

**San Pedro Bay Ports
Technology Advancement Program**

Guidelines for Proposals



Port of
LONG BEACH
The Green Port

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1. INTRODUCTION

The Technology Advancement Program (TAP) was developed in 2007 under the San Pedro Bay Ports Clean Air Action Plan (CAAP)¹, which aimed to significantly reduce the health risks posed by air pollution from the ships, trucks, harbor craft, cargo handling equipment, and rail locomotives that serve the Port of Long Beach and Port of Los Angeles (Ports).

To achieve our CAAP goals, the Ports need technologies that reduce criteria pollutants and greenhouse gases (GHG). Thus, the TAP seeks to accelerate the commercial availability of new, clean technologies for port equipment, in order to move towards an emissions-free port. The TAP is focused on testing and evaluating the performance of emerging technologies through in-service demonstrations. The TAP's goal is to nurture nascent emission-reduction technologies so they can be commercialized and deployed portwide.

Unlike other regional and state technology advancement programs, the Ports' TAP is focused on clean technologies and associated infrastructure specifically for maritime related mobile sources that operate in and around ports. The Ports have identified the following mobile source applications for TAP funding priority:

- Zero- or near-zero emissions² cargo-handling equipment
- Harbor craft technologies
- Ship technologies
- Locomotive technologies
- Near-zero and zero-emissions heavy-duty on-road trucks

2. PROJECT IDENTIFICATION

The TAP is a competitive funding program that relies on several approaches to identify and support potential projects:

- **Requests for Proposals (RFPs):** Periodically, in order to stimulate technology development in high-need applications, the Ports will issue RFPs to seek projects for specific technologies or source categories. RFPs may seek projects for any of the five key mobile sources that operate in or around ports – ships, trucks, trains, harbor craft, and cargo-handling equipment – and for a range of technologies, including after-treatment devices, engine technologies, and alternative fuels.

¹ <http://www.cleanairactionplan.org/>

² The California Air Resources Board is expected to define “near-zero emissions” for on-road and off-road equipment in 2019. It is anticipated that this standard will be established somewhere between 0.1 g/bhp-hr of NO_x and 0.02 g/bhp-hr of NO_x (ie. the existing low NO_x standards).

Additionally, the Ports may issue RFPs for emerging infrastructure solutions to support cleaner vehicles and equipment and for technologies or operational efficiency strategies that result in less fuel consumption and thus fewer GHG emissions.

Details on eligibility requirements, project types, allowable costs, project deliverables, and application instructions will be contained in the RFPs. Developers wishing to receive advanced notice of RFPs should sign up for the TAP contact list at www.cleanairactionplan.org/tap.

- **Call for Projects (CFP):** Annually or on as-needed basis, typically in the 2nd^d quarter of the year, the Ports will issue a CFP for technology projects suitable for port applications that meet the eligibility requirements listed in Section 3. A CFP provides technology developers an opportunity to propose projects that are not a good fit for an RFP but that show promise for emission reductions in or around ports. More detail on the CFP process is provided in this document.
- **Port-Initiated Projects:** On occasion where the Ports have specific interest in an emissions reduction technology or project, we will develop a project, seek partnerships to demonstrate the use of the technology in port applications, and manage the implementation of the project. Such projects may include paper studies, development of test protocols, and co-funding for port-related technology projects led by other agencies.

Developers are strongly encouraged to submit their proposals during an open RFP or CFP period. Unsolicited proposals may be submitted at other times of the year, but there is no guarantee the Ports will act upon them. Unsolicited proposals must adhere to the same eligibility requirements and follow the same process as a CFP, which is described below.

3. ELIGIBILITY

3.1. Eligible Applicants

Any public or private entity is eligible to apply. The proposer must include documentation of a demonstration project partner that operates at one or both of the Ports (i.e., a terminal operator, shipping line, etc.).

3.2. Eligible Projects

All TAP projects must meet the following requirements:

- Technology has the potential to result in reductions of diesel particulate matter (DPM), nitrogen oxides (NOx), sulfur oxides (SOx), or GHG.

- Technology is beyond the conceptual and/or research and development (R&D) phase and already exists as a prototype³ (exception: R&D and prototype-development projects will be considered for ships, harbor craft, and locomotives), and
- Equipment must operate in one or both of the Ports for the duration of the demonstration.

Projects may target either new equipment or the retrofit of existing equipment.

As stated previously, the Ports are not limited in project types for our own RFPs and port-initiated projects. The Ports, however, will only consider the following project types under a CFP or as an unsolicited proposal:

- Zero- or near-zero emissions cargo-handling equipment (cranes, yard tractors, forklifts, etc.) technologies
- Harbor craft technologies
- Ship technologies
- Locomotive technologies
- Zero- or near-zero emissions on-road drayage truck technologies

For the project types listed above, the Ports seek projects that can demonstrate the following and will give preference accordingly:

- **Trucks:** Zero emissions (no tailpipe emissions and 100% diesel fuel displacement) or near-zero emissions; for non-certified near-zero-emission trucks, preference will be given to hybrid vehicles with capacity to operate in all zero-emissions mode.
- **Cargo-handling equipment:** Zero-emissions (no tailpipe emissions and 100% diesel fuel displacement), hybrids and near-zero emissions operations; for near-zero emissions equipment, preference will be given to hybrid equipment with capacity to operate at least some of the time in zero-emissions mode.
- **Ships:** Alternative fuel and/or engine technologies resulting in NOx emission levels *better than* Tier 3, or, technologies that can be applied to existing ships (i.e., retrofit) to achieve Tier 3 emission levels or better. Additionally, projects that demonstrate optimized fuel efficiency.
- **Harbor craft:** Hybrid, alternative fuel, and/or engine technologies resulting in NOx emission levels better than Tier 4 standards, or, technologies that can be applied to existing harbor craft (i.e., retrofit) to achieve Tier 3 or Tier 4 emission levels.

³ A prototype is a fully designed and constructed piece of equipment that is not yet commercially available. A technology may be considered a prototype if it exists at a smaller scale than what is required by port operations or in a similar application.

- **Locomotives:** Zero emissions (no tailpipe emissions and 100% fuel displacement) or hybrid and near-zero emissions engine technologies or alternative fuel

The following project types are not eligible for TAP funding:

- Technologies that are not applicable to port-related mobile equipment;
- Fuel additives;
- Technologies in the conceptual or R&D phase (with the exception of ships, harbor craft, and locomotives);
- Energy management or energy demand reduction technologies⁴; and
- Transport Refrigeration Unit (TRU) technologies.

3.3. Eligible Costs and Match Funding

The following costs are eligible for TAP funding:

- Design and engineering
- Materials and equipment
- Construction
- Systems integration
- Data tracking equipment and software
- Emissions testing
- Fueling infrastructure to support the demonstration
- In-use demonstration costs, including staff time to track and report data
- Project management not to exceed 10% of the total project cost

The following costs are not eligible for TAP funds:

- Fuel and other consumables
- Labor to operate the equipment or vehicle during the course of normal business operations
- Administrative overhead, including office space, utilities, insurance, personnel not directly related to project implementation
- Travel
- Marketing or promotional costs

Match funding is a TAP requirement. Up to 50% of a project's costs will be funded by the TAP. Of the technology provider's minimum 50% cost share, a minimum of 10% must be in the form of a cash contribution to the project. All costs, including match funding, will be tracked and documented in accordance with contract requirements.

⁴ Applicants with energy-related projects can apply to the Port of Long Beach's Energy Technology Advancement Program (ETAP). More information can be found at www.polb.com/energyisland.

Although TAP funds cannot be used to pay for labor to operate the equipment or vehicle in the course of normal business operations or fuels and other consumables, these costs can be used to meet match funding requirements.

4. CALL FOR PROJECTS PROPOSAL SUBMITTAL PROCESS

The Ports intend to issue a CFP annually, typically in the 2nd quarter of the year. The CFP announcement will be posted to the TAP website and emailed to all contacts on the TAP contact list. The CFP process consists of two steps:

- (1) A concept paper, and,
- (2) A full proposal, if requested.

Proposers should be aware that documents submitted to the Ports are considered public record.

4.1. Concept Paper

In response to a CFP, proposers shall fill out the Call for Projects cover sheet (1 page) in Appendix A, which requests basic summary information about the project. Additionally, proposers must attach a 2-page project description to the cover sheet to create a 3-page Concept Paper. The Concept Paper should include the following details:

- Technology (scientific explanation of how it works and its current use in other applications, if applicable)
- Description of the proposed demonstration, including duration, objectives, project partners, and cost estimates
- Projected emission reductions and the basis for those projections (for the project itself, not an extrapolation to larger scale implementation)
- Plan for agency approval (i.e., verification or certification) and commercialization, if applicable

The CFP announcement will include details on how and where to submit the Concept Paper and the deadline by which to do so.

In advance of submittal, proposers are encouraged to review the documents listed in Appendix B, which include testing protocols and duty cycle reports, as applicable.

4.2. Initial Screening

Port staff will perform an initial screening of the project Concept Paper, based upon the following questions:

- Does the proposed project meet all eligibility criteria, including inclusion of a port partner?
- Is the technology feasible in a marine environment?
- Does the technology have significant potential benefits relative to the Ports' clean-air goals, specifically, does the technology address a sizeable portion of the fleet or show promise for significant emission reductions?
- Has the proposer adequately justified the funding request (i.e., is the request reasonable in terms of the ratio of port to project funds, and/or does the project cost match the scale of potential benefits/applicability)?

The Ports will perform this screening in consultation with the Ports TAP Advisory Committee (TAP AC), which is comprised of representatives from both Ports, the United States Environmental Protection Agency, the California Air Resources Board (CARB), the California Energy Commission, and the South Coast Air Quality Management District (SCAQMD). The TAP AC serves in an advisory role to the Ports for screening, reviewing, and recommending projects that merit further evaluation and development.

4.3. Next Steps

Upon completion of this initial screening, the Ports may take one of the following actions on the proposal:

- Reject the project Concept Paper because it did not pass the initial screening review
- Request additional information
- Request submittal of a full proposal
- Issue an RFP for projects related to the Concept Paper topic

Notification will be made via email to all proposers.

4.4. Full Proposal

Project concepts warranting further consideration will be invited to submit a full proposal. A full proposal consists of the following information:

1. Cover page:
 - a. Descriptive project title
 - b. Contact information
 - i. Name of primary contact for the project
 - ii. Business and mailing addresses
 - iii. Telephone and email addresses
2. Project description:
 - a. Brief description of the technology and principle of operation
 - b. Description of the proposed project and expected deliverables

- c. Projected air quality benefits (i.e., PM, NO_x, SO_x, GHG reductions) of the technology at the port, including documentation of emission testing results. This is for the project equipment, not the port fleet.
 - d. Projected commercial cost of technology
 - e. Project schedule (include milestones, deliverables and associated deadlines)
3. Project team description:
- a. Qualifications and capabilities of project team
 - b. Commitment letter(s) secured from port operators participating in the project
 - c. Commitment letter(s) secured from project team members that document role and cost share.
4. Project Scope of Work:
- a. Task Description, including list of key milestones. These milestones will be linked to invoice payments.
 - b. List of project deliverables by task
5. Proposed budget, by task in table format (see templates below in Table 1 and Table 2):
- a. Cost of each task, including cost type (in-kind, cash) and source (TAP, contractor, other grant sources, etc.)
 - b. Provide a clear summary in table format of all in-kind and direct cost-sharing, secured and anticipated

The proposal must not exceed 15 pages and must be submitted via email.

Table 1 –Budget Template

Task Description	Requested TAP Funding (A)	Project Team Cash \$\$ (B)	Project Team In-Kind \$\$ (C)	Total Project Team \$\$ (B+C=D)	Total Cost (A+D)
Design and Engineering					
Materials and Equipment ¹					
Construction and/or Systems Integration					
In-Use Demonstration ²					
Emissions Testing					
Fueling Infrastructure					
Project Management ³					
TOTAL:					

¹ Includes data tracking equipment and software

² Includes labor during the demonstration to test the equipment and staff time to track and report data

³ Not to exceed 10% of the total project cost

Table 2 –Cost Share Template

Project Partner/Agency	Cost Share
TOTAL:	

4.5. Full Proposal Review Process

Upon receipt of a full proposal, Port staff will forward the proposal to the Advisory Committee for evaluation. The evaluation criteria identified in Section 5 will be used. The Advisory Committee will provide recommendations to the Ports to either approve or disapprove the funding for the project. A minimum score of 70 points must be achieved to be considered for TAP funding.

5. EVALUATION CRITERIA

The Ports, in consultation with the TAP Advisory Committee, will use the evaluation criteria and scoring matrix in Table 3 when reviewing full project proposals.

Table 3 – Evaluation Criteria and Scoring Under a Call for Projects

Evaluation Criteria	Maximum Score
<p>Potential Emission Reductions</p> <ul style="list-style-type: none"> • Has the proposer adequately articulated the technology’s potential to significantly reduce emissions? (0-5 points) • Was initial emissions testing documentation submitted to support these claims? (Yes = 0-5 points) <p><i>For cargo-handling equipment and trucks:</i></p> <ul style="list-style-type: none"> • Is the technology zero-emissions? (Yes = 10 points) <p><u>Or</u></p> <p><i>For ships, harbor craft, and locomotives:</i></p> <ul style="list-style-type: none"> • Does the technology significantly reduce NOx, PM, SOx, or GHG? (reductions <10% = 3 points, reductions 11-24% = 5 points, reductions > 25% = 10 points) 	20
<p>Project Cost</p> <ul style="list-style-type: none"> • What percentage of funding is the TAP expected to contribute to this project? (TAP funding request is 50% of total project cost = 3 points; TAP funding request is less than 50% of total project cost = 4-10 points, with more points awarded for larger cost share contributions) 	10
<p>Degree of Technology Maturity</p> <ul style="list-style-type: none"> • Is the technology certified or verified, even in another application? (Yes = 0-5 points) • Is the technology ready for in-use demonstration? (Yes = 0-5 points) 	10
<p>Proposal Team’s Qualifications</p> <ul style="list-style-type: none"> • Has the team previously participated in in-use demonstrations? (Yes = 0-5 points) • Has the team developed this technology before, even in another application? (Yes = 0-5 points) • Has the team previously worked together? Did the team complete the project per the scope of work, budget, and schedule? (Yes = 0-5 points) 	15
<p>Potential Benefits</p> <ul style="list-style-type: none"> • Is this technology applicable to a large segment of the fleet? (Yes = 0-5 points) • Does the technology have the potential to meet the demands of port operations? (Yes = 0-10 points) • Has the proposer articulated the potential capital, operating, and lifecycle costs associated with commercialization of this technology? (Yes = 0-5 points) • Has the Port partner signaled intent to use the technology in regular operations upon completion of a successful in-use demonstration? (Yes = 0-5 points) 	25
<p>Technical Approach</p> <ul style="list-style-type: none"> • Has the proposer clearly articulated the demonstration plan? (Yes = 0-10 points) • Is the plan able to meet the project objectives? (Yes = 0-5 points) • Is the schedule reasonable? (Yes = 0-5 points) 	20
TOTAL	100

Potential Emission Reductions

All projects will be evaluated for their potential to reduce emissions of DPM, NOx, and SOx. In addition, emission reductions of GHG will be considered.

Emissions reductions will be calculated following the accepted CARB and SCAQMD methodologies. The primary calculation methodology to be used will be from the Carl Moyer Program⁵. Applicants may propose alternative emissions reduction calculation approaches believed to be appropriate to their project proposal, which may be necessary for unique project types.

Project Cost

The requested funding level, or the cost to the Ports, will be considered when prioritizing the use of limited Port funds. In order to leverage TAP funding, a minimum of 50% of matching funds will be required for all projects, either as a direct financial commitment or in-kind services. A minimum of 10% of match funding must be a direct financial commitment (i.e., cash). Proposers must document commitments from project partners and showing the level of financial support secured.

Degree of Technology Maturity

A key evaluation criterion is the degree of technology maturity. This criterion refers to the certainty of an emissions control approach to achieve the expected emission reductions.

At minimum, technologies must exist as a prototype to be considered under a TAP CFP or unsolicited proposal. A prototype is a fully designed and constructed piece of equipment that is not yet commercially available. A technology may be considered a prototype if it exists at a smaller scale than what is required by port operations or in a similar application.

Technologies that are certified or verified⁶ by CARB at the time of project implementation for a different type of equipment, indicating full technology maturation, will be considered most favorably. Proposals that involve non-certified or non-verified technologies will also be considered, but proposers must detail steps they have taken to secure CARB certification or verification or demonstrate plans to do so. Zero-emissions equipment does not require certification or verification; however, proposers should indicate whether they will seek CARB “approval” of their technology.

⁵ Moyer Program Guidelines are available at <http://www.arb.ca.gov/msprog/moyer/moyer.htm>

⁶ Refer to <http://www.arb.ca.gov/diesel/verdev/background.htm> for background regarding CARB's certification and verification programs relating to the sale, use, or modification of emission control systems in California. The programs are specific to the type of device as well as the market for which it is designed.

Proposers must submit supporting documentation to verify the emission reduction capability of the proposed project, including either CARB Executive Orders indicating verification/certification or emission test results (including the laboratory name, address and telephone number; test protocols; and methods).

Projects may include funding requests for emissions testing at testing facilities agreed upon by CARB, the Ports and the proposer.

For projects related to ships, harbor craft, and locomotives only: The TAP will consider technologies in the R&D/pre-prototype phase. For such projects, proposers must demonstrate they have the technical, logistical, and financial ability to manufacture a working prototype for demonstration purposes.

Proposal Team’s Qualifications/Expertise

Proposals will be evaluated based on the experience and qualifications of the project applicant and/or project team, as documented in the proposal. The Ports will give preference to proposers with previous experience participating in technology advancement programs and/or grant-funded demonstrations and to companies with experience designing, manufacturing, and integrating the proposed technology.

Potential Industry Benefits

Technologies with a high likelihood of industry acceptance as judged by fleet applicability and technological readiness to meet the demands of port operations are preferred. At minimum, proposers should ensure their project reflects equipment used at the Port of Long Beach or Port of Los Angeles.⁷

The Ports will consider the following criteria in evaluating industry benefits:

- Opportunities for widespread commercial deployment (and thus significant port-wide emission reductions), i.e., technologies with the potential to address large segments of the fleet.
- Technology is likely to be durable, have adequate power to meet port duty cycles, and has been proven in a marine environment (or has substantial potential to be proven in a marine environment).
- Capital, operating, and lifecycle costs will be considered in order to gauge how well a new technology may be accepted by the industry.

⁷ Emissions inventories for each port are available online and provide detailed information on port equipment. https://www.portoflosangeles.org/environment/studies_reports.asp
<http://www.polb.com/environment/air/emissions.asp>

Technical Approach/Statement of Work/Project Schedule

Proposals will be evaluated based on the technical approach, statement of work and project schedule. Proposed demonstration projects should be consistent with Port-approved test protocols, if applicable, and maximize TAP resources.

6. PROJECT SELECTION

Projects are recommended for TAP funding by the Ports' staffs in consultation with the TAP AC to each Port's respective Board of Harbor Commissioners. The Boards of Harbor Commissioners have final approval over all TAP projects.

7. CONTRACT REQUIREMENTS

If selected for TAP funding, the proposer will be required to execute a contract with the Ports that includes standard terms and conditions for the project award, including project-specific insurance requirements. The contract will be issued to a single entity; in the case of a project partnership, it will be the entity that maintains fiscal liability for the project.

The contract must be executed within three months of proposed award by Port staff, unless a written extension is granted by the Ports. If an awardee is unable or unwilling to execute a contract within that timeframe, the project award may be rescinded.

7.1. Project Milestones and Deliverables

The Ports will establish performance milestones and associated deliverables to ensure adequate progress. These deliverables are incorporated into the TAP contract and are linked to the payment schedule.

Performance milestones and deliverables are negotiated with the contractor and thus vary from project to project, but some commonly used performance milestones include but are not limited to:

- Acceptance of the test plan
- Completion of technology/equipment integration, manufacturing and/or installation
- Initial acceptance testing
- Delivery of equipment or vehicle at prescribed port terminal(s)
- Progress of the in-use demonstration at prescribed intervals
- Final report

Deliverables include but are not limited to:

- Test plan
- Interim progress reports
- Final report

In addition, the Ports will also request documentation for CARB certification or verification, as appropriate.

7.2. Reports

Contractors are required to provide regular updates on the progress of the technology development and demonstration. Types of reports include:

- *Project Meetings*: Monthly project meetings will be required during the project term. These project meetings may take place by phone. The contractor must also facilitate field visits during the demonstration as specified in the contract terms.
- *Interim Reports*: Written reports filed at intervals prescribed by the contract and used to document project progress for payment purposes. They require supporting documentation such as invoices, test data, and photographs.
- *Final Report*: Written report at the conclusion of the project. This report should include:
 - Documented emissions reductions achieved, if applicable
 - Total project budget and final cost
 - Lessons learned (any challenges/limitations with application, opportunities to improve performance, etc.)
 - Information on future roll-out and availability of the technology
 - Business case for commercialization

8. BASIS OF PAYMENTS

TAP payments are issued on a reimbursement basis following completion of the milestone task described in the contract. Contractors must provide sufficient documentation of task completion, including but not limited to interim reports, data logs, invoices, purchase reports, and photographs.

9. PROJECT CLOSEOUT

The TAP project is considered complete when the Ports accept the final report and issue the final payment. Final reports are posted to the TAP website.

10. NON-PERFORMANCE

Contractors that fail to meet the terms and conditions specified in their contract may be deemed “non-performing.” Non-performance may include:

- Failure to abide by general funding contract terms and conditions
- Failure to meet major milestones
- Failure to file required reports

Should the Ports believe non-performance has occurred, or if it appears non-performance may occur during the grant term as evidenced by interim reports or project progress, the contractor will be required to submit a corrective action plan. The Ports have sole discretion to accept or reject the corrective action plan. Repeated non-performance may result in the Ports canceling the TAP contract.

Additionally, at any time, if a contractor cannot or no longer wants to move forward on a project, the contractor may request contract cancellation. The request must be sent in writing to the Ports and may be submitted via email.

11. CONTACTS

Questions about these guidelines or the TAP in general may be submitted to:

Teresa Pisano
Port of Los Angeles
tpisano@portla.org

Rose Siengsubcharti
Port of Long Beach
rose.sieng@polb.com

APPENDIX A – SAMPLE CALL FOR PROJECTS COVER SHEET

TAP Call for Projects Title and Reference Number⁸:

Project Concept Title:

Company Name, primary contact, address, phone and email:

Brief Summary of Project Concept:

Project Concept Cost: _____

TAP Funding Request: _____

Call for Projects Due Date: _____ Submittal Date: _____

Attach a 2-page project description that includes the following information:

- Technology description (how it works and its current use in other applications, if applicable)
- Description of the proposed project/demonstration, including duration, objectives, project partners, and cost estimates
- Projected emission reductions and the basis for those projections (for the project itself, not an extrapolation to larger scale implementation)
- Plan for agency approval (i.e., verification or certification) and commercialization, if applicable

⁸ This information is provided on the Ports' TAP Call for Projects.

APPENDIX B: RESOURCES

San Pedro Bay Ports Technology Advancement Program

<http://www.cleanairactionplan.org/technology-advancement-program/>

San Pedro Bay Ports Fleet

Port of Long Beach: *<http://www.polb.com/environment/air/emissions.asp>*

Port of Los Angeles:

https://www.portoflosangeles.org/environment/studies_reports.asp

Duty Cycle Reports

Drayage Trucks

<http://www.cleanairactionplan.org/documents/drayage-truck-chassis-dynamometer-test-cycle-final-report-9-30-11.pdf>

<http://www.cleanairactionplan.org/documents/hdv-drayage-truck-duty-cycle-final-report-revised-3-10-11-with-modal-data.pdf>

Yard Trucks

<http://www.cleanairactionplan.org/documents/development-of-a-yard-hostler-activity-cycle-final-report.pdf>

<http://www.cleanairactionplan.org/documents/development-of-a-yard-hostler-activity-cycle-2-summary-report.pdf>

TAP Final Reports

<http://www.cleanairactionplan.org/technology-advancement-program/completed-projects/>

Test Protocols

Drayage Trucks

<http://www.cleanairactionplan.org/documents/san-pedro-bay-ports-zero-near-zero-emissions-drayage-truck-testing-demonstration-guidelines.pdf>

Yard Trucks

<http://www.cleanairactionplan.org/documents/yard-tractor-test-protocol-final-draft.pdf>

Emission Reduction Calculations

Use the methodology for the Carl Moyer Program:

https://www.arb.ca.gov/msprog/moyer/guidelines/2011gl/2011cmp_appc_20151218.pdf