APPENDIX C

TEXAS EMISSIONS REDUCTION PLAN BIENNIAL REPORT (2021-2022)

2025 REGIONAL HAZE PROGRESS REPORT

NON-RULE PROJECT NUMBER 2024-007-OTH-NR
SFR-122/2024-007-OTH-NR

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December 2022
SFR-079/22

Texas Emissions Reduction Plan Biennial Report (2021-2022)

Report to the 88th Texas Legislature

Air Grants Division

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Texas Emissions Reduction Plan
Biennial Report (2021 – 2022)

A Report to the 88th Texas Legislature

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Prepared by:
Air Grants Division
Texas Commission on Environmental Quality
SFR-079/22

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY · PO BOX 13087 · AUSTIN, TX 78711-3087

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Summary

Texas Emissions Reduction Plan

In 2001, the 77th Texas Legislature enacted Senate Bill (SB) 5, establishing the Texas Emissions Reduction Plan (TERP) under Texas Health and Safety Code (THSC) Chapter 386. Under THSC Section 386.052(b), the statutory objectives of the TERP include:

1. Achieving maximum reductions in nitrogen oxides (NO_x) to demonstrate compliance with the Texas State Implementation Plan (SIP).
2. Preventing areas of the state from being in violation of National Ambient Air Quality Standards (NAAQS) established by the United States Environmental Protection Agency (EPA) under authority of the federal Clean Air Act (FCAA).
3. Achieving cost-savings and multiple benefits by reducing emissions of other pollutants.
4. Achieving reductions of emissions of diesel exhaust from school buses.
5. Advancing technologies that reduce NO_x and other emissions from facilities and other stationary sources.

Texas Commission on Environmental Quality (TCEQ) produced this Texas Emissions Reduction Plan biennial report to fulfill the requirements of THSC Sections 386.057, 386.116(d), and 395.015.

Revenue and Funding

The TERP is funded from fees and surcharges on obtaining a certificate of vehicle title for all vehicles, purchase or lease of heavy-duty vehicles and equipment, and registration and inspection of commercial vehicles. Revenue into the TERP Trust during the Fiscal Year (FY) 2022–2023 biennium is projected to be nearly $500 million. A projected $324 million will be available for TERP programs and administration, after the statutorily required transfer of no less than 35% of the fund to the Texas Highway Fund for the Texas Department of Transportation (TXDOT) to implement congestion mitigation projects.

Program Highlights

The TERP includes incentive funding for a variety of programs. The primary TERP grant programs provide grants to reduce NO_x emissions from mobile sources in the state's nonattainment areas and other affected counties. Other programs include funding to:

- Encourage the use of natural gas vehicles and other alternative fuel vehicles, and infrastructure to provide fuel for those vehicles.
- Reduce emissions from school buses.

- Encourage greater use of light-duty vehicles powered by electricity or an alternative fuel.
- Conduct studies and fund pilot programs for Port Authorities to encourage cargo movement that reduces emissions.
- Fund new technologies to reduce emissions from certain stationary facilities.
- Fund air monitoring in the North Texas region.
- Establish energy efficiency programs.

TERP Program Highlights

Diesel Emissions Reduction Incentive Program

Since 2001, the Diesel Emissions Reduction Incentive Program has provided over $1.1 billion to replace or upgrade 20,450 vehicles and pieces of equipment. These projects will reduce NO_X in the nonattainment areas and other affected counties by 189,151 tons.

Texas Clean Fleet and Texas Natural Gas Vehicle Grant Programs

TCEQ implemented the Texas Clean Fleet Program in 2009 and the Texas Natural Gas Vehicle Grant Program in 2012. Together, they have provided over $123 million to replace or upgrade 1,875 existing vehicles with new vehicles or engines powered by natural gas or an alternative fuel. These projects will reduce NO_X in the area designated the Clean Transportation Zone by 2,372 tons.

Seaport and Rail Yard Areas Emissions Reduction Program

Since 2015, the Seaport and Rail Yard Areas Emissions Reduction Program has provided over $28 million to replace 363 drayage vehicles and pieces of cargo handling equipment operating at seaport and rail yard facilities in nonattainment areas. These projects will reduce NO_X in those nonattainment areas and other affected counties by 1,303 tons.

Alternative Fueling Facilities Program

Since 2012, the Alternative Fueling Facilities Program has provided over $31 million to construct or expand 311 natural gas, alternative fuel, or electric charging facilities in the area designated the Clean Transportation Zone.

Texas Clean School Bus Program

Since 2008, the Texas Clean School Bus Program has provided over $53 million, including over $4 million in federal funds, to retrofit or replace 7,860 school buses in Texas.

New Technology Implementation Grants Program

Since 2010, the New Technology Implementation Grants Program has awarded over $16 million to reduce stationary source emissions and incentivize installation of electricity storage related to renewable energy.

Port Authority and Studies Pilot Projects Program

Since 2018, the Port Authority and Studies Pilot Projects Program has provided $2 million to Port Authorities in Texas for studies and pilot programs that provide incentives to encourage cargo movement that reduces emissions.

Light-Duty Motor Vehicle Purchase or Lease Incentive Program

TCEQ implemented the Light-Duty Motor Vehicle Purchase or Lease Incentive Program in 2014 through its statutory expiration date of August 31, 2015. The Texas Legislature reinstated the program in 2017. The program has provided over $16 million in rebates for the purchase or lease of light-duty alternative fuel and electric-powered vehicles. This includes rebates for 6,477 plug-in electric and plug-in hybrid electric vehicles and 274 natural gas vehicles.

Governmental Alternative Fueling Fleet Program

Since 2021, the Governmental Alternative Fueling Fleet Program has provided $6 million in grant funds to one governmental entity for the purchase of vehicles and refueling infrastructure.

Regional Air Monitoring Program

Since 2012, the Regional Air Monitoring Program has provided over $27 million to establish 21 air monitoring sites in the North Texas region. These sites include 13 Automated Gas Chromatograph systems that provide near real-time volatile organic compound data on an hourly basis and eight volatile organic compound canister systems that collect ambient air samples every six days.

I. Overview

The TERP was established by Senate Bill (SB) 5,77th Texas Legislature, Regular Session, 2001, under THSC Chapter 386. The TERP has subsequently been updated and modified to ensure program objectives are being met and to address new priorities.

Since NO_x is a primary precursor to the formation of ground-level ozone, the TERP targets areas in Texas designated as nonattainment for ground-level ozone under the FCAA, as well as other affected counties for ozone. Lowering NO_x emissions from the TERP-eligible sources remains an important component of the SIP, which details how the state will meet FCAA requirements.

The TERP is currently comprised of the following incentive grant programs:

- Diesel Emissions Reduction Incentive (DERI) Program
- Texas Clean Fleet Program (TCFP)
- Texas Natural Gas Vehicle Grant Program (TNGVGP)
- Seaport and Rail Yard Areas Emissions Reduction (SPRY) Program
- Alternative Fueling Facilities Program (AFFP)
- Texas Clean School Bus (TCSB) Program
- New Technology Implementation Grants (NTIG) Program
- Light-Duty Motor Vehicle Purchase or Lease Incentive Program (LDPLIP)
- Governmental Alternative Fuel Fleets (GAFF) Program

Additional TERP programs include:

- Port Authorities Studies and Pilot Projects (PASPP) Program
- Energy Efficiency Programs
  - Goal for Energy Efficiency
  - Energy Efficiency Programs in Institutions of Higher Education and Certain Government Entities
  - Texas Building Energy Performance Standards
- Regional Air Monitoring Program
- Health Effects Study
- Air Quality Research Support Program
- Foreign Emissions and Exceptional Events Research

II. Funding

Texas Emissions Reduction Plan Trust

The TERP is funded from revenue deposited to the TERP Trust established under THSC Section 386.250 as an account outside the state treasury. Use of the revenue deposited to the TERP Trust is authorized by the Texas Legislature and is projected to be nearly $500 million in FY 2022-2023. The projected revenue deposits are listed in Appendix 1 of this report. The revenue going to the TERP Trust comes from the fees and surcharges listed below.

- Tax Code Section 151.0515(b): A 1.5% surcharge on the sale price or lease/rental amount of off-road diesel equipment sold, rented, or leased. (A surcharge is also applied to the storage, use, or consumption of this equipment in Texas.)
- Tax Code Section 152.0215(a): A 2.5% surcharge of the total consideration on sale or lease of model year pre–1997 on-road diesel vehicles over 14,000 pounds and a 1% surcharge for vehicle model year 1997 and newer.
- Texas Transportation Code Section 502.358: A 10% surcharge of the total fees due for the registration of truck-tractors and commercial motor vehicles.
- Texas Transportation Code Section 501.138(a): A portion of the vehicle certificate of title fee, $20 of the $33 fee for applicants in the nonattainment counties and affected counties and $15 of the $28 fee for applicants in all other counties.
- Texas Transportation Code Section 548.5055: A $10 fee on commercial motor vehicles required to have an annual safety inspection.

The fees and surcharges will continue until, for each active or revoked ozone NAAQS, all areas in Texas have been designated by the EPA as in attainment or unclassifiable/attainment or the EPA has approved a re-designation substitute making a finding of attainment. The TERP fees and surcharges will expire once there is no pending judicial review of those EPA actions, and the final notice of such action is published in the Texas Register by TCEQ as required by THSC Section 387.037.

Funds Allocation

TERP allocation amounts listed in Appendix 2 are based upon projected TERP fee revenue. As of August 2022, a projected $324 million will be available for TERP programs and administration in the FY 2022-2023 state fiscal biennium.

Beginning September 1, 2021, TCEQ was authorized to utilize the total revenue from the TERP fees remitted to the TERP Trust for the TERP programs, without appropriation, provided that no less than 35% of that revenue be transferred to the Texas Highway Fund for TXDOT to implement congestion mitigation projects. For TERP programs with a statutory percentage allocation, the percentage allocation was taken after the deduction of the required 35% transfer to the state highway fund as revenue was received each month.

THSC Section 396.252, provides for TERP funds to be used for other programs under the plan as determined by the commission, based on demand for grants for eligible projects under programs after the commission solicits projects to award grants according to the initial allocation of each program. Therefore, the initial allocations listed in Appendix 2 may change based upon the demand for each grant program in FY 2022-2023.

III. Program Accomplishments

The sections that follow include the accomplishments of the TERP grant programs from implementation through August 2022. Programs are organized by their stated goals to reduce NO_x emissions from vehicles and equipment, provide alternative fuels for transportation, reduce vehicle emissions, encourage energy efficiency, or achieve emissions reductions from facilities.

Grants to Reduce NO_X Emissions from Vehicles and Equipment

Diesel Emissions Reduction Incentive Program

The DERI Program, established under THSC Chapter 386, provides grants for projects that reduce NO_x emissions in the DERI-eligible counties, including counties designated as in nonattainment of the NAAQS and the "Affected Counties" defined under THSC Section 386.001 (see Appendix 3 of this report). The DERI Program includes the Emissions Reduction Incentive Grants Program, the Rebate Grants Program, Small Business Grants, and Third-Party Grants.

Since 2001, the DERI Program has provided $1,192,434,745 for 12,694 grant projects to replace or upgrade 20,450 vehicles and pieces of equipment. DERI is projected to reduce 189,151 tons of NO_x emissions in the DERI-eligible counties. The DERI Program remains the most cost effective TERP program at an average cost of $6,304 per ton of NO_x reduced.

A summary of DERI projects awarded through August 2022 is provided by area in Appendix 4 and by emissions source in Appendix 5 of this report. A complete list of DERI projects is available at www.terpgrants.org.

The emissions reductions presented are projections based on emissions reduction calculations completed for each grant project. The projections are continually updated to account for completed projects, newly awarded projects, and changes to active projects.

The status of each DERI grant program is provided below.

Emissions Reduction Incentive Grants Program

The ERIG Program provides grants for the lease or purchase, replacement, repower, or retrofit of non-road equipment, heavy-duty on-road vehicles, marine vessels, locomotives, and stationary equipment. Grants may also be available for the acquisition and installation of refueling and idle-reduction infrastructure for heavy-duty non-road equipment, heavy-duty on-road vehicles, marine vessels, locomotives, and stationary equipment.

Since 2001, the ERIG Program has provided $905,845,741 in grants for 5,652 projects. The ERIG Program is projected to reduce 156,281 tons of NO_x emissions at an average cost of $5,796 per ton.

TCEQ anticipates opening the next ERIG grant round in February 2023, with an estimated $45 million in available funding over the biennium. TCEQ anticipates that the ERIG Program will be oversubscribed in FY 2022-2023.

Rebate Grants Program

The Rebate Grants Program provides a streamlined and simplified process for the submission and approval of grants for projects to reduce NO_x emissions from heavy-duty on-road diesel vehicles and non-road diesel equipment. Rebate grants are based on pre-approved maximum rebate grant amounts for eligible on-road and non-road replacement and repower projects.

Since 2006, the Rebate Grants Program has provided $208,674,493 for 3,221 projects. The Rebate Grants Program is projected to reduce 22,852 tons of NO_x emissions at an average cost of $9,131 per ton.

The latest Rebate Grants Program grant round was opened on October 21, 2022, with a projected $75 million in available funding over the biennium. As of November 9, 2022, TCEQ received 606 applications requesting a total of $151,809,427.

Small Business Grants Program

The Small Business Grants Program targets small businesses and other entities that, for more than two years, have owned and operated no more than five vehicles or pieces of equipment, or a combination of the two, one of which must be diesel-powered. The program includes a streamlined application process for small businesses in the DERI-eligible counties to apply for financial assistance to replace or repower vehicles or equipment.

TCEQ has incorporated the Small Business Grants Program into the Rebate Grants Program by providing a set-aside funding amount for projects submitted by entities who meet the statutory definition of a small businesses under the program.

Since 2006, the Rebate Grants Program has provided $97,889,738 in grants to small businesses for 1,487 projects totaling 10,958 tons of NO_x reductions at an average cost of $8,933 per ton of NO_x reduced.

Third-Party Grant Program

TCEQ has awarded eight third-party grant contracts to four grantees to assist with the implementation of TERP projects in the DERI-eligible counties: the Railroad Commission of Texas was awarded $44,150,000 to

fund propane and natural gas vehicles and equipment projects; the North Central Texas Council of Governments was awarded $22,823,372 to fund various TERP projects, including refuse haulers; the Houston-Galveston Area Council was awarded $8,000,000 to fund local government and commercial TERP projects, including projects to replace vehicles operating at or near the ports; and the Texas General Land Office was awarded $6,150,000 to fund natural gas vehicle and equipment projects.

There are no current third-party grants in effect, although previous grantees continue to monitor the sub-grant projects over the life of those projects.

Since 2004, the Third-Party Grants Program has provided $65,489,149 in grants to 3,589 third-party sub-grant recipients totaling 8,694 tons of NO_x reductions at an average cost of $7,532 per ton of NO_x reduced.

Texas Clean Fleet Program

The TCFP, established under THSC Chapter 392, provides grants to owners of atleast 75 vehicles in Texas to replace a minimum of 10 diesel vehicles with new alternative-fuel or hybrid vehicles. Eligible alternative fuels include compressed natural gas (CNG), liquefied natural gas (LNG), liquefied petroleum gas (LPG), hydrogen, methanol (85 % by volume), and electricity.

Grant-funded vehicles are required to operate at least 25% of annual use in one or more of the counties included in the Clean Transportation Zone. A map of those counties is included in Appendix 6 of this report.

Since 2010, the TCFP has provided $69,363,635 in grants for 37 projects. The TCFP is projected to reduce 704 tons of NO_x emissions at an average cost of $98,594 per ton. A summary of projects awarded under the TCFP by area and fuel type is provided in Appendix 7 of this report. A complete list of TCFP grant projects is available on the TERP website at www.terpgrants.org.

The latest TCFP grant round was open from July 18, 2022, and ran through September 16, 2022, with a projected $16 million in available funding over the biennium. TCEQ received 12 applications requesting a total of $24,477,683.

Texas Natural Gas Vehicle Grant Program

The TNGVGP, established under THSC Chapter 394, provides grants for projects to replace or repower existing heavy-duty and medium-duty vehicles with natural gas vehicles and engines powered by CNG, LNG, or LPG.

Grant-funded vehicles are required to operate at least 75% of their annual use in one or more of the counties included in the Clean Transportation

Zone. A map of those counties is included in Appendix 6 of this report.

Since 2012, the TNGVGP has provided $54,012,006 in grants for 140 projects replacing 1,145 vehicles. The TNGVGP is projected to reduce 1,668 tons of NO_x emissions at an average cost of $32,372 per ton. A summary of projects awarded under the TNGVGP by area and fuel type is provided in Appendix 8 of this report. A complete list of TNGVGP grant projects is available on the TERP website at www.terpgrants.org.

The TNGVGP was undersubscribed in the FY 2020-2021 biennium. The 87th Texas Legislature changed the TNGVGP requirements to allow grants to fund the purchase of used natural gas vehicles, as well as new natural gas vehicles. Additionally, TCEQ increased the grant amounts offered for TNGVGP projects to provide greater incentives for participation in the program.

The latest TNGVGP grant round opened October 14, 2022, with a projected $32 million in available funding over the biennium. Eligible projects will be awarded on a first-come, first-served basis through March 31, 2023, or until all available funds are awarded.

Seaport and Rail Yard Areas Emissions Reduction Program

The SPRY Program (formerly referred to as the Drayage Truck Incentive Program), established under THSC Chapter 386, provides grants for the repower or replacement of drayage vehicles and cargo handling equipment operating at seaport and rail yard facilities located in areas designated as nonattainment.

Grant-funded vehicles and equipment are required to operate at one or more of the eligible seaports, facilities, or Class I rail yards for a minimum of 200 days per year. In addition, grant-funded vehicles are required to operate at least 50% of their annual use in one or more of the DERI-eligible counties (See Appendix 3 of this report).

Since 2015, the SPRY Program has provided $28,702,701 in grants for 190 projects replacing 363 pieces of equipment. The SPRY program is projected to reduce 1,303 tons of NO_x emissions in the Texas nonattainment areas and affected counties at an average cost of $22,022 per ton. A summary of projects awarded under the SPRY Program by area is provided in Appendix 9 of this report. A complete list of SPRY grants is available on the TERP website at www.terpgrants.org.

The latest SPRY grant round was open from December 9, 2021, and ran through November 22, 2022, with a projected $20 million in available funding over the biennium. As of November 9, 2022, TCEQ received 133 applications requesting a total of $19,345,580. TCEQ anticipates awarding all available funds under the SPRY Program.

Grants to Provide Alternative Fuels for Transportation

Alternative Fueling Facilities Program

The AFFP, established under THSC Chapter 393, provides grants for the construction, reconstruction, or acquisition of public and private facilities to store, compress, or dispense alternative fuels including CNG, LNG, LPG, biodiesel, hydrogen, methanol (85 percent by volume), and electricity. To be eligible, facilities must be located in the area designated as the Clean Transportation Zone (see Appendix 6 of this report).

Since 2012, the AFFP has provided $31,936,737 for the construction, reconstruction, or acquisition of 311 facilities to store, compress, or dispense alternative fuels in the Clean Transportation Zone. A summary of projects awarded under the AFFP by area and by fuel type is provided in Appendix 10 of this report. A complete listof AFFP grant projects is available on the TERP website at www.terpgrants.org.

The latest AFFP grant round was open from May 10, 2022, and ran through July 12, 2022, with a projected $12 million in available funding over the biennium. TCEQ received 289 applications requesting a total of $40,691,668.

Other Grants to Reduce Vehicle Emissions

Texas Clean School Bus Program

The TCSB Program, established under THSC Chapter 390, provides grants statewide for the retrofit or replacement of school buses to reduce children's exposure to diesel exhaust in and around school buses. To be eligible for retrofit or replacement, school buses must be operated on a daily route to and from school.

Since 2008, the TCSB Program has provided $34,558,623, including $4,694,101 in federal funds, for the retrofit of 7,560 school buses. Projects involve the acquisition and installation of emissions-reducing add-on equipment such as closed-crankcase filtration systems and diesel particulate filters or diesel oxidation catalysts on engines of model year 1998 and older.

In FY 2018, TCEQ was authorized to fund school bus replacement projects in addition to retrofit projects under the TCSB Program. Since 2018, the TCSB Program has provided $18,495,003 for 94 projects to replace 300 school buses totaling 166 tons of projected NO_x reductions at an average cost of $111,448 per ton of NO_x reduced. A list of TCSB Program replacement projects, by area and by fuel type, is provided in Appendix 12 of this report.

The latest TCSB Program grant round was open from February 4, 2022, and ran through October 20, 2022, with a projected $13 million in available funding over the biennium. TCEQ received 148 applications requesting a total of $41,163,655.

Light-Duty Motor Vehicle Purchase or Lease Incentive Program

The LDPLIP, established under THSC Chapter 386, provides rebate grants statewide for the purchase or lease of new light-duty motor vehicles powered by CNG, LPG, or hydrogen fuel cell or other electric drive (plug-in or plug-in hybrid) to encourage the greater use of these vehicles, and to stimulate the market for these vehicles and fuels in Texas.

Since 2014, the program has awarded $16,361,015 for the purchase or lease of 6,751 vehicles, including $15,487,265 in rebates for 6,477 electric and plug-in electric hybrid vehicles and $873,750 in rebates for 274 natural gas vehicles. A summary of LDPLIP rebates awarded by fuel type is provided in Appendix 11 of this report.

TCEQ is statutorily limited to awarding no more than 1,000 rebate grants for qualifying natural gas vehicles and no more than 2,000 rebates for qualifying hydrogen fuel cell or other electric drive vehicles.

The latest LDPLIP grant round was opened October 28, 2021, with a projected $16 million in available funds over the biennium. TCEQ received 2,326 electric vehicle rebate applications for a total of $5,724,955. Acceptance of electric vehicle rebate applications was suspended on July 6, 2022. TCEQ will continue to accept applications for compressed natural gas and liquefied petroleum gas (propane) vehicles until January 7, 2023. As of November 9, 2022, TCEQ has not received a natural gas vehicle rebate request.

Governmental Alternative Fuel Fleet Program

The GAFF Program, established under THSC Chapter 395, provides grants to state agencies and political subdivisions, who operate a fleet of more than 15 vehicles, to help offset the difference in cost of purchasing a new alternative fuel or hybrid vehicle versus a traditional vehicle powered by diesel or gasoline.

SB 1731, 85th Texas Legislature, Regular Session, 2017, created the GAFF Program and authorized TCEQ to award funds under the program if money was appropriated from the TERP Fund for that purpose. The 86th Texas Legislature, Regular Session, 2019, appropriated funds for the GAFF program with HB 1 totaling $6 million for the FY 2020-2021 biennium.

In FY 2021, TCEQ awarded $6 million to an independent school district to

replace 80 older school buses with new, LPG-powered school buses and to purchase and install LPG refueling infrastructure for those buses (see Appendix 13).

TCEQ anticipates opening the next GAFF Program grant round in Spring 2023, with an estimated $4 million in available funding over the biennium. TCEQ anticipates that the GAFF Program will be oversubscribed in FY 2022-2023.

Programs to Encourage Energy Efficiency

Energy Efficiency Programs

Under THSC Section 386.057, the TCEQ is to include information in this report regarding the effectiveness of certain energy efficiency programs in avoiding and reducing emissions. These programs include:

- Goal for Energy Efficiency, established under the Texas Utilities Code (TUC) Section 39.905.
- Energy Efficiency Programs in Institutions of Higher Education and Certain Government Entities, established under THSC Section 388.005.
- Texas Building Energy Performance Standards, established under THSC Section 388.003.

Goal for Energy Efficiency

Electric utilities are required to establish and administer energy efficiency programs. Under rules adopted by the Public Utility Commission of Texas (PUC), electric utilities are required to acquire energy efficiency savings through the administration of standard offer programs, market transformation programs, pilot programs, and self-directed programs.

As per TUC Section 39.905, the PUC rules establish a savings goal for electric utilities of 30% of growth in demand and a goal to reduce four-tenths of 1% of summer weather-adjusted peak demand in subsequent years once the utility reaches the 30% goal. The PUC provides information on these programs to the Energy Systems Laboratory (ESL), at the Texas A&M Engineering Experiment Station of the Texas A&M University System, to assess the emissions reductions achieved through these programs.

Energy Efficiency Programs in Institutions of Higher Education and Certain Government Entities

Political subdivisions, institutions of higher education, and state agencies

located in nonattainment areas or affected counties, are required to establish a goal to reduce electric consumption by at least 5% each state fiscal year for 10 years, beginning October 1, 2011.

These entities are also required to implement energy efficiency measures that meet the standards established for a contract for energy conservation measures under Local Government Code Section 302.004(b).

The entities are required to report to the State Energy Conservation Office (SECO) within the Comptroller of Public Accounts on the implementation of these requirements. SECO provides the information to the ESL to assess the emissions reductions achieved through these programs.

Texas Building Energy Performance Standards

These provisions adopt the Energy Efficiency chapter of the International Residential Code to achieve energy conservation in single-family residential construction and the International Energy Conservation Code to achieve energy conservation in all other residential, commercial, and industrial construction.

Local governments have the responsibility to administer and enforce the standards found in the International Energy Conservation Code and the Energy Efficiency chapter of the International Residential Code. The ESL is responsible for determining the energy savings from energy code adoption and, when applicable, form more stringent or above-code performance ratings.

Effectiveness of Energy-Efficiency and Renewable Energy Programs

The ESL compiles the information on energy-efficiency programs and assesses the annual electricity savings and annual NO_x emissions reductions that can be attributed to those savings. In addition to the programs explained above, under THSC Section 386.252(a), the TCEQ contracts with the ESL for an annual computation of statewide emissions reductions obtained through wind and renewable energy resources. The ESL has also assessed the electricity savings from residential air conditioner replacements.

The ESL prepares a report of integrated annual electricity savings and total NO_x emissions reductions from these programs entitled *Energy Efficiency/Renewable Energy Impact in the Texas Emissions Reduction Plan (TERP)*. The ESL reports are available from the ESL website at https://esl.tamu.edu/terp/documents/terp-reports/. A link to the reports is also provided on the TERP website at www.terpgrants.org.

The latest ESL report (ESL-TR-21-11-01) was published in November 2021 for the period January 2020 through December 2020 (Calendar Year (CY)

2020 Report).The CY 2021 report is anticipated to be published by the end of 2022 and will be available on the ESL website.

The tables below provide information from the CY 2020 report on total annual electricity savings in megawatt hours per year (MWh/year) and the ESL's calculated annual NO_x emissions reductions from these programs in 2020. The savings and emissions reductions for 2021 are based on ESL's preliminary projections included in the CY 2020 report.

Updated estimates for 2021 will be available in the CY 2021 report. At the TCEQ's request, ESL updated the base year used for the estimates of energy savings, renewable generation, and emissions reductions from 2008 –2018 to match the current SIP baseline year.

Annual Electricity Savings and Wind Generation (CY 2020 and 2021)

Program	2020 (MWh/year)	2021* (MWh/year)
Texas Building Energy Performance Standards	249,930	508,611
Goal for Energy Efficiency	1,263,892	1,866,549
Energy Efficiency Programs in Institutions of Higher Education and Certain Government Entities	567,339	765,147
Renewable Generation - Wind (ERCOT)	77,365,814	83,941,908
Residential Air Conditioner Retrofits	1,626,346	1,545,029
Total Integrated Annual Savings	**81,073,322**	**88,627,244**

*2021 figures are the ESL's projections through the end of 2021 included in the CY 2020 final report.

Annual NO_x Emissions Reductions (CY 2020 and 2021)

Program	2020 Tons of NO_x	2021* Tons of NO_x
Texas Building Energy Performance Standards	104	212
Goal for Energy Efficiency	496	734
Energy Efficiency Programs in Institutions of Higher Education and Certain Government Entities	230	329
Renewable Generation - Wind (ERCOT)	47,874	51,943
Residential Air Conditioner Retrofits	746	709
Total Integrated Annual NO_x Emissions Reductions	**49,450**	**53,927**

*The 2021 figures are the ESL's projections through the end of 2021 included in the CY 2020 final report.

Energy-Efficiency and Renewable Energy Programs and the Texas SIP

The programs administered by the PUC and SECO under the mandates of SB 5 (2001) and SB 7 (1999) provide avenues for potentially creditable

emission reductions to be claimed in the SIP. Accurate quantification of emissions reductions from energy efficiency and renewable energy (EE/RE) is challenging due to the complex nature of the electrical grid system. It is not possible to determine exactly where on the electrical grid electricity comes from for any certain electrical user. To factor in the degree of complexity and the uncertainties in the data and methods used, emission reduction estimates are modified using a discounting formula to arrive at the reduction estimates reported in the SIP.

TCEQ has not specifically claimed creditable NO_x reductions for EE/RE in the SIP since the 2005 Dallas-Fort Worth 5% Increment of Progress SIP Revision. The current guidance provided by the EPA for claiming emission reductions from EE/RE presents additional challenges for taking direct credit for EE/RE measures in areas that have a NO_x cap and trade program.

Furthermore, the EPA guidance requires additional commitments for states claiming reductions from EE/RE measures. Given the uncertainties associated with ensuring that reductions from EE/RE measures meet the EPA's criteria to be SIP eligible (emissions reductions must be quantifiable, permanent, enforceable, and surplus) and current guidance, TCEQ has in more recent SIP revisions included EE/RE measures in the Weight of Evidence portion of the SIP rather than claim direct creditable reductions.

Program for Emissions Reductions from Facilities

New Technology Implementation Grants Program

The NTIG Program, established under THSC Chapter 391, provides grants statewide for projects to offset the incremental cost of emissions reductions of pollutants from facilities and other stationary sources. Projects that may be funded under the NTIG include:

- Advanced Clean Energy projects.
- New technology projects that reduce emissions of regulated pollutantsfrom point sources.
- New technology projects that reduce emissions from upstream and midstream oil and gas production, completions, gathering, storage, and processing and transmission activities.
- Electricity storage projects related to renewable energy.

Since 2010, the NTIG Program has awarded $16,296,259 to help fund 10 projects, including six projects providing electricity storage related to renewable energy; three projects using new technology to reduce emissions from stationary sources; and one project using new technology to reduce emissions from natural gas storage and compression. A complete list of active NTIG projects is provided in Appendix 14 of this report. A complete list of NTIG grant projects is available on the TERP website at

www.terpgrants.org.

TCEQ anticipates opening the next NTIG grant round in January 2023, with approximately $10 million in available funding. TCEQ expects to award all the available funding.

Other Programs Included under the TERP

Port Authority Studies and Pilot Projects Program

The PASPP Program provides grants to port authorities in the DERI-eligible counties for studies and pilot programs to assess incentives that may be implemented to encourage cargo movement that reduces emissions of NO_x and particulate matter (PM). This grant program implements THSC Section 386.252(a)(13). The provision authorizes the agency to use no more than $500,000 each year to fund the studies and pilot programs.

As of August 2022, TCEQ has awarded three PASPP grants. In FY 2018, TCEQ awarded the Port of Houston Authority (PHA) $500,000 to conduct a study of incentives to encourage cargo movement that reduces emissions of NO_x and PM at the port. In 2019, TCEQ awarded the remaining $500,000 to PHA for the implementation of electric tractors at their container terminals, to include the operation and evaluation of the equipment and infrastructure to determine whether it meets Port of Houston's unique needs.

Port of Houston submitted the grant-funded study entitled "Market Demand Study and Business Case Analysis for Reduction of Emissions through Intermodal Opportunities and Incentives." The study, conducted for the Port of Houston through a subcontract with AECOM, assessed the market demand, business sustainability, and long-term economic viability of five strategies for reducing emissions from cargo movement.

In FY 2020, TCEQ awarded the Port of Corpus Christi Authority (PCCA) $1 million over the biennium to analyze and implement technology to capture exhaust from marine vessels that operate using ship power while at berth. As of August 2022, PCCA has contracted an emissions reduction pilot study at the Avery Point Terminal to help inform their planning effort to develop an emissions reduction program for control strategies for vessels at berth and during loading and unloading operations.

TCEQ anticipates that PCCA will begin implementation of a pilot program to install, operate, and analyze emissions reduction technology at Avery Point Terminal in FY 2023-2024, and report its findings to TCEQ.

Regional Air Monitoring Program

The 82nd Texas Legislature, Regular Session, 2011, amended THSC Chapter 386 to establish a regional air monitoring program in TCEQ's Regions 3 (Abilene Region) and 4 (Dallas/Fort Worth Region), which includes the Barnett Shale geological area. The statutory language directs TCEQ to allocate TERP funds for a regional air monitoring program implemented under the commission's oversight, including direction regarding the type, number, location, operation of, and data validation practices for monitors funded by the program through a regional nonprofit entity located in North Texas having representation from counties, municipalities, higher education institutions, and private sector interests across the area. The North Texas Commission (NTC) was found to meet all eligibility requirements and received a contract from TCEQ on October 21, 2011.

The program was allocated up to $7 million per fiscal year over the FY 2012-2013 biennium to establish monitoring sites and begin monitoring activities. The program was allocated up to $3 million in 2014 and subsequent years to continue monitoring. The cumulative TERP expenditures for the program through August 2022 were $27,431,998.

The NTC Regional Air Monitoring Program has a total of 21 monitoring sites to include 13 Automated Gas Chromatograph systems that provide near real-time volatile organic compound (VOC) data on an hourly basis and eight VOC canister systems that collect ambient air samples every six days. The regional air monitoring program was designed to collect air toxics data to determine the potential for health effects with the growth in the region due to Barnett Shale gas production. Monitoring data to date has provided evidence that overall, shale play activity does not significantly impact air quality or pose a threat to human health.

Furthermore, TCEQ has conducted extensive ambient air monitoring in this area, specifically looking at air emissions from natural gas operations. Based on the ambient air monitoring data collected in the Dallas–Fort Worth area, and TCEQ's conservative evaluation of the potential for human health risk to occur upon exposure to the measured concentrations, TCEQ has concluded that there is no substantial health risk from short-term or long-term exposure to air emissions from natural gas operations.

Air Quality Research Support Program

The AQRP, established under THSC Chapter 387, works to identify, and prioritize scientific questions important to air quality management in Texas and funds scientific investigations to provide answers to these questions.

The AQRP program was originally part of the New Technology Research and Development (NTRD) Program. SB 527, 82nd Texas Legislature, Regular Session, 2011, amended the THSC to eliminate the NTRD Program, but retained the air quality research component.

Since 2009, TCEQ has contracted with the University of Texas at Austin to administer the research program. Research topics are identified and prioritized by an Independent Technical Advisory Committee (ITAC). Projects to be funded under the research program are selected from lists of ITAC recommended projects by TCEQ and an Advisory Council.

The TERP allocations to this program are determined each fiscal biennium. The allocation for the FY 2022-2023 biennium is $750,000 per fiscal year. The AQRP has provided $18,038,142 in funding for 86 projects by 25 lead entities and numerous collaborating entities.

Some of the major projects that have been sponsored through this program from FY 2010 through FY 2023 include:

- Air quality measurements in the Houston area that quantified continuing progress in reducing emissions of Highly Reactive VOCs.
- Full-scale measurements of industrial flares that have led to operator training to reduce flaring emissions, and improved quantification of flare emissions.
- Studies of natural emission sources, such as wildfires, biomass burning, and biogenic emissions.
- Air quality measurement programs in the oil and natural gas production region, near the cities of Fort Worth and San Antonio, that examined the role of emissions associated with oil and gas production on ozone formation.
- Improvements to the air quality models used to simulate air pollution events, and to evaluate proposed air quality regulations.
- Analysis of rich data sets collected during air quality field studies, including seven major field campaigns that took place in Texas during CY 2006, 2009, 2011, 2013, 2017, 2019, and 2020.
- Development of new tools to use satellite observations to characterize pollutants in Texas cities.

Foreign Emissions and Exceptional Events Research

The 85th Texas Legislature amended THSC Chapter 386 to allow grants for research on the impact of foreign emissions and exceptional air quality events if money was appropriated from the TERP Fund for that purpose.

HB 3745, 86th Texas Legislature, Regular Session, 2019, amended THSC Section 386.252(f), authorizing the agency to use no more than $2.5 million from the TERP Trust per year to fund the research and other activities associated with making demonstrations to the EPA, beginning FY 2022.

Ten research projects, totaling $2,185,000, were funded in FY 2022, which focused on:

- Supporting a federal Clean Air Act (FCAA) §179B demonstration that El Paso is impacted by international emissions.
- Monitoring studies of chemical tracers for wildfires, biomass burning, and international emissions.
- Developing smoke tracking algorithms and stratospheric ozone intrusion tools using satellite imagery.
- Refining the emission inventories of wildfires and Mexican electric generating units.
- Improving the understanding and modeling of meteorological and chemical conditions that may be influenced by biomass burning and/or foreign emissions.

Funding in FY 2023 will continue and expand on these research projects.

Health Effects Studies

The Health Effect Studies implements THSC Section 386.252(a)(8). Each fiscal year until FY 2022, $200,000 has been allocated from the TERP Fund for use by TCEQ in conducting studies on health effects related to air quality and exposure to certain compounds and pollutants. TCEQ will continue funding additional health effects studies with the same allocation from the TERP Trust, as well as through other non-TERP funding sources. Recent studies and activities conducted in FY 2021 and 2022 are outlined below.

- A set of simulation studies, which began in FY 2020 and continued through FY 2021, were conducted to evaluate the patterns of results from epidemiology studies that show associations between $PM_{2.5}$ and mortality. These simulations provide insights about whether $PM_{2.5}$ causes mortality. This work has resulted in several peer-reviewed journal articles published in FY 2022.

- Studies began in FY 2021 to evaluate health risk factors and disease incidence in fenceline communities, particularly those downwind of refineries (e.g., around the Houston Ship Channel). Such research will help the agency understand the health burden of these communities, which will improve our understanding of effects attributable to airborne chemicals from industrial facilities. This work is ongoing and will continue into FY 2023.

IV. TCEQ Monitoring of TERP Grants

To minimize the risk of fraud, TCEQ continues to implement a three-tiered Quality Assurance and Fraud Prevention and Detection Program for the TERP grant programs.

The three levels are listed and described below:

1. The Application Phase requires TCEQ to maintain a uniform process when reviewing applications, verify equipment and technologies, confirm emission reductions and cost-effectiveness calculations, maintain an electronic database, and perform duplicate reviews. Additionally, TCEQ may assign an independent contractor to complete pre-award site visits to ensure applicant compliance with program eligibility requirements.
2. The Contract Phase requires TCEQ to consistently utilize templates and obtain approval from TCEQ legal and central contracting offices for each contract, follow written grant management procedures, review reimbursement requests completed by fiscal and program staff prior to program management, and maintain an electronic database for contract and fiscal information.
3. The Tracking and Reporting Phase requires TCEQ to ensure grantees track usage and report this usage information to TCEQ for the life of the project, utilize internal and external auditors to perform desk and on-site reviews of activities, and maintain contract provisions for return of funds if the usage does not meet contract commitments or is not tracked and reported. This phase, along with strategic on-site audits by an independent contractor, verifies the project's actual NO_x emission reductions and usage of the funded vehicle/equipment in the affected areas during the activity life.

Under all phases of grant administration, the TERP staff works with TCEQ legal and investigative staff to follow-up on noncompliance issues or issues of potential fraud or abuse.

V. Future Considerations for the TERP Programs

TCEQ will continue to focus on achieving reductions in NO_x emissions and emissions of other pollutants to help nonattainment areas meet federal air quality standards and to help other areas address air quality concerns.

Legislative Update

During the 87th Texas Legislature, Regular Session, 2021, state lawmakers passed the following bills that impact the administration and programs of the TERP Program:

- **House Bill (HB) 4472** became effective September 1, 2021, and amended THSC to:
    - direct the TCEQ to transfer no less than 35% of the TERP Trust Fund revenue to the state highway fund for TXDOT to administer congestion mitigation projects;
    - require TXDOT to report emissions reductions and other information related to congestion mitigation projects to TCEQ;
    - redirect the transfer of the Motor Vehicle Certificate of Title Fee revenue from the Texas Mobility Fund to the TERP Trust Fund;
    - set the minimum percentage of annual hours of operation required for TERP-funded marine vessels or engines at 55% under the DERI program;
    - remove the requirement that flaring and other oil and gas site emissions reduction projects must capture waste heat to generate electricity solely for on-site service for New Technology Implementation Grant projects;
    - add new technology projects that reduce flaring emissions and other site emissions to the list of projects to which TCEQ shall give preference when awarding grants; and
    - allow New Technology Implantation Grants to fund the lease of necessary equipment and the costs for operating and maintaining the grant-funded system.
- **HB 2361** became effective September 1, 2021, and amended THSC to:
    - remove the requirement that flaring and other oil and gas site emissions reduction projects must capture waste heat to generate electricity solely for on-site service for New Technology Implementation Grant projects;

- add new technology projects that reduce flaring emissions and other site emissions to the list of projects to which TCEQ shall give preference when awarding grants; and
- allow New Technology Implantation Grants to fund the lease of necessary equipment and the costs for operating and maintaining the grant-funded system.

- **HB 963** became effective September 1, 2021, and amended THSC to:
  - include used vehicles of model year 2017 or later as eligible for purchase under the TNGVGP, provided that the model year may not be more than six years older than the current model year at the time of the grant application submission.

To ensure the successful implementation of these newly enacted laws, TCEQ:

- sought public comment and adopted rule and guideline changes to implement HB 4472;
- adopted guideline changes to implement HB 2361; and
- updated solicitation documents to implement HB 4472, HB 2361, and HB 963.

Cost-Effectiveness

The TERP DERI Program remains the most cost-effective TERP program, with a historical average cost of $6,304 per ton of NO_x reduced as of August 2022. In the most recent biennium, FY 2020-2021, the average cost per ton of NO_x reduced under the DERI programs was $8,787.

TCEQ expects the average cost per ton of NO_x reduced in future grant rounds to increase from the historical averages for the program. Recent projects under theTERP programs increasingly include the upgrade or replacement of newer vehicles and equipment with engines that already meet more stringent NO_x emissions standards than past projects, requiring TCEQ to fund more projects to achieve the same or more emissions reductions as in previous biennia. Additionally, inflation and supply chain issues are increasing the costs of new and used vehicles, engines, and other equipment. As a result, TCEQ must offer more grant funds per ton of NO_x reduced to continue to ensure that grant awards are high enough to incentivize participation, and to achieve the amount of NO_x reductions that have been achieved under the grant programs in the past.

The statutory limits on the maximum cost-effectiveness of a project under the DERI Program were removed by the Texas Legislature in 2013. TCEQ is authorized to set limits as needed to address program goals and objectives. In the most recent biennium, FY 2020-2021, TCEQ set the DERI cost per ton limits at $12,500 per ton of NO_x reduced for marine and locomotive projects, and $17,500 per ton of NO_x reduced for all other projects.

TCEQ will continue to assess cost-effectiveness and adjust limits as appropriate in future grant rounds to ensure participation in the program while achieving the greatest level of emissions reductions.

Role of TERP Going Forward

TCEQ estimates mobile sources to be responsible for more than half of NO_x emissions in certain nonattainment areas in Texas. NO_x emissions react with VOCs in the presence of sunlight to form ground-level ozone. Unlike point and stationary sources of NO_x emissions, mobile sources are not under the regulatory oversight of TCEQ and are not subject to permitting requirements. The TERP, however, can realize significant reductions of NO_x emissions from mobile sources by providing financial incentives for the early retirement of heavy-duty vehicles and equipment, particularly those with large diesel engines. Retired vehicles and equipment are rendered permanently inoperable and are replaced with newer, cleaner models that grantees commit to operating in the nonattainment areas and other affected counties.

The TERP Programs will continue to support attainment demonstrations in SIP revisions as either an existing control measure; as a long-term strategy for reasonable progress; or as additional measures called "Weight of Evidence," which include activities that are expected to further reduce ozone levels in the nonattainment areas, supplement model results, and support the adequacy of proposed control strategies.

The TERP programs also continue to provide significant incentives encouraging the build-out of alternative fueling facilities in Texas, as electric and other alternative technologies expand in the state's private and commercial transportation sectors.

Finally, TERP funding for electricity storage, oil and gas emissions reductions, and other stationary source emissions reduction continues to encourage innovation that can enhance the state's electric and energy markets.

TCEQ is available to provide any additional information that may be needed to assist the legislature in determining the future role of the TERP to help improve and maintain good air quality in areas throughout the state.

Appendix 1. TERP Fund (FY 2021) and TERP Trust (FY 2022 -2023)

Texas Emissions Reduction Plan	FY 2021 TERP Fund	FY 2022 TERP Trust[1]	Est FY 2023 TERP Trust[2]
Beginning Balance (Unencumbered)	$1,909,866,803	$0	$132,162,004
REVENUE			
3004 Heavy-Duty Motor Vehicle Sales, Lease, & Use	$18,505,880	$21,380,409	$16,212,000
3012 Motor Vehicle Certificate of Title	$146,878,707	$126,938,396	$152,334,000
3014 Commercial Motor Vehicle Registration	$13,977,164	$14,764,258	$11,689,000
3016 Motor Vehicle Sales & Seller Finance	$27,335	$29,946	$31,000
3020 Commercial Motor Vehicle Inspection	$6,668,292	$6,791,000	$5,912,000
3102 Diesel Equipment Sales, Lease, & Use	$69,812,106	$82,795,798	$67,646,000
3714 Judgements	$0	$0	$0
Subtotal: Actual/Estimated Revenue	$255,869,484	$252,699,807	$385,986,004
Total Available	**$2,165,736,287**	**$252,699,807**	**$385,986,004**
DEDUCTIONS:			
Regular Appropriation to TCEQ	($106,339,363)	$-	$-
Statewide Cost Allocation Plan	($521,087)	$-	$-
Transfer - Employee Benefits	($1,424,174)	$-	$-
Transfer – Retirement Benefits	($428,285)	$-	$-
Transfer – Reimburse TWC for Unemployment Costs	($3,310)	$-	$-
HB 37, 79th Session - Transfer to Fund 151	($500,000)	$-	$-
Article III – Appropriation to the Energy Systems Laboratory, TexasA&M Engineering Experiment Station	$-	$-	$-
Actual/Estimated Expenditures from the TERP Trust	$-	($31,451,297)	($298,466,554)
Transfer to TxDOT from the TERP Trust	$-	($88,586,506)	($87,019,450)
Transfer to Fund 151 from the TERP Trust	$-	($500,000)	($500,000)
TOTAL DEDUCTIONS	**($109,659,780)**	**($120,537,803)**	**($385,986,004)**
Ending Fund / Account Balance	**$2,056,076,507**	**$132,162,004**	**$0**

[1]Amounts listed for FY 2022 are still subject to change as the fiscal year finances are reconciled.
[2]Amounts listed for FY 2023 are estimated.

Appendix 2. Projected TERP Funding Allocation FY 2022 - 2023

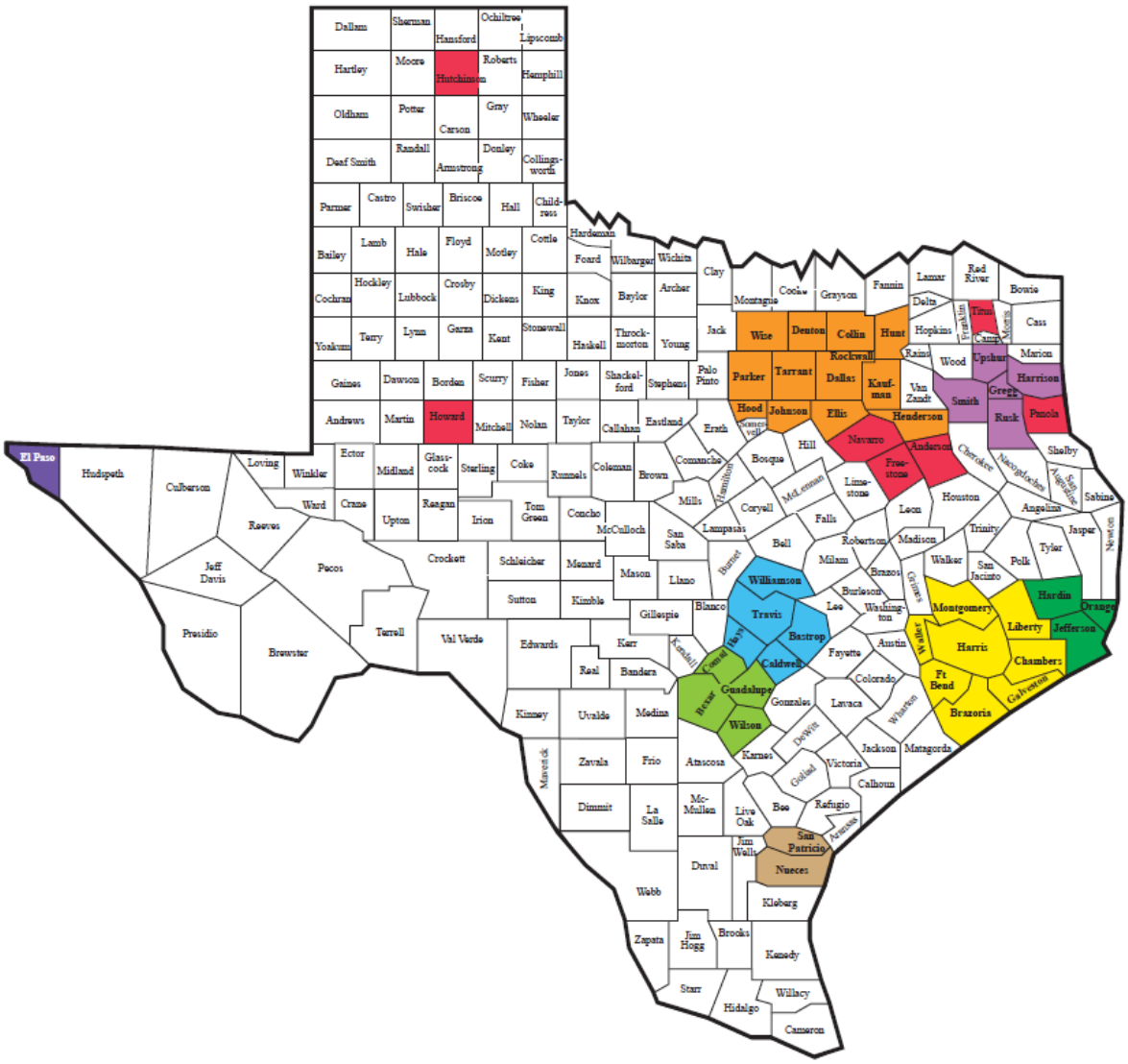
Program	Projected Allocation[1,2]	Statutory Allocation Percentage (%)
TCEQ Administration	$16,000,000/FY	At least $6,000,000 but not more than $16,000,000/FY
TXDOT Congestion Mitigation Projects	$87,476,619/FY	TCEQ shall deposit no less than 35% of the fund to the credit of the state highway fund
Texas Clean School Bus Program	$6,558,500/FY	4%
New Technology Implementation Grants	$4,918,875/FY	3%; with at least $1 million for battery storage
Texas Clean Fleet Program	$8,198,125/FY	5%
Regional Air Monitoring Program	$3,000,000/FY	not more than $3,000,000/FY
Texas Natural Gas Vehicle Grant Program	$16,396,250/FY	10%
Alternative Fueling Facilities Program	$6,000,000/FY	not more than $6,000,000/FY
Research	$750,000/FY	not more than $750,000/FY
Health Effects Study	$200,000/FY	not more than $200,000/FY
Seaport and Rail Yards Emissions Reduction Program	$9,837,750/FY	6%
Light-Duty Motor Vehicle Purchase or Lease Incentive Program	$8,198,125/FY	5%
Energy Systems Laboratory Contract	$216,000/FY	not more than $216,000/FY
Foreign Emissions and Exceptional Events Research	$2,500,000	not more than $2.5 million to conduct research and other activities to account for the impact of foreign emissions or an exceptional event
Port Authorities Studies & Pilot Projects	$500,000/ FY	not more than $500,000/FY
Governmental Alternative Fuel Fleet Program	$3,976,943/FY2022	not more than 3% of the balance at the start of each FY
Diesel Emissions Reduction Incentive Program	$77,410,483/FY	balance of the fund
Total Allocation	**$249,933,198/FY**	

[1]Allocation amounts are projected and subject to change as revenue from the TERP fees is deposited to the credit of the TERP Trust monthly.
[2] Projected TERP percentage allocation amounts are based on fee revenue remaining after transferring 35% to the state highway fund.

Appendix 3. DERI Program Eligible Counties

Anderson	El Paso	Hays	Montgomery	Tarrant
Bastrop	Ellis	Henderson	Navarro	Travis
Bexar	Fort Bend	Hood	Nueces	Titus
Brazoria	Freestone	Howard	Orange	Upshur
Caldwell	Galveston	Hunt	Panola	Waller
Chambers	Gregg	Hutchinson	Parker	Williamson
Collin	Guadalupe	Jefferson	Rockwall	Wilson
Comal	Hardin	Johnson	Rusk	Wise
Dallas	Harris	Kaufman	San Patricio	
Denton	Harrison	Liberty	Smith	

Note: *eligible counties may vary with each grant cycle.*



Appendix 4. DERI Program Projects by Area

Texas Emissions Reduction Plan
Diesel Emissions Reduction Incentive Program

Projects by Area
2001 through August 2022

Area	Total Number of Projects	Total Number of Activities	Total Grant Amount[1,2]	Total NO_X Reduction (Tons)[2]	Average Cost Per Ton of NO_X Reduced[3]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
Austin	1,244	1,846	$97,274,205	11,278	$8,625	2.08	1.93	1.70	1.23
Beaumont/Port Arthur	284	557	$49,456,242	9,052	$5,464	0.92	0.83	0.80	0.70
Corpus Christi	100	288	$12,616,904	1,790	$7,048	0.37	0.33	0.38	0.34
Dallas/Fort Worth	4,846	7,803	$406,794,350	67,093	$6,063	6.06	5.11	6.00	5.07
El Paso	149	216	$4,762,262	885	$5,383	0.08	0.08	0.10	0.10
Houston/Galveston/Brazoria	4,558	7,574	$486,563,405	81,317	$5,984	7.09	6.14	5.79	4.46
San Antonio	1,202	1,729	$96,637,493	11,977	$8,068	1.79	1.59	1.54	1.31
Tyler/Longview	218	333	$32,803,031	5,172	$6,343	0.19	0.15	0.16	0.16
Victoria	93	104	$5,526,853	587	$9,412	0.27	0.25	0.21	0.14
Grand Total	**12,694**	**20,450**	**$1,192,434,745**	**189,151**	**$6,304**	**18.85**	**16.41**	**16.68**	**13.50**

Note: The number of projects and number of activities are based on the primary area of a project. The grant amount, total NO_X reduced, and cost per ton of NO_X reduced are apportioned to all areas of use associated with a project.

[1]The total grant amount includes $12,425,362 million in federal American Recovery and Reinvestment Act funding awarded in 2010; resulting in 1,322 tons of NO_X reduced.

[2]Totals have been rounded to the nearest whole number.

[3]The average cost per ton of NO_X reduced equals the total grant amount divided by the total NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.

Appendix 5. DERI Program Projects by Emissions Source

Texas Emissions Reduction Plan
Diesel Emissions Reduction Incentive Program

Projects by Emissions Source
2001 through August 2022

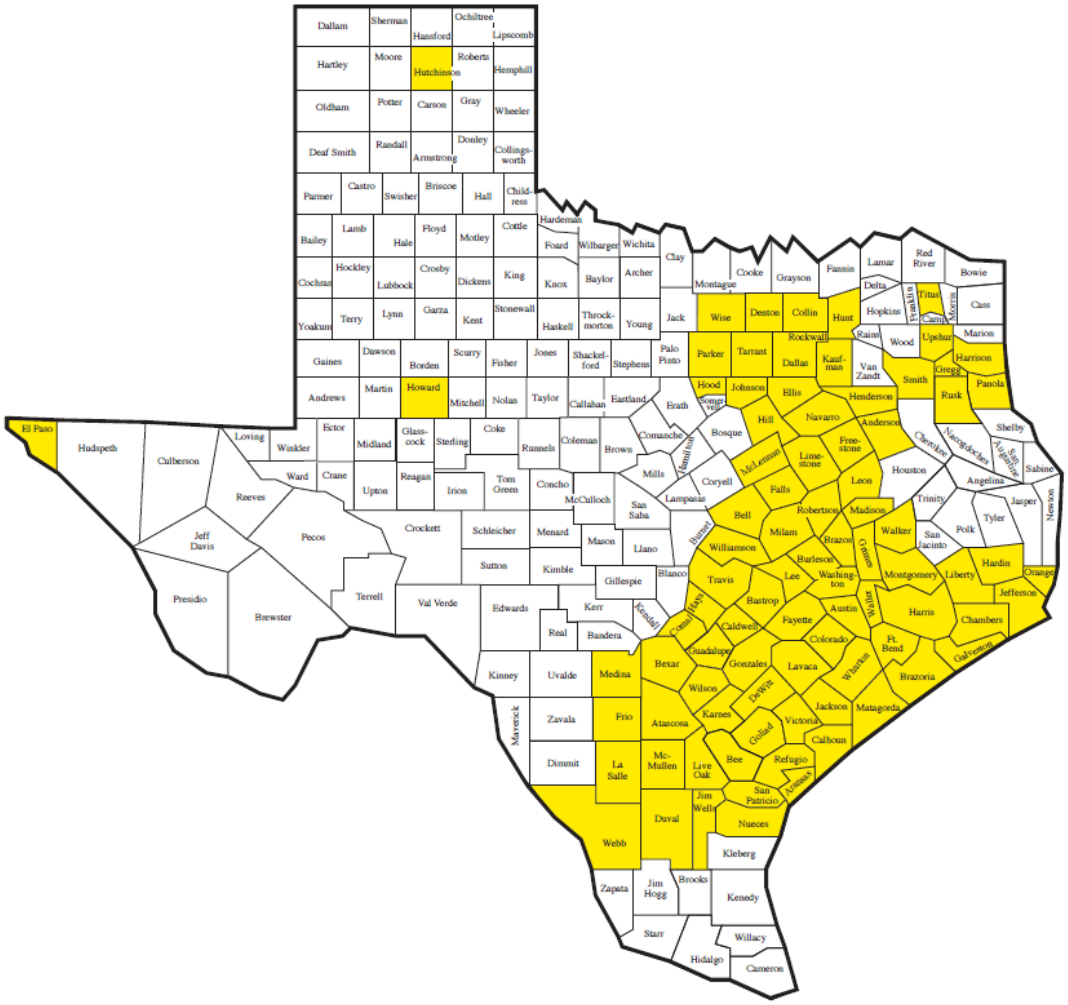
Emission Source	Total Number of Projects	Total Number of Activities	Total Grant Amount[1,2]	Total NO_X Reduction (Tons)[2]	Average Cost Per Ton of NO_X Reduced[3]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
Non-Road	7,146	9,872	$421,451,328	51,572	$8,172	7.38	6.75	5.95	4.44
On-Road	5,315	9,551	$468,619,262	63,321	$7,401	7.74	6.16	5.44	4.27
Marine	100	565	$58,837,769	16,109	$3,653	1.59	1.36	1.57	1.08
Stationary	83	152	$21,678,087	6,768	$3,203	0.10	0.09	1.46	1.45
Locomotive	50	310	$221,848,299	51,382	$4,318	2.04	2.04	2.26	2.26
Grand Total	**12,694**	**20,450**	**$1,192,434,745**	**189,151**	**$6,304**	**18.85**	**16.41**	**16.68**	**13.50**

[1]The total grant amount includes $12,425,362 million in federal American Recovery and Reinvestment Act funding awarded in 2010; resulting in 1,322 tons of NO_X reduced.
[2]Totals have been rounded to the nearest whole number.
[3]The average cost per ton of NO_X reduced equals the total grant amount divided by the total NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.

Appendix 6. Clean Transportation Zone Counties

Aransas	Comal	Gregg	Karnes	Montgomery	Walker
Atascosa	Dallas	Grimes	Kaufman	Navarro	Waller
Austin	Denton	Guadalupe	La Salle	Nueces	Washington
Bastrop	DeWitt	Hardin	Lavaca	Orange	Webb
Bee	Duval	Harris	Lee	Parker	Wharton
Bell	Ellis	Harrison	Leon	Refugio	Williamson
Bexar	El Paso	Hays	Liberty	Robertson	Wilson
Brazoria	Falls	Henderson	Limestone	Rockwall	Wise
Brazos	Fayette	Hill	Live Oak	Rusk	
Burleson	Fort Bend	Hood	Madison	San Patricio	
Colorado	Freestone	Hunt	Matagorda	Smith	
Calhoun	Frio	Jackson	McLennan	Tarrant	
Chambers	Galveston	Jefferson	McMullen	Travis	
Collin	Goliad	Jim Wells	Medina	Upshur	
Colorado	Gonzales	Johnson	Milam	Victoria	

Note: *The Clean Transportation Zone includes the counties eligible under the Alternative Fueling Facilities Program, the Texas Clean Fleet Program, and the Texas Natural Gas Vehicle GrantProgram.*



Appendix 7. TCFP Projects by Area and Fuel Type

Texas Emissions Reduction Plan
Texas Clean Fleet Program

Projects by Area and Fuel Type
2009 through August 2022

Area	Total Number of Projects	Total Number of Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
Austin	10	198	$17,879,757	165	$108,519	0.02	0.02	0.02	0.02
Beaumont/Port Arthur	1	17	$912,608	8	$109,465	0.01	0.01	0.00	0.00
Dallas/Fort Worth	10	202	$17,835,047	261	$68,211	0.06	0.05	0.03	0.01
Houston/Galveston/Brazoria	11	253	$22,177,013	192	$115,788	0.09	0.07	0.05	0.01
San Antonio	5	60	$10,559,210	77	$136,368	0.05	0.05	0.06	0.02
Grand Total	**37**	**730**	**$69,363,635**	**704**	**$98,594**	**0.23**	**0.19**	**0.16**	**0.06**

Note: The number of projects and number of activities are based on the primary area of a project. The grant amount, total NO_X reduced, and cost per ton of NO_X reduced are apportioned to all areas of use associated with a project.

Fuel Type[3]	Total Number of Projects	Total Number of Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
CNG	15	304	$41,349,802	456	$90,629	0.15	0.14	0.13	0.03
Diesel Hybrid	1	55	$3,181,967	40	$80,506	<0.01	<0.01	<0.01	<0.01
Electricity	2	15	$3,642,569	17	$217,246	0.01	0.01	0.01	0.01
LPG	19	356	$21,189,296	191	$110,948	0.07	0.05	0.02	0.02
Grand Total	**37**	**730**	**$69,363,635**	**704**	**$98,594**	**0.23**	**0.19**	**0.16**	**0.06**

[1]Totals have been rounded to the nearest whole number.
[2]The average cost per ton of NO_X reduced equals the total grant amount divided by the total tons of NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.
[3]CNG= Compressed Natural Gas, LPG= Liquefied Petroleum Gas.

Appendix 8. TNGVGP Projects by Area and Fuel Type

Texas Emissions Reduction Plan
Texas Natural Gas Vehicle Grant Program

Projects by Area and Fuel Type
2012 through August 2022

Area	Total Number of Projects	Total Number of Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
Austin	7	75	$3,508,264	95	$36,893	0.03	0.03	0.01	0.01
Beaumont/Port Arthur	1	2	$86,193	5	$16,173	<0.01	<0.01	<0.01	<0.01
Corpus Christi	0	0	$197,412	9	$22,863	0.01	<0.01	<0.01	<0.01
Dallas/Fort Worth	60	484	$17,263,847	565	$30,562	0.11	0.06	0.05	0.03
El Paso	4	27	$795,945	41	$19,212	<0.01	<0.01	<0.01	<0.01
Houston/Galveston/Brazoria	33	343	$14,511,489	366	$39,673	0.07	0.04	0.07	0.06
San Antonio	6	63	$3,840,886	131	$29,429	0.03	0.03	0.03	0.00
Tyler/Longview	2	12	$771,385	33	$23,433	0.01	<0.01	<0.01	<0.01
Victoria	0	0	$55,341	3	$16,869	<0.01	<0.01	<0.01	<0.01
Clean Transportation Zone	27	139	$12,981,244	421	$30,861	0.03	0.02	0.02	0.01
Grand Total	**140**	**1,145**	**$54,012,006**	**1,668**	**$32,372**	**0.29**	**0.18**	**0.18**	**0.11**

Note: The number of projects and number of activities are based on the primary area of a project. The grant amount, total NO_X reduced, and cost per ton of NO_X reduced are apportioned to all areas of use associated with a project.

Fuel Type[3]	Total Number of Projects	Total Number of Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Total Tons Per Day of NO_X Reduced FY 2022	Total Tons Per Day of NO_X Reduced FY 2023	Total Tons Per Day of NO_X Reduced FY 2024	Total Tons Per Day of NO_X Reduced FY 2025
CNG	100	834	$38,213,296	1191	$32,076	0.23	0.12	0.15	0.10
LNG	8	130	$6,687,000	260	$25,738	0.01	0.01	0.00	0.00
LNG/Diesel	8	61	$5,430,000	162	$33,471	0.00	0.00	0.00	0.00
LPG	24	120	$3,681,710	55	$66,776	0.05	0.05	0.02	0.02
Grand Total	**140**	**1,145**	**$54,012,006**	**1,668**	**$32,372**	**0.29**	**0.18**	**0.18**	**0.11**

[1]Totals have been rounded to the nearest whole number.
[2]The average cost per ton of NO_X reduced equals the total grant amount divided by the total tons of NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.
[3]CNG= Compressed Natural Gas, LNG= Liquefied Natural Gas, LPG= Liquefied Petroleum Gas.

Appendix 9. SPRY Projects by Area

Texas Emissions Reduction Plan
Seaport and Rail Yard Areas Emissions Reduction Program

Projects by Area
2015 through August 2022

Area	Total Numberof Projects	Total Numberof Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Total Tons PerDay of NO_X Reduced FY 2022	Total Tons PerDay of NO_X Reduced FY 2023	Total Tons PerDay of NO_X Reduced FY 2024	Total Tons PerDay of NO_X Reduced FY 2025
Dallas/Fort Worth	8	32	$1,527,349	68	$22,571	0.04	0.02	0.02	0.03
El Paso	1	2	$109,745	5	$20,000	0.00	0.00	0.00	0.00
Houston/Galveston/Brazoria	174	318	$26,662,128	1,214	$21,961	0.55	0.57	0.55	0.71
San Antonio	7	11	$403,479	16	$24,988	0.01	0.01	0.01	0.01
Grand Total	**190**	**363**	**$28,702,701**	**1,303**	**$22,022**	**0.60**	**0.60**	**0.58**	**0.75**

Note: The number of projects and number of activities are based on the primary area of a project. The grant amount, total NO_X reduced, and cost per ton of NO_X reduced are apportioned to all areas of use associated with a project.
[1]Totals have been rounded to the nearest whole number.
[2]The average cost per ton of NO_X reduced equals the total grant amount divided by the total tons of NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.

Appendix 10. AFFP Projects by Area and Fuel Type

Texas Emissions Reduction Plan
Alternative Fueling Facilities Program

Projects by Area and Fuel Type
2012 through August 2022

Note: Totals include projects funded under the previous Clean Transportation Triangle Program that was incorporated into the AFFP in FY 2018.

Fuel Type[1]	Number of Projects	Grant Amount
CNG	39	$15,356,614
Electricity	182	$6,652,588
Biodiesel	23	$5,257,478
CNG/LNG	4	$1,700,000
LPG	58	$1,086,727
Biodiesel/Electricity	3	$848,325
CNG/Electricity	1	$570,005
Hydrogen	1	$465,000
Grand Total	311	$31,936,737

[1]CNG= Compressed Natural Gas, LNG= Liquefied Natural Gas, LPG= Liquefied Petroleum Gas

Area	Number of Projects	Total Grant Amount
Beaumont-Port Arthur	1	$14,500
Corpus Christi	2	$29,000
Dallas/Fort Worth	141	$11,145,079
Houston/Galveston/Brazoria	73	$8,890,417
Austin	43	$5,166,249
Clean Transportation Zone	16	$2,428,270
San Antonio	18	$2,388,135
El Paso	3	$696,557
Tyler/Longview	12	$1,127,972
Victoria	2	$50,556
Grand Total	311	$31,936,737

Appendix 11. LDPLIP Projects by Fuel Type

Texas Emissions Reduction Plan
Light Duty Purchase or Lease Incentive Program

Projects by Fuel Type
2014 through August 2022

Fuel	Total Rebates	Total Grant Amounts
Electricity	6,477	$15,487,265
CNG	216	$583,750
CNG/Gasoline	43	$215,000
LPG	9	$45,000
CNG/Diesel	6	$30,000
Grand Total	**6,751**	**$16,361,015**

Appendix 12. TCSB Program Projects by Area and Fuel Type

Texas Emissions Reduction Plan
Texas Clean School Bus Program
Projects by Area and Fuel Type
2018 through August 2022

Primary Area	Number Of Projects	Number Of Activities	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Tons Per Day of NO_X Reduced FY 2022	Tons Per Day of NO_X Reduced FY 2023	Tons Per Day of NO_X Reduced FY 2024	Tons Per Day of NO_X Reduced FY 2025	Tons Per Day of NO_X Reduced FY 2026	Tons Per Day of NO_X Reduced FY 2027
Austin	6	27	$1,558,125	14	$113,467	0.01	0.01	0.01	0.01	0.01	<0.01
Beaumont/Port Arthur	6	13	$763,205	7	$105,478	<0.01	<0.01	<0.01	0.01	0.01	<0.01
Corpus Christi	1	3	$231,300	2	$124,360	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dallas/Fort Worth	16	57	$3,779,942	31	$120,113	0.02	0.02	0.02	0.02	0.02	0.01
Houston/Galveston/Brazoria	4	13	$834,780	6	$128,984	<0.01	<0.01	<0.01	0.01	0.01	<0.01
San Antonio	5	22	$1,308,980	12	$112,521	0.01	0.01	0.01	0.01	0.01	<0.01
Tyler	1	3	$235,303	1	$186,674	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Victoria	0	0	$1,980	0	$111,959	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Other	55	162	$9,781,388	92	$106,007	0.06	0.07	0.07	0.05	0.04	0.02
Grand Total	**94**	**300**	**$18,495,003**	**166**	**$111,448**	**0.10**	**0.11**	**0.11**	**0.10**	**0.09**	**0.05**

Primary Fuel	Number Of Buses	Total Grant Amount[1]	Total NO_X Reduction (Tons)[1]	Average Cost Per Ton[2]	Tons Per Day of NO_X Reduced FY 2022	Tons Per Day of NO_X Reduced FY 2023	Tons Per Day of NO_X Reduced FY 2024	Tons Per Day of NO_X Reduced FY 2025
CNG	3	$198,000	2	$111,959	<0.01	<0.01	<0.01	<0.01
Diesel	240	$14,694,669	133	$110,483	0.08	0.08	0.08	0.08
Gasoline	44	$2,857,334	25	$115,668	0.02	0.02	0.02	0.01
LPG	13	$745,000	6	$115,049	<0.01	0.01	0.01	0.01
Grand Total	**300**	**$18,495,003**	**166**	$111,448	**0.10**	**0.11**	**0.11**	**0.10**

[1]Totals have been rounded to the nearest whole number.
[2]The average cost per ton of NO_X reduced equals the total grant amount divided by the total tons of NO_X reduced. The average cost per ton of NO_X reduced was calculated using raw numbers and then rounded to the nearest whole number.

Appendix 13. GAFF Project Description

Texas Emissions Reduction Plan
Governmental Alternative Fuel Fleets

Project Description
2021 through August 2022

APPLICANT	PRIMARY AREA	PROJECT DESCRIPTION	PRIMARY FUEL TYPE	GRANT AMOUNT
Cypress-Fairbanks Independent School District	Houston/Galveston/Brazoria	Replace 80 on-road school buses, and purchase and install refueling infrastructure	Liquified Petroleum Gas	$6,000,000.00

Appendix 14. NTIG Projects

Texas Emissions Reduction Plan
New Technology Incentive Grants

Project Descriptions
2014 through August 2022

PROJECT NAME	PROJECT CATEGORY	PROJECT DESCRIPTION	LOCATION	GRANT AMOUNT
Elbow Creek Wind Project, LLC	Electricity Storage	NRG Texas Power (NRG) is the owner and operator of the Energy Storage Project (ESP) at Elbow Creek Wind Farm. NRG has an integrated lithium-ion (li-ion) battery system providing 2.0 megawatts (MW) of electric output of energy from wind and other renewable power. Wind energy captured by the Elbow Creek wind farm and other renewable resources is stored and delivered via the ERCOT system to the Energy Storage System and then in turn delivered back to the electric grid.	Big Spring, TX	$1,011,875.00
Austin Energy	Electricity Storage	Austin Energy (AE) is the owner and operator of the utility-scale Energy Storage System (ESS), that has an integrated lithium-ion (li-ion) battery system, providing 1.5 megawatts (MW) of electric output and storing up to 3.0 megawatt-hours (MWh) of energy. AE has contracted for an adjacent 2.6 MW solar PV facility. Both facilities are located at AE's Kingsbury substation (KB), located in east Austin. The system will reduce demand during periods of peak energy use.	Austin, TX	$1,000,000.00

PROJECT NAME	PROJECT CATEGORY	PROJECT DESCRIPTION	LOCATION	GRANT AMOUNT
Southwest Research Institute	New Technology	Southwest Research Institute in San Antonio installed a stainless-steel baghouse equipped with a combined Activated Carbon Injection (ACI) and Dry Sorbent Injection (DSI) system, providing service to three contiguous buildings in the Fire Technology area. The goal of the emission reduction project is to capture and control emissions of particulate matter, as well as hazardous and toxic air pollutants from the three buildings in the Fire Technology area. This was achieved by ducting emission from these buildings to a common centralized Pollution Abatement System that treats the emissions before releasing them to the atmosphere.	San Antonio, TX	$500,000.00
CPS Energy	Electricity Storage	CPS Energy's project consists of a 10-megawatt MW /10-megawatt hour MWh lithium-ion battery energy storage system (BESS). The BESS is collocated with a 5 MW utility-scale solar photovoltaic (PV) facility located in San Antonio. Solar energy is captured by the PV facility and is stored by the BESS and delivered back to the electric grid. The Project allows emission reductions by shifting clean, renewable energy to peak hours when energy demand is the highest, thereby displacing fossil fuel generation. The Project additionally provides emission reduction by supplying frequency regulation to the Electric Reliability Council of Texas (ERCOT) grid.	San Antonio, TX	$3,000,000.00

PROJECT NAME	PROJECT CATEGORY	PROJECT DESCRIPTION	LOCATION	GRANT AMOUNT
Pedernales Electric Cooperative, Inc.	Electricity Storage	The Pedernales Energy Storage Automation & Management with Solar (PESAMS) project integrates a 2 MW / 4 MWh lithium-ion battery energy storage system (BESS) in Blanco County, Texas, near the newly installed Johnson City solar Photovoltaic array. Solar energy is stored in the batteries and then discharged/shifted to provide predictable and reliable energy to PEC members in rural areas of the Texas Hill Country during peak load demand times (3p.m.-7p.m.) when costs for using electricity is the highest.	Dripping Springs, TX	$1,500,000.00
Vistra Energy Corporation	Electricity Storage	Vistra Energy Corp. engineered, procured, and constructed a 10 MW/42 MWh battery system co-located at their 180 MW Upton 2 solar facility in McCamey, TX. The batteries charge during the day and discharge in the evenings during peak energy use. The batteries are designed to discharge as the solar facility drops below 180 MW.	McCamey, TX	$1,000,000.00
Vistra Energy Corporation	New Technology	Vistra Energy Corporation will install a carbon capture facility located at Vistra's existing Oak Grove coal power plant. The facility will be installed next to the existing facility and will reroute the flue gas from the operating facility where it will be treated in several towers, compressed, and used for enhanced oil recovery in West Texas. The project's goal is to capture 10,000 of the 13,000 tons of carbon dioxide produced by the facility each day.	Franklin, TX	$3,542,857.62

PROJECT NAME	PROJECT CATEGORY	PROJECT DESCRIPTION	LOCATION	GRANT AMOUNT
University of Texas at Arlington	New Technology	University of Texas at Arlington retrofitted two natural gas boilers that produce steam for the campus for heating and process loads. The retrofitted boilers have new burner management and combustion controls to increase efficiency and reduce emissions. The new controls have flue gas recirculation, stack oxygen metering, and trim and staged combustion to reduce the NOx and Nitrous Oxide emissions.	Arlington, TX	$99,334.38
ENSTOR Katy Storage and Transportation, L.P.	New Technology: Oil and Gas	ENSTOR Katy Storage and Transportation, L.P. is the owner and operator of a gas storage project in Fort Bend County, Texas. The project consists of replacing eight lean-burn natural gas engine drivers used in natural gas storage compression service with eight remanufactured, more efficient, and lower emission engines to reduce oxides of nitrogen (NO_X), volatile organic compounds (VOC), and particulate matter (PM) emissions. They will also install a new three-way catalyst to reduce NO_X, VOC, and PM emissions.	Katy, TX	$2,631,091.00
Nelson Gardens Energy, LLC	Electricity Storage	Nelson Gardens Energy, LLC is the operator of the generation facilities at Nelson Gardens Landfill, located at 8963 Nelson Road, San Antonio, Texas. They will design and install a hybrid system of landfill gas-to-energy, solar energy, and flow battery storage on a closed landfill through integration of approximately 5.81 MW gross of DC solar generation together with 13 vanadium flow batteries of 78 kW each totaling approximately 1.014 MW at the existing generation site.	San Antonio, TX	$2,011,101.00
Grand Total				$16,296,259.00