CLIMATE POLLUTION REDUCTION GRANTS PRIORITY ACTION PLAN FOR THE STATE OF TEXAS

Prepared for:
State and Local Climate Energy Program
U.S. ENVIRONMENTAL PROTECTION AGENCY

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EXECUTIVE SUMMARY

This Priority Action Plan (PAP) was developed by the Texas Commission on Environmental Quality (TCEQ) as part of the U.S. Environmental Protection Agency's (EPA) Climate Pollution Reduction Grants (CPRG) Phase I Planning Grant. Texas is highly committed to improving air quality and places a priority on reducing pollutants that have a direct health impact to Texans.

Priority measures were identified by TCEQ with extensive input from a variety of stakeholders. This PAP focuses on incentivized, voluntary measures with co-pollutant benefits from the three largest greenhouse gas (GHG) emitting sectors in Texas: industry, transportation, and electric power. Those three sectors emit almost 90% of the GHG emissions in Texas. Measures included in this plan are voluntary actions that are available statewide for implementation by eligible entities. TCEQ is the primary implementing agency for these measures.

Estimates show that implementation of these measures could reduce GHG emissions in Texas by 174 million metric tons (MMT) from 2025 through 2030 and 592 MMT from 2025 through 2050. Co-pollutants could also be reduced by 0.6 MMT from 2025 through 2030 and 3.0 MMT from 2025 through 2050. Measures by sectors are summarized below.

Industry Measures:

- Electrify industrial process equipment or modify to produce or use hydrogen;
- Promote energy efficiency;
- Decarbonize cement;
- Promote the improvement/expansion of carbon capture;
- Replace hydrofluorocarbon (HFC) with ultra-low global warming potential (GWP) refrigeration equipment;
- Replace pneumatic controllers, motors, and pumps, add surveillance, add monitoring, and remove redundant equipment to reduce fugitive emissions from oil and gas activities;
- Reduce flaring and capture methane from oil and gas activities; and
- Remediate and/or plug low producing and abandoned wells.

Transportation Measures:

- Decarbonize sea and inland ports and associated support equipment;
- Add infrastructure for electric vehicle (EV) charging and hydrogen fueling;
- Expand programs for zero emissions medium- and heavy-duty trucks;
- Incentivize school bus replacement with zero emission school busses;
- Expand rebate programs for light-duty zero emission vehicles;
- Create a medium- and heavy-duty third party scrappage program;
- Replace government fleets with zero emission vehicles;
- Decarbonize airports with lower emission support equipment and vehicles, and use of low emission jet fuels; and
- Promote low emission passenger or freight locomotives.

Electric Power Industry Measures:

- Upgrade transmission lines to improve capacity;

- Promote nuclear energy with molten salt reactors and modular reactors and promote geothermal energy by using oil and gas infrastructure;
- Add grid scale renewable energy storage;
- Lower demand with load shifting, load management, and energy efficiency; and
- Add infrastructure to capture, use, and store carbon from both power plants and industrial processes.

Other Measures:

- Create biofuels through methane capture from landfills and wastewater treatment plants, or by using surplus biomass;
- Combine solar arrays with biogas at closed landfills and add solar to commercial and residential buildings;
- Switch to electric heat pumps;
- Increase energy efficiency and weatherization in homes and commercial buildings;
- Support projects to increase recycling, reduce waste, increase composting, and add recycling infrastructure;
- Promote sustainable agriculture practices to reduce emissions and restoration of coastal landscapes to sequester carbon; and
- Reforest agriculture lands no longer in use, promote efficient pumps and irrigation systems in agriculture, and increase urban tree canopy.

These measures will provide cleaner air, improve health, improve quality of life, reduce heat risk, create jobs, mitigate extreme weather risks, and increase community engagement for all Texans including those in low income and disadvantaged communities (LIDACs). Texas will continue to seek input from both these communities and other stakeholders as more comprehensive plans are developed.

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LIST OF ACRONYMS

AR5	Fifth Assessment Report
BAU	business as usual
BC	black carbon
CAP	Comprehensive Action Plan
CCS	carbon capture and sequestration
CH_4	methane
CEJST	Climate Justice and Economic Screening Tool
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
CPRG	Climate Pollution Reduction Grants
EI	emissions inventory
EIA	United States Energy Information Administration
EPA	United States Environmental Protection Agency
EPA	Energy Policy Simulator
ERCOT	Electric Reliability Council of Texas
EV	electric vehicle
F-gasses	fluorinated gasses
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HGAC	Houston-Galveston Area Council
IPCC	Intergovernmental Panel on Climate Change
LIDAC	low income and disadvantaged community
LULUCF	land use, land use change, and forestry
MSA	metropolitan statistical area
MMT	million metric tons (MMT)
MSRP	manufacturer's suggested retail price
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NDC	Nationally Determined Contribution

NF_3	nitrogen trifluoride
NO_X	nitrogen oxides
NREL	National Renewable Energy Laboratory
OC	organic carbon
PAP	Priority Action Plan
PIS	policy implementation schedule
PM_{10}	coarse particulate matter
$PM_{2.5}$	fine particulate matter
PUC	Public Utility Commission of Texas
PV	photovoltaic
QAPP	Quality Assurance Project Plan
RMI	Rocky Mountain Institute
RRC	Railroad Commission of Texas
SECO	State Energy Conservation Office
SF_6	sulfur hexafluoride
SO_X	sulfur oxides
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality
TxDOT	Texas Department of Transportation
TWC	Texas Water Code
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
VOC	volatile organic compounds

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CHAPTER 1: INTRODUCTION

This Priority Action Plan (PAP) was developed by the Texas Commission on Environmental Quality (TCEQ) as part of the U.S. Environmental Protection Agency's (EPA) Climate Pollution Reduction Grants (CPRG) Phase I Planning Grant. Texas is highly committed to improving air quality and places a priority on reducing pollutants that have a direct health impact to Texans. As such, significant state resources have been and will continue to be directed toward compliance with the established National Ambient Air Quality Standard (NAAQS) as outlined under the federal Clean Air Act. While Texas remains focused on addressing compliance with health-based federal NAAQS, we acknowledge there are opportunities to implement strategies and measures that could result in a NAAQS and climate co-benefit.

The PAP supports investment in practices and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life for all Texans. The focus will be on incentivized, voluntary measures with co-pollutant benefits from the three largest greenhouse gas (GHG) emitting sectors in Texas: industry, transportation, and electric power. Measures included in this plan are voluntary actions that are available statewide for implementation by eligible entities.

This PAP is organized into six sections:

1. Introduction
2. Greenhouse Gas Emissions Inventory
3. Priority Measures
4. Low-Income/Disadvantaged Community Benefits Analysis
5. Review of Authority to Implement
6. Coordination and Outreach

CHAPTER 2: GREENHOUSE GAS EMISSIONS INVENTORY

2.1 TEXAS GREENHOUSE GAS EMISSION INVENTORY

TCEQ prepared a statewide emissions inventory (EI) of major sources of GHG emissions within Texas. This inventory was prepared using the existing state-level GHG EI developed by EPA (EPA 2023a). The methodology used to develop the inventory is consistent with the United Nations Framework Convention on Climate Change (UNFCCC) transparency reporting system guidelines (EPA 2023b). Detailed quality assurance procedures for preparation of this GHG EI are contained in TCEQ's Quality Assurance Project Plan (QAPP) (TCEQ 2023). The Texas GHG EI includes the emissions from the sectors and gasses outlined in Table 2-1.

Table 2-1: Sectors and Gasses Included in the Texas GHG EI

Sectors	Greenhouse Gases (across all sectors)
• Transportation • Electric power industry • Industry • Agriculture • Commercial • Residential • Natural and working lands	carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)

Table 2-2 details GHG emissions in million metric tons (MMT) of carbon dioxide equivalents (CO_2e) for all economic sectors. EPA used 100-year global warming potentials (GWPs) from the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment Report (AR5) to calculate CO_2e from non-CO_2 emissions (IPCC 2013). Although Texas has selected 2021 as the GHG EI base year, emissions from 2005 are also displayed for comparison purposes. The table shows a small overall increase in Texas GHG emissions from 2005 through 2021. While most sectors observed increases, the electric power industry sector saw a decrease of approximately 50 MMT CO_2e. The decrease in the electric power industry sector was mostly due to a transition from coal to natural gas power generation across the state. Three sectors account for most of the GHG emissions in Texas: industry, transportation, and the electric power industry.

Table 2-2: Texas GHG EI in MMT CO_2e by Economic Sector

Sector/Source	2005	2021
Transportation	**182.7**	**209.7**
CO_2 from Fossil Fuel Combustion	172.8	203.6
Substitution of Ozone Depleting Substances	6.3	3.7
Mobile Combustion	2.9	1.3
Non-Energy Use of Fuels	0.7	1.0
Electric Power Industry	**234.1**	**183.0**
CO_2 from Fossil Fuel Combustion	230.4	180.1
Stationary Combustion	2.5	2.3
Incineration of Waste	0.0	NO
Electrical Equipment	1.0	0.3
Other Process Uses of Carbonates	0.3	0.3
Industry	**320.2**	**364.2**
CO_2 from Fossil Fuel Combustion	151.4	169.0

Sector/Source	2005	2021
Natural Gas Systems	52.4	50.1
Non-Energy Use of Fuels	56.9	74.9
Petroleum Systems	21.5	25.0
Coal Mining	0.5	0.2
Iron and Steel Production	2.4	4.2
Cement Production	5.6	5.6
Substitution of Ozone Depleting Substances	0.7	3.5
Petrochemical Production	17.6	21.4
Lime Production	0.8	1.0
Ammonia Production	0.5	0.2
Nitric Acid Production	1.0	0.5
Abandoned Oil and Gas Wells	1.9	2.0
Wastewater Treatment	0.6	0.6
Urea Consumption for Non-Agricultural Purposes	0.3	0.4
Mobile Combustion	0.5	0.4
Abandoned Underground Coal Mines	NO	NO
Adipic Acid Production	1.6	0.6
Carbon Dioxide Consumption	0.1	0.4
Electronics Industry	1.0	1.6
N_2O from Product Uses	0.3	0.3
Stationary Combustion	0.4	0.3
Other Process Uses of Carbonates	0.3	0.3
Fluorochemical Production	NO	NO
Aluminum Production	0.5	NO
Soda Ash Production	NO	NO
Ferroalloy Production	NO	NO
Titanium Dioxide Production	NO	NO
Caprolactam, Glyoxal, and Glyoxylic Acid Production	0.6	0.5
Glass Production	0.2	0.1
Magnesium Production and Processing	NO	NO
Zinc Production	0.0	NO
Phosphoric Acid Production	0.0	NO
Lead Production	0.0	NO
Landfills (Industrial)	0.6	0.8
Carbide Production and Consumption	0.0	0.0
Agriculture	**61.7**	**62.0**
N_2O from Agricultural Soil Management	25.9	24.6
Enteric Fermentation	25.7	25.4
Manure Management	4.0	5.6
CO_2 from Fossil Fuel Combustion	4.3	4.7
Rice Cultivation	1.5	1.4
Urea Fertilization	0.1	0.2
Liming	NO	NO
Mobile Combustion	0.1	0.1
Field Burning of Agricultural Residues	0.1	0.1
Stationary Combustion	0.0	+
Commercial	**26.6**	**35.9**

Sector/Source	2005	2021
CO_2 from Fossil Fuel Combustion	10.6	13.4
Landfills (Municipal)	11.4	11.9
Substitution of Ozone Depleting Substances	1.8	7.5
Wastewater Treatment	2.5	3.0
Composting	0.2	0.1
Stationary Combustion	0.1	0.1
Anaerobic Digestion at Biogas Facilities	+	+
Residential	**12.9**	**18.3**
CO_2 from Fossil Fuel Combustion	12.0	12.2
Substitution of Ozone Depleting Substances	0.6	6.0
Stationary Combustion	0.2	0.1
Total Emissions (Sources)	**838.3**	**873.1**
Land Use, Land Use Change, and Forestry (LULUCF) Sector Net Total	**-52.1**	**-36.9**
Net Emissions (Sources and Sinks)	**786.2**	**836.2**

Note: Data from EPA's State-level GHG inventories file State-GHG_Trends_Emissions__Sinks_Economic_Sector_08312023.xlsx, accessed on October 30, 2023 (EPA 2023a). An NO in the table means the activity is not occurring and a "+" symbol indicates that the value does not exceed 0.005 MMT CO_2e.

Table 2-3 details emissions of specific GHGs across all sectors. The majority of GHG emissions in Texas, about 82%, are from CO_2. The second largest amount of GHG emissions, about 12%, are from CH_4. Although Texas has selected 2021 as the GHG EI base year, emissions from 2005 are also displayed for comparison purposes. From 2005 through 2021, CO_2 has increased, but CH_4 has decreased.

Table 2-3: Texas GHG EI in MMT CO_2e by Gas

Gas/Source	2005	2021
CO_2	**679.7**	**712.5**
Fossil Fuel Combustion	581.6	583.0
Electric Power Sector	230.4	180.1
Transportation	172.8	203.6
Industrial	155.7	173.6
Residential	12.0	12.2
Commercial	10.6	13.4
Non-Energy Use of Fuels	57.6	75.9
Natural Gas Systems	8.7	12.1
Cement Production	5.6	5.6
Lime Production	0.8	1.0
Other Process Uses of Carbonates	0.6	0.7
Glass Production	0.2	0.1
Soda Ash Production	NO	NO
Carbon Dioxide Consumption	0.1	0.4
Incineration of Waste	0.0	NO
Titanium Dioxide Production	NO	NO
Aluminum Production	0.3	NO
Iron and Steel Production & Metallurgical Coke Production	2.4	4.2
Ferroalloy Production	NO	NO
Ammonia Production	0.5	0.2
Urea Consumption for Non-Agricultural Purposes	0.3	0.4

Gas/Source	2005	2021
Phosphoric Acid Production	0.0	NO
Petrochemical Production	17.5	21.1
Carbide Production and Consumption	0.0	0.0
Lead Production	0.0	NO
Zinc Production	0.0	NO
Petroleum Systems	3.3	7.4
Abandoned Oil and Gas Wells	+	+
Magnesium Production and Processing	NO	NO
Coal Mining	0.0	0.0
Liming	NO	NO
Urea Fertilization	0.1	0.2
Substitution of Ozone Depleting Substances	+	+
*International Bunker Fuels***	16.0	12.3
*Wood Biomass, Ethanol, and Biodiesel Consumption**	9.0	15.8
CH_4	**108.7**	**103.4**
Stationary Combustion	0.5	0.4
Mobile Combustion	0.4	0.3
Coal Mining	0.5	0.2
Abandoned Underground Coal Mines	NO	NO
Natural Gas Systems	43.7	38.0
Petroleum Systems	18.2	17.6
Abandoned Oil and Gas Wells	1.9	2.0
Petrochemical Production	0.1	0.3
Carbide Production and Consumption	NO	NO
Iron and Steel Production & Metallurgical Coke Production	+	+
Ferroalloy Production	NO	NO
Enteric Fermentation	25.7	25.4
Manure Management	2.4	3.3
Rice Cultivation	1.5	1.4
Field Burning of Agricultural Residues	0.0	0.0
Landfills	12.0	12.7
Wastewater Treatment	1.7	1.7
Composting	0.1	0.0
Anaerobic Digestion at Biogas Facilities	+	+
Incineration of Waste	+	NO
*International Bunker Fuels***	0.0	0.0
N_2O	**38.3**	**34.6**
Stationary Combustion	2.5	2.3
Mobile Combustion	3.2	1.5
Adipic Acid Production	1.6	0.6
Nitric Acid Production	1.0	0.5
Manure Management	1.6	2.3
Agricultural Soil Management	25.9	24.6
Field Burning of Agricultural Residues	0.0	0.0
Wastewater Treatment	1.4	1.9
N_2O from Product Uses	0.3	0.3
Caprolactam, Glyoxal, and Glyoxylic Acid Production	0.6	0.5
Incineration of Waste	+	NO

Gas/Source	2005	2021
Composting	0.1	0.0
Electronics Industry	0.0	0.1
Natural Gas Systems	+	+
Petroleum Systems	+	0.0
*International Bunker Fuels***	0.1	0.1
HFCs, PFCs, SF_6 and NF_3	**11.5**	**22.6**
HFCs	9.5	20.9
Substitution of Ozone Depleting Substances	9.4	20.7
Fluorochemical Production	NO	NO
Electronics Industry	0.0	0.1
Magnesium Production	NO	NO
PFCs	0.8	1.0
Aluminum Production	0.1	NO
Electronics Industry	0.7	1.0
Electrical Equipment	NO	NO
Substitution of Ozone Depleting Substances****	+	+
SF_6	1.2	0.4
Electrical Equipment	1.0	0.3
Electronics Industry	0.2	0.1
Magnesium Production	NO	NO
NF_3	0.1	0.3
Electronics Industry	0.1	0.3
Total (Sources) Emissions	**838.3**	**873.1**
LULUCF Emissions***	**5.5**	**5.2**
LULUCF CH_4 Emissions	5.4	5.1
LULUCF N_2O Emissions	+	0.1
LULUCF Carbon Stock Change****	**-57.5**	**-42.1**
LULUCF Sector Net Total*****	**-52.1**	**-36.9**
Net Emissions (Sources and Sinks)	**786.2**	**836.2**

Note: Data from EPA's State-level GHG inventories file State-GHG_Trends_Emissions__Sinks_By_Gas_08312023.xlsx, accessed on October 30, 2023 (EPA 2023a). An NO in the table means the activity is not occurring and a "+" symbol indicates that the value does not exceed 0.005 MMT CO_2e.

*Emissions from Wood Biomass, Ethanol, and Biodiesel Consumption are not included specifically in summing Energy sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in the estimates for Land Use, Land-Use Change, and Forestry.

**Emissions from International Bunker Fuels are not included in totals.

***LULUCF emissions of CH_4 and N_2O are reported separately from gross emissions totals. LULUCF emissions include the CH_4, and N_2O emissions from Peatlands Remaining Peatlands; CH_4 and N_2O emissions reported for Non-CO_2 Emissions from Forest Fires, Non-CO_2 Emissions from Grassland Fires, and Coastal Wetlands Remaining Coastal Wetlands; CH_4 emissions from Land Converted to Coastal Wetlands; Flooded Land Remaining Flooded Land, and Land Converted to Flooded Land; and N_2O emissions from Forest Soils and Settlement Soils.

****Small amounts of PFC emissions also result from this source.

***** LULUCF Carbon Stock Change is the net C stock change from the following categories: Forest Land Remaining Forest Land, Land Converted to Forest Land, Cropland Remaining Cropland, Land Converted to Cropland, Grassland Remaining Grassland, Land Converted to Grassland, Wetlands Remaining Wetlands, Land Converted to Wetlands, Settlements Remaining Settlements, and Land Converted to Settlements.

******The LULUCF Sector Net Total is the net sum of all CH_4 and N_2O emissions to the atmosphere plus net carbon stock changes.

2.2 HIGHEST EMITTING SECTORS

When examining GHG emissions by economic sector, three sectors account for 87% of the total GHG emissions in Texas for 2021. Those sectors, as shown in Figure 2-1, are industry, transportation, and electric power industry. Fossil fuel combustion is the largest individual source of GHG emissions in Texas and accounts for about 67% of GHG emissions no matter the economic sector. Fossil fuel combustion accounts for 99% of GHG emissions in the electric power industry sector, 97% of emissions in the transportation sector, and 46% of emissions in the industrial sector. For the electric power industry, 98% of the GHG from fossil fuel combustion is from electricity generation using coal and natural gas. For the transportation sector, 91% of the fossil fuel combustion is from petroleum combustion.

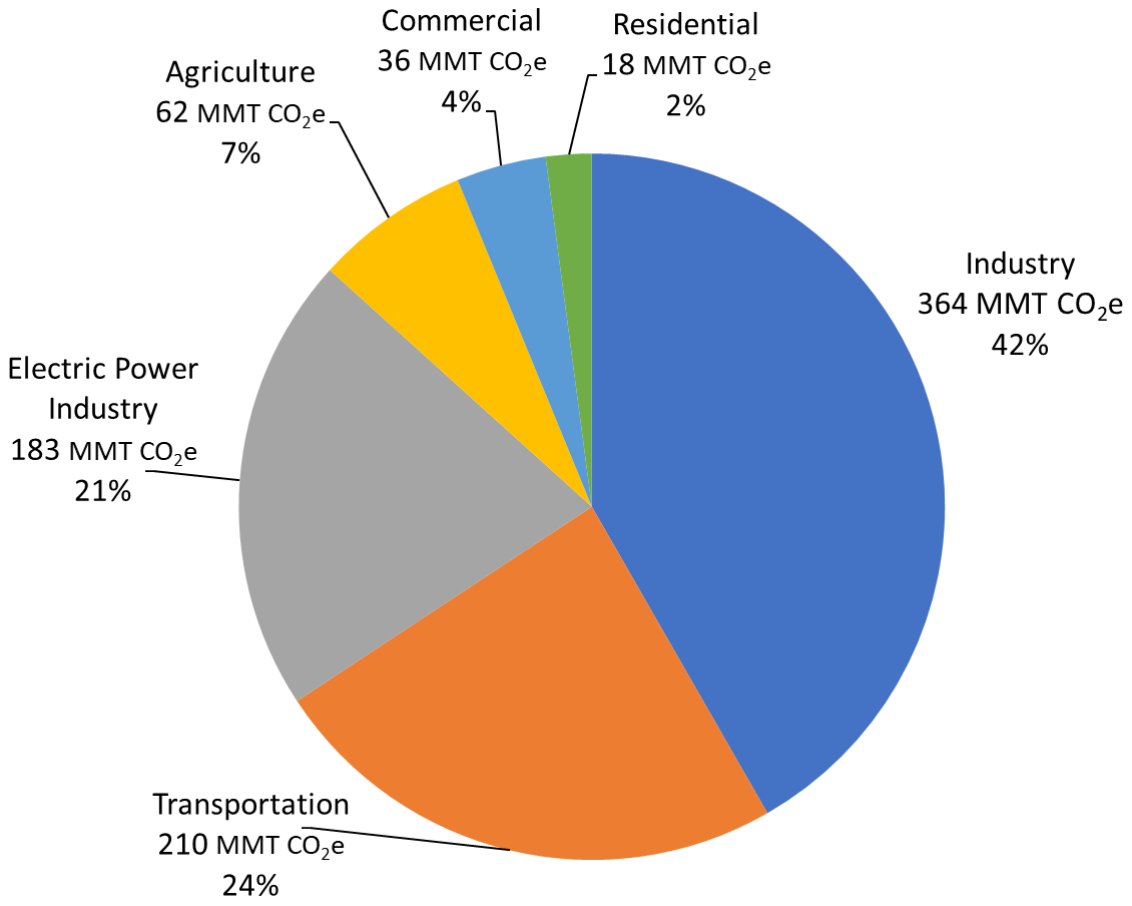

Figure 2-1: 2021 Texas GHG Emissions by Economic Sector

Since only 46% of industrial GHG emissions are from fossil fuel combustion, sources from that sector were further examined. The breakdown of GHG emissions in the industrial sector are shown in Figure 2-2. The breakdown shows that fossil fuel combustion, non-energy use of fuels, natural gas systems, petroleum systems, and petrochemical production account for 93% of GHG emissions in the industrial sector.

Emissions from fossil fuel combustion are mostly from the burning of petroleum and natural gas. This source category includes emissions from mobile agricultural equipment. Non-energy use of fuels is not broken down into further source categories,

but it includes emissions from fuels used as feedstock, non-energy refinery and coke oven production, and use of solid carbon for metal and inorganic chemical production. Emissions from natural gas systems includes fugitive emissions from distribution, processing, production, exploration, transmission, and storage of natural gas. Natural gas systems emissions are composed mostly of methane emissions from natural gas production and exploration. Emissions from petroleum systems includes fugitive emissions from exploration, production, refining, and transport of petroleum. Like with natural gas systems, GHG emissions from petroleum systems are mostly methane from production and exploration of petroleum. Emissions from petrochemical production is composed of emissions from the production of acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, and methanol. Emissions in this source category are mostly CO_2 emissions from ethylene production.

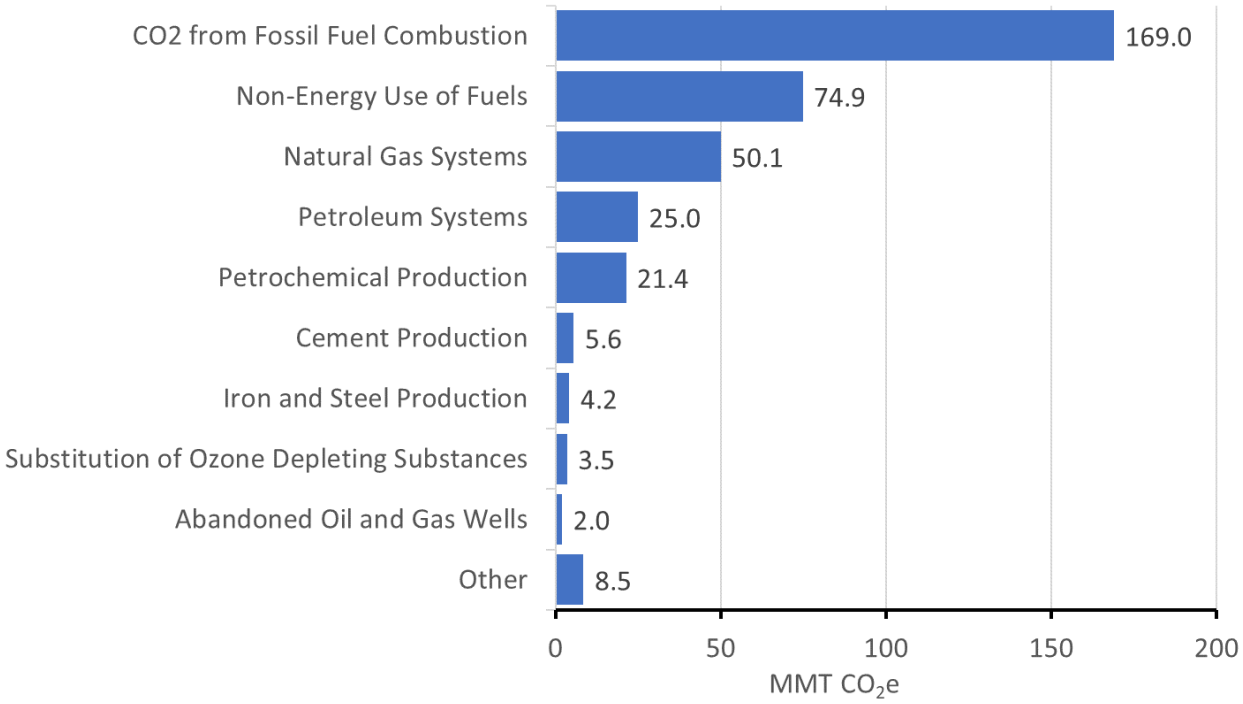

Figure 2-2: 2021 Texas GHG Emissions from the Industry Sector

2.3 EI IMPROVEMENT

Although the EPA-developed GHG EI has undergone years of improvement, there are areas specific to Texas that can be improved. The industry sector has been identified during development of this plan as an area for improvement. TCEQ plans to develop a comprehensive statewide GHG inventory as part of the Comprehensive Action Plan (CAP), due to EPA in July of 2025.

CHAPTER 3: PRIORITY MEASURES

The measures in this section have been identified by TCEQ, with input from a variety of stakeholders, as "priority measures" for Texas. Most priority measures in Texas will focus on incentivized, voluntary measures that cover the three economic sectors that produce the most GHG emissions in the state: industry, transportation, and electric power industry.

These measures may be used to pursue funding through the implementation phase of the CPRG program by the state of Texas or another eligible entity. This list is not exhaustive of Texas' priorities or programs and Texas may elect to not apply for funding for every measure included in this plan. The selected priority measures included in this PAP meet the following criteria:

- The measure is implementation ready, meaning that the design work for a program or project associated with the measure is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application;
- The measure can be completed in the near term, meaning that all funds will be expended, and the project completed, within the five-year performance period for the CPRG implementation grants; and
- The measure produces reductions of both ground-level air pollution and GHG emissions, increasing the number of quality jobs, and increases economic opportunity in the state of Texas.

TCEQ used the Energy Policy Simulator tool to estimate GHG emission reductions in CO_2e (Energy Innovation and RMI 2024). Estimates show that implementation of these measures could reduce GHG emissions by 174 MMT from 2025 through 2030 and 592 MMT from 2025 through 2050. The Energy Policy Simulator tool also provided quantified emission changes of nitrogen oxide (NO_X), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), black carbon, organic carbon, volatile organic compounds (VOC), sulfur oxides (SO_X), and carbon monoxide (CO). Estimates show total co-pollutant reductions of 0.6 MMT from 2025 through 2030 and 3.0 MMT from 2025 through 2050.

Estimates of emission reductions for individual co-pollutants are shown in Table 3-1. Estimates show large reductions in ozone precursors (NO_X and VOC), which total 0.2 MMT from 2025 through 2030 and 1.2 MMT from 2025 through 2050. Pollutants that contribute to secondary $PM_{2.5}$ formation (NO_X, black carbon, organic carbon, and SO_X) show a total decrease of 0.2 MMT from 2025 through 2030 and 0.8 MMT from 2025 through 2050.

Table 3-1: Co-Pollutant Reductions from Priority Measures

Co-Pollutant	2025-2030 Cumulative Reduction (metric tons)	2025-2050 Cumulative Reduction (metric tons)
NO_X	130,810	673,810
$PM_{2.5}$	8,838	47,304
PM_{10}	11,516	78,571
Black Carbon	1,197	6,628

Co-Pollutant	2025-2030 Cumulative Reduction (metric tons)	2025-2050 Cumulative Reduction (metric tons)
Organic Carbon	3,273	15,378
VOC	93,420	560,666
SO_X	18,203	122,715
CO	307,981	1,471,422

Appendix A to this PAP provides additional details about emission reduction quantifications for both GHG and co-pollutants as well as an implementation schedule and milestones. TCEQ will use a variety of metrics to track the implementation progress of these measures. These metrics include funding dollars awarded and spent, number of equipment changes, number of vehicles deployed, number of associated projects completed, number of acres reforested, and acres of restored coast.

3.1 INDUSTRY MEASURES

The industrial sector, which contributes to almost half (42%) of all GHG emissions in the state, presents the largest opportunity for implementation of impactful GHG reduction measures. These measures focus on upgrades to industrial equipment to facilitate electrification, fuel switching, energy efficiency, carbon capture, and methane reductions. The state expects these measures to reduce GHG emissions by 116 MMT CO_2e from 2025 through 2030 and 362 MMT CO_2e from 2025 through 2050. TCEQ will serve as the primary implementing agency for most of these measures, with the Railroad Commission of Texas (RRC) implementing the abandoned and orphaned well plugging program. Priority measures and the associated GHG reductions for industry are summarized in Table 3-2.

Table 3-2: Texas Priority Measures for the Industrial Sector

Priority Measure	2025-2030 Cumulative GHG reductions (MMT CO_2e)	2025-2050 Cumulative GHG reductions (MMT CO_2e)
Electrify industrial process equipment or modify to produce or use hydrogen	63.46	252.26
Promote energy efficiency in industry	6.62	0.29
Decarbonize cement	0.33	0
Promote the improvement/expansion of carbon capture	33.41	70.73
Replace hydrofluorocarbon (HFC) with ultra-low GWP refrigeration equipment	2.51	11.60
Replace pneumatic controllers, motors, and pumps, add surveillance, add monitoring, and remove redundant equipment to reduce fugitive emissions from oil and gas activities.	1.39	0.03
Reduce flaring and capture methane from oil and gas activities	7.46	27.28
Remediate and/or plug low producing and abandoned wells	0.77	0.04

3.2 TRANSPORTATION MEASURES

The transportation sector in Texas composes almost one quarter of the total GHG emissions in the state. Measures for this sector focus on zero emission light-, medium-, and heavy-duty vehicles, infrastructure, and decarbonization incentives for ports, airports, and railways. The state expects these measures to reduce GHG emissions by 25 MMT CO_2e from 2025 through 2030 and 131 MMT CO_2e from 2025 through 2050. TCEQ will serve as the main implementing agency for most of these measures, with assistance and input from the Texas Department of Transportation (TxDOT. Interested municipalities and ports within Texas may also choose to implement these measures. Priority measures and the associated GHG reductions for transportation are summarized in Table 3-3.

Table 3-3: Texas Priority Measures for the Transportation Sector

Priority Measure	2025-2030 Cumulative GHG reductions (MMT CO_2e)	2025-2050 Cumulative GHG reductions (MMT CO_2e)
Decarbonize sea and inland ports and associated support equipment	0	2.43
Add infrastructure for electric vehicle (EV) charging and hydrogen fueling	7.11	41.30
Expand programs for zero emissions medium- and heavy-duty trucks	0	85.24
Incentivize school bus replacement with zero emission school busses	0	0.23
Expand rebate programs for light-duty zero emission vehicles	0	0.002
Create a medium- and heavy-duty third party scrappage program	9.09	0.01
Replace government fleets with zero emission vehicles	0	1.4
Decarbonize airports with lower emission support equipment and vehicles, and use of low emission jet fuels.	6.93	0
Promote low emission passenger or freight locomotives	1.73	0

3.3 ELECTRIC POWER INDUSTRY MEASURES

Texas leads the nation in electricity generation and the electric power sector is the third largest source of GHG emissions in Texas. This sector is one of the only economic sectors in the state to show GHG emission reductions from 2005 through 2021. These decreases are mainly due to the transition from coal to natural gas, but Texas also has a strong renewable energy portfolio. Texas leads the nation in wind generation and is one of the leading states in solar potential energy and generation (US EIA 2023). Measures for this sector focus on facilitating access to clean energy with upgraded transmission and storage, promotion of clean energy such as nuclear or geothermal, lowering demand, and carbon capture and storage. The state expects these measures to reduce GHG emissions by 18 MMT CO_2e from 2025 through 2030 and by 34 MMT CO_2e from 2025 through 2050. TCEQ will serve as the main implementing agency for

most of these measures, but interested municipalities and state universities within Texas may also choose to implement these measures.

Table 3-4: Texas Priority Measures for the Electric Power Industry Sector

Priority Measure	2025-2030 Cumulative GHG reductions (MMT CO_2e)	2025-2050 Cumulative GHG reductions (MMT CO_2e)
Upgrade transmission lines to improve capacity	0.73	0.20
Promote nuclear energy with molten salt reactors and modular reactors and promote geothermal energy by using oil and gas infrastructure	0.29	6.44
Add grid scale renewable energy storage	2.03	0.18
Lower demand with load shifting, load management, and energy efficiency	1.13	0.25
Add infrastructure to capture, use, and store carbon from both power plants and industrial processes	13.69	26.44

3.4 OTHER MEASURES

The remaining measures are from various sectors that have lower GHG emissions when compared to the top three sectors in Texas. Some measures may span multiple sectors. These measures include biogas recovery and utilization, building electrification, lower emitting agricultural processes, reforestation, and landscape restoration. The state expects these measures to reduce GHG emissions by 15 MMT CO_2e from 2025 through 2030 and 66 MMT CO_2e from 2025 through 2050. TCEQ may serve as the implementing agency on these measures. Other interested state agencies, municipalities, or state universities may also choose to implement these measures.

Table 3-5: Other Texas Priority Measures

Priority Measure	Sector	2025-2030 Cumulative GHG reductions (MMT CO_2e)	2025-2050 Cumulative GHG reductions (MMT CO_2e)
Create biofuels through methane capture from landfills and wastewater treatment plants, or by using surplus biomass	Industry/ Commercial	0	2.38
Combine solar arrays with biogas at closed landfills and add solar to commercial and residential buildings	Commercial/ Electric Power Industry	5.30	0.40
Switch to electric heat pumps	Industry/ Commercial/ Residential	5.30	33.34
Increase energy efficiency and weatherization in homes and commercial buildings	Commercial/ Residential	0.74	0.13

Priority Measure	Sector	2025-2030 Cumulative GHG reductions (MMT CO_2e)	2025-2050 Cumulative GHG reductions (MMT CO_2e)
Support projects to increase recycling, reduce waste, increase composting, and add recycling infrastructure	Industry/ Commercial/ Residential	0	4.56
Promote sustainable agriculture practices to reduce emissions and restoration of coastal landscapes to sequester carbon	Agriculture/ Land Use, Land Use Change, and Forestry (LULUCF)	2.16	12.45
Reforest agriculture lands no longer in use, promote efficient pumps and irrigation systems in agriculture, and increase urban tree canopy	Industry/ Agriculture/ LULUCF	1.57	12.57

CHAPTER 4: LOW INCOME/DISADVANTAGED COMMUNITIES ANALYSIS

Implementation of the measures included in this PAP will significantly benefit all Texans including those in low-income and disadvantaged communities (LIDACs). These communities are defined in the Climate and Economic Justice Screening Tool (CEJST) as census tracts that are above the threshold for one or more environmental, climate, or other category of burden, or are above the threshold for an associated economic burden, or are within the boundaries of a Federally Recognized Tribe (Council on Environmental Quality 2022). Categories of burden include climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. This section identifies each LIDAC in Texas, how Texas engaged with these communities in the development of this PAP, and how the measures in this PAP will impact these communities.

4.1 IDENTIFICATION OF LIDACS

TCEQ identified 2369 LIDAC census tracts within Texas using CEJST. Most counties in Texas, 227 out of 254, contain at least one LIDAC census tract.

There are several areas in Texas that fail to meet the NAAQS for ozone, particulate matter, or sulfur dioxide. These areas encompass large populations, including LIDACs. Texas currently has three nonattainment areas for the 2015 eight-hour ozone NAAQS that span 16 counties. Those counties are Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, Wise, Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery, and Bexar. Texas has one county, El Paso, designated as nonattainment for PM_{10}. Texas has six areas across eight counties designated as nonattainment for the 2010 sulfur dioxide NAAQS. Those counties are Anderson, Freestone, Howard, Hutchinson, Navarro, Panola, Rusk, and Titus. Finally, Texas anticipates that there will be several additional counties designated as nonattainment under the recently revised annual $PM_{2.5}$ NAAQS.

People throughout Texas are vulnerable to climate risks, including LIDACs. Those residents in the coastal areas of the state are particularly vulnerable to flooding, coastal erosion, and extreme weather events such as hurricanes. Other counties in Texas, especially those in central Texas, are prone to larger wildfire risk and drought. Statewide, people are vulnerable to extreme weather events such as high temperatures and statewide freezes such as Winter Storm Uri.

4.2 LIDAC ENGAGEMENT

TCEQ created an engagement plan to seek feedback on the CPRG planning process and on priorities for this PAP. See Chapter 6: *Coordination and Outreach* for the engagement plan, a record of outreach activities, and a summary of identified stakeholders. Strategies used to engage with LIDACs during PAP development are summarized below:

- State CPRG webpage;
- Email list;
- Survey to submit ideas;
- Meetings across the state with options for in-person, livestream, and video conference participation;

- Targeted outreach to known community-based organizations; and
- Public input on the draft priority measures.

Texas plans to use the strategies above, as well as those outlined in the engagement plan, to continue engagement with these communities throughout implementation of these measures and development of the CAP.

4.3 IMPACT OF PAP IMPLEMENTATION ON LIDACS

Because the priority measures are broad in scope, Texas anticipates that measures included in this plan will benefit all Texans, including LIDACs. Texas counties with numerous industrial facilities include, but are not limited to, Harris, Dallas, Tarrant, Brazoria, Jefferson, Wise, Chambers Nueces, Bexar, Galveston, Johnson, and Orange. Many of these counties are also located within a nonattainment area.

In addition to large industrial facilities, many counties include oil and gas wells. These wells span across Texas but are concentrated in areas such as the Permian Basin in west Texas, the Granite Wash in the Panhandle, the Barnett Shale west of the Dallas-Fort Worth Area, the Eagle Ford Shale south of San Antonio, and the Haynesville Shale in east Texas.

A full list of LIDACs in Texas by census tract is available in Appendix B. Anticipated benefits and the measures associated with each benefit are listed in Table 4-1. Due to the broad scope of the PAP and the numerous LIDACs throughout the state, the benefits described below are qualitative. TCEQ used the EPA's report on Climate Change and Social Vulnerability to determine potential qualitative benefits from reduced greenhouse gasses and associated air pollutants (EPA 2021). The CAP, due to the EPA in July of 2025, will contain a quantitative LIDAC benefits analysis.

Table 4-1: PAP Measure Benefits for LIDACs

Benefit	Related Measure
Improved public health due to co-pollutant reductions of ozone, nitrogen oxides (NO_X) volatile organic compounds (VOC), sulfur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), black carbon, organic carbon, and carbon monoxide (CO).	Electrify industrial equipment and use hydrogen; promote energy efficiency in industry; decarbonize cement; carbon capture, storage, and utilization; fugitive reduction, methane capture, and well remediation and/or plugging in the oil and gas industry; port, airport, and railway decarbonization; electric vehicle infrastructure; zero emission vehicles and equipment; third part medium and heavy-duty scrappage program; methane capture for biogas; electric heat pumps in buildings; rooftop solar in buildings; energy efficiency in buildings; and efficient agricultural systems.
Less heat exposure, less premature heat related deaths, less labor hours lost, and increased quality of life due to mitigation of extreme temperatures.	All measures.
Decreases in traffic, decreased property loss, and decreased deaths due to less coastal flooding.	All measures.

Benefit	Related Measure
Creation of high-quality jobs, increased opportunities for small businesses, increased training in new and emerging technologies.	All measures.
Enhanced community engagement.	All measures.
Improved access to services and community amenities, new greenspaces, increased community beautification.	Electric vehicle and hydrogen fueling infrastructure; zero emission school busses; rebates for light-duty zero emission vehicles; medium and heavy-duty scrappage program; electric heat pumps; rooftop solar; energy efficiency and weatherization in buildings; recycling and waste reduction; increased urban tree canopy and reforestation; and coastal restoration.
Lower energy costs.	Industrial energy efficiency; transmission line upgrades; increased renewable storage; nuclear energy; geothermal energy; lowering demand through load shifting, load management, and energy efficiency; capturing methane to create biogas; rooftop solar on buildings; and energy efficiency and weatherization for buildings.

CHAPTER 5: REVIEW OF AUTHORITY TO IMPLEMENT

This PAP is non-regulatory. Measures included in this plan are voluntary actions that are available statewide for implementation by eligible entities. TCEQ has reviewed existing statutory and regulatory authority to implement each priority measure in this plan and determined that no new regulatory authority is required to implement these measures.

TCEQ has existing legal authority to implement measures that maintain or control the quality of the state's natural resources and that protect the state's environment. The TCEQ's authority is found in both the Texas Water Code (TWC) and the Texas Clean Air Act (TCAA). The TCAA is codified as Chapter 382 of the Texas Health and Safety Code. The TCAA is frequently amended for various purposes during the biennial legislative sessions.

The general authority of the TCEQ is found in TWC, Chapter 5. TWC, Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TCEQ, and the responsibilities and authority of the executive director. TWC, Chapter 5, also provides the TCEQ with authority to award grants for any purpose regarding resource conservation or environmental protection.

The TCAA, Subchapters A - D, authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; to conduct research and investigations; to prescribe monitoring requirements; to enter into contracts and execute instruments; to formulate rules; and to issue, establish, and operate a system of permits for construction or modification of facilities.

The statutes described above provide the necessary authority for Texas to implement the voluntary measures included as a part of this PAP.

CHAPTER 6: COORDINATION AND OUTREACH

TCEQ conducted extensive intergovernmental coordination and outreach in the development of this PAP. This section describes the framework TCEQ used to support meaningful engagement strategies, to ensure comprehensive stakeholder representation, and to overcome obstacles to engagement, including linguistic, cultural, institutional, geographic, and other barriers.

6.1 IDENTIFICATION OF STAKEHOLDERS

TCEQ identified stakeholders representative of the entities, groups, and individuals who may be impacted by implementation of this PAP. Stakeholders included, without limitation:

- Other state agencies;
- Metropolitan planning organizations;
- Council of governments;
- City governments;
- Universities;
- Economic development organizations;
- Environmental advocates;
- Industrial associations;
- Automotive associations;
- Utilities;
- Agricultural associations;
- Waste management organizations;
- Industrial organizations;
- Elected officials;
- Community-based organizations;
- Other interested organizations; and
- Residents of Texas

To identify stakeholders, TCEQ contacted local council of governments, state agencies, community organizations, and industry groups known to have low carbon goals or who were known participants in the CPRG program. The list of identified stakeholders as of the publication of this PAP is included in Appendix C. TCEQ will update this list of stakeholders as needed.

6.2 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION

TCEQ coordinated with the metropolitan statistical areas (MSAs) in Texas that received CPRG planning grants through bi-weekly meetings for all planning grant recipients in EPA Region 6. TCEQ also held meetings with the Texas MSA's with CPRG planning grants to coordinate measures for the PAP as well as measures to include in applications for CPRG implementation grants. The Texas MSA's with planning grants are listed in Table 6-1.

Table 6-1: List of Texas MSA's Awarded CPRG Planning Grants

Metropolitan Area Name	Lead Organization
Austin-Round Rock-Georgetown	City of Austin Office of Sustainability

Metropolitan Area Name	Lead Organization
Dallas-Fort Worth-Arlington	North Central Council of Governments (NCTCOG)
El Paso	City of El Paso
Houston-The Woodlands-Sugarland	Houston-Galveston Area Council (HGAC)
McAllen-Edinburg-Mission	City of McAllen
San Antonio-New Braunfels	City of San Antonio's Office of Sustainability

TCEQ engaged the following state agencies that may have an interest in CPRG planning: TxDOT, RRC, the State Energy Conservation Office (SECO), the Public Utility Commission of Texas (PUC), and the Electric Reliability Council of Texas (ERCOT). TCEQ also received input from municipalities and other state entities interested in the implementation grant process through stakeholder meetings and individual meetings as requested. TCEQ used input received from these stakeholders to draft priority measures for this plan.

6.3 OUTREACH PLAN

TCEQ's outreach plan was developed with three key goals: identify, inform, and involve key communities and stakeholders across the state. In a large state, both in population and geography, a key strategy for Texas involves virtual communication.

To identify key communities and stakeholders, TCEQ used existing contacts that the agency has created over many years. These contacts include community groups, regulated entities, council of governments, nongovernmental organizations, and other state agencies. Texas will continue to rely on these contacts to reach out to other interested groups.

To inform the public and stakeholders, TCEQ created a webpage and email list. These resources will inform interested stakeholders and the community on any updates to CPRG planning activities. Quarterly stakeholder and public meetings will be held with in-person, hybrid, and virtual only options. Additional meetings will be added as needed. TCEQ will also collaborate with other MSAs to expand public outreach, including participation in public meetings hosted by those MSAs to share information and program updates from the state's perspective. TCEQ will use existing social media and agency marketing campaigns to aid in outreach to a large part of the state. TCEQ will also continue to engage in individual meetings and conferences as requested to inform as many people as possible. To overcome language barriers, TCEQ will translate webpages and relevant presentations into Spanish. TCEQ will reasonably provide translation services when reasonably requested and will ensure that all documents distributed publicly meet accessibility requirements.

To involve community and stakeholder groups TCEQ plans to seek input from all interested parties. Forms and surveys will be released to identify planning gaps and issues that are most important to Texans. TCEQ plans to seek input on its plan through public meetings, emails, and surveys. TCEQ will use input received in the development of the CAP.

6.4 OUTREACH AND COORDINATION DOCUMENTATION

TCEQ created a CPRG webpage and email list to inform interested stakeholders and communities of TCEQ's plans. As of February 2, 2024, the email list had 333 subscribers. TCEQ plans to incorporate future social media campaigns through existing TCEQ channels to inform the public of Texas' PAP and to increase subscriber numbers.

TCEQ released a public survey by soliciting input through its email list and by posting the survey on the CPRG webpage. The survey was open from December 14, 2023, to January 12, 2024, to collect reduction measure ideas. The survey received 57 responses, 37% from community members and 20% from communities considered LIDAC. A summary of results from the survey is available in Appendix D.

TCEQ hosted one in-person meeting and one hybrid (in-person and virtual) meeting for those interested stakeholders and members of the public. The in-person meeting introduced the CPRG program to stakeholders and received input on measures they would like to see. The hybrid meeting presented TCEQ's draft priority measures and next steps in the planning process. In addition to TCEQ hosted meetings, TCEQ CPRG staff attended public meetings, workshops, stakeholder meetings, and roundtable discussions on request. Table 6-2 provides a summary of the outreach and engagement meetings attended by TCEQ. Table 6-2 does not include individual stakeholder meetings. Meeting and outreach materials and resources are available on the TCEQ's CPRG webpage.

Table 6-2: CPRG Outreach Meetings

Event	Date/Time/Location	Organizer
Texas Industry Project Meeting	September 7, 2003/ 11am-12pm/ Houston (with virtual option)	Texas Industry Project and Baker Botts. TCEQ invited as guest speaker
IRA/IIJA Roundtable Call	November 9, 2023/ 2pm-3pm/ virtual meeting	Citizens Climate Education, Stoic Energy Consulting, TCEQ invited as guest speaker
TCEQ Stakeholder Meeting	December 7, 2023/ 10am-12pm/ TCEQ headquarters, Austin, Texas	TCEQ – Attendee list in Appendix C
HGAC Public Meeting	January 11, 2024/ 10am-12pm/ Houston (with virtual option)	HGAC, TCEQ invited as guest speaker
CERES Permian Basin Dialog Meeting	January 12, 2024/ 8:30am-9:15am/ University of Texas at Austin	CERES, TCEQ invited as guest speaker
Dallas-Fort Worth Air Quality Improvement Plan meeting on Section 185 fees	January 16, 2024/ 2pm-4pm/ Arlington (with virtual option)	NCTCOG, TCEQ invited as guest speaker
TCEQ Stakeholder/Public Meeting	January 25, 2024/ 10am-12pm (with virtual option)	TCEQ – Attendee list in Appendix C
Dallas-Fort Worth Air Quality Improvement Plan meeting	February 15, 2024/ 9am-3pm/ University of Texas at Arlington	NCTCOG, TCEQ invited as guest speaker

CHAPTER 7: CONCLUSION

This PAP is the first major deliverable under the CPRG planning grant awarded to TCEQ and includes priority measures identified by TCEQ with extensive input from a variety of stakeholders. This PAP focuses on incentivized, voluntary measures with co-pollutant benefits from the three largest GHG emitting sectors in Texas: industry, transportation, and electric power. The measures in this PAP are anticipated to reduce GHG emissions in Texas by 174 MMT from 2025 through 2030 and 592 MMT tons from 2025 through 2050. Co-pollutants would also be reduced by 0.6 MMT from 2025 through 2030 and 3.0 MMT from 2025 through 2050.

TCEQ and its partners will continue planning, engagement, and action to reduce emissions; invest in infrastructure, technologies, and best practices; build our economy; and enhance the quality of life for all Texans. In 2025, TCEQ will publish a Comprehensive Action Plan, or CAP, which will establish strategies to reduce emissions across all economic sectors. The CAP will include near- and long-term emissions projections, a suite of emission reduction measures, a robust analysis of measure benefits, plans to leverage federal funding, and a workforce planning analysis. In 2027, TCEQ will publish a status report that details implementation progress for measures included in the PAP and CAP, any relevant updates to PAP and CAP analyses, and next steps and future budget and staffing needs to continue implementation of CAP measures.

If you have questions about this PAP or input for the upcoming CAP and status report, contact Kasey Savanich at cprg@tceq.texas.gov.

CHAPTER 8: REFERENCES

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APPENDIX A: MEASURE APPENDIX

This appendix explains the method and assumptions used for developing the estimated greenhouse gas (GHG) and co-pollutant emissions reduced for the various priority measures included in the Priority Action Plan (PAP) for the state of Texas. Assumptions used to quantify emission reductions also include implementation milestones. The emission reductions for the priority measures were estimated using the Energy Policy Simulator (EPS) v. 3.4.3, an open-source computer model created by Energy Innovation and the Rocky Mountain Institute (RMI). The EPS is a system dynamics computer model simulated by a tool called Vensim. Vensim was developed by Ventana Systems for the creation and simulation of System Dynamics models. Current emissions were calibrated to the U.S. Environmental Protection Agency's (EPA's) inventory and current policy progress was assessed using information in Climate Xchange's State Climate Policy tracker and supplemental desk research (EPS Documentation and RMI State scorecard, 2024).

A.1 EMISSIONS REDUCTIONS ESTIMATE METHOD

Data used to estimate the emissions reductions for the priority measures were obtained primarily from national datasets and data sets that are open source. This data includes energy consumption per sector from the Energy Information Administration (EIA), EPA developed GHG emissions inventory for Texas, and data on technology stock and cost of technologies from the National Renewable Energy Lab (NREL). The Texas Commission on Environmental Quality (TCEQ) quantified emission reductions for priority measures from the three sectors in Texas with the most GHG emissions: industry, transportation and, electric power. TCEQ also quantified reductions for measures from other combined sectors such as agriculture, buildings, and land use, land use charge, and forestry (LULUCF). GHG emissions were quantified in million metric tons (MMT) carbon dioxide equivalents (CO_2e) and include the following greenhouse gasses: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gasses (F-gasses).

A.1.1 Industry Sector

The EPS considered emissions from specific industries such as coal mining, oil and gas extraction, cement and other nonmetallic minerals, iron and steel, computers and electronics, road vehicles, pulp and paper, construction, water and waste, appliance and electrical equipment, rubber and plastic products and glass products. There were two types of emissions tracked: energy related emissions and process emissions. Energy related emissions are those that come from fuel combustion to create either usable heat or onsite electricity. Process emissions are emissions from pollutants that occur because of industry operations not related to combustion of fuel for energy. For example, CO_2 from limestone breakdown and methane leaks from oil wells and pipelines.

The priority measures on electrifying industrial process equipment and using hydrogen were modeled using the electrification and hydrogen policy. This policy reduces GHG emissions by switching the fuel used by facilities for medium and high temperature operations to electricity and hydrogen. Since it is easier to electrify low temperature operations while hydrogen can meet needs of any temperature, this was considered in the model. For example, industries such as coal mining, oil and gas

extraction, food beverage and tobacco, textiles apparel and leather, wood products, pulp paper and printing, glass and glass products, computers and electronics, road and non-road vehicles, other manufacturing, and construction were projected to switch to electricity with 100% of fuel shift. Meanwhile, it was projected that Iron and Steel will have an 81% shift to hydrogen and 19% shift to electricity, cement and other nonmetallic minerals will have a 73% shift to hydrogen and 27% shift to electricity, rubber and plastic products, chemicals and refined petroleum and coke will have a 19% shift to hydrogen and 81% shift to electricity.

The measure on promoting energy efficiency was modeled using the industry energy efficiency standards. A 14% reduction in energy use was set based on Nationally Determined Contributions (NDC) pathway. The decarbonization of the cement industry was modeled using the cement clinker substitution policy, where CO_2 emissions are reduced by substituting other inputs like fly ash for a part of the clinker cement. A 100% of potential achievement was adopted. The measure on promoting industrial processes that would ease improved carbon capture was modeled using the industry carbon capture and sequestration (CCS) policy. This policy specifies the fraction of CO_2 emissions from industry that is captured and stored, above the amount predicted in the business-as-usual scenario. Although very few CCS-equipped industrial facilities exist today, CCS settings as high as 100% is workable under scenarios in which industry mostly or entirely transitions to clean energy due to other policies such as industrial fuel switching and industrial energy efficiency. Thus, industries considered in this measure include, refined petroleum and coke, rubber and plastic products, cement and other nonmetallic minerals, iron and steel, and energy pipeline and gas processing.

Replacement of HFC with ultra-low GWP measure was modeled using the F-gas measures i.e., F-Gas substitution, F-Gas destruction, and F-Gas recovery. A set point of 100% potential achieved was used based on the NDC pathway. The fugitive emissions reduction from oil and gas activities measure was modeled using the improved system design policy. This policy reduces fuel consumption in the industry sector by improving the way components are put together and the way material or energy flows between them. A set point of 100% potential achieved was used based on the NDC pathway. The measure on reducing flaring and capturing methane emissions from oil and gas activities for beneficial use was modeled using the methane capture and destruction policy. Industry categories here include oil and gas extraction, energy pipelines and gas processing, coal mining, and water and waste. A set point of 100% potential achieved was used based on the NDC pathway. The measure on remediating low producing wells was modeled using the early retirement of industrial facilities policy. This policy reduces fuel consumption in the industry sector by retiring older, inefficient industrial facilities sooner than they otherwise would retire. A set point of 100% potential achieved was used based on the NDC pathway.

Figure A-1 shows the emission effects of the different policy measures on the industrial sector from 2020 to 2050, comparing the BAU with the TCEQ model. The graph shows that industrial electrification and hydrogen use will have the most impact on emissions reductions compared to other policy measures within the industrial sector (EPS 2024, Industrial sector).

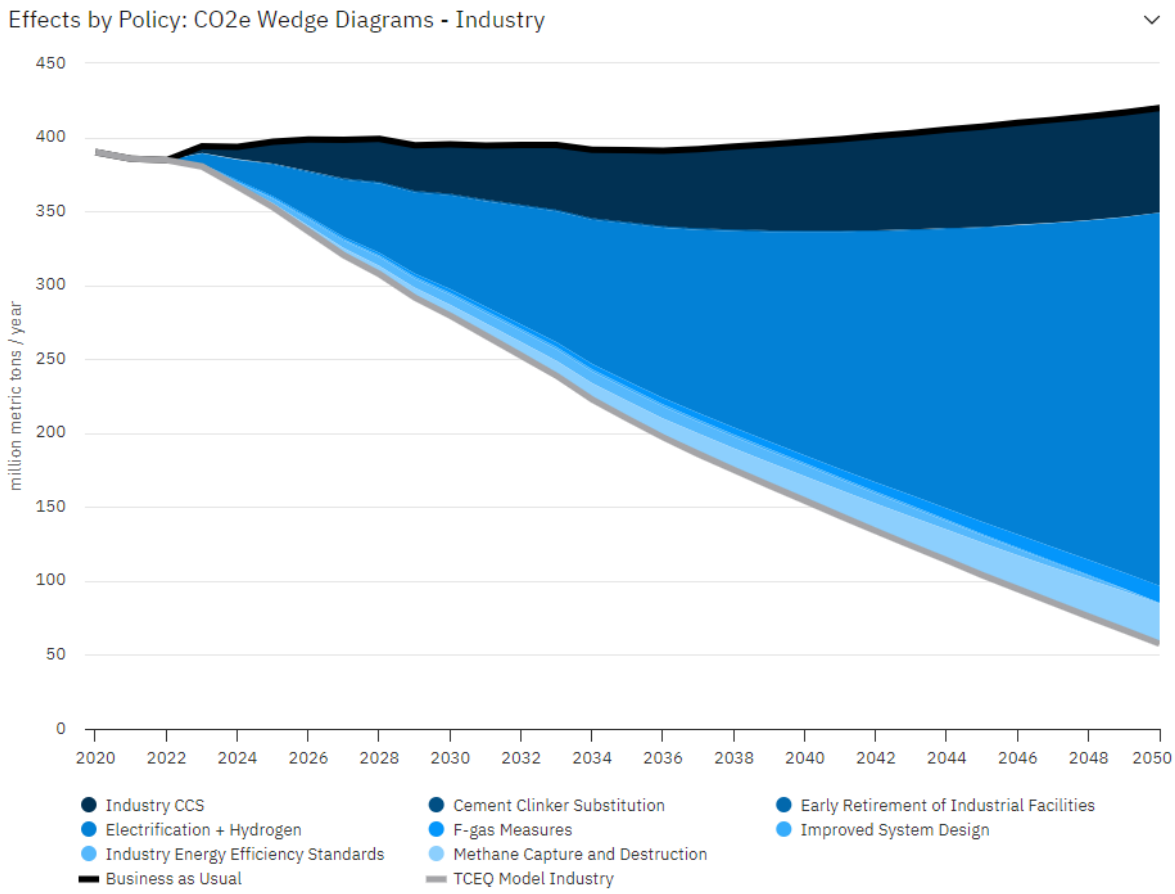


Figure A-1: Emission Effect of Policy Measures on the Industrial Sector from 2020 through 2050

A.1.2 Transportation Sector

For the transportation sector, variables considered for quantification were cargo-distance transported i.e., passenger-miles and freight ton-miles transported, number of vehicles, and amounts of fuel consumed. The priority measures on port decarbonization, electric vehicle charging and hydrogen fueling stations, zero emission school buses, government fleet replacement with zero emission vehicles, and zero emission medium- and heavy-duty trucks were modeled using the electric vehicle sales standard policy in the EPS. Data were obtained for the different vehicle type to estimate their individual emissions (BoatInfoWorld, 2017; DOT, 2020). The implementation schedule used for this schedule was 30% by 2030 and 100% from 2035 through 2050.

The electric vehicle subsidy policy in the EPS was used to model the priority measure on a rebate program for light-duty zero emission vehicles. The implementation schedule used for this measure assumed an increase in percentage of vehicle cost subsidized from 2023 at 58.7% with a gradual increase up to 2028 at 100%, then a decrease in percentage from there until 2031 at 0%, which continues till 2050. TCEQ estimated 18% of the manufacturer's suggested retail price (MSRP) based on the NDC pathway simulation.

The feebate policy was used to model the third party scrappage program. This policy implements a fee on selling inefficient vehicles. The model was done based on the global best practice feebate rate. The low emission jet fuels and passenger or freight locomotives were modeled using the low carbon fuel standard policy. The policy specifies the percentage reduction in carbon emissions from the transportation sector that must be achieved via fuel switching. A 60% reduction in carbon intensity of the transportation pool by 2050 was adopted.

Figure A-2 shows the emission effects of the different policy measures on the transportation sector from 2020 to 2050, comparing the business as usual (BAU) with the TCEQ model. The graph shows that vehicle electrification will have the most impact on emissions reductions compared to other policy measures within the transportation sector (EPS 2024, Transportation sector).

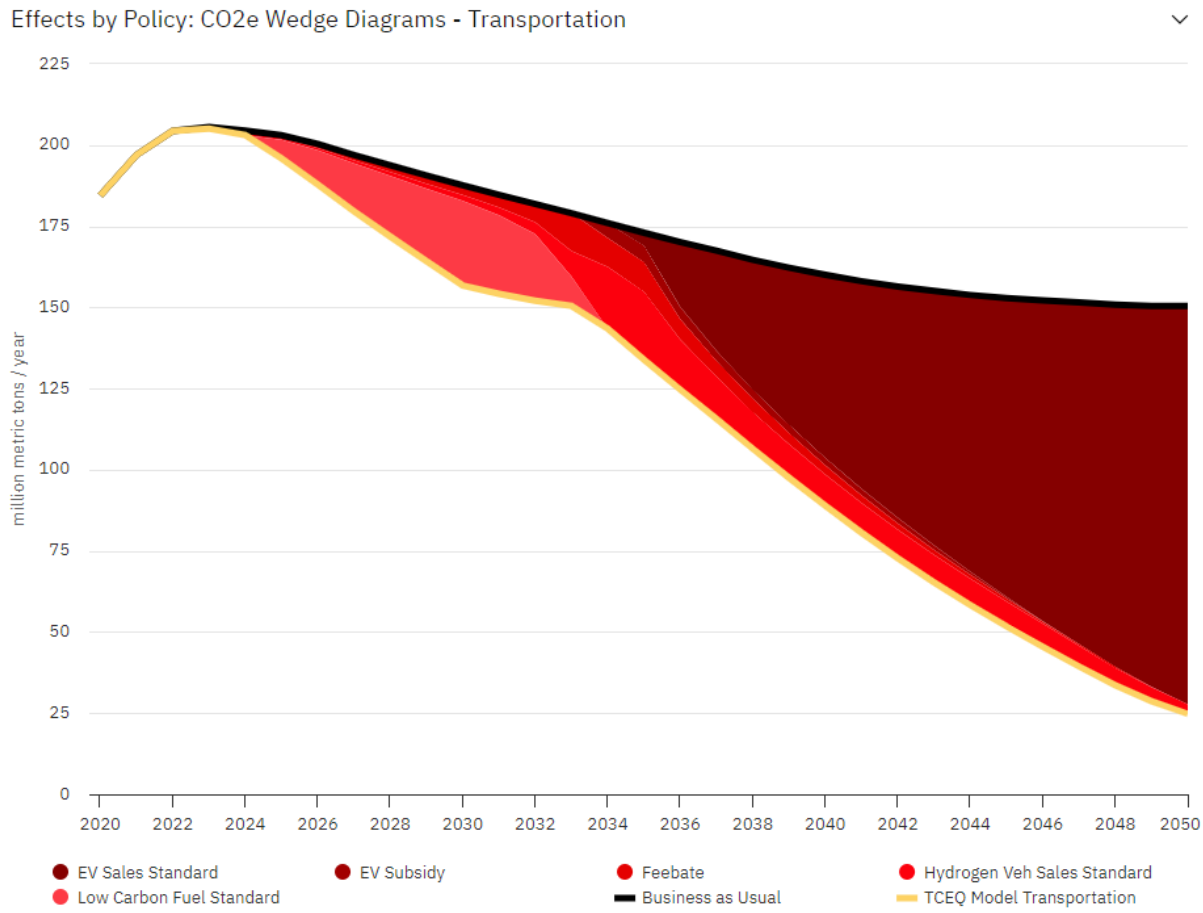


Figure A-2: Emission Effect of Policy Measures on the Transportation Sector from 2020 through 2050

A.1.3 Electric Power Industry Sector

In the electric power sector, the transmission line upgrade measure was modeled using the policy on increasing transmission which allows for flexibility of the grid, allowing for the integration of more wind and solar photovoltaics (PV) compared to the

business-as-usual case. Quantifications projects a 100% increase in transmission capacity.

The measure on promoting nuclear energy with molten salt reactors and modular reactors and using oil and gas infrastructure for geothermal energy was modeled using the policy on subsidy for capacity construction and electricity production. The policy describes payment of subsidy to electricity suppliers for the addition of renewable sources. An 80% of construction cost was used for geothermal and 13% for nuclear based on NDC. For the subsidy for electricity production, $11/MWh was used for both nuclear and geothermal for preexisting power plants.

The measure on lowering demand with improved load management was modeled using the policy on reducing transmission and distribution losses. A 33% policy setting of losses avoided was used to match NDC by 2050. Currently the U.S. has a 6% reduction in transmission and distribution losses.

The measure on capturing and storing carbon from power plants and industrial processes was modeled using the CCS policy. This policy specifies the fraction of CO_2 emissions from power plants that is captured and stored, above the amount predicted in the business-as-usual scenario. Since there are currently very few CCS-equipped power plants, a 20% CO_2 capture was modeled as suggested by the EPS. This was modeled for all potential electricity sources i.e., hard coal, natural gas nonpeaker, biomass, petroleum, natural gas peaker, lignite, and municipal waste. We used a Policy Implementation Schedule (PIS) of 100% by 2035 and plateauing to 2050.

Figure A-3 shows the emission effects of the different policy measures on the electric power industry sector from 2020 to 2050, comparing the BAU with the TCEQ model. The graph shows that carbon capture and sequestration will have the most impact on emissions reductions compared to other policy measures (EPS 2024, Electricity sector).

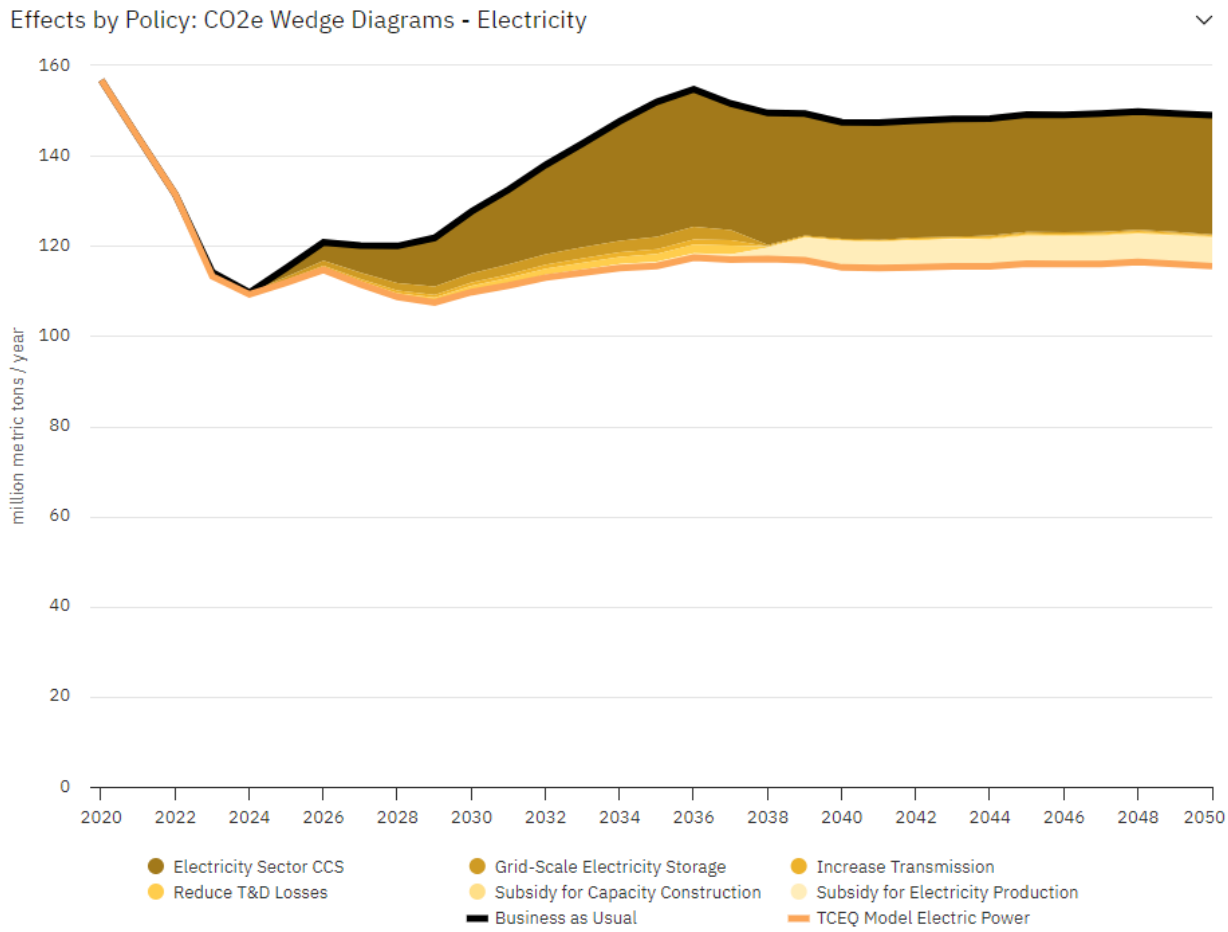


Figure A-3: Emission effect of Policy Measures on the Electric Power Sector from 2020 through 2050

A.1.4 Other Sectors

For other sectors, we considered policies in agriculture, commercial and residential buildings and LULUCF. The measure on creating biofuels through methane capture was modeled using the 2021 GHG Emission for landfills (municipal), 11.9 MMT CO2e. A 20% methane capture was modeled (EPA 2023a; EPA 2023b).

The measure on combining solar arrays with biogas at closed landfills and adding solar to commercial and residential buildings was modeled using the policy on distributed solar carve-out policy. This policy requires at least the specified percentage of total retail electricity demand to be generated by residential and commercial buildings distributed solar systems (typically rooftop PV). Based on Colorado's 3% carve-out for 2020, a 24% minimum electricity from solar by 2050 was modeled. A PIS of 50% by 2030 and 100% by 2050 was used.

The measure on switching to electric heat pumps was modeled using the building component electricity policy. This policy replaces a specified fraction of newly sold non-electric building components with electricity-using components. The building type includes urban, residential, and commercial. A PIS of 100% by 2030, plateauing to 2050 was used.

The measure on increasing energy efficiency and weatherization in homes and commercial buildings was modeled using the retrofit existing building policy. This policy specifies the percentage of specific buildings that will be retrofit with more efficient heating, cooling, and envelope components. A 15% retrofit of existing buildings was set based on NDC. A PIS of 100% by 2050 was used.

The measure on supporting projects to increase recycling and reduce waste was modeled using the capital cost reduction policy. This is a policy under the research and development lever, used for modelling research in the technological advancement. Based on the EPS, a 30% lever was used, implying a 1% annual improvement.

The measure on promoting sustainable agricultural practices to reduce emissions and restoration of coastal landscapes to sequester carbon was modeled using the policy on improved soil measures, cropland, and forest management. The policy on improved soil measures stores CO_2 in agricultural soils through improved tillage practices, retiring organic and marginal soils, and setting up windbreaks/shelterbelts. This can store up to 70 MMT of CO_2 in soils. For cropland management policy, CH_4 and N_2O emissions from agricultural practices are reduced through cropland management practices, such as improved crop rotations, reduced soil tillage, and improvements in fertilizer composition and application. Measures particular to rice cultivation include improved flooding practices that avoid anaerobic, methane-forming conditions. A 100% potential achieved was used for both soil and cropland measures. The improved forest management policy increases CO_2 sequestration by forests through forest management practices. A 50% of potential achieved lever was set based on the NDC pathway. For all three policies, a PIS of 100% was used.

The measure on reforesting agriculture lands no longer in use and promoting efficient pumps and irrigation systems in agriculture was modeled using the afforestation and reforestation policy. This policy increases the sequestration of CO_2 by planting forests. Planted forests are assumed to be managed with best practices and are not used for timber harvesting. A 100% potential achieved was used. A PIS of 100% by 2030, plateauing to 2050 was used.

Figure A-4 shows the emission effects of the different policy measures on agriculture, buildings, and land use from 2020 to 2050, comparing the BAU with the TCEQ model. The graph shows that building component electrification and afforestation/reforestation will have the most impact on emissions reductions compared to other policy measures in the agriculture, commercial and residential buildings, and LULUCF sectors (EPS 2024, Building, Agriculture and Land Use sector).

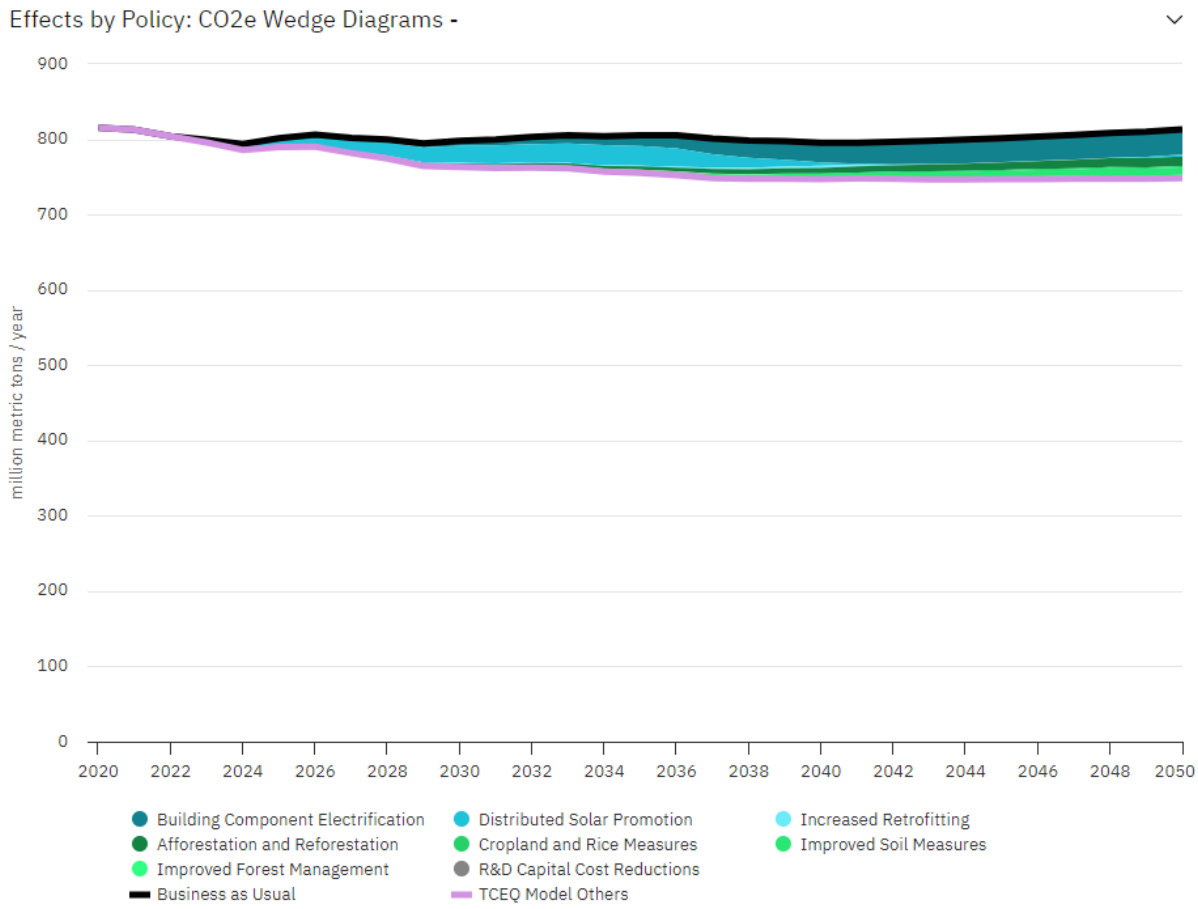


Figure A-4: Emission Effect of Policy Measures on Other Sectors from 2020 through 2050

A.1.5 Measure Implementation Assumptions

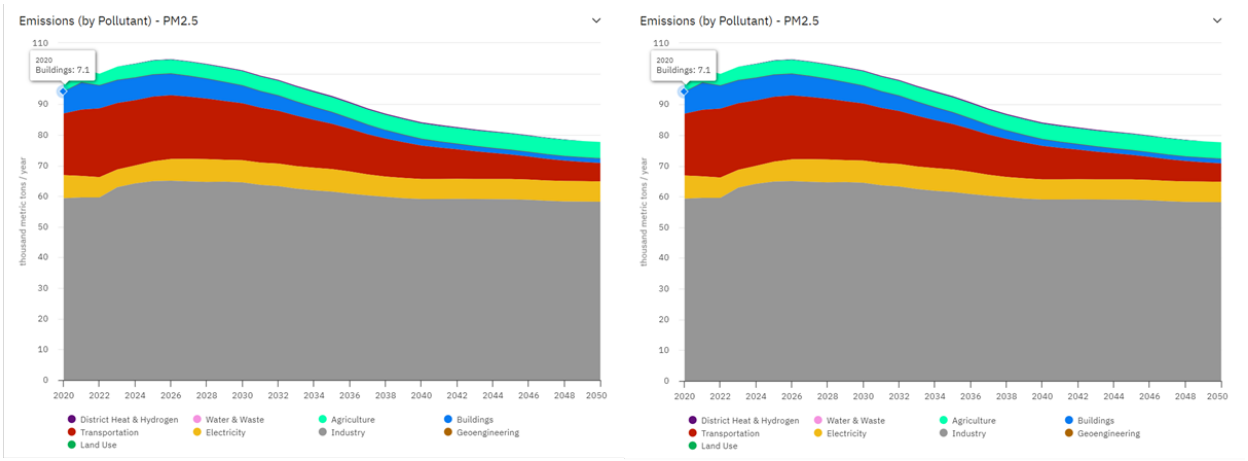
The following key assumptions about measure implementation were used to quantify emissions reductions:

- The geographical scope considered for quantification was Texas.
- For several measures, the policy levers were set based on estimates from the NDC.
- Uptake for most measures was set at full implementation. A measure that did not use full implementation was the CCS policy under the electric power sector. This was set at 20% as full implementation would be unrealistic due to the low number of CCS-equipped power plants that exist today.
- Some priority measures were set to have achieved an implementation milestone of 30-50% by 2030 and 100% by 2050.

A.2 CO-POLLUTANT EMISSIONS REDUCED

The EPA tool also provided quantified emission changes of nitrogen oxide (NO_X), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), black carbon (BC), organic

carbon (OC), volatile organic compounds (VOC), sulfur oxides (SO_X), and carbon monoxide (CO) for each economic sector. Although there may be increases in some co-pollutants for some economic sectors, each co-pollutant shows an overall decrease and there is an overall decrease in total co-pollutants. Implementation of the priority measures for the different economic sectors is predicted to reduce a total of 0.58 MMT of co-pollutants from 2025 through 2030 and 2.97 MMT from 2025 through 2050. Figures A-5 through A-12 show the emissions reductions by co-pollutants for the different sectors. The cumulative reductions for each sector by pollutant are shown in Tables A-1 through A-16. The graphs show that $PM_{2.5}$, PM_{10}, OC, NO_X, VOC, SO_X, have the most emissions in the industrial sector while BC and CO have the most emissions in the transportation sector. Comparing the business-as-usual scenario with the projected model shows implementation of the priority measures will decrease all co-pollutant emissions up to 2050.



a) Business-as-Usual b) Projected Model

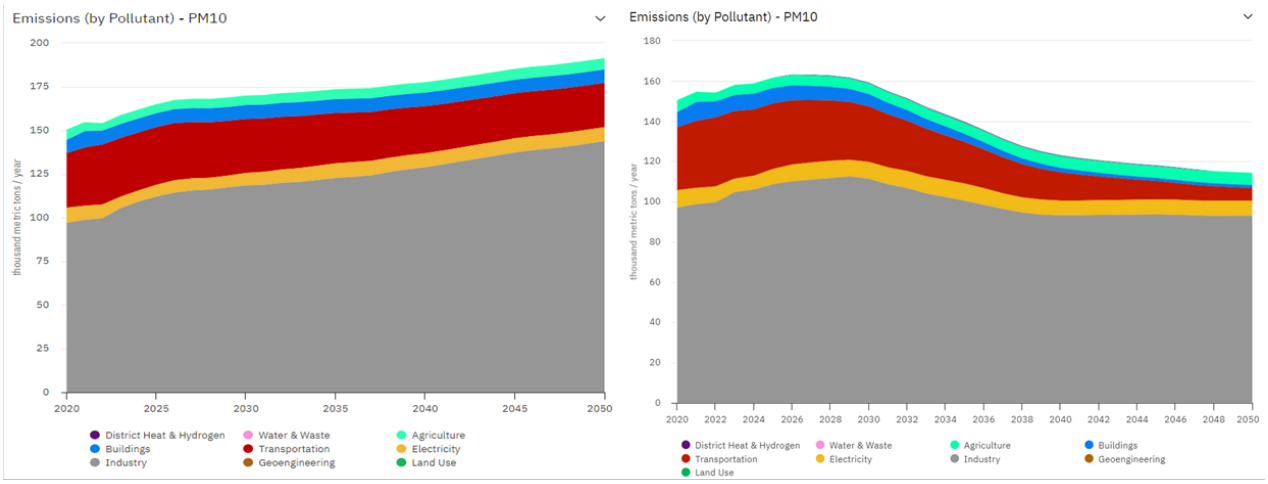
Figure A-5: Emissions Reductions of $PM_{2.5}$ by Economic Sector

Table A-1: Cumulative Change in $PM_{2.5}$ Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.006293	0.070441	0.020494	0.012390	0.109617
Projected	0.007243	0.064500	0.018581	0.010455	0.100779
Change	+0.000949	-0.005940	-0.001913	-0.001934	-0.008838

Table A-2: Cumulative Change in $PM_{2.5}$ Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.007263	0.085601	0.018000	0.014125	0.124990
Projected	0.006617	0.058207	0.006008	0.006855	0.077686
Change	-0.000646	-0.027395	-0.011993	-0.007270	-0.047304



a) Business-as-Usual b) Projected Model

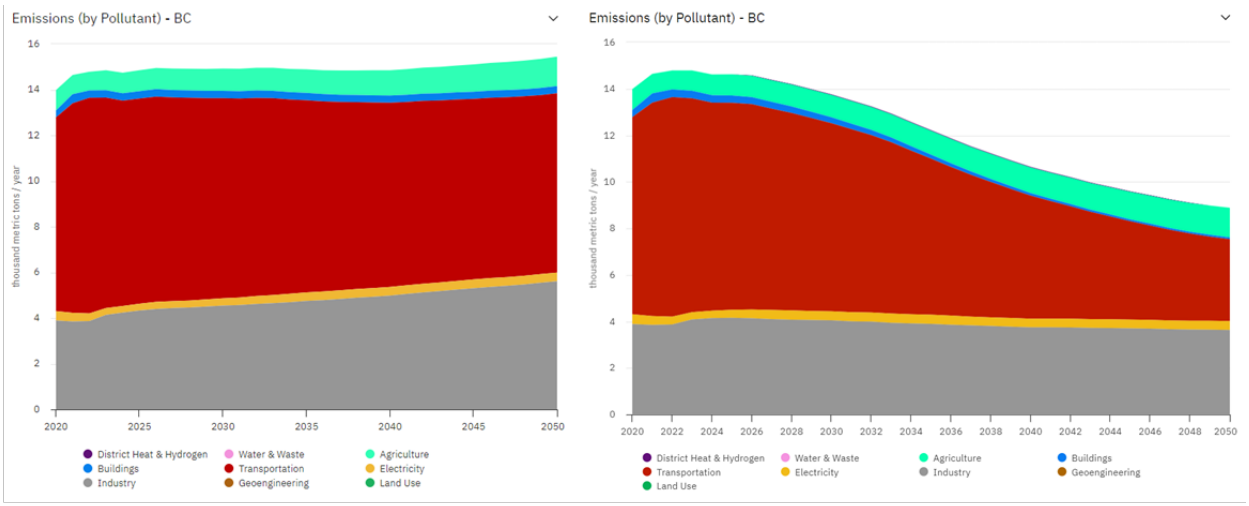
Figure A-6: Emissions Reductions of PM_{10} by Economic Sector

Table A-3: Cumulative Change in PM_{10} Emissions in MMT from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.007322	0.118499	0.030990	0.013503	0.170313
Projected	0.008337	0.111402	0.027638	0.011421	0.158798
Change	+0.001015	-0.007097	-0.003352	-0.002082	-0.011516

Table A-4: Cumulative Change in PM_{10} Emissions in MMT from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.008353	0.143857	0.025367	0.015389	0.192966
Projected	0.007424	0.093024	0.006381	0.007566	0.114395
Change	-0.000929	-0.050833	-0.018986	-0.007823	-0.078571



a) Business-as-Usual b) Projected Model

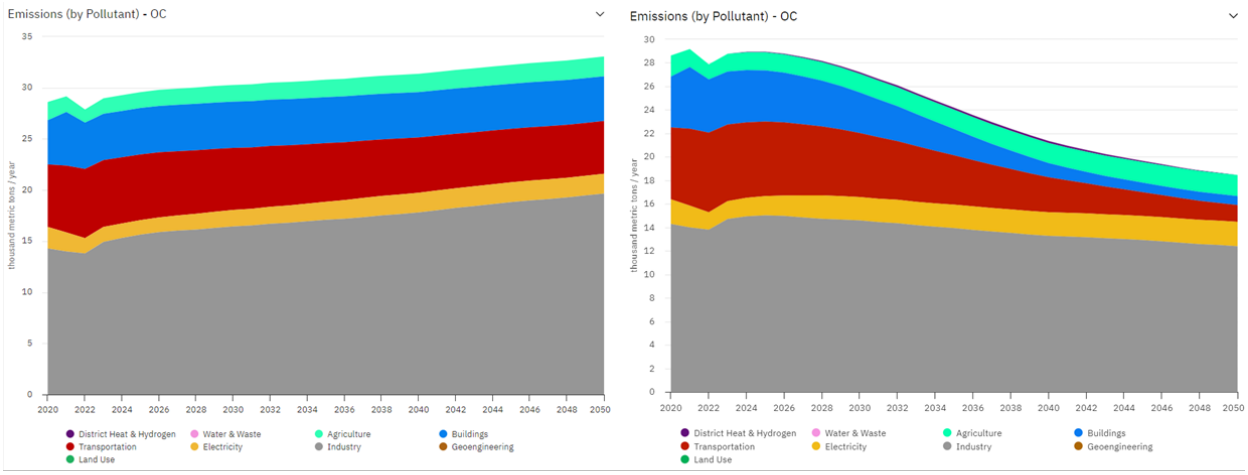
Figure A-7: Emissions Reductions of BC by Economic Sector

Table A-5: Cumulative Change in BC Emissions in MMT from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.000334	0.004543	0.008757	0.001300	0.014934
Projected	0.000395	0.004045	0.008082	0.001216	0.013738
Change	+0.000061	-0.000498	-0.000675	-0.000083	-0.001197

Table A-6: Cumulative Change in BC Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.000395	0.005613	0.007858	0.001649	0.015514
Projected	0.000380	0.003635	0.003519	0.001352	0.008886
Change	-0.000015	-0.001978	-0.004339	-0.000296	-0.006628



a) Business-as-Usual b) Projected Model

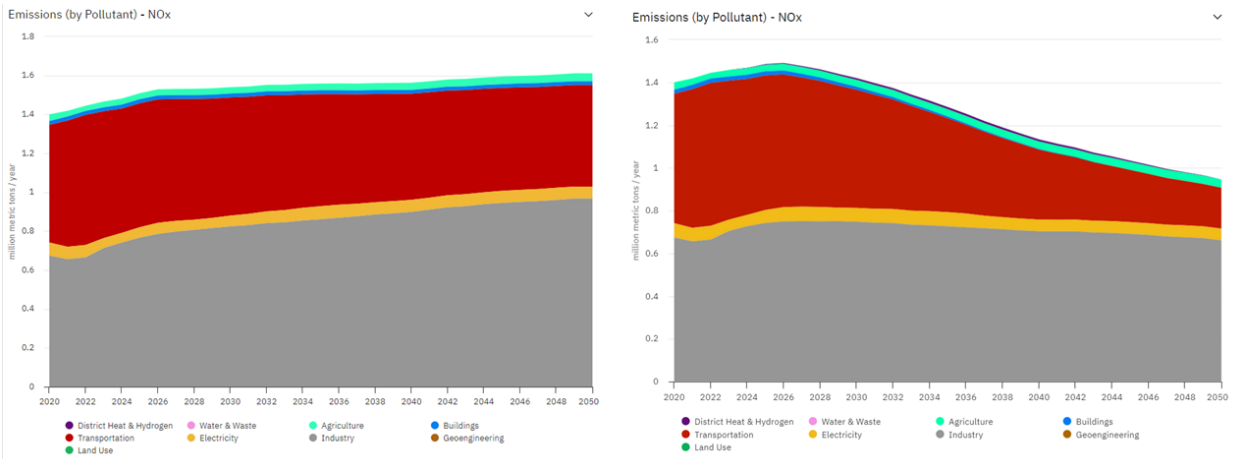
Figure A-8: Emissions Reductions of OC by Economic Sector

Table A-7: Cumulative Change in OC Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.001623	0.016442	0.006072	0.006212	0.030350
Projected	0.001984	0.014595	0.005454	0.005044	0.027077
Change	+0.000361	-0.001847	-0.000618	-0.001169	-0.003273

Table A-8: Cumulative Change in OC Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.002005	0.019673	0.005156	0.006997	0.033831
Projected	0.002076	0.012398	0.001423	0.002556	0.018453
Change	+0.000071	-0.007274	-0.003733	-0.004441	-0.015378



a) Business-as-Usual b) Projected Model

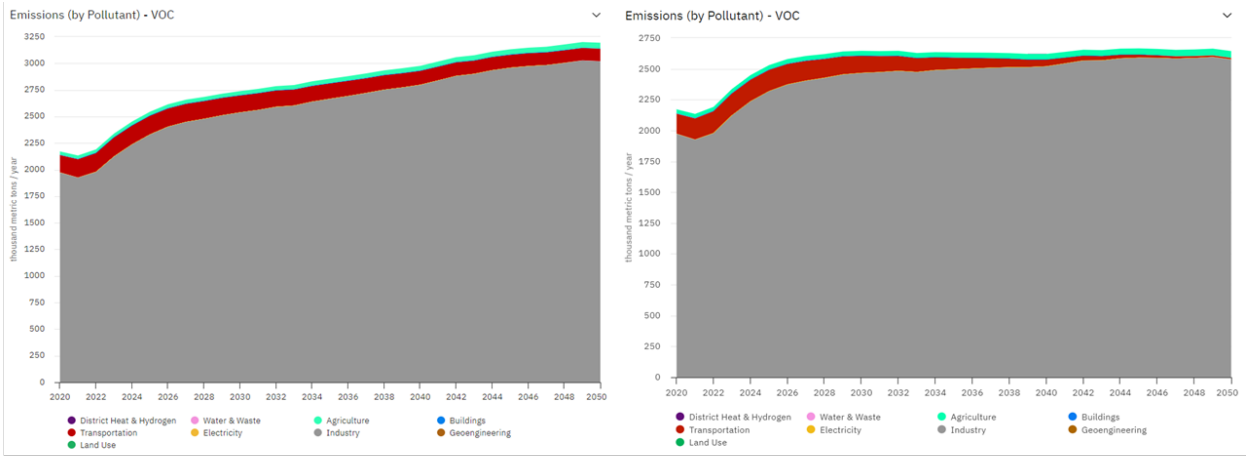
Figure A-9: Emissions Reductions of NO_x by Economic Sector

Table A-9: Cumulative Change in NO_x Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.057500	0.824384	0.607846	0.053297	1.543000
Projected	0.064387	0.748213	0.553012	0.046605	1.412217
Change	+0.006887	-0.076171	-0.054834	-0.006692	-0.130810

Table A-10: Cumulative Change in NO_x Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.064130	0.970330	0.522010	0.063130	1.619600
Projected	0.054388	0.661225	0.191239	0.038942	0.945794
Change	-0.009750	-0.309110	-0.330770	-0.024180	-0.673810



a) Business-as-Usual b) Projected Model

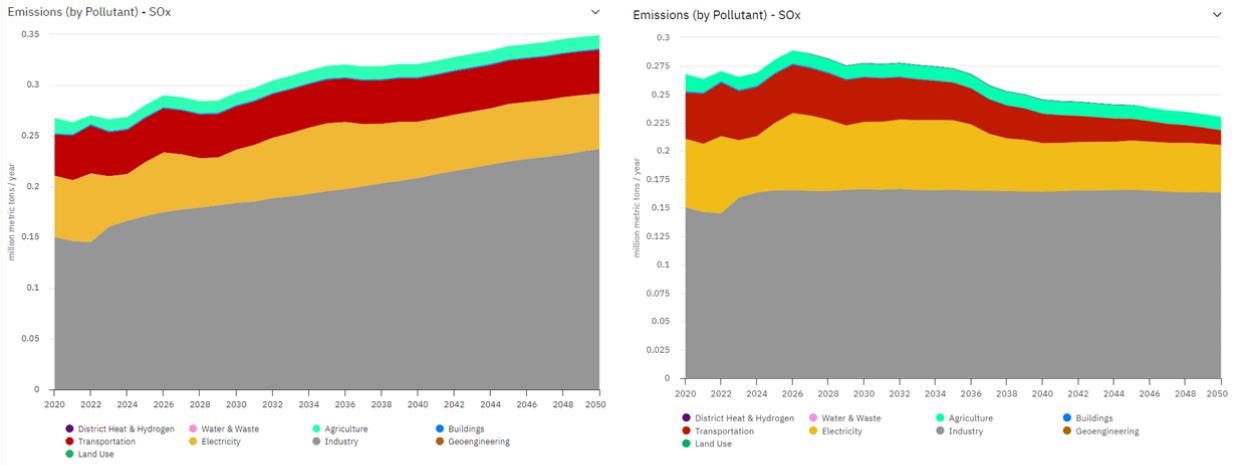
Figure A-10: Emissions Reductions of VOC by Economic Sector

Table A-11: Cumulative Change in VOC Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.001974	2.537140	0.157993	0.041961	2.739068
Projected	0.002296	2.465110	0.136910	0.041332	2.645648
Change	+0.000322	-0.072030	-0.021083	-0.000629	-0.093420

Table A-12: Cumulative Change in VOC Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.002335	3.027540	0.116333	0.057820	3.204028
Projected	0.002211	2.574410	0.010823	0.055918	2.643362
Change	-0.000124	-0.453130	-0.105510	-0.001902	-0.560666



a) Business-as-Usual b) Projected Model

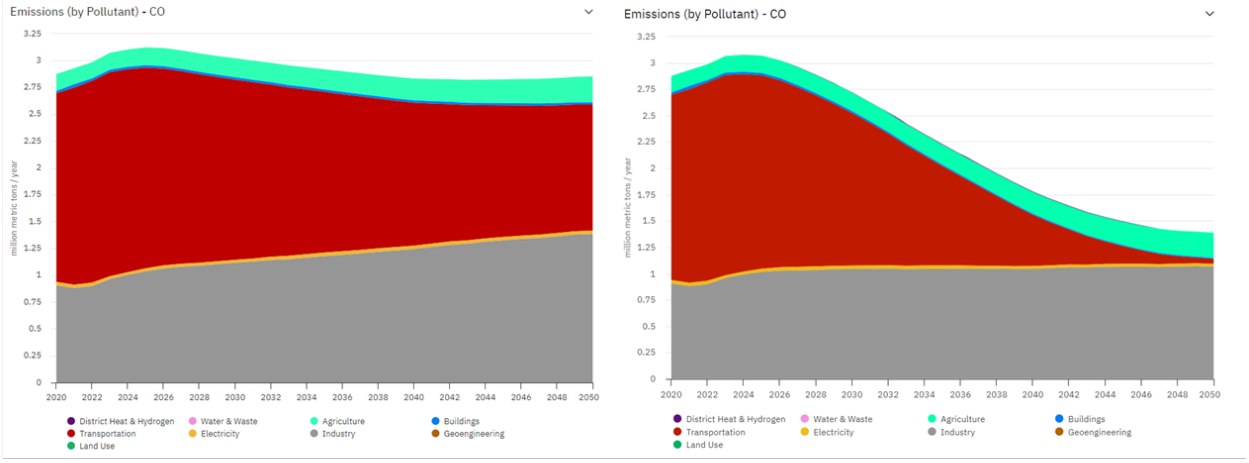
Figure A-11: Emissions Reductions of SO_x by Economic Sector

Table A-13: Cumulative Change in SO_x Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.055289	0.183861	0.042809	0.013457	0.295416
Projected	0.059008	0.166515	0.039110	0.012581	0.277213
Change	+0.003719	-0.017346	-0.003700	-0.000877	-0.018203

Table A-14: Cumulative Change in SO_x Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.057809	0.237220	0.042951	0.014777	0.352757
Projected	0.041935	0.163229	0.013093	0.011785	0.230042
Change	-0.015874	-0.073991	-0.029858	-0.002992	-0.122715



a) Business-as-Usual b) Projected Model

Figure A-12: Emissions Reductions of CO by Economic Sector

Table A-15: Cumulative Change in CO Emissions from 2025 through 2030 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.029953	1.115440	1.680470	0.199813	3.025676
Projected	0.032756	1.043740	1.446020	0.195180	2.717696
Change	+0.002803	-0.071700	-0.234450	-0.004634	-0.307981

Table A-16: Cumulative Change in CO Emissions from 2025 through 2050 by Sector

	Electric Power (MMT)	Industry (MMT)	Transportation (MMT)	Others (MMT)	Total (MMT)
BAU	0.033579	1.387350	1.173430	0.265052	2.859411
Projected	0.027935	1.065230	0.045235	0.249589	1.387989
Change	-0.005644	-0.322120	-1.128195	-0.015463	-1.471422

APPENDIX B: LOW INCOME AND DISADVANTAGED COMMUNITIES IN TEXAS

Table B-1: Texas Census Tracts Identified as a Low Income and Disadvantaged Community by CEJST (Council on Environmental Quality, 2022)

County	Census Tract 2010 ID
Anderson County	48001950500
Anderson County	48001950600
Anderson County	48001950700
Anderson County	48001950800
Anderson County	48001950901
Anderson County	48001950902
Anderson County	48001951000
Andrews County	48003950300
Angelina County	48005000200
Angelina County	48005000400
Angelina County	48005000500
Angelina County	48005000600
Angelina County	48005000700
Angelina County	48005001001
Angelina County	48005001002
Angelina County	48005001200
Angelina County	48005001300
Aransas County	48007950100
Aransas County	48007950300
Aransas County	48007950400
Aransas County	48007950500
Archer County	48009020300
Atascosa County	48013960100
Atascosa County	48013960201
Atascosa County	48013960202
Atascosa County	48013960300
Atascosa County	48013960401
Atascosa County	48013960500
Atascosa County	48013960600
Austin County	48015760100
Austin County	48015760502
Bailey County	48017950100
Bandera County	48019000101
Bastrop County	48021950501
Bastrop County	48021950801
Bastrop County	48021950802
Bee County	48025950201
Bee County	48025950202
Bee County	48025950300
Bee County	48025950400
Bee County	48025950500
Bee County	48025950600
Bell County	48027020401
Bell County	48027020402
Bell County	48027020500
Bell County	48027020600
Bell County	48027020701
Bell County	48027020702
Bell County	48027020800
Bell County	48027020900
Bell County	48027021000
Bell County	48027021601
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Bell County	48027022105
Bell County	48027022300
Bell County	48027022600
Bell County	48027022801
Bell County	48027022900
Bell County	48027023202
Bell County	48027023203
Bell County	48027023204
Bell County	48027023500
Bexar County	48029110300
Bexar County	48029110500
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Bexar County	48029121404
Bexar County	48029121508
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Bexar County	48029121812
Bexar County	48029130200
Bexar County	48029130300
Bexar County	48029130401
Bexar County	48029130402
Bexar County	48029130500
Bexar County	48029130600
Bexar County	48029130700

County	Census Tract 2010 ID
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Bexar County	48029130900
Bexar County	48029131000
Bexar County	48029131100
Bexar County	48029131200
Bexar County	48029131300
Bexar County	48029131402
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Bexar County	48029131614
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Bexar County	48029141000
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Bexar County	48029151700
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Bexar County	48029152201
Bexar County	48029152202
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County	Census Tract 2010 ID
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Bexar County	48029170500
Bexar County	48029170600
Bexar County	48029170700
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County	Census Tract 2010 ID
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County	Census Tract 2010 ID
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Young County	48503950500
Zapata County	48505950301
Zapata County	48505950302
Zapata County	48505950400
Zavala County	48507950100
Zavala County	48507950200
Zavala County	48507950301
Zavala County	48507950302

APPENDIX C: IDENTIFIED STAKEHOLDERS

Table C-1: Identified Stakeholders

Stakeholder or Organization
Abilene Christian University
Air Alliance Houston
AJW
Alamo Area Council of Governments
Ameresco
America Short Line and Regional Railroad Association
Apache Corp.
Ash Grove Cement
Atmos Energy
Becky McGee
Biochar Development Company
Bioeconomy Development Opportunity Zone Initiative
BPX
Bridger Photonics
Center for the New Energy Economy
CenTrio Energy
Ceres
ChampionX
Citizens Climate Education
City of Austin Office of Sustainability
City of El Paso
City of Forth Worth
City of McAllen
City of San Antonio Office of Sustainability
City of Waco
City of Weatherford
City of Wright
Cleakfork Strategies
Clean Air Task Force
ClimCo
Colorado Energy Office
Crown Holdings
CTEH Environmental Consulting
Daimler Truck
DOW
EcoStrat Inc.
Electric Reliability Council of Texas
Energy Transfer
Engineered Advisory
Environmental Defense Fund

Stakeholder or Organization
Environmental Research Group
EPRI
Ernst and Young
ExxonMobil
Freese and Nichols
GBA
Granicus
Great Plains Institute
Greater Houston Partnership
Guidehouse
Halff
Holcim
Houston Advanced Research Center
Houston Energy Transition Initiative
Houston-Galveston Area Council
Hyliion
Independent Petroleum Association of America
INIRX
Legacy Environmental Services
Load-Point
Metco Engineering
Modern Stewardship
Natura Resources
New Mexico Environment Department
North American Sustainable Refrigeration Council
North Central Texas Council of Governments
Oklahoma Department of Environmental Quality
Oxbow
PACCAR
Panhandle Producers and Royalty Owners Association
Parallel Systems
Permian Basin Petroleum Association
Perpetual Use
Peter Bella
Port Houston
PowerHouse Texas
Public Citizen
Public Utility Commission of Texas
Recurve
Renewable Thermal Collective
Republic Services
Rice University
Robert Grobe

Stakeholder or Organization
Rocky Mountain Institute
RWEnergy
Schneider National
Shyft Group
Sierra Club
SPEER Energy Efficiency
State Energy Conservation Office
Stoic Energy Consulting
Sysco
Syzygy Plasmonics
Tejas Health Management Association
Terra Pave International
TexAmerica's Center
Texas Advanced Energy Business Alliance
Texas Association of Regional Councils
Texas Department of Transportation
Texas Gas Service
Texas General Land Office
Texas House Representatives
Texas Impact
Texas Independent Producers and Royality Association
Texas Industry Project
Texas Oil and Gas Association
The Railroad Commission of Texas
THG Energy Solutions
Travis County
TRC
U.S. Green Building Council
University of Texas at Austin
University of Texas Rio Grande Valley
Vistra Energy
Vogel Group
Waste Management
Zoneomics

APPENDIX D: TEXAS CLIMATE POLLUTION REDUCTION GRANTS SURVEY

The Texas Commission on Environmental Quality (TCEQ) released a public survey by soliciting input through its email list and by posting the survey on the Climate Pollution Reduction Grant (CPRG) webpage. The survey was open from December 14, 2023, to January 12, 2024, to collect reduction measure ideas. The survey received 57 responses, 37% from community members and 20% from communities considered LIDAC. Answers to each question are summarized below.

D.1 WHAT IS YOUR AFFILIATION?

There were 57 total responses to this question. Results are shown in the Table D-1.

Table D-1: Responses to Survey Question 1

Affiliation	Responses
Community Member	21
Community Member and Volunteer with Citizens' Climate Lobby	1
Industry Representative	14
Municipality	2
NGO	3
Nonprofit	9
Public School	1
Small Business	1
State Government	1
University	1
(blank)	3

D.2 DO YOU REPRESENT OR BELONG TO A LOW INCOME AND DISADVANTAGED COMMUNITY?

There were 57 total responses to this question. Eleven people identified as representing or belonging to a low income and disadvantaged community. Two responses were blank and the remaining 44 respondents did not identify as representing or belonging to a low income and disadvantaged community.

D.3 WHICH SECTOR ARE YOU MOST INTERESTED IN (CHECK ALL THAT APPLY)?

There were 57 total responses to this question including two blank responses. Figure 1 summarizes those responses. Most respondents were interested in the electric power sector followed by the transportation sector then the oil and gas sector.

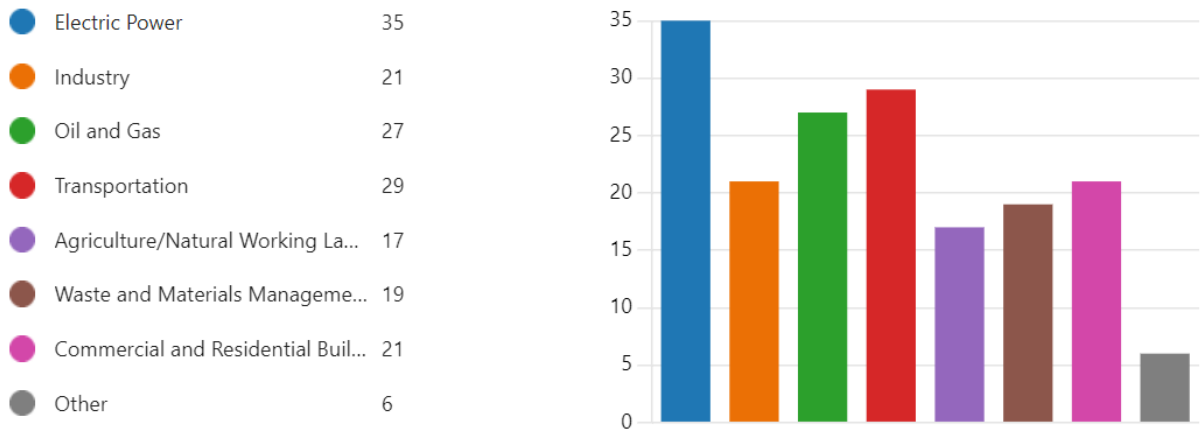

Figure D-1: Responses to What Sector are You Most Interested In?

D.4 ELECTRIC POWER SECTOR MEASURES

Out of 57 respondents, 38 left a measure idea for the electric power sector. Ideas from each respondent are listed in Table D-2.

Table D-2: Electric Power Sector Measures as Submitted by Survey Respondents

Respondent ID	Electric Power Sector Measure Idea
5	Solar
6	ONCOR
8	Electric Power Sector: Our company currently provides value-added products & services to deregulated market participants (retail electric providers, aggregations, etc.). These services are catered to data management & reporting, energy management, and demand response solutions for commercial and industrial (non-residential) end-users. We believe that regulated market participants like municipal utilities and co-ops are lagging behind in these initiatives simply because the competitive nature in deregulated parts of the State have advanced the adoption of these offerings. Working with these (regulated TDSP/muni/co-op) stakeholders to provide better tools for enablement and reporting of energy efficiency and load management initiatives would be a logical first step that would open doors to a large population of electricity users across the State. We believe that a portion of these funds can help kick-start these initiatives that will inevitably be adopted more broadly over the next 5-10 years.
9	* Transition to Renewable Energy: Increase the share of renewable energy sources (solar, wind, hydro) in the power generation mix. * Energy Storage: Invest in advanced energy storage technologies to address intermittency issues associated with renewables. * Grid Modernization: Upgrade and modernize the electricity grid to enhance efficiency and accommodate a higher penetration of renewable energy. * Demand Response Programs: Implement programs that incentivize consumers to shift electricity usage during peak demand periods.
10	Permitting reform to speed up the process and decrease the cost of green energy projects. A focus on transmission lines (funding, facilitating, and permitting) so that the power from green energy projects can be brought to the consumer. Tax incentives and grants to encourage green energy projects.

Respondent ID	Electric Power Sector Measure Idea
12	"Presently as part of the TERP program, TCEQ has a $1 million grant program for storage connected to renewables. This grant program could be expanded beyond that authorized by TERP. In addition, the state could make grants and or loans available to school districts for storage, onsite solar and energy measures. It could be coordinated with SECO's existing programs. "
13	The Low income neighborhoods I work in are using GAS and the homes that are not sealed off due to their age. I have seen homes with noticeable holes in the roof, flooring or walls. House built in the 1940's also have very limited electrical panels and old wiring which makes it difficult for non profit groups with funding to invest in update the homes with new appliances that would produce less emissions because the electrical is already a safety hazard. So these home owners continue to use these out of date appliances, some leaking toxic air into the environment.
14	More solar on homes to help with peak demand from AC in summer
15	our value proposition is to use residual agriculture waste to produce a clean syngas suitable to produce green hydrogen or electricity or alternative to natural gas
17	Add more wind, solar, and battery storage.
18	A. Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. (See page 98 in this pdf file - https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF) Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. C. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids.

Respondent ID	Electric Power Sector Measure Idea
19	A. Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. (See page 98 in this pdf file - https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF) Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. C. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids.
20	Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids

Respondent ID	Electric Power Sector Measure Idea
21	A. Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. (See page 98 in this pdf file - https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF) Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. C. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids.
22	Build transmission lines from generators to users. Incentivize energy conservation and thereby reduce GHG emissions. Get rid of crypto mining in the state. Make it easier for home owners to sell electricity back to the grid
23	Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030; renewed focus on energy efficiency efforts including creation of a statewide energy efficiency counsel.

Respondent ID	Electric Power Sector Measure Idea
24	A. Develop programs to get to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. C. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids.
26	Incentivize the sector to develop specific programs with public accountability to get to net zero GHG emissions by 2050 with an ambitious nearer term goal of 50% reduction by 2030.
27	A. Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. (See page 98 in this pdf file - https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF) C. Increase emphasis on nuclear power, large scale solar, wind and storage, and behind the meter solar and storage

Respondent ID	Electric Power Sector Measure Idea
28	A. Projects to incentivize stakeholders in the Electric Power Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. B. Creation of a statewide Energy Efficiency Council like has been recommended by the Public Utility Commission of Texas. (See page 98 in this pdf file - https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF) Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. C. New clean distributed technologies are now economically available, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments. This would enable greater local energy independence and resilience and expand market opportunities for distributed microgrids.
33	A. Encourage companies in the Electric Power Sector to create programs that set specific goals and measurements, reporting their progress toward achieving net zero greenhouse gas (GHG) emissions by the mid-century. A shorter-term target is a 50% reduction by 2030. B. Create a statewide Energy Efficiency Council in Texas, as suggested by the Public Utility Commission. This renewed focus on energy efficiency will benefit Texans by reducing energy use, cutting GHG emissions, enhancing grid reliability, saving money on energy bills, creating job opportunities, and ensuring Texans take full advantage of available federal incentives (check page 98 in this PDF: https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF). C. Embrace new clean technologies like local solar and storage. Collaborate with the Public Utility Commission to improve market rules, leveraging grid benefits and reducing emissions. Encourage private investments to enhance local energy independence, resilience, and create opportunities for microgrids.
34	Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act.
38	Award to projects that incentivize players in the Electric Power Sector to develop programs that will yield a path to net zero GHG emissions by 2050 and a 50% reduction in GHG emissions by 2030.
39	Solar Farms, Wind turbines, Rooftop solar, Utilities energy storage

Respondent ID	Electric Power Sector Measure Idea
40	Build out transmission and bulk energy storage to optimize Texas' existing and planned renewable generation. Seriously explore Small Modular Reactors to provide zero carbon baseload power with the ability to also produce hydrogen for industrial processes (cement, chemicals, etc.).
41	TAEBA Suggested Measures: Rebates for generators to purchase CCUS equipment. (https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage) Rebates for companies to purchase more efficient equipment that uses less energy or emits less criteria pollutants and GHGs. Grants for companies to develop and implement carbon or criteria pollutant management or reduction programs. Grants to assist in the closure of coal plants, or their transition to natural gas, near Low-Income and Disadvantaged Communities
42	1. Go back to charging higher peak demand costs, as was done in the past. A) It could lower system peaks, require less use of coal fired plants. B) Use a portion of the extra demand cost income for renewable programs. 2. Start a program for reimbursing the replacement of old HVAC equipment with super high efficiency equipment. Stop requiring energy studies as a prereq to get the reimbursement. The studies are often nothing but shifty number crunching (I was involved in doing such studies for years). What is needed is to install the super high efficiency equipment, and make it as easy and fast as can be. You don't need a study to know this is a good idea. 3. Put a price on CO2 emissions. 4. Start a massive program of installing solar panels on big box buildings and over parking lots. Make it a private-public partnership. Finance it publicly or guarantee the financing.
44	-Projects with incentives to reach net zero GHG emissions by mid-century, with a nearer term goal of a 50% reduction by 2030. -Creation of a statewide Energy Efficiency Council Renewed focus on energy efficiency efforts would result in these benefits for Texans: - Reduce energy consumption thereby reducing GHG gas emissions, - Increased grid reliability by reducing peak demands and times of extreme conditions, - Saving Texans money on their energy bills by making their homes more efficient and thus needing less energy for achieving the same quality of life and comfort, - Boost business and employment opportunities in energy efficiency businesses, - Help save Texans money by ensuring they take full advantage of federal incentives already. available in the Inflation Reduction Act. -The use of more clean energy technologies, such as local behind-the-meter solar and storage. Work with the Public Utility Commission to establish improved market rules to leverage the grid benefits and reduced emissions of these resources and further incentivize private investments.
45	Make it easier for homeowners to install solar. right now there are way too many scams out there and it is not very clear what is truly available for homeowners

Respondent ID	Electric Power Sector Measure Idea
46	Enhanced grid infrastructure: improved and expanded transmission capabilities More non-fossil fuel energy production: wind, solar, nuclear, geothermal, etc. Incentives, programs, and information dispersion to help citizens become more energy-efficient
48	Syzygy Plasmonics offers a technology platform that creates all-electric chemical reactors that use light instead of combustion to power industrial chemical reactions. Our photocatalytic decomposition of ammonia (P-DA) reactor bank contributes to reductions in emissions in the power sector by providing inexpensive H2 on demand from carbon-free ammonia (NH3).The H2 produced from Syzygy's reactor bank will be co-fired with natural gas to generate power. P-DA uses up to 30% less NH3 compared to traditional thermal cracking and significantly less electricity than electrolyzers for the same emission-free hydrogen output, which reduces H2 feedstock costs. These factors, combined with a small, modular footprint, makes it an extremely attractive solution for the energy industry that can be easily implemented at scale.
50	TCEQ must recognize that while Battery Energy Storage Systems (BESS) provide the opportunity to temporarily shift renewable energy from over supply period to peak demand and low renewable energy output (lack of wind or solar irradiation), these BESS can not replace the voltage support and dispatchable capacity of spinning fossil fuel fired generation. For real carbon dioxide reductions in Texas, replacing older, less efficient combined cycle, natural gas fired steam units and peakers with newer state of the art dispatchable generation that better matches the intermittency characteristics of the ERCOT renewable energy fleet should be incentivized as it would not only increase resiliency of the grid but lower emissions and send price signals to the wholesale energy market to continue to develop intermittent renewable energy that does not degrade grid resiliency. Avoided emissions are the most cost effective reductions and programs should incentivize commercial and residential customers to achieve material energy efficiency improvements. This is not a statement in support of replacing natural gas space heating and appliances with electric, but rather to improve the overall energy consumption of the place of business or dwelling. It is one in favor of better insulation, tighter building envelopes and the use of technology to match energy use with need.
51	I would prefer to see more power production with the installation of solar panels on all state-owned buildings, utilizing the Federal Inflation Reduction Act and Oncor financial incentives, to increase the electrical energy reserves of Texas with maximum flexibility and without an exorbitant and confining investment in infrastructure.

Respondent ID	Electric Power Sector Measure Idea
52	A caveat that will apply to many of my responses. A Texas IOU 'wires' company (a TDU, Transmission and Distribution Utility) is obligated to perform services that are applicable across the entire rate base. Tariffs may vary across industrial and commercial clients, or large and small consumers, but our energy efficiency activity must be applied, in most cases, across all clients equally (as overseen by the PUC-T). For us, that's 14 million users on 4 million points of connection. The same *generally* applies to a CoOp or Muni Utility, but they have more liberty to 'direct' their activity to specific locations or consumer groups. 'Nuff for the prelims. We manage some relatively small consumer energy efficiency programs ($10Ms a year is, IMHO, small). Load reduction is the PUCT-applied metric. Peak load reduction, which is what drives the cost of our capital, and the delivery cost of energy, should be incented. A consumer may have a time of use or even state-sensitive rate plan, but that does not influence TDU pricing, which is effectively a half of the energy cost. Also note that on-peak energy is more likely to be fossil fuel in origin. Increasingly, consumer loads have time of use discretion, even in cases where a battery is not present ... even though, increasingly, they are (e.g., EV charging). If incentives existed to avoid times when the energy source mix was 'poor' (i.e., more polluting), and across both the Retail (consumption) and TDU (capacity) components of pricing, behavior would change. Although that'd be nice to see across our Grid, it would be acceptable to direct even our smaller EE funds to these efficiencies, were we allowed to do so. (And, everyone's cost also goes down if our infrastructure size, as total capacity, is lessened). On another tack, consider the fact that electric utilities are the largest electric CONSUMERS. The 'unaccounted for energy' (UFE) that is lost between the amount that goes into the Grid for transport, vs. the amount consumed by clients, makes almost all Utilities the largest 'consumer' in their service areas (as the largest TDU in our state, we hold that dubious honor of being the largest consumer in the State, including even the large manufacturers and military facilities located here). There are physics involved in the line and transformer losses, but there is little incentive (at present) to improve the situation. Also, we are converting streetlights to LEDs (a million of them...) only when new installations are made, or for repairs, or when a franchise city pays for the cost of replacement. Incentives to them, or an perhaps to the Utilities as the agents of that change, would have a large impact. But, again, a TDU can't choose to do any suck locationally-preferential action, unless we are directed to do so, or if we do it across the entire service area.
54	We need incentives to encourage the electric power sector to develop concrete plans for how to reach national goals for emissions levels (like 50% reduction by 2030). We should establish an Energy Efficiency Council as recommeded on p97 of the Public Utility Comission's Filing Receipt in Jan-2023 (https://interchange.puc.texas.gov/Documents/54037_9_1264621.PDF).
55	More battery storage and wind and solar. Even nuclear would be better than fossil fuels.
57	Support for EV charging infrastucture with additional incentives for green power, especially for e-school buses. Also helps reduce NOx emissions and PM2.5 emissions.

Respondent ID	Electric Power Sector Measure Idea
58	Accelerate the process for getting solar, wind, and storage projects approved in the interconnection queue. Study the emissions reductions that could be achieved by adding transmission connections from ERCOT to neighboring grids and thereby allowing more wind and solar from Texas to displace fossil-fueled generation in other states.

D.5 INDUSTRY SECTOR MEASURES

Out of 57 respondents, 35 left a measure idea for the industry sector. Ideas from each respondent are listed in Table D-3.

Table D-3: Industry Sector Measures as Submitted by Survey Respondents

Respondent ID	Industry Sector Measure Idea
5	Solar
6	Waste Managment
8	Industry Sector: We have seen first-hand that many industrial and manufacturing verticals with domestic footprints are at a crossroads right now when it comes to initiatives to set, track, and meet sustainability & emissions goals. While more SEC guidance continues to evolve, many in the sector have already felt the pressure to address reporting and tracking best-practices because of their contribution to the supply chain of organizations that have already set goals and established frameworks for reporting. The "crossroads" many are in is caused by uncertainty of the total scope of what will be expected from them in terms of reporting and disclosure; both for their clients and supply-chain, as well as for future mandatory disclosures and reporting. Our perspective is that there would be value in offering incentives to specific industrials who represent growing workforces in communities across the State to help kick-start basic best-practices related to utility data collection and reporting. The objective starting place, in our opinion, is supporting the collection and validation of utility data that aligns with the Greenhouse Gas Protocol (GHG Protocol). This data also inherently enables more detailed benchmarking and energy intensity reporting that can help inform initiatives and investment related to efficiency and decarbonization.
9	* Energy Efficiency Measures: Encourage industries to adopt energy-efficient technologies and practices. * Cogeneration: Implement combined heat and power (CHP) systems to maximize energy efficiency in industrial processes. * Process Optimization: Explore innovative technologies and practices to optimize industrial processes and reduce emissions. * Carbon Capture and Utilization: Invest in and incentivize the development of carbon capture and utilization technologies for industrial facilities.
10	Tax incentives to encourage the use of 100% renewable energy.
12	We support the idea of an energy efficiency program for industrial sectors, but believe it could include a revolving loan component.

Respondent ID	Industry Sector Measure Idea
13	The neighborhoods I work in are Lowest in the city and in the nation. They are surrounded by not only Superfund sites but many different toxic industries like Metal Recycling Plants, CPS Energy plants, Multiple Landfills with very high methane numbers, Silica Sand Distribution and Cement plants. This redlined section of San Antonio needs funding to bring in Air Quality Monitors, there should be funding available to non profits or schools nearby to educate the community on ways to help monitor these businesses for the safety of all. For example they regularly have Silica Sand all over the distribution plant, openly able to be airborne at any moment or absorbed into the soil by rain. This is the same problem with the Metal Recycling plant. There is more but I would need a page.
15	our value proposition is to use residual agriculture waste to produce a clean syngas suitable to produce green hydrogen or electricity or alternative to natural gas
17	Electrify all operations.
18	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.
19	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.
20	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. In particular reviewing impact of CBAM and carbon tax congressional proposals
21	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.
22	Programs to incentivize industry to adopt measures that reduce GHG emissions. This can be done by regulation and incentives to meet specific targets by certain dates.
23	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030. Funds to conduct a third-party audit of industrial permitting requirements for industrial developers to hold them accountable for industrial waste and pollution.
24	Projects to get net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.
27	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.

Respondent ID	Industry Sector Measure Idea
29	Please crack down on the practices used by industry to get around compliance with environmental policies. Businesses break themselves into segments in order to be classified as ""small"" rather than ""large,"" all in an effort to get around pollution regulations. Please follow the link to read: https://www.texastribune.org/2024/01/05/texas-pollution-companies-permits-tceq-epa/
30	Funding to improve/upgrade industrial facilities and their efficiency, for use of alternative fuels in equipment, and for purchasing more efficient equipment.
32	Electrifying stevedoring and port cargo handling equipment across all TX ports and private port operations.
33	Encourage businesses in the Industrial Sector to create programs with specific goals and measurements and public reporting. The aim is to reach net zero greenhouse gas (GHG) emissions by the mid-century, with a shorter-term goal of a 50% reduction by 2030.
38	Award to projects that incentivize players in the Industry Sector to develop programs that will yield a path to net zero GHG emissions by 2050 and a 50% reduction in GHG emissions by 2030.
39	Smart grids
40	Promote electrification (industrial heat pumps) and potential use of hydrogen in those hard to electrify processes.
41	TAEBA Suggested Measures: Rebates for industrial consumers purchasing more efficient equipment Rebates for industrial consumers to purchase electrified versions of traditional commercial equipment e.g. an electric arc furnace for steelmaking. Incentives for industry stakeholders to create or participate in energy efficiency and demand response programs. Grants for the development and implementation of circular economy processes to reduce waste and energy use.
42	1. now and forever, eliminate the sweet deals for crypto currency miners (are they an 'industry'?) when they get paid for cutting energy use in critical times. Force them to cut off; or just cut them off. Or, let them use what they want, but charge them SUBSTANTIALLY higher rates.
44	Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.
45	mandatory emmission caps especially in the Houston Area, limit the amount of plastics that can be produced, ban single use plastics
46	Non-fossil fuel sources of energy as possible Projects to incentivize stakeholders in the Industrial Sector to develop programs with goals, measurements, and public reporting that puts them on a path to net zero GHG emissions by mid-century with a nearer term goal of a 50% reduction by 2030.

Respondent ID	Industry Sector Measure Idea
48	Syzygy Plasmonics offers a technology platform that creates all-electric chemical reactors that use light instead of combustion to power industrial chemical reactions. The technology can be applied to a wide range of use cases in industries including oil, gas, chemical, steel and other industrial processes.
51	Give more flexible legal protections to the grocery industry so that it can donate dented and slightly damaged packages of food to various food banks, kitchens, and dining facilities for the less fortunate, instead of trashing them in landfills.
52	Demand response should be incented with an AQ component, not just a cost component. Well, put a price on carbon, and that'd be saying the same thing.
54	We need incentives to encourage the industrial sector to develop concrete plans for how to reach national goals for emissions levels (like 50% reduction by 2030).
55	Electrification.
56	Leverage grant dollars to support NOx emission reductions at industrial point sources. For example, ultra-low NOX burners and SCR. Focus grant dollars on ozone non-attainment areas to support future attainment demonstrations. Notably these same reductions could benefit EJ communities located located near point sources.

D.6 OIL AND GAS SECTOR MEASURES

Out of 57 respondents, 33 left a measure idea for the oil and gas sector. Ideas from each respondent are listed in Table D-4.

Table D-4: Oil and Gas Sector Measures as Submitted by Survey Respondents

Respondent ID	Oil and Gas Sector Measure Idea
8	Oil & Gas Sector: Texas oil & gas stakeholders take many different shapes and sizes. Many small to midsize producers or infrastructure operators are finding it difficult to prioritize initiatives that, from their perspective, do not have a direct impact to their bottom line today. One of the objective initaitives that can check both cost and emissions reductions is energy efficiency. Access to funds that can help offset costs for motor & pump replacements to make them more efficient from both a usage and power factor is an ideal starting place. To access funds, reporting on energy usage and other scope 1 and 2 line items could be required - placing an inherent incentive to adopt initiatives for better historical and ongoing reporting.
9	* Methane Capture: Implement technologies and practices to capture and reduce methane emissions during extraction and processing. * Flare Minimization: Minimize flaring of associated gas through better gas utilization or conversion to electricity. * Energy Efficiency: Enhance the energy efficiency of operations and transportation within the oil and gas sector. * Transition to Low-Carbon Fuels: Invest in research and development of low-carbon and alternative fuels.

Respondent ID	Oil and Gas Sector Measure Idea
10	Place a carbon fee on all greenhouse gas producing fuels. This carbon fee should then be distributed to everyone as a dividend to help defray the cost of the transition to green energy. The carbon fee should be applied incrementally (increase over time) so that it encourages a gradual transition to non-polluting sources.
12	TERP already has a gas emission reduction program, but given the new EPA methane rules and funding coming to TCEQ potentially for low-production wells, we think a new program focused on support to reduce methane emissions - perhaps allowing existing industry to meet the new EPA standards sooner - could help reduce emissions of methane, a climate cooker. WE also think allowing some money to be used for flyover and gas imaging cameras for TCEQ inspectors could be part of a compliance effort to assist industry locate unlit flares, vents and furtive emissions.
17	Cap all abandoned wells. Monitoring of pipes and other infrastructure for leaks from well head to final use.
18	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
19	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
20	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits. CBAM and carbon tax implementation and PROVE Act impact should be evaluated
21	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
22	Plug abandoned and orphan wells. Increase the money withheld for well permits to cover the costs of plugging wells and increase the fees to reflect inflation. Emphasize reduction of GHG in both operations (scope2) and products (scope3).

Respondent ID	Oil and Gas Sector Measure Idea
23	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
24	Develop projects to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
26	Incentivize the sector to take more responsibility for GHG emissions produced by the use of O&G. Also to increase deployment of carbon capture and direct air capture to be paid for with their profits.
27	Develop projects to encourage oil and gas companies to eliminate emissions from all of their own operations at a minimum. Develop projects to encourage oil and gas companies to reduce the emissions from the combustion of their products by their customers.
28	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
29	See #5 above.
33	Create projects that encourage companies to use their profits more responsibly by addressing the waste from burning their products. Currently, their business models don't consider managing these byproducts. If they include this responsibility in their business models, it might motivate them to reduce costs and invest in technologies like carbon capture and direct air capture, using their profits to fund these efforts.
34	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits. Create publicly available tracking mechanisms to highlight the best actors in this regard.
38	Award projects that incentivize carbon capture and direct air capture of byproducts currently being ignored.
39	More regulation, no more self reporting of emissions
40	Significantly reduce wellhead and other system leaks of methane. Explore the use of abandoned wells for low temperature geothermal and or physical energy storage systems.

Respondent ID	Oil and Gas Sector Measure Idea
41	TAEBA Suggested Measures: Rebates for companies to replace combustion equipment or generators with advanced technology like distributed energy resources (DERs), microgrids, or other electrified options. (https://www.nrel.gov/docs/fy02osti/31570.pdf) Grants for the deployment of microgrids for resiliency support of electrified compression facilities and for wells in the drilling or completion operation phases (pre-production) as a bridge solution while grid connections are being built.
42	1. Greatly expand your staff for monitoring methane leakage. 2. Require elimination of flaring. Or start charging considerable penalties for flaring and leakage.
43	State law that any vehicles unoccupied should not be running. Referring to ICE cars. Exception would be delivery vehicles or. Cars with pets in them.
44	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products. Currently their business models don't take into account managing these byproducts. If they Included this responsibility in their business models, then they might be motivated to accelerate lowering costs and increasing deployment of technologies such as carbon capture and direct air capture which would be paid for with their profits.
46	Capture of methane from wells Capture of greenhouse gases as possible and feasible, given technology for carbon capture and storage
48	Syzygy Plasmonics offers a technology platform that creates all-electric chemical reactors that use light instead of combustion to power industrial chemical reactions. The technology can be applied to a wide range of use cases in the oil and gas sector including photocatalytic steam methane reforming and our GHG to value solution processes GHGs into low-carbon fuels and methanol.
49	Review and tighten regulation enforcement related to oil export and transportation, especially from the largest export site in Texas, Ingleside and Port of Corpus Christi. Include storage and transfer processes and transportation by shipping.
52	Electrification of oil pumps would reduce a reliance on VERY dirty diesel systems, which operate at very low PQ. Even just installing batteries at the sites, allowing for better PQ balancing, would greatly improve AQ impacts and energy efficiencies (and equipment life cycles).
53	· Expand or replicate a program like TCEQ's New Technology Implementation Grant program to accelerate replacement of emitting pneumatic controllers with zero-emission technology, consistent with guidelines in EPA's OOOOc rules, ahead of compliance obligations for existing sources. Emissions from pneumatic controllers are a significant source of emissions from oil and gas operations. Reducing these emissions would not only have methane and co-pollutant reduction benefits, but also could potentially serve to reduce liability under, or even applicability of, the MERP Waste Emissions Charge. · Fund or create a program to provide assistance in the form of training, technical assistance, and potentially financial assistance for smaller producers to reduce methane emissions and other co-pollutants.

Respondent ID	Oil and Gas Sector Measure Idea
54	Develop projects to challenge the sector to invest profits to be more responsible and accountable for the combustion waste byproducts when making use of their products.
55	Removal.
59	Methane emissions and detection technology have advanced significantly in the past decade. Many small operators need help to afford the best methane detection and quantification technology. The most effective mitigation efforts can only be taken if methane can be detected and quantified systematically. Helping small businesses obtain and implement new methane detection technology is vital for reducing methane emissions within the oil and gas sector. We recommend funding be provided to train operators on new technology and help small businesses obtain the best detection technology. These measures can alleviate the upfront capital costs of methane detection.

D.7 TRANSPORTATION MEASURES

Out of 57 respondents, 35 left a measure idea for the transportation sector. Ideas from each respondent are listed in Table D-5.

Table D-5: Transportation Measures as Submitted by Survey Respondents

Respondent ID	Transportation Sector Measure Idea
5	Replace old buses
6	Construction of multiple EV Charging Stations around the City of Waco and at the Bus Terminal for the new fleet of EV Buses.
9	* Electric and Hybrid Vehicles: Promote the adoption of electric and hybrid vehicles by providing incentives and developing charging infrastructure. * Public Transportation: Invest in and expand public transportation options to reduce individual car usage. * Cycling and Walking Infrastructure: Develop infrastructure that supports and encourages cycling and walking. * Fuel Efficiency Standards: Enforce and strengthen fuel efficiency standards for vehicles.
10	Increase the gas tax. The gas tax in Texas and nationally is rarely increased and has not even kept pace with inflation. Encourage the use of electric vehicles through tax incentives. Encourage the growth of electric vehicle infrastructure.
14	EV and hybrid plus better mass transit
15	our value proposition is to use residual agriculture waste to produce a clean syngas suitable to produce green hydrogen for mobility
17	Electrify the entire sector.
18	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.

Respondent ID	Transportation Sector Measure Idea
19	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
20	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
21	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
22	Build out EV charging net works at roadside parks. Incentivize private business (such as restaurants and filling stations) to install charging stations. Educate car buyers about EVs and how the IRA rules apply.
23	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access and financial incentives to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
24	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
26	Develop projects to accelerate access to charging infrastructure for multifamily buildings. Provide sound information to accelerate the spread of EV vehicles.
27	Develop projects to accelerate installation of reliable high speed EV charging stations
33	A. Improve TERP to keep track of and report CO2 emissions and reductions from TERP programs. B. Create projects to speed up access to charging stations for apartment buildings. C. Create electric vehicle (EV) education and training programs to dispel common misconceptions about EVs
34	Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. Develop EV education and training programs to counter spread of EV myths.

Respondent ID	Transportation Sector Measure Idea
35	Schneider is a leading provider of truckload, intermodal and logistics services with an immense impact on the freight transportation sector. As such, Schneider has committed to continuing strategic implementations that will cut our carbon footprint significantly. For our Dallas-Wilmer location in Texas, we would actively replace old Diesel engines and instead deploy 10 Zero Emission Vehicles (ZEV) and its charging infrastructure to operate them. This will consist of 5 DC Chargers and the utility upgrades attached to it. This will offset Nox and CO2 Emissions significantly in the transportation sector. 36% of Nox emissions in Dallas come from On-Road Mobile sector, whereas it is 21% in Texas in general. With Schneider operating around 70,000 miles per year on each of these trucks, annualized a reduction of about 1,173 US Tons of CO2 could be achieved.
36	Encourage people to use electric vehicles by giving them an incentive, including electric bikes and scooters. This would include making electric vehicle charging stations more available.
38	Incentivize EV charging at multi-family residences. Place mini solar panel ""farms"" along highway right-of-ways'
39	Electric vehicle infrastructure, more public transport that is reliable, on time, and safe
40	Promote electrification and where it makes sense fuel cell vehicles. Focus should be on medium and heavy duty transport. Light duty vehicles are well on their way towards large scale adoption.
41	TAEBA Suggested Measures: Increase funding for the Texas Clean School Bus Program, and the Light-duty Motor Vehicles Powered by Alternative Fuel Program. Expand eligibility for these programs, specifically allowing Texans to seek grants for used vehicle purchases and leases, thereby expanding opportunities for EV adoption by Low- and Moderate-Income households. Grants for the deployment of microgrids to support the electrification of commercial fleets Fund a campaign to increase awareness of available grant programs in Low-Income and Disadvantaged Communities. Provide Grants to Low-Income and Disadvantage Communities to install electric vehicle chargers at public locations and residences
43	More charging stations at apartments. Should be in the building code. Reduce the speed limit! We can live with 65. If we are serious about climate change and conserving oil reserves, this is obvious.
44	A. Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths.
45	Reduce VMT by promoting more active transportation and investing into mass transit in our wonderful cities in Texas

Respondent ID	Transportation Sector Measure Idea
46	- Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. - Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. - Expand infrastructure for charging of electric vehicles - More use of electic vehicles in commercial use: city buses, mail trucks, commercial trucking
47	Greenspeed Energy Solutions does not currently have an active proposed project to submit for inclusion in the implementation plan, however we are diligently engaged in conversations with potential stakeholders such as multi-unit dwelling developments, tribal communities, fleet operators and municipalities with a focus on those located within the Justice40 boundaries. We expect to have active projects prior to NOFA release. Through the inclusion of both EV charging infrastructure and solar energy projects, we are uniquely positioned to reduce greenhouse gas emissions by not only assisting in the overarching goal of vehicle electrification adoption and prevalence of ICE vehicles but also creating alternative energy sources for communities across the country.
51	Revoke the coercive Texas $200 Electric Vehicle fee and introduce highway taxation based on mileage per calendar year, as a more equitable equivalency with gasoline tax.
52	In the electric Utility industry, and many others, there are fleets of vehicles that idle much of the time. For our medium and heavy bucket trucks, it is a majority of the time. And, and idling diesel is a VERY bad thing for particularly NOx emissions (a very strong consideration for Ozone non-attainment regions), but also for COx and VOx and particulates. This is particularly unfortunate when there is a today alternative, electrification of the payload on these vehicles, (an ePTO, electric power takeoff), not the vehicle transportation components themselves ... which are not yet ready for this industry (whether or not at cost parity). There is an ~25-30% premium on those electric bucket (etc.) vehicles. But, they are actually better at doing their job, and the 15kWh battery on a medium bucket truck can offset 70-90% of the NOx annual emissions on these vehicles, the small amount of electricity (requiring only L1/L2 charging) typically lasting for 2 days. However, these vehicles are not classified by the EPA and other agencies, for grant purposes, as 'hybrid electric' vehicles, or even idle reduction technologies. They should be.
54	A.Enhance TERP to include tracking and reporting of CO2 emissions and reductions from TERP programs. B. Develop projects to accelerate access to charging infrastructure for multifamily residential buildings. C. Develop EV education and training programs to counter spread of EV myths. D. Incentivize the construction of EV infrastructure, such as charging stations in non-single family residences. E. Build trains between Houston and Dallas and Austin.
55	Electrification. All new cars should be hybrid, if not fully electric.
57	EV incentive grants (vehicles and buses), EV charging infrastructure, support for hydrogen (H2) duty vehicle pilots, support for CO2/NOX capture equipment for HD vehicles, support for planning needs/research for H2 deployment in Texas

Respondent ID	Transportation Sector Measure Idea
58	Provide funding for electric school buses and transit buses. Do not allow natural gas vehicles to qualify, as their net emissions benefit is small and they would require pumping infrastructure that won't help subsequent transitions.

D.8 AGRICULTURE/NATURAL WORKING LANDS MEASURES

Out of 57 respondents, 27 left a measure idea for the agriculture/natural working lands sector. Ideas from each respondent are listed in Table D-6.

Table D-6: Agriculture/Natural Working Lands Measures as Submitted by Survey Respondents

Respondent ID	Agriculture/Natural Working Lands Sector Measure Idea
8	Ag/Natural Working Lands: Usage of water and plastics or related products are key concerns for this segment. Similar to both industrial and oil & gas stakeholders, agriculture would benefit from a kick-start incentive to help better track and report on their usage of these things. Depending on the segment, some are large power and gas users as well. Encouraging adoption of reporting initiatives through available funds to help offset costs for more efficiency pumps and irrigation systems would be an attractive opportunity for many in the space.
9	* Sustainable Farming Practices: Promote sustainable agricultural practices that reduce emissions from soil and livestock. * Afforestation and Reforestation: Encourage tree planting and reforestation projects on agricultural lands. * Precision Agriculture: Implement precision agriculture techniques to optimize resource use and minimize emissions. * Methane Reduction in Livestock: Explore and implement technologies to reduce methane emissions from livestock.
10	Encourage the planting of trees on agricultural land through tax incentives.
12	Texas Soil and Water Conservation District have a soil conservation program but does not presently have funding for farmers and ranchers to implement good programs. TCEQ could work with Soil and Water to provide a grant program to make improvements that keep more carbon onsite.
15	our value proposition is to use residual agriculture waste to produce a clean syngas suitable to produce green hydrogen or electricity or alternative to natural gas
16	Texas has the opportunity to reduce emissions in agriculture and get farmers more funding through incentivizing their transition to resilient agricultural practices. Partnering with companies who will pay farmers to implement practices like cover crops, tillage and buffer strips, and also create carbon credits that will offer more top up payment for farmers.
18	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
19	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
20	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils. Consider reduction of methane production by in particular dairy cows (modified diets)

Respondent ID	Agriculture/Natural Working Lands Sector Measure Idea
21	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soil55
22	Heavy fines for runoff that contains nitrogen compounds and other GHG. Train farmers and ranchers in more sustainable practices. Encourage ranchers to augment cattle feed to reduce enteric fermentation.
23	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
24	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
27	Develop projects to increase the quality of carbon credits from agriculture/natural working lands and reduce the junk credits that are proliferating.
28	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
33	Create projects to speed up the adoption of farming methods that help store more carbon in the soil.
38	Incentivize projects that accelerate the use of regenerative farming practices that will allow for more sequestering of carbon in the soils.
39	Regenerative agriculture, conservation agriculture, forest and coastal wetlands protections
40	Promote agri-voltaics and possibly renewable fuels from agricultural waste.
41	TAEBA Suggested Measures: Grants to landowners to implement sustainable farming practices such as precision agriculture, agroforestry, agrivoltaics (solar coupled with farming activities) and organic farming methods. Grants to landowners for the purchase of methane capture or reduction technologies for livestock management Grants to reforest urban spaces or brownfields, particularly targeting Low-Income and Disadvantaged Communities
43	No more roundup.
44	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
46	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils.
52	Similar to the above, a 'different' definition of hybrid would allow for ePTO ag vehicles. I can't say enough about the possible future of vertical farming. It is energy intensive, but could be incented to (a) emphasize renewable power and (b) provide eventual cost parity with all but the most seasonal large commercial farms. That is, parity can be attained in year-around and boutique crops.
54	Projects to accelerate the use of regenerative farming practices that can lead to sequestering more carbon in soils. Also, we need more state parks, particularly more funds so that the state parks being managed by the state are actually also owned by the state and can be managed and expanded under the park's own authority.
55	Less chemicals.
58	Provide incentives and/or do research for feed additives that reduce methane emissions from livestock.

D.9 WASTE AND MATERIALS MANAGEMENT MEASURES

Out of 57 respondents, 23 left a measure idea for the waste and materials management sector. Ideas from each respondent are listed in Table D-7.

Table D-7: Waste and Materials Management Measures as Submitted by Survey Respondents

Respondent ID	Waste and Materials Management Sector Measure Idea
6	Beneficial Uses of Landfill Gas; Landfill Gas Waste-to-Energy Combined with Solar Utility Farm at Closed Landfill Sites; Compost Facility; Anaerobic Digesters for Multi-feedstocks.
9	* Waste-to-Energy: Invest in waste-to-energy technologies to capture energy from organic waste. * Recycling Programs: Implement and enhance recycling programs to reduce the amount of waste sent to landfills. * Landfill Gas Capture: Capture and utilize methane emissions from landfills for energy production. * Circular Economy Practices: Encourage the adoption of circular economy principles to minimize waste generation.
10	Implement changes that will make it profitable for U.S. companies to recycle waste (rather than shipping it overseas to be incinerated or worse). This can be done by taking measures that decrease contamination in the recycling stream. For example manufacturers can be required to take measures that will make their products more easily recycled. Consumers need to be better informed by those managing waste on how to properly recycle. fines need to be levied or recycling privileges need to taken from households who willfully don't properly recycle. As a landlord I see recycling bins filled with things that aren't recyclable, it's no wonder the recycling isn't working in the U.S. The U.S. should learn best practices from other countries that are doing it successfully. Methane needs to be managed and collected at landfills.
15	our value proposition is to use residual agriculture waste to produce a clean syngas suitable to produce green hydrogen or electricity or alternative to natural gas
18	To best position Texas businesses to compete in the 21st century, we should incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.
19	To best position Texas businesses to compete in the 21st century, we should incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.
20	To best position Texas businesses to compete in the 21st century, we should incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.

Respondent ID	Waste and Materials Management Sector Measure Idea
21	To best position Texas businesses to compete in the 21st century, we should incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.
22	Reduce waste by encouraging recycling. reuse, and repurpose.
23	Programs to encourage growth of industry aimed at commercializing non-plastic containers including bio-degradable and/or cyclical-economy methods. Incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.
24	Incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling of batteries, solar panels, and wind turbines.
30	Funding to incentivize building materials that have a longer lifecycle. Education on the value of a circular economy.
33	To help Texas businesses compete in the 21st century, we should encourage projects that use technology to be more efficient with resources, like recycling. These technologies not only help the environment by cutting emissions but also create opportunities for research and local jobs in recycling, especially for batteries, solar panels, and wind turbines.
37	expanded recycling or composting in my community
38	Incentivize projects that produce ""green packaging"", or at least less packaging at purchase. Incentivizing recycling is always good.
39	Improved mechanical recycling, no chemical recycling of plastics, reduce through taxation on industry the amount of single use plastic packaging produced since they cannot be recycled. More oversight of environmental impacts, third party regulations review
40	Explore renewable fuel opportunities from waste materials.
43	Rebate on electric lawn mowers. Would reduce greenhouse gases and noise!
44	To best position Texas businesses to compete in the 21st century, we should incentivize projects that leverage technology advancements to prioritize resource efficiency like recycling. In addition to reducing GHG emissions, incentivizing these technologies for local and regional recycling of batteries, solar panels, and wind turbines would enable opportunities in recycling research and local manufacturing jobs.
46	Enhanced recycling, especially of plastics. Reduce use of plastic bags in grocery stores, perhaps by not providing them or by charging extra for them.

Respondent ID	Waste and Materials Management Sector Measure Idea
52	There is a world-wide shortage of Utility-scale electrical transformers, and it is pacing {clean} electrification. Some larger Distribution transformers now have 4 year lead times. There are, however other possible sources: refurbishment, and re-allocation. Utilities will make their State-allocated profits regardless of when a load is serviced, with some incentive to start that 'collection' on a 60 year asset sooner than later. However, there is little incentive to change operations in significant ways to do so. In the first case above (refurbishment) grants could tip the scales for cost/benefits within the industry, or spawn new suppliers (of used materials). In the latter case, re-allocation, it is possible that 'used and useful' measures of Utility expenditures might be subject to externally-reviewed efficiency standards.
54	We need to educate the public on the feasibility of plastic recycling and disincentivize industry's use of nonrecycleable (plastic) materials when not absolutely necessary.
55	More plastic recycling, and funding for companies to lessen plastic production and lessen plastic packaging. Funding for "refill" shops.

D.10 COMMERCIAL AND RESIDENTIAL BUILDINGS MEASURES

Out of 57 respondents, 29 left a measure idea for the commercial and residential buildings sector. Ideas from each respondent are listed in Table D-8.

Table D-8: Commercial and Residential Buildings Measures as Submitted by Survey Respondents

Respondent ID	Commercial and Residential Buildings Sector Measure Idea
6	Multiple LED Conversations at City Facilities.
8	Commercial Buildings: Public education across the State has been forced to deal with rapidly growing population. With so much capital being spent on expansions of footprints and facilities, legacy builds have suffered from lack of investment. We see it first-hand in the disparity of energy intensity per SQFT across many districts. A targetted approach that encourages improving efficiency in legacy buildings would make a significant impact on energy intensity for most districts in the State, since their priorities have been forced to shift to expansion. EnergyStar PM is not always a good fit for education because of campus build-outs and other variables impacting complete reporting. Associating available incentives with further commitments to standardized reporting and the adoption of demand response/load management carries an array of benefits that would also enable the M&V of retrofit projects and EE investments; reducing scope 1 & 2 emissions, and reducing water usage.
9	* Energy Efficiency Standards: Implement and enforce energy efficiency standards for buildings. * Renewable Energy Integration: Promote the use of rooftop solar panels and other renewable energy sources in buildings. * Smart Building Technologies: Utilize smart building technologies to optimize energy usage. * Energy Retrofit Programs: Implement programs to retrofit existing buildings for improved energy efficiency.
10	Building codes need to be updated to maximize efficiency and encourage the use of electricity rather than fossil fuels.

Respondent ID	Commercial and Residential Buildings Sector Measure Idea
12	While Texas has a program through SECO for public buildings through the LOANSTAR program, there is no program in Texas for private building owners to make their existing buildings more energy efficiency, other than some utility program and federal funding that comes to TDHCA. We would suggest that TCEQ could create a program that combined grants for low-income residents or developers of low-income housing, and a revolving loan program for commercial and residential erg efficiency upgrades. These loans could be combined with existing utility programs overseen by the PUCT.
13	The homes in these low income neighborhoods are severely in need of roof and floor restoration in order to keep outside elements from blowing into the homes of residents near the toxic business that surround them. Many of these pier and beam homes in San Antonio, TX are all from the 1940's.
17	Electrify all buildings.
18	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems.
19	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems.
20	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems. Make it easier for new home buyers and builders to consider options to incorporate these measures as options in new homes with credits perhaps automatically applied without excessive paperwork on buyers side.
21	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems
22	Train and encourage contractors to install heat pumps and other device that can reduce GHG emissions. Encourage methods to reduce consumption.
23	Projects to identify supply chain opportunities to accelerate heat pump deployments and solar panels in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems.
24	Projects to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems.
26	Accelerate heat pumps in buildings. Incentivize new home builders to incorporate things like heat pumps, induction stoves, electric appliances, and EV charging stations into new homes.
27	Educate suppliers and contractors on new low emissions products like heat pump air conditioning, heat pump water heaters, solar panels, batteries. Make it very easy for homeowners to purchase and get credits for this equipment.
30	Funding to improve/upgrade industrial facilities and their efficiency, for use of alternative fuels in equipment, and for purchasing more efficient equipment. Funding for identifying specific upgrades in commercial facilities that would reduce pollution/improve efficiency.

Respondent ID	Commercial and Residential Buildings Sector Measure Idea
31	RE-volv is a 501c3 nonprofit with a mission to empower people and communities to invest collectively in renewable energy. We envision a world where people are thriving in communities powered by clean energy. RE-volv helps nonprofit organizations in historically excluded communities across the country install solar and storage on their properties with $0 down through leases, loans, or power purchase agreements while engaging local community members to go solar and advocate for clean energy at home. Since 2011, we've developed solar and storage installations for 65 community-serving nonprofits in 17 states, helping each of them save a minimum of 15% on their electricity bills. RE-volv is developing a presence in Texas and is training a student team from the University of Texas - Austin in professional solar skills. We also have several Texas nonprofits in our pipeline that we are working to develop solar projects for. We are submitting this form to express our support for more nonprofit solar initiatives to be included in the PCAP, and we are open to working with the state to support these efforts through any CPRG grant funding opportunities that may become available in the future. For more information, please contact Ashley Malyszka, Development Director, at ashley@re-volv.org.
33	Create projects to find ways to speed up the use of heat pumps in buildings. One example is offering state tax credits to heating and cooling system distributors if they stock heat pump systems instead of traditional ones.
38	Incentivize the use of heat pumps and geothermal in building construction via costs, codes, and tax credits.
39	Net zero buildings, cooling roofs, smart glass and smart thermostats, green roofs
40	Improve and enforce building codes to make buildings more energy efficient given our changing climate and the pace of growth in Texas.
41	TAEBA Suggested Measures Incentives program for energy-efficient construction practices, promoting retrofitting programs for existing structures, and encouraging the adoption of renewable energy sources for heating and electricity. Provide incentives for LEED-certified construction. LEED is Leadership in Energy and Environmental Design; it is the world's most widely used green building rating system. (https://www.usgbc.org/guide-LEED-certification) Provide grants for rooftop solar and battery storage projects for commercial and residential customers Provide grants for sustainable projects such as installation of green walls and microforests in urban centers, and green or living roofs for buildings. These projects reduce air and noise pollution, decrease the urban heat effect and create habitat which will likely translate to less energy use and better air quality.
43	Eaves on houses should stick out much further, would reduce a/c bills.
44	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems.
46	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems. More research and deployment as feasible of geothermal heating and cooling

Respondent ID	Commercial and Residential Buildings Sector Measure Idea
52	Site managers are savvy energy consumers. They need more opportunities to be compensated for their load flexibility, market participation (both bulk energy and ancillary services, AND compensation by the TDUs directly for PQ management services rendered in lieu of Utility infrastruicture.
54	Projects to identify supply chain opportunities to accelerate heat pump deployments in buildings. For example, state tax credits to HVAC distributors to stock heat pump systems vs traditional HVAC systems. Also encourage construction of new homes to make available options to upgrade homes for energy efficiency, with good information about the benefits it would offer.
55	Solar should be on every new building.

D.11 OTHER MEASURES

Out of 57 respondents, 24 left a measure idea that did not fit into one of the defined sectors. Ideas from each respondent are listed in Table D-9.

Table D-9: Other Measures as Submitted by Survey Respondents

Respondent ID	Other Measure Ideas
7	Hydrogen production, specifically green hydrogen produced with renewable energy, needs to be a focus of attention for various sectors - transportation, distributed power, chemical processes, industrial processes, synthetic fuel, power generation, etc.
8	Other Ideas: ERCOT is unique from other electricity markets in that there are robust analytics on emissions factors related to electricity generation in near real-time. While many in the Fortune 500 have either operationalized or have contracted to use real-time reporting metrics to encourage load shifting, there is no near-term incentive for others to do the same. Using interval data, it is possible to set benchmarks to encourage load shifting away from the highest 5% of CO2e hours of the year. Providing ad-hoc incentives for a subset of users from a combination of the above sectors to reduce their RT CO2e against the grid average would yield near-term benefits from a decarbonization perspective, and also pave the way towards what many are considering the more granular and dynamic future of Scope 2 emissions reporting.
9	* Carbon Offsetting Programs: Support and participate in carbon offset programs that fund emissions reduction projects in various sectors. * Education and Outreach: Conduct public awareness campaigns to encourage sustainable practices and behavior. * Innovation and Research Funding: Allocate resources for research and development in clean energy and emission reduction technologies.
10	Implement policies that increase tree populations in urban environments. One of the hallmarks of a desirable neighborhood is a tree canopy. Trees make living in an urban environment more comfortable (due to shade and decreased temperature) and are visually pleasing. Growing trees pull CO2, that causes climate change, out of the atmosphere.
12	TCEQ could add a TERP-like program for lawn equipment that is electrified and therefore less polluting then traditional diesel or gas-powered lawn equipment. IT would be voluntary but allow both companies and individuals to convert to electric-powered lawnmowers, leaf blowers etc.

Respondent ID	Other Measure Ideas
18	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
19	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
20	Statewide public education programs to help more citizens and high schoolers and students get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
21	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
22	The best way to reduce GHG emissions is to encourage efficiency. Lowering consumption will reduce GHG.
23	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, education will address understanding the basics of the problem. Particularly to a younger generation, it can foster creative solution-finding and technological advancement, which can also encourage economic growth for Texas.
24	Statewide public education programs regarding the basic science of our changing climate.
25	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.

Respondent ID	Other Measure Ideas
26	Statewide public education programs to help more citizens accept the science of climate change.
28	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
33	Create programs across the state to teach people about the basic science of our changing climate. To find helpful solutions and get support for those solutions, it's important for more people to understand the basics of the issue. Otherwise, there will be unnecessary resistance to fixing the problem, and people who could be helping will be sitting on the sidelines. In short, to make a difference, people first need to understand what's happening.
34	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate. To move forward with constructive solutions and support for those solutions, we need more folks understanding the basics of the problem. Otherwise, we will continue to have too much unnecessary and unproductive resistance to addressing the problem and too much brainpower sitting on the sidelines which could be solving it. Said more concisely, to make a difference, we must first understand what's happening.
38	Educate public about the benefits of EVs and more education about Climate Change in general, so we can have more minds helping to counter the warming problem.
39	Preserve and protect prairie lands, preserve lands around rivers and streams for help with filtering the drinking water before it gets treated.
41	Create a program under which Texas residents could: Access an online hub that provides resources on how to claim federal and state funds and rebates to electrify their home Apply for free residential energy audits offered through the program Receive online or in-person counseling on how to go solar, weatherize their home and save on their electricity bills
46	Disallow open doors for businesses running air conditioning in hot weather.
52	The same item mentioned in 10 (and as reflected in 4) can be applied to aggregated residential consumers, who (with their electric vehicles, smart homes, etc.) are prosumers (producing consumers), with capital outlays for these millions of grains of sand on the beach that actually will soon be the larger part of that beach. If so incented. Perhaps even if just so informed (make it a game!).
54	Statewide public education programs to help more citizens get comfortable with the basic science of our changing climate.
57	energy efficiency and green energy for government facilities that reduce reduce criteria pollutants and GHG