Emissions Reduction Incentive Grants
Dual-Fuel Conversion Systems
Procedures to Request a Determination of Emissions Reduction Factors

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Texas Commission on Environmental Quality
Air Quality Division
Implementation Grants Section (Incentive Grants), MC-204
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www.terpgrants.org

Texas Commission on Environmental Quality
Texas Emissions Reduction Plan (TERP)

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Dual-Fuel Conversion Systems
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Instructions

As outlined in guidelines for the Texas Emissions Reduction Plan (TERP) Emissions Reduction Incentive Grants (ERIG), *Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Programs (RG-388),* the Texas Commission on Environmental Quality (TCEQ) may consider alternative information, in addition to the emission standard to which an engine is certified, to determine appropriate nitrogen oxides (NO_X) emissions reductions that may be achieved through the conversion of an existing heavy-duty on-road or non-road diesel engine to operate under a dual-fuel configuration that uses natural gas and diesel fuel.

This authorization does not extend to the conversion of marine, locomotive, or stationary engines.

The TCEQ may also consider a dual-fuel conversion system that is shown to reduce NO_X emissions by a lower percentage than required for other types of projects. Under the current guidelines projects must result in at least a 25% reduction in NO_X. For dual-fuel conversion systems the TCEQ will consider projects that will result in at least a 10% reduction in NO_X.

This document contains the procedures and format to be used by a manufacturer of a dual-fuel conversion system to request a determination by the TCEQ of appropriate emission factors to be used to calculate NO_X emissions reductions for dual-fuel conversion projects that may be submitted in a grant application under the ERIG program.

The alternative criteria for the ERIG Program do not extend to other TERP grant programs, including the Texas Natural Gas Vehicle Grants Program and the Texas Clean Fleet Program.

Limitation of Applicability

Unless otherwise stated in the Request for Grant Applications issued for each grant application period, applicants for a retrofit project to convert an existing heavy-duty on-road or non-road diesel engine to dual-fuel operation must either own the vehicle or equipment and engine at the time of application or commit to finalizing the purchase and ownership before a request for reimbursement is submitted for the grant.

When should a request be submitted?

If a manufacturer anticipates its system being included in a grant application, it is recommended that a request be submitted to the TCEQ as soon as the manufacturer has the necessary data and information for the TCEQ to consider. It may not be feasible for the TCEQ to evaluate test data for a conversion system submitted late during a grant

application period and such late submission may void consideration an application for that system.

What must be submitted?

A manufacturer should use the attached format in completing the request and include the data and information requested. Requests that do not provide all requested information will not be accepted. Key information needed is explained below.

On-Road Engines

The United States Environmental Protection Agency (EPA) rules (Title 40 Code of Federal Regulations Part 85) provide for EPA approval of alternative fuel conversion systems for on-road engines and vehicles. The testing required for acceptance of an alternative fuel conversion system differs depending on the age and mileage of the vehicle: near and relatively new (generally 0-2 years); intermediate useful life (years or mileage); and outside of useful life.

The test results used to obtain EPA approval should be submitted, including the notification form and summary documents submitted to the EPA showing the results of emissions testing, including results for operation of the engine in dual-fuel mode and diesel-only mode (if applicable). Final approval must have been issued by the EPA.

If a system is also certified by the California Air Resources Board (CARB), the CARB Executive Order showing the certified test results should also be provided.

Non-Road Engines

The EPA currently does not require approval for systems for conversion of an existing non-road engine to operate on alternative fuel. However, a manufacturer may request voluntary approval of the system under EPA Advisory Circular 02B, *Field Fixes Related to Emission Control-Related Components*. This process is available to the original engine manufacturer but not a system manufacturer that is separate from the manufacturer of the engine being converted. Alternatively, the system may be certified by CARB under its alternative fuel retrofit certification program.

Under Texas Health and Safety Code, §386.104(f-1), in order to be considered by the TCEQ under this alternative process a dual-fuel conversion system must be certified by the EPA or CARB. Therefore, for non-road engines only a system that has been approved under the EPA's Field Fix approval process or certified under a CARB Executive Order will be considered.

If a Field Fix approval has been issued for the conversion system, the test results used to obtain EPA should be submitted, including the submission form and summary documents submitted to the EPA. Also include the Field Fix approval certificate or letter. The information should include the test results in dual-fuel mode and diesel-only mode (if applicable).

If the system is certified by CARB under its alternative fuel retrofit certification program, the CARB Executive Order showing the certified test results should be provided.

Submission of the Request

The request should be submitted to the TCEQ at the address provided below.

By regular mail:
Dual-Fuel Coordinator
Implementation Grants Section, MC 204
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Tx 78711-3087

By express mail:
Dual-Fuel Coordinator
Implementation Grants Section, MC 204
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, Tx 78753

How will the percentage reduction in NO_X emissions be determined?

The TCEQ will review the test results and information provided. Based on that assessment, the TCEQ will determine an accepted percentage reduction in NO_X emissions for the dual-fuel engine. In general, the TCEQ will use the procedures outlined below. However, the TCEQ may consider using a different approach, as determined appropriate, for particular systems and engines.

1. The NO_X emissions test rate for the conversion system in dual-fuel mode will be divided by the NO_X emissions test rate for the converted engine in diesel-only mode to determine an initial percentage reduction in NO_X emissions.
2. If the converted engine is only capable of operating in dual-fuel mode, the NO_X emissions test rate of the original unconverted engine may be used for the comparison.
3. Also, unless the converted engine is only capable of operating in dual-fuel mode, the TCEQ will assume that the converted engine will operate 80% of its annual operation in dual-fuel mode. The percentage reduction in NO_X emissions will be adjusted (i.e., weighted) by 80% to account for the possible use of the engine in diesel-only mode.
4. Once established by the TCEQ, the adjusted percentage reduction in NO_X emissions will need to be entered in the grant application forms and will be used in the emissions reduction calculations for a retrofit activity, as explained in the application forms and calculators provided by the TCEQ. In general, the NO_X emissions standard or Family Emissions Limit (FEL) to which the unconverted engine was certified by the EPA will be multiplied by this percentage to determine the emissions reductions in grams per brake horsepower-hour (g/bhp-hr).

TCEQ Acceptance Process

The TCEQ will evaluate the information provided and will make a determination of whether the dual-fuel conversion system will be considered under this alternative approach. If accepted, the TCEQ will respond to the manufacturer by letter explaining the percentage reduction in NO_X emissions that may be used to consider an application for a grant for installation of the dual-fuel conversion system.

The TCEQ's determination on a request will be final. A manufacturer may submit a new request regarding a particular system when/if new or updated data and information becomes available.

If a system is accepted, the letter provided by the TCEQ will also be posted on the TERP grants website at <www.terpgrants.org>. The TCEQ may update or withdraw the approval at any time.

Contact Information

Phone: 1-800-919-TERP (8377)

E-mail: terp@tceq.texas.gov

Website: <www.terpgrants.org

Texas Commission on Environmental Quality
Texas Emissions Reduction Plan (TERP)

Emissions Reduction Incentive Grants
Retrofits with Dual-Fuel Conversion Systems
Procedures to Request a Determination of Emissions Reduction Factors

Required Information

The following information should be submitted with a cover letter signed by an authorized official of the manufacturer. Separate information must be submitted for each conversion system certification/approval or Field Fix approval issued by the U.S. Environmental Protection Agency (EPA) or the California Air Resources Board (CARB), although one cover letter may be used for multiple requests.

Note that upon submission, the information provided will be subject to the Texas Public Information Act, V.T.C.S. art. 6252-17a. The TCEQ does not anticipate that confidential business information will need to be submitted in order to provide the necessary information. However, if a manufacturer feels that any of the information requested should be considered proprietary and confidential, contact the dual-fuel coordinator at 800-919-TERP (8377) to discuss before submitting the request.

1. **Manufacturer Name**
2. **Mailing Address**
3. **Physical Address** (if different)
4. **Authorized Representative Name**
5. **Contact Phone Number**
6. **Contact E-mail**
7. **System Description**

   Provide a brief description of the dual-fuel conversion system including the types of vehicles and equipment on which the system may be installed. Include information on the expected percentage reduction in nitrogen oxides (NO_X) emissions.

8. **System Name**

   Include the name of the conversion system as designated by the manufacturer. If applicable, provide the system make, model, etc.

9. **On-Road / Non-Road**

   Indicate if the system is for conversion of an on-road or a non-road engine.

10. EPA and CARB Approval

For on-road engine conversion systems indicate if the system is approved by EPA under the requirements for *New or Relatively New*, *Intermediate Useful Life*, or *Outside Useful Life* engines. For non-road engines, indicate if the system is approved under an EPA Field Fix approval. Also indicate if the system has been certified by CARB.

11. Conversion System Engine Family/Test Group

For a system to convert an on-road engine, list the engine family/test group assigned to the conversion system by the EPA. If the system is for conversion of a non-road engine and the system is only approved under a Field Fix approval by the EPA, include any identifying information provided by the EPA with its approval. For systems certified by CARB list the CARB Executive Order number.

12. Original Engine Information

Provide the information below for the engines covered under the EPA approval and/or CARB certification (you may provide the forms submitted to the EPA or CARB listing the applicable engines).

a. Original Equipment Manufacturer (OEM) Name

b. OEM Engine Family(ies)

c. Engine Model(s)

d. Engine Model Year(s)

e. Engine Displacement

13. Conversion Fuel

List the fuel combinations (i.e., Diesel/CNG, Diesel/LNG) for the converted engine. Indicate if the converted engine may operate in diesel-only mode in addition to dual-fuel mode.

14. Qualified Testing Entity

Provide the name, address, and contact information of the qualified testing entity (i.e., laboratory, facility, etc.), if applicable, that conducted the emissions tests on the conversion system.

15. Test Results

List the test results for NO_X submitted to and accepted by the EPA and/or CARB. Test results should be shown in grams per brake horsepower hour (g/bhp-hr). The test results should include the NO_X emissions in both the dual-fuel mode and diesel-only mode (if applicable). Include a brief explanation of the test process and/or protocols used. This test information is required for the TCEQ to make a determination of the emissions reductions. Contact the dual-fuel coordinator at the TCEQ (1-800-919-8377) with any questions.

16. Test Engine(s)

List the engine make, model, model year, and engine family/test group of the engine or engines used in the tests.

17. Original Engine Test Results (if applicable)

If the converted engine is only capable of operating in dual-fuel mode or test data is otherwise not available for the converted engine in diesel-only mode, list the certified NO_X emissions test rate for the original diesel engine for comparison with the test results for the converted engine. The certified test emission rates are listed in the EPA engine certification tables and on the CARB Executive Orders. If needed, convert grams per kilowatt hour (g/kW-hr) to g/bhp-hr.

If the original engine test results are only listed for NO_X + NMHC (non-methane hydrocarbons), the TCEQ will convert the rate to NO_X-only using a conversion factor of 0.95.

Required Documentation

a. EPA Certificate of Conformity – On-Road (this would only be available if the system is certified under the standards for conversion of a new or relatively new on-road engine).
b. EPA Alternative Fuel Conversion Approval List – On-Road (provide a copy of the page from the EPA approval table listing the approved system).
c. EPA *Field Fix* Approval documents – Non-Road (if applicable).
d. CARB Executive Order (if applicable).
e. Submission/notification form(s) used to request approval from the EPA and/or CARB. Confidential information may be omitted, as long as the documents reflect the information identifying the dual-fuel system and the applicable engines.
f. Test results submitted to the EPA and/or CARB with the submission/notification forms. Confidential data tables and supporting documents are not required, but summary documentation of the test process or protocol and the final emissions test results should be provided. The test results should document the emissions of the converted engine in dual-fuel mode and, if applicable, diesel-only mode.
g. Other information to help the TCEQ understand the function of the dual-fuel system, such as specification sheets for the system.