Diesel Emissions Quantifier (DEQ) Frequently Asked Questions (FAQs)

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Administrative

Logging In

Question: I'm having trouble logging in.

Answer: Close the DEQ and try again. If this doesn't work, delete your internet browser's history and cookies (usually found under "tools") and try logging in. If you still can't log in, please send an email to cleandiesel@epa.gov with "DEQ User Account Problem" in the Subject Line, and include your DEQ user account email. Meanwhile, you can create a new username and password or use the DEQ without logging in.

Question: When I try to access the DEQ, I receive an error message.

Answer: The server that hosts the DEQ can get overloaded when too many users are trying to log on at the same time. DEQ traffic will be high around the close of any National Clean Diesel grant competition.

Try using the DEQ during off-peak hours (early morning, late evening or weekends). Or you can try closing your browser and re-accessing the DEQ using a different browser or without logging in.

If you still can't access the DEQ or cannot get through a calculation without the DEQ sending an error message, send an email to cleandiesel@epa.gov with "Cannot Access or Complete DEQ run" in the Subject Line. Please include a screenshot of the error message and your user account email (if you logged in).

If you can replicate the error message, it's helpful to include all of the inputs entered before the DEQ sent the error message. If you can't replicate the error, please provide a description of the calculation you were trying to make.

Saving Results

Question: Is there a way to save more than three "fleets" in the DEQ under a single login account?

Answer: No. However, each "fleet" (with the exception of marine vessels) can accommodate up to 30 "vehicle groups". Currently, each marine vessel must be a separate "fleet" (each vessel can have up to five marine engines). You may open multiple user accounts, but each account must have a unique email address.

Question: Sometimes when trying to save DEQ results in an Excel format, the data is saved as a text (txt) file. How can I get the results into Excel format?

Answer: The DEQ allows users to save both the Summary Results and Detailed Results in Excel or CSV formats. Sometimes files won't save properly because of the download settings of your browser and/or computer.

If your results are being saved as a text file, re-save or rename the file with an "xls" extension and Excel should be able to open it. If you need the results in CSV format, save in the CSV format directly from the DEQ, instead of saving to Excel and then converting to CSV.

Changing Your Password

Question: How do I change my DEQ password?

Answer: To change your password, go to www.epa.gov/cleandiesel/quantifier, select the "Use the Quantifier" tab, log in, and click on "Edit Profile".

Activating Your Account
Question: I've submitted my account registration information, but I am unable to log in. How does my account get activated?

Answer: You should have received an activation email with a validation link. You must click on this validation link to activate your account.

The activation email may have been caught in your SPAM filter or your email address may have been mistyped on the registration form. If you can't find the activation email in your SPAM filter, try registering the account again.

Occasionally the DEQ server doesn't recognize an email address ending in ".net". We are working to resolve this and suggest that you register with an email address that ends with ".gov, .edu, or .com" if possible.

Uses and Limitations
Light-duty Vehicles
Question: Can the DEQ be used for light-duty projects (i.e. diesel pickups)?

Answer: No. The DEQ calculates emission reductions for medium-heavy and heavy- heavy-duty vehicles only. The Motor Vehicle Emissions Simulator (MOVES) model at www.epa.gov/otaq/models/moves can be used to calculate emission reductions for light-duty or heavy-duty vehicles.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)
Question: Can the DEQ be used to estimate benefits for the Congestion Mitigation and Air Quality Improvement Program (CMAQ)?

Answer: Yes, the DEQ is an estimation tool that may be used for CMAQ planning purposes.

State Implementation Plans (SIPs)
Question: Can the DEQ be used for State Implementation Plan (SIP) calculations?

Answer: No. When the DEQ estimates emission reductions, some default values are used. SIP and conformity calculations require more sophisticated modeling tools that use specific inputs. Please refer to your SIP and conformity guidance documents or contact your regional EPA office at www.epa.gov/cleandiesel/ncdc-cmt.htm for more information.

Fuel Savings/Fuel Economy Benefits
Question: Does the DEQ provide information on fuel savings?

Answer: No. However, when the quantity of saved diesel fuel is input to the DEQ, it can calculate the CO_2 emission reductions.

CO_2
Question: Would replacing an engine reduce CO_2 (carbon dioxide) emissions?

Answer: Maybe. In addition to reductions from burning less fuel, there is a potential for CO_2 reduction from the new engine. Because engines are not currently certified for CO_2, the DEQ relies only the amount of fuel reduced to estimate CO_2 reductions.

C3 Marine
Question: How can I calculate emission reductions for C3 marine engines in ocean-going vessels?

Answer: C3 marine engines are currently beyond the scope of the DEQ. Please see "Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories" at www.epa.gov/cleandiesel/publications.htm for help in calculating these emission reductions or contact EPA's Helpline at 1-877-NCDC-FACTS or cleandiesel@epa.gov.

Black Carbon

Question: Black carbon, also known as elemental carbon, is a potent climate change agent found in diesel particulate matter. Does EPA have plans to include black carbon in the DEQ so its climate change impacts can be estimated?

Answer: The agency is still working on guidance regarding black carbon. At this time, there are no definite plans to include black carbon in the DEQ.

Defaults and Emission Rates

Defaults

Question: Can you provide more information about the DEQ default values?

Answer: The DEQ default values were compiled using various reports and models. For more information, see the DEQ Default Values document at www.epa.gov/cleandiesel/documents/420b10035.pdf.

Question: How does the DEQ calculate the life of a vehicle? Can that value be overridden?

Answer: For on-highway vehicles, the lifetime is set at 30 years based on our modeling. For nonroad applications, the lifetime is usually shorter but will vary depending on equipment type and horsepower. The default values for the life of a vehicle cannot be overridden in the DEQ.

Emission Rates

In November 2010, EPA updated DEQ emission rates for highway/on-road vehicles using data from the Mobile Vehicle Emissions Simulator (MOVES2010) at www.epa.gov/otaq/models/moves. MOVES2010 incorporates a number of significant improvements over the old MOBILE6.2 rates, particularly in baseline emissions, activity data, and calculations used to estimate emissions in real-world driving conditions. For current and future highway/on-road projects, it is ***highly recommended*** that you use the MOVES2010 emission rates by selecting retrofit year of 2011 or later.

Question: Which "Year of Retrofit Action" should I use if my project spans several years, for instance 2008 to 2011?

Answer: We recommend that you use MOVES2010 emissions rates by selecting 2011 or later as the "Year of Retrofit Action" for the entire project, even if the retrofit activity took place before 2011.

Question: What should I do if my project spans 2008 -2011 and my initial calculations used the old MOBILE 6.2 emission rates in the DEQ?

Answer: We recommend that you perform your final calculations using the new MOVES2010 emission rates by choosing 2011 as your "Year of Retrofit Action".

Question: My project has been completed and I've already done my calculations using the old DEQ numbers. Do I need to re-run the DEQ using 2011 as the "Year of Retrofit Action"?

Answer: No. If your project is closed and you have already turned in your final report, there is no need to re-run the DEQ to update the emissions savings.

Question: What happens if I continue to use the old DEQ MOBILE 6.2 emission rates by selecting a "year of Retrofit Action" prior to 2011?

Answer: You will not run into any problems using the DEQ. However, using the old MOBILE 6.2 numbers for your calculations will *severely underestimate* your emission reductions.

Question: Why do DEQ emission factors vary from state to state for the same vehicle(s)?

Answer: The modeling tools used to generate emission factors for the DEQ take into account a variety of state- and county-specific characteristics such as climate, geography, roads, and population. These characteristics affect emission levels, causing them to differ by state and/or county. Neighboring states and counties may see smaller differences than those that are farther apart.

For projects extending beyond a single state, select the state in which the majority of activity will take place.

Question: Can EPA provide the emission factors and methodology used by the DEQ in a spreadsheet format so we can do the calculations ourselves?

Answer: The DEQ derives its emission factors from EPA's standard modeling tools - MOVES2010 for on-highway calculations and NONROAD2008 for non-road calculations. For more information about these factors and models, please visit the MOVES www.epa.gov/otaq/models/moves or the NONROAD www.epa.gov/otaq/nonrdmdl website.

Calculations and Units

Calculations

Question: In calculating lifetime benefits, does the DEQ consider the remaining life of the vehicle or of the emission control device?

Answer: Lifetime calculations are based on the remaining life of the vehicle, not the emission control device. EPA assumes that once a vehicle is retrofitted, it will remain retrofitted until the vehicle is retired.

Question: Why do lifetime emission reductions use a vehicle's *remaining life* instead of the *full life* of the vehicle? For instance, I am replacing a 20 year old school bus with a brand new one. The old bus has 10 years left while the new one has 30. The DEQ shows lifetime emission benefits for only the 10 remaining years of the old bus. Doesn't this underestimate the emissions benefit of my new bus?

Answer: The most the old bus will emit pollutants is its remaining life (10 years) - it will be replaced in 10 years (when its remaining life is over) or some time before then. If it is replaced now (early replacement), the full 10 years of emissions will be reduced. That is the maximum that can be claimed.

Units

Question: Does the DEQ give results in US short tons (2000 pounds), British long tons (2240 pounds) or metric tons (2204 pounds)?

Answer: Short tons.

Question: Can the DEQ separate particulate matter (PM) by $PM_{2.5}$ and PM_{10}?

Answer: No. The DEQ only calculates $PM_{2.5}$.

Use in the Grant Process

Choosing a Calculator

Question: If the DEQ is not a good match for my project, are there other calculation tools I can use?

Answer: You can use any model you wish as long as you explain and document your calculations. Here are some other models for your consideration:

1. Motor Vehicle Emission Simulator (MOVES) for on-road vehicles
   www.epa.gov/otaq/models/moves

2. NONROAD Model for nonroad engines, equipment, and vehicles
   www.epa.gov/otaq/nonrdmdl.htm

3. SmartWay FLEET Tools for freight shippers, logistics companies, and rail, trucks, drayage and multi-modal carriers
   www.epa.gov/smartway/partnership

4. Argonne National Laboratory GREET Model, for estimating vehicle lifecycles and carbon footprints. greet.es.anl.gov

Cost-Effectiveness

Question: How does the DEQ calculate cost-effectiveness?

Answer: Cost-effectiveness can be calculated by the DEQ in two ways. Both calculations are simple and can also be done by hand.

First, the DEQ can provide the dollar per ton of pollutant reduced for the *entire project* (Total Fleet Cost Effectiveness). For this calculation, input the cost of the whole project before you add a "Vehicle Group".

Second, the DEQ can provide the dollar per ton of pollutant reduced for *each unit* (Capital Cost Effectiveness). For this calculation, enter the installation and unit costs per vehicle when you add a technology to your vehicle group.

The Total Fleet Cost Effectiveness for the entire project appears only on the "Results" screen, while the Capital Cost Effectiveness per unit appears both on the "Results" screen and the Summary and Detailed results spreadsheets.

1) **Total Fleet Cost-Effectiveness**
   a) The DEQ totals the entire project funding amounts entered on the first DEQ screen (shown below). This is the **Total Project Cost**.

Enter Fleet Information

Start Over

New

Fleet Name	School Bus
Fleet Type	On Highway/NonRoad
State	Maine

Do you want to estimate the total cost effectiveness of the project? Yes ⦿ No ○

Total cost effectiveness numbers are based solely on the user inputs below

EPA $	200000	Private $	2300	Other $	3333
Other Federal $		Match/Lev. $	25000	Unknown $	1000
CMAQ $		SEP $	0	State $	0
Local $	1500				

b) After the Vehicle Groups have been entered, the DEQ calculates the total lifetime emission reductions by pollutant (NOx, PM, HC, CO, and CO_2) for the entire fleet. This is the **Total Lifetime Tons Reduced.**

c) The DEQ then divides the **Total Project Cost** by the **Total Lifetime Tons Reduced** for each of the five pollutants. The results are shown in dollars/ton *on the bottom of the Emission Results Page*. The results are currently *not* shown in outputs that are downloadable in Excel and CSV formats. However, it is a relatively simple calculation that can be done by hand using DEQ results.

2) **Capital Cost-Effectiveness** is calculated using the installation and unit costs entered in the DEQ screen shown below. It does not include things like project administration costs and overhead.

Capital Cost-Effectiveness is calculated by **adding the Unit Cost and Installation Cost** for each technology and dividing the sum by the **Total Lifetime Tons Reduced** for each of the five pollutants. This value is displayed both on the **Emissions Results page** and the outputs that are **downloadable in Excel and CSV formats.**

Enter Fleet Information

Idle Reduction

- **Fleet Type** On Highway / Non-road
- **State** Kentucky

Edit Fleet | Start Over

Long Haul Idle

- **Quantity** 2
- **Type** On Highway
- **Target Fleet** Long Haul
- **Class/Equipment** Class 8a (33,001–60,000)
- **Model Year** 1996
- **Retrofit Year of Action** 2012
- **Fuel Type** Regular Diesel (ULSD), 15 ppm
- **Fuel Volume** 33334
- **Veh. Miles Traveled** 100000
- **Idling Hours** 2400

New Technology

Technology Type
Emissions Control Devices

Technology
Diesel Oxidation Catalyst

Apply To 2 (out of 2) with no technology

Reduction by Pollutant

NOX % 0
PM % 20
HC % 50
CO % 30
CO2 % 0

Install Cost 1000 $ per vehicle
Unit Cost 6000 $ per vehicle

Save Technology | Cancel

Edit Group | Delete

Health Benefits

Pollutants and Health Effects

Question: Which health effects of diesel $PM_{2.5}$ are included in the cost/benefit calculation in the Health Benefits Module?

Answer: The benefits of reduced diesel emissions are based on avoided incidences of the following:

- Premature mortality
- Chronic bronchitis
- Acute bronchitis
- Upper and lower respiratory symptoms
- Asthma exacerbation
- Nonfatal heart attacks
- Hospital admissions

- Emergency room visits
- Lost work days
- Restricted-activity days

Question: Does the DEQ estimate reductions in total particulate matter or fine particulate matter (PM$_{2.5}$)?
Answer: The DEQ estimates reductions in PM$_{2.5}$ and that is what is used for determining health benefits. For additional information, please refer to the Health Benefits Methodology at www.epa.gov/cleandiesel/documents/420b10034.pdf.

Question: Is diesel particulate matter the only pollutant considered in the Health Benefits Module?
Answer: Yes. There are likely benefits from reducing other pollutants, such as ozone and air toxics, but the DEQ cannot quantify these benefits at this time.

Counties
Question: How do I determine in which counties the emission reductions take place?
Answer: The DEQ requires you to choose one state where the retrofits take place. For projects that span multiple states, such as long-haul trucks and locomotives, select the state where the majority of emissions are generated.

Once the DEQ calculations are completed and you go to the Health Benefits tab, you can allocate the emission reductions among up to five counties (in multiple states). Note that the Health Benefits Module is <u>not</u> asking *whether* pollution from one county is drifting into another; it's asking *where* the vehicles that are reducing their emissions are operating.

Question: My county is "flagged." What does that mean?
Answer: The Health Benefits Module will flag results for counties where there may be an under or over estimate of health benefits due to the migration of emissions into or out of the county.

For counties with a large quantity of emissions flowing **into** the county, the results are flagged with the following message: *Benefits estimates are "flagged" for this county, indicating that we have less confidence in these results due to a large amount of inter-county transport of emissions. The impacts estimation tool may be <u>overestimating</u> the benefits for emission reduction projects in this county, because it has relatively few emissions compared to surrounding areas. As a result, this county is likely to be a net <u>importer</u> of diesel emissions, and air quality is significantly affected by emissions in upwind counties. Please take this increased uncertainty into account when interpreting your results.*

For counties with a large quantity of emissions flowing **out** of the county, the results are flagged with the following message: *Benefits estimates are "flagged" for this county, indicating that we have less confidence in these results due to a large amount of inter-county transport of emissions. The impacts estimation tool may be <u>underestimating</u> benefits for emissions reduction projects in this county, because it has a relatively high density of emissions compared to surrounding areas. As a result, this county is likely to be a net <u>exporter</u> of diesel emissions, and many of the benefits of reducing these emissions are likely to take place in downwind counties. Please take this increased uncertainty into account when interpreting your results.*

Question: When I enter the same data for retrofit projects in different counties, why do I get different health benefits?

Answer: One of the main factors in determining the health benefits from reduced emissions is the proximity of people to where those emissions would have been generated. If a certain level of emission reduction is assigned to a census tract with a larger area, it will result in a lower concentration as the pollution is being spread over a greater area. The opposite is true as well. Assigning emission reductions to a smaller area census tract will result in higher concentrations.

In addition, if a certain level of emission reductions is assigned to a less populated census tract, fewer people will be exposed resulting in a lower concentration ratio. Again, the opposite is true: emissions assigned to higher-populated tracts leads to a higher concentration ratio.

Calculations and Accuracy

Question: How are benefits of reducing diesel particulate matter calculated?

Answer: The Health Benefits Module uses a county "look-up table", which includes estimated benefits per ton of $PM_{2.5}$ reduced for each county in the United States.

The user answers a set of questions about their project. Once the DEQ estimates the emission changes, the Health Benefits Module uses the "look-up table" to estimate the health benefits associated with the $PM_{2.5}$ reductions for the specified county. The combined monetary benefits of avoided mortality and avoided morbidity (i.e. non-fatal illness) for the selected counties are displayed.

As part of the Quality Assurance process, EPA has also developed a table using on-road and nonroad diesel $PM_{2.5}$ source tables. These tables and more are available in the Health Benefits Methodology at www.epa.gov/cleandiesel/documents/420b10034.pdf.

Question: How accurate are the Health Benefits Module estimates?

Answer: The methodology used to estimate health benefits was peer-reviewed both inside and outside EPA and many of the suggestions were incorporated. The module includes data and modeling from several existing EPA tools, such as the National Emissions Inventory (NEI), the National Air Toxics Assessment (NATA), and the Environmental Benefits Mapping and Analysis Program (BenMap).

The benefits reflect reductions only in fine particulate matter. They do not include benefits from the reduction of other pollutants, including air toxics.

The estimates are based primarily on county-level data and do not capture smaller-scale variability, such as living very near a retrofitted diesel source or regularly riding a retrofitted school bus.

The results also do not include the impact of emission sources from Canada or Mexico. Results for border states will not reflect these potentially significant sources of transported emissions.

The results are best used to assess the relative benefits among different locations or retrofit projects.

For a complete discussion of the accuracy of these estimates, please see the chapter titled "Uncertainties, Limitations, and Quality Assurance" in the methodology document at www.epa.gov/cleandiesel/documents/420b10034.pdf.

Outputs and Uses

Question: What information does the Health Benefits Module provide?

Answer: This module provides information on health benefits from reduced exposure to diesel $PM_{2.5}$ emissions.

The DEQ requires users to input detailed information regarding their retrofit projects. The DEQ then calculates the emission reductions for particulate matter (PM), nitrogen oxides (NOx), hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO_2).

The Health Benefits Module allows users to identify the counties where the emission reductions are taking place and to estimate the monetary impact of the resulting health benefits. These estimates are based on the change in fine particle concentrations and do not reflect changes in any other pollutants.

Users can save and export files summarizing the emissions and health effects estimates. There is also a Health Benefits Methodology at www.epa.gov/cleandiesel/documents/420b10034.pdf that explains the methodology used to estimate the health benefits and the limitations of the estimates.

Question: How can this health benefits information be used?
Answer: The Health Benefits Module is a helpful tool for preparing estimates and understanding benefits of specific emission diesel reduction projects. It can help in making informed decisions by comparing the benefits of several diesel retrofit options. It can also provide an estimate of benefits for EPA grant applications and help build public support for such projects. It should _**not**_ be used in the calculation of emission reductions for State Implementation Plan (SIP) or conformity determination.

Cost Benefits (Explanation and Troubleshooting)

Question: Why does the Health Benefits Module use annual costs and benefits?
Answer: Diesel retrofit projects tend to be capital-intensive in the first year due to the purchase and installation of new equipment or parts. The benefits, however, are spread out over many years as people continue to receive health benefits from the reduced emissions.

In order to properly compare costs and benefits, this difference in timeframes must be addressed. We annualize the costs and the benefits so the user can tell at a glance if the benefits outweigh the costs on an annual basis. They also provide an indication of the scale and magnitude of the expected costs and benefits over the lifetime of the project.

Annualized costs are not the out-of-pocket costs in the first year, but what would be paid each year if the out-of-pocket costs were distributed the over the life of the engine. This is similar to the way a mortgage distributes the purchase price of a home over 30 years. If you used a loan to purchase the retrofit technology, the annualized costs are roughly what the loan payments might look like.

Lifetime costs and benefits can be estimated by multiplying the annual costs or benefits by the number of remaining years in the life of the retrofitted vehicle. While the lifetime estimate does not take into account factors such as discount rates for benefits in future years or population growth, it does provide a rough estimate.

Question: Why are there no costs in the "Results" table of the Health Benefits Module?
Answer: The Health Benefits Module estimates the annualized costs from the "install cost" (labor) and "unit cost" (equipment) of the project, which are entered into DEQ's Fleet Information screen under "Add a New Technology." If no cost information is entered, no cost information will appear in the benefits results table.

Please note, funding information can also be entered on the first screen of the DEQ by answering yes to "Do you want to estimate the total cost effectiveness of the project?" These are assumed to be total project costs, including overhead, and *are not used to estimate annual costs*.

Question: I am trying to determine the health benefits for a marine engine repower project. While there are significant PM reductions, why do the benefits come up as $0?

Answer: The health benefits calculation depends on the PM reduction in tons. Sometimes, that reduction may be lower than you realize and the benefits may be so close to zero that they are accidentally truncated. Please download the **Summary Results** for both the DEQ calculation and the Health Benefits calculation in Excel or CSV and send it to cleandiesel@epa.gov

Other

Question: Where can I get more information about particulate matter in diesel exhaust?

Answer: For information about particulate matter, visit www.epa.gov/air/particlepollution

Data Entry

Multiple Technologies

Question: Can I select combined emission control devices like DOC+CCV (Diesel Oxidation Catalyst + Closed Crankcase Ventilation) or DPF+CCV (Diesel Particulate Filter + Closed Crankcase Ventilation)? How about CCV by itself?

Answer: CCV is included under "Emission Control Devices" as DOC+CCV, or DPF+CCV, but it is not listed as a stand-alone retrofit technology. To use CCV as a stand-alone technology, select "Other Emission Control Devices" from the "Technology" menu and enter the reduction percentages provided by the CCV manufacturer.

Question: Can I select multiple technologies such as engine repower with DOC or DPF?

Answer: Some technologies cannot or should not be installed together (e.g. DPFs and Partial Flow filters). However, many technologies can be used at the same time.

To add multiple technologies to a vehicle group, select the first technology and save it to the vehicle group. Then select the second, saving it to the same vehicle group. The screen always returns to the first vehicle group after adding a technology, so if there is more than one vehicle group, make sure the technology being added to the correct group.

Fuel Types

Question: The emission factors for NOx, PM, HC, and CO do not change when I select a different fuel type for my Vehicle Group. Why are these emissions not different for CNG and ULSD?

Answer: Fuel type and volume are used to calculate only CO_2 emissions. This is done by converting non-diesel fuel amounts to diesel-equivalent gallons, and then calculating CO_2 emissions based on the diesel carbon content.

Question: How does the DEQ estimate emission savings for switching from one fuel type to another?

Answer: When you enter the vehicle information on the "New Vehicle Group" screen, select the fuel type being used before the retrofit. Then go to "Add a New Technology," select "Fuel Options" and the fuel type that will be used after the retrofit. You can apply as many additional technologies as you need to.

Question: When I select CNG as the new fuel for my old diesel vehicle, all of the reduction percentages are zero. Why is this?

Answer: The DEQ is primarily designed to calculate emission reductions for vehicles that use diesel fuel (ULSD, LSD, etc). All other fuels (biodiesel, CNG, LNG, etc) are converted by the DEQ to a diesel equivalent ("Calculated Fuel Volume") before any calculations are performed. Currently, the DEQ is not able to provide emission reductions for CNG and LNG fuel conversions because fuel-specific emission factors are not available in all cases. For more information, please visit the Alternative Fuel Conversion website at www.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm

As a workaround for this, create two vehicle groups in the DEQ, one with a baseline engine using diesel fuel, and one with a baseline engine using the new fuel (you would need to know the annual amount of new fuel the used after the conversion, the annual of miles the vehicle would travel, and annual hours it would idle). Comparing the outputs for these two vehicles provides the CO_2 emission reductions from the fuel conversion.

Replacement

Question: Does the DEQ calculate emission reductions for engine replacements?

Answer: Yes. Under "Technology Type," select "Engine Replacement/Repower." Then under "Technology" select "Engine Replacement."

Question: Can the DEQ be used to calculate emission reductions from replacing a diesel engine with electric technology?

Answer: Installing electric technology reduces diesel emissions to zero. To quantify the reductions, start by entering the fleet information. For "Technology Type," select "Emission Control Devices," and for "Technology, " select "Other Emissions Control Devices." In the "Reduction by Pollutant" box, enter 100% for each of the pollutants. The DEQ will quantify the project's emission reductions using reductions of 100 percent.

Question: For engine repower or replacement projects, should "engine replacement/repower" be selected as the technology or should the DEQ be run twice, first with the baseline engine and then with the new engine?

Answer: Please select "engine replacement/repower" as a technology.

Truck Stop Electrification

Question: How are emission reductions determined for Truck Stop Electrification (TSE)?

Answer: The DEQ calculates TSE emission reductions the same way it does for other idle reduction technologies. The best calculations will result from inputting your best estimates of the number and type of trucks that would use the TSE facility, as well as the expected reduction in idle hours.

Trailer Refrigeration Unit

Question: How can I calculate the emissions reduced by replacing a trailer refrigeration unit (TRU) in a box trailer?

Answer: TRUs are not currently a technology option in the DEQ. As a workaround, create a Vehicle Group for the TRU by selecting "Non Road", "Stationary" and "Power Generation". Then select "Engine Replacement" as the technology. Be sure that all Vehicle Group inputs (model year, hp, usage rate, fuel usage, etc) are for the TRU and not for the tractor-trailer.

Uncertainty, Missing Information, Averaging, and Diverse Fleets

Question: We have a project with a variety of fleet components, but we are unsure of the exact vehicles that will be in the program. What should we use for the DEQ calculations?

Answer: If you are unsure of the exact fleet, you should use your best judgment and any past history you have with such a program to make estimates in the DEQ.

Question: What if I don't have all of the information required to use the DEQ?

Answer: The DEQ will self-populate some default values when you select "Get Default Values." Other defaults must be input manually. They can be found in the DEQ Default Values document at www.epa.gov/cleandiesel/documents/420b10035.pdf. You can also make your own estimates; however, using real-life data is highly recommended.

Question: For nonroad vehicles, the DOC unit cost varies depending on engine size. Can we average the costs per unit or must we do a separate run for each application?

Answer: You can either do separate runs for each unit or average them, but the separate runs will give you more precise results.

Question: How do you estimate emissions for a fleet with multiple, diverse vehicles? Must a separate calculation be performed for each vehicle?

Answer: You may generate a report for each vehicle or group of similar vehicles. Alternately, you may run a single report using "average" inputs to minimize the number of runs. Separate runs will give you more precise results. For more information on the best ways to group vehicles and still ensure accuracy, refer to the Appendix of this document.

Question: How do I handle a project with both on-road and nonroad vehicles?

Answer: The DEQ can support multiple Vehicle Groups, including a mix of on-highway and nonroad in the same Fleet. Include the on-road/highway vehicles in one vehicle group and the nonroad in another.

Fleets

Question: Which inputs are for a single vehicle and which are for the entire fleet?

Answer: All of the inputs except for Fuel Volume should be entered for per vehicle or engine. Fuel Volume should be entered as a total for the entire Vehicle Group.

Baseline Emissions

Question: How can I calculate baseline emissions using the DEQ?

Answer: To calculate baseline emissions, begin by entering the information about your fleet. When you "Add a New Technology," select "Emission Control Devices" for "Technology Type" and "Other Emission Control Devices" for "Technology." This will default the reduction percentages to zero and the DEQ will calculate only the baseline emissions. Please note, if you do not add any technology to your fleet, the DEQ will calculate baseline emissions and display them on the Emission Results Screen, but the results won't appear on the DEQ Summary Results spreadsheet.

Question: For engines with OEM catalysts, adding a new retrofit device sometimes requires the removal of the original catalyst. How does the DEQ take the removal of the catalyst into consideration when calculating emission reductions?

Answer: The DEQ's baseline emission factors are always based on certified engine configurations, which include OEM catalysts. Whether a retrofit device is added to a vehicle with an OEM catalyst or to a

vehicle that has had the catalyst removed to accommodate a new device, the DEQ calculates emission reductions from the certified OEM baseline. Please keep in mind that project can only claim emission reductions from a vehicle/engine's certified baseline.

Idle Reduction

Question: Are idling hours included in the nonroad "Usage Rate"?

Answer: Idling hours are included in the default "Usage Rate" for nonroad vehicles. If you are entering actual "Usage Rate" hours, be sure to include idling hours.

Question: The idle reduction technologies display emission reductions for NOx, PM, and CO_2 only. What about HC and CO?

Answer: Although idle reduction technologies may reduce HC and CO emissions, idling emission factors are available only for NOx, PM, and CO_2 and only for on-highway vehicles.

Question: When calculating emission reductions for idle reduction technology, the reduction percentages that populate the input screen are not the same as those shown on the downloaded spreadsheet. Why?

Answer: For on-highway vehicle calculations, the DEQ uses two sets of emission factors, idle emissions and running emissions. When a user applies an idle reduction technology, the reduction percentages that populate the input screen reflect *only* the idle emissions. The downloaded spreadsheet shows the reduction percentages for both idling *and* running emissions. For instance, an idle reduction technology may reduce a vehicle's idle emissions by 90%, but it may reduce the vehicle's overall emissions by only 10%. This will vary based on the vehicle idling hours relative total usage hours.

Maintenance and Operating Costs

Question: How can I include project maintenance and operating costs in the DEQ estimates?

Answer: These costs do not have specific input fields in the DEQ. They may be included as part of the total project costs.   Enter them as part of the total funding on the first screen by answering "yes" to the question "Do you want to estimate the total cost-effectiveness of the project?".

Vehicle Definitions and Classes

Question: How does the DEQ define a bus? Does it include hotel or airport shuttles?

Answer: The DEQ calculates emission for only medium heavy-duty and heavy heavy-duty vehicles (Classes 5-8). This includes school buses and transit buses. Shuttle buses are usually Class 4 or 5, but please verify this is the case for your specific fleet. For a more information on vehicles and weight classes, please see the DEQ Default Values document at epa.gov/cleandiesel/documents/420b10035.pdf.

Question: Where can I find the definition of the different vehicle classes? Are they the same as DOT classes?

Answer: For highway vehicles, medium heavy-duty and heavy heavy-duty vehicles are included in the DEQ. The classes are defined by US DOT by gross vehicle weight rating (GVWR).

- Class 5; 16,001 - 19,500 lbs GVWR
- Class 6; 19,501 - 26,000 lbs GVWR
- Class 7; 26,001 - 33,000 lbs GVWR
- Class 8a; 33,001 - 60,000 lbs GVWR
- Class 8b; 60,001 lbs GVWR and over

For further definitions of vehicles and weight classes, please see the DEQ Default Values document at epa.gov/cleandiesel/documents/420b10035.pdf.

Verification Information
Question: Does EPA have a list of engine family names that have been approved for verified products?

Answer: No. Unlike CARB, EPA does not issue a list of engine family names for each technology that has been verified. Please refer to the Verified Technology Listing at www.epa.gov/cleandiesel/verification/verif-list.htm#retrofit for specific engine model applicability and general operating criteria. Engine certification data, including engine family names, are available at www.epa.gov/otaq/certdata.htm#largeng

Input Errors
Vehicle Groups

Question: I get the following error message when I try to add a vehicle group to a saved fleet: *"An Unexpected Error has Occurred. We are sorry, the Diesel Emissions Quantifier has experienced an unexpected error. The details of this error have been logged and the development team has been notified. If you left your browser inactive for over 30 minutes, this error is due to your session timing out."* What should I do?

Answer: If possible, take a screenshot of the error page and send an email to cleandiesel@epa.gov, with "Could not Update Saved Fleet" in the subject line. Also include as much info as you can about the inputs you entered, info about the vehicle group, etc, as well as your DEQ user email. Meanwhile, try logging out, closing the browser and then logging back in again. You can also try running the DEQ without signing.

Question: Is there a limit to how many Vehicle Groups can be included in one Fleet? I have entered 47 Vehicle Groups and when I try to quantify emissions, I get an error message saying the DEQ is experiencing an error.

Answer: We recommend that you keep the number of Vehicle Groups under 30.

Model Year
Question: Sometimes the DEQ does not allow me to select a specific model year for my vehicles.

Answer: Depending on the vehicle type, the DEQ may assume that only certain model years are able to be retrofitted. If the model year of your vehicle is not displayed as an option, select the closest model year that is available.

Horsepower
Question: The DEQ does not list the horsepower of my nonroad vehicle. The nearest available horsepower option is either too high or too low. What should I do?

Answer: We recommend using the closest available horsepower option. At this time, the DEQ does not have data for every available horsepower, as data collection and approval of emission factors may take years.

Replacement (Engine and Vehicle)
Question: How do I calculate emission reductions for vehicle replacement using the DEQ?

Answer: The DEQ does not offer an option for vehicle replacement. To calculate emission reductions for a vehicle replacement project, please select "Engine Replacement" for "Technology Type".

Technologies

Question: If idle reduction is not an option for nonroad equipment, how can I quantify emission reductions for automatic shutdown devices on nonroad vehicles?

Answer: At this time the DEQ does not support idling strategies in nonroad engines. Please consider using another calculation method.

Question: When using the DEQ, only technologies that have been verified are listed. How can I include an Emerging Technology in the calculations?

Answer: Please refer to the Emerging Technology List at www.epa.gov/cleandiesel/verification/emerg-list.htm and manually input the projected emission reductions for PM NOx, HC and CO.

Question: The emission reduction results for several technologies I'm using, such as direct fired heaters, are 0%. What might be the problem?

Answer: If the "Idle Hours Reduced" was left blank, then you will get 0% reductions. Be sure to enter the number of idle hours in this field.

Fuels

Question: How do I calculate emissions reductions if the fuel blends we are using, like high blends of Biodiesel plus ULSD, are not listed?

Answer: The DEQ results are estimates, so please select the option that is closest to your real-world situation.

Question: The DEQ has selections for B-20 and B-100 but nothing in between. The National Clean Diesel RPF indicates that any blend of Biodiesel (B-5 to B100) is eligible. How do I calculations on something other than B20 and B100?

Answer: The DEQ can't accommodate blends other than B20 and B100 at this time. You may select the option that is closest to the fuel you are using or use another calculation tool more geared to fuels.

Question: My organization has 20 trucks and we'll be replacing the engines in 10 of them. For the "Fuel Volume" for the fleet, do we enter the total fuel consumed by the 20 trucks in the fleet or just the 10 that are going to be replaced?

Answer: Create a Vehicle Group of 20 vehicles, then select "Engine Replacement" and apply it to 10 of the 20 vehicles. For "Fuel Volume", enter the combined fuel consumption for the entire Vehicle Group (all 20 trucks).

Currently Documented Errors

The DEQ is an estimation tool only and users may not be able to quantify all possible scenarios. EPA suggests you familiarize yourself with the options. These are outlined in

- Health Benefits Methodology www.epa.gov/cleandiesel/documents/420b10034.pdf
- Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories www.epa.gov/cleandiesel/publications.htm#ports.

If the DEQ is not a good fit for your project, you may want to download the emission factors from www.epa.gov/otaq/nmim.htm and make your own calculations. You can also use other available data

sources.   If you are using the DEQ for a DERA application, you can use any documented methodology to calculate emission reductions as long as you cite the source in the application.

Below are some common errors and suggested work-around solutions. If the problem you are encountering is not listed, please log out, restart the DEQ, and try again. If the error occurs again, please send your inputs and error message (screen shot or copied and pasted) to cleandiesel@epa.gov.

Problem: I can't log in to my user account.
Solution: Send an email to cleandiesel@epa.gov with the subject line "User Account Problem" and include your log-in email. Meanwhile, you can create a new user account using a different email address.

Problem: My previously saved scenarios are not working.
Solution: Due to updates to the DEQ structure, some saved scenarios may no longer work properly. If you encounter this, please delete the old Fleets and recreate them. In some cases, users are able to access a saved Vehicle Group, but are not able to quantify it. This can be fixed by deleting the existing technology, re-entering it, and then clicking on "Quantify Emissions."

Problem: I can't find Total Cost-Effectiveness on the exported Results spreadsheets.
Solution: Total Cost-Effectiveness is displayed on the Summary Results screen, but it is not yet available on the spreadsheets. Please refer to the screen directly after clicking "Quantify Emissions," or calculate yourself:

- The DEQ calculates *Total Cost-Effectiveness* by taking the total project funding and dividing it by the total Lifetime Tons Reduced of each pollutant.
- The DEQ calculates *Capital Cost-Effectiveness* by taking the total Unit Cost and Installation Cost for *each technology* added and dividing that by the Lifetime Tons Reduced for each pollutant.

Problem: The Lifetime Emissions equal the Annual Emissions.
Solution: Based on our modeling, the DEQ uses standard lifetimes for vehicles and non-road equipment, even though they may be used longer. The DEQ assumes if a vehicle is older than its standard life, its remaining life is just one year, resulting in Lifetime Emissions equaling Annual Emissions. One work-around is to multiply the Annual Emissions by your estimate of the vehicle's remaining life.

Appendix: Grouping Vehicles for Calculations in the DEQ

The DEQ is designed to provide emission reduction estimates for a variety of fleet and technology options. If your project has a mix of vehicle and engine types, you do not have to run the DEQ for each vehicle. You can divide the fleet into several groups and run the DEQ several times. The following guidelines are based on the on-road and nonroad emission standards. For more information, see
- On-Highway Heavy Duty Compression Ignition Exhaust Certification Emission Standards
www.epa.gov/otaq/standards/heavy-duty/hdci-exhaust.htm
- Non Road Compression Ignition Exhaust Emission Standards
www.epa.gov/otaq/standards/nonroad/nonroadci.htm

1) First, separate the DEQ Calculation Groups for multi-sector projects into Highway/On-road, Nonroad, and Marine. Marine retrofits require a separate DEQ run for each vessel, so the following will apply only to Highway/On-road and Nonroad vehicles.

   a) On Highway.

      i) First, group all on-highway vehicles into their respective Target Fleets:
         (1) City/County Vehicle
         (2) Delivery Truck
         (3) School Bus
         (4) Transit Bus
         (5) Refuse Hauler
         (6) Emergency Vehicle
         (7) Long Haul
         (8) Short Haul

      ii) Within each Target Fleet, group vehicles based on the Class/Equipment:
         (1) School Buses
         (2) Transit Busses
         (3) Class 5
         (4) Class 6
         (5) Class 7
         (6) Class 8a
         (7) Class 8b

      iii) Next, divide the Class/Equipment groups by the following Model Year ranges (based on the On-Highway PM level emission standards) :
         (1) Pre-1987
         (2) 1988-1990
         (3) 1991-1993
         (4) 1994-1997
         (5) 1998-2003
         (6) 2004-2006
         (7) 2007-2010

iv) Finally, within each Model Year group, divide your vehicles based on the type of retrofit technology that will be applied (i.e. Diesel Oxidation Catalyst + CCV, Engine Replacement, etc)

b) Nonroad (non-marine vessels/engines)
   i) First, group all nonroad vehicles into their respective Target Fleets:
      (1) Agriculture
      (2) Construction
      (3) Ports and Airports
      (4) Rail
      (5) Stationary

   ii) Within each Target Fleet, divide the vehicles based on the Class/Equipment (too many to list here, and realize that some nonroad equipments can overlap so you could have fewer groups than you realize).

   iii) Within each Class/Equipment group, divide by the following Horsepower/Model Year combinations (based on nonroad emission standards for NOx, PM, NMHC+NOx and CO):
      (a) <11 hp and pre-2000 (Tier 0)
      (b) <11 hp and 2000-2004 (Tier 1)
      (c) <11 hp and 2005-2010 (Tier 2)
      (d) 11≤ hp <25 and pre-2000
      (e) 11≤ hp <25 and 2000-2010
      (f) 25≤ hp <50 and pre-1999
      (g) 25≤ hp <50 and 1999-2003
      (h) 25≤ hp <50 and 2004-2010
      (i) 50≤ hp < 100 and pre-2004
      (j) 50≤ hp < 100 and 2004-2010
      (k) 100≤ hp < 174 and pre-2003
      (l) 100≤ hp < 174 and 2003-2010
      (m) 174≤ hp < 301 and pre-1996
      (n) 174≤ hp < 301 and 1996-2002
      (o) 174≤ hp < 301 and 2003-2010
      (p) 301≤ hp < 603 and pre-1996
      (q) 301≤ hp < 603 and 1996-2000
      (r) 301≤ hp < 603 and 2001-2010
      (s) 603≤ hp < 750 and pre-1996
      (t) 603≤ hp < 750 and 1996-2001
      (u) 603≤ hp < 750 and 2002-2010
      (v) > 750 hp and pre-2000
      (w) > 750 hp and 2001-2010

   iv) Finally, within each Horsepower/Model Year group, divide your vehicles based on the type of retrofit technology that will be applied (i.e. Engine Replacement, Engine repower, Hybrid Replacement, etc.)