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Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants

Air Quality Division

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants

Prepared by
Air Quality Division

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Page to be added in final publication

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Chapter 1
Summary

These guidelines contain the criteria for grants under the Texas Emissions Reduction Plan (TERP), authorized under Chapter 386, Subchapter C, of the Texas Health and Safety Code. The Texas Commission on Environmental Quality (TCEQ) has adopted rules to implement this program under Title 30, Texas Administrative Code (30 TAC), Chapter 114, Subchapter K.

Purpose

This program was established by the Texas Legislature to create monetary incentives for projects to improve air quality in the state's nonattainment areas. These areas have been determined not to meet certain air quality standards established by the U.S. Environmental Protection Agency (EPA). Other eligible counties of the state that may face air quality challenges in the future are also eligible for incentives under this program.

Activities eligible for funding under this program are intended to reduce the emissions of nitrogen oxides (NO_x). NO_x is usually a by-product of high-temperature combustion. Everyday functions like driving a motor vehicle or operating heavy equipment contribute to the creation of NO_x. It reacts with volatile organic compounds (VOC) in the presence of sunlight to form ground-level ozone.

As required under the statute, these guidelines establish the standards and criteria for grants issued under the TERP. Along with the statutory and regulatory provisions applicable to this program, recipients of incentive funding must adhere to the criteria set forth in these guidelines.

The TCEQ may also establish more specific criteria, through contracts or other funding mechanisms, consistent with these guidelines.

Funding

This program is funded through revenue deposited into the Texas Emissions Reduction Plan Fund. That revenue consists of fees and surcharges established by the Texas Legislature.

The amount of funds available for grants during each year may vary depending on the cash flow to the program and the amount of revenues received, as well as legislative appropriations to the program. The TCEQ will periodically issue notices and

information regarding the grant programs, including information on the amount of funds available.

Grant-Program Descriptions

Several grant programs are administered through the TERP:

Emissions Reduction Incentive Grants Program. Authorized in Texas Health and Safety Code 386.102, this program awards grants to cover the incremental costs of projects in the state's 41 air quality nonattainment and near-nonattainment counties.

Rebate Grants Program. Texas Health and Safety Code 386.117 directs the TCEQ to award rebate grants in order to streamline grant applications, contracting, reimbursement, and reporting for project categories designated by the TCEQ.

Small-Business Grants Program. Per Texas Health and Safety Code 386.116, businesses that own and operate one or two vehicles or pieces of equipment—one of which must be diesel-powered and a pre–1994 model vehicle—or pieces of non-road equipment with "uncontrolled emissions" are considered small businesses. This program is intended to afford these small businesses greater opportunities to participate in the emissions-reduction incentive programs.

Third-Party Grants Program. Texas Health and Safety Code 385.103(a) authorizes the TCEQ to allow a person other than the owner to apply for and receive a grant in order to improve the ability of the program to achieve its goals.

Particulate Matter Reduction Retrofits Grants Program. Texas Health and Safety Code 386.053(d) authorizes adding pollutants in order to improve the ability of the plan to achieve its goals. Accordingly, funding may be made available for retrofit or add-on technologies to achieve the reduction of particulate-matter emissions from school buses.

Grant funding levels for activities of these types will be developed consistent with the TCEQ Clean School Bus program. Funding determinations will be a result of TCEQ analysis of the cost and relative effectiveness of available retrofit technology to reduce PM. Projects will be limited to retrofit activities located in the eligible counties and specifically identified and approved by the TCEQ. Funding for these activities shall be awarded consistent with the provisions of Texas Health and Safety Code Chapter 390 and 30 TAC Chapter 114, Subchapter K, Division 4.

Other Programs. Other air quality grant, monitoring, and research programs are paid for via the TERP Fund. Programs not specifically addressed in these guidelines are administered under separate requirements established for those programs.

How to Contact Us

For information about the grant programs, interested parties should check the TERP website at <www.terpgrants.org>. Also linked from that page are electronic versions of this document, the technical supplements to the guidelines, and the application forms, as well as other information that may be helpful to a potential applicant.

Staffers at the TCEQ are available to answer questions and offer assistance with the grant programs. If you are unclear about whether a proposed project would qualify for a grant, please feel free to contact TCEQ personnel to discuss the project.

Program staffers may be reached by calling 800-919-TERP (8377) between 8 a.m. and 5 p.m., Monday–Friday, by E-mail at <terp@tceq.texas.gov>, or by mail at:

Implementation Grants Section, MC 204
Air Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Chapter 2
Glossary

Terms as they are defined in Texas Health and Safety Code, Chapter 386, and the TCEQ rules (30 TAC 114.620) apply to this program, except as such terms are further defined and have the meanings as explained below.

activity Each individual purchase or lease, replacement, repower, retrofit of an on-road vehicle, non-road piece of equipment, locomotive, marine vessel, or stationary equipment. An activity also includes each purchase of on-vehicle infrastructure, on-site infrastructure, or qualifying fuel as may be specifically grouped as an activity by the TCEQ in the application forms and approved under a grant contract.

activity life The period used to determine the emissions reductions and cost-effectiveness of the activity. The minimum activity life for most projects is five years, although a longer minimum activity life may be established by the TCEQ for a particular grant application period. For all on-road heavy-duty vehicle replacement, purchase, or lease activities, the activity life will be five years or more, or 400,000 miles, whichever occurs earlier. The TCEQ will establish a start date for each type of activity. For replacement and repower projects, the activity life usually begins as soon as the TCEQ has verified that proper disposal of the vehicle, equipment, or engine has occurred.

cost-effectiveness The total dollar amount expended divided by the total number of tons of reduced emissions of nitrogen oxides attributable to that expenditure. In calculating cost-effectiveness, one-time grants of money are annualized using a time value of public funds or discount rate determined for each project by the TCEQ, taking into account the interest rate on bonds, interest earned by state funds, and other factors the TCEQ considers appropriate. The current discount rate used to determine cost-effectiveness is 3% per year.

incremental cost The cost of an applicant's project, less a baseline cost that would otherwise be incurred by an applicant in the normal course of business. It may include added lease or fuel costs, as well as additional capital costs.

motor vehicle A self-propelled device designed for transporting persons or property on a public highway that is required to be registered under Texas Transportation Code Chapter 502.

non-road equipment A piece of equipment, excluding a motor vehicle or on-road heavy-duty vehicle, that is powered by a non-road engine, including non-road and non-recreational equipment and vehicles; construction equipment; industrial equipment; mining equipment; locomotives; marine vessels; and other high-emitting engine categories.

non-road engine An internal combustion engine that is in or on a piece of equipment that is self-propelled or that propels itself and performs another function, excluding a vehicle that is used solely for competition, a piece of equipment that is intended to be propelled while performing its function, or a piece of equipment designed to be capable of being carried or moved from one location or another. In general, an engine that will stay at a single site for at least a full year will be considered a stationary engine, rather than a non-road engine. The TCEQ will make the final determination of the type of engine.

on-road heavy-duty vehicle An on-road motor vehicle that has a gross vehicle weight rating of 8,500 pounds or more. This definition does not include a vehicle over 8,500 pounds that is classified by the EPA as a medium-duty passenger vehicle subject to the federal light-duty on-road vehicle emission standards.

person An individual, corporation, organization, government or governmental subdivision or agency, business trust, partnership, association, or any other legal entity. This may include a corporation headquartered outside Texas that operates equipment or vehicles primarily in an eligible county in Texas.

project One or more activities approved by the TCEQ under one grant contract.

qualifying fuel Any liquid or gaseous fuel or additive that is ultimately dispensed into a motor vehicle, on-road heavy-duty vehicle, non-road equipment, or a stationary engine that reduces emissions of nitrogen oxides, as determined by the TCEQ, beyond reductions required by state or federal law.

repower To replace an old engine with a new engine, a used engine, a remanufactured engine, or one or more electric motors, drives, or fuel cells.

retrofit To equip an engine, a fuel system, or both with new emissions-reducing parts or technology after the manufacture of the original engine or fuel system.

stationary engine A machine used in non-mobile applications that converts fuel into mechanical motion, including turbines and other internal combustion devices. In general, a stationary engine is used either in a fixed application or in a portable (i.e., transportable) application in which it will stay at a single site for at least a full year (12 consecutive months). The TCEQ will make the final determination of the type of engine.

Uniform Grant Management Standards (UGMS) Standards issued by the Office of the Governor for use by state agencies in issuing and administering grants under the authority of the Uniform Grant and Contract Management Act, Texas Government Code, Chapter 783.

Chapter 3
Eligible Areas

The counties eligible under this program (eligible counties) include those counties within the nonattainment areas designated under the Federal Clean Air Act, 107(d), as well as other counties identified as "Affected Counties" in Texas Health and Safety Code 386.001(2) and TCEQ rules (30 TAC 114.629). The 42 eligible counties currently located within a nonattainment area or designated as affected are listed in Table 3.1 (see also map, Figure 3.1). While this list is accurate at the time of publication, eligible counties and the boundaries of nonattainment areas may be subject to change.

Table 3.1
Counties in Texas Eligible for the TERP Program

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

The TCEQ may limit funding under a grant period to projects in only some of the eligible counties based on the funding allocation decisions for that period.

The TCEQ may also designate highways and roadways, or portions of highways and roadways, to count towards requirements outlined later in these guidelines that at least 75% of the miles driven by grant-funded on-road vehicles be in the eligible counties. Usage outside of the TERP eligible counties will not count towards emissions reductions used to determine the cost-effectiveness of the project.

The following are portions of highways that are designated for travel by grant-funded on-road vehicles to meet the 75% usage requirement:

- Interstate Highway 10 from the Texas–New Mexico border to the Texas-Louisiana border,
- IH 20 from IH 10 to the Texas-Louisiana border,
- IH 30 from the Rockwall County border to the Texas-Arkansas border,
- IH 35 from the Texas-Mexico border to the Texas-Oklahoma border,

- IH 37 from the Gulf of Mexico to the Bexar County border,
- IH 45 from the Montgomery County border to the Ellis County border,
- U.S. Highway 59 from the Texas-Mexico border to the Texas-Arkansas border,
- US 79 from the Williamson County border to the Texas-Louisiana border,
- US 281 from the Texas-Mexico border to the Texas-Oklahoma border,
- US 77 from the Texas-Mexico border to the Ellis County border, and
- US 290 from IH 10 to the Waller County border.

A number of the United States Highway segments shown above are in the process of being re-designated as part of the new Interstate Highway 69. Those highway segments will remain on this list after conversion to IH 69.

(See also Figure 3.2.)

The TCEQ may limit the funding under a grant period to only some of these highways based on allocation decisions for that period.

Figure 3.1
TERP Eligible Counties (subject to change)

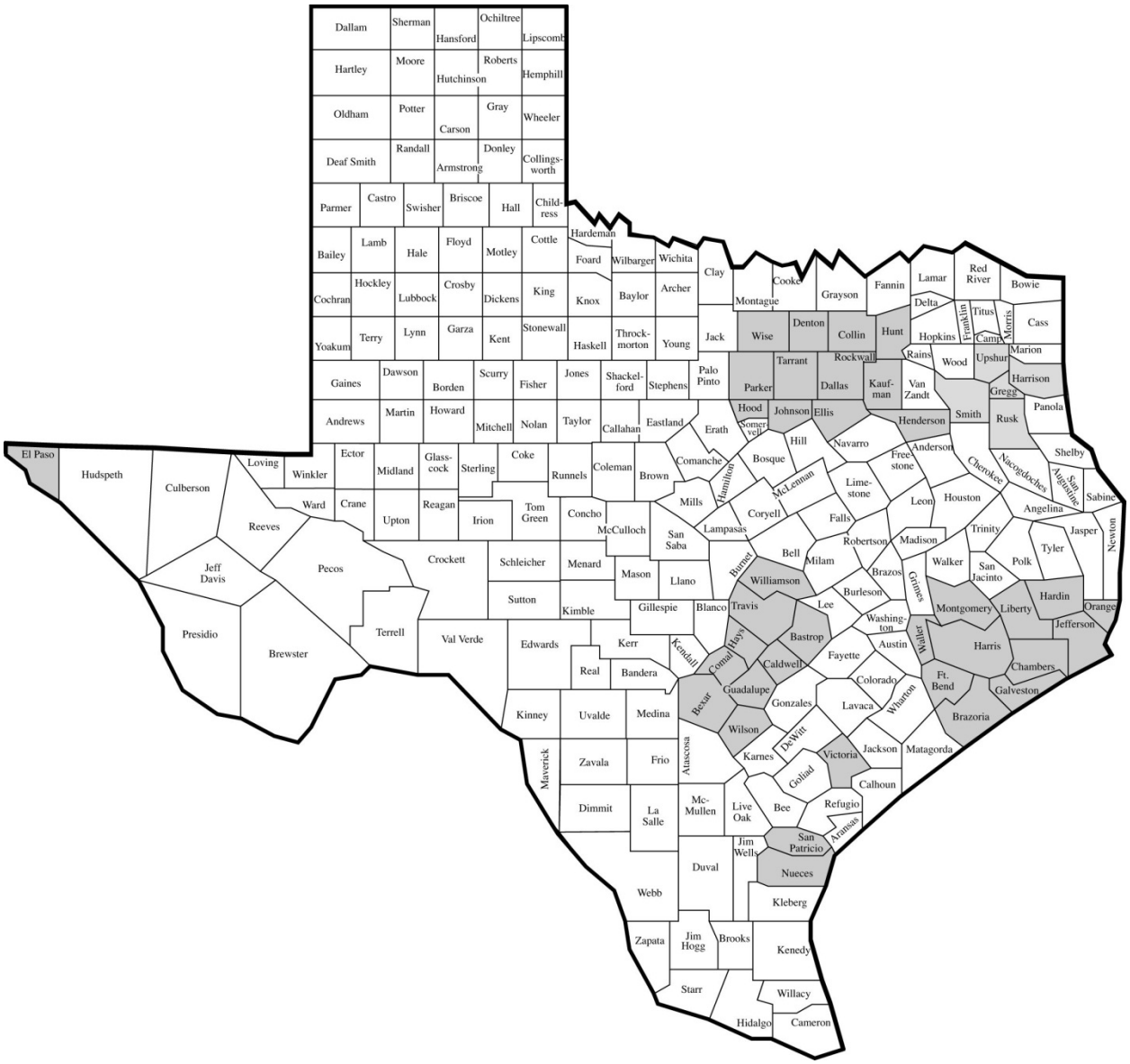
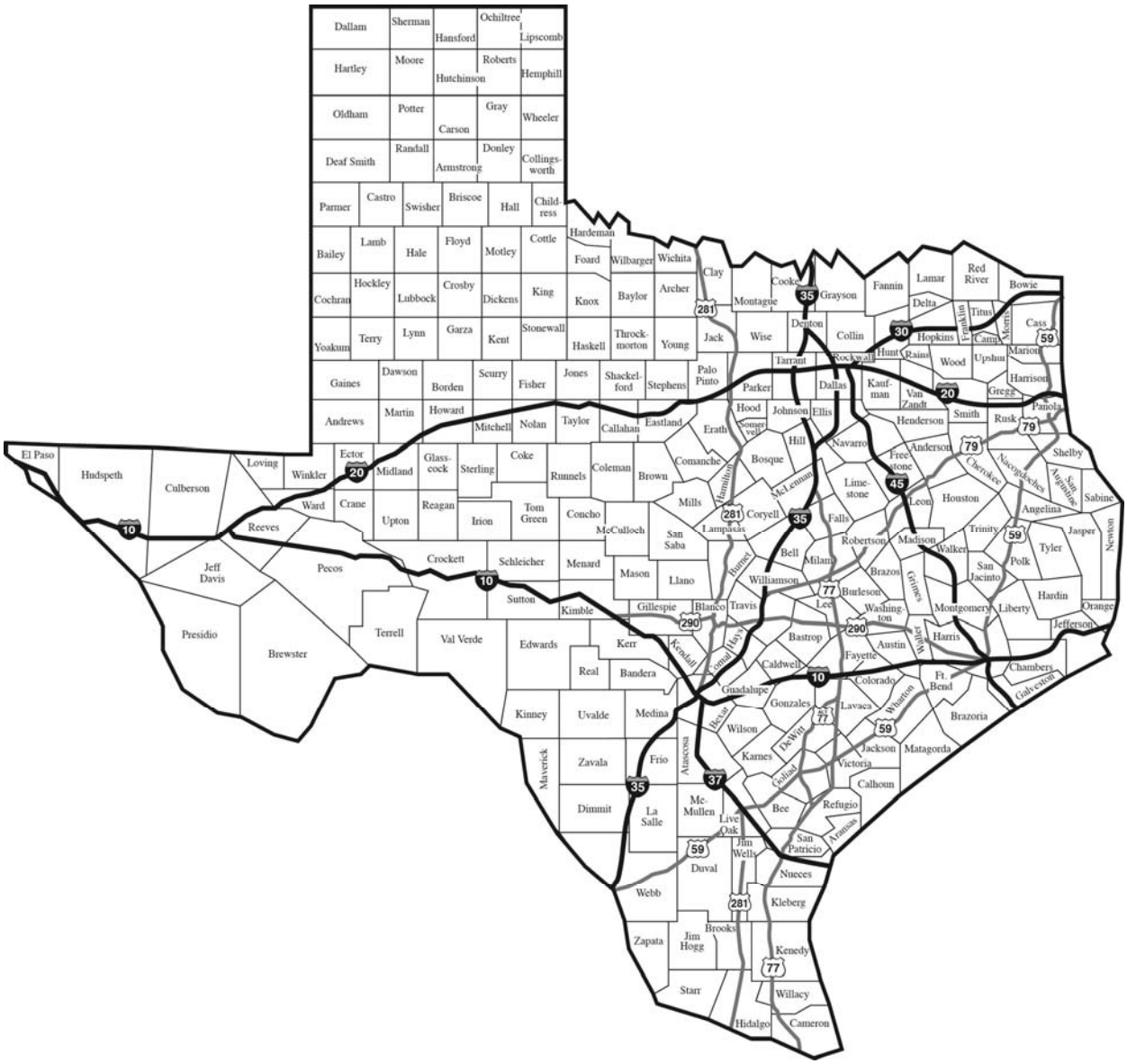


Figure 3.2
TERP Designated Highways and Roadways (subject to change)*



*Note – A number of the United States Highway segments shown above are in the process of being re-designated as part of the new Interstate Highway 69. Those highway segments will remain on this list after conversion to IH 69. The TCEQ may periodically provide updated maps to show the IH 69 designations, as those changes are made.

Chapter 4
Emissions Reduction Incentive Grants Program

The Emissions Reduction Incentive Grants (ERIG) program awards grants to fund the incremental costs of projects in the eligible counties.

Activities that may be eligible under this program are outlined below. Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories. The TCEQ may more narrowly define or limit the types of eligible activities for a particular funding period.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_x emissions in the eligible counties.

For infrastructure activities (see Appendixes 6–8) persons owning and operating the infrastructure in an eligible county may also be eligible for funding. For demonstration projects, persons may be eligible for funding if they own the technology to be demonstrated in an eligible county, or if they own the vehicles or equipment on which the technology will be demonstrated.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Eligible Activities

Activities eligible for incentive funding are intended to reduce NO_x emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines when compared with a baseline vehicle or piece of equipment. Additional information and criteria on eligible activities and costs are available in the appendixes to this volume.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also

be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding period, as needed to best achieve the goals of the TERP.

On-Road Heavy-Duty Vehicles

On-road heavy-duty vehicles with a gross vehicle weight rating of 8,500 pounds or more are eligible for grants under this program. Activities and eligible costs are explained in Appendix 1. Eligible activities include:

- lease or purchase of new on-road vehicles (fleet expansion),
- replacement of on-road vehicles,
- repower of on-road vehicles, and
- retrofit or add-on of emissions-reduction technology.

Non-Road Heavy-Duty Equipment

Non-road equipment powered by an engine rated at 25 horsepower or greater is eligible for grants under this program. For replacement and repower projects, this requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology. Activities and eligible costs are explained in Appendix 2. Eligible activities include:

- lease or purchase of new non-road vehicles (fleet expansion),
- replacement of non-road vehicles,
- repower of non-road vehicles, and
- retrofit or add-on of emissions-reduction technology.

Marine Vessels

Marine vessels powered by engines of at least 25 hp, and associated auxiliary marine engines of at least 25 hp, are eligible for grants under this program. For replacement and repower projects, the requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology. Activities and eligible costs are explained in Appendix 3. Eligible activities include:

- lease or purchase of new marine vessels (fleet expansion),
- replacement of marine vessels,

- repower of marine vessels, and
- retrofit or add-on of emissions-reduction technology.

Locomotives

Locomotives are eligible projects under this grant program. Activities and eligible costs are explained in Appendix 4. Eligible activities include:

- lease or purchase of new locomotives (fleet expansion),
- replacement of locomotives,
- repower of locomotives, and
- retrofit or add-on of emissions-reduction technology.

Stationary Equipment

Activities involving stationary engines of at least 25 hp are eligible for grants under this program. For replacement and repower projects, this requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology.

An activity is not eligible if the activities or emissions reductions to be funded are already required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. In addition, any emissions-reduction credits generated by a project must be transferred to the state for the State Implementation Plan, and permanently retired.

Activities and eligible costs are explained in Appendix 5. Eligible activities include:

- lease or purchase of new stationary equipment (fleet expansion),
- replacement of stationary equipment,
- repower of stationary equipment, and
- retrofit or add-on of emissions-reduction technology.

Refueling Infrastructure

An eligible activity may include the purchase and installation of stationary or mobile on-site infrastructure for refueling motor vehicles, on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, and stationary engines with a qualifying liquid or gaseous fuel. In some cases, the TCEQ may accept applications for refueling infrastructure related to stationary equipment. The applicant will need to supply proof that the infrastructure is needed and will be used in an eligible county.

A qualifying fuel is a liquid or gaseous fuel or additive, other than gasoline or diesel fuel, that is ultimately dispensed into a motor vehicle, an on-road heavy-duty vehicle, non-road equipment, a locomotive, a marine vessel, or a stationary engine, where the provision of the fuel results in NO_x emissions reductions [~~and that reduces NOx emissions~~], as determined by the TCEQ, beyond reductions required by state or federal law. The NO_x emissions reductions may be achieved directly through the use of the fuel or as a result of the replacement, repower, or retrofit of vehicles or equipment using gasoline or diesel fuel to vehicles or equipment using the qualifying fuel.

Activities and eligible costs are explained in Appendix 6.

On-Site Electrification and Idle-Reduction Infrastructure

An eligible activity may include the purchase and installation of on-site infrastructure—including auxiliary power units—designed to dispense electricity to motor vehicles, on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, and stationary engines. The electricity may replace the power normally supplied by the engine while the vehicle or equipment is parked (idle reduction) or may recharge electric vehicles or equipment being used in lieu of vehicles or equipment powered by an internal combustion engine. The applicant will need to supply proof that the infrastructure is needed and will be used in an eligible county.

The TCEQ may also tender funds to other state agencies to implement infrastructure projects at rest areas and other public facilities on major highway transportation routes within eligible areas. Projects may also be funded for marine vessels operating in eligible waterways. Funding may be used for initial start-up and proper operation of the idle-reduction technologies.

Activities and eligible costs are explained in Appendix 7.

On-Vehicle Electrification and Idle-Reduction Infrastructure

An eligible activity may include the purchase and installation of equipment that enables an on-road vehicle, non-road equipment, marine vessel, locomotive, or stationary engine to use electric power to operate, while the vehicle or equipment is parked, the systems normally supplied power by the propulsion engine or another on-board internal combustion engine that emits NO_x.

Activities and eligible costs are explained in Appendix 8. Eligible equipment may include:

- devices added on to enable acceptance of electricity from an external power source, and
- an auxiliary power unit purchased and installed on the vehicle or equipment to generate electricity.

Activities and eligible costs are explained in Appendix 8.

Rail Relocation and Improvements

Eligible activities may include rail-line relocation and improvements at rail intersections and grade crossings that will reduce emissions of NO_x by reducing locomotive idle time at those intersections or on-road vehicle idle time at those grade crossings.

Activities and eligible costs are explained in Appendix 9.

Use of Qualifying Fuel

The incremental costs associated with the purchase and use of a qualifying fuel or fuel additive in a motor vehicle, an on-road heavy-duty vehicle, non-road equipment, a marine vessel, a locomotive, or a stationary engine may be eligible for funding under this program. The incremental cost is the difference in cost between the qualifying fuel and a baseline fuel. For the purchase of fuel additives, the incremental costs include the full cost of the additive.

To determine an incremental cost for fuel purchases, the cost per gallon of the baseline fuel should be compared with the cost for an equivalent amount of the qualifying fuel. Equivalency between the qualifying fuel and the baseline fuel should be determined based on the energy content of the fuel, as measured by the use per mile or hour, or other method.

Activities and eligible costs are explained in Appendix 10.

Demonstration of New Technology

Projects under this category must demonstrate practical low-emissions retrofit technologies, repower options, and advanced technologies for on-road heavy-duty diesel vehicles and diesel-powered non-road equipment. Projects under this category may include:

- use of retrofit, repower, and add-on technologies to reduce NO_x emissions from the existing stock of heavy-duty diesel vehicles and non-road diesel equipment, and
- use of advanced technologies, including use of qualifying fuels, for new engines and vehicles that produce very low or zero emissions of NO_x—including stationary and mobile fuel cells—which could replace the use of higher-emitting diesels.

Activities and eligible costs are explained in Appendix 11.

Grant-Program Procedures

This section contains the general procedures that will be used for applying for, awarding, and administering grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

Grant projects will be solicited through periodic or open-ended Requests for Applications (RFAs) and through other mechanisms to solicit grant applications. Copies of the RFAs and the necessary application forms are made available at the TERP website <www.terpgrants.org> and directly from the TCEQ.

Application Review and Selection

The program will review and evaluate grant applications according to criteria established in these guidelines and the RFAs. When it uses a competitive process, the agency will select among projects using ranking and scoring procedures explained in the RFAs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories. Grants may also be selected in the order received or by another mechanism.

The TCEQ may also establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application-Verification Visits

Upon receipt of a grant application, the TCEQ may check the vehicle and equipment for condition, engine identification, and vehicle identification.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant. Grant contracts may be issued on a

contingency basis, subject to a follow-up Notice to Proceed being issued by the TCEQ, once sufficient funds are available.

Reimbursement

Grant payments will be reimbursements, meaning that the agency will remit payment **after** the eligible expense has been incurred by the recipient. Recipients will also have the option to assign their grant payments directly to a dealer or service provider. The TCEQ will supply reimbursement request and reporting forms for use by the recipient.

In some cases, particularly for large projects and projects of long duration, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining expenses. The final request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on the grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Verification of Vehicle, Equipment, and Engine Disposition

The applicant must agree to decommission any old vehicle, equipment, or engine replaced under this program no later than 90 days after receiving reimbursement by the TCEQ.

Unless the executive director agrees to an alternative method, the decommissioning must be carried out by complete crushing or other complete destruction of the vehicle, equipment, or engine, or by making a hole in the engine block on both sides large enough to prevent repairs (usually at least 3 inches) and, for a replacement project, permanently destroying the frame by cutting the frame rails or main structural components of the vehicle or equipment.

In lieu of crushing an engine block or cutting a hole in it, the executive director may also allow the engine to be sent to a remanufacture facility operated or authorized by the original engine manufacturer. The remanufacture of the engine must include removing all parts and using the old block to build a remanufactured engine with a new serial number.

For a locomotive-replacement project the executive director may allow permanent removal from Texas, in lieu of destruction, in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas. This option will not normally be available for other types of projects, although

exceptions may be established for specific grant rounds to meet the goals of the program.

The applicant must certify the disposition of the vehicle, equipment, or engine using forms supplied by the TCEQ. The executive director may require a certified or duplicate Texas Nonrepairable Vehicle Title as evidence that an on-road vehicle has been rendered permanently inoperable. Grantees may be required to return grant funds if they fail to meet the disposition requirements, including if the vehicle, equipment, or engine is later returned to operation.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_x emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year, unless the TCEQ authorizes an alternative reporting schedule. The reports will document the usage over the required reporting period. The TCEQ may, at its sole discretion, authorize an annual or longer reporting schedule, including suspending the reporting requirements, if a grant recipient is meeting the reporting requirements and is otherwise complying with all program requirements. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor the TCEQ selects.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to supply monitoring information to the TCEQ on request. The grant recipient must notify the TCEQ immediately if the use of the locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions-Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for performing the activities, as defined in the contract, necessary to achieve the calculated reductions in NO_x emissions within the eligible areas. Unless the TCEQ has determined that the intent of the program has been met, recipients will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions over the activity life are not achieved.

The emissions reduction calculations are based on a *usage amount* (miles, hours, or fuel use) over the activity life. In order to verify that the required emissions

reductions are actually achieved, the TCEQ may require a usage commitment by the grant recipient or may establish default usage amounts either based on the category the project belongs to or for individual types of vehicles or equipment. If a specific usage commitment is required, grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract. If default usage amounts are established by the TCEQ, a grant recipient may not be required to commit to a specific usage amount over the activity life but will still need to meet commitments on the percentage of annual use in the eligible counties.

In determining whether the intent of the program has been met, the TCEQ may consider the good-faith efforts of the grant recipient to meet the usage commitments originally projected. The TCEQ may consider circumstances that impeded the recipient's use of the grant-funded vehicle or equipment, such as natural disasters and other factors not under the recipient's control.

The TCEQ may include an annual commitment to reduce NO_x in the contract, where appropriate. At its discretion, the TCEQ may require the return of all or a pro rata share of grant funds if the annual emissions reductions are not being achieved. The decision to require the return of grant funds may be based on—but need not be limited to—an assessment that the annual performance is so low that it is unlikely that the grant recipient will be able to achieve the emissions reductions committed to over the activity life. The TCEQ may also use annual emissions-reduction commitments to ensure that a grant recipient does not overachieve emissions reductions during the first years of the activity life in order to underachieve the emissions reductions in later years.

[~~The emissions reduction calculations are based on a *usage amount* (miles, hours, or fuel use) over the activity life. The TCEQ may require a usage commitment by the grant recipient or may establish default usage amounts either based on the category the project belongs to or for individual types of vehicles or equipment. Grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract, if any.~~]

The TCEQ may work with the grant recipient to implement other options for ensuring that the emissions-reduction commitments will be achieved before it requires a return of the grant funds. If the TCEQ requires the return of a pro rata share of the grant funds for underachievement of the annual emissions-reduction commitment, the TCEQ may revise the commitment over the remaining activity life to a lower amount, based on a new projection of the emissions reductions.

Except where no percentage-of-use commitment is required for that type of project, grant recipients must also agree to operate the grant-funded vehicle or equipment in the eligible counties for a minimum percentage of the annual or total usage (or both). Except when the TCEQ determines that the intent of the program has been met, the recipient will be required to return all or a pro rata share of the grant funds to the TCEQ if the percentage-of-use commitment is not met. The TCEQ may work with

the grantee to implement other options for ensuring that a percentage-of-use commitment will be met before it requires the return of grant funds.

Chapter 5
Rebate Grants Program

The Rebate Grants Program awards grants to fund the incremental costs of projects in the eligible counties.

Activities that may be eligible under this program are outlined below. Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories. The TCEQ may more narrowly define or limit the types of eligible activities for a particular funding period. The TCEQ may also establish more than one rebate-grants program to include various emission-source categories and types of projects, such as replacements, repowers, and retrofits.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_x emissions in the eligible counties.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Eligible Activities

Activities eligible for rebate grants are intended to reduce NO_x emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories and types of activities, such as replacements, repowers, and retrofits, listed under the Emissions Reduction Incentive Grants program in Chapter 4 of these guidelines may be eligible for funding in the Rebate Grants program. The

TCEQ may limit the types of activities that may be funded under a rebate grant for particular funding periods.

The TCEQ may establish default usage rates to determine the rebate grant amounts. The TCEQ may also establish a minimum average annual usage for vehicles and equipment being replaced under a rebate grant.

Grant-Program Procedures

This section contains the general procedures that will be used for applying for, awarding, and administering grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The agency will solicit project grants through a periodic or open-ended Notice of Rebate Grants (NRG) and through other processes. Copies of the NRG and the necessary application forms will be made available at the TERP website <www.terpgrants.org> and directly from the TCEQ.

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

Grant applications will be reviewed and evaluated according to criteria established in these guidelines and the NRGs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories.

The agency will review applications for rebate grants in the order received and will fund projects as money becomes available.

Application-Verification Visits

Upon receipt of a grant application, the TCEQ may check any vehicles and equipment for condition, engine identification, and vehicle identification number.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant.

Reimbursement

Grant payments will be reimbursements, meaning that the agency will remit payment after the eligible expense has been incurred by the recipient. Recipients will also have the option to assign their grant payments directly to a dealer or service provider. The TCEQ will supply reimbursement request and reporting forms for use by the recipient.

In some cases, particularly for large projects and projects of long duration, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining unreimbursed expenses. The final request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on the grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Verification of Vehicle, Equipment, and Engine Disposition

The applicant must agree to decommission any old vehicle, equipment, or engine replaced under this program no later than 90 days after receiving reimbursement by the TCEQ.

Unless the executive director agrees to an alternative method, the decommissioning must be carried out by complete crushing or other complete destruction of the vehicle, equipment, or engine, or by making a hole in the engine block on both sides large enough to prevent repairs (usually at least 3 inches) and, for a replacement project, permanently destroying the frame by cutting the frame rails or main structural components of the vehicle or equipment.

In lieu of crushing an engine block or cutting a hole in it, the executive director may also allow the engine to be sent to a remanufacture facility operated or authorized by

the original engine manufacturer. The remanufacture of the engine must include removing all parts and using the old block to build a remanufactured engine with a new serial number.

For a locomotive replacement project the executive director may allow permanent removal from Texas, in lieu of destruction, in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas. This option will not normally be available for other types of projects, although exceptions may be established for specific grant rounds to meet the goals of the program.

The applicant must certify the disposition of the vehicle, equipment, or engine using forms supplied by the TCEQ. The executive director may require a certified or duplicate Texas Nonrepairable Vehicle Title as evidence that an on-road vehicle has been rendered permanently inoperable. Grantees may be required to return grant funds if they fail to meet the disposition requirements, including if the vehicle, equipment, or engine is later returned to operation.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_x emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year, unless the TCEQ authorizes an alternative reporting schedule. The reports will document the usage over the required reporting period. The TCEQ may, at its sole discretion, authorize an annual or longer reporting schedule, including suspending the reporting requirements, if a grant recipient is meeting the reporting requirements and is otherwise complying with all program requirements. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor the TCEQ selects.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to supply the monitoring information to the TCEQ upon request. The grant recipient must notify the TCEQ immediately if the use of the locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions-Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is

responsible for performing the activities, as defined in the contract, necessary to achieve the calculated reductions in NO_x emissions within the eligible areas. Except in circumstances where the TCEQ determines that the intent of the program has been met, recipients will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions over the activity life are not achieved.

The emissions reduction calculations are based on a *usage amount* (miles, hours, or fuel use) over the activity life. In order to verify that the required emissions reductions are actually achieved, the TCEQ may require a usage commitment by the grant recipient or may establish default usage amounts either based on the category the project belongs to or for individual types of vehicles or equipment. If a specific usage commitment is required, grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract. If default usage amounts are established by the TCEQ, a grant recipient may not be required to commit to a specific usage amount over the activity life but will still need to meet commitments on the percentage of annual use in the eligible counties.

In determining whether the intent of the program has been met, the TCEQ may consider the good-faith efforts of the grant recipient to meet the usage commitments originally projected. The TCEQ may consider circumstances that impeded the recipient's use of the grant-funded vehicle or equipment, such as natural disasters and other factors not under the control of the grant recipient.

The TCEQ may include an annual commitment to reduce NO_x emissions reduction in the contract, where appropriate. At its discretion, the TCEQ may require the return of all or a pro rata share of grant funds if the annual emissions reductions are not being achieved. The decision to require the return of grant funds may be based on—but need not be limited to—an assessment that the annual performance is so low that it is unlikely that the grant recipient will be able to achieve the emissions reductions committed to over the activity life. The TCEQ may also use annual emissions-reduction commitments to ensure that a grant recipient does not overachieve emissions reductions during the first years of the activity life in order to underachieve the emissions reductions in later years.

[~~The emissions reduction calculations are based on a usage amount (miles, hours, or fuel use) over the activity life. The TCEQ may require a usage commitment by the grant recipient or may establish default usage amounts either based on the category the project belongs to or for individual types of vehicles or equipment. Grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract, if any.~~]

The TCEQ may work with the grant recipient to implement other options for ensuring that the emissions-reduction commitments will be achieved before it requires a return of the grant funds. If the TCEQ requires the return of a pro rata share of the grant funds for underachievement of the annual emissions-reduction commitment, the TCEQ may revise the commitment over the remaining activity life to a lower amount, based on a new projection of the emissions reductions.

Except where no percentage-of-use commitment is required for that type of project, grant recipients must also agree to operate the grant-funded vehicle or equipment in the eligible counties for a minimum percentage of the annual or total usage (or both). Except when the TCEQ determines that the intent of the program has been met, the recipient will be required to return all or a pro rata share of the grant funds to the TCEQ if the percentage-of-use commitment is not met. The TCEQ may work with the grantee to implement other options for ensuring that a percentage-of-use commitment will be met before it requires the return of grant funds.

Chapter 6
Small-Business Grants Program

In accordance with Texas Health and Safety Code 386.116, the TCEQ is required to establish and administer a grant program targeted at small businesses and other entities that operate only a limited number of eligible vehicles and equipment.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_x emissions in the eligible counties.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Under this program, a "small business" is defined as a "person" (that is, an individual or organization; see Glossary [Chapter 2] for a more specific definition) that has owned (for more than one year) and operates not more than two vehicles or pieces of equipment, one of which is an on-road diesel heavy-duty vehicle with an engine from a model year before 1994 or a non-road diesel-powered piece of equipment with an engine with uncontrolled emissions.

Eligible Activities

Activities eligible for small-business grants are intended to reduce NO_x emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories listed under the Emissions Reduction Incentive Grants program described in Chapter 4 of these guidelines may be eligible for funding in the small-business grants program. At a minimum, the grants will be available for the

replacement or repower of an on-road heavy-duty vehicle with an engine from a model year before 1994, and for the replacement or repowering of non-road equipment with an engine with uncontrolled emissions.

Grant-Program Procedures

This section contains the general procedures that will be used for applying for, awarding, and administering grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The TCEQ will make information available on times when applications may be filed for small-business grants, based on the expected availability of funding for the program. To the extent possible, the TCEQ will keep dealers and installers informed of the availability of funds for the program. The TCEQ may also limit the grants to certain geographic areas, based on the needs of the program. Small-business grants may be funded through another grant program, such as the Rebate Grants program. Information and funds available for small-business grants will be posted in the Requests for Applications (RFAs) or Notices of Rebate Grants (NRGs).

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

Grant applications will be reviewed and evaluated according to criteria established inthese guidelines and the NRG. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories.

Verification of Vehicle, Equipment, and Engine Disposition

The applicant must agree to decommission any old vehicle, equipment, or engine replaced under this program no later than 90 days after receiving reimbursement by the TCEQ.

Unless the executive director agrees to an alternative method, the decommissioning must be carried out by complete crushing or other complete destruction of the vehicle, equipment, or engine, or by making a hole in the engine block on both sides large enough to prevent repairs (usually at least 3 inches) and, for a replacement

project, permanently destroying the frame by cutting the frame rails or main structural components of the vehicle or equipment.

In lieu of an engine block or cutting a hole in it, the executive director may also allow the engine to be sent to a remanufacture facility operated or authorized by the original engine manufacturer. The remanufacture of the engine must include removing all parts and using the old block to build a remanufactured engine with a new serial number.

For a locomotive replacement project the executive director may allow permanent removal from Texas, in lieu of destruction, in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas. This option will not normally be available for other types of projects, although exceptions may be established for specific grant rounds to meet the goals of the program.

The applicant must certify the disposition of the vehicle, equipment, or engine using forms supplied by the TCEQ. The executive director may require a certified or duplicate Texas Nonrepairable Vehicle Title as evidence that an on-road vehicle has been rendered permanently inoperable. Grantees may be required to return grant funds if they fail to meet the disposition requirements, including if the vehicle, equipment, or engine is later returned to operation.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles and equipment for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_x emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year, unless the TCEQ authorizes an alternative reporting schedule. The reports will document the usage over the required reporting period. The TCEQ, at its sole discretion, may authorize an annual or longer reporting schedule, including suspending the reporting requirements, if a grant recipient is meeting the reporting requirements and is otherwise complying with all program requirements. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor the TCEQ selects.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to supply the monitoring information to the TCEQ upon request. The grant recipient must notify the TCEQ immediately if the use of the locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions-Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for performing the activities, as defined in the contract, necessary to achieve the calculated reductions in NO_x emissions within the eligible areas. Except when the TCEQ determines that the intent of the program has been met, recipients will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions are not achieved.

A small-business grant may be awarded under the criteria for either the Emissions Reduction Incentive Grants Program or the Rebate Grants Program. The requirements for emissions reductions and usage for the applicable program will apply.

Chapter 7
Third-Party Grants Program

Texas Health and Safety Code 385.103(a) authorizes the TCEQ to allow a person other than the owner to apply for and receive a grant in order to improve the ability of the program to achieve its goals.

Eligible Applicants

Public agencies, such as those able to coordinate local and regional projects, are eligible to apply for third-party grants. Third-party applicants will need to be able to pass through money to eligible applicants. The TCEQ may limit eligible applicants, areas, and projects. Applicants will be considered case by case.

Eligible Activities

Activities eligible for third-party grants are intended to reduce NO_x emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories listed under the Emissions Reduction Incentive Grants program in Chapter 4 of these guidelines may be eligible for funding under the Third-Party Grants program, subject to a determination by the TCEQ for each third-party grant. In some cases, the TCEQ may require that a third party has already identified the projects to be funded before submitting an application.

Grant-Program Procedures

This section contains the general procedures that will be used for applying for, awarding, and administering grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The TCEQ will make information available on times when applications may be filed for third-party grants, based on the expected availability of funding for the program.

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

The agency will evaluate grant applications according to the project's ability to meet and support the goals of the TERP. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various emissions-reduction categories.

Potential applicants will work with the TCEQ to determine the goals and priorities of the third-party grants.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a contract that is signed by the third-party grant recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant.

Grant contracts will include the minimum requirements for use of the funds, including the pass-through of funding by the recipient. Administrative costs of the third-party grant recipient will not be eligible for funding under this program.

To the extent needed to ensure compliance with the program requirements, the TCEQ may require preapproval authority over the funding decisions of the grant recipient and over the contracts and agreement used by the recipient as part of a pass-through program.

Any pass-through agreements and other contracts used by the grant recipient must ensure compliance with these guidelines and other requirements imposed by the TCEQ.

Reimbursement

The TCEQ will establish the payment and reporting processes case by case. Payments may be reimbursements, meaning that payment will be made after expenses are incurred by the grant recipient. In some cases, the TCEQ may also authorize advance payments, based on the expected or final selection of pass-through projects or other projects.

The grant contract and the payment forms will include requirements for documentation of expenses. The TCEQ may also require approval authority over the payment processes used by the grant recipient to fund a pass-through project or other project.

Monitoring and Reporting

The grant recipient will be required to establish a mechanism to monitor and track the use of grant-funded on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

The recipient must also submit reports on project status for the period designated by the TCEQ in the grant contract and upon completion of all grant-funded activities.

Emissions-Reduction Commitment

Over the activity life of each grant-funded activity, the third-party grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for enforcing the emissions-reduction commitments by sub-grant recipients. The TCEQ may require return of all or a pro rata share of the grant funds for failure to enforce the emissions reduction requirements.

Sub-Grant-Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of sub-grants (pass-through grants). The TCEQ may adjust these procedures and develop more detailed ones, as needed, to ensure the effectiveness of the program.

Project Solicitation

The third-party grant recipient will announce solicitations for projects in accordance with the third-party grant contract between the TCEQ and the recipient.

The third-party grant recipient will make information available on times when applications may be filed for grants, based on the expected availability of funding for the program. To the extent possible, the third-party grant recipient will keep dealers and installers informed of the availability of funds for the program.

Application Review and Selection

The third-party grant recipient will evaluate grant applications according to criteria established in these guidelines and the Request for Applications (RFA). In selecting among projects, the third party must use ranking and scoring procedures to be explained in the RFA or in the order received. The RFA will explain the procedure for application review and selection.

The TCEQ will establish cost-effectiveness thresholds that may not be exceeded by the third-party grant recipients in awarding pass-through grants. However, a third-party grant recipient may establish a lower threshold than the limit set by the TCEQ for particular funding periods and geographic areas.

Application-Verification Visits

Upon receipt of a grant application, the third-party grant recipient may check the vehicle and equipment for condition, engine identification, and vehicle identification.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the sub-grant recipient and by the third-party grantee. Grant contracts may contain additional and more specific requirements beyond those contained in these guidelines. Grant recipients should review the contract language carefully before accepting and signing the contract.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the TCEQ's receipt of sufficient revenue to cover the grant.

Reimbursement

Grant payments will be reimbursements, meaning that payment will be made after the eligible expense has been incurred by the grant recipient. The third-party grant recipient may, but is not required to, give the sub-grant recipients the option to assign their grant payments directly to a dealer or service provider. The third-party

grantee will supply reimbursement request and reporting forms for use by the grant recipient.

In some cases, particularly for large and lengthy projects, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining unreimbursed expenses. The final reimbursement request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Verification of Vehicle, Equipment, and Engine Disposition

The subgrant applicant must agree to decommission any old vehicle, equipment, or engine replaced under this program no later than 90 days after receiving reimbursement by the [~~TCEQ~~]third-party grant recipient.

The third-party grant recipient may request approval from the executive director to allow an alternate disposition method. Unless the third-party grant recipient is authorized to accept an alternative disposition method, the decommissioning must be carried out by complete crushing or other complete destruction of the vehicle, equipment, or engine, or by making a hole in the engine block on both sides large enough to prevent repairs (usually at least 3 inches) and, for a replacement project, permanently destroying the frame by cutting the frame rails or main structural components of the vehicle or equipment.

In lieu of crushing an engine block or cutting a hole in it, the third-party grant recipient may also allow the engine to be sent to a remanufacture facility operated or authorized by the original engine manufacturer. The remanufacture of the engine must include removing all parts and using the old block to build a remanufactured engine with a new serial number.

For a locomotive project the executive director may authorize the third-party grant recipient to allow permanent removal from Texas in specific grants where the sub-grant applicant has furnished adequate assurances that the old locomotive will not be returned to Texas. This option will not normally be available for other types of projects, although exceptions may be established by the executive director and included in the third-party grant contract for specific grant rounds to meet the goals of the program.

The pass-through-grant recipient must certify the disposition of the old vehicle or equipment to the third-party grantee, using forms supplied by the third-party grantee. The third-party grant recipient must require a certified or duplicate

Texas Nonrepairable Vehicle Title as evidence that an on-road vehicle has been permanently rendered inoperable. The third-party grant recipient should require the return grant funds if a sub-grant recipient fails to meet the disposition requirements, including if the vehicle, equipment, or engine is later returned to operation.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in emissions of NO_x and the cost-effectiveness of the activities and the project.

The recipient must submit monitoring reports to the third-party grantee twice a year, unless the TCEQ authorizes an alternative reporting schedule. These reports will include information on usage over the required reporting period. The TCEQ may, at its sole discretion, authorize an annual or longer reporting schedule, including suspending the reporting requirements, if a grant recipient is meeting the reporting requirements and is otherwise complying with all program requirements. The third-party grantee may require applicants to use global positioning system units to monitor grant funded equipment, or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor the TCEQ selects.

If an alternative disposition plan is approved for a locomotive replacement project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to supply all monitoring information to the third-party grantee upon request. The grant recipient must notify the third-party grantee immediately if the use of the locomotive, including where it is used, deviates from the approved alternative disposition plan.

Emissions-Reduction Commitment

Over the life of each grant-funded activity, the sub-grant recipient commits the generated emissions reductions to the State Implementation Plan. The sub-grant recipient is responsible for performing the activities, as defined in the contract, necessary to achieve the calculated reductions in NO_x emissions within the eligible areas.

The third-party grant recipient will implement and enforce emissions-reduction commitments by the sub-grant recipients according to the criteria established for the Emissions Reduction Incentive Grants Program or the Rebate Grants Program, as applicable to the approach used to award and administer the sub-grants. The TCEQ may include more specific enforcement requirements in the third-party grant contracts.

Appendix 1
On-Road Heavy-Duty Vehicles

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for an on-road vehicle project. Most of the calculations will require input of an NO_x emissions factor applicable to the engine, the vehicle, or both. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP website, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this appendix.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

The granting of a waiver to the eligibility requirements is at the discretion of the executive director or the executive director's designee. In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

Eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities and may more narrowly define eligibility requirements during a particular funding period, as needed to best achieve the goals of the TERP.

Purchase or Lease of On-Road Heavy-Duty Vehicles

This category is for the purchase or lease of **new** on-road heavy-duty vehicles. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing vehicle; the baseline for comparison of emissions is the current federal NO_x emissions standard for that vehicle. The baseline vehicles used for determining the difference in cost must be **new**.

To be eligible for funding, the new vehicle must be certified as emitting at least 25% less NO_x than required (in other words, no more than 75% of the NO_x allowable) under the current federal standard for that vehicle. "Certification" means approval by the U.S. EPA or the California Air Resources Board (CARB), or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new on-road heavy-duty vehicle, in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease costs above those that would otherwise have been incurred for the lease of a baseline vehicle.

The TCEQ will reimburse the incremental cost of the **purchase** of a new on-road heavy-duty vehicle subject to cost-effectiveness limits established by the TCEQ. The incremental cost is the difference between the manufacturer's suggested retail price, the documented dealer price of a baseline vehicle, or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner vehicle.

Replacement of On-Road Heavy-Duty Vehicles

This category is for the replacement of an on-road heavy-duty vehicle with a new or late-model on-road heavy-duty vehicle. For a replacement project, the TCEQ will evaluate whether the vehicle being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following standards.

- The applicant must be named as the owner on the front of the vehicle title or provide other documentation, as determined by the executive director, that the applicant has authority to dispose of the vehicle and engine being replaced.
- The applicant must have continuously owned, leased, or otherwise commercially financed the vehicle for the two years preceding the grant application.
- The vehicle must currently be registered for operation in Texas in the applicant's name.
- Unless otherwise approved by the TCEQ, the vehicle must have been continuously registered and used in Texas for the two years preceding the application date.
- The vehicle must be in good operating condition and capable of performing its primary function.

- The vehicle must have a current safety inspection (if a safety inspection is required for that vehicle and use) and must have continuously had an up-to-date safety inspection over the preceding two years.

The TCEQ may waive the two-year ownership, lease, or commercial financing requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed its name or incorporation status. The use or vocation (for example, regional delivery) of the vehicles being replaced must not have changed.

The TCEQ may waive the two-year registration, use, and safety-inspection requirements for short lapses in registration or operation attributable to economic conditions, seasonal work, or other circumstances, based on a finding of good cause. The historical usage described by the applicant on the grant-application forms must reflect the lapses in use of the vehicle in those activities.

For on-road vehicles used exclusively for off-road purposes the TCEQ may, in specific cases, waive the requirements regarding registration and safety inspections. The vehicle must not be subject to state registration and inspection requirements. The historical usage described by the applicant on the grant-application forms must reflect the use of the vehicle for those off-road purposes.

In order for a replacement activity to result in creditable emissions reductions, the applicant must intend to continue to use the vehicle being replaced for the same type of use and amount of use over the same period as the activity life, absent the award of a grant. The TCEQ may require additional assurances, certifications, and documentation to verify that the applicant would continue to use the vehicle being replaced if the grant is not awarded.

For replacement projects, the emissions reductions are based on replacement of the future use of the original vehicle or equipment with the use of the reduced-emission vehicle or equipment. The estimated future use of the original vehicle or equipment is determined from the recent historical use. Except when a default usage amount is used for the emissions reduction calculations, the activity level used for the emissions reduction calculations and the corresponding usage commitment for a replacement project may not exceed the average annual use of the vehicle or equipment being replaced for the two years preceding the application.

The replacement vehicle must be certified to emit at least 25% less NO_x than the vehicle being replaced. The baseline for comparison of emissions is the difference between the emissions of the vehicle being replaced and the emissions of the vehicle being purchased. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement vehicle must be of the same type, weight category, and body and axle configuration as the vehicle being replaced. The replacement vehicle must be configured and intended for use in the same application or vocation (for example, regional delivery), as the vehicle being replaced. The TCEQ may accept, in particular cases, vehicles of a different type, weight category, or body and axle configuration to

account for the latest technology used in a specific vocation. In addition, the TCEQ may accept, case by case, the replacement of a multi-engine vehicle with a single-engine vehicle, or vice versa, as long as the new vehicle will have the same use as the vehicle being replaced and the emissions reductions can be adequately determined.

The model year of the replacement vehicle may not be more than three years prior to the current calendar year, unless an alternative age limit is established by the TCEQ for a particular grant round. The TCEQ may also waive the age-limit requirements case by case in instances where the vehicle has a unique or specialized use and where a recently manufactured model is not available.

The grant recipient may be eligible for reimbursement of up to 80% of the eligible costs for the purchase or lease of the replacement vehicle subject to cost-effectiveness limits established by the TCEQ [~~not to exceed an incentive amount that results in a cost-effectiveness of $15,000 per ton of NO_x reduced~~]. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs [~~and a cost-effectiveness lower than $15,000 per ton~~]for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, with taxes and delivery charges included in the price of the replacement vehicle, or the cash basis for the lease charges. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. Delivery charges from a third party not included in the invoice price from the vehicle or equipment vendor may be included also, subject to approval by the TCEQ.

The total incentive amount must not exceed 80% of the cost of the replacement vehicle minus the scrappage value received for the old vehicle. The TCEQ may establish a default scrappage value.

Repower of On-Road Heavy-Duty Vehicles

This category is for the replacement of an existing engine on an on-road heavy-duty vehicle with a new, rebuilt, or remanufactured engine. The upgrade of an engine with a certified emissions upgrade kit may also be considered under the repower category. The engine must be certified to emit 25% less NO_x than the engine being replaced, based on the federal standard for that engine. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The conversion of an existing on-road heavy-duty diesel engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or the CARB may also be considered under the repower category. Per Texas Health and Safety Code 386.104(f-1), the TCEQ may establish alternative minimum standards for the percentage reduction in NO_X that must be achieved by the conversion of the engine. Under this provision, the TCEQ will establish any alternative standards on a grant-round basis after

considering the effectiveness of available dual-fuel conversion technology in reducing emissions.

Repowers resulting in any alteration from an original configuration of a vehicle or engine must comply with the provisions of EPA Memorandum 1A related to ensuring that altered vehicles and engines continue to meet required emissions standards. Copies of Memo 1A are available from the EPA and the TCEQ, and will be made available on the TERP website at <www.terpgrants.org>.

Eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

[~~The TCEQ will reimburse the incremental cost of the replacement engine~~]The grant recipient may be eligible for reimbursement of up to 80% of the incremental cost of the repower, subject to the cost-effectiveness limits established by the commission. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP.

The incremental cost for an engine replacement is the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old [~~vehicle~~]engine, if applicable. The TCEQ may establish a default scrappage value. The total incentive amount also must not exceed the cost of the replacement engine.

For certified conversions and emissions-upgrade kits, the incremental cost is the cost to purchase and install the conversion system or kit, including the new fuel system, if applicable. Other upgrades or modifications to the engine or vehicle that are not necessary for the conversion or upgrade of the engine are not eligible.

[~~The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.~~]

Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine or conversion system, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine or conversion system, including the fuel system if converting to dual-fuel operation;
- associated supplies directly related to the installation of the engine or system;
- the costs to remove and dispose of the old engine, if applicable;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit; and

- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on an on-road heavy-duty vehicle, or adding on devices to the vehicle. To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25% less NO_x than the engine prior to the retrofit or add-on. "Verification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Retrofits and add-on activities resulting in any alteration from an original configuration of a vehicle or engine must comply with the provisions of EPA Memorandum 1A, related to ensuring that altered vehicles and engines continue to meet required emissions standards. Importantly, aftermarket systems for converting a vehicle and engines to alternative fuel operation must comply with EPA certification requirements under Memo 1A. Copies of Memo 1A are available from the EPA and the TCEQ, and will be made available on the TERP website at <www.terpgrants.org>.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology subject to cost-effectiveness limits established by the TCEQ. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs for particular funding periods, as needed to best achieve the goals of the TERP.

Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges,
- associated supplies directly related to the installation of the devices,
- installation costs,
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used, and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving on-road heavy-duty vehicle activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- The applicant must own the vehicle being replaced, repowered, or retrofitted and the applicant's name must appear on the front of the vehicle title.
- Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories.
- On-road heavy-duty vehicle activities must reduce NO_x emissions compared to baseline emissions. The NO_x emissions of vehicles, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. In situations where the model year of the vehicle and the model year of the existing engine are different, such as in a vehicle that has already had its engine replaced with a newer engine, the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. How the 25% reduction criterion applies to each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the vehicle and engine being purchased or leased must be certified to emit at least 25% less NO_x than (that is, no more than 75% as much NO_x as) the current federal NO_x emissions standard for that vehicle.

  Replacements. The replacement vehicle and engine must have been certified to emit at least 25% less NO_x than (that is, no more than 75% as much NO_x as) the vehicle being replaced. For example, if an applicant wants to replace a 1989 bus with a 1999 bus, the replacement bus and engine must have been certified to emit 25% less NO_X than the 1989 emissions standard.

  Repowers. The replacement engine must be certified to emit at least 25% less NO_x than the engine being replaced. The TCEQ may establish an alternate standard for the conversion of an on-road heavy-duty diesel engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or the CARB.

  Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the model year of the engine being retrofitted. The retrofit or add-on technology must be verified to emit at least 25% less NO_x than the standard for the vehicle and engine being retrofitted. For example, if an applicant wants to retrofit the engine on a bus, and the bus engine was originally manufactured in

1996, then the retrofit kit must have been verified to result in NO_x emissions that are 25% less than the original (1996) certified emissions level of the vehicle and engine.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same vehicle or engine, the TCEQ may consider the combined reductions from the two technologies in meeting the 25% requirement. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25%.

- The cost-effectiveness of a project [~~, other than a demonstration project,~~] must not exceed [~~$15,000~~] any limits set by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. [~~Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.~~
- ~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.~~]
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required the baseline and reduced emissions-rate calculations for diesel-engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056, and
  - the reductions are permanently retired.
- For repower activities, eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all on-road heavy-duty vehicle replacement, purchase, or lease activities, the minimum activity life will be five years or more, or 400,000 miles of operation, whichever occurs earlier. For all other on-road vehicle activities, the activity life must be a minimum of five years. For activities other than an on-road vehicle replacement, purchase, or lease activity, the TCEQ may establish longer activity-life requirements for each grant period. At least 75% of the annual usage of the vehicle must take place in one or more of the eligible counties and designated highways throughout the life of the project. Leases that do not include a binding commitment to purchase must be for the length of the activity life, and 75% of the annual usage over the lease period must take place in one or more of the eligible counties and designated highways or roadways. At the executive director's discretion the TCEQ may require a minimum percentage for use of the vehicle in the eligible counties with any grant-application period.
- For most on-road vehicles, annual usage is to be measured using miles of operation. For refuse vehicles, street sweepers, and other vehicles with substantial power-take-off operations, fuel consumption normally should be used as the usage factor. The TCEQ may consider using either miles of operation or fuel consumption for particular applications case by case.
- Applicants should refer to the technical supplements to these guidelines available at the TERP website for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.

Figure A1.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.
- Vehicles used at port facilities and other inter-modal delivery and transportation facilities, commonly referred to as *terminal tractors* or *yard trucks,* may have engines certified to either the federal on-road or non-road emission standards.

Both the on-road and non-road versions of these vehicles perform the same primary functions; the on-road versions usually travel only limited distances on roads and highways. To account for these similarities in use, the TCEQ may allow, at its discretion, an applicant to apply for a project involving a terminal tractor with an on-road engine under the non-road forms and criteria. This provision does not include any on-road vehicle not designed and manufactured as a terminal tractor, even if the vehicle is being used in that role.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The baseline NO_x emissions [~~standards~~] factors for this program will normally be the federal standard for NO_x emissions applicable to the type of engine and model year of vehicle. However, if the baseline engine was certified by the EPA or the CARB to a Family Emissions Limit (FEL), the TCEQ may use the FEL for the baseline NO_x emissions factor.

The federal NO_x emissions standards for on-road (highway) heavy-duty engines are listed in the technical supplement that will be made available by the TCEQ during each grant application period. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.The NO_x emissions factor for the reduced-emission engines will normally be the federal NO_X emissions standard or the FEL to which the reduced-emission engine is certified. For retrofit and add-on activities verified by the EPA or the CARB to reduce NO_x emissions by a specified percentage, the verified percentage will be applied to the baseline emissions factor to determine the emissions factor for the retrofitted engine.

Emissions Factors for Repowers with Dual-Fuel Conversion Systems

The TCEQ may consider alternative information to determine the emissions factors and calculate the emissions reductions for repower projects involving the conversion of a heavy-duty on-road vehicle engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or the CARB. In particular, if the TCEQ determines it to be necessary and appropriate, the TCEQ may consider certified engine test information that demonstrates reductions of NO_X emissions and other information to determine the emissions reductions.

To be considered under this alternative approach, the TCEQ may require that manufacturers or dealers apply to the TCEQ for a determination of the appropriate emissions factors and emissions reductions that will be accepted for that system. In general, any testing performed to verify the emissions should be performed and certified by an independent testing entity or facility. The TCEQ is not required to accept a dual-fuel conversion system under this alternative, and it will be the responsibility of the manufacturer to provide sufficient test data and other information to verify the emissions factors.

Where appropriate, the TCEQ will determine an appropriate factor for the percentage reduction in NO_x emissions as a result of the dual-fuel engine conversion. The percentage reduction factor will be applied to the baseline emissions factor determined by the TCEQ for that engine in order to calculate the emissions reductions. Alternatively, the TCEQ may determine a specific NO_x emission rate for the converted engine based on the certified test results. In that case, the TCEQ may also consider the certified test results of either the original engine or the converted engine operating in diesel-only mode to determine the baseline emission rate.

In considering certified test information and agreeing to an appropriate percentage reduction in emissions or a specific emission rate, the TCEQ will take into account if the engine can operate solely on diesel fuel in addition to dual-fuel operation. The TCEQ may adjust the percentage reduction factor or the specific emission rate to account for the difference in emissions using solely diesel fuel and dual-fuel operation of the engine. In determining appropriate adjustments to the emissions factors, the TCEQ may also take into account the level of confidence the can be given to the test information. In addition, a TxLED correction factor may be applied to account for the partial use of TxLED in dual-fuel operation of the engine.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline vehicle or engine and a reduced-emissions vehicle or engine. In situations where the model year of the vehicle chassis and the model year of the existing engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and the activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions vehicles or engines should be calculated separately and then differences taken to determine emissions reductions.

Emission factors are generally expressed in terms of grams per brake horsepower-hour (g/bhp-hr), grams per mile (g/mi), or grams per gallon (g/gal). Conversion factors are generally expressed in units of brake horsepower-hour per mile (bhp-hr/mi) or horsepower-hour per gallon (hp-hr/gal).

Different types of on-road vehicles operate very differently. For most on-road applications, the activity level should be established by the annual mileage. Refuse haulers, street sweepers, and other on-road vehicles with significant power-take-off operations are an exception, and the activity level may be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Mileage

The calculation of emissions and emissions reductions using annual mileage as the usage factor is determined by the steps in Table A1.1. The applicable NO_x emissions standards are included in the technical supplement available from the TERP Program. For retrofit and add-on activities, as well as other activities, where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the applicable emissions factor to determine the reduced NO_x emissions factor.

Table A1.1
Calculating NO_x Emissions Reductions Based on Annual Mileage

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Step 1. Determine the NO_x Emissions Factor

Determine baseline NO_x emissions factor	
Baseline NO_x emissions standard (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)	
= correction g/bhp-hr	
× conversion factor (bhp-hr/mi)	
= baseline NO_x emissions factor (g/mi)	
Determine reduced NO_x emissions factor (g/mi)	
Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/mi)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/mi)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)	
= corrected g/bhp-hr	
× conversion factor (bhp-hr/mi)	

= reduced NO_x emissions factor (g/mi)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline g/mi – reduced emissions g/mi	
× annual miles of operation	
× percent within eligible counties (%)	
= grams per year reduced (g/yr)	
	÷ 907,200 grams per ton
= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_x emissions reduction (tons)	

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, a conversion factor is needed to determine an appropriate emissions factor in grams per mile. Appropriate conversion factors, to convert g/bhp-hr to g/mi, are included in the technical supplement available from the TERP Program.

Calculation of NO_x Emissions Reductions Based on Annual Fuel Use

The calculation of emissions and emissions reductions using annual mileage as the usage factor is determined by the steps in Table A1.2.

Refuse vehicles, street sweepers, and other on-road vehicles with significant power-take-off operations accrue low mileage, yet intermittently operate at high load during compaction or sweeping mode. Therefore, annual fuel use is a more appropriate emissions factor to use for these vehicles. Alternatively, an applicant may base the emissions reductions on annual mileage for these types of vehicle uses, provided sufficient supporting documentation is submitted as determined by the TCEQ.

If annual fuel consumption is the basis for the emissions reductions, an energy consumption factor is used to convert g/bhp-hr to g/gal of fuel used. There are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or
2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for a baseline engine, the annual fuel consumption of the new vehicle or engine is an estimated proportion to the change in the energy-consumption factor.

Heavy-duty diesel engines typically have a brake-specific energy consumption of 6,500 to 7,000 British thermal units (Btu) per hp-hour on the certification cycle. Diesel fuel has an energy density of about 18,000 Btu/lb and a mass density of 7.0 lb/gal. This results in an energy consumption factor of about 18.5 hp-hour/gal of fuel consumed, which should be used as the default for vehicles.

In general, the calculation of emissions reductions should be based on the same amount of fuel for the baseline and the reduced-emission vehicle or engine. However, the TCEQ may accept, at its discretion, fuel-economy benefits of the new or repowered vehicle over the baseline unit when calculating emissions reductions.

For example, a new hybrid-electric utility truck may save fuel by powering the non-propulsive systems with a battery. The emissions reductions from this fuel savings may be considered by the TCEQ based on the particular case.

To use this approach, the application must list the percentage reduction in fuel use expected through use of the reduced-emission vehicle when compared to the baseline. For **replacement activities**, the application should also list the **historical average** annual fuel use of the old vehicle (the baseline) and commit to an annual fuel use for the new or repowered vehicle.

Documentation must accompany with the application to justify the reduced fuel use amount. The TCEQ will evaluate the documentation to determine the level of fuel savings that may be accepted.

Regardless of the fuel-use baseline listed in the application, the TCEQ will apply an economy factor to the fuel-use commitment for the reduced-emission vehicle and engine. For instance, if the TCEQ agrees that the reduced-emission vehicle will use 30% less fuel than the baseline vehicle for the same amount of work, then the baseline fuel use will be the fuel use commitment times 1.43 (1/0.70). If the historical annual fuel use listed in the application is less than the number derived by applying the fuel economy factor, then that lower baseline number will be used.

The applicant must commit to realistic fuel use for the work expected from the reduced-emission vehicle. If a grant is awarded, the recipient is obligated to use at least that amount of fuel annually in order to meet the grant usage requirements over the activity life.

Table A1.2
Calculating NO_x Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions standard (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	

= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_x emissions reduction (tons)	

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in the cost-effectiveness calculation for on-road heavy-duty vehicles. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost, or incentive amount requested, to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A1.3. Capital-recovery factors for use in calculations for up to 20 years appear in Table A1.4.

Table A1.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$\text{CRF} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	

Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	

Table A1.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized cost / total annual NO_x reductions = project cost-effectiveness

Appendix 2
Non-Road Equipment

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions reductions for a non-road equipment project. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP website, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this Appendix.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

The granting of a waiver to the eligibility requirements is at the discretion of the executive director or the executive director's designee. In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

The activities and eligible costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Non-Road Equipment

This category is for the purchase or lease of new non-road equipment. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment, and the baseline for comparison of emissions is the current federal NO_x emissions standard for a non-road engine of that horsepower. The baseline non-road equipment used for determining the difference in cost must be **new**.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25% less NO_x than required (in other words, no more than 75% of the NO_x allowable) under the current federal standard for a non-road engine of that horsepower. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new piece of non-road equipment in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline vehicle.

The TCEQ will reimburse the incremental cost of the purchase of non-road equipment subject to cost-effectiveness limits establish by the TCEQ. The incremental cost is the difference between the documented dealer price of a baseline piece of equipment, or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner equipment.

Replacement of Non-Road Equipment

This category is for the replacement of non-road equipment with a new or newer piece of non-road equipment. For this category, the applicant must be replacing a piece of equipment with a minimum of five years of remaining useful life. However, the TCEQ may establish longer activity-life requirements for any grant period. The baseline for comparison of emissions is the difference between the emissions of the equipment being replaced and the emissions of the equipment being purchased.

For a replacement project, the TCEQ will evaluate whether the equipment being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the equipment for at least the two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the equipment must have been continuously located and used in Texas over the preceding two years.

3. The equipment must be in good operating condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed its name or incorporation status. The use of the equipment being replaced must not have changed.

The TCEQ may waive the requirement for two years of continuous use for short lapses in operation attributable to economic conditions, seasonal work, or other circumstances, based on a finding of good cause. The historical usage described by the applicant on the grant-application forms must reflect the lapses in use of the equipment in those activities.

In order for a replacement activity to result in creditable emissions reductions, the applicant must intend to continue to use the equipment being replaced for the same type of use and amount of use over the same period as the activity life, absent the award of a grant. The TCEQ may require additional assurances, certifications, and documentation to verify that the applicant would continue to use the equipment being replaced if the grant is not awarded.

For replacement projects, the emissions reductions are based on replacement of the future use of the original vehicle or equipment with the use of the reduced-emission vehicle or equipment. The estimated future use of the original vehicle or equipment is determined from the recent historical use. Except when a default usage amount is used for the emissions reduction calculations, the activity level used for the emissions reduction calculations and the corresponding usage commitment for a replacement project may not exceed the average annual use of the vehicle or equipment being replaced for the two years preceding the application.

The engine on the replacement equipment must be certified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with the engine being replaced. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement equipment must be of the same type and should be intended for use in the same application or vocation (for example, excavator, compactor, grader) as the equipment being replaced. The TCEQ may accept, case by case, equipment of a different type to account for the latest technology used for a specific vocation. In addition, the TCEQ may accept, case by case, the replacement of a multi-engine piece of equipment with a single-engine piece of equipment, or vice versa, as long as the new equipment will have the same use as the equipment being replaced and the emissions reductions can be adequately determined.

The year of manufacture of the engine installed on the replacement equipment may not be more than three years prior to the current calendar year, unless an alternative age limit is established by the TCEQ for a particular grant round. The TCEQ may also waive the age-limit requirements case by case in instances where the equipment has

a unique or specialized use and where a model with a recently manufactured engine is not available.

The grant recipient may be eligible for reimbursement of up to 80% of the eligible costs for the purchase or lease of the replacement equipment subject to cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP [~~not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NOx reduced~~]. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. [~~The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs and a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.~~]

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement equipment, or the cash basis for the lease charges. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount also must not exceed 80% of the cost of the replacement equipment minus the scrappage value received for the old equipment. The TCEQ may establish a default scrappage value.

Repower of Non-Road Equipment

This category is for the replacement of an existing engine on a non-road piece of equipment with a new, rebuilt, or remanufactured engine. The upgrade of an engine with a certified emissions upgrade kit may also be considered under the repower category. The engine must be certified to emit at least 25% less NO_x (that is, no more than 75 as much NO_x) as compared with the engine being replaced. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The conversion of an existing non-road diesel engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or the CARB may also be considered under the repower category. Per Texas Health and Safety Code 386.104(f-1), the TCEQ may establish alternative minimum standards for the percentage reduction in NO_X that must be achieved by the conversion of the engine. Under this provision, the TCEQ will establish any alternative standards on a grant-round basis after considering the effectiveness of available dual-fuel conversion technology in reducing emissions.

Eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The grant recipient may be eligible for reimbursement of up to 80% of the incremental cost of the repower subject to cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

[~~The TCEQ will reimburse the incremental cost of the replacement engine —~~]The incremental cost for an engine replacement is the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old engine, if applicable. The TCEQ may establish a default scrappage value. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

For certified engine conversions and emissions-upgrade kits, the incremental cost is the cost to purchase and install the conversion system or kit, including the new fuel system, if applicable. Other upgrades or modifications to the engine or vehicle that are not necessary for the conversion or upgrade of the engine are not eligible.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine or conversion system, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine or conversion system, including the fuel system if converting to dual-fuel operation;
- associated supplies directly related to the installation of the engine or system;
- costs to remove and dispose of the old engine, if applicable;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit; and
- other costs directly related to the project.

Retrofit or Add-on of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a non-road piece of equipment, or adding devices onto the equipment.

To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) as compared with the engine prior to the retrofit or add-on. “Verification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology subject to cost-effectiveness limits established by the TCEQ. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine

and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- costs of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving non-road equipment activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide during a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- The applicant must own the equipment being replaced, repowered, or retrofitted.
- Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories.
- Non-road equipment activities must reduce emissions of NO_x compared to baseline NO_x emissions. The NO_x emissions of equipment, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. Where the model year of the equipment and the model year of the existing engine are different—such as equipment that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the "25% reduction" criterion for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the equipment and engine being purchased or

leased must be certified to emit at least 25% less NO_x (in other words, no more than 75% as much NO_x) as compared with the current federal NO_x emissions standard for that engine.

Replacements. The replacement equipment and engine must have been certified to emit at least 25% less NO_x than the engine being replaced.

Repowers. The replacement engine must be certified to emit at least 25% less NO_x than the engine being replaced. The TCEQ may establish an alternate standard for the conversion of a non-road diesel engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or the CARB.

Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. The retrofit or add-on technology must be verified to emit at least 25% less NO_x than the federal standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same equipment, engine, or both, the TCEQ may consider the combined reductions from the two technologies in meeting the 25% requirements. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25%.

- The cost-effectiveness of a project, other than a demonstration project, must not exceed [~~$15,000~~] any limits set by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. [~~Individual activities included under a single project application may exceed that amount, but the combined project must meet the cost-effectiveness standard.~~
- ~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.~~]
- In the areas of the state where TxLED is required, the baseline and reduced emissions-rate calculations for diesel-engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments. See Figure A2.1 for more information about the TxLED correction factor.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment required only by local law or regulation, or by corporate controlling board policy of a public or private

entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.

- An activity involving a new emissions reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator, as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity-life requirements for each grant period. Except for non-road equipment used for natural gas recovery, not less than 75% of the annual usage of the equipment must take place in one or more of the eligible counties throughout the life of the project. Leases that do not include a binding commitment to purchase must be for the length of the activity life. Annual usage is to be measured by either hours of operation or fuel consumption.

Figure A2.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Non-road equipment used for natural gas recovery must be operated in the eligible counties for a sufficient amount of use over the activity life to meet the requirements of a commitment to reduce emissions and cost effectiveness. To qualify for this provision, the primary purpose and use of the equipment must be natural gas recovery, as determined by the TCEQ. For example, a generator used on a natural gas drill rig may qualify, but a tracked dozer used to build a road to a drill site would not.
- For most non-road equipment, annual usage is to be measured using hours of operation. For equipment without an hour meter installed and no viable mechanism for measuring the hours of operation, fuel consumption may be used as the usage factor, if accepted by the TCEQ.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.

- Administrative costs and other internal costs of the grant recipient—including but not limited to personnel expenses, internal salaries, indirect costs, and travel—are not eligible. This restriction also applies to situations where the grant recipient acts as a transporter for delivery of the grant-funded vehicle or equipment before or after its acceptance.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The baseline NO_x emissions [~~standards~~] factors for this program will normally be the federal standards applicable to the type of engine and model year. However, if the baseline engine was certified by the EPA or the CARB to a FEL, the TCEQ may use the FEL for the baseline NO_x emissions factor.

The federal NO_x emissions standards for non-road engines are listed in the technical supplement available from the TERP Program. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

The NO_x emissions factor for the reduced-emission engines will normally be the federal NO_x emissions standard or the FEL to which the reduced-emission engine is certified. For retrofit and add-on activities verified by the EPA or the CARB to reduce NO_x emissions by a specified percentage, the verified percentage will be applied to the baseline emissions factor to determine the emissions factor for the retrofitted engine.

Emissions Factors for Repowers with Dual-Fuel Conversion Systems

The TCEQ may consider alternative information to determine the emissions factors and calculate the emissions reductions for repower projects involving the conversion of a non-road engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel through an alternative fuel conversion system certified by the EPA or

the CARB. In particular, if the TCEQ determines it to be necessary and appropriate, the TCEQ may consider certified engine test information that demonstrates reductions of NO_x emissions and other information to determine the emissions reductions.

To be considered under this alternative approach, the TCEQ may require that manufacturers or dealers apply to the TCEQ for a determination of the appropriate emissions factors and emissions reductions that will be accepted for that system. In general, any testing performed to verify the emissions should be performed and certified by an independent testing entity or facility. The TCEQ is not required to accept a dual-fuel conversion system under this alternative and it will be the responsibility of the manufacturer to provide sufficient test data and other information to verify the emissions factors.

Where appropriate, the TCEQ will determine an appropriate factor for the percentage reduction in NO_x emissions as a result of the dual-fuel engine conversion. The percentage reduction factor will be applied to the baseline emissions factor determined by the TCEQ for that engine in order to calculate the emissions reductions. Alternatively, the TCEQ may determine a specific NO_x emission rate for the converted engine based on the certified test results. In that case, the TCEQ may also consider the certified test results of either the original engine or the converted engine operating in diesel-only mode to determine the baseline emission rate.

In considering certified test information and agreeing to an appropriate percentage reduction in emissions or a specific emission rate, the TCEQ will take into account if the engine can operate solely on diesel fuel in addition to dual-fuel operation. The TCEQ may adjust the percentage reduction factor or the specific emission rate to account for the difference in emissions using solely diesel fuel and dual-fuel operation of the engine. In determining appropriate adjustments to the emissions factors, the TCEQ may also take into account the level of confidence the can be given to the test information. In addition, a TxLED correction factor may be applied to account for the partial use of TxLED in dual-fuel operation of the engine.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions of a baseline engine and a reduced-emissions engine. In situations where the model year of the equipment and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately, and then differences taken to determine emissions reductions.

Emission factors are generally expressed in terms of grams per brake horsepower-hour (g/bhp-hr), grams per mile (g/mi), or grams per gallon (g/gal). Conversion factors are generally expressed in units of brake horsepower-hour per mile (bhp-hr/mi) or horsepower-hour per gallon (hp-hr/gal).

For most non-road applications, the activity level should be established by the annual hours of operation. For equipment without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps in Table A2.1.

Appropriate baseline NO_x emissions factors and default load factors are included in the technical supplement to these guidelines. Use the emissions factors associated with engine horsepower and model year. Use the load factor associated with the type of equipment. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

Table A2.1
Calculating NO_x Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emission factor (g/bhp-hr)	
× load factor		× load factor	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			
= grams per year reduced (g/year)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

For retrofit and add-on activities, as well as other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NOx_X emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, use that emissions level as the emissions factor.

Calculation of NO_x Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor must also be calculated. The energy consumption factor converts the emissions factor in terms

of g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. dividing the hp of the engine by the fuel economy in gal/hr, or
2. dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

The calculation of NO_x emissions reductions using annual fuel use is outlined in Table A2.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

Table A2.2
Calculating NO_x Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor *(diesel engines only)*		× TxLED correction factor *(diesel engines only)*	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A2.3. For use in the calculations, capital-recovery factors for up to 20 years appear in Table A2.4.

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

Table A2.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A2.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized cost / total annual NO_x reductions = project cost-effectiveness

Appendix 3
Marine Vessels

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a marine-vessel project. Most of the calculations will require input of an NO_x emissions factor applicable to the engine. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP website, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this Appendix.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director will ensure that the emissions reductions attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

The activities and eligible costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period, as needed to best achieve the goals of the TERP.

The types of vessels that may be eligible for funding are diverse, and may include both oceangoing vessels and harbor craft. However, to be eligible for funding, at least 75% of a vessel's annual use must occur in the bays adjacent to an eligible county, or in the Texas Intracoastal Waterway. Therefore, it is expected that there will be few projects involving large oceangoing vessels.

The TCEQ may also consider, case by case, vessels that operate in coastal or international waters, where it can be definitively shown that the emissions from those vessels are included by the TCEQ in the inventory of emissions for an eligible county or area made up of eligible counties. This decision will be solely at the discretion of the TCEQ. It is recommended that potential applicants contact the TCEQ to discuss this type of project before submitting an application.

In addition, many marine vessels will have one or more propulsion engines, as well as one or more auxiliary engines. In most cases, for lease or purchase and replacement projects, the combined NO_x emissions for both the propulsion and the auxiliary engine will be used to determine the NO_x emissions reductions for the project. For engine repower, retrofit, and add-on projects, the NO_x emissions reductions will be based on the individual engines being replaced or retrofitted.

This section explains the eligible activities and costs under each project category. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding round, or by geographic area, as needed to best achieve the objectives of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Marine Vessels

This category is for the purchase or lease of new marine vessels. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment; the baseline for comparison of emissions is the current NO_x standard for a marine engine of that horsepower and use. The baseline vessel used for determining the difference in cost must be **new**.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25% less NO_x than required (in other words, no more than 75% as much NO_x as is allowable) under the current standard for that engine.

A *lease* is defined as the use and control of a new marine vessel in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline vessel.

The TCEQ will reimburse the incremental cost of the purchase of a new marine vessel subject to cost-effectiveness limits established by the TCEQ. The incremental cost is the difference between the documented dealer price of a baseline vessel or other appropriate baseline cost established by the TCEQ and the actual cost of the cleaner vessel.

Replacement of Marine Vessels

This category is for the replacement of marine vessels with a new or newer marine vessel. For this category, the applicant must be replacing a vessel with a minimum of five years of remaining useful life. The TCEQ may establish longer activity-life requirements for any grant period. The baseline for comparison of emissions is the difference between the emissions standard (or in some cases, the certified emissions level) for the engine or engines on the vessel being replaced, and the certified emissions level of the engine or engines installed on the vessel being purchased.

For a replacement project, the TCEQ will evaluate whether the vessel being replaced would have otherwise been used in the bays adjacent to the eligible counties or in the Texas portion of the Gulf Intracoastal Waterway for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have owned the vessel continuously for at least the two years immediately preceding the grant-application date.
2. Unless otherwise approved by the TCEQ, the vessel must have been continuously located and used in Texas over the preceding two years.
3. The vessel must currently be registered for operation in Texas in the applicant's name.
4. The vessel must be in good operating condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed its name or incorporation status. The use of the vessels being replaced must not have changed.

The TCEQ may waive the requirement for two years of continuous use for short lapses in operation attributable to economic conditions, seasonal work, or other circumstances, based on a finding of good cause. The historical usage described by the applicant on the grant-application forms must reflect the lapses in use of the vessel in those activities.

In order for a replacement activity to result in creditable emissions reductions, the applicant must intend to continue to use the marine vessel being replaced for the same type of use and amount of use over the same period as the activity life, absent the award of a grant. The TCEQ may require additional assurances, certifications, and documentation to verify that the applicant would continue to use the marine vessel being replaced if the grant is not awarded.

For replacement projects, the emissions reductions are based on replacement of the future use of the original vehicle or equipment with the use of the reduced-emission vehicle or equipment. The estimated future use of the original vehicle or equipment is determined from the recent historical use. Except when a default usage amount is

used for the emissions reduction calculations, the activity level used for the emissions reduction calculations and the corresponding usage commitment for a replacement project may not exceed the average annual use of the vehicle or equipment being replaced for the two years preceding the application.

The combined NO_x emissions of the engines on the replacement vessel must be certified to be at least 25% less than (that is, no more than 75% as much as) the combined NO_x emissions of the engines on the vessel being replaced, based on the emissions standard for those engines. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement vessel must be of the same type and should be intended for use in the same application or vocation (for example, tug, fireboat, pusher) as the vessel being replaced. The TCEQ may accept, based on the particular case, a vessel of a different type to account for the latest technology used for a specific vocation. In addition, the TCEQ may accept, case by case, the replacement of a multi-engine vessel with a single-engine vessel, or vice versa, as long as the new vessel will have the same use as the vessel being replaced and the emissions reductions can be adequately determined.

The year of manufacture of the engine installed on the replacement vessel may not be more than three years prior to the current calendar year, unless an alternative age limit is established by the TCEQ for a particular grant round. The TCEQ may also waive the age-limit requirements case by case in instances where the vessel has a unique or specialized use and where a model with a recently manufactured engine is not available.

The grant recipient may be eligible for reimbursement of up to 80% of the eligible costs for the purchase or lease of the replacement vessel subject to cost-effectiveness limits establish by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP. [~~not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_x reduced. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs and a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.~~]

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement vessel, or the cash basis for the lease charges. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount must not exceed 80% of the cost of the replacement vessel minus the scrappage value received for the old vessel. The TCEQ may establish a default scrappage value.

Repower of Marine Vessels

This category is for the replacement of an existing engine on a marine vessel with a new, rebuilt, or remanufactured engine. The upgrade of an engine with a certified emissions upgrade kit may also be considered under the repower category. The replacement, rebuilt, or remanufactured engine must be certified to emit at least 25% less NO_x (in other words, no more than 75% as much NO_x) compared with the engine being replaced, or the engine before rebuilding or remanufacture, based on the standard for that engine. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The grant recipient may be eligible for reimbursement of up to 80% of the incremental cost of the repower subject to cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

[~~The TCEQ will reimburse the incremental cost of the replacement engine—~~]The incremental cost for an engine replacement is the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old engine, if applicable. The TCEQ may establish a default scrappage value. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

For certified engine conversions and emissions-upgrade kits, the incremental cost is the cost to purchase and install the conversion system or kit, including the new fuel system, if applicable. Other upgrades or modifications to the engine or vehicle that are not necessary for the conversion or upgrade of the engine are not eligible.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine, if applicable;
- installation costs;
- reengineering costs, if the vessel must be modified for the new engine to fit; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-on of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a marine vessel, or for adding devices onto the vessel. To be eligible for funding, the retrofit or add-on systems must be verified to cause the engine to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with prior to the retrofit or add-on. Certification means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology subject to cost-effectiveness limits established by the TCEQ. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the marine vessel must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to projects involving marine vessels. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding round, or by geographic area, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the vessel being replaced, repowered, or retrofitted.
- Marine vessels used primarily for competition or recreation are not eligible for funding.

- Marine vessel activities must reduce emissions of NO_x by at least 25% compared to baseline NO_x emissions. The NO_x emissions of engines and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or accepted on other grounds by the TCEQ. Where the model year of the marine vessel and the model year of the existing engine are different—such as in a vessel that has already had its engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the 25% reduction criteria for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the combined NO_x emissions of the vessel being purchased or leased must be certified to be at least 25% less than the NO_x emissions would have been if the engine or engines only met the minimum standard.

  Replacements. The replacement combined certified NO_x emissions of the replacement marine vessel must be at least 25% less than the combined NO_x emissions of the vessel being replaced, based on the emissions standards for those engines.

  Repowers. The replacement engine must be certified to emit at least 25% less NO_x than the engine being replaced, based on the federal standard for that engine.

  Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or add on a device, the technology must be verified to emit at least 25% less NO_x than the standard for the engine being retrofitted.

  Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same vessel or engine, the TCEQ may consider the combined reductions from the two technologies in meeting the 25% requirements. This decision will be solely at the discretion of the TCEQ, and will be based on a determination that the combination of the two technologies will permanently reduce emissions by at least 25%.

- The cost-effectiveness of a project, other than a demonstration project, may not exceed [~~$15,000~~] <u>any limits established by the TCEQ on the cost</u> per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. [~~Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.~~
- ~~Infrastructure activities—including infrastructure costs that are part of a cost-effectiveness limit for a broader repower, retrofit, replacement or add-on project—are excluded from the $15,000 per ton.~~]
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in

equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.

- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade. The more stringent standard will be used as the baseline emissions rate in the calculation to determine the emissions reductions and the determination that the activity will reduce NO_x at least 25%.
- In the areas of the state where TxLED is required, the baseline and reduced emissions-rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction-credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces its cost, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity-life requirements for each grant period. Not less than 75% of the annual use of the marine vessel must take place in the Texas portion of the Gulf Intracoastal Waterway or in bays adjacent to an eligible county throughout the life of the project. Leases that do not include a binding commitment to purchase must be for the length of the activity life.

- For most marine vessels, annual use must be measured using hours of operation. For vessels with no viable mechanism for measuring the hours of operation, fuel consumption normally should be chosen as the usage factor.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient—including but not limited to personnel expenses, internal salaries, indirect costs, and travel—are not eligible. This restriction also applies to situations when the grant recipient delivers the grant-funded vehicle or equipment before or after accepting it.

Figure A3.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. Howeverthese estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.

- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The EPA has adopted exhaust emissions standards for marine diesel engines. These standards apply to the following:

- **Marine diesel engines with displacement at or above 30 liters per cylinder.** These engines are also known as Category 3 marine diesel engines. They range from about 2,500 to 70,000 kilowatts (3,000 to 100,000 hp). These are very large marine diesel engines used for propulsion power on oceangoing vessels such as container ships, oil tankers, bulk carriers, and cruise ships.
- **Marine diesel engines with displacement ranging from 2.5 liters per cylinder to below 30 liters per cylinder.** These engines are also known as Category 1 and Category 2 marine diesel engines. They range in size from about 500 to 8,000 kilowatts (700 to 11,000 hp). These engines are used to propel many kinds of vessels, including tugboats, push boats, supply vessels, fishing vessels, and other commercial vessels in and around U.S. ports. They are also used as stand-alone generators for auxiliary power on many types of vessels.

For purposes of this program, the EPA standards for marine engines are to be used for propulsion engines, where applicable. These standards are included in the technical supplement to these guidelines. To determine the emissions level for an engine manufactured before the EPA standards applied to that engine, the TCEQ will work with the applicant to determine the most appropriate level, based on information supplied by the manufacturer and from other sources.

For new leases and purchases, where the vessel's NO_x emissions must be at least 25% less than the current minimum standards, and where the EPA standards do not yet apply to the engines installed on the vessel, the TCEQ will work with the applicant to determine whether the engines meet the requirements for this program.

In most cases, the EPA standards for non-road engines will be used for determining the emissions of auxiliary engines on marine vessels.

For activities involving oceangoing vessels, the TCEQ will work with the applicant to determine the appropriate standards to use, case by case.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the marine vessel and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor and an activity level. Because conversion factors and the activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately, and then differences taken to determine emissions reductions.

Emission factors are generally expressed in terms of grams per brake horsepower-hour (g/bhp-hr), grams per mile (g/mi), or grams per gallon (g/gal). Conversion factors are generally expressed in units of brake horsepower-hour per mile (bhp-hr/mi) or horsepower-hour per gallon (hp-hr/gal).

For most marine applications, the activity level should be established by the annual hours of operation. For engines without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined from annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps shown in Table A3.1.

Appropriate baseline NO_x emissions factors are included in a technical supplement available from the TCEQ. Use the emissions factors associated with engine horsepower and model year. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

For retrofit and add-on activities, and other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NO_x emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, that emissions level should be used as the emissions factor.

Table A3.1
Calculating NO_x Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			

= grams per year reduced (g/year)	
	÷ 907,200 grams per ton
= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_X emissions reduction (tons)	

Calculation of NO_x Emissions Reductions Based on Annual Fuel Use

If annual fuel consumption is the basis for the emissions reductions, an energy consumption factor is used to convert g/bhp-hr to g/gal of fuel used. There are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or
2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for an engine being replaced, repowered, or retrofitted, the annual fuel consumption of the new vehicle or engine is an estimate, proportional to the change in the energy-consumption factor. Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

Otherwise, there are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or
2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for a baseline engine, the annual fuel consumption of the new vehicle or engine is an estimated proportion to the change in the energy consumption factor. For example, a reduced-emissions engine having an energy consumption factor of 18.5, which replaces a baseline engine that uses 5,000 gallons/year, and that has an energy consumption factor of 17.8, would have an estimated annual fuel consumption of 5,197 gal/yr.

The calculation of NO_x emissions reductions using annual fuel use is outlined in Table A3.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Table A3.2
Calculating NO_x Emissions Reduction Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption gallons per year (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	

= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_x emissions reduction (tons)	

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations for marine vessels. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A3.3. For use in the calculations, capital-recovery factors for up to 20 years appear in Table A3.4.

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized cost / total annual NO_x reductions = project cost-effectiveness

Table A3.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A3.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

Appendix 4
Locomotives

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a locomotive project. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP website, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this Appendix.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

The granting of a waiver to the eligibility requirements is at the discretion of the executive director or the executive director's designee. In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

Locomotives are eligible for grants under this program. Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods. Eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding round or by geographic area, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Locomotives

This category is for the purchase or lease of new locomotives. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing locomotive, and the baseline for comparison of emissions is the current federal NO_x emissions standard for that locomotive.

To be eligible for funding, the engine on the new locomotive must be certified to emit at least 25% less NO_x than required (in other words, no more than 75% as much NO_x as is allowable) under the current federal standard for that engine.

A *lease* is defined as the use and control of a new locomotive in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline locomotive.

The TCEQ will reimburse the incremental cost of the purchase of a new locomotive subject to cost-effectiveness limits establish by the TCEQ. The incremental cost is the difference between the documented dealer price of a baseline locomotive or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner locomotive.

The baseline locomotive used for determining the difference in cost must be a **new** locomotive certified to the current federal NO_x emission standards.

The EPA has previously defined "new locomotive" to mean a freshly manufactured or remanufactured locomotive, and "remanufacture" of a locomotive as replacement of all the power assemblies of a locomotive engine with freshly manufactured (containing no previously used parts) or reconditioned assemblies. The TCEQ will make the final determination regarding the applicability of a baseline new locomotive.

Replacement of Locomotives

This category is for the replacement of a locomotive with a new or newer locomotive. For this category, the applicant must be replacing a locomotive with a minimum of five years of remaining useful life. The TCEQ may establish longer activity-life requirements for each grant period. The baseline for comparison is the emissions of the locomotive being replaced and the emissions of the locomotive being purchased.

For a replacement project, the TCEQ will evaluate whether the locomotive being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the locomotive for at least the two years immediately preceding the grant application date.

2. Unless otherwise approved by the TCEQ, the locomotive must have been continuously located and used in Texas over the preceding two years.
3. The locomotive must be in good operating condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed its name or incorporation status. The use of the locomotives being replaced must not have changed.

The TCEQ may waive the requirement for two years of continuous use for short lapses in operation attributable to economic conditions, seasonal work, or other circumstances, based on a finding of good cause. The historical usage described by the applicant on the grant-application forms must reflect the lapses in use of the locomotive in those activities.

In order for a replacement activity to result in creditable emissions reductions, the applicant must intend to continue to use the locomotive being replaced for the same type of use and amount of use over the same period as the activity life, absent the award of a grant. The TCEQ may require additional assurances, certifications, and documentation to verify that the applicant would continue to use the locomotive being replaced if the grant is not awarded.

For replacement projects, the emissions reductions are based on replacement of the future use of the original vehicle or equipment with the use of the reduced-emission vehicle or equipment. The estimated future use of the original vehicle or equipment is determined from the recent historical use. Except when a default usage amount is used for the emissions reduction calculations, the activity level used for the emissions reduction calculations and the corresponding usage commitment for a replacement project may not exceed the average annual use of the vehicle or equipment being replaced for the two years preceding the application.

The engine on the replacement locomotive must be certified to emit at least 25% less NO_x (in other words, no more than 75% as much NO_x) compared with the engine being replaced. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement locomotive must be of the same type and should be intended for use in the same application or vocation (for example, switcher) as the locomotive being replaced. The TCEQ may accept, case by case, engines or equipment of a different type to account for the latest technology used for a specific vocation. In addition, the TCEQ may accept, case by case, the replacement of a multi-engine locomotive with a single-engine locomotive, or vice versa, as long as the new locomotive will have the same use as the locomotive being replaced and the emissions reductions can be adequately determined.

The year of manufacture of the engine installed on the replacement locomotive may not be more than three years prior to the current calendar year, unless an alternative age limit is established by the TCEQ for a particular grant round. The TCEQ may also waive the age-limit requirements case by case in instances where the locomotive has a unique or specialized use and where a model with a recently manufactured engine is not available.

The grant recipient may be eligible for reimbursement of up to 80% of the eligible costs for the purchase or lease of the replacement locomotive, [~~not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_x reduced~~]subject to cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs [~~and a cost-effectiveness lower than $15,000 per ton for particular funding periods~~], as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement locomotive, or the cash basis for the lease charges. Delivery charges from a third party not included in the invoice price from the vehicle or equipment vendor may be included, subject to approval by the TCEQ.

The total incentive amount also must not exceed 80% of the cost of the replacement locomotive minus the scrappage value received for the old locomotive. The TCEQ may establish a default scrappage value.

Repower of Locomotives

This category is for the replacement of an existing engine on a locomotive with a new, rebuilt, or remanufactured engine. The upgrade of an engine with a certified emissions upgrade kit may also be considered under the repower category. The engine must be certified to emit at least 25% less NO_x than the engine being replaced (in other words, no more than 75% of the NO_x allowable), based on the federal standard for that engine. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

[~~The TCEQ will reimburse the incremental cost —~~] The grant recipient may be eligible for reimbursement of up to 80% of the incremental cost of the report, subject to the cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of eligible costs as needed to best achieve the goals of the TERP. The incremental cost for an engine replacement is the cost to

purchase and install the replacement engine and associated equipment minus the scrappage value received for the old engine, if applicable. The TCEQ may establish a default scrappage value. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

For certified engine conversions and emissions-upgrade kits, the incremental cost is the cost to purchase and install the conversion system or kit, including the new fuel system, if applicable. Other upgrades or modifications to the engine or vehicle that are not necessary for the conversion or upgrade of the engine are not eligible.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine, if applicable;
- installation costs;
- reengineering costs, if the locomotive must be modified for the new engine to fit; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-on of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a locomotive, or for adding devices onto the locomotive.

To be eligible for funding, the retrofit or add-on systems must be verified to reduce the NO_x produced by the engine by 25% or more, compared with the engine prior to the retrofit or add-on. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology subject to cost-effectiveness limits established by the TCEQ. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost is the full cost of purchasing and installing the technology. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving locomotives. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the locomotive being replaced, repowered, or retrofitted.
- Locomotives used primarily for competition or recreation are not eligible for funding.
- An activity must reduce NO_x emissions compared to baseline emissions. The NO_x emissions of locomotives, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. In situations where the model year of the locomotive and the model year of the existing engine are different—such as a locomotive that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The 25% reduction criterion for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the locomotive and engine being purchased or leased must be certified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with the current federal NO_x emissions standard for that locomotive.

  Replacements. The replacement locomotive and engine or engines must have been certified to emit at least 25% less NO_x than the locomotive being replaced.

  Repowers. The replacement engine must be certified to emit at least 25% less NO_x than the engine being replaced.

Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or add on a device, the technology must be verified to emit at least 25% less NO_x than the federal standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same locomotive, engine, or both, the TCEQ may consider the combined reductions from the two technologies in meeting the 25% requirement. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25%.

- The cost-effectiveness of a project, other than a demonstration project, must not exceed [~~$15,000~~] any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed that amount, but the combined project must meet the cost-effectiveness standard.
- [~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.~~]
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.
- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade. The more stringent emissions standard will be used as the baseline rate in the calculation to determine the emissions reductions and whether the activity will result in at least a 25% reduction in NO_x.
- In the areas of the state where TxLED is required the baseline and reduced-emissions-rate calculations for diesel-engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit

averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator, as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be for a minimum of five years. The TCEQ may establish longer activity-life requirements for each grant period. Not less than 75% of the annual usage of the locomotive must take place in one or more of the eligible counties throughout the life of the project. Leases that do not include a binding commitment to purchase must be for the length of the activity life.
- Annual use normally should be measured using fuel consumption.

Figure A4.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use, change in use; sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies when the grant recipient delivers the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for

managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The EPA adopted emissions standards for locomotives in December 1997, which took effect in 2000. Federal standards apply to locomotives originally manufactured in 1973 and later, and apply any time they are rebuilt or remanufactured. Not regulated are electric locomotives, historic steam-powered locomotives, and locomotives originally manufactured before 1973.

The baseline NO_x emissions [~~standards~~] factors for this program are the federal standards for NO_x emissions applicable to the type of locomotive and model year. The federal NO_x emissions standards for locomotives are listed in a technical supplement to these guidelines. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

The NO_X emissions factor for the reduced-emission engines will normally be the federal NO_X emissions standard or the FEL to which the reduced-emission engine is certified. For retrofit and add-on activities verified by the EPA or the CARB to reduce NO_X emissions by a specified percentage, the verified percentage will be applied to the baseline emissions factor to determine the emissions factor for the retrofitted engine.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the locomotive and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately and then differences taken to determine emissions reductions.

Emission factors are generally expressed in terms of grams per brake horsepower-hour (g/bhp-hr), grams per mile (g/mi), or grams per gallon (g/gal). Conversion factors are generally expressed in units of brake horsepower-hour per mile (bhp-hr/mi) or horsepower-hour per gallon (hp-hr/gal).

For most locomotive applications, the activity level should be based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor will also need to be calculated. The energy consumption factor converts the emissions factor in terms of g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. by dividing the hp of the engine by the fuel economy in gal/hr, or
2. by dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

For most locomotive applications a default fuel consumption rate factor of 20.8 bhp-hr/gal should be used. The technical supplement to these guidelines will include the appropriate emissions factors, as well as any alternative fuel-consumption factors.

In general, the calculation of emissions reductions should be based on the same amount of fuel for the baseline and the reduced-emission locomotive or engine. However, the TCEQ may accept, at its discretion, fuel-economy benefits of the new or repowered locomotive engine over the baseline unit when calculating emissions reductions. In general, fuel savings may result from idle-reduction systems that come with the new or repowered locomotive as well as from the enhanced fuel economy of the new engine.

To request the use of this approach, the application must list the percentage reduction in fuel use expected through use of the reduced-emission locomotive when compared to the baseline. For replacement activities, the application should also list the historical average annual fuel use of the old locomotive (the baseline) and commit to an annual fuel use for the new or repowered locomotive.

The TCEQ may consider a fuel-economy benefit based on independent studies and test data. Documentation must accompany the application to justify the reduced fuel

amount. The TCEQ will evaluate the documentation to determine the level of fuel savings that it may accept.

Regardless of the baseline fuel use amount listed in the application, the TCEQ will apply a fuel economy factor to the fuel use commitment listed for the reduced-emission locomotive and engine. For instance, if the TCEQ agrees that the reduced-emission locomotive fuel use will be 30% less than the baseline locomotive fuel use for the same amount of work, then the baseline fuel use for the calculation will be the fuel-use commitment times 1.43 (1/0.70). If the historical annual fuel use listed in the application is less than the number derived by applying the fuel economy factor, then that lower baseline number will be used.

The applicant must commit to realistic fuel use for the work expected from the reduced-emission locomotive. If a grant is awarded, the recipient is obligated to use at least that amount of fuel annually in order to meet the grant usage requirements over the activity life.

The calculation of NO_x emissions reductions using annual fuel use is outlined in Table A4.1. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in cost-effectiveness calculations for locomotives. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity, the incentive amount for the activity—with the exception of qualifying fuel activities—included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

Table A4.1
Calculating NO_x Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× energy-consumption factor (hp-hr/gal)		× energy-consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A4.2. For use in the calculations, capital-recovery factors for up to 20 years appear in Table A4.3.

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Table A4.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A4.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

Appendix 5
Stationary Equipment

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a stationary equipment project. Most of the calculations will require input of an NO_x emissions factor applicable to the engine. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP website, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this Appendix.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

The granting of a waiver to the eligibility requirements is at the discretion of the executive director or the executive director's designee. In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

The eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, under a particular funding round or by geographic area, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Stationary Equipment

This category is for the purchase or lease of new stationary equipment. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment, and the baseline for comparison of emissions is the current NO_x emissions standard for an engine of that horsepower. The baseline equipment used for determining the difference in cost must be **new**.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25% less NO_x than required (that is, no more than 75% of the NO_x allowable) under the current standard for an engine of that horsepower. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new piece of equipment in accordance with a lease contract for five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline piece of stationary equipment.

The TCEQ will reimburse the incremental cost of the purchase of a new piece of equipment subject to cost-effectiveness limits establish by the TCEQ. The incremental cost is the difference between the documented dealer price of a baseline piece of equipment or other appropriate baseline cost established by the TCEQ and the actual cost of the cleaner equipment.

Replacement of Stationary Equipment

This category is for the replacement of stationary equipment with a new or newer piece of equipment. For this category, the applicant must be replacing a piece of equipment with a minimum of five years of remaining useful life. However, the TCEQ may establish longer activity-life requirements for each grant period. The baseline for comparison of emissions is the difference between the emissions of the equipment being replaced and those of the equipment being purchased.

For a replacement project, the TCEQ will evaluate whether the equipment being replaced would otherwise have been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the equipment for a minimum of two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the equipment must have been continuously located and used in Texas over the preceding two years.
3. The equipment must be in good operating condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed its name or incorporation status. The use of the equipment being replaced must not have changed.

The TCEQ may waive the requirement for two years of continuous use for short lapses in operation attributable to economic conditions, seasonal work, or other circumstances, based on a finding of good cause. The historical usage described by the applicant on the grant-application forms must reflect the lapses in use of the equipment in those activities.

In order for a replacement activity to result in creditable emissions reductions, the applicant must intend to continue to use the equipment being replaced for the same type of use and amount of use over the same period as the activity life, absent the award of a grant. The TCEQ may require additional assurances, certifications, and documentation to verify that the applicant would continue to use the equipment being replaced if the grant is not awarded.

For replacement projects, the emissions reductions are based on replacement of the future use of the original vehicle or equipment with the use of the reduced-emission vehicle or equipment. The estimated future use of the original vehicle or equipment is determined from the recent historical use. Except when a default usage amount is used for the emissions reduction calculations, the activity level used for the emissions reduction calculations and the corresponding usage commitment for a replacement project may not exceed the average annual use of the vehicle or equipment being replaced for the two years preceding the application.

The engine on the replacement equipment must be certified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with the engine being replaced. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement equipment must be of the same type and horsepower and be intended for use in the same application or vocation (for example, well pump or generator) as the equipment being replaced. The TCEQ may accept, based on the particular case, equipment of a different type to account for the latest technology used for a specific vocation. In addition, the TCEQ may accept, case by case, the replacement of a multi-engine piece of equipment with a single-engine piece of equipment, or vice versa, as long as the new piece of equipment will have the same use as the piece of equipment being replaced and the emissions reductions can be adequately determined.

The year of manufacture of the engine installed on the replacement equipment may not be more than three years prior to the current calendar year, unless an alternative age limit is established by the TCEQ for a particular grant round. The TCEQ may also waive the age-limit requirements case by case in instances where the equipment has

a unique or specialized use and where a model with a recently manufactured engine is not available.

The grant recipient may be eligible for reimbursement of up to 80% of the eligible costs for the purchase or lease of the replacement equipment, [~~not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_x reduced~~]subject to cost-effectiveness limits establish by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs [~~and a cost-effectiveness lower than $15,000 per ton for particular funding periods~~], as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement equipment, or the cash basis for the lease charges. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount must also not exceed 80% of the cost of the replacement equipment, minus the scrappage value received for the old equipment. The TCEQ may establish a default scrappage value.

Repower of Stationary Equipment

This category is for the replacement of an existing engine on a piece of stationary equipment with a new, rebuilt, or remanufactured engine. The upgrade of an engine with a certified emissions upgrade kit may also be considered under the repower category.

The engine must be certified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with the engine being replaced, based on the federal standard for that engine. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ may also consider the conversion of a currently installed engine to operate on a different fuel or to install an emissions-upgrade kit under the repower category.

Eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The grant recipient may be eligible for reimbursement of up to 80% of the incremental cost of the repower subject to cost-effectiveness limits established by the TCEQ. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

[~~The TCEQ will reimburse the incremental cost of the replacement engine —~~]The incremental cost for an engine replacement is the cost to purchase and install the replacement engine and associated equipment, minus the scrappage value received

for the old engine. The TCEQ may establish a default scrappage value. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

For certified engine conversions and emissions-upgrade kits, the incremental cost is the cost to purchase and install the conversion system or kit, including the new fuel system, if applicable. Other upgrades or modifications to the engine or vehicle that are not necessary for the conversion or upgrade of the engine are not eligible.

Expenses for salaries, travel, and overhead, including indirect costs, are not covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- the cost of associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine, if applicable;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit; and
- other costs directly related to the project.

Retrofit or Add-on of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a stationary piece of equipment, or for adding devices onto the equipment.

To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25% less NO_x (that is, no more than 75% as much NO_X) compared with the engine prior to the retrofit or add-on. "Verification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology subject to cost-effectiveness limits established by the TCEQ. If the engine is to be rebuilt to install the emissions- reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost is the full cost of purchasing and installing the technology. The TCEQ may further limit the incentive amount to a lower percentage of the eligible costs as needed to best achieve the goals of the TERP.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to projects involving stationary engines. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible activities of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the equipment being replaced, repowered, or retrofitted.
- Stationary equipment used primarily for competition or recreation, or used primarily to support those types of activities, is not eligible for funding.
- Stationary-equipment activities must reduce NO_x emissions at least 25% compared to baseline NO_x emissions. The NO_x emissions of equipment, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA orthe CARB, or otherwise accepted by the TCEQ. Where the model year of the equipment and the model year of the existing engine are different—such as equipment that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the 25% reduction criterion for each type of activity is explained as follows.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the equipment and engine being purchased or leased must be certified to emit at least 25% less NO_x (that is, no more than 75% as much NO_x) compared with the current standard for that engine.

  Replacements. The replacement equipment and engine must have been certified to emit at least 25% less NO_x than the standard for the engine installed on the equipment being replaced.

  Repowers. The replacement engine must be certified to emit at least 25% less NO_x than the engine being replaced, based on the standard for that engine.

  Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or

add on a device, the technology must be verified to emit at least 25% less NO_x than the standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same equipment, engine, or both, the TCEQ may consider the combined reductions from the two technologies in meeting the 25% requirement. This decision will be solely at the discretion of the TCEQ, and will be based on a determination that the combination of the two technologies will permanently reduce emissions by at least 25%.

- In the areas of the state where TxLED is required, the baseline and reduced-emissions-rate calculations for diesel-engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- The cost-effectiveness of a project, other than a demonstration project, must not exceed [~~$15,000~~] any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. [~~Individual activities included under a single project application may exceed this~~
- ~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.~~]
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is

Figure A5.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

required only by local law or regulation or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.

- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade. The more stringent emissions standard will be used as the baseline emissions rate in the calculation to determine the emissions reductions and the determination that the activity will reduce NO_x at least 25%.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal programs for averaging, banking, or trading emissions-reduction credits is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
    - For repower activities, eligible rebuilt or remanufactured engines must use only components from the original engine manufacturer and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity-life requirements for any grant period. Not less than 75% of the annual use of the equipment must take place in one or more of the eligible counties throughout the life of the project. Leases that do not include a binding commitment to purchase must be for the length of the activity life. Annual use will be measured by either hours of operation or fuel consumption.
- For most equipment, annual use normally will be measured using hours of operation. For equipment without an hour meter installed, and no viable mechanism for measuring the hours of operation, fuel consumption normally should be used as the usage factor.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel, are not eligible. This restriction also applies to situations where the grant recipient acts as a transporter for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and

technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The baseline NO_x emissions standards for this program normally should be the federal standards for NO_x emissions applicable to the type of engine involved. For most agricultural irrigation-pump activities, the standards applicable to non-road engines will apply. The federal NO_x emissions standards for non-road diesel engines are listed in a technical supplement available from the TCEQ. For gas turbine engines and alternative-fuel engines the emission standards and applicable baseline factors may not be listed in the technical supplement, and may need to be determined case by case. Potential grant applicants should consult with the TCEQ to ensure that they use the appropriate baseline standards.

The NO_X emissions factor for the reduced-emission engines will normally be the federal NO_X emissions standard or the FEL to which the reduced-emission engine is certified. For retrofit and add-on activities verified by the EPA or the CARB to reduce NO_X emissions by a specified percentage, the verified percentage will be applied to the baseline emissions factor to determine the emissions factor for the retrofitted engine.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the equipment and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately, and then differences taken to determine emissions reductions.

Emission factors are generally expressed in terms of grams per brake horsepower-hour (g/bhp-hr), grams per mile (g/mi), or grams per gallon (g/gal). Conversion factors are generally expressed in units of brake horsepower-hour per mile (bhp-hr/mi) or horsepower-hour per gallon (hp-hr/gal).

For most stationary-engine applications, the activity level should be established by the annual hours of operation. For equipment without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps shown in Table A5.1.

For diesel engines, appropriate baseline NO_x emissions factors and default load factors are included in a technical supplement to these guidelines. Potential applicants may need to contact the TCEQ for appropriate factors to use for gas turbine and alternative-fuel engines. Use the emissions factors associated with engine horsepower and model year. Use the load factor associated with the type of equipment. In general, grams per kilowatt-hour should be converted to grams per brake horsepower-hour for the calculations. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

For retrofit and add-on activities, and other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NO_x emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (in g/bhp-hr), such as purchases or repowers, use that emissions level as the emissions factor.

Table A5.1
Calculating NO_x Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× load factor		× load factor	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			
= grams per year reduced (g/year)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

Calculation of NO_x Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor must also be calculated. The energy consumption factor converts the emissions factor in g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. by dividing the hp of the engine by the fuel economy in gal/hr; or
2. by dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

The calculation of NO_x emissions reductions based on annual fuel use is outlined in Table A5.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

Table A5.2
Calculating NO_x Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_x emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_x emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_x emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_x emissions factor (g/bhp-hr)		NO_x emissions factor (g/bhp-hr)	
× TxLED correction factor *(diesel engines only)*		× TxLED correction factor *(diesel engines only)*	
= corrected NO_x emissions factor (g/bhp-hr)		= corrected NO_x emissions factor (g/bhp-hr)	
× energy consumption factor horsepower-hour per gallon (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption gallons per year (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A5.3. Capital-recovery factors for up to 20 years appear in Table A5.4, for use in the calculations.

For projects that include more than one activity, the total project incentive amount is to be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

Table A5.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A5.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Appendix 6
Refueling Infrastructure

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a refueling infrastructure project. To estimate emissions reductions, the TCEQ will use applicant-supplied information on the type of vehicles and equipment using the fuel. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_x expected to be produced by baseline vehicles and equipment, and the emissions level in tons of NO_x expected to be produced through the use of the qualifying fuel by the vehicles and equipment, within the eligible counties.

The emissions standards and factors applicable to this program are contained in a technical supplement which the TCEQ will make available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this appendix or the appendix applicable to the type of vehicle or equipment activities used to show that emissions reductions will be achieved as a result of the infrastructure project.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

The TCEQ may further limit the types of eligible activities beyond policies stated here, and may more narrowly define eligibility requirements, under a particular funding round or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement up to 50% of the total eligible costs for the purchase and installation of the infrastructure. However, expenses for

salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;
- installation costs;
- costs of design and engineering work directly necessary for the installation of the infrastructure; and
- reengineering and construction costs, if the existing site must be modified to allow for installation of the infrastructure.

All grant-funded infrastructure must be purchased, not leased.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving non-road equipment activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in the guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible activities of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Infrastructure for fueling vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- The infrastructure project must result in new, surplus emissions reductions that will then be available to the TCEQ for use in the State Implementation Plan. In general, the TCEQ will not accept as a new emissions reduction the conversion of a vehicle or equipment fleet that occurred earlier than 12 months before the grant application deadline.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded,

as long as the reductions directly attributable to the project are not used to comply with those requirements.

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056, and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- In the areas of the state where TxLED is required, the baseline and reduced-emissions-rate calculations for diesel-engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- [~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness limit of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.~~] The cost-effectiveness of a project, other than a demonstration project, may not exceed any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed.
- For all activities, the activity life must be at least five years. The TCEQ may establish longer activity-life requirements for each grant period. Not less than 75% of the annual usage of the qualifying fuel dispensed from the infrastructure must take place in one or more of the eligible counties throughout the life of the project. For infrastructure activities to fuel marine vessels, not less than 75% of the annual usage of the qualifying fuel dispensed from the infrastructure must take place in bays adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway, throughout the life of the project.
- Annual usage normally should be measured using fuel consumption by the vehicles or equipment being fueled from the infrastructure. Therefore, a grant recipient must have a viable mechanism for tracking and reporting on the use of the fuel dispensed.
- The TCEQ will determine an acceptable activity life for infrastructure activities, case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity. If the grant recipient does not own or operate the vehicles or equipment to be fueled from the infrastructure, the recipient will need to explain, as a condition of the grant, what mechanism will be used to ensure that the vehicles

and equipment are operated within the eligible counties for the specified time period.

Figure 6.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel, are not eligible. This restriction also applies when the grant recipient delivers the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and

technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The baseline NO_x emissions [~~standards~~] factors for this program normally should be the federal standards for NO_x emissions applicable to the engines being provided the fuel from the infrastructure. The federal NO_x emissions standards for various categories of engines are listed in a technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. For refueling-infrastructure activities, NO_x emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the fuel.

NO_x emissions reductions may be claimed for a verified fuel or fuel additive, the purchase and use of alternative-fueled vehicles or equipment, or an upgrade or conversion of vehicles or equipment. The TCEQ may limit the types of eligible activities during a particular grant period.

Emissions reductions for the use of a fuel or fuel additive must be verified by the EPA or the CARB, or otherwise accepted by the TCEQ, as achieving the claimed reductions when used in lieu of a baseline fuel or an additive mixed with a baseline fuel. The verified fuel or additive may only be used in vehicles and equipment owned or operated by the applicant.

In some cases, the TCEQ may accept a claim of NO_x emissions reductions based on the purchase and use of alternative-fueled vehicles or equipment certified at an NO_x emissions rate that is less than the federal standard for that engine. In general, the vehicles and equipment using the qualifying fuel should be owned or operated by the applicant. However, the TCEQ will consider situations where the fuel will be supplied to upgraded fleets owned or operated by another enterprise or authority. The TCEQ will require a letter of agreement with a third party indicating a willingness to use the qualifying fuel and report on its use.

For vehicle or fleet upgrades or conversions, a reduction in NO_x emissions must occur when compared to an equivalent baseline engine. The upgraded vehicle or equipment engines must be certified to an NO_x-emissions rate that is less than the standard for that type of engine under the test cycle used. The NO_x emissions reductions are based on the difference in the emissions rates. In general, the baseline for comparison for natural gas vehicles certified under the diesel cycle will be the diesel-engine standard applicable to that type of engine. Similarly, for propane-, natural gas–, and other-fueled vehicles and equipment certified under the Otto-cycle standard, the baseline for comparison will be the federal Otto-cycle standard applicable to that type of engine.

The TCEQ may also consider, at its discretion, reductions in NO_x through the replacement of conventionally powered vehicles or equipment with new or late-model vehicles powered by alternative fuels to be served by the refueling infrastructure. The emissions reductions under this approach will be based on the same methodology and requirements as apply to a replacement project involving the same type of vehicle or equipment. If the grant recipient does not own the vehicles or equipment being replaced, the recipient will be responsible for securing necessary agreements from the vehicle or equipment owner to destroy the vehicle or equipment being replaced and to use the replacement vehicle or equipment in the eligible counties for the percentage of annual usage and for the annual and total usage amounts required for the activity life.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount must be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A6.1. Capital-recovery factors for up to 20 years appear in Table A6.2, for use in the calculations.

For projects that include more than one activity, the total project incentive amount will be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

$$\textit{total annualized costs / total annual } NO_x \textit{ reductions} = \textit{project cost-effectiveness}$$

Table A6.1
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A6.2
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

Appendix 7
On-Site Electrification and Idle-Reduction Infrastructure

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for an on-site electrification and idle-reduction infrastructure project. The emissions reductions will be estimated using applicant-supplied information on the type of vehicles and equipment being supplied the electricity or serviced by the idle-reduction infrastructure. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_x expected to be produced by baseline vehicles and equipment, and the emissions level in tons of NO_x expected to be produced through the electrification or reduction in idling of the vehicles and equipment, within the eligible counties.

The emissions standards and emissions factors applicable to this program appear in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

In accordance with Texas Health and Safety Code, 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this appendix or the appendix applicable to the type of vehicle or equipment activities used to show that emissions reductions will be achieved as a result of the infrastructure project.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

An eligible activity may include the purchase and installation of on-site infrastructure —including auxiliary power units—designed to dispense electricity to motor vehicles,

on-road heavy-duty vehicles, non-road equipment, stationary equipment, locomotives, or marine vessels. The electricity may replace the power normally supplied by the engine while the vehicle or equipment is parked (idle reduction), or recharge electric vehicles or equipment being used in lieu of vehicles or equipment powered by an internal combustion engine. The applicant will need to show that the infrastructure is needed and will be used in an eligible county.

Subject to approval of the TCEQ, the on-site infrastructure may also include other services, in addition to supplying electricity, as part of an idle-reduction program. These other services may include air conditioning and heating, phone and cable TV access, and other hospitality services directly related to reducing vehicle idling.

In some cases, the TCEQ may also accept applications for infrastructure related to electrification of stationary equipment, in lieu of equipment powered by an internal combustion engine.

State agencies may apply for grants to fund the lease, purchase, or installation of idle-reduction technologies and facilities at rest areas and other public facilities on major highway routes in eligible areas, and on eligible water routes. The TCEQ may approve operating costs for initial setup and for ensuring proper operation of the infrastructure at these facilities. Idle-reduction facilities are encouraged at the state's ports and border crossings.

In some areas, idling operation of on-road vehicles may be limited by state regulations. Accordingly, the project emissions reductions used to determine the cost-effectiveness for infrastructure activities in an area with such a requirement may not include the replacement of idling hours of operation for on-road vehicles. Non-road equipment and other eligible uses of the electricity by on-road vehicles are not covered by this restriction.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

Projects Other than Idle-Reduction Infrastructure Installed by Other State Agencies

For such projects, the grant recipient may be eligible for reimbursement up to 50% of the total eligible costs for the purchase and installation of the infrastructure. However, expenses for salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;

- installation costs;
- the costs of design and engineering work directly necessary for the installation of the infrastructure;
- reengineering and construction costs, if the existing site must be modified to allow for installation of the infrastructure; and
- other costs directly related to the project.

All grant-funded idle-reduction equipment and infrastructure must be purchased and not leased.

Idle-Reduction Infrastructure Installed by Other State Agencies at Rest Stops and Other Public Facilities

Up to the full cost of idle-reduction infrastructure installed at rest stops and other public facilities by another state agency may be eligible for funding under the grant. In addition, the cost of leasing or contracting for the infrastructure installation and start-up operation of the infrastructure may be included in the grant, subject to limitations on the length of time the funds are available under the grant contract.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to projects involving electrification infrastructure. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible activities of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Infrastructure used to service vehicles and equipment used primarily for competition or recreation are not eligible for funding.
- The infrastructure project must result in new, surplus emissions reductions that will then be available to the TCEQ for assignment to the State Implementation Plan. In general, the TCEQ will not accept as a new emissions reduction the conversion of a vehicle or equipment fleet that occurred earlier than 12 months prior to the grant application deadline.
- In the areas of the state where TxLED is required, the baseline and reduced emissions-rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A7.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- [~~Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.~~]The cost-effectiveness of a project, other than a demonstration project, may not exceed any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private enterprise or authority. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit

averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For infrastructure activities, the activity life must be a minimum of five years. The TCEQ will establish the required activity life for each grant period. Not less than 75% of the annual use of the electricity dispensed from the infrastructure—or the idling operation reduced—must take place in one or more of the eligible counties throughout the life of the project. For infrastructure activities involving marine vessels, not less than 75% of the annual use of the electricity dispensed from the infrastructure must take place in bays adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway, throughout the life of the project.
- Annual use will normally be measured using hours of operation by the vehicles or equipment being provided the electricity from the infrastructure. Therefore, a grant recipient must have a viable mechanism for tracking and reporting on the use of the vehicles or equipment receiving electricity from the infrastructure.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity. If the grant recipient does not own or operate the vehicles or equipment to receive electricity from the infrastructure, the recipient will need to explain, as a condition of the grant, what mechanism will be used to ensure that the vehicles and equipment are operated within the eligible counties for the specified time period.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies when the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.

- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions [~~Standards~~] Factors

The baseline NO_x emissions [~~standards~~] factors for this program normally should be the federal standards for NO_x emissions applicable to the engines receiving electricity from the infrastructure. The federal NO_x emissions standards for various categories of engines are listed in a technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. For electrification infrastructure activities, the NO_x emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the electricity.

Electrification of Vehicles and Equipment

Electrification infrastructure may be purchased to support the purchase of new electric vehicles or equipment in lieu of vehicles or equipment powered by internal combustion engines. Infrastructure may also be purchased to support the electrification of existing vehicles or equipment.

NO_x emissions reductions should be calculated based on the difference between the baseline emissions and the emissions from the electric-powered engine. In most cases, electric engines will be considered zero-emissions sources.

Grant applicants should refer to the chapter of this guide pertaining to the type of vehicle or equipment being purchased, repowered, or retrofitted for information on

the methodology that should be used to determine the reductions in NO_x emissions attributable to the use of the electric-powered engine in lieu of an internal combustion engine. The applicable emissions factors for use in the calculations will generally appear in the technical supplement to these guidelines. Activities for which appropriate emissions factors do not appear should be discussed with the TCEQ.

The usage factor for electrification of on-road vehicles normally should be miles of operation, while the usage factor for non-road and stationary equipment normally should be hours of operation.

Normally, NO_x emissions that may be attributable to the generation of the electricity should not be considered in determining the NO_x emissions reductions, if the electricity is supplied through the central power grid or other central power supply. However, if the electricity will come from a local generating source, any NO_x emissions from the source may need to be included in the calculations. As part of the grant application, the applicant will need to explain the source of the electricity.

Note that, if the vehicle or equipment purchases or conversions are included in the grant application as part of a combined project, the NO_x emissions reductions attributable to the overall project will only be counted once, in conjunction with the purchase or conversion activities.

Alternatively, if the purchases or conversions are to be funded from another source, the NO_x emissions reductions attributable to the electrification of the vehicles or equipment should be used to determine the reductions in NO_x emissions for the infrastructure project. The grant recipient must ensure that the reductions are surplus and available to apply to this program, and are not already being claimed by the other funding program or for another purpose.

Idle Reduction

On-site electrification of truck stops, rest stops, and other areas may also be funded under this program, in support of idle-reduction programs to reduce NO_x emissions in the eligible counties. The reductions are to be calculated based on the reduction in idling NO_x emissions for the engine.

In general, the emissions-reduction benefit represents the NO_x emissions that would have normally been generated by the engine at idle. The idling emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary.

For most applications, the idling activity level should be established by the annual hours of idle operation. The calculation of emissions and emissions reductions based on annual hours of operation as the usage factor is determined by the steps shown in Table A7.1.

Table A7.1
Calculating the NO_x Idling Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Calculate the NO_x Idling Emissions Reduction

NO_x idling emissions factor grams per hour (g/hr)	
× TxLED correction factor *(diesel engines only)*	
= g/hr	
× annual hours of idling reduced (within the eligible county)	
= grams per year reduced (g/year)	
	÷ 907,200 grams per ton
= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_x emissions reduction (tons)	

Appropriate baseline NO_x idling emissions factors are included in the technical supplement to these guidelines. Use the emissions factors most closely associated with the vehicle or engine. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

Normally, NO_x emissions that may be attributable to the generation of the electricity should not be considered in determining the NO_x emissions reductions, if the electricity is provided through the central power grid or other central power supply. However, if the electricity will come from a local generating source, any NO_x emissions from the generating source may need to be included in the calculations. As part of the grant application, the applicant will need to explain the source of the electricity.

Note that, if the vehicle or equipment purchases or conversions are included in the grant application as part of a combined project, the NO_x emissions reductions

attributable to the overall project should only be counted once, in conjunction with the purchase or conversion activities.

Alternatively, if the purchases or conversions are to be funded from another source, the reductions in NO_x emissions attributable to the electrification of the vehicles or equipment should be used to determine the NO_x emissions reductions for the infrastructure project. The grant recipient must ensure that the NO_x emissions reductions are surplus and available to apply to this program, and are not already being claimed by the other funding program or for another purpose.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A7.2. Capital-recovery factors for up to 20 years appear in Table A7.3, for use in the calculations.

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the

combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Table A7.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A7.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

Appendix 8
On-Vehicle Electrification and Idle-Reduction Infrastructure

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for an on-vehicle electrification and idle-reduction infrastructure project. The emissions reductions will be estimated using the applicant's information on the type of vehicles or equipment on which the infrastructure is being installed. The emissions reduction for the activity will be the reduction in the idling emissions level in tons of NO_x expected to be produced by baseline vehicles, within the eligible counties.

The emissions standards and emissions factors applicable to this program are contained in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

In accordance with Texas Health and Safety Code, 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. Situations where good cause may be determined and a waiver granted are explained in the discussion of eligibility requirements in this appendix or the appendix applicable to the type of vehicle or equipment activities used to show that emissions reductions will be achieved as a result of the infrastructure project.

The executive director may identify other eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

An eligible activity may include the purchase and installation of equipment that enables a vehicle or equipment to use electric power to operate while parked, of the systems normally supplied power by the propulsion engine, or of another onboard internal combustion engine that emits NO_x.

Eligible equipment may include: (1) the add-on of devices to enable acceptance of electricity from an external power source or (2) the purchase and installation on the vehicle or equipment of an auxiliary power unit (APU) to generate electricity.

The TCEQ may also accept, case by case, idle-limiting devices for locomotives, as well as other types of idle-reduction devices.

Note, that in some areas, idling operation of on-road vehicles may be limited by state regulations. Accordingly, the project emissions reductions used to determine the cost-effectiveness for infrastructure activities in an area with such a requirement may not include the replacement of idling hours of operation for on-road vehicles. Non-road equipment and other eligible uses of the electricity by on-road vehicles are not covered by this restriction.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement of the cost for the purchase and installation of the infrastructure. However, expenses for salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified to allow for installation of the infrastructure; and
- other costs directly related to the project.

All vehicles and equipment must be owned by the grant applicant, including the vehicle and equipment that will benefit from the add-on or idle-reduction infrastructure. All grant-funded add-on devices, APUs, and other idle-reduction equipment must be purchased and not leased.

Project Criteria

In addition to the eligibility criteria previously presented, the criteria listed below apply to projects involving electrification infrastructure. The TCEQ may impose additional criteria, and may more narrowly define the criteria, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible activities of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Infrastructure used to service vehicles and equipment used primarily for competition or recreation are not eligible for funding.
- The cost-effectiveness of a project, other than a demonstration project, may not exceed any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.
- In the areas of the state where TxLED is required, the baseline and reduced emissions-rate calculations for diesel engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal programs for averaging, banking, or trading emissions-reduction credits is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For infrastructure activities, the activity life must be a minimum of five years. The TCEQ will establish the required activity life for each grant period. Not less than 75% of the annual use of the electricity dispensed from the infrastructure, or the

  idling operation reduced, projected for the activity life, must be projected to take place in one or more of the eligible counties. For infrastructure activities involving marine vessels, not less than 75% of the annual use of the electricity dispensed from the infrastructure projected for the activity life must be projected to take

place in bays adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway.

- Annual use will normally be measured using hours of idling operation by the vehicles or equipment being replaced by the electricity from the infrastructure.
- The TCEQ will determine an acceptable activity life for infrastructure activities case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies when the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the “cost plus a percentage of cost” method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

Figure A8.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

NO_x Emissions Factors

The baseline NO_x emissions factors for this program normally should be the federal standards applicable to the engines being provided the electricity from the infrastructure. The federal NO_x emissions standards for various categories of engines are listed in a technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and the auxiliary power unit, if it emits NO_x. For infrastructure to allow a vehicle or equipment to accept electricity from an external source, the emissions-reduction benefit will be the reduction in emissions from the on-board internal combustion engine as a result of the use of electricity.

For APUs and idle-limiting devices on locomotives, the emissions-reduction benefit is to be determined by the reduction in fuel use or hours of idling. Grant applicants should consult with the TCEQ to determine the most appropriate methodology to use

in calculating the reductions in NO_x emissions attributable to these types of locomotive projects.

The NO_x emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the electricity. The idling emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary.

Calculating NO_x Idling Emissions Reductions Based on Hours of Operation

For most applications, the idling activity level should be established by the annual hours of idle operation. The calculation of emissions and emissions reductions based on annual hours of operation as the usage factor is determined by the steps shown in Table A8.1.

For activities involving the add-on of idle-limiting devices or devices to enable acceptance of electricity from an external power source, the emissions reductions can be calculated using just the baseline emissions. The APU emissions will be set at zero.

Appropriate baseline NO_x idling emissions factors, APU NO_x emissions standards, and APU load factors appear in the technical supplement to these guidelines. Use the factors most closely associated with the vehicle or engine. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

Table A8.1
Calculating the Idling NO_x Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Calculate the NO_x Idling Emissions Reduction

Baseline		APU	
NO_x Idling emissions factor grams per hour (g/hr)		APU NO_x emissions factor grams per brake horsepower-hour (g/bhp-hr)	
		× TxLED correction factor *(diesel engines only)*	
× TxLED correction factor *(diesel engines only)*		× APU load factor	
		× APU horsepower	
= NO_x emissions factor (g/hr)		= NO_x emissions factor (g/hr)	
Baseline g/hr – APU emissions g/hr			
× annual idling hours			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_x emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_x emissions reduction (tons)			

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A8.2. Capital-recovery factors for up to 20 years appear in Table A8.3, for use in the calculations.

Table A8.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A8.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Appendix 9
Rail Relocation and Improvements

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a rail relocation and improvement project. This type of project must be applied for separately from the other eligible activities.

Applicants should estimate reductions in emissions based on the type of relocation or improvements. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_x expected to be produced by existing conditions, and the emissions level in tons of NO_x expected after the rail relocation or improvements, within the eligible counties.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. The executive director may identify eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

An eligible activity may include the relocation of rail lines to reduce the number of grade crossings, improvements at rail intersections, and other improvements that will directly reduce locomotive engine idling at rail intersections and other locations. The grant recipient must own or otherwise control the rail line, the right-of-way, or the facility being improved.

The TCEQ may consider various congestion-mitigation projects. Funding decisions may be based on the likelihood that the emissions reductions will be proven and accepted.

The applicant will need to show that the project is viable and can be expected to achieve significant reductions in NO_x emissions.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement of the costs of the rail relocation or improvements. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the costs of design and engineering work directly necessary for completing the improvements;
- permitting and governmental fees needed to complete any site improvements or construction;
- costs for new construction or reengineering costs for modifications of an existing site;
- the invoice cost of equipment or other infrastructure, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the equipment or infrastructure;
- installation costs; and
- other costs directly related to the projects.

All grant-funded equipment will be required to be purchased, not leased. Studies and plans will not be eligible for reimbursement by the TCEQ.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to rail-improvement projects. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- An activity under the category must be submitted on a separate application.
- The project must result in new, surplus emissions reductions that will be available to the TCEQ for assignment to the State Implementation Plan.
- In general, a project should involve proven techniques that ensure a reduction in air pollution.
- The project must take place within an eligible county.
- The cost-effectiveness of a project, other than a demonstration project, may not exceed any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed. An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State

Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal programs for averaging, banking, or trading emissions-reduction credits is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- The activity life must be a minimum of five years. The TCEQ will determine an acceptable maximum activity life for infrastructure activities case by case.
- A grant recipient must have a viable mechanism for tracking and reporting on the emissions reduced by the project.
- Applicants must agree to monitor the use of grant-funded equipment and infrastructure, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel, are not eligible. This restriction also applies when the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient,

are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions Factors

The baseline NO_x emissions factors will be based on the federal standards applicable to the category of locomotive for which idle time will be reduced. In general, baseline idling emissions should be based on EPA- or TCEQ-approved estimates for locomotive engine idle emissions. Default idling emissions factors of 800 grams of NO_x per hour for two-stroke engines and 620 grams per hour for four-stroke engines may be considered by the TCEQ.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit should be calculated based on the projected number of hours of engine idling reduced, multiplied by an idle-emissions factor for that type of locomotive. The calculation of emissions and emissions reductions using annual hours of idling operation reduced is determined by the steps shown in Table A9.1.

Reductions in vehicle engine idling that are directly attributable to the project may also be included in the calculation of its emissions reductions, subject to a determination by the TCEQ that those additional reductions are verifiable and will be enforceable under the grant contract.

Because of the nature of this type of project, it will be the applicant's responsibility to verify the types of locomotives and the number of locomotive engine idling hours, as well as any reductions in vehicle engine idling to be included in the project, that will be reduced annually as a result of the rail line relocation or improvements. All studies and reports to show the projected reduction in locomotive engine idling and vehicle engine idling must be completed before an application is made, and those studies and reports must be submitted with a grant application.

Table A9.1
Calculating the Idling NO_x Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Calculate the NO_X Idling Emissions Reduction

NO_x idling emissions factor (g/hr)	
× TxLED correction factor *(diesel engines only)*	
= grams per hour (g/hr)	
× annual hours of idling reduced (within the eligible county)	
= grams per year reduced (g/year)	
	÷ 907,200 grams per ton
= estimated annual NO_x emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_x emissions reduction (tons)	

It is recommended that interested parties meet with TCEQ personnel before submitting an application to discuss the information that will be used to verify reductions in engine idling.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3%.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where i = discount rate (3%)
n = activity life

The discount rate of 3% reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations appear in Table A9.1. Capital-recovery factors for up to 20 years appear in Table A9.2, for use in the calculations.

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

Table A9.1
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$\text{CRF} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A9.2
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Appendix 10
Use of Qualifying Fuel

This section outlines the criteria for project eligibility and gives the methods for calculating the reductions in NO_x emissions for a project using qualifying fuel. In order to be considered a qualifying fuel, the fuel or fuel additive must be verified by the EPA or the CARB, or otherwise accepted by the TCEQ as resulting in lower emissions of NO_x than the baseline fuel for the vehicle or equipment in which the qualifying fuel or additive is used. The baseline fuel used for comparison normally will be either standard on-road or non-road diesel fuel, or gasoline.

The methods for calculating the NO_x emissions reductions for a qualifying fuel project also appear in this chapter. Most of the calculations will require input of an NO_x emissions factor applicable to the engine or vehicle. The emissions standards and factors applicable to this program appear in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director or his or her designee has the authority to waive certain eligibility requirements, based on a finding of good cause. The executive director may identify eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Eligible Activities and Costs

The reimbursements for incremental fuel costs under this category should be made over the life of the activity, based on the actual amount of fuel purchased and the cost of that fuel. The incentive amounts included in the grant contract are not to exceed a maximum amount that may be reimbursed under the grant. The actual reimbursement will depend upon the cost differential between the baseline fuel and the qualifying fuel at the time of the purchase. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

In some cases, the TCEQ may pre-approve a reimbursement amount per unit of qualifying fuel for all activities using the fuel. Grant applicants and suppliers of qualifying fuel may consult with the TCEQ regarding alternative approaches for establishing an approved reimbursement amount.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to projects involving qualifying fuel activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible activities of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Fuel used in vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- When required under federal law, fuel additives must be registered by the EPA to be eligible under this program.
- When required, qualifying fuel to be used in on-road vehicles must be registered by the EPA for on-road use to be eligible under this program.
- The NO_x emissions reductions attributable to the qualifying fuel must be verified by the EPA or the CARB, or accepted on other grounds by the TCEQ.
- Qualifying fuel technologies will be reviewed by the TCEQ's technical staff. Any questions regarding the effects of a fuel or fuel additive on health or the environment will need to be resolved before the fuel is considered eligible for funding. Manufacturers and suppliers of a qualifying fuel are encouraged to discuss their products with the TCEQ early in the process, before submitting a grant application.
- The cost-effectiveness of a project, other than a demonstration project, must not exceed any limits established by the TCEQ on the cost per ton of NO_x emissions reduced in the eligible counties for which the project is proposed.
- In the areas of the state where TxLED is required, the baseline and reduced emissions-rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule,

regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the project are not used to comply with those requirements.

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan, or the owner or operator, as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- The use of qualifying fuel funded under this program must take place in one or more of the eligible counties.
- For most qualifying fuel activities, annual use will be measured using calculations based on the fuel use. The TCEQ may consider using either miles of operation or hours of operation using the qualifying fuel for particular applications, case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies when the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.

Figure A10.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–19) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all those eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10% by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7%** (0.057) for on-road use and **7.0%** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, these estimates are subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factors to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the "cost plus a percentage of cost" method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions Factors

The baseline NO_x emissions factors for this program should be the federal standards for NO_x emissions applicable to the type of engine and model year of vehicle. The

federal NO_x emissions standards for engines are listed in a technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_x Emissions Reductions

The NO_x emissions reductions for a qualifying-fuel activity will be based on the types of vehicles and equipment using the fuel. Grant applicants should refer to the chapter or chapters of these guidelines applicable to the vehicles and equipment being fueled, to determine how the emissions reductions will be calculated.

In most cases, reductions in NO_x emissions should be based on the difference between the NO_x emissions using the baseline fuel and the NO_x emissions using the qualifying fuel. The grant applicant will be required to list the vehicles and equipment that will be fueled using the qualifying fuel.

For many types of qualifying fuel, the TCEQ may allow applicants to list the vehicles and equipment by category, rather than listing each individual vehicle or piece of equipment. The technical supplement to these guidelines will include information on the categories that may be used.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

The cost-effectiveness of qualifying fuel activities should be determined somewhat differently than for other activities. Whereas the incentive amount for other types of activities must be amortized over the activity life, using a 3% discount rate, the incentive amount for qualifying fuel activities does not need to be amortized. Cost-effectiveness calculations appear in Table A10.1.

For projects that include more than one activity, the total project incentive amount should be used to determine cost-effectiveness. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

Table A10.1
Calculating Cost-Effectiveness for Qualifying Fuel Activities

total cost ($) / total NO_x emissions reduction (tons) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. For purposes of calculating the cost-effectiveness of a project that includes other types of activities, the annualized cost for the qualifying fuel activity should be the total activity cost. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for those activities. Again, the total emissions reductions for the qualifying fuel activity should be added to the annualized emissions reductions from the other activities. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_x emissions reductions for the combined project activities.

total annualized costs / total annual NO_x reductions = project cost-effectiveness

Appendix 11
Demonstration of New Technology

This section contains the eligibility criteria for projects demonstrating new technology. A project of this type must be applied for separately from other eligible activities.

Eligible Activities and Costs

In general, the emissions reductions attributable to the technologies demonstrated under this program should already be proven—for example, through certification or verification by the EPA or the CARB. This program can then help encourage the implementation and use of the technology in the areas of the state where the emissions reductions are needed.

However, the TCEQ may also consider technologies that are still in the testing or verification stage of development. Funding decisions may be based on the likelihood that the emissions reductions will be proven and accepted.

The grant recipient may be eligible for reimbursement of all expenses attributable to the project. No cost-effectiveness requirements will be applied to a demonstration project, but the applicant will need to show that the technology is viable and can be expected to achieve significant reductions in NO_x emissions. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

In accordance with Texas Health and Safety Code 386.104(j) and TERP program rules, 30 TAC 114.622(g), the executive director has the authority to waive certain eligibility requirements, based on a finding of good cause. The executive director may identify eligibility criteria for which a waiver may be considered, based on a finding of good cause and subject to the statutory and regulatory requirements. Waiver options will be explained in the grant-application materials.

The granting of a waiver to the eligibility requirements is at the discretion of the executive director or the executive director's designee. In determining good cause and deciding whether to grant a waiver, the executive director shall ensure that the emissions reductions that will be attributable to the project will still be valid and, where applicable, meet the conditions for assignment for credit to the State Implementation Plan.

Project Criteria

In addition to the eligibility criteria previously presented, the following list applies to projects involving demonstration of new-technology activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding round or by geographic area, as needed to best achieve the objectives of the TERP.

- The TCEQ will select demonstration projects case by case, based on a full review of the project proposal and a determination that the project can lead to broader use of the technology.
- In general, a demonstration project should involve a limited number of vehicles or equipment (for example, one to five), so that the project can be considered a demonstration and not implementation of the technology.
- The demonstration project must take place within an eligible county. However, testing and other work required for completing the project may take place outside of the eligible counties, subject to approval by the TCEQ.
- Unless otherwise authorized by the TCEQ, the technology must be demonstrated on vehicles or equipment actually being used for intended purposes. Again, projects under this category normally should be for demonstrated technologies in real-world applications.
- Demonstration projects will normally last one year, but the TCEQ will consider projects that last for a different period. However, due to contracting and financial management requirements, projects may not extend beyond 18 months after the end of the state fiscal year of the grant award. The state fiscal year extends from September 1 through August 31.
- The grant recipient must monitor the use and effectiveness of the technology, including associated costs. At the end of the project, the recipient must prepare a project report with information and conclusions regarding the effectiveness and efficacy of using the technology in the application demonstrated. The project report must be accepted by the TCEQ before the project will be considered completed.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded,

as long as the reductions directly attributable to the project are not used to comply with those requirements.

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies when the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition to the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the “cost plus a percentage of cost” method of contracting for professional services must not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.