

Chapter 12: MARINE VESSELS

This chapter describes the minimum criteria and requirements for Carl Moyer Program marine vessel projects. Local air districts may set more stringent requirements based upon local priorities.

1. Projects Eligible for Funding

ARB has adopted two regulations that could impact funding opportunities for marine vessel projects – Amendments to the Regulations to Reduce Emissions from Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline (Harbor Craft Regulation or HCR) and Regulations to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels While At-Berth at a California Port (Shore Power Regulation). There are limited funding opportunities for marine vessels subject to these regulations.

Table 12-1: Summary of Funding Opportunities

Project Type		Subject to ARB Rule?	Moyer Funding Opportunities ¹
Barge, crew & supply, dredge, excursion, ferry, towboat, tugboat, engine repower, remanufacture, retrofit or new purchase		Harbor Craft Regulation ²	Limited opportunity
Fishing vessel or pilot/work boat engine repower, remanufacture, retrofit or new purchase		No	Not limited by regulation
Shore power - shore-side	Shore Power Regulation ³		Very limited opportunity
Shore power - vessel retrofit	Shore Power Regulation ³		Limited opportunity

¹ Limited opportunities means a fleet's compliance status with the ARB regulation must be determined. Refer to Tables 12-3 through 12-6 of this chapter or contact district Carl Moyer Program staff for eligibility.

² Harbor Craft Regulation: <http://www.arb.ca.gov/ports/marinevess/harborcraft.htm>

³ Shore Power Regulation: <http://www.arb.ca.gov/ports/shorepower/shorepower.htm>

Project Types: Taking the above table into consideration, the following categories may be eligible for funding:

- **Engine Repower:** Replacing an old harbor craft engine with a newer, cleaner engine. Based on the vessel's operation, the newer engine must be surplus to the currently required U.S. EPA marine engine emission standard (i.e. Tier 2 or cleaner). Limited opportunities remain for those vessels subject to the in-use requirements of the HCR.
- **Remanufacture Kit:** A kit comprised of engine component parts that, when installed, reduces the engine's emissions relative to that of the existing baseline engine. Limited opportunities remain for those vessels subject to the in-use requirements of the HCR.

- **Retrofit Device:** The installation of an ARB verified diesel emission control strategy (VDECS). At time of Guidelines approval, only one retrofit device has been verified by ARB. This project type will be considered for funding on a case-by-case basis.
- **New Purchase:** New marine vessels with propulsion and auxiliary engines certified to be at least 30 percent cleaner than the applicable NOx emission standard are eligible for Carl Moyer Program funding on a case-by-case basis.
- **Shore Power Projects:** Due to regulatory compliance deadlines, all shore power projects must be completed and operational prior to January 1, 2014. Ship-side shore power projects may be eligible after this date if the project can demonstrate that it will be surplus to the 2014 implementation requirements of ARB's Shore Power Regulation. Shore-side shore power projects within port locations subject to the regulation will no longer be considered eligible after this date.

Please see Section 4 (Project Criteria) for detailed minimum eligibility requirements.

2. Maximum Eligible Funding Amounts

The Carl Moyer Program pays only the incremental cost of clean air projects. Table 12-2 specifies the maximum eligible funding for each project type. All projects are also subject to the cost-effectiveness threshold defined in Chapter 2 – General Criteria and surplus requirements as defined in the Project Criteria below.

Table 12-2: Maximum Project Costs Eligible for Carl Moyer Program Funding

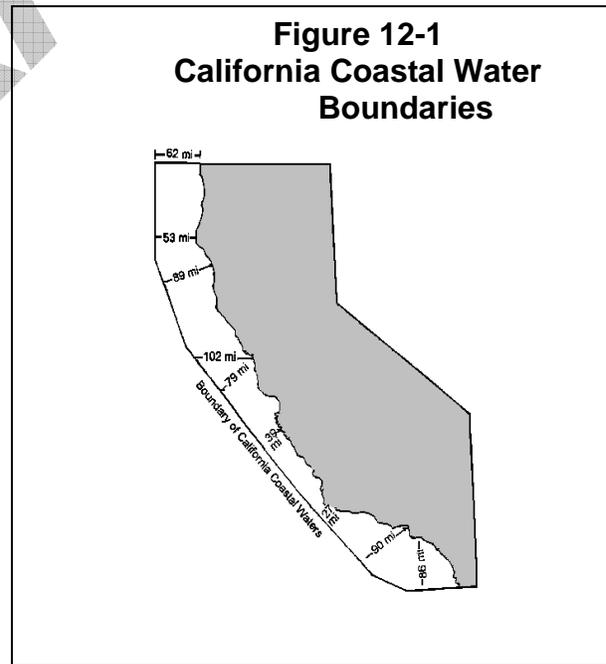
Project Type		Maximum Eligible Funding
Barge, crew & supply, dredge, excursion, ferry, towboat, tugboat	Engine repower or remanufacture kit surplus to required emission level	50 percent
Fishing, pilot, work boat, other vessels not subject to Harbor Craft Regulation in-use requirements	Engine repower or remanufacture kit compliant to EPA marine Tier 2 emission level	80 percent
	Compliant to EPA marine Tier 3 emission level	85 percent
ARB Verified Marine Retrofit Device		Case-by-Case Basis
New Vessel Purchase		Case-by-Case Basis
Shore power – shore-side		50 percent of transformer & other customized equipment
Shore power – ship-side		100 percent of retrofit cost; 50 percent of transformer cost

3. Project Criteria

These criteria provide the minimum requirements for Carl Moyer Program marine vessel projects. All projects must also conform to the requirements in Chapter 2 – General Criteria, as well as the requirements described in Chapter 3 - Program Administration.

(a) General Marine Project Criteria

- (1) Marine vessels and engines utilizing an alternative compliance plan to comply with a rule, requirement, or other mandate are not eligible for Carl Moyer Program funds.
- (2) To be eligible for Carl Moyer Program funding, a harbor craft must have a United States Coast Guard Documentation Number, except in cases where such documentation is not required (such as fishing boats constructed outside the United States, vessels of less than five net ton displacement, or vessels owned by non-United States citizens). In such cases, a valid California vessel registration (CF) number and a copy of the California Department of Fish and Game license can be provided instead of a Coast Guard Documentation Number. This information must be included in the project application. A project application for an oceangoing vessel that does not have any of the above documentation must include the vessel's Lloyd's/IMO number.
- (3) Both propulsion and auxiliary engines are eligible for Carl Moyer Program funding.
- (4) Only marine vessel activity in California coastal waters and internal waters may be used to determine project emission reductions. Figure 12-1 depicts California coastal waters. For the purposes of the Carl Moyer Program, California water boundaries are based upon each air districts' emission inventory boundary. If a local district has not established an emission inventory boundary, ARB and district staff will determine an appropriate boundary for use in project evaluation.



- (5) Non-captive California fleets and vessels may be considered for funding on a case-by-case basis if their operation in California coastal waters can be properly documented.
- (6) Funding is not available for projects where spark-ignition engines are replaced with diesel engines. Repowering a diesel engine to a spark-ignited engine may be considered on a case-by-case basis.
- (7) Only marine engines equal to or greater than 25 horsepower are eligible for Carl Moyer Program funding.
- (8) Harbor craft engines less than 50 horsepower are exempt from the in-use requirements of the Harbor Craft Regulation. These engines are considered surplus and are not subject to the Moyer Project deadlines outlined in tables 12-3 through 12-6.
- (9) U.S. EPA Harbor Craft Emission Standards, finalized on March 14, 2008, require most harbor craft engines greater than 800 horsepower meet remanufacture emission standards upon remanufacture if a certified remanufacture kit is available. Pre-1973 model year engines may be eligible for funding. In order to qualify, the owner and operators of these pre-1973 model year engines must certify that they have less than \$5 million in gross annual sales revenue, as these applicants are exempt from this aspect of the federal regulation.
- (10) Engines on marine vessels with wet exhaust systems are eligible for Carl Moyer Program funding if the project vessel meets all other applicable program requirements. The wet exhaust systems themselves are not eligible for Carl Moyer Program funding. A wet exhaust factor of 0.80 must be applied to the baseline and reduced emission propulsion and auxiliary engine emission calculations for all projects on vessels with wet exhaust systems. See Appendix C for an example of how to calculate project emission reductions and cost-effectiveness for a vessel with a wet exhaust system.
- (11) Tables 12-3 through 12-6 summarize the dates by which projects subject to the Harbor Craft Regulation must be operational to be eligible for Carl Moyer Program funding. In the case of engine repowers, the Moyer Project Operational Deadline indicated in these tables reflects the date by which the new engine must be installed and operational. In addition, project life for an engine cannot extend beyond that engines compliance deadline. For example, in Table 12-3, a 1990 model year tugboat engine operating 750 hours annually has a compliance deadline of December 31, 2014, and therefore would have a maximum project life of three years.

Table 12-3: Carl Moyer Program Project Operational Deadlines for Engines on Ferries, Excursion Vessels, Tugboats, and Towboats, with Homeports Outside the South Coast AQMD

Engine Model Year	Total Annual Hours of Operation	Rule Compliance Deadline	Moyer Project Operational Deadline
Pre- 1985	≥ 300	2011-12	No funds available
1986 – 1995	≥ 1500	12/31/2013	No funds available
1986 – 1995	300 -1500	12/31/2014	12/31/2011
1996 - 2000*	≥ 1500	12/31/2015	12/31/2012
1996 - 2000*	300 -1500	12/31/2016	12/31/2013
2001 – 2002	≥ 300	12/31/2017	12/31/2014
2003	≥ 300	12/31/2018	12/31/2015
2004	≥ 300	12/31/2019	12/31/2016
2005	≥ 300	12/31/2020	12/31/2017
2006	≥ 300	12/31/2021	12/31/2018
2007	≥ 300	12/31/2022	12/31/2019

*1996 through 1999 model year engines in ferries have an accelerated rule compliance deadline of 12/31/2014. The Carl Moyer Program project operational deadline for these engines is therefore 12/31/2011.

Table 12-4 Carl Moyer Program Project Operational Deadlines for Engines on Ferries, Excursion Vessels, Tugboats, and Towboats with Homeport Inside the South Coast AQMD

Engine Model Year	Rule Compliance Date	Moyer Project Operational Deadline
Pre- 2001	12/31/2013	No funds available
2001	12/31/2014	12/31/2011
2002	12/31/2015	12/31/2012
2003	12/31/2016	12/31/2013
2004	12/31/2017	12/31/2014
2005	12/31/2018	12/31/2015
2006	12/31/2019	12/31/2016
2007	12/31/2020	12/31/2017

Table 12-5: Carl Moyer Program Project Operational Deadlines for Engines on Crew & Supply Vessels Statewide

Engine Model Year	Total Annual Hours of Operation	Rule Compliance Deadline	Moyer Project Operational Deadline
Pre- 1985	> 300	2011-12	No funds available
1986 - 1995	> 1500	12/31/2013	No funds available
1986 - 1995	300 -1500	12/31/2014	12/31/2011
1996 - 2000	> 1500	12/31/2015	12/31/2012
1996 - 2000	300 -1500	12/31/2016	12/31/2013
2001 - 2002	> 300	12/31/2017	12/31/2014
2003	> 300	12/31/2018	12/31/2015
2004	> 300	12/31/2019	12/31/2016
2005	> 300	12/31/2020	12/31/2017
2006	> 300	12/31/2021	12/31/2018
2007	> 300	12/31/2022	12/31/2019

Table 12-6: Carl Moyer Program Project Operational Deadlines for pre-Tier 1 and Tier 1 Engines on Barge and Dredge Vessels Statewide

Engine Model Year	Total Annual Hours of Operation	Rule Compliance Deadline	Moyer Project Operational Deadline
Pre-1985	> 80	12/31/2013	No funds available
1986 - 1990	> 80	12/31/2014	12/31/2011
1991 - 1995	> 80	12/31/2015	12/31/2012
1996 - 1999	> 80	12/31/2016	12/31/2013
2000 - 2001	> 80	12/31/2017	12/31/2014
2002	> 80	12/31/2018	12/31/2015
2003	> 80	12/31/2019	12/31/2016
2004	> 80	12/31/2020	12/31/2017
2005	> 80	12/31/2021	12/31/2018
2006	> 80	12/31/2022	12/31/2019

- (12) The following criteria apply to engines subject to ARB’s Harbor Craft Regulation:
- A. Engines that demonstrate rule compliance through a mechanism other than engine replacement or installation of an ARB-verified retrofit device are not eligible for Carl Moyer Program funding.
 - B. To ensure project eligibility, vessel engines rebuilt or remanufactured to a cleaner emission standard (such as an IMO standard) with Carl Moyer Program funds prior to January 1, 2008 shall use the engine model rather than the date of remanufacture to determine funding eligibility and project life. Vessel engines rebuilt with a rebuild kit certified by U.S. EPA or the

International Maritime Organization to achieve at least a 25 percent PM emission reduction shall use the engine model year plus five years, consistent with Section (e)(6)(D)(2) of the ARB Harbor Craft Regulation, to determine the engine model year used in tables 12-3 through 12-6. Projects basing surplus reductions on this model year plus five option must include documentation of the original rebuild kit U.S. EPA or IMO certification to achieve the required PM reductions as part of their project application.

- C. All harbor craft vessels are required to install and maintain a functioning hour meter as required by the Harbor Craft Regulation. Project cost-effectiveness calculations and eligibility should be based on hours of operation. Districts have the option of requesting and utilizing historical fuel usage. This data must be based on the previous two years of historical fuel usage documentation specific to the vessel being funded. Acceptable forms of documentation may include fuel logs, purchase receipts or ledger entries. Grant funding that is based on historical fuel usage may not exceed the grant funding amount that would be based on hours of operation; the more conservative calculation must be used.
- D. Engines on vessels subject to the in-use requirements of the Harbor Craft Regulation must include a copy of the most recent Initial Report in their project application. The reporting requirements are outlined under Cal. Code Regs., tit. 17 § 93118.5(h)(1).

(b) Repower

Repower projects involving the replacement of an older harbor craft engine with a newer, cleaner engine must meet the following criteria:

- (1) All new engines and replacement engines purchased for Carl Moyer Program marine vessel repower projects must be certified to meet U.S. EPA Tier 2 marine or Tier 2 nonroad engine emission standards or cleaner (e.g. Tier 3 or higher). Use of a nonroad engine must adhere to the requirements set forth under Cal. Code Regs., tit. 17 § 93118.5(e)(3) and (e)(4) (i.e. Harbor Craft Regulation). Nonroad repowers must consider additional warranty considerations for marine use, if necessary. Tier 2 engines that are less than or equal to 100 horsepower and are installed after January 1, 2009 are only eligible for Carl Moyer Program funds if it can be demonstrated that a Tier 3 engine is unavailable or technically infeasible.
- (2) For all marine engine repower projects, the replacement engine must provide at least a 15 percent NOx reduction relative to the baseline engine. If the replacement engine is significantly modified or re-configured in any way during the project life, emissions testing must be conducted

and submitted to ARB regulatory staff to review and determine its new emission rates.

- (3) The maximum project life for a marine vessel repower project is 16 years. A longer project may receive case-by-case approval if applicants provide justifying documentation. The maximum project life does not consider regulatory requirements and may be shorter.
- (4) The total project repower cost may include charges for the following:
 - (A) The capital cost of the new engine.
 - (B) Purchase of or modifications to the cooling system; fuel and exhaust system; wiring, panel, and harness system; power take-offs; propulsion control system; gauges and alarms; and radiator and ventilation, if attached to or integral to the functioning of funded engine.
 - (C) Costs related to the purchase and/or installation of a new transmission may be eligible dependent on:
 - Documentation from engine dealer/installer justifying the necessity of a new transmission
 - HP of new engine is less than a 25 percent increase from the baseline engine
 - Notification to ARB liaison with correspondence to be placed in district project file
 - (D) Frames needed to be extended or other parts needed to be cut or modified in order to accommodate the new engine, as well as paint or coating needed to protect those specific areas that were cut or modified.
 - (E) Tax and transport for eligible parts or costs.
 - (F) Labor for installation of or modification to parts eligible for funding.
- (5) The total project repower cost may not include charges for the following:
 - (A) Rudders or propellers.
 - (B) Steering system.
 - (C) Sea trials and dry docking.
 - (D) Paint, coatings, or hull work not directly related to the engine repower.
 - (E) Tax and transport for ineligible parts or costs.
 - (F) Labor for installation of or modification to parts ineligible for funding.
 - (G) Any parts or labor typically included as part of the vessel or engine overhaul, maintenance, repair, or upkeep.
 - (H) These and other items may be eligible for funding on a case-by-case basis if it can be proven that they are not part of the typical vessel overhaul, repair, upkeep or maintenance and are a necessary part of the engine repower.

- (6) All engines replaced as part of a marine vessel repower project must be scrapped, consistent with the requirements of Chapter 3 - Section 31.

(c) Engine Remanufacture Kit

Engine remanufacture kits have the potential to reduce emissions from older engines in cases when an engine repower is not technically feasible. However, emission reductions from engine remanufacture kits have the potential to be shorter lived than reductions from an engine repower, and some of these kits may result in increased PM emissions in order to achieve NOx reductions. Carl Moyer Program criteria for engine remanufacture kit projects help ensure these reductions are real and endure for the full project life.

- (1) A remanufacture kit for a specific vessel type may be certified by the U.S. EPA or International Maritime Organization (IMO) but must be surplus to the current in-use requirements of Commercial Harbor Craft Regulation.
 - A. Engine remanufacture kits specific to vessels not subject to the in-use requirements of the HCR must meet U.S. EPA Tier 2 marine or Tier 2 nonroad engine emission standards or cleaner (e.g. Tier 3 or higher).
 - B. Engine remanufacture kits specific to vessels subject to the in-use requirements of the HCR must be surplus to the current requirements of the Commercial Harbor Craft Regulation.
- (2) A copy of the regulatory compliance letter from the ARB (similar to an Executive Order) must be provided to demonstrate that the remanufacture kit is compliant with the HCR. Remanufacture kits that only reduce NOx to the currently required emission standard are not eligible for Carl Moyer Program funding.
- (3) Remanufacture kit projects have a maximum project life of six years.
- (4) If the U.S. EPA Emissions Warranty for the project kit requires fuel injectors to be replaced before the end of the project life, the applicant must replace the injectors with equivalent low-emission injectors. The Carl Moyer Program project cost may include the replacement injectors. The project annual report must include documentation that all required maintenance identified in the U.S. EPA Emissions Warranty (if applicable) is completed on schedule. Maintenance other than replacement of low-emission fuel injectors is not eligible for Carl Moyer program funding.

(d) Retrofit Device

Retrofits involve hardware modifications to the engine or exhaust system to reduce emissions, and include selective catalytic reduction, diesel oxidation catalysts or diesel particulate filters. A retrofit device must be verified by the ARB to reduce emissions from the project engine in order to be eligible for funding. At time of Guidelines approval, only one retrofit device has been verified by ARB. This project type will be considered for funding on a case-by-case basis.

(e) New Purchase

New marine vessels with propulsion and auxiliary engines certified to be at least 30 percent cleaner than the applicable NOx emission standard are eligible for Carl Moyer Program funding on a case-by-case basis. While no marine vessel propulsion engines currently are certified as such, engines meeting these emission limits may become commercially available as engine technologies continue to advance.

- (1) The incremental costs for a marine vessel new purchase project shall reflect the difference between the cost of the cleaner-than-required vessel and the cost of a similar vessel that meets existing standards.
- (2) New purchase of a ferry is not eligible for Carl Moyer Program funding due to the ARB Harbor Craft Regulation requirement that new ferries utilize the Best Available Control Technology.

(f) Shore Power (Cold Ironing)

- (1) Only a port authority, terminal operator, or marine vessel owner may apply to receive Carl Moyer Program funding for a shore power project.
- (2) Applications for Carl Moyer Program funding of shore power projects shall include a copy of the Initial Terminal Plan, as identified in Section (g) of the Shore Power Regulation. All subsequent project reports to air districts shall include any new or updated Terminal Plans in order to evaluate compliance with the project contract.
- (3) The commitment of visits and hours made by the applicant, above those required by the Shore Power Regulation, must be used in the project cost-effectiveness calculation and is required in the contract between the applicant and the air district.
 - A. For shore-side funding – The fleet of vessels that have been retrofitted and have the ability to use the berth or terminal's shore-side shore power committing to a specific number of visits and hours.

- B. For ship-side funding - The entire fleet roster and all the California ports of harbor the fleet will be visiting. From the locales submitted, the fleet must indicate per location, the number of vessel visits and hours per year the fleet will be utilizing shore-side power.
- (4) Up to 50 percent of the total cost of a shore-side transformer and other associated customized equipment at the berth, pier or terminal is eligible for Carl Moyer Program funding for projects installed and operational prior to January 1st, 2014.
- (A) Carl Moyer Program funds cannot be commingled with Goods Movement (Proposition 1B bond) funds for shore-side projects at goods movement berths (i.e. berths involved in the movement of goods rather than passengers) in the Bay Area, San Diego, and South Coast air districts, as well as Port Hueneme. Shore-side costs for goods movement berths in these areas may be eligible for Carl Moyer Program funding on a case-by-case basis if it can be reasonably demonstrated that Proposition 1B funding is unavailable.
- (B) “Installed and operational” for a shore-side shore power project means that the customized equipment at the terminal has been installed and the first scheduled vessel visit will have occurred utilizing the Program funded grid-based power in place prior to January 1, 2014.
- (C) Due to the lengthy project lead times required for shore-side shore power projects, the following minimum requirements must be met to consider the project expended (see also Section 18 of Chapter 3: Program Administration):
- The necessary customized equipment for each location (e.g., pier, berth) has been procured and invoiced. Examples of eligible equipment include a transformer, grounding switches, a service breaker, a capacitor bank, and cranes or booms for cable management that have been customized for installation at the project location, and;
 - The customized equipment is present on site and ready for installation, and;
 - 75 percent or more of the Carl Moyer Program-eligible customized equipment costs or total project costs (including costs borne by the applicant or local public utility), whichever is greater, has been paid by the June 30th expenditure deadline.
- (D) The Carl Moyer Program shall not pay for modifications or enhancements made to the shore-side electrical infrastructure needed to bring power to the terminal.
- (5) Up to 100 percent of necessary vessel (non-transformer) retrofit costs, specifically required to allow the vessel to plug into shore-side power, are eligible for Carl Moyer Program funding. Up to 50 percent of transformer costs on board the vessel, if necessary, are eligible for Carl Moyer Program funding.

- A. Vessel retrofits funded with Carl Moyer Program funds cannot claim emission reductions resulting from ship visits to piers or berths during the active contract period in which Goods Movement Program (Proposition 1B) funds paid for the shore side power. Docking at these Goods Movement funded ports or berths is not prohibited.
 - B. "Installed and operational" for a retrofitted vessel project means that the Carl Moyer funded vessel will have the capability to utilize grid based shore power (not funded by Goods Movement) prior to January 1st, 2014. In a rare event that the retrofitted vessel's first scheduled visit will not occur until after this date, due to the berth grid based power not being complete, the vessel retrofit project will still be considered installed and operational pending the scheduled visits will occur as contracted.
- (6) The Carl Moyer Program shall not pay for energy costs (fuel or electricity), shore power routine maintenance, or labor costs for connection and disconnection of the vessel to shore-side power.
 - (7) All contracts for Carl Moyer Program funding of shore power projects must include a stipulation that receipt of program funding is contingent on the project being post-inspected and operational. The project contract must include a provision that if the shore power is not used for the total hours committed to in the contract, the project participant shall return the pro-rated contract amount (commensurate with the shortfall in usage) to the air district.
 - (8) Shore power projects have a maximum project life of 20 years. A longer project may receive case-by-case approval if applicants provide justifying documentation. The maximum project life does not consider regulatory requirements and may be shorter.
 - (9) Terminals using or intending to use the Equivalent Emission Reduction Option to demonstrate compliance with the Shore Power Regulation may be eligible for Carl Moyer Program funding on a case-by-case basis, if it can be demonstrated that the project shall achieve emission reductions surplus to the rule.
 - (10) The emissions from vessels using grid power in lieu of auxiliary engines when the vessel is at berth are assumed to be reduced by 90 percent. The emission reductions from a shore-side transformer project are calculated as the total emission reductions from each participating ship. Each ship's emission reductions calculated as:

(Ship emission rate * berthing time * power requirements * number of visits * 0.9)

Estimated berthing time shall include the time needed to connect and disconnect the vessel to shore power. Ship emission rates and power requirements are included in Appendix B.