

Proposition 1B: Goods Movement Emission Reduction Program **Directions: Benefits Calculators**

Heavy Duty Diesel Trucks

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To: User

This document, and the corresponding calculators, includes methodologies for estimating the emission benefits and cost effectiveness of projects identified in the “Guidelines for Implementation.” If there are additional projects that you would like to estimate benefits for that are not included in the calculators please contact us for guidance. We recommend you print out these directions in color.

Truck Emissions Benefit Calculator (for Class 7 and Class 8)

This calculator allows a user to estimate the weighted emissions benefit of a proposed truck project funded under the \$1B Goods Movement Emission Reduction Program. Included below are the methodology and directions for filling in each field necessary for the emission benefit estimation.

Methodology

The methodology presented below comes from the adopted Regulation to Control Emissions from In-Use On-Road Diesel-Fueled Trucks. Emissions from trucks are the product of population (by model year), annual accrual (miles/year), and pollutant and model year specific emission rates (grams/mile). To estimate the project emissions benefit, the emissions from the existing truck(s) and replacement truck(s) are calculated. The difference between the two is the benefit of that project. See example below:

Calendar Year (CY) 2012: Local Agency A proposes to replace 75 1998 diesel Class 8 trucks with 2007 diesel Class 8 trucks. Fleet records indicate that the trucks accrue 30,100 miles/year.

PM Emission Rate (1998 Model Year in CY 2012) = 0.66 grams/mile

PM Emission Rate (2007 Model Year in CY 2012) = 0.10 grams/mile

Benefit Calculation for Calendar Year 2012

Emissions (75 1998 Model Year Trucks) = $75 * 0.66 \text{ grams/mile} * 30,100 \text{ miles/year} = 1,489,950 \text{ grams/year} * (1 \text{ lb./}454 \text{ grams}) * (1 \text{ ton/}2000 \text{ pounds}) = 1.64 \text{ tons/year}$

Emissions (75 2007 Model Year Trucks) = $75 * 0.10 \text{ grams/mile} * 30,100 \text{ miles/year} = 225,750 \text{ grams/year} * (1 \text{ lb./}454 \text{ grams}) * (1 \text{ ton/}2000 \text{ pounds}) = 0.25 \text{ tons/year}$

PM Benefit of replacing 75 1998 diesel trucks with 2007 diesel trucks in CY 2012

PM Benefit = $1.64 \text{ tons/year} - 0.25 \text{ tons/year} = 1.39 \text{ tons/year}$

This process is repeated for the next four years (project life is 5 years). The total PM emission reductions by replacing 75 engine model 1998 trucks is calculated by summing reductions for each of the 5 years starting in 2012. The same process is repeated for NOx emissions.

Cost-effectiveness of each project is calculated by computing the total weighted emission reductions (NOx + 20*PM) over the project life and then dividing by the State contribution.

Directions

The truck benefits calculator contains the following tabs. Each tab will be described in greater detail below.

Table 1: Summary of all the worksheets in the calculator

TAB	DESCRIPTION
Directions	Provides directions on using the calculator to calculate emissions reductions for various project options.
Sample Inputs	This tab contains sample projects with sample inputs.
Input Data	In this tab the applicant or the local agency will input the data necessary for the emissions benefit estimation for each truck project.
Benefits Summary	This tab contains a summary of the PM and NOX emissions benefits by project ID. It also provides the CE for each project. Also provided is a summary of the total for all the projects input into the Input Data tab.

“Input Data” Tab

In order to estimate the emissions benefit of a proposed project, information on each project must be entered into the "Input Data" tab of this calculator. These inputs as described in Table 2 below may include: project calendar year, project type, existing truck engine model year, truck class type, and annual VMT in California. Pull down menus are provided in most cells to assist users in selecting an appropriate option for each cell. The "Sample Inputs" tab provides sample proposed projects with the correct inputs for those projects.

ONLY INPUT DATA IN THE "INPUT DATA" TAB.

Inputs in **RED** must be filled out - inputs in **BLUE** can be left blank if no information exists.

Table 2: "Input Data" Tab - Input Data Fields and Descriptions

PROJECT DETAILS	Project Name	An ID that is unique to each vehicle/engine or each vehicle/engine group. This ID can be any value/character the user chooses. No two projects should have the same ID and each project should be input in a single row.
	First Year of Operation	Project calendar year (valid entries: 2012-2016) - this is the calendar year the project will be in use and operational. The same calendar year should be used for all applications.
	Project Option - Detailed	What is the project type? The list includes retrofits, repowers, replacements and 3-Way Truck transactions. See Appendix A for updated project specifications (March-April 2011). For 2-for-1 replacements, use "Replacements" and then fill the 2nd truck details in appropriate columns in the Input Data sheet.
EXISTING TRUCK ENGINE	Drayage Truck (Y/N)	If the existing truck is a drayage truck select "Yes", otherwise select "No".
	Engine Model Year	Model year of the existing truck engine to be replaced, repowered, or retrofit.
	GVWR	Gross Vehicle Weight Rating. Requires user to select a Class 7 (26001-33000) or Class 8 (33001-higher) vehicle.
	DPF Installed?	Requires user to input if existing truck has any retrofits: Level 1 PM (25% PM reduction), Level 2 PM (50% PM reduction), Level 3PM (85% PM reduction), Level 3PM+ Mark 1 NOX (85% PM + 25% NOX reduction) or none.
	CA VMT	Project applicant to input annual miles traveled in California for existing vehicle. For 2-for-1 options or 3-way truck options, input only the VMT for the 1st truck in this cell (for 3-way, it is Truck A).
3-WAY TRUCK OR 2 TRUCK FOR ONE OPTION	2 Trucks being replaced by one?	Prop 1B offers an option for two old trucks from a fleet (or other source) be scrapped and replaced by a new truck funded by Prop 1B. If this is the case, then user needs to select "Y" for this column. If not, user needs to choose "N".
	DPF on 2nd Truck or Truck B of 3-Way?	Requires user to input if existing project has any retrofits: Level 1 PM (25% PM reduction), Level 2 PM (50% PM reduction), Level 3PM (85% PM reduction), Level 3PM+ Mark 1 NOX (85% PM + 25% NOX reduction) or none. This needs to be input only if selecting a 3-way truck option or a 2-for-1 truck option. Also, this is for the 2nd truck in a 2-for-1 option or for Truck B in a 3-way option.
	Drayage Truck for 2nd Truck or Truck B?	If the existing second truck (or Truck B in a 3-way) is a drayage truck select "Yes", otherwise select "No".
	Engine Model Year of 2nd Truck or Truck B (3-Way Project)	Model year of the existing truck engine to be replaced, repowered, or retrofit. This is for the 2nd truck of a 2-for-1 project or for Truck B in a 3-Way Truck project.
	GVWR of 2nd truck or Truck B	Gross Vehicle Weight Rating. Requires user to select a Class 7 (26001-33000) or Class 8 (33001-higher) vehicle.
	Annual CA VMT for 2nd Truck or Truck B	Project applicant to input annual miles traveled in California for the second truck in a 2-for-1 option for Truck B in a 3-way option.

Directions: Proposition 1B GMERP Benefit Calculators

REPLACEMENT/ REPOWER TRUCK ENGINE	<u>GVWR</u>	Gross Vehicle Weight Rating of Replacement truck. Requires user to select a Class 7 (26001-33000) or Class 8 (33001-higher) vehicle.
	Fuel Type	Fuel type used for replacement/repowered truck (valid entries: diesel, LNG/CNG, Hybrid, Electric)
	% CA Operation proposed	Prop1B now offers the option to allow projects that operate 90% of their annual miles in California with new trucks funded with Prop 1B grants. This is where users opt for this choice if selected by the applicant. The options are either 100% or 90%.
	<u>NOx Cert Level</u>	For the 08-09 Grants, Prop1B requires applicants to only select one of three NOx CERT level engines for funding for new or repowered trucks. The three levels are 1.2, 0.5 and 0.2 g NOx/bhp-hr. The applicant does not have to choose the engine model year for the replacement or repowered truck at the time of application.
PROP 1B AND OTHER FUNDING DETAILS	Total Project Cost (\$)	What is the total cost of the project (\$).
	Prop 1B funding for Truck B (3-Way-Truck)	The Bond program contribution to the project (\$) for retrofitting truck A in a 3-way project. Leave blank if not applicable.
	Prop 1B Investment (\$)	The Bond program contribution to the project (\$) for a retrofit, repower, or replacement. The input here does not include the retrofit funding for Truck A in a 3-Way Project.
	Local	Details of funding \$\$ from local agencies.
	Private	Funding from private sources (applicant, loan, etc.)
	AB118	Funding from AB 118 (Greenhouse Gas Incentives)
	Other State	Other State Funds. Input only if other (non AB 118) State sources of funding are used in addition to Prop 1B.
Project Life (Years)	The length of time an equipment owner is obligated (under an equipment project contract) to maintain and operate the bond-funded equipment according to the requirements of the program.	

Special Note for Three-Way Transactions - For all three-way transactions please list Truck A first, followed by Truck B in the input sheet (see example). This is critical because cost effectiveness calculations are based on these projects arranged in that manner on the spreadsheet. The cost effectiveness is calculated by adding the benefits from both Truck A and Truck B and dividing by the State contribution for the replacement of Truck A.

“Sample Inputs” Tab

The examples in this tab will provide guidance for inputting data into the “Input Data” tab. Four sample project inputs and emission reductions have been provided for illustration.

“Benefits Summary” Tab

The “Benefits Summary” tab contains an automatically updated table of the PM and NOX emissions benefits and cost effectiveness by project name, project year, project type, and state investment for the entire contract life of that project. An overall emission benefits and cost effectiveness for all the projects is also provided at the top of this tab.

Emissions Benefits Summary

This tab provides the emissions benefits (PM and NOX) for each proposed project. If **"FALSE"** or "N/A" or "#VALUE" or "0" appears in the table there is an invalid project entry.

Total State Investment (\$)	Total PM Benefits (lbs.)	Total NOX Benefit (lbs.)	Cost Effectiveness NOX+20*PM (lbs./State \$)
\$ 150,000	2,796	28,749	0.56

EMISSIONS BENEFITS AND COST EFFECTIVENESS FOR ALL PROJECTS

Project Name	Project Calendar Year	Project - Detailed	State Investment (\$)	Total PM Benefits (lbs.)	Total NOX Benefits (lbs.)	Cost Effectiveness NOX+20*PM (lbs./State \$) Retrofit, Repower & Replacement
Example 1	2012	Replacement	\$ 40,000	1,026.38	7,335.17	0.70
Example 2	2012	Replacement	\$ 40,000	1,361.74	12,811.65	1.00
Example 3	2012	Level 3 PM Retrofit	\$ 5,000	85.01	0.00	0.34
Example 4	2012	3-Way Truck	\$ 65,000	323.05	8,602.30	0.23

Data Sources

Emission factors for diesel heavy duty trucks are based on in-use testing of Class 7 and Class 8 diesel trucks, which is different than certification data. The emission factors were obtained from the On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Since similar data is not available for CNG/LNG trucks, diesel emission rates were used for these alternatively fueled engines (model years 2007 and newer). This methodology will still account for the additional benefits of an LNG/CNG heavy duty truck meeting 2010 standards over a diesel heavy duty truck meeting 2007 standards. For a hybrid truck, 25% NOx credit is provided (compared to its diesel counterpart) in alignment with AB 118.

Shore Power Emissions Benefit Calculator

This calculator allows a user to input information about vessels visiting berth and estimate the emissions benefits of a proposed project funded under the \$1B Goods Movement Emission Reduction Program. Included below are the methodology and directions for filling in each field necessary for emissions benefit estimation. Where data is not provided an ARB fleet average default will be used.

Methodology ("Project Calcs")

The methodology presented below comes from the adopted Regulation to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels while at Berth at a California Port. Emissions benefits of a proposed shore power project are a function of the type of vessels that call to the berth and how long they hotel while at the berth. Emissions from ocean-going vessels are calculated by multiplying the population, frequency of berth visits, hoteling time per visit (hours/year), power, load factor and fuel specific emission rates (grams/kW-hr). To estimate the project emissions benefits the emissions from the existing vessels using diesel fuel and the existing vessels using grid/non-grid power are estimated. The difference between the two is the benefit of that project. See example below:

Calendar Year 2014: Local Agency F proposes to install grid power at a particular berth. Local Agency F also proposes to make ship modifications to 2 container vessels.

These container vessels have the following characteristics and are projected to visit the berth 10 times a year in 2014 using grid power.

Container Vessel Size	Total Aux Power (kW) per engine	In-Use Aux Power (kW) per vessel	Fuel Type	Total # Vessel Visits to Berth per vessel	Ave Hoteling Time per visit (hours) per vessel
Container <2000 TEU	5,200	1,000	Marine Distillate @ 0.1% Sulfur	10	40

PM Emission Rate (Marine Distillate Fuel @ 0.1%) = 0.25 g/kW-hr

PM Emission Rate (Grid Power) = 0.01 g/kW-hr

Load Factor = Net Hoteling Load/Total Power

Benefit Calculation for Calendar Year 2014

Emissions (2 Container Vessel at <2000 TEU using Marine Distillate Fuel)

Emissions = 2 vessels*5200 kW*(1000 kW/5200 kW)*10 visits/year*40 hours/visit*0.25 g/kW-hr= 200,000 grams/year*(1 lb/454 grams)*(1 ton/2000 pounds) = 0.22 tons/year

Emissions (2 Container Vessel at <2000 TEU using Shore power (Grid))

Directions: Proposition 1B GMERP Benefit Calculators

Emissions = 2 vessels*5200 kW*(1000 kW/5200 kW)*10 visits/year*40 hours/visit*0.01 g/kW-hr= 8,000 grams/year*(1 lb/454 grams)*(1 ton/2000 pounds) = 0.008 tons/year

Benefits of replacing using Shore power for 2 Container Vessels (<2000 TEU size)
Benefits = 0.22 tons/year - 0.008 tons/year = 0.212 tons/year

Cost-effectiveness of each project is calculated by dividing the weighted emissions reductions (NOx + 20*PM) over the project life by the State contribution.

Directions

The truck benefits calculator contains the following tabs. Each tab will be described in greater detail below.

Table 3: Summary of all the worksheets in the calculator

TAB	DESCRIPTION
Benefits Summary	This tab contains a summary of the PM and NOX emissions benefit by project ID
Sample Inputs	This tab contains sample projects with sample inputs.
Berth Input Data	In this tab the user will input the necessary information for the Berth.
Input Data QA	This tab provides information on whether the proposed project meets compliance or guidelines. See the "Guidelines for Implementation".
Inputs	In this tab the user will input the necessary information for the Vessels visiting the berth. There are vessel inputs tabs for all critical compliance years.
Calc Inputs	These tabs organize the data inputted by the user (in the Vessel Inputs tab) for emissions benefit calculations. Fields left blank that are necessary for benefit calculations will be replaced with default data.
Calcs	These tabs provide the year by year and total benefits for PM and NOX.
Defaults and EFs	This tab provides the information used for emissions benefits calculations including emission factors, load factor, etc. It also contains the default data used when the user cannot provide information critical for benefit calculations. The data included in this tab are consistent with the Shore Power Regulation.

“Berth Input Data” and “Input” Tabs

In order to estimate the emissions benefits of a proposed project information on each project must be entered into the "Inputs" tab (yellow tab) and "Berth Input Data" tabs in this calculator. Each user should provide the necessary information for each project. The necessary inputs are described in Tables 6 and 7 below. Where no information is available leave the field blank. The "Sample Inputs" tab provides sample proposed projects with the correct inputs for those projects.

**ONLY INPUT DATA IN THE "Inputs" or the "Berth Input Data" TABS.
 ONLY ONE BERTH PER CALCULATOR. ADDITIONAL BERTHS SHOULD BE ON
 SEPARATE SHOREPOWER CALCULATORS.**

Inputs in RED must be filled out - inputs in BLUE can be left blank if no information exists.

Because this calculator is only set up to estimate the emissions benefits of one berth there is one "Berth Input Data" tab. There are multiple "_Inputs" tabs. These tabs correspond to compliance years established in the "Guidelines for Implementation" (2012, 2014, 2017 and 2020 for Grid Power and 2012, and 2014 for Non-Grid Power). The total benefits for the project life will be estimated by using the Benefits Schedule provided in the "Benefits Summary" tab.

Table 4: "Berth Inputs Data" Tab - Input Data Fields and Descriptions

Grant Number	The grant agreement number between ARB and the local agency
Solicitation Name	Name of the solicitation through which application was collected
First Operational Year	The first year the berth will be operational and vessels visiting the berth using shore power
Berth Name	An identification number given to the berth. This ID can be any value/character that the user (ex. local agency) chooses.
Port	The port where the berth is located
Replacement Power	The type of shore power project (i.e. grid or non-grid)
If Non-Grid, what is the power of the unit (megawatts)	If the proposed project is for non-grid based power the unit's power, in megawatts, must be inputted here.
Total Eligible Cost (\$)	Total of the eligible shoreside costs of installing grid power or purchasing non-grid unit.
Prop1B Investment (\$)	The Bond program contribution (\$)
Number_of_Non_Bond_funding_Source	How many sources of non-Bond funding will the equipment project have? If more than 3, enter more columns to end of spreadsheet
Non_Bond_Funding_Type#1	Acceptable entries: Private Local Federal Other State

Directions: Proposition 1B GMERP Benefit Calculators

Non_Bond_Funding_Source#1	Name/Description of non-Bond funding source
Non_Bond_Amount#1	Amount of non-Bond funding
Non_Bond_Funding_Type#2	
Non_Bond_Funding_Source#2	
Non_Bond_Amount#2	
Non_Bond_Funding_Type#3	
Non_Bond_Funding_Source#3	
Non_Bond_Amount#3	
Performance Compliance Option (Grid Power ONLY)	Applicant must choose at the time of application or prior to rank list approval option for counting total visits. Option 1 includes visits by regulated vessels only while Option 2 includes visits by all vessels
Projected Annual Visits to Berth (Grid Power ONLY)	If choosing Grid power what is the projected number of vessel visits (annual) for berth for calendar years 2012, 2014, 2017 and 2020. This includes both vessels that will be using shore power and those that will not be using shore power.

The following inputs will allow the user to enter information on each unique vessel that visits the berth and uses shore power. If you are a local agency and have not yet identified the existing berth or terminal please input information for the vessels that will likely visit the berth. For this purpose we have added a vessel population input.

Table 5: "Inputs" Tab - Input Data Fields and Descriptions

Vessel Type	The type of vessel that will be visiting the berth and using shorepower
Vessel Population	The population of that vessel type that will be visiting the berth and using shorepower
Container Vessel Size	If the vessel is a container, the size of the container vessel (in TEU capacity)
<u>Total Aux Power (kW) per vessel</u>	Total auxiliary power (kW) per vessel
<u>In-Use Aux Power (kW) per vessel</u>	The auxiliary power (kW) used per vessel
Fuel Type*	Fuel type is fixed at Marine Distillate @0.1% Sulfur
Total # Vessel Visits to Berth per vessel	The number of times the vessel will visit the berth and use shorepower in a given year.
<u>Avg Hotelling Time per visit (hours) per vessel</u>	The amount of time the vessel will spend hotelling per visit (hours/visit). Note this value will be adjusted for the time allowed under the regulation for "limited engine use."

The "Berth Input Data" tab is where all input data on the proposed berth should go. There are drop down menu options for hailing port and replacement power.

The "Inputs" tabs are where all input data on the vessels visiting the proposed berth using shore power should go. There are drop down menu options for vessel type, vessel size, and fuel type. All other inputs can have any range of values. The user is required to input vessel data for all critical compliance years; therefore, there are four tabs for Grid power and 3 for Non-Grid power. These tabs are labeled as follows:

2012 Grid | 2012 Non-Grid Inputs: In this tab the user will input vessel data for the critical compliance year of 2012 for grid power or non-grid power.

2014 Grid | 2014 No-Grid Inputs: In this tab the user will input vessel data for the critical compliance year of 2014 for grid power or non-grid power.

2017 Grid Inputs: In this tab the user will input vessel data for the critical compliance year of 2017 for grid power.

2020 Grid Inputs: In this tab the user will input vessel data for the critical compliance year of 2020 for grid power, no information is required for non-grid power.

"Sample Inputs" Tab

The examples in this tab will provide guidance for inputting data into the "Input Data" tab. Samples and correct inputs are provided in the appendix to this document.

“Benefits Summary” Tab

The “Benefits Summary” tab contains an automatically updated table of the PM and NOX emissions benefits and cost effectiveness for the proposed berth for the term of the contract.

Project Emissions Benefits Summary				
This contains an <u>automatically</u> updated table of the PM and NOX emissions benefits and cost effectiveness for the proposed berth for the term of the contract.				
Total State Investment (\$)	Total PM Benefits (lbs)	Total NOX Benefits (lbs)	Cost Effectiveness NOX+20*PM (lbs:State \$)	
\$ 2,500,000	17,648	1,034,001	0.555	

Benefits Schedule - Grid								
Year	Calendar Year	PM (lb)	NOX (lb)	Compliance Calendar Year	Grid - Applicable Calendar Years	Non-Grid - Applicable Calendar Years	PM (lb)	NOX (lb)
1	2014	145	8,495	2012 Grid 2012 Non-Grid	First Operational Year-2013	2012-2013	-	-
2	2015	145	8,495	2014 Grid 2014 Non-Grid	Years 2014-2016	2014 and beyond	145	8,495
3	2016	145	8,495	2017 Grid	Years 2017-2019		291	17,056
4	2017	291	17,056	2020 Grid	Years 2020 and beyond		4,085	239,337
5	2018	291	17,056					
6	2019	291	17,056					
7	2020	4,085	239,337					
8	2021	4,085	239,337					
9	2022	4,085	239,337					
10	2023	4,085	239,337					

Data Sources

Technical Support Document for the Regulation to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels while at Berth at a California Port - Appendix B: Emission Inventory Methodology

<http://www.arb.ca.gov/regact/2007/shorepwr07/appb.pdf>

2006 Hotelling Times

Lands Commission and Wharfinger Data

Non-Grid Emission Factors:

Technical Support Document for the Regulation to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels while at Berth at a California Port - Appendix B: Emission Inventory Methodology

<http://www.arb.ca.gov/regact/2007/shorepwr07/appb.pdf>

AP-42, (SCR providing 90% control for NOX)

Appendix - Examples:

Heavy Duty Truck Emissions Benefit Calculator

The Sample Inputs Tab in the calculator provides four project examples which are described below and the table shows what the correct inputs should look like in the calculator. The pull downs are designed to provide only the appropriate options based on the project option selected.

For example, selecting a Replacement project with a class 8 existing truck under “PROJECT DETAILS” will allow only a class 8 replacement truck as the correct available option under “REPLACEMENT/REPOWER TRUCK ENGINE”.

Important: Once a project option has been selected and all information has been input in a row for that project option, to make any changes, clear all entries and start with a new project option.

Example 1: Replacement

The applicant is proposing to replace a non-drillage class 8 truck (GVWR of 33,001 lbs. and greater) that has a 1972 engine and reports an annual VMT in California of 50,000. The new truck will be operational in 2012, is a class 8 diesel truck with a 1.20 NOx cert level engine, will operate 100% in California, and will have a five year project life. The total project cost is \$110,000 and the applicant is requesting the maximum Prop 1B funding of \$40,000.

The following would be the correct inputs for Example 1.

PROJECT DETAILS			EXISTING TRUCK ENGINE					3-WAY TRUCK OR 2 TRUCK FOR ONE OPTION					
Project Name	First Year of Operation	Project Option - Detailed	Drayage Truck (Y/N)	Engine Model Year	GVWR	DPF Installed ?	CA VMT	2 Trucks being replaced by one?	DPF on 2nd Truck or Truck B of 3-Way?	Drayage Truck for 2nd truck or Truck B?	Engine Model Year of 2nd Truck or Truck B (3-Way Project)	GVWR of 2nd truck or Truck B	Annual CA VMT for 2nd Truck or Truck B
Example 1	2012	Replacement	N	1972	33001 and >	N	50000	N	INPUT NOT REQUIRED	INPUT NOT REQUIRED	INPUT NOT REQUIRED	INPUT NOT REQUIRED	

REPLACEMENT/REPOWER TRUCK ENGINE				Project Cost	Prop 1B Funding		Non-Prop 1B Funding				Project Life (Years)
GVWR	Fuel Type	% CA Operation proposed	NOx CERT Level	Total Project Cost (\$)	Prop 1B funding for Truck B (3-Way-Truck)	Prop 1B Investment (\$)	Local	Private	AB118	Other State	Project Life (Years)
33001 and >	diesel	100 percent	1.20	\$ 110,000		\$ 40,000					5

Directions: Proposition 1B GMERP Benefit Calculators

Example 2: 2-for-1 Replacement:

The applicant is proposing to replace two non-drayage class 7 trucks (GVWR of 26,001 to 33,000 lbs.) that have 1972 engines and both trucks report an annual California VMT of 50,000. The new truck will be operational in 2012, is a Class 7 diesel truck with a 0.20 NOx cert level engine, will operate 90% in California and will have a five year project life. The total project cost is \$150,000 and the applicant is requesting the maximum Prop 1B funding of \$40,000.

The following would be the correct inputs for Example 2.

PROJECT DETAILS			EXISTING TRUCK ENGINE					3-WAY TRUCK OR 2 TRUCK FOR ONE OPTION					
Project Name	First Year of Operation	Project Option - Detailed	Drayage Truck (Y/N)	Engine Model Year	GVWR	DPF Installed?	CA VMT	2 Trucks being replaced by one?	DPF on 2nd Truck or Truck B of 3-Way?	Drayage Truck for 2nd truck or Truck B?	Engine Model Year of 2nd Truck or Truck B (3-Way Project)	GVWR of 2nd truck or Truck B	Annual CA VMT for 2nd Truck or Truck B
Example 2	2012	Replacement	N	1972	26001-33000	N	50000	Y	N	N	1972	26001-33000	50,000

REPLACEMENT/REPOWER TRUCK ENGINE				Project Cost	Prop 1B Funding		Non-Prop 1B Funding				Project Life (Years)
GVWR	Fuel Type	% CA Operation proposed	NOx CERT Level	Total Project Cost (\$)	Prop 1B funding for Truck B (3-Way-Truck)	Prop 1B Investment (\$)	Local	Private	AB118	Other State	Project Life (Years)
26001-33000	diesel	90 percent	0.20	\$ 150,000		\$ 40,000					5

Directions: Proposition 1B GMERP Benefit Calculators

Example 3: Retrofit

The applicant is proposing to install a retrofit on an existing 1994 engine model year non-drayage class 7 truck (GVWR of 26,001 to 33,000 lbs.) and reports an annual California VMT of 50,000. The upgraded truck will be operational is 2012, will operate in California 100%, and will have a two year project life. The total project cost is \$20,000 and the applicant is requesting the maximum Prop 1B funding of \$5,000.

The following would be the correct inputs for Example 3.

PROJECT DETAILS			EXISTING TRUCK ENGINE					3-WAY TRUCK OR 2 TRUCK FOR ONE OPTION					
Project Name	First Year of Operation	Project Option - Detailed	Drayage Truck (Y/N)	Engine Model Year	GVWR	DPF Installed?	CA VMT	2 Trucks being replaced by one?	DPF on 2nd Truck or Truck B of 3-Way?	Drayage Truck for 2nd truck or Truck B?	Engine Model Year of 2nd Truck or Truck B (3-Way Project)	GVWR of 2nd truck or Truck B	Annual CA VMT for 2nd Truck or Truck B
Example 3	2012	Level 3 PM Retrofit	N	1994	26001-33000	N	50000	INPUT NOT REQUIRED	INPUT NOT REQUIRED	INPUT NOT REQUIRED	INPUT NOT REQUIRED	INPUT NOT REQUIRED	

REPLACEMENT/REPOWER TRUCK ENGINE				Project Cost	Prop 1B Funding		Non-Prop 1B Funding				Project Life (Years)
GVWR	Fuel Type	% CA Operation proposed	NOx CERT Level	Total Project Cost (\$)	Prop 1B funding for Truck B (3-Way-Truck)	Prop 1B Investment (\$)	Local	Private	AB118	Other State	Project Life (Years)
INPUT NOT REQUIRED	diesel	100 percent	INPUT NOT REQUIRED	\$20,000		\$5,000					2

Directions: Proposition 1B GMERP Benefit Calculators

Example 4: 3-Way Truck

The first truck in the proposed transaction is a non-drayage class 8 truck (GVWR of 33,001 lbs. and greater) that has a 1998 engine and reports an annual VMT in California of 50,000. The second truck is a non-drayage class 8 truck that has a 1972 engine and reports an annual VMT in California of 5,000. The applicant will install a Level 3 PM retrofit on the first truck and it will have a two year project life (Calculator includes benefits for Level 3 PM retrofit). The applicant will replace the second truck with a class 8 diesel truck with a 0.20 NOx cert level engine and it will have a five year project life. Both upgrades will be operational in 2012, with 90% California operation. The total project cost is \$150,000 and the applicant is requesting Prop. 1B funding of \$65,000 (\$60,000 replacement and \$5,000 retrofit).

The following would be the correct inputs for Example 4.

PROJECT DETAILS			EXISTING TRUCK ENGINE					3-WAY TRUCK OR 2 TRUCK FOR ONE OPTION					
Project Name	First Year of Operation	Project Option - Detailed	Drayage Truck (Y/N)	Engine Model Year	GVWR	DPF Installed?	CA VMT	2 Trucks being replaced by one?	DPF on 2nd Truck or Truck B of 3-Way?	Drayage Truck for 2nd truck or Truck B?	Engine Model Year of 2nd Truck or Truck B (3-Way Project)	GVWR of 2nd truck or Truck B	Annual CA VMT for 2nd Truck or Truck B
Example 4	2012	3-Way Truck	N	1998	33001 and >	N	50000	INPUT NOT REQUIRED	N	N	1972	33001 and >	5,000

REPLACEMENT/REPOWER TRUCK ENGINE				Project Cost	Prop 1B Funding		Non-Prop 1B Funding				Project Life (Years)
GVWR	Fuel Type	% CA Operation proposed	NOx CERT Level	Total Project Cost (\$)	Prop 1B funding for Truck B (3-Way-Truck)	Prop 1B Investment (\$)	Local	Private	AB118	Other State	Project Life (Years)
33001 and >	diesel	90 percent	0.20	\$150,000	\$5000	\$ 60,000					5

Shore Power Emissions Benefit Calculator

Project B1:

Local agency B proposes to install grid power at a berth and have it operational by 2014.

The local agency projects the following activity for future compliance dates:

CY	Vessel	Size	Population	Fuel Type	Vessel Visits per Vessel
2014	Container	container_<2000	2	Marine Distillate @0.1% Sulfur	14
2014	Container	container_4000-4999	3	Marine Distillate @0.1% Sulfur	7
2014	Container	container_7000-7999	1	Marine Distillate @0.1% Sulfur	9
2014	Reefer		1	Marine Distillate @0.1% Sulfur	3
2017	Container	container_<2000	2	Marine Distillate @0.1% Sulfur	16
2017	Container	container_4000-4999	3	Marine Distillate @0.1% Sulfur	7
2017	Container	container_7000-7999	1	Marine Distillate @0.1% Sulfur	10
2017	Reefer		1	Marine Distillate @0.1% Sulfur	3
2020	Container	container_<2000	2	Marine Distillate @0.1% Sulfur	18
2020	Container	container_4000-4999	3	Marine Distillate @0.1% Sulfur	9
2020	Container	container_7000-7999	1	Marine Distillate @0.1% Sulfur	10
2020	Reefer		1	Marine Distillate @0.1% Sulfur	3

Directions: Proposition 1B GMERP Benefit Calculators

Correct Inputs

The following would be correct berth inputs for Project B1.

Grant Number	Solicitation Name	Local_Agency _Project_Identifier	First Operational Year	Berth Name	Port	Equipment Project Option	If Non-Grid, what is the power of the unit (megawatts)
G08GMLS1	South Coast Ships	SC_PA13.5	2014	NWT_BTH5 5	LB	Grid	

The following would be correct "2014" Vessel Inputs" for Project B1.

Vessel Type	Vessel Population	Container Vessel Size	Total Aux Power (kW) per vessel	In-Use Aux Power (kW) per vessel	Fuel Type	Total # Vessel Visits to Berth per vessel	Avg Hotelling Time per visit (hours/visit) per vessel
Container	2	Container_<2000	2,500	1,800	Marine Distillate @0.1% Sulfur	14	
Container	3	container_4000- 4999			Marine Distillate @0.1% Sulfur	7	
Container	1	container_7000- 7999			Marine Distillate @0.1% Sulfur	9	

Likewise, users will input information for 2017 and 2020 tabs.