United States Environmental Protection Agency

Office of Transportation and Air Quality
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EPA Clean Ports Program: Guide to Collecting Activity Data from Vehicles, Equipment, and Infrastructure

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Disclaimer

The statements in this document, with the exception of referenced requirements, are intended solely as guidance. This document is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. This guidance may be revised without public notice to reflect changes in the EPA's approach to Clean Ports Program equipment and infrastructure annual activity data collection.

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1. Introduction and Instructions

The purpose of this guide is to provide Clean Ports Program grant recipients with best practices for collecting vehicle, equipment, and infrastructure activity data for reporting to the EPA using the *Clean Ports Program Zero-Emission Technology Deployment Competition Semiannual Project and Final Project Reporting Template* (EPA Form Number 5900-721). For additional guidance on completing the Project Reporting Template, refer to the *EPA Clean Ports Program: Supplemental Resource for Completing Progress Reporting Templates*, and the *Instructions* and *Data Dictionary* tabs of the Project Reporting Template.

Recipients and subrecipients are responsible for oversight of Clean Ports Program awards and must monitor award activities to ensure compliance with program requirements. Throughout the award performance period, the recipient agrees to submit the Project Reporting Template, Technology Deployment Evidence Statements, Scrappage Eligibility Statements, and Scrappage Evidence Statements, as applicable, in accordance with the award Terms and Conditions.

Data collection best practices:

- Collect data for all new vehicles, equipment, and infrastructure at regular intervals.
- Assign a unique ID to each piece of equipment and implement a tracking system to organize the data. The best unique identifier will be the Vehicle Identification Number (VIN) or equipment serial number provided by the manufacturer. Alternative unique IDs could include other identifiers used in the operation of equipment, such as license plates or identifiers used in maintenance logs.
- If using telematics data, verify the accuracy of telematics systems by periodically checking the data against another source, such as an in-vehicle hour meter.
- The EPA recommends having a second individual review data, calculations, and Project Reporting Template entries.

Data reporting instructions for new equipment and infrastructure:

- For equipment and infrastructure that is not yet in service, leave the activity data fields blank.
- Once equipment or infrastructure enters service, enter activity data on the *New Fleet Description* and *Infrastructure* tabs of the Project Reporting Template at the end of **each calendar year** of project performance (for the **January** submission) and at project closeout.
    - **First year in service:** For the calendar year when equipment or infrastructure first enters service, the reported data should cover activity from the date-in-service through the end of the calendar year (e.g., if a vehicle's date-in-service is 8/1/2026, enter data covering activity from 8/1/2026 through 12/31/2026).
    - **Second and third years in service:** For the second and third calendar years of equipment or infrastructure operation, the reported data should cover activity

for the full calendar year (e.g., from 1/1/2027 through 12/31/2027, and from 1/1/2028 through 12/31/2028).

- **Fourth year in service:** For the fourth calendar year of equipment or infrastructure operation, the reported data should cover activity from the beginning of the year up to the three-year mark from the original date-in-service (e.g., if a vehicle's date-in-service is 8/1/2026, enter data covering activity from 1/1/2029 up to 7/31/2029).
- Note: The current Project Reporting Template will expire on 9/30/2028. The EPA will provide additional guidance about how grantees should report activity data following the expiration of the current Project Reporting Template. The EPA will also provide guidance on additional activity data grantees will need to report if the minimum usage requirements for the equipment are not met in the first three years of deployment.

- When entering activity data, provide a response in the column with the header "Brief Description of Data Source." Describe the source for the activity data (e.g., telematics or maintenance logs), and any other relevant information about data collection and reporting.

2. New Mobile Equipment

Table 1 lists Clean Ports Program new mobile equipment activity data fields in the Project Reporting Template.

Table 1. *New mobile equipment activity data fields.*

Mobile Equipment Activity	Mobile Equipment Type
Vehicle or Equipment Annual Hours of Operation	Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment
Share of Hours Serving Ports Included in Project	Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment
Vehicle Annual Miles Traveled	Onroad Vehicles
Annual Number of Visits to Ports Included in this Project	Onroad Vehicles, Locomotives, and Marine/Harbor Vessels
Number of Days Operating at Ports Included in Project	Locomotives

Vehicle or Equipment Annual Hours of Operation

Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment

Use the below approach to document the total number of hours the equipment is online (powered on) and functioning in a manner that is typical during normal operation.

1. Determine how to track annual hours of operation. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Maintenance log
    e. Hour meter (usually located near the equipment gauges or controls):
        i. For mechanical hour meters, some models feature a tenth-of-an-hour digit displayed in a different color wheel. Read the numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        ii. For digital hour meters, some models require the instrument cluster panel to be powered on by activating the equipment's accessory power. Read the displayed numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        iii. An hour meter may be found by exploring digital menus on the equipment's control panel. Refer to the owner's manual for additional guidance. Equipment may also incorporate other built-in means of recording activity, such as axle-based counters, that may serve to infer hours of operation.
2. Calculate the annual hours of operation:
    a. Subtract the hours at the start of the year from the hours at the end of the year.
    b. Alternatively, sum the usage hours across the entire year at relevant intervals (e.g., weekly hours from the driver/operator log, quarterly hours from the maintenance log, etc.).
3. Record annual hours of operation in the Project Reporting Template.

Share of Hours Serving Ports Included in Project

Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment

Use the below approach to calculate the share (percentage) of hours the equipment is serving port locations.[1] *Note: In most cases, this number will be 100% except for equipment that also operates in one or more non-port locations.*

[1] Port definitions:
►**Water port:** places on land alongside navigable water (e.g., oceans, rivers, or lakes) with one or more facilities in close proximity for the loading and unloading of passengers or cargo from ships, ferries, and other commercial vessels.
►**Dry port:** an intermodal truck-rail facility that is included in the 2024 Federal Highway Administration's (FHWA) Intermodal Connector Database based on meeting the criteria set in 23 CFR 470. These criteria include having more than 50,000 20-foot equivalent units per year or 100 trucks per day, or comprising more than 20 percent of freight volumes handled by any mode within a State.

1. Determine the equipment hours of operation (see *Vehicle or Equipment Annual Hours of Operation* data field).
2. If telematics data is available (accessed through a web-based portal or app):
    a. Determine if spatial data is available.
    b. Set a reasonable geographic boundary to define each port location.
    c. Pair spatial data and equipment hours of operation to determine the percentage of activity that takes place at each location.
3. Alternatively, estimate the percentage of hours serving each port location. Potential data sources may include:
    a. Fleet management software
    b. Driver/operator log
    c. Records of known usage for each location
4. Record the share of hours in the Project Reporting Template.

Vehicle Annual Miles Traveled

Onroad Vehicles

Use the below approach to document the total number of miles traveled.

1. Determine how to track annual miles traveled. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Maintenance log
    e. Vehicle odometer:
        i. For mechanical odometers, some models feature a tenth-of-an-hour digit displayed in a different color wheel. Read the numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        ii. For digital odometers, some models require the instrument cluster panel to be powered on by activating the vehicle's accessory power. Read the displayed numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        iii. An odometer may be found by exploring digital menus on the vehicle's control panel. Refer to the owner's manual for additional guidance.
2. Calculate the annual miles traveled:
    a. Subtract the mileage at the start of the year from the mileage at the end of the year.
    b. Alternatively, sum the vehicle mileage across the entire year at relevant intervals (e.g., weekly mileage from the driver/operator log, quarterly mileage from the maintenance log, etc.).
3. Record vehicle annual miles traveled in the Project Reporting Template.

Annual Number of Visits to Ports Included in this Project

Onroad Vehicles, Locomotives, and Marine/Harbor Vessels

Use the below approach to document the number of unique occurrences[2] when the vehicle or equipment entered port boundaries[3] to perform work or serve a location included in the project. *Note: this data field should be left blank if the equipment operates exclusively at the port location(s) included in the project.*

1. If telematics data is available (accessed through a web-based portal or app):
    a. Determine if the data is sufficient to obtain the count of visits made to the port location(s) in a specific period of time.
2. Alternatively, evaluate operation logs to determine the number of visits made to the port(s):
    a. Number of visits may be inferred through charging logs, driver/operator logs, counts of freight movement, truck appointment/gate management system data, or other activity records.
3. Record annual number of visits in the Project Reporting Template.

Number of Days Operating at Ports Included in Project

Locomotives

Use the below approach to document the number of days that the locomotive operated at ports included in the project.

1. If telematics data is available (accessed through a web-based portal or app):
    a. Determine if the data is sufficient to obtain the count of days when the locomotive was in use at the port location(s) included in the project.

[2] A single truck "visit" to a port includes entering and exiting a port gate to pick up and/or drop off a load. Truck movements solely within a port (e.g., travel to and from a terminal or between terminals) would not count as separate "visits". For simplicity, recipients may wish to track the number of days per year that a truck visits a port as an indicator of number of visits per year.

[3] Port definitions:

►**Water port:** places on land alongside navigable water (e.g., oceans, rivers, or lakes) with one or more facilities in close proximity for the loading and unloading of passengers or cargo from ships, ferries, and other commercial vessels.

►**Dry port:** an intermodal truck-rail facility that is included in the 2024 Federal Highway Administration's (FHWA) Intermodal Connector Database based on meeting the criteria set in 23 CFR 470. These criteria include having more than 50,000 20-foot equivalent units per year or 100 trucks per day, or comprising more than 20 percent of freight volumes handled by any mode within a State.

2. Alternatively, evaluate operation logs to determine the number of days when the locomotive was used at the port(s):
    a. Number of days may be inferred through charging logs, driver/operator logs, counts of freight movement, or other activity records.
3. Record number of days in the Project Reporting Template.

3. Current Mobile Equipment for Scrappage

Table 2 lists Clean Ports Program current mobile equipment activity data fields in the Project Reporting Template.

Table 2. *Current mobile equipment activity data fields.*

Current Mobile Equipment Activity	Mobile Equipment Type
Annual Amount of Fuel Used	All
Annual Usage Hours	Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment
Annual Miles Traveled	Onroad Vehicles
Annual Idling Hours	Onroad Vehicles
Annual Hoteling Hours	Onroad Class 8 Long-Haul Combination Vehicles
Remaining Life of Current Engine/Vehicle	All

Annual Amount of Fuel Used

All Equipment Types

Use the below approach to document the amount of fuel used by the vehicle or equipment being scrapped, in gallons.

1. Determine how to track the fuel usage from the latest 12-month period of operation available. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Fuel tracking system, receipts, or billing records
2. Record annual amount of fuel used in the Project Reporting Template.

Annual Usage Hours

Locomotives, Harbor Craft, Cargo Handling Equipment, and Other Eligible Non-road Equipment

Use the below approach to document the total number of hours the equipment is online (powered on) and functioning in a manner that is typical during normal operation.

1. Determine how to track annual hours of operation. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Maintenance log
    e. Hour meter (usually located near the equipment gauges or controls):
        i. For mechanical hour meters, some models feature a tenth-of-an-hour digit displayed in a different color wheel. Read the numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        ii. For digital hour meters, some models require the instrument cluster panel to be powered on by activating the equipment's accessory power. Read the displayed numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        iii. For equipment without a designated hour meter, an hour meter may be found by exploring digital menus on the equipment's control panel. Refer to the owner's manual for additional guidance. Equipment may also incorporate other built-in means of recording activity, such as axle-based counters, that may serve to infer hours of operation.
2. Calculate the annual usage hours:
    a. Subtract the hours at the start of the year from the hours at the end of the year.
    b. Alternatively, sum the usage hours across the entire year at relevant intervals (e.g., weekly hours from the driver/operator log, quarterly hours from the maintenance log, etc.).
3. Record annual hours of operation in the Project Reporting Template.

Annual Miles Traveled

Onroad Vehicles

Use the below approach to document the total number of miles traveled.

1. Determine how to track annual miles traveled. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Maintenance log

    e. Vehicle odometer:
        i. For mechanical odometers, some models feature a tenth-of-an-hour digit displayed in a different color wheel. Read the numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        ii. For digital odometers, some models require the instrument cluster panel to be powered on by activating the equipment's accessory power. Read the displayed numbers from left to right, rounding the tenth-of-an-hour digit to the nearest whole number.
        iii. An odometer may be found by exploring digital menus on the equipment's control panel. Refer to the owner's manual for additional guidance.
2. Calculate the annual miles traveled:
    a. Subtract the mileage at the start of the year from the mileage at the end of the year.
    b. Alternatively, sum the vehicle mileage across the entire year at relevant intervals (e.g., weekly mileage from the driver/operator log, quarterly mileage from the maintenance log, etc.).
3. Record annual miles traveled in the Project Reporting Template.

Annual Idling Hours

Onroad Vehicles

Use the below approach to document the number of hours the vehicle was idling. *Note: this data field should be left blank if the vehicle does not record idling hours.*

1. Determine how to track annual idling hours. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. Maintenance log
    e. Vehicle idling meter
2. Calculate the annual idling hours:
    a. Subtract the idling hours at the start of the year from the idling hours at the end of the year.
    b. Alternatively, sum the vehicle idling hours across the entire year at relevant intervals (e.g., weekly idling hours from operator/driver log, quarterly idling hours from the maintenance log, etc.).
3. Record annual idling hours in the Project Reporting Template.

Annual Hoteling Hours

Onroad Class 8 Long-Haul Combination Vehicles

Use the below approach to document the hours when trucks were parked during mandatory rest periods for long-haul drivers. Typically, engine idling or an auxiliary power unit (APU) are used during these hoteling hours.

1. Determine how to track hoteling hours for the prior year of operation. Potential data sources may include:
    a. Fleet management software
    b. Telematics data (accessed through a web-based portal or app)
    c. Driver/operator log
    d. APU operating hours (if recorded with an hour meter)
    e. APU maintenance log
2. Calculate the annual hoteling hours:
    a. If APU operating hours are recorded with an hour meter, subtract the hours at the start of the year from the hours at the end of the year.
    b. Alternatively, sum the hours across the entire year at relevant intervals (e.g., weekly hours from the driver/operator log, quarterly hours from the maintenance log, etc.).
3. Record annual hoteling hours in the Project Reporting Template.

Remaining Life of Current Engine/Vehicle

All Equipment Types

Use the below approach to document the expected remaining life of the current vehicle, equipment, or engine at the time of replacement. Remaining life is the fleet owner's estimate of the number of years until the unit would have been retired from service if it were not rebuilt or scrapped. The remaining life estimate depends on the age and condition of the vehicle, along with its past usage, maintenance history, and the region’s climate.

1. Determine the expected useful life of the vehicle, equipment, or engine. Potential data sources may include:
    a. Equipment manufacturer
    b. Owner/operator experience based on similar equipment
2. Subtract the number of years the vehicle has been in operation from the expected useful life.
3. Record remaining life of current engine/vehicle in the Project Reporting Template.

4. Charging and Other Fueling Infrastructure

Table 3 lists Clean Ports Program infrastructure activity data fields in the Project Reporting Template.

Table 3. *Infrastructure activity data fields.*

Infrastructure Activity	Infrastructure Type
Annual Total Energy Dispensed (kWh)	Electric Vehicle/Vessel Supply Equipment (EVSE)
EVSE Annual Percentage Uptime (based on hours)	Electric Vehicle/Vessel Supply Equipment (EVSE)
EVSE Total Annual Number of Charging Sessions Completed	Electric Vehicle/Vessel Supply Equipment (EVSE)
Has the Infrastructure Ever Been Powered by an Internal Combustion Generator in the Past Year?	Electric Vehicle/Vessel Supply Equipment (EVSE)
Typical Auxiliary Engine Tier of Vessels Using Shore Power	Shore Power
Fuel Type of Vessels Using Shore Power	Shore Power
Number of Annual Vessels Calls Utilizing Shore Power	Shore Power
Average Hotel Hours Per Vessel Call Utilizing Shore Power	Shore Power
Annual Total Energy Dispensed (MWh)	Shore Power
Shore Power Annual Percentage Uptime (based on hours)	Shore Power
Annual Total Number of Fueling Events	Hydrogen (H2) Fueling
Annual Total H2 Dispensed (kg)	Hydrogen (H2) Fueling
On-Site Power Generation Annual Energy Dispensed (MWh)	On-Site Power Generation
On-Site Power Generation Annual Percentage Uptime (based on hours)	On-Site Power Generation
BESS Annual Energy Dispensed/Discharged (MWh)	Battery Energy Storage System (BESS)
BESS Annual Energy Received/Charged from Grid (MWh)	Battery Energy Storage System (BESS)
BESS Annual Percentage Uptime (based on hours)	Battery Energy Storage System (BESS)
Has the BESS Infrastructure Been Ever Charged by an Internal Combustion Generator in the Past Year?	Battery Energy Storage System (BESS)

Electric Vehicle/Vessel Supply Equipment (EVSE)

Annual Total Energy Dispensed (kWh)

Use the below approach to document the total energy the EVSE dispensed, in kilowatt-hours (kWh).

1. Determine how to access data on total energy dispensed. Potential data sources may include:
    a. System data platform (accessed through an on-site display, web-based portal, or app)

   b. Energy management system
   c. Receipts or purchase records for charging usage
2. Read or calculate the annual total energy dispensed:
   a. Read total energy dispensed for the year.
   b. If the system provides cumulative data over time, subtract the total energy dispensed at the start of the year from the total energy dispensed at the end of the year.
   c. If the system only tracks energy dispensed per charging session, calculate the total amount of energy dispensed by summing the amount of energy dispensed for all charging sessions during the year.
3. Record annual total energy dispensed in the Project Reporting Template.

EVSE Annual Percentage Uptime (based on hours)

Use the below approach to document the percentage of time the EVSE is online and functioning properly (as opposed to down due to maintenance or a fault/outage).

1. Determine how to track downtime, which refers to periods when the system was not functioning properly – such as from maintenance, faults, or outages. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Maintenance logs, fault records, or outage reports
2. Sum all instances of downtime (in hours) for the year, rounding up the final total to the nearest hour.
3. Calculate uptime:

$$uptime\ (\%) = \left(\frac{8{,}760\ hours - total\ hours\ of\ downtime}{8{,}760\ hours}\right) \times 100$$

4. Record annual percentage uptime in the Project Reporting Template.

EVSE Total Annual Number of Charging Sessions Completed

Use the below approach to document the total number of charging sessions.

1. Determine how to track the total number of charging sessions. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Receipts or purchase records for charging usage
2. Record the annual number of charging sessions in the Project Reporting Template.

Has the Infrastructure Ever Been Powered by an Internal Combustion Generator in the Past Year?

Use the below approach to document whether the EVSE was charged by an internal combustion generator (such as an on-site diesel generator) instead of power from the electric grid or on-site solar.

1. Determine how to track whether the EVSE was charged by an internal combustion generator. Potential sources may include:
    a. Communications with knowledgeable personnel
    b. Energy management system
2. Respond Yes/No in the Project Reporting Template.

Shore Power

Typical Auxiliary Engine Tier of Vessels Using Shore Power

Use the below approach to document the typical (median) EPA engine tier of auxiliary engines in vessels using shore power. Note that this data field refers to auxiliary engines (such as generators) that are powered off when the vessel is connected to shore power.

1. Determine how to track the auxiliary engine tier of vessels using shore power.
    a. For ocean-going vessels (i.e., ships): it is possible to determine the auxiliary engine tier based on the vessel keel laid date according to the following table:

Keel Laid Date	Engine Tier
1999 and earlier	Tier 0
2000–2010	Tier I
2011–2015	Tier II
2016 and later	Tier III

    Keel laid date or auxiliary engine tier information may be available in public vessel databases. Alternatively, communicate with vessel owners or operators to inquire about vessels' keel laid date or the auxiliary engine tier.
    b. For harbor craft: if possible, refer to publicly available resources with vessel-specific characteristics. Alternatively, communicate with vessel owners or operators to inquire about vessels' auxiliary engine tier.
2. Calculate the median auxiliary engine tier of vessels using shore power. The median calculation should include all vessel calls when vessels were connected to and utilized shore power, including repeat calls by the same vessel.
3. Record median auxiliary engine tier in the Project Reporting Template.

Fuel Type of Vessels Using Shore Power

Use the below approach to document the fuel type of vessels using shore power.

1. Determine how to track the fuel type of vessels using shore power:
    a. Fuel type information may be available in public vessel databases or may be provided to the port by vessel operators as part of the port's process to authorize vessels to use shore power. In most cases, a particular fuel should be the de-facto standard for a port or region.
    b. Alternatively, communicate with vessel owners or operators to inquire about fuel type.
2. Fuel type options listed in the Project Reporting Template include *Marine Gas Oil (MGO, 0.10% S)*, *Liquefied Natural Gas (LNG)*, or *Other*, with the option to describe in more detail if *Other* is selected.
    a. If fuel type varies among vessels using shore power, report the fuel type associated with the majority of vessel calls.
3. Record fuel type in the Project Reporting Template.

Number of Annual Vessel Calls Utilizing Shore Power

Use the below approach to document the number of vessel calls when vessels connected to and utilized shore power

1. Determine how to track the number of annual vessel calls utilizing shore power. Potential data sources may include:
    a. System data platform (accessed through an on-site display, web-based portal, or app)
    b. Shore power operation logs
    c. Receipts or purchase records for shore power usage
2. Record number of vessel calls utilizing shore power in the Project Reporting Template.

Average Hotel Hours Per Vessel Call Utilizing Shore Power

Use the below approach to document the average number of hours that vessels used shore power.

1. Determine the duration of time (in hours) each vessel that used shore power was connected to and operating on shore power. Potential data sources may include:
    a. System data platform (accessed through an on-site display, web-based portal, or app)

   b. Shore power operation logs
   c. Records of vessel arrivals and departures
   d. Receipts or purchase records for shore power usage
2. If the exact duration is known (excluding connection and disconnection times), use that value. If only total time at-berth is known (arrival to departure), subtract three hours to account for connection and disconnection times.
3. Calculate the average number of hours that vessels used shore power while hoteling:
   a. Determine the number of vessel calls that used shore power (see *Number of Annual Vessel Calls Utilizing Shore Power* data field).
   b. Sum the total number of hours that vessels used shore power across all vessel calls.
   c. Calculate the average hotel hours that vessels used shore power, rounding to the nearest tenth of an hour (e.g., 4.5 hours):

$$average\ hotel\ hours = \frac{total\ number\ of\ hours\ vessels\ used\ shore\ power}{number\ of\ vessel\ calls\ utilizing\ shore\ power}$$

4. Record average hotel hours per vessel call utilizing shore power in the Project Reporting Template.

Annual Total Energy Dispensed (MWh)

Use the below approach to document the total energy the shore power system dispensed, in megawatt-hours (MWh).

1. Determine how to access data on total energy dispensed. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Shore power operation logs
   c. Energy management system
   d. Electric meter
   e. Receipts or purchase records for shore power usage
2. Read or calculate annual total energy dispensed:
   a. Read total energy dispensed for the year. If the system records in kWh, convert to MWh using the formula:

$$MWh = \frac{kWh}{1{,}000}$$

   b. If the system provides cumulative data over time, subtract the total energy dispensed at the start of the year from the total energy dispensed at the end of the year.
   c. If the system only tracks energy dispensed per vessel call, calculate the total amount of energy dispensed by summing the amount of energy dispensed for all vessel calls that utilized shore power during the year.
3. Record annual total energy dispensed in the Project Reporting Template.

Shore Power Annual Percentage Uptime (based on hours)

Use the below approach to document the percentage of time the shore power system is online and functioning properly (as opposed to down due to maintenance or a fault/outage).

1. Determine how to track downtime, which refers to periods when the system was not functioning properly – such as from maintenance, faults, or outages. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Maintenance logs, fault records, or outage reports
2. Sum all instances of downtime (in hours) for the year, rounding up the final total to the nearest hour.
3. Calculate uptime:

$$uptime\ (\%) = \left(\frac{8{,}760\ hours - \ total\ hours\ of\ downtime)}{8{,}760\ hours}\right) \times 100$$

4. Record annual percentage uptime in the Project Reporting Template.

Hydrogen (H2) Fueling

Annual Total Number of Fueling Events

Use the below approach to document the total number of instances when the system dispensed fuel.

1. Determine how to track total number of fueling events. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Fueling logs
   c. Receipts or purchase records for hydrogen fueling events

2. Record the number of fueling events in the Project Reporting Template.

Annual Total H2 Dispensed (kg)

Use the below approach to document the total amount of hydrogen the system dispensed, in kilograms (kg).

1. Determine how to access data on the amount of hydrogen dispensed. Potential data sources may include:
    a. System data platform (accessed through an on-site display, web-based portal, or app)
    b. Mass flow meter
    c. Fueling logs
    d. Receipts or purchase records for hydrogen fueling events
2. Read or calculate annual total H2 dispensed:
    a. Read the total H2 dispensed for the year.
    b. If the system provides cumulative data over time, subtract the total H2 dispensed at the start of the year from the total H2 dispensed at the end of the year.
    c. If the system only tracks H2 dispensed per fueling event, calculate the total amount of hydrogen dispensed by summing the amount of H2 dispensed for all fueling events during the year.
3. Record annual total hydrogen dispensed in the Project Reporting Template.

On-Site Power Generation

On-Site Power Generation Annual Energy Dispensed (MWh)

Use the below approach to document the total amount of energy the on-site power generation system has dispensed, in megawatt-hours (MWh).

1. Determine how to access data on total energy dispensed. Potential data sources may include:
    a. System data platform (accessed through an on-site display, web-based portal, or app)
    a. Production/generation meter
2. Read or calculate annual energy dispensed:
    a. Read the total energy dispensed for the year. If energy is reported in kilowatt-hours (kWh), convert to megawatt-hours (MWh) using the formula:

$$MWh = \frac{kWh}{1{,}000}$$

   b. If the system only provides cumulative data over time, subtract the total energy dispensed at the start of the year from the total energy dispensed at the end of the year.
3. Record annual energy dispensed (MWh) in the Project Reporting Template.

On-Site Power Generation Annual Percentage Uptime (based on hours)

Use the below approach to document the percentage of time the power generation system is online and functioning properly (as opposed to down due to maintenance or a fault/outage).

1. Determine how to track downtime, which refers to periods when the system was not functioning properly – such as from maintenance, faults, or outages. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Maintenance logs, fault records, or outage reports
2. Sum all instances of downtime (in hours) for the year, rounding up the final total to the nearest hour.
3. Calculate uptime:

$$uptime\ (\%) = \left(\frac{8{,}760\ hours - total\ hours\ of\ downtime}{8{,}760\ hours}\right) \times 100$$

4. Record annual percentage uptime in the Project Reporting Template.

Battery Energy Storage System (BESS)

BESS Annual Energy Dispensed/Discharged (MWh)

Use the below approach to document the total amount of energy the system dispensed/discharged, in megawatt-hours (MWh).

1. Determine how to access data on energy dispensed/discharged. Potential data source may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Battery/energy management system
2. Read or calculate annual energy dispensed/discharged:
   a. Read energy dispensed/discharged for the year. If the system records in kWh, convert to MWh using the formula:

$$MWh = \frac{kWh}{1{,}000}$$

   b. If the system only provides cumulative data over time, subtract the total energy dispensed at the beginning of the year from the total energy dispensed at the end of the year.
3. Record annual energy dispensed/discharged in the Project Reporting Template.

BESS Annual Energy Received/Charged from Grid (MWh)

Use the below approach to document the amount of energy the BESS system received from the electric grid and on-site power generation systems, in megawatt-hours (MWh).

1. Determine how to access data on energy received/charged. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Battery/energy management system
2. Read or calculate annual energy received/charged:
   a. Read energy received/charged from the electric grid and on-site power generation systems for the year. If the system records in kWh, convert to MWh using the formula:

$$MWh = \frac{kWh}{1{,}000}$$

   b. If the system only provides cumulative data over time, subtract the total energy received/charged at the beginning of the year from the total energy received/charged at the end of the year.
3. Record annual energy received/charged in the Project Reporting Template.

BESS Annual Percentage Uptime (based on hours)

Use the below approach to document the percentage of time the battery energy storage system is online and functioning properly (as opposed to down due to maintenance or a fault/outage).

1. Determine how to track downtime, which refers to periods when the system was not functioning properly – such as from maintenance, faults, or outages. Potential data sources may include:
   a. System data platform (accessed through an on-site display, web-based portal, or app)
   b. Maintenance logs, fault records, or outage reports
2. Sum all instances of downtime (in hours) for the year, rounding up the final total to the nearest hour.

3. Calculate uptime:

$$uptime\ (\%) = \left(\frac{8{,}760\ hours\ - total\ hours\ of\ downtime}{8{,}760\ hours}\right) \times 100$$

4. Record annual percentage uptime in the Project Reporting Template.

Has the BESS Infrastructure Been Ever Charged by an Internal Combustion Generator in the Past Year?

Use the below approach to document whether the BESS was charged by an internal combustion generator (such as an on-site diesel generator) instead of power from the electric grid or on-site solar.

1. Determine how to track whether the BESS was charged by an internal combustion generator. Potential sources may include:
    a. Communications with knowledgeable personnel
    b. Battery/energy management system
2. Respond Yes/No in the Project Reporting Template.

5. Appendix

Additional Program Resources

The following documents provide additional information about the EPA Clean Ports Program and the data fields described in this document.

- *Port Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions:* https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1014J1S.pdf
    - Chapter 3: Ocean-Going Vessels
    - Chapter 4: Harbor Craft
    - Chapter 6: Cargo Handling Equipment
    - Chapter 7: Onroad Vehicles
    - Chapter 8: Rail
- *Clean Ports Program: Zero-Emission Technology Deployment Competition Notice of Funding Opportunity:* https://www.epa.gov/system/files/documents/2024-04/2024-clean-ports-ze-tech-deploymt-competition-rev-2024-04-10.pdf
- *Shore Power Technology Assessment, 2022 Update:* https://www.epa.gov/ports-initiative/shore-power-technology-assessment-us-ports

    - Shore Power Emissions Calculator: https://www.epa.gov/system/files/documents/2023-04/shore-power-ems-calc-v2023-2023-04-06.xlsx
- Clean Ports Program website: https://www.epa.gov/ports-initiative/cleanports