative to the overall historical trend taken as the "additional" capacity incentivized by the program. This additional capacity was further scaled down by 20% to account for resource constraints, resulting in an incremental annual growth of 12.4MW per year of new utility-scale wind capacity.

The additional installed capacity of solar and wind must integrate into MISO Central (MISO-C), the regional grid of which Central Indiana is a part. The forecasted installed generation capacity (MW) and total generation (MWh) by energy source of MISO-C was taken from EIA's 2023 Annual Energy Outlook<sup>191</sup>, using the No Inflation Reduction Act scenario. This enabled the calculation of the baseline grid intensity of electricity consumed in Central Indiana and the annual energy intensity (MWh/MW) of fossil fuel, solar and wind generation connected to the grid. In each year of the analysis, new additional solar and wind generation displaces fossil fuels, reducing the emissions of the electricity grid. The fossil fuel displacement coefficient of new solar and wind capacity was taken from Pata & Balcilar (2024)<sup>192</sup>, who estimated that, due to the variability of renewable generation, for every 1% increase in solar and wind capacity share, the fossil fuel capacity share is reduced by 0.524%. While the development of new renewable capacity by Central Indiana has a noticeable impact on emissions, it has a relatively small impact on the emissions intensity of the MISO-C grid due to its large size.

## Cost Analysis

The costs for this measure include the expansion of existing programs to incentivize the installation of utility-scale wind and solar generation capacity. The cost analysis only includes total costs incurred by implementing and supporting entities and Central Indiana localities. This does not include the total cost to build utility-scale wind and solar or connect it to the grid. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to incentivize the installation of utility-scale wind, the capital cost to install one MW of wind capacity was first adjusted by a wind-specific learning factor to simulate the decrease in capital cost over time. This learning factor allowed for the calculation a reasonable

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<sup>191</sup> U.S. Energy Information Administration. Annual Energy Outlook. 2023. Retrieved from: <https://www.eia.gov/outlooks/archive/aeo23/>

<sup>192</sup> Pata, S. & Balcilar, M. Decarbonizing energy: Evaluating fossil fuel displacement by renewables in OECD countries. Environmental Science and Pollution. 2024. Retrieved from: <https://link.springer.com/article/10.1007/s11356-024-33324-8>

cost-per-MW for each year in the analysis period. This per-MW cost was then multiplied by the total capacity installed in a given year, which was drawn from the calculations performed in the Greenhouse Gas Analysis.<sup>193</sup> This calculation was performed for utility-scale solar installation costs as well, using a solar-specific learning factor and the total capacity of solar installed in a given year.<sup>194</sup> Administrative costs were assumed to be 5% of the total program cost and have been added to program costs, resulting in the total costs.

## METHODOLOGY

### MEASURE 4 - DISTRIBUTED AND COMMUNITY SOLAR

#### Greenhouse Gas Analysis

This measure estimates GHG emissions reductions via the expansion of the deployment of distributed solar systems in Central Indiana. Data on historical uptake of distributed generation in Indiana was taken from the EIA, which provides the annual installed capacity (MW) and annual electricity sold to the grid (MWh) by distributed systems, for both metered and non-metered residential, commercial, and industrial customers. As net metering is no longer available to grid customers, the baseline growth in distributed solar for both metered and non-metered customers is assumed to match the historical trend of non-metered customers after 2025. The program implementation scenario continued the historical growth of metered customers after 2025. The additional uptake of solar was thus the difference in the metered capacity between the baseline and implementation scenarios.

The uptake of distributed solar was generated for the state of Indiana and disaggregated to Central Indiana by the proportion of the state's population which resides in Central Indiana. The total electricity generated by the new installed solar was estimated by calculating a weighted capacity factor from example projects provided as part of the PCAP analysis, which totaled 1,2800 MWh/MW, matching closely with publicly available data. The generated electricity was assumed to displace electricity that would otherwise have come from the MISO-C grid, and thus the distribution of MISO-C generation by fuel type was used to allocate the solar generation to fossil fuels and renewables. For example, the total distributed solar production in 2026 was

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<sup>193</sup> National Renewable Energy Laboratory (NREL). 2024. Land-Based Wind | Electricity | 2024 | ATB. Retrieved from: [Land-Based Wind | Electricity | 2024 | ATB | NREL](#)

Indiana State Utility Forecasting Group. 2024. Annual Report: Indiana Renewable Energy Resources Study. Retrieved from: [2024 Annual Report - Indiana Renewable Energy Resources Study.pdf](#)

<sup>194</sup> National Renewable Energy Laboratory (NREL). 2024. Utility-Scale PV | Electricity | 2024 | ATB. Retrieved from: [Utility-Scale PV | Electricity | 2024 | ATB | NREL](#)

Indiana State Utility Forecasting Group. 2024. Annual Report: Indiana Renewable Energy Resources Study. Retrieved from: [2024 Annual Report - Indiana Renewable Energy Resources Study.pdf](#)

allocated as follows: 50.4% to coal, 0.20% to petroleum fuels, 15.4% to natural gas, and 34% to renewables.

## Cost Analysis

The costs for this measure include the costs to incentivize the construction of distributed solar energy systems on residential, public, and commercial buildings. The cost analysis only includes total costs incurred by implementing and supporting entities. This does not include the total cost to install and maintain distributed solar energy systems. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to incentivize the construction of distributed solar, example projects were taken from the previously completed Priority Climate Action Plan (PCAP) for Central Indiana, covering residential, commercial, and industrial installations.<sup>195</sup> Using the total costs and total capacity for each project, a per-MW cost was derived. Each per-MW cost was then multiplied by the total MW capacity installed for the corresponding building type (residential, commercial, industrial) to find the total program cost for each year in the analysis period. Administrative costs were assumed to be 5% of total program costs, and have been added to program costs, resulting in the total costs.

## METHODOLOGY

## MEASURE 5 - INDUSTRIAL ENERGY EFFICIENCY AND ALTERNATIVE FUELS

## Greenhouse Gas Analysis

GHG emissions reductions for this measure were calculated by taking the BAU industrial electricity and natural gas consumption and applying 2030 and 2050 targets for energy use reductions, with a linear estimate applied to the intermediate years. Orvis et.al<sup>196</sup>, using the Energy Policy Simulator<sup>197</sup>, modeled tightening standards for industry, envisioning a 4 percent reduction in energy use by 2030 and reaching 14 percent in 2050. In the modeling, the same 4

<sup>195</sup> Gibson, London. 2019. IndyStar: A New City Program Will Provide Free Solar Installations for Low-Income Homes in 2020. Retrieved from: [A new city program will provide free solar installations for low-income homes](#)  
Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>196</sup> Orvis et.al. Closing the Emissions Gap Between the IRA and 2030 U.S. NDC: Policies to Meet the Moment.2022. Retrieved from: <https://energyinnovation.org/wp-content/uploads/Closing-The-Emissions-Gap-Between-IRA-And-NDC-Policies-To-Meet-The-Moment.pdf>

<sup>197</sup> Energy Innovation LLC. Energy Policy Simulator. Available at: <https://energypolicy.solutions/>

percent target was set for 2030, with a more ambitious target of 30 percent for 2050, based on the potential for energy management systems to reduce energy use in industrial facilities<sup>198</sup>.

## **Cost Analysis**

The costs for this measure include the expansion of existing programs to incentivize and facilitate the adoption of energy-efficiency retrofits at industrial facilities. The cost analysis only includes total costs incurred by implementing and supporting entities. This does not include the total cost to install these energy efficiency retrofits or any other associated costs. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to incentivize and facilitate energy efficiency retrofits at industrial facilities, a main program - Purdue Industrial and Assessment Center (PIAC) funding – was selected. This funding source offers up to 50% cost share for follow-on energy efficiency retrofits based on their assessment of a given facility.<sup>199</sup> Using examples from the PCAP, it was possible to determine a per-MWh and a per-MMBTU cost for both Purdue Industrial and Assessment Center audits and follow-on work grants.<sup>200</sup> PIAC cost share is limited to 50% of total costs of follow-on projects, so it was similarly assumed that PIAC would cover no more than 50% of the total decrease in energy consumption, with non-implementer funding – e.g. the industrial facilities themselves - covering the remaining 50%.

Once costs and cost share were determined, PIAC's cost-per-MWh-reduction was multiplied by its share of the total decrease in electricity consumption in industrial facilities calculated in the Measure 5 Greenhouse Gas Analysis, resulting in the total program cost for implementers to implement efficiency improvements to reduce electricity consumption. Similarly, the program's per-MMBTU-reduction cost was multiplied by its share of the total decrease in natural gas usage in industrial facilities calculated in the Greenhouse Gas Analysis to find the total cost of efficiency improvements leading to natural gas usage reductions. Administrative costs were assumed to be 5% of total program costs, and have been added to program costs, resulting in the total costs. Finally, electricity and natural gas efficiency improvements – both including administrative costs – were added together to generate a total cost for this measure.

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<sup>198</sup> U.S. Department of Energy. Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector. 2014. Retrieved from: <https://www.energy.gov/sites/default/files/2021-07/industrial-ee.pdf>

<sup>199</sup> Indiana University–Purdue University Indianapolis (IUPUI). n.d. About IAC. Retrieved from: [IAC: Indiana University-Purdue University](#)

<sup>200</sup> Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025.

Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>  
U.S. Energy Information Administration (EIA). n.d. Frequently Asked Questions (FAQs). Retrieved from: [Frequently Asked Questions \(FAQs\) - U.S. Energy Information Administration \(EIA\)](#)

## MEASURE 6 - ENHANCE GREEN SPACES

### Greenhouse Gas Analysis

This measure estimates carbon dioxide emissions reductions from the enhancement of green spaces through tree planting and wetland restoration across Central Indiana. To calculate emissions reductions in the CCAP implementation scenario, this analysis estimated carbon dioxide removed from wetlands restored and trees planted through the expansion of existing programs and the implementation of Central Indiana's proposed Open Space Revitalization and Connectivity Program<sup>201</sup>.

First, this analysis calculated total acreage of proposed wetlands and trees planted across the Central Indiana region utilizing data from the Priority Climate Action Plan<sup>202</sup> (PCAP) for proposed reforestation and restoration projects, including the Connor Prairie Reforestation and Wetland Enhancement Program, the Grassy Creek Trail project, and total funding offered through the proposed Regional Open Space Program. Second, this analysis calculated the total emissions reduced from wetland restoration by multiplying total acres restored by carbon dioxide removal factors from US Geological Service's Second State of the Carbon Cycle Report (Appendix 13B Supplement: Carbon Pools and Fluxes)<sup>203</sup> and tree planting using emissions factors derived from the PCAP's Connor Prairie Reforestation project<sup>204</sup>.

### Cost Analysis

The cost for this measure includes the cost share provided by existing programs to incentivize wetlands restoration and reforestation. The cost analysis only includes total costs incurred by implementing and supporting entities. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs of reforestation and wetlands restoration to implementers in Central Indiana, research was conducted to identify the total cost per acre to implement reforestation and wetland restoration efforts in similar regions and biomes to Central Indiana, as well as

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<sup>201</sup> Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>202</sup> Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>203</sup> United States Geological Service. Executive Summary: In Second State of the Carbon Cycle Report (SOCCR2): A Sustained Assessment Report. 2018. Accessed August 2025. Retrieved from: <https://pubs.usgs.gov/publication/70201999#:~:text=Abstract,1%2C%20p.>

<sup>204</sup> Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>



reasonable cost share percentages for governments looking to incentivize these programs.<sup>205</sup> The cost-share percentage selected was 50%, as that was by far the most common share.

To calculate total costs, the total acreage of wetlands restored - as calculated under the CCAP's Greenhouse Gas Analysis - was multiplied by the corresponding cost-per-acre and then adjusted by the cost-share percentage of 50%. Similarly, the total acreage of reforestation completed was multiplied by the cost-per-acre of reforestation, and then adjusted by the cost share percentage of 50%. Administrative costs were assumed to be 5% of total program costs, and have been added to program costs to calculate the total implementation cost.

## MEASURE 7 - ADVANCED TRANSPORTATION TECHNOLOGY: ELECTRIC VEHICLES, CHARGING INFRASTRUCTURE, AND FREIGHT EFFICIENCIES

### Greenhouse Gas Analysis

This measure estimates emissions reductions from the adoption of privately owned electric light duty vehicles (LDVs) as replacements for traditional gasoline LDVs and the adoption of heavy-duty freight vehicles incentivized by the construction of public electric vehicle (EV) charging infrastructure across Central Indiana. This measure also estimates emissions reductions from the conversion of the Central Indiana public LDV and bus fleet from fossil fuel to electric power.

First, this analysis calculated a baseline business-as-usual scenario for EV adoption, which assumed the rate of EV adoption in Central Indiana, as described in the Indiana Vehicle Fuel Dashboard<sup>206</sup> for 2024, remains constant through 2050, but is adjusted annually for population growth. Central Indiana annual baseline EV vehicle miles traveled (VMT) were then estimated using daily VMT data from the Federal Highway Administration for the Indianapolis MSA<sup>207</sup>.

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<sup>205</sup> Farm Service Agency (FSA). n.d. Conservation Reserve Program (CRP). Retrieved from: [Conservation Reserve Program \(CRP\) | Farm Service Agency](#)

Farm Service Agency (FSA). n.d. Farmable Wetlands Program (FWP). Retrieved from: [Farmable Wetlands Program \(FWP\) | Farm Service Agency](#)

Indiana Department of Natural Resources. n.d. Fish & Wildlife: Landowner and Wildlife Habitat Assistance. Retrieved from: [DNR: Fish & Wildlife: Landowner and Wildlife Habitat Assistance](#)

North Carolina Wildlife Resources Commission. n.d. USDA Wetlands Reserve Program. Retrieved from: [Wetlands Reserve Program | NC Wildlife](#)

U.S. Department of Agriculture, Economic Research Service. 2023. Costs of Restoring and Preserving Wetlands Vary across the United States. Retrieved from: [Costs of restoring and preserving wetlands vary across the United States | Economic Research Service](#)

Zambrano, Amanda, et al. 2023. Challenges to the Reforestation Pipeline in the United States. *Frontiers in Forests and Global Change*. Retrieved from: [Frontiers | Challenges to the Reforestation Pipeline in the United States](#)

<sup>206</sup> Indiana Vehicle Fuel Dashboard. Accessed August 2025. Retrieved from: <https://www.in.gov/oed/resources-and-information-center/vehicle-fuel-dashboard/>

<sup>207</sup> Office of Highway Policy Information. Highway Statistics Series. October 26, 2021. Accessed August 2025. Retrieved from: <https://www.fhwa.dot.gov/policyinformation/statistics/2020/hm71.cfm>



Emissions reductions for CO<sub>2</sub>, carbon monoxide (CO), NO<sub>x</sub>, and Particulate Matter 2.5 (PM<sub>2.5</sub>) from avoided gasoline LDV miles traveled were then calculated using emissions factors from the Bureau of Transportation Statistics<sup>208</sup>, projected through 2050. Emissions from EV grid electricity consumption during charging were calculated using average operational efficiency values for electric LDVs from the National Renewable Energy Laboratory (NREL)<sup>209</sup> and annual grid emissions factors projected by the project team for the business-as-usual scenario. Net emissions reductions were calculated for the baseline scenario by subtracting electricity consumption emissions from the emissions reductions of avoided LDV use.

Second, CCAP implementation emissions impacts were calculated by projecting electric LDV adoption using historical LDV data from the Indiana Vehicle Fuel Dashboard<sup>210</sup> and electric LDV adoption rates from the Indiana Department of Transportation<sup>211</sup>. The same methodology described above for baseline emissions was used to calculate emissions reductions for CO<sub>2</sub>, CO, NO<sub>x</sub>, and PM<sub>2.5</sub> in the CCAP implementation scenario. Emissions from EV grid electricity consumption were calculated using the same operational efficiency values from NREL,<sup>212</sup> but utilized annual grid emissions factors projected by the project team for the CCAP implementation scenario. To calculate net emissions reductions for the CCAP implementation scenario, net baseline emissions reductions were subtracted from net CCAP emissions reductions.

Third, this analysis calculated emissions reductions from converting publicly owned fossil fuel powered LDVs and buses in the Central Indiana region to electric vehicles. This analysis does not include publicly owned trucks due to current grid intensity projections, which would result in net-positive GHG emissions. This analysis assumed that 90% of publicly owned LDVs and 80% of buses are converted to electric. Total public LDV and bus fleet numbers were projected through 2050 using historical fleet data from the Federal Highway Administration,<sup>213</sup> and adjusting for projected population growth within the region.<sup>214</sup> Annual VMT was calculated for each vehicle

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<sup>208</sup> Bureau of Transportation Statistics. Estimated US Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric – Table 4-43. Accessed August 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-type-using-gasoline-and>

<sup>209</sup> Powell, Bonnie, Caley Johnson, Arthur Yip, and Amy Snelling. 2024. Electric Medium- and Heavy-Duty Vehicle Charging Infrastructure Attributes and Development. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5R00-91571. Accessed August 2025. Retrieved from: <https://docs.nrel.gov/docs/fy25osti/91571.pdf>

<sup>210</sup> Indiana Vehicle Fuel Dashboard. Accessed August 2025. Retrieved from: <https://www.in.gov/oed/resources-and-information-center/vehicle-fuel-dashboard/>

<sup>211</sup> <https://www.in.gov/indot/files/EV-Deployment-Plan.pdf>

<sup>212</sup> Powell, Bonnie, Caley Johnson, Arthur Yip, and Amy Snelling. 2024. Electric Medium- and Heavy-Duty Vehicle Charging Infrastructure Attributes and Development. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5R00-91571. Accessed August 2025. Retrieved from: <https://docs.nrel.gov/docs/fy25osti/91571.pdf>

<sup>213</sup> U.S DOT Federal Highway Administration. Highway Statistics Series Table MV-1: State Motor Vehicle Registrations. November 2024. Accessed August 2025. Retrieved from: <https://www.fhwa.dot.gov/policyinformation/statistics/2023/mv1.cfm>

<sup>214</sup> STATS Indiana. Indiana Population Projections. Accessed August 2025. Retrieved from: [https://www.stats.indiana.edu/pop\\_proj/](https://www.stats.indiana.edu/pop_proj/)

type using average VMT values from the DOE's Alternative Fuels Data Center.<sup>215</sup> Emissions reductions from avoided bus diesel consumption and LDV gasoline consumption were calculated using emissions factors from the Bureau of Transportation Statistics.<sup>216</sup> Grid emissions from EV charging were calculated using the methodology explained previously.

Fourth, emissions reductions from increased adoption of EV freight vehicles replacing traditional diesel vehicles in the Central Indiana region were calculated. Commercial VMT was projected through 2050 using historical commercial VMT data from the Indiana Department of Transportation (INDOT).<sup>217</sup> Baseline emissions reductions from freight EVs were calculated based on the 2022 EV market share value of 3%, which was assumed to remain constant through 2050 in the baseline scenario.<sup>218</sup> Using the medium uptake scenario EV market share values from INDOT's Electric Vehicle Plan,<sup>219</sup> commercial VMT from freight EVs was projected through 2050. The annual difference in CCAP implementation and baseline scenario VMT was multiplied by emissions factors from the Bureau of Transportation Statistics<sup>220</sup> to calculate CO<sub>2</sub>, CO, NO<sub>x</sub>, and PM<sub>2.5</sub> emissions reductions. Emissions from electricity use for EV charging were calculated using the methodology described previously. Net emissions were calculated by subtracting electricity use emissions from emissions reductions achieved through avoided fossil fuel consumption.

Total net emissions reduced were calculated by summing emissions reductions from public fleet conversion, privately owned LDEV adoption, and fleet EV adoption.

## Cost Analysis

The costs for this measure include the costs to incentivize the adoption of electric vehicles by installing public charging infrastructure, as well as the costs of converting public fleets and transit fleets to electric. The cost analysis only includes total costs incurred by implementing and

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<sup>215</sup> U.S DOE Alternative Fuels Data Center. Average Annual VMT traveled by Major Vehicle Category. September 2024. Accessed August 2025. Retrieved from: <https://afdc.energy.gov/data/widgets/10309#:~:text=World%20Resources%20Institute%20Electric%20School%20Bus%20Initiative%2C,Transit%20Association%27s%202022%20Public%20Transportation%20Fact%20Book>.

<sup>216</sup> Bureau of Transportation Statistics. Estimated US Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric – Table 4-43. Accessed August 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and>

<sup>217</sup> INDOT. Mileage and Daily VMT by year, County, City, and Functional Classification 2015-2024. Accessed August 2025. Retrieved from: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.in.gov%2Ffindot%2Ffiles%2FHistoricINVMTByCityandFunctionalClass-2015-.xlsx&wdOrigin=BROWSELINK>

<sup>218</sup> INDOT. Electric Vehicle Infrastructure Plan. 2024 Update. Accessed August 2025. Retrieved from: [https://chargingthecrossroads.com/wp-content/uploads/2024/11/INDOT\\_NEVI\\_2024\\_Annual\\_Plan\\_Update.pdf](https://chargingthecrossroads.com/wp-content/uploads/2024/11/INDOT_NEVI_2024_Annual_Plan_Update.pdf)

<sup>219</sup> INDOT. Electric Vehicle Infrastructure Plan. October 2023 Update. Accessed August 2025. Retrieved from: <https://www.in.gov/indot/files/EV-Deployment-Plan.pdf>

<sup>220</sup> Bureau of Transportation Statistics. Estimated US Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric – Table 4-43. Accessed August 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and>

supporting entities and Central Indiana localities. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to drive the installation of EV chargers, the cost-per-charger to install both Direct Current Fast Charging (DCFC) and L2 (Level 2) chargers was calculated, with the understanding that any grant support would likely take the form of a percentage of total cost.<sup>221</sup> Calculating the cost-per-charger, the total cost could then be calculated based on the number of chargers of each type installed in each year as calculated in the Greenhouse Gas Analysis. Using this total cost, a cost share of 20% was assumed in order to calculate the total implementer cost.

To quantify the costs to convert public fleets to EVs, the Project Team performed research to identify an average cost for an electric LDV, electric bus, and EV trucks.<sup>222</sup> Once this was calculated, average costs were multiplied by the number of vehicles of the corresponding type converted to EVs in each year to calculate the total conversion cost. These costs were then added together to calculate the total cost to convert public fleets.

For both above calculations, administrative costs were assumed to be 5% of program costs, and have been added to program costs, resulting in the total costs.

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<sup>221</sup> Nelder, Chris and Emily Rogers. 2023. Rocky Mountain Institute (RMI). Reducing EV Charging Infrastructure Costs. Retrieved from: [RMI-EV-Charging-Infrastructure-Costs.pdf](#)  
City of Greenfield, Indiana. 2024. Charging Greenfield Plan. January 30, 2024. Retrieved from: [Charging-Greenfield-Plan-2024-01-30.pdf](#)

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U.S. Department of Energy. 2025. GOEVIN Charging Infrastructure Funding Opportunity Selections. Retrieved from: [8.4.25 - GOEVIN Charging Infrastructure Funding Opportunity Selections](#)

<sup>222</sup> U.S. Department of Transportation. 2024. Implementation Challenges and Evolving Solutions for Rural Communities. Retrieved from: [Implementation Challenges and Evolving Solutions for Rural Communities | US Department of Transportation](#)  
Alternative Fuels Data Center, U.S. Department of Energy. 2023. Flipping the Switch on Electric School Buses: Cost Factors: Module 1. Retrieved from: [Alternative Fuels Data Center: Flipping the Switch on Electric School Buses: Cost Factors: Module 1 \(Text Version\)](#)

Advanced Clean Tech News for the Commercial Transport Sector. 2020. Calculating TCO for Medium and Heavy-Duty EVs to Find Cost Savings. Retrieved from: [Calculating TCO for Medium and Heavy-Duty EVs to Find Cost Savings](#)

Chase Bank. 2024. Electric Vehicle Costs. Retrieved from: [Electric Vehicle Costs | Chase.com](#)

## MEASURE 8 - TRANSPORTATION ALTERNATIVES: BICYCLES, PEDESTRIAN WALKWAYS, AND MOBILITY DEVICES

### Greenhouse Gas Analysis

This analysis calculated GHG emissions reductions from the expansion of single occupancy vehicle (SOV) transportation alternatives such as biking, walking, and micromobility programs. First, GHG emissions reductions from a baseline scenario were calculated for avoided gasoline vehicle VMT being replaced by biking and walking using travel and transportation data from IMPO's 2011 Central Indiana Travel Survey<sup>223</sup>. This analysis assumes that the frequency of bike use stays the same through 2050, the average distance an individual travels for a walking trip (10 minutes at 3mph) is 0.5 miles, and the average distance an individual travels for a bike trip (10 minutes of biking at 9-14mph) is 2 miles. Annual avoided LDV VMT was multiplied by emissions factors from The Bureau of Transportation Statistics<sup>224</sup> to calculate baseline CO<sub>2</sub>, CO, NO<sub>x</sub>, and PM<sub>2.5</sub> emissions reductions. The baseline scenario also includes a calculation of annual GHG reductions for Indy's Bikeshare program<sup>225</sup> using existing emissions reduction data. Total CO<sub>2</sub>, CO, NO<sub>x</sub>, and PM<sub>2.5</sub> emissions reductions for the baseline scenario were calculated by summing walking, biking, and Pacer Bikeshare emissions reductions.

Second, GHG emission reductions were calculated for avoided gasoline consumption from the increased prevalence of biking and walking using enhanced travel and transportation data from IMPO's 2011 Central Indiana Travel Survey<sup>226</sup>. This analysis assumes that the construction of bikeway and walkway infrastructure will incentivize individuals to use active transportation as an alternative to traditional gasoline LDV use. This analysis also assumes the percent of bike users that use their bike 7 times/week increases from 7.8% to 10%, the percent using their bike 2.5 times/week increases from 24% to 26%, the percent using their bike 1.25 times/week increases from 16.5% to 19%, the percent using their bike 0.25 times/week increases from 20% to 22%, and the percent using their bike 0 times/week decreases from 32% to 24%. This analysis assumed that these percentages increase linearly and max out in 2050. These assumptions are based on the rationale that with the expansion of the existing bike network and improved safety of biking infrastructure, more Central Indiana residents will opt to use biking as a preferred

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<sup>223</sup> Indianapolis Metropolitan Planning Organization. Central Indiana Travel Survey: Final Report. March 11, 2011. Accessed August 2025. Retrieved from: <https://d16db69sqbolil.cloudfront.net/mpo-website/downloads/Technical-Studies/Central Indiana Travel Survey 2008-2009.pdf>

<sup>224</sup> Bureau of Transportation Statistics. Estimated US Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric – Table 4-43. Accessed August 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-type-using-gasoline-and>

<sup>225</sup> Indiana Pacers Bikeshare. The Impact of Pacers Bikeshare. Accessed August 2025. Retrieved from: <https://pacersbikeshare.org/>

<sup>226</sup> Indianapolis Metropolitan Planning Organization. Central Indiana Travel Survey: Final Report. March 11, 2011. Accessed August 2025. Retrieved from: <https://d16db69sqbolil.cloudfront.net/mpo-website/downloads/Technical-Studies/Central Indiana Travel Survey 2008-2009.pdf>

method of transportation as well as for recreational purposes. The avoided LDV VMT was multiplied by emissions factors from The Bureau of Transportation Statistics<sup>227</sup> to calculate CCAP implementation emissions reductions. This analysis also assumed that there will be at least five total micromobility programs (incl. Pacers Bikeshare) in the Central Indiana region by 2050. Total emissions reductions for the CCAP implementation scenario were calculated by summing walking, biking, and micromobility program GHG emissions reductions.

To calculate net emissions reductions for the expansion of transportation alternatives, baseline emissions reductions were subtracted from CCAP implementation emissions reductions.

## **Cost Analysis**

The costs for this measure include the cost to incentivize the use of transportation alternatives including biking and walking through the expansion of the bike network, micromobility programs, and active transportation safety infrastructure. The cost analysis only includes total costs incurred by implementing and supporting entities and Central Indiana localities. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to implementing entities existing PCAP funding for walking and biking was utilized as a guide. In the PCAP, \$54,000,000 was noted as being available for active transportation infrastructure improvements.<sup>228</sup> After inflation-adjusting this from 2023 dollars to 2025 dollars, the total funding available was set at \$56,610,297. It was assumed that the funding available would be disbursed at a constant annual rate, so the annual disbursement rate necessary for the funding to last until 2050 was calculated by dividing the total funding by the total years in the analysis period. Administration costs were assumed to be 10% of program costs, and have been added to program costs, resulting in the total costs.

## **MEASURE 9 - WASTE TO ENERGY**

### **Greenhouse Gas Analysis**

This analysis calculated GHG emissions reductions from diverted landfill waste utilized for waste to energy systems and the installation of waste-to-energy (WTE) systems at select wastewater treatment plants (WWTPs) across the Central Indiana region.

First, baseline GHG emissions reductions were calculated from current waste to energy operations (currently representing the use of about 4.2% of total municipal solid waste (MSW))

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<sup>227</sup> Bureau of Transportation Statistics. Estimated US Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline, Diesel, and Electric – Table 4-43. Accessed August 2025. Retrieved from: <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-type-using-gasoline-and>

<sup>228</sup> Central Indiana Regional Development Authority. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from: <https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

produced in Indiana) based on GHG emissions reductions calculated for the WTE project outlined in the PCAP,<sup>229</sup> which assumed biogas was used as replacement for natural gas. Annual MSW totals were calculated using the method described in measure 10.

Second, annual MSW available for waste to energy systems was calculated based on an assumed waste diversion rate goal of 10% (excl. composting and recycling), which was derived from Indiana's goal recycling and diversion rate of 50%<sup>230</sup> (assumed 30% recycling, 10% composting, 10% other diversion). The amount of generated MSW used in waste-to-energy systems is currently around 4.2%, and this analysis assumed the region will increase this percentage at a linear rate to reach the diversion goal of 10% by 2050. Annual MSW totals were calculated using the method described in measure 10. To calculate emissions reductions, annual total MSW was multiplied by the new rate and the emissions reduction factor identified in the PCAP analysis<sup>231</sup> for waste-to-energy systems. Net emissions reductions were calculated by subtracting baseline emissions reductions from the CCAP implementation emissions reductions.

Third, this analysis estimated GHG emissions reductions from the installation of biodigesters on WWTPs in the Central Indiana region. Emissions reductions from the proposed Speedway WWTP digester project<sup>232</sup> were used to estimate potential emissions reductions if the Noblesville, Carmel, Lebanon, Belmont, and Southport WWTPs were to install similar systems on their facilities. The emissions reductions were scaled based on the daily flow of each WWTP<sup>233, 234, 235, 236</sup> compared to the Speedway WWTP<sup>237</sup>. This analysis assumed the Speedway WWTP project comes online in 2026, Noblesville and Carmel by 2030, Lebanon and Southport by 2035, and Belmont by 2040. This analysis also assumed a 20-year lifetime of WWTP biogas capture facilities.

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<sup>229</sup> CIRDA. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from:

<https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>230</sup> Indiana Department of Environmental Management. Indiana's Municipal Solid Waste Metrics Accessed August 2025.

Retrieved from: <https://www.in.gov/idem/recycle/recycling-activity-reporting/indianas-municipal-solid-waste-metrics/>

<sup>231</sup> CIRDA. Priority Climate Action Plan. February 2024. Accessed August 2025. Retrieved from:

<https://www.epa.gov/system/files/documents/2024-03/indianapolis-cprg-cirda-pcap-report.pdf>

<sup>232</sup> Daniel Lee. Speedway unveils utility partnership, plans to turn waste into power. July 30, 2025. *Indianapolis Business Journal*.

Accessed August 2025. Retrieved from: <https://www.ibj.com/articles/speedway-unveils-project-to-convert-waste-into-power>

<sup>233</sup> Noblesville, Indiana. Treatment Plant. Accessed August 2025. Retrieved from: <https://www.noblesville.in.gov/404/Treatment-Plant>

<sup>234</sup> City of Carmel Utilities. About Carmel Utilities. Accessed August 2025. Retrieved from: <https://carmelutilities.com/history/>

<sup>235</sup> Indiana State Revolving Fund. Environmental Assessment of Lebanon Utilities WWTP Improvements. May 16, 2025. Accessed August 2025. Retrieved from: <https://www.in.gov/ifa/srf/files/Lebanon-WWTP-Improvements-EA-w-FONSI-6.15.2025.pdf>

<sup>236</sup> Indiana Department of Environmental Management. Permit No. IN0023183 – Belmont and Southport Advanced WWTPs.

May 20, 2024. Accessed August 2025. Retrieved from: <https://2545024.fs1.hubspotusercontent-na1.net/hubfs/2545024/site/wastewater%20industrial%20pretreatment%20program/Indianapolis%20NPDES%20%20Permit%20IN0023183%20Final%202024.pdf>

<sup>237</sup> Town of Speedway. About the Wastewater Plant. Accessed August 2025. Retrieved from:

<https://www.speedwayin.gov/wastewater/pages/about-plant>



Total GHG emissions reductions for this measure are represented by the sum of net MSW-to-energy emissions reductions and WWTP digester project GHG emissions reductions.

## Cost Analysis

The costs for this measure include the cost to develop waste-to-energy facilities across Central Indiana. As local governments are the ones to shoulder the cost of constructing or retrofitting facilities to handle waste-to-energy generation, this cost analysis assumes that the total cost of installation is the same as the total implementer cost. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to install WTE facilities, this analysis differentiated between MSW facilities and WWTPs.

To quantify the costs for MSW facilities, the first step was to calculate the cents-per-kWh cost of operating an MSW WTE facility, as well as the expected kWh per ton of MSW converted to energy.<sup>238</sup> This allowed us to calculate the total cost per ton of MSW, which was then multiplied by the additional tons of MSW WTE in the CCAP - compared to BAU - as calculated in the Greenhouse Gas Analysis.

To quantify the costs for WWTP facilities, the Dillman plant in Bloomington, IN was used as an example plant.<sup>239</sup> Utilizing cost, capacity, and savings data, we were able to calculate a cost-per-MGD (million gallons per day) metric. Multiplying this metric by the total MGD capacity of WWTPs outfitted with digesters each year, we were able to calculate the total cost each year.

The above calculations for both MSW and WWTP costs generated cumulative costs for each year in the analysis period. Once these costs were calculated, the cumulative cost for each given year had the prior year's cumulative cost subtracted from it to find the incremental cost for each year. The incremental costs for MSW and WWTP WTE were then combined to find an overall

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<sup>238</sup> U.S. Department of Energy. 2019. Waste-to-Energy from Municipal Solid Wastes. Retrieved from: [Waste-to-Energy from Municipal Solid Wastes](#)

International Energy Agency (IEA). 2020. Sustainable Supply Potential and Costs – Outlook for Biogas and Biomethane: Prospects for Organic Growth. Retrieved from: [Sustainable supply potential and costs – Outlook for biogas and biomethane: Prospects for organic growth – Analysis - IEA](#)

Ahlm, P., Bocklund, K., Jordan, B., McFarlane, D., & Zaghdoudi, M. (n.d.). Anaerobic digestion evaluation study.

Recyclingandenergy.org. <https://recyclingandenergy.org/wp-content/uploads/2020/11/AnaerobicDigestionEvaluationStudy.pdf>

Kaplan, P. Ozge, Joseph Decarolis, Susan Thorneloe. 2009. Is It Better To Burn or Bury Waste for Clean Electricity Generation? Environmental Science & Technology. Retrieved from: [es802395e](#)

Mukherjee, C. J. Denney, E.G. Mbonimpa, J. Slagley, R. Bhowmik, 2019. [A review on municipal solid waste-to-energy trends in the USA - ScienceDirect](#)

<sup>239</sup> Kelson, Vic. 2020. Waste-to-Energy Memo. March 6, 2020. Retrieved from: [bloomington.in.gov/sites/default/files/2020-03/20200306\\_Waste-to-Energy\\_Memo.pdf](#)

incremental project cost. Administrative costs were assumed to be 5% of the total project cost, and have been added to project costs, to calculate the total implementer cost.

While not incorporated into total cost, additional adjustments include the savings from avoided costs of natural gas and electricity and income from biogas sales. These have all been added to the table separately for clarity. The avoided cost of electricity was calculated by taking the Dillman plant's total savings and total capacity, calculating a per-MGD savings metric, and multiplying it by the total MGD capacity outfitted with digesters each year. The avoided cost of natural gas was calculated by calculating the scf/hr per MGD capacity utilized for heating, multiplying it by the current cost of natural gas, and then multiplying by 8,760 – the number of hours in a year - to calculate annual savings.

Lastly, the income from biogas sales was calculated by subtracting the scf/hr per MGD utilized for heating from the total scf/hr per MGD, with the remaining scf/hr per MGD being biogas that could be sold. This was multiplied by the current cost per scf of natural gas and then multiplied by the total MGD capacity outfitted with anaerobic digesters in each year to find a total annual income.<sup>240</sup>

## MEASURE 10 - LANDFILL WASTE REDUCTION AND DIVERSION

### Greenhouse Gas Analysis

This analysis measured GHG emissions reductions for the diversion of waste from landfills as a result of expanded access to recycling and composting programs in the Central Indiana region.

First, baseline MSW generation across the Central Indiana region through 2050 was projected using the 2022 per capita MSW generation value<sup>241</sup> and annual projected population increase in central Indiana through 2050.<sup>242</sup> Total tonnage of recycled and landfilled materials by waste category were calculated using state level data.<sup>243</sup> Total tonnage of composted materials by waste category were calculated using national average values from the EPA.<sup>244</sup> Baseline

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<sup>240</sup> U.S. Energy Information Administration (EIA). 2024. Indiana Natural Gas Industrial Price (Dollars per Thousand Cubic Feet). Retrieved from: [Indiana Natural Gas Industrial Price \(Dollars per Thousand Cubic Feet\)](#)

<sup>241</sup> Indiana Department of Environmental Management. Indiana's Municipal Solid Waste Metrics Accessed August 2025. Retrieved from: <https://www.in.gov/idem/recycle/recycling-activity-reporting/indianas-municipal-solid-waste-metrics/>

<sup>242</sup> Indiana STATS. Indiana Population Projections. Accessed August 2025. Retrieved from: [https://www.stats.indiana.edu/pop\\_proj/](https://www.stats.indiana.edu/pop_proj/)

<sup>243</sup> Indiana Department of Environmental Management. 2022 Recycling Index Report. Accessed August 2025. Retrieved from: [https://www.in.gov/idem/recycle/files/reporting\\_recycling\\_2022\\_activity\\_report.pdf](https://www.in.gov/idem/recycle/files/reporting_recycling_2022_activity_report.pdf)

<sup>244</sup> U.S EPA. National Overview: Facts and Figures on Materials, Wastes, and Recycling. Accessed August 2025. Retrieved from: <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#:~:text=Over%20time%2C%20recycling%20and%20composting,to%2032.1%20percent%20in%202018.>



emissions for waste management were calculated using emissions factors from EPA's Waste Reduction Model (WARM).<sup>245</sup>

Second, GHG emissions were calculated for the CCAP implementation scenario, which assumes that Central Indiana will achieve Indiana's goal of 50% of total MSW recycled or diverted by 2050<sup>246</sup> (30% recycled, 10% composted, 10% other diversion). This analysis assumed that the goal is fully achieved by 2050 and annual percentages of MSW composted, recycled, and diverted increase linearly, based on current estimations. Annual waste tonnage from the baseline scenario is multiplied by the increased rates for recycled, composted, and diverted waste. The amount of waste generated by waste type and waste management method was calculated using percentages from the Indiana Department of Environmental Management (IDEM) and EPA, as described in the baseline scenario. GHG emissions from the increase in recycling, composting, and waste diversion were calculated using the emissions factors described in the baseline scenario.

Total annual net GHG emissions reductions were calculated by subtracting CCAP implementation scenario emissions from baseline emissions.

## Cost Analysis

The costs for this measure include the cost to reduce or divert waste from landfills and increase composting and recycling. The cost analysis only includes total costs incurred by implementing and supporting entities and Central Indiana localities. This does not include the entire cost to manage recycling or composting programs. An analysis of available funding opportunities to reduce overall costs can be found in the Funding Analysis section of this report.

To quantify the costs to reduce landfill waste via recycling, this analysis used the City of Indianapolis's contract with Lakeshore Recycling as a guide. The contract has a set price per unit per month.<sup>247</sup> With the contract applying to Districts 1-7 in Indianapolis, we were able to calculate the average number of units per person, which then allowed for the calculation the total number of units required for all of Central Indiana based on total population.<sup>248</sup> The total number of units was multiplied by the cost per unit per month, which was then multiplied by 12 to find the total cost per year for this program. To understand the measure's cost to accomplish

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<sup>245</sup> U.S EPA Office of Resource Conservation and Recovery. Documentation for GHG Emission and Energy Factors used in the Waste Reduction Model (WARM), Exhibits 6-18, 2-2, and 4-1. December 2023. Accessed August 2025. Retrieved from: [https://www.epa.gov/system/files/documents/2024-01/warm\\_management\\_practices\\_v16\\_dec.pdf](https://www.epa.gov/system/files/documents/2024-01/warm_management_practices_v16_dec.pdf)

<sup>246</sup> Indiana Department of Environmental Management. Indiana's Municipal Solid Waste Metrics. Accessed August 2025. Retrieved from: <https://www.in.gov/idem/recycle/recycling-activity-reporting/indianas-municipal-solid-waste-metrics/>

<sup>247</sup> Fox 59 News. 2024. New Trash Service Coming to Indy in 2026, with Curbside Recycling by 2028. Retrieved from: [New trash service coming to Indy in 2026, with curbside recycling by 2028 | Fox 59](#)  
WTHR. 2024. Curbside Recycling Coming to Indianapolis in 2028. Retrieved from: [Curbside recycling coming to Indianapolis in 2028](#)

<sup>248</sup> STATS Indiana. n.d. InDepth Profile. Retrieved from: [InDepth Profile: STATS Indiana](#)

the CCAP's goals, this total cost was adjusted by the increase in overall recycling from BAU to CCAP, and the difference in total cost was identified as the true implementer cost.

To quantify the costs to increase composting, research was performed to identify common rebate amounts utilized to incentivize the adoption of composting system. The most commonly utilized rebate was \$75, which was selected as the default incentive amount for this measure as well.<sup>249</sup> Using Indiana University research, we found that the average American creates 4.5 pounds (lbs) of waste per day, of which 28% is compostable.<sup>250</sup> Assuming composting requires the same number of units per person as was found for recycling, we were able to divide the metric by the waste created per person per day to find the amount of waste created per unit per day. That was then multiplied by 365 day to calculate the amount of waste composted per unit per year. Dividing the total composted waste in each given year by the amount per unit per year, we can calculate the total units adopted in each year. This was then multiplied by the per-unit rebate to calculate the total program cost.

For both the recycling program and the compost rebate program, administrative costs were assumed to be 5% of the program cost and have been added to program costs, resulting in the total costs.

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<sup>249</sup> City of Indianapolis, Office of Sustainability. 2024. Home Composting Program. Retrieved from: [Home Composting Program | zerowaste](#)

HOTBIN Composting. 2024. Home Composting Rebates. Retrieved from: [Home Composting Rebates – HOTBIN Composting US](#)

<sup>250</sup> Indiana University, Environmental Resilience Institute. 2024. Home Compost: Fact Sheets. Retrieved from: [Home Compost: Fact Sheets: Resources: Environmental Resilience Institute: Indiana University](#)