

THE NORTHWEST SEAPORT ALLIANCE
MEMORANDUM

MANAGING MEMBERS
STAFF BRIEFING

Item No. 5B
Date of Meeting July 17, 2018

DATE: July 3, 2018
TO: Managing Members, The Northwest Seaport Alliance
FROM: John Wolfe, Chief Executive Officer
Sponsor: Jason Jordan, Director, Environmental and Planning Services
Project Manager: Sara Cederberg, Environmental Senior Project Manager
SUBJECT: Staff Briefing on Air Quality Grant Funding

A. BRIEFING REQUESTED

The Northwest Seaport Alliance (NWSA) staff will provide an overview of four air quality related grants opportunities and projects for 2018.

B. SYNOPSIS

The Northwest Seaport Alliance has made significant commitments to reduce air pollution and greenhouse gas emissions through the Northwest Ports Clean Air Strategy (NWPCAS) and the NWSA Greenhouse Gas Resolution. Meeting these air quality goals will require large investments in infrastructure, fleet modernization, and operational efficiency from the NWSA as well as industry partners. NWSA staff is exploring the following grant opportunities to supplement costs associated with emission reduction projects:

- Volkswagen Mitigation Settlement (VW)
- Diesel Emission Reduction Act (DERA) 2018
- Washington State Department of Ecology Clean Diesel Grants 2018
- DERA 2017 agreement with SCAQMD

NWSA, Port of Tacoma and Port of Seattle staff have been coordinating VW grant priorities over the last two years and have concluded the following priorities are best suited to meet the needs of the three organizations. Staff is seeking confirmation from the Managing Members on the prioritized projects. With the priorities established staff is requesting that all Managing Members advocate for these priorities with local, state and federal entities.

C. BACKGROUND

Two policies direct NWSA's air quality programs. First, the Northwest Ports Clean Air Strategy, which establishes overarching emission targets for diesel particulate matter (DPM) and greenhouse gasses (GHG) to be achieved by 2020 as well as sector specific strategies and activity based targets. These goals will be updated in 2019 to extend to 2025 and 2030.

The overarching NWPCAS goals are reduce:

- Diesel particulate matter emissions per metric ton of cargo by 80% by 2020, to decrease immediate and long-term health effects on adjacent communities, relative to 2005.
 - NWSA DPM emissions per metric ton of cargo were reduced by 80% between 2005 and 2016.
- Greenhouse gas emissions per metric ton of cargo by 15% by 2020, to limit contributions to climate change and reduce associated environmental, health, and economic impacts, relative to 2005.
 - NWSA GHG emissions per metric ton of cargo were reduced by 17% between 2005 and 2016.

As confirmed in the recently completed 2016 Puget Sound Maritime Emissions Inventory, the three U.S. ports are on track to achieve these goals by 2020. As of 2016, the combined total progress for the three entities together is a 78% reduction in DPM per ton of cargo and 8% reduction in GHG per ton of cargo, relative to 2005 levels.

Second, in keeping with the Paris Agreement, NWSA has renewed its commitment to GHG emission reductions through the adoption of its Greenhouse Gas Policy Resolution (2017-02). The airshed scale GHG emission reduction targets are as follows:

By 2030:

- 50% below 2005 levels (Scope 1,2, and 3 emissions¹)

By 2050:

- Carbon neutral (Scope 1 and 2)
- 80% below 2005 levels (Scope 3 emissions)

As presented in April 2018, staff developed a glidepath to demonstrate the emission reduction efforts required to meet the targets. The glidepath helps prioritize emission reduction efforts and indicates the sectors that have the greatest emission reduction potential.

The cumulative effect of glidepath emission reduction measures are shown in Figure 1, illustrating the emission reduction measures necessary to get from the projections (black line) to the targets (green line). The light blue shaded area indicates the emission estimates for

¹ "Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions." From the *Greenhouse Gas Protocol*

2005 and 2016. The decrease reflects progress made by the NWPCAS. The green shaded area and dark green line indicate the GHG Resolution targets in 2030 and 2050. The other shaded areas represent the emission reductions associated with measures that are expected to be technically feasible in the coming years, where the black line on top indicates estimated and projected emissions. The hatched area is the difference between proposed emission reduction measures and the targets, indicating the extent to which renewable fuels and GHG offsets must be considered.

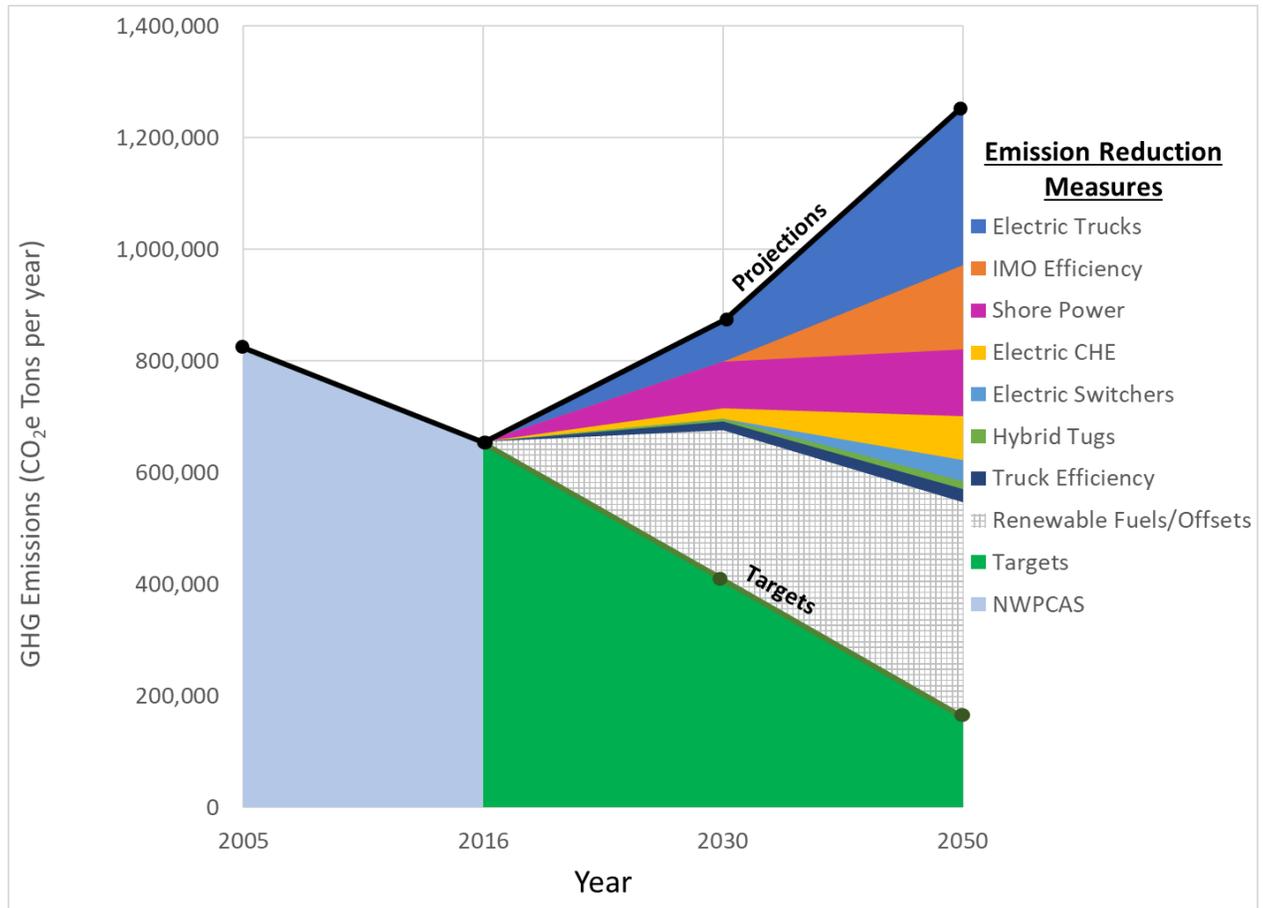


Figure 1. Effectiveness of GHG Emission Reduction Measures in Attaining GHG Targets.

D. CURRENT STATUS: GRANT OPPORTUNITIES

Staff have identified equipment or infrastructure eligible for the specific grant opportunities owned and/or operated by the NWSA, home ports, tenants, or other industry partners through outreach. Once a grant opportunity becomes available, staff develop proposals and follow the internal Investment Development Decision Process and present to the Grant Steering Committee. The following projects and priorities were approved by the Grant Steering Committee at their May 24, 2018 meeting. Per the Master Policy, the Managing Members authorize the acceptance of any grants.

National Volkswagen Mitigation Settlement

NWSA staff recommend prioritizing shore-side shore power infrastructure and zero emission cargo handling equipment as the top priorities for port-related VW funding.

Background

The automaker VW sold vehicles designed to cheat emissions tests from 2008 to 2015 and these vehicles emitted up to 40 times the allowable amount of nitrogen oxides as a result. Through the resulting national lawsuit, a fund was established to mitigate these emissions through replacement of dirty diesel engines and the construction of infrastructure that circumvents the use of diesel fuel. Washington state is eligible for \$112.7 million and the Washington State Department of Ecology will administer the funds.

The federal settlement designated eligible categories as described in Appendix D-2 of the Consent Decree².

The Department of Ecology has constructed a Draft Mitigation Plan³, indicating their initial intentions for how they plan to distribute the funds. It should be noted that this is a draft and is subject to change. NWSA and POS submitted comments on the draft in December 2018 (Attachments A and B). Staff met with the Department of Ecology in February to discuss the emission reduction opportunities associated with funding NWSA projects and to better understand Ecology's internal priorities for assigning the funds.

Staff followed up with Ecology and the State Department of Commerce in late April and also met with the Department of Commerce in early June to discuss the strengths of NWSA project proposals. Through these conversations and the draft mitigation plan, it has become clear that the governor's top priority is to fund retrofit projects for converting ferries to hybrid-electric. However, staff remains hopeful that there will be funds remaining for maritime related projects.

Local clean air agencies in Washington, in partnership with the Department of Ecology, are developing a set of guiding principles for the best use of the mitigation funds, as laid out in the Draft Mitigation Plan. The mitigation plan has not been finalized and a Request for Proposals has yet to be issued, therefore the timeline on when funds will be awarded is still unclear. Staff has had conversations with the department of Ecology that indicated that a Request for Proposals may be issued in quarter 3 or quarter 4 of 2018, but this is still uncertain.

The guiding principles from the mitigation plan for distributing the funds as it is currently written are as follows:

- cost effectiveness for nitrogen oxide (NO_x) emission reductions (most pollution reduction per dollar);
- emission reductions of other air pollutants and greenhouse gasses (PM, CO₂, VOCs, etc.)
- reducing pollution exposure of highly impacted communities;
- leveraging with other emission-reduction efforts; and

² <https://www.vwcourtsettlement.com/wp-content/uploads/documents/DOJ/Approved%20Appendix%20D-2.pdf>

³ <https://ecology.wa.gov/DOE/files/41/417a6510-a669-4a10-927d-4ebc02282f4a.pdf>

- large-scale projects that are too expensive to be funded by other grant programs.

The draft state mitigation plan divides the fund into six categories with funding distributed by the Department of Ecology based on the following priorities, however, according to Ecology, even though a category is listed, it doesn't mean they will offer opportunities for all:

- Marine Vessels – (up to 45%, \$50.7 million)
 - Includes infrastructure for shore power as well as vessel and engine replacements.
 - Government owned ocean-going vessel shore power infrastructure projects can be funded at up to 100%.
- Non-Road Equipment – (up to 5%, \$5.6 million)
 - Cargo handling equipment is eligible here. Only proposals for all electric equipment will be considered.
 - Non-government owned cargo handling equipment replacements and repowers can be funded at up to 75%.
- Locomotives – (up to 5%, \$5.6 million)
 - Government owned switching locomotives can be funded at up to 100%.
- Light Duty Zero Emission Vehicle Supply Equipment – (15%, \$16.9 million)
- On-Road Heavy Duty Vehicles – (up to 45%, \$50.7 million)
 - New equipment only, priority for school buses and public transit.
 - Staff are not pursuing funding for drayage trucks at this time due to the following factors:
 - Funds are likely to be distributed after the January 1, 2019 deadline for the Clean Truck Program.
 - VW funds must be spent on new trucks, which are not a cost-effective option for truck drivers, even with 50% grant contribution.
- DERA Match – (up to 5%, \$5.6 million)

Priority Projects

Staff have identified the most effective port-related projects and external projects for which NWSA can offer support. In December 2016, NWSA and Port of Seattle (POS) developed an initial joint list of 15 projects which was submitted to the Puget Sound Clean Air Agency (see Attachment C). NWSA, POT and POS staff have since refined the list and propose prioritizing the following short list of potential projects, in order of emission reduction priority.

1. Ocean going vessel shore power at all NWSA international container terminals and Pier 66

Ocean going vessel shore power is eligible for funding under the marine vessels category of the Department of Ecology Draft Mitigation plan and is called out directly in Appendix D-2 of the Federal Consent Decree. As described in Appendix D-2, government owned marine shore power can be funded at up to 100% of the “costs associated with shore-side systems, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components”.

This opportunity would allow NWSA to construct state of the art infrastructure at strategic, deep water berths on its General Central Peninsula, among other locations. This is in addition to the currently planned shore power infrastructure at Terminal 5, which is to be constructed as part of the upcoming wharf rehabilitation project.

Description

Shore power, or cold ironing, can reduce at-berth air emissions from ocean going vessel auxiliary engines by up to 100% by powering ships from the local grid rather than burning on-board fuel. There are alternative technologies such as barge based “bonnet” systems, which capture and treat emissions from a ship’s stack, or generators that use cleaner fuels to power the ship, such as LNG, that can provide similar air pollutant emission reductions for vessels at berth. However, while these alternative technologies can provide significant air emission reductions over diesel auxiliary engines, they do not provide significant Greenhouse Gas (GHG) emission benefits and are therefore less effective at progressing towards NWSA’s air quality goals.

Shore power installations will be considered gateway-wide and will be prioritized based on total costs and potential emission reductions. Total costs include those to install infrastructure on terminals as well as any required upgrades to the utilities’ distribution systems to supply electricity for shore power. Emission reduction potential is generally a function of the number of shore power capable vessels (those with ship-side infrastructure that allows them to plug in) calling the terminal and the length of their stays. The terminals being considered for VW funding are shown below in Table 2.

Because there are not local regulations that require ships to plug in to shore power in Washington State, the use of shore power must be incentivized through operational cost savings while vessels are at berth. NWSA is partnering with Tacoma Power and Seattle City Light to create electricity rate structures that provide these operational cost savings. Additional on-dock reefer plug infrastructure will also be proposed to reduce the need for generators to power refrigerated containers while they are on the terminal, lowering emissions as well as fuel costs for the terminal operators.

Terminal 5

In the draft mitigation plan, projects that were already planned are ineligible for funding under the VW Settlement. The Department of Ecology has not yet issued clear guidance on how this will be evaluated. Shore power infrastructure is planned as part of the upcoming wharf rehabilitation project and was accounted for in the Environmental Impact Statement (EIS) and the permit conditions. The project description in the EIS states that “conduit, wiring, and a connection system would be provided for a shore power system for two berths”, and use of shore power was assumed throughout the emission calculations and air pollutant dispersion modeling. The emission limits stipulated in the permit conditions were taken directly from this environmental review and meeting these limits depends, in part, on the use of shore power. There is potential for T-5 to be eligible if grant funding would make the utilization of shore power higher than what was estimated in the EIS.

Pier 66

Port of Seattle is also considering pursuing funding to install shore power for cruise ships at the Pier 66 terminal. Port of Seattle is just initiating a system impacts study with Seattle City Light to assess the costs of installing the required upgrades to the utility’s distribution system. Shore power installation at Pier 66 has some complexity because of the on-site infrastructure

installation and the length of the off-site feed connection required to be buried in the street right-of-way.

Assessment of Vessel Readiness to Use Shore Power

For shore power infrastructure to be utilized, ships that have the requisite infrastructure to plug-in must call the terminal. Fortunately, the state of California has enacted requirements for vessels to use shore power, driving the fraction of shore power capable vessels in the Pacific fleet to increase. Currently, 70% of vessel calls for each shipping line must use shore power in California. Table 1 shows an analysis of the vessels that call at the NWSA terminals and California ports. Overall, 40% of vessels calling the 6 terminals analyzed were shore power capable. Pier 66 operates for 5 months of the year with 19 vessel calls that are shore power capable. This shore power capability differential is worthy of note and reflects the fact that California-bound vessels do not all rotate through the Pacific Northwest. While global adoption of shore power is advancing, the growing range of technology options, challenges with generation and grid reliability, and overall global scale of operations leaves an unclear path for fleet adoption. Policy discussions at the International Maritime Organization (IMO) are a key opportunity for global efforts to yield national and local benefits that would otherwise be unachievable through state and local incentives or regulation.

Table 1. Shore power capable calls and hours for container terminals considered for VW. Analysis was performed for vessels that called NWSA terminals from January 1, 2018 to June 30, 2018.

Terminal	Percentage of Call Shore Power Capable	Calls Per Month Shore Power Capable	Average Length of Shore Power Capable Call (hours)	Average Shore Power Capable Hoteling Hours per Month
T-18	43%	8.8	41	359
T-30	36%	2.8	33	95
T-46	57%	4.9	41	201
Husky	48%	5.0	67	333
PCT	56%	4.5	30	142
WUT	23%	2.3	31	73
P66 (5 months per year)	50%	4	9	36
T-5 ^a	30%	2.6	53	138

^aEstimated shore power use at T-5 was taken from assumptions used in the Environmental Impact Statement. Resuming operations at T-5 would likely divert shore power capable vessels from other terminals in the gateway.

Emission Reductions

Implementing a shore power program for container ships across the NWSA gateway would significantly reduce vessel hoteling emissions as shown in Table 2. Plugging in every shore power capable vessel that calls the gateway would result in reductions of nearly 4 tons of PM_{2.5}, over 11,500 tons of greenhouse gasses, and over 200 tons of NOx per year. If the proportion of vessels calling the gateway that are shore power capable continues to increase, the potential for emission reductions would also increase. This is likely but not assured, due

to regulations in California as well as the potential for regulations in Asia and with the IMO. Pier 66 emission reductions follow the same assumptions – that every shore power capable vessel that called in 2018 took advantage of shore power. Terminal 5 is likely to handle a mix of new business cargo and cargo diverted from elsewhere in the gateway when it reopens. Therefore, shore power infrastructure at Terminal 5 would serve to reduce emissions from new business as well as allowing ships diverted from other terminals to continue to use shore power. The potential for ships to move service from one terminal to another highlights the importance of employing shore power as a gateway – wide strategy.

Table 2. Emission reductions associated with implementing shore power at each terminal for the hours shown in Table 1.

	NO_x	VOC	PM_{2.5}	CO_{2e}
NWSA Total Airshed Emissions (tons per year)	9,901	209.0	197.0	643,676
Emission Reductions per Terminal (tons per year)*				
T-18	69	2.0	1.2	3,478
T-30	18	0.51	0.29	891
T-46	38	1.1	0.64	1,937
Husky	64	1.9	1.1	3,230
PCT	26	0.75	0.43	1,302
WUT	14	0.40	0.23	687
NWSA Total (current vessels)	229	6.66	3.89	11,525
NWSA Reduction Percentage (current vessels)	2%	3%	2%	2%
P66	30	unknown	0.49	1,477
Projected T-5 ^a	33	0.96	0.55	1,666

*Emission reductions were calculated using the usage rates from Table 1 and assuming an auxiliary power demand of 1156 kW, taken from the EPA's shore power tool⁴ and emission factors from the Puget Sound Maritime Emissions Inventory⁵.

^aT-5 emission reductions for T-5 were estimated from the usage rates assumed in the environmental impact statement, shown above in Table 2. The hoteling power demand was also taken from the EIS and was assumed to be 1450 kW. T-5 emissions are not included in the current NWSA total, as those totals will change once T5 is operational.

Estimated costs

The estimated costs of installing shore power infrastructure at NWSA international container terminals is shown in Table 3. Staff is currently working with Port of Seattle Engineers and Seattle City Light to perform a system impacts study for the three North Harbor terminals considered to determine the cost of required distribution system upgrades to provide electricity

⁴ <https://www.vwcourtsettlement.com/wp-content/uploads/documents/DOJ/Approved%20Appendix%20D-2.pdf>
<https://ecology.wa.gov/DOE/files/41/417a6510-a669-4a10-927d-4ebc02282f4a.pdf>

⁵ <https://pugetsoundmaritimeairforum.org/2016-puget-sound-maritime-air-emissions-inventory/>

for shore power. System Impact Studies with SCL may have up to a three-month lead time. Port of Seattle Engineers are also performing updated cost estimates for the required on-terminal infrastructure, which are expected by the end of July.

Current estimates show the gateway-wide cost (for terminals listed in table 1) of on-terminal infrastructure considered for VW funding to be \$68.68 million. Additional reefer capacity will also be proposed, with reefer plug infrastructure carrying a \$3,200 unit cost. The total cost of increasing reefer capacity by 1000 plugs gateway wide would be an additional \$3.2 million. Because the shore power and reefer plug infrastructure would be government owned, up to 100% of the cost would be eligible for grant funding. Staff recommend terminals be prioritized based on cost and potential for emission reductions (the number and length of shore power capable vessel calls).

Table 3. Estimated Costs of Installing Shore Power Infrastructure at NWSA Terminals (2019 dollars).

Terminal	Number of Berths	On-Terminal Infrastructure Costs	Utility Distribution Network Upgrade Costs
T-18	2	\$14.1 million ^a	In Progress ^c
T-46	2	\$9.0 million ^a	In Progress ^c
T-30	2	\$7.1 million ^a	In Progress ^c
T-5	2	\$11.8 million ^a	\$592,250 ^d
P66	1	\$12.0 million ^a	In Progress ^c
Husky	2	\$4.80 million ^b	\$7.5 million ^e
PCT	2	\$4.05 million ^b	
WUT	2	\$5.83 million ^b	
TOTAL	15	\$68.68 million	TBD

^aNorth Harbor on-terminal costs were taken from a study conducted by Sophometrics in 2006 and translated into 2019 dollars using 5% per year escalation. Port of Seattle Engineering is currently performing a new study to update these estimates due end of July.

^bSouth Harbor on-terminal cost estimates were performed by Cross Engineering in June 2018. These estimates include a 75% contingency.

^cNWSA staff in collaboration with Port of Seattle staff have initiated a System Impacts Study with Seattle City Light to determine the cost of required distribution system upgrades to provide electricity for shore power. Results of this study will inform feasibility and prioritization of North Harbor Terminals.

^dCost for the preferred alternative of the Seattle City Light Method of Service Cost Estimate for the Port of Seattle Terminal 5 Expansion Project.

^eTacoma Power has volunteered a high-level cost estimate to supply electricity for shore power at the South Harbor international container terminals. This figure accounts for all three terminals listed and includes a new substation on the General Central Peninsula, upgrades to the distribution circuits serving the terminals, metering equipment, and connection.

Operational Advantage

Cost savings of 10-20% can be achieved by using electricity to power ships while at berth rather than ECA (0.1% sulfur) fuel. This is a result of low electricity costs in the Pacific Northwest and partnership with the utility companies to develop rates for shore power that create further cost savings. The utilities are a critical partner in developing shore power proposals. In 2017, Tacoma Public Utilities (TPU) approached NWSA staff with interest to collaborate on the installation of shore power at South Harbor container terminals. TPU has volunteered their own staff time to scope infrastructure proposals as well as to develop an electricity rate structure for shore power. Successful implementation of a shore power program requires that there be a financial incentive for the shipping lines to plug in.

Staff are currently working collaboratively with Tacoma Public Utilities to create an electricity rate structure that will provide cost savings for the shipping lines when using shore power. This process includes assisting the utility to demonstrate the potential usage levels of electrical services for shore power, demonstrating the need for reduced cost power to create the necessary financial incentive for shore power use, and leading the effort to submit the application for VW funding. In return, TPU has assisted by developing a prospective shore power rate, provided infrastructure cost estimates where applicable at no cost to NWSA, and is supporting the development of the application for VW funding. Staff has also initiated conversations with Seattle City Light about shore power rates.

Grant funding is extremely important for generating operational cost savings through electricity rates due to the following:

- Public utilities must design rate structures that equitably recover costs for maintenance and capital development. Using grant funds to develop the electrical infrastructure may allow Tacoma Power to provide lower rates for shore power, by reducing the amount of capital investment that must be recouped through the sale of electricity.
- Multiple separate organizations must work together to make shore power a reality. This endeavor would involve collaboration between the utilities, the Port, multiple terminal operators, and multiple ship operators. The probability of this happening is very low where each participant has economic incentive without either grant funding or mandatory regulation.

2. Electric Cargo Handling Equipment

The national VW Mitigation Settlement identifies Port Cargo Handling Equipment as an eligible mitigation action. The Department of Ecology have provisionally proposed that up to 5% of the WA State fund (approximately \$5.6 million) be set aside for these projects. The national settlement requires old equipment be scrapped and be replaced with all-electric equipment. Both the port or tenants are eligible to apply for VW funding for cargo-handling equipment, at different levels of matching funds. Port-owned equipment will be eligible for up to 100% of the cost for both the associated charging infrastructure and equipment, for both equipment replacement or a repower (i.e. replace diesel engine with electric). Tenant-owned equipment will be eligible for up to 75% of the cost of all new electric equipment or a repower, and associated charging infrastructure.

Description

Replace old diesel cargo handling equipment with electric equipment. At present, yard tractors and rubber tired gantries (RTGs) are the most widely accepted electric cargo handling technology and will be targeted. Staff are discussing opportunities to partner with other west coast ports to demonstrate new technology and potentially pool resources for bulk equipment purchases.

Estimated Costs

- New electric RTG: \$1.5 million
- Electric yard tractor: \$275,000
- Infrastructure: Dependent on grid system impacts of new load, number of equipment pieces using combined infrastructure, and synergy with other projects.
- **\$5.6 million could pay for 4 RTGs or 27 yard tractors, assuming 75% grant contribution and 25% match from tenants.**

Operational Advantage

Electric equipment offers operational cost savings over diesel equipment because the electricity used to run them is cheaper than diesel and electric engines require less maintenance than internal combustion engines. Grant funding is a great opportunity to replace older, less efficient equipment with new equipment. Tenants have expressed interest in converting RTGs to electric.

Additional Projects for NWSA Support

The following projects are related to port activities and NWSA proposes to provide letters of support and in-kind staff support to promote these projects.

1. Assist Tug Repowers

Description

Replacement of old, dirtier engines that power assist tug vessels, specifically those that often serve NWSA terminals. Repowering tugs is a very cost-effective way of achieving emission reductions because of how dirty old, unregulated marine engines are. Tug repower project applications come from the same maritime funding allocation and directly compete with funding for shore power.

Estimated Cost

Engine replacement and labor: Roughly \$1 million for two propulsion engines, but highly dependent on vessel-type.

2. Switching Locomotive Repowers

Description

Replacement of dirty, unregulated engines that power switching locomotives owned by Tacoma Rail. This could be an effective way of reducing emissions from a sector that has been traditionally difficult to influence.

Estimated Cost

Engine replacement: Approximately \$1.5 million per engine based on 2009 locomotive reproject.

DERA 2018

Description

The NWSA applied for DERA (Diesel Emissions Reduction Act) grant funding in June 2018 towards the purchase of two new Tier 4 diesel reach stackers, to be used for operations at EB-1. If successful, DERA funding would cover 25% of the cost of the new equipment, while the NWSA would contribute 75% of the purchase cost, alongside additional staff time and administrative costs.

DERA funding is available annually, administered by the EPA's Office of Transportation and Air Quality. Approximately \$40 million is available nationally this year under DERA Clean Diesel funding assistance. Funding is distributed by EPA by their regional offices – the Region 10 office covers Washington, Oregon, Idaho and Alaska. This year, up to \$900,000 is available per project in Region 10 and 2-8 projects will be awarded. Funding is to be prioritized to fleets operating at or servicing goods movement facilities. Further, priority for funding will be given to projects which result in outcomes that benefit affected communities, those that engage affected communities with respect to the design and performance of the project, and those which can demonstrate the ability to promote and continue efforts to reduce emissions after the project has ended. The NWSA proposal is well placed to meet the EPA's priorities with an application for funding two new reach stackers.

Following approval by the internal Grant Steering Committee in May 2018, staff applied for DERA funding towards the purchase of two new reach stackers at the EB-1 breakbulk terminal in the South Harbor. The two reach stackers would replace two Tier 0 diesel, leased top handlers and a leased yard truck, which will be returned to Jones Stevedoring. Under the published national DERA RFP, each vehicle or piece of equipment replaced using DERA funds had to identify a suitable piece of equipment to be scrapped. The equipment to be scrapped is usually an older version of the new piece (e.g. DERA funding for a new reach stacker, with an old reach stacker being scrapped). However, as the two reach stackers being purchased are replacing leased equipment, the NWSA did not have an easy one-for-one swap to offer in our application. Following discussions with the EPA, the NWSA has proposed to scrap three Tier 0 diesel straddle carriers in place of the leased equipment, ensuring that equivalent emission reductions are still achieved.

Emission Reductions

The NWSA proposed to scrap three Tier 0 (uncontrolled) Valmet straddle carriers to offset the emissions that would have been reduced by scrapping the leased top handlers. Straddle

carriers perform similar functions to the top handlers – they move empty and loaded containers around a terminal. Each straddle carrier has two 185hp engines and each reachstacker has one 335hp engine. The EPA emission standards for new (Tier 4 Final) nonroad engines and the oldest standards are shown below, further demonstrating that this project would achieve significant emission reductions. The straddle carriers that will be scrapped in this proposal were built before Tier 1 regulations, meaning they likely emit more than the Tier 1 standard. DEQ⁶ model calculations indicate that replacing the three Tier 0 straddle carriers with two Tier 4 reachstackers would result in annual emission reductions of 98% for PM_{2.5}, 96% for NO_x, 89% for hydrocarbons, and 99% for CO and a net reduction of 8,170 gallons of diesel fuel use per year. In addition, the project will result in annual health related cost savings of \$38,220/yr and \$264,600 over the project lifetime.

	NO _x	PM _{2.5}	CO _{2e}
2016 NWSA Total Airshed Emissions (tons per year)	9,901	197.0	643,676
Project Emission Reductions			
Tons/Yr	0.707	0.063	40
Tons/Lifetime	4.687	0.428	231
Percent Reduction	96%	98%	48%

Estimated Costs

- Equipment purchased: 2 reach stackers
- Cost per piece of equipment (subject to quotes): \$750,000
- Total cost: \$1.5 million
- DERA funds: \$375,000
- NWSA funds: \$1,125,000

Timeline:

Tuesday, June 12, 2018	Application deadline [achieved]
July 2018	Anticipated notification of selection
September-November 2018	Anticipated Award
February 2019	Anticipated equipment order
September 2019	Receive new reach stackers and begin operations; return leased equipment, scrap straddle carriers

⁶ <https://cfpub.epa.gov/quantifier/>

The equipment must be purchased and equipment identified to be scrapped would have to be disposed of by the end of 2020. Staff anticipates procurement during 2019, with the project completed by the end of 2019, a year ahead of the EPA deadline.

The NWSA needs to lead by example and procure the cleanest equipment possible. This project will improve reliability and efficiency. Staff assessed the possibility of applying for DERA funding towards an electric reach stacker, but a fully electric reach stacker is not currently commercially available – a Tier 4 final diesel was determined to be the cleanest option available. While zero emission cargo handling operations are the ultimate goal, interim benefits may be achieved with cleaner diesel technology, electric and hybrid non-automated equipment.

Washington State Department of Ecology Clean Diesel Grant

To support the Clean Truck Program and Clean Truck Fund, staff applied for scrapping grants from the Department of Ecology in June 2018. To meet the requirement for Ecology and avoid shifting older, polluting trucks to other places, these grants will supplement the difference between trade-in value and the value of the scrap metal for a scrapped truck. For example, if a 2001 Freightliner is worth \$12,000 in trade-in value, but only \$3,000 in scrap metal, this grant would give the truck owner a voucher for the difference (\$9,000), up to \$10,000.

Approximately \$500,000 total was available for projects within three eligible project categories:

1. Idle reduction projects using fuel-fired heaters
2. Marine shore power systems for harbor vessels
3. Scrap incentives for heavy-duty on-road vehicles and buses

The NWSA applied for the third category and was successfully awarded \$216,000 on June 22, 2018. Awards for scrap incentives will be limited to a maximum amount of \$10,000 per scrapped vehicle, not to exceed the current fair trade-in value offered by commercial vehicle dealers in the region.

Assuming an average voucher of \$6,000 (the average trade-in value of \$8,865 minus the value of the scrap metal), at least 36 trucks will be served. Staff will present the ILA to the Managing Members for review and approval at the August or September 2018 meeting.

South Coast Air Quality Management District 2017 DERA Grant

In 2017, the California South Coast Air Quality Management District (SCAQMD), in partnership with the Puget Sound Clean Air Agency and Oregon Dept. of Environmental Quality, successfully applied for a DERA grant for scrapping and replacing drayage trucks. Since the project was awarded, Oregon DEQ has backed out of the agreement, cutting the available funding in half. The State of California and the San Pedro Bay ports have more aggressive truck requirements than the NWSA's 2007 engine standard – moving to a 2014 model year (MY) this summer and near zero standard by 2023. Several drayage companies in California had recently upgraded trucks to 2012 MY or newer and are reluctant to scrap what is still a useable and valuable truck. Under this program, SCAQMD will reimburse Southern California fleet owners \$100,000 for purchasing a low NOx emission truck. In

addition, their 2012 MY truck will be sold in WA to replace a pre-2007 truck and the pre-2007 truck will be scrapped. The total selling price of the 2012-compliant truck cannot exceed \$30,000. The Washington truck purchaser will pay the SoCal fleet owner up to \$30,000 for the sale of the 2012-compliant truck.

PSCAA was originally going to administer this program in Washington, but is no longer able to and approached NWSA to take over the project. Ten trucks are available and, based on local estimates from dealerships, are valued at least \$15,000 below market rate. The price of the trucks is capped at \$30,000. Staff proposes accepting these trucks and including the driver selection process and grant administration in the scope of work for the consultant managing the Clean Truck Fund. This grant will provide \$25,000 to cover administrative costs.

Staff is discussing with other west coast ports, EPA, and local air agencies how this model can be used in the future for trucks and potentially cargo handling equipment.

The ILA will be presented to the Managing Members at the July 17, 2018 meeting.

E. ATTACHMENTS TO THIS REQUEST

- a. Attachment A: NWSA Public Comments. All public comments can be found here <http://ac.ecology.commentinput.com/comment/extra?id=er7j6>
- b. Attachment B: POS Public Comments.
- c. Attachment C: 2016 List of VW Projects.

F. NEXT STEPS

- VW
 - Complete North Harbor on-terminal shore power cost estimates by end of July.
 - Complete Seattle City Light system impact studies.
 - Communicate Port priority projects to other agencies and stakeholders.
- Return to Managing Members for authorization to accept Clean Diesel grant (August or September 2018).
- Pending successful application, return to Managing Members for authorization to accept DERA grant (September or October 2018).