

THE NORTHWEST SEAPORT ALLIANCE
MEMORANDUM

MANAGING MEMBERS
ACTION ITEM

Item No. 5B

Date of Meeting January 14, 2020

DATE: December 31, 2019

TO: Managing Members

FROM: John Wolfe, CEO

Sponsor: Jason Jordan, Director, Environmental and Planning Services

Project Manager: Graham VanderSchelden, Environmental Project Manager II

SUBJECT: TransAlta Grant Acceptance

A. ACTION REQUESTED

Requesting The Northwest Seaport Alliance (NWSA) Managing Members' authorization to accept grant funds in the amount of \$1 million from the TransAlta Centralia Coal Transition Grant Program Energy Technology Fund, to support installation of shore power at Husky Terminal, project number 2020-19.

B. SYNOPSIS

In working towards the vision of the Northwest Ports Clean Air Strategy and the NWSA's Greenhouse Gas (GHG) Resolution, and to be prepared to take advantage of external funding opportunities, NWSA staff have begun developing a program to facilitate the installation of shore power (cold ironing) infrastructure and implementation of shore power. Shore power planning efforts to date include cost estimates for shore power infrastructure installations at NWSA's major international container terminals, assessment of the vessel fleet's capabilities to use shore power, the operational costs for vessel operators using shore power, collaboration with Tacoma Power to develop a special rate for shore power and a draft timeline of proposed installations and emission reduction benefits.

Based on our assessment of the container vessel fleet calling the NWSA's major international container terminals, roughly half are equipped with onboard infrastructure for accepting shore side power (we call these vessels "shore power capable"). Given the significant fraction of shore power capable vessels, that shore power technology has been robustly demonstrated globally, and that zero emission drayage trucks and cargo handling equipment are not yet competitive with traditional options, shore power is the best opportunity to make substantial progress towards NWSA's aggressive air quality and climate goals today.

In addition to the environmental benefits, shore power also has some commercial benefits which include supporting low carbon shipping services desired by some Beneficial Cargo Owners (BCOs), progressing NWSA's brand as a green gateway, and potentially reducing

vessel operating costs while at berth. The potential reduction in operating costs would be dependent on future fuel prices, labor agreements, utility rates, and any carbon pricing policy that allows shore power users to generate carbon credits (and thereby additional revenue). Cost savings are expected based on current fuel and electricity prices and many projections expect fuel costs to increase with implementation of the International Maritime Organization (IMO)'s 2020 fuel sulfur regulation.

Presently, the following opportunities are emerging for NWSA to move forward with shore power installations by leveraging external funding.

- 1) A \$1 million grant offer from the EPA through the Diesel Emission Reduction Act (DERA) grant program for shore power infrastructure at Husky Terminal. This is the maximum amount EPA Region 10 was authorized to award under the 2019 DERA program.
 - EPA unofficially selected NWSA's application in June and provided an official grant agreement in September for consideration by NWSA Managing Members. Managing Members authorized acceptance of the grant in November.
- 2) TransAlta Centralia Coal Transition grant.
 - Staff submitted a funding application for shore power infrastructure at Husky Terminal in September 2019 and received a preliminary grant offer of \$1 million in late October. A final grant award agreement was provided in late November for consideration by NWSA Managing Members.
- 3) Re-appropriate remaining funds from the \$1.2 million Washington State Department of Ecology (Ecology) grant (\$1.1 million remaining) for shore power infrastructure, originally provided to back loans as part of the Clean Truck Fund.
 - The bill appropriating these funds to NWSA rigidly requires funds to be used for a loan program run by a Community Development Financial Institution (CDFI), meaning that a change in bill language would be necessary. Ecology would also need to agree to the new use of funds.
- 4) Department of Ecology managed grants, including the Federal VW settlement.
 - Ecology sent out a Request for Information (RFI) in August 2019, soliciting interest in grants for shore power installations from ports in Washington State. NWSA responded in September 2019.
 - Ecology can make available up to \$50.4 million for marine vessel projects through the VW settlement.

The first step of the shore power program is to build shore power infrastructure at one of NWSA's strategic terminals in each harbor, providing air quality benefits for the citizens of King and Pierce Counties. Installation is currently moving forward at Terminal 5 in Seattle as part of that ongoing redevelopment program. Funds have been allocated in the budgets for 2020 to 2022 to build shore power infrastructure at Husky Terminal in Tacoma. The planning level estimate for the Husky project is \$5.4 million (~\$4.7 million for design and construction and ~\$700,000 for staff). This estimate will be further refined throughout the design process.

This authorization request is to accept the TransAlta grant in the amount of \$1 million to support the Husky project, offsetting the total project cost of \$5.4 million. The TransAlta grant

supplements the \$1 million DERA grant previously accepted by Managing members. Staff is working to align further external support for the Husky project through reallocation of the Department of Ecology Clean Truck grant.

C. BACKGROUND

The NWSA has set significant goals to reduce air pollutant and GHG emissions including the Northwest Ports Clean Air Strategy and the Managing Members' 2017 Greenhouse Gas Resolution, which sets targets of 50% and 80% reductions in GHG emissions by 2030 and 2050, respectively. Shore power is one of the many measures necessary to meet these targets and demonstrate our commitment to sustainable development.

Ocean going vessels are a major source of diesel pollution that have historically been extremely difficult for ports to influence, since ports themselves do not own or operate the vessels. Due to existing regulations in California that require 80% of container vessels to use shore power, the aggressive deployment of shore side infrastructure in China, and growing deployment by other ports around the world, ocean carriers serving the Pacific Rim have begun to install equipment onboard vessels that allows them to use power from the local grid while at berth. The NWSA seeks to leverage this existing vessel-side infrastructure to reduce emissions at berth. With the right electrical rates and labor agreements, shore power may also provide cost savings to our customers.

The International Maritime Organization (IMO) has taken significant regulatory actions over the last 10 years that have greatly reduced emissions from ships. These actions include the North American Emissions Control Area (ECA), implemented in 2015, which requires vessels to use fuel with 0.1% sulfur content or less within 200 miles of shore and the new global regulation beginning January 1, 2020 that requires vessels to use 0.5% everywhere not governed by a stricter emissions control area. Within the Puget Sound Airshed, the 2020 regulation will not affect emissions since it is less restrictive than the existing ECA (only requiring 0.5% sulfur fuels, compared with the 0.1% requirement within the ECA).

ECA has resulted in monumental emission reductions within the Puget Sound. As of the 2016 Puget Sound Maritime Emissions Inventory, diesel particulate matter (DPM) emissions from vessels calling NWSA's terminals were down 87% when compared with 2005 levels and accounted for less than 4% of the regional total when all sources (port and non-port) are considered. In 2016, vessels calling NWSA's terminals emitted 13.4 tons of diesel particulate matter (DPM) and 66,385 tons of GHGs while hoteling. Shore power seeks to further minimize these impacts.

Shore Power Description:

Shore power is the provision of power from the local electrical grid to a vessel to satisfy auxiliary power demands while at berth, allowing the vessel to shut off its auxiliary engines. This eliminates emissions from auxiliary engines on the terminal, with the only associated emissions being remote, from power generation. Hydropower dominates Seattle City Light and Tacoma Power's grid mixes, meaning net emissions from auxiliary power use are nearly zero when using shore power, compared with burning onboard fuel. Shore power installations include the power distribution elements required to bring electricity from the existing supply

point to the dock and the connection points on-dock for ships to plug in to, as well as any necessary upgrades to local distribution outside the fence.

Commercial Benefits of Shore Power:

In addition to the environmental benefits associated with air pollutant and GHG emission reductions, installing shore power infrastructure could also present commercial benefits as detailed below.

- *Energy cost certainty and savings while at berth for shipping lines.*
 - Based on the analysis shown below, shore power would likely be cheaper than burning marine gasoil, providing financial incentive for vessels to use shore power.
 - With the implementation of 2020 international fuel sulfur regulations, many are projecting an increase in distillate fuel prices, which would affect prices of compliant vessel fuels. Providing shore power would help mitigate an increase in fuel cost and would provide cost certainty while at berth since electricity rates do not fluctuate like fuel prices.
- *Continue to build NWSA's brand and reputation as a modern, green gateway.*
 - NWSA's competitors in Vancouver B.C. and California have implemented or are in the process of implementing shore power.
 - Maersk is piloting a carbon-neutral shipping option with some of its customers. If more beneficial cargo owners ask for this service and other lines were to follow suit, shore power facilities would help NWSA support this market offering.
 - The IMO has set substantial greenhouse gas emission reduction targets for international shipping to be achieved by 2050. Shore power is one important tool ocean carriers can use to reduce emissions.
- *Opportunity to generate credits (revenue) if a low carbon fuel standard or other similar carbon pricing rule is enacted regionally or at the state level.*
 - In California, maritime is an opt-in participant to the low carbon fuel standard, meaning that shore power use generates "carbon credits" that can be sold to higher emitters, allowing them to demonstrate compliance with the standard. If a similar rule were enacted in Washington, shore power use could produce revenue in a similar manner for the Port, Marine Terminal Operator (MTO), and/or shipping line.

Shore Power Operational Costs:

A key driver for whether vessel operators will be motivated to use shore power is the operational cost. More specifically, whether the cost of grid electricity and labor to execute the ship to shore power connection are less than the cost of fuel the ship would burn if not using shore power.

Recognizing the importance of providing a financial incentive for vessel operators to use shore power through rates, NWSA staff have closely examined the costs of using shore power in both Seattle and Tacoma. A notable difference between the two is that in Tacoma, the rate schedule includes a much larger peak demand fee (\$8.35 per kW in Tacoma vs. \$3.39 per kW in Seattle) complicating billing procedures for the individual vessels and making the

economics less favorable. To ensure that shore power does indeed provide cost savings for shipping lines, staff have been working with Tacoma Power since 2018 to create a special electricity rate for shore power that would eliminate the demand charge, instead opting for a higher usage fee. In February 2019, the Tacoma Utility Board passed a resolution directing staff to work with the Port of Tacoma and NWSA to develop this new rate and pursue grant funding for shore power projects. Port staff have had preliminary conversations with Seattle City Light staff about pursuing a similar arrangement and expect the conversations to continue as part of the Port of Seattle's "Clean Energy Strategic Plan" project.

The following analysis examines the operational costs of using shore power vs. burning fuel at NWSA terminals in both harbors. The Tacoma analysis considers the Tacoma Power's preliminary shore power rate and the Seattle analysis considers the existing "Large General Service" rate schedule. The fuel costs were determined using recent marine gasoil (MGO) spot prices as well as price ranges from the past year and the past three years.

Labor Costs:

An estimate of labor costs to execute the shore power connection is included, though it should be noted that a standard manning requirement has yet to be established. Currently, labor costs are highly dependent on the type of cold ironing being done and the contractual obligations of each MTO. Based on conversations with MTOs currently using shore power, the operations team provided an assumption of 2 man-hours at \$100 per hour for connection and disconnection, totaling \$400 per vessel call. For added contingency and to account for administrative costs, this analysis adds an additional man-hour at either end of each shore power call, for a total of \$600 in labor costs per call.

South Harbor Shore Power Operational Cost Analyses:

For the South Harbor Terminals, shore power use at Husky and WUT were considered, taking into account the typical range of at-berth durations. For a typical vessel call, the costs of burning fuel and using shore power are shown below.

Husky (at-berth duration: 72.9 hours per call)

Cost of **fuel** for auxiliary engines per vessel call assuming 7/29/2019 MGO price: **\$12,344**

- Fuel cost range given 2019 MGO prices: **\$11,187 - \$13,237**
- Fuel cost range given MGO prices from past 3 years: **\$8,476 - \$14,904**

Cost of **shore power** per vessel (electricity + labor): **\$9,870**

WUT (at-berth duration: 39.6 hours per call)

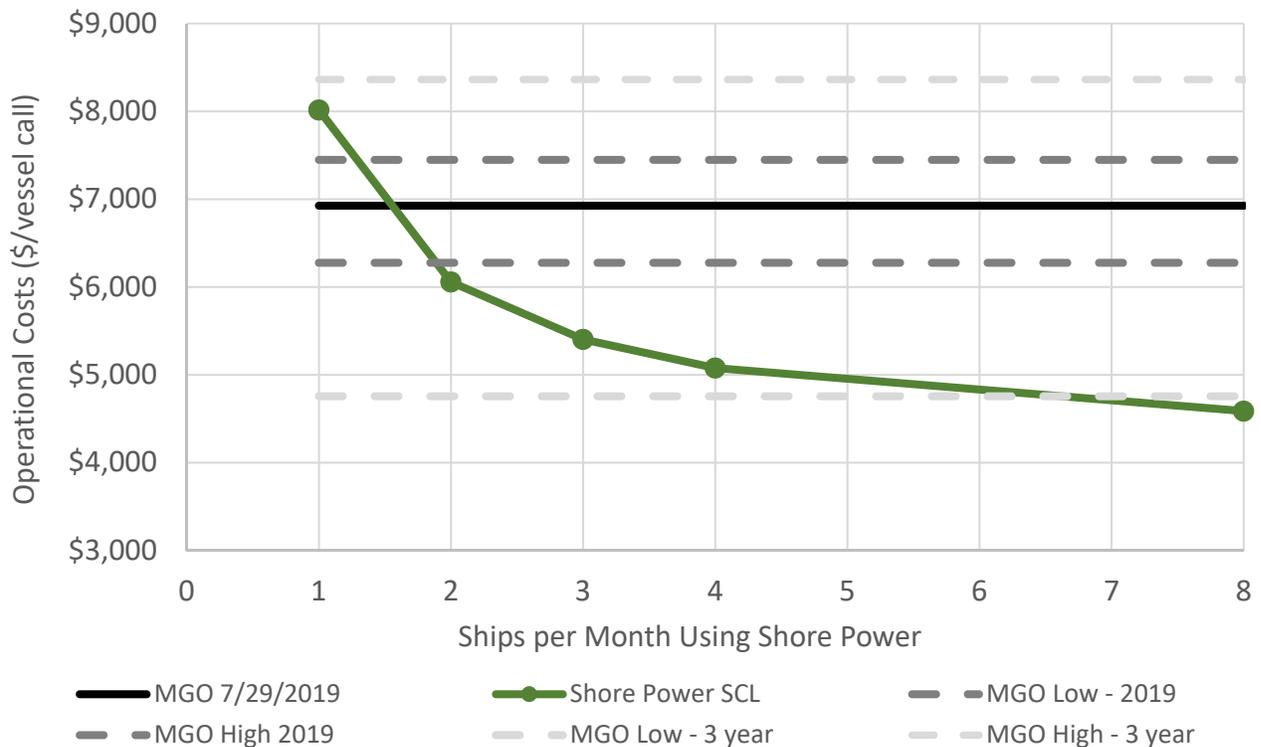
Cost of **fuel** for auxiliary engines per vessel call assuming 7/29/2019 MGO price: **\$6,705**

- Fuel cost range given 2019 MGO prices: **\$6,077 - \$7,210**
- Fuel cost range given MGO prices from past 3 years: **\$4,604 - \$8,096**

Cost of **shore power** per vessel (electricity+ labor): **\$5,636**

North Harbor Shore Power Operational Cost Analysis:

In Seattle, the shore power costs for each vessel are sensitive to the number of vessels plugging in each month because the existing rate includes a demand charge (\$3.39/kW at monthly max demand, or for this example $\$3.39/\text{kW} \times 1156 \text{ kW} = \$3,919/\text{month}$) which could be split amongst all vessels calling during each month. Therefore, when more vessels use shore power the cost per vessel decreases. T-18 was used as the case study for the North Harbor, since T-5 is not yet operational. The graph below shows the cost each vessel would pay per visit using shore power (green) and the cost they would pay burning fuel (black) based on the MGO price from 7/29/2019. The dashed lines reflect the range of MGO prices in 2019 (darker) and over the past 3 years (lighter). In 2018, there were 9.6 calls per month by shore power capable vessels at T-18.



Analysis of Fleet Shore Power Readiness:

Due to regulations in California requiring shore power use and other deployment of shore side installations world-wide, especially China, a significant fraction of the international container ships in service on Pacific routes are equipped with onboard infrastructure to use shore side power. This number is expected to increase over time as California requirements become increasingly strict. Indeed, an assessment of the international vessel fleet calling NWSA's major international terminals in 2018 showed that roughly half of the container vessel calls at these terminals were by shore power capable vessels. These results indicate that, if shore power is installed, numerous vessels are capable of using it.

2018 Vessel Fleet Calling NWSA's Major International Container Terminals

	Pct. Calls SP Capable	Total Calls/Month	SP Capable Calls/Month	Avg SP Capable Call Length (hours)	Avg SP Capable Hours/Month
T-18	39%	24.6	9.58	40.9	392
Int. T-46 & T30 *	63%	12.6	7.83	40.6	318
<i>NH Total</i>	<i>47%</i>	<i>37.2</i>	<i>17.1</i>	<i>40.8</i>	<i>710</i>
Husky	54%	8.3	4.5	72.9	328
PCT	69%	8.6	5.92	33.4	197
WUT	47%	10.2	4.92	39.6	194
<i>SH Total</i>	<i>57%</i>	<i>27.1</i>	<i>15.3</i>	<i>46.9</i>	<i>720</i>
Gateway Total	51%	64.3	32.7	43.7	1,430
<i>T-5 EIS</i>	<i>30%</i>	<i>8.7</i>	<i>2.6</i>	<i>53</i>	<i>138</i>

Energy Planning Efforts in Support of NWSA's Sustainability Goals:

Supporting the NWSA's GHG Resolution and the new NWCAS, energy planning studies are scheduled in the North and South Harbors to understand the infrastructure investments required to support zero emission operations. Port of Seattle will be leading the North Harbor effort, called the Seattle Waterfront Clean Energy Strategic Plan (SWCESP), which will include NWSA's North Harbor marine terminal facilities. NWSA will be leading a similar effort in the South Harbor called the NWSA South Harbor Electrification Roadmap.

In addition to the environmental drivers, there is also a business case for this work. Since we know that operational costs (energy + maintenance) are lower for electric equipment than diesel, the total cost of ownership for electric equipment could be lower if purchase prices decrease substantially or policy changes the economics. Comprehensive harbor planning prepares us to respond to either of these drivers. In addition, making these investments proactively could net more external funding.

These planning efforts will first assess energy usage at our facilities given current operations and project future usage associated with use of shore power, electric (or other alternatively fueled) cargo handling equipment, and alternatively fueled drayage trucks where applicable. Given these projected energy demands, on-facility infrastructure needs can be identified. Working closely with the utilities, another important component of this work will be to understand the capabilities of the existing grid to deliver the energy we will need. Building from there, further opportunity exists for joint planning to ensure that our needs are incorporated in the utilities' long-term plans, which has the potential to reduce overall development costs.

Port of Seattle has budgeted \$250,000 for the SWCESP and NWSA plans to provide an additional \$50,000. NWSA has also budgeted \$165,000 per year for 2020 and 2021 (\$125,000 for consultant fees and \$40,000 for staff time each year) with the Port of Tacoma contributing \$25,000 of support in each year. Port of Seattle staff are currently procuring a consultant for the SWCESP and the NWSA South Harbor Electrification roadmap is scheduled to kick off in 2020.

Planning Efforts Towards a Gateway-wide Shore Power Program:

In working towards the vision of the Northwest Ports Clean Air Strategy and the NWSA’s GHG Resolution and to be prepared to take advantage of external funding opportunities, staff has been working on a gateway-wide installation plan for shore power including an estimate of year by year costs. The gateway-wide plan will be a critical communication tool for gaining the support of legislative and agency funding partners.

Shore Power Cost Estimates by Terminal:

In 2018, NWSA staff worked with the engineering teams from the Ports of Seattle and Tacoma to develop planning level cost estimates for shore power infrastructure at NWSA’s major international container terminals. The focus was on the major international container terminals since their vessel fleets are most likely to be equipped with shipside shore power infrastructure and provide the largest emission benefits when plugged in. These terminals are T-5, T-18, Husky, WUT, and PCT. NWSA’s other terminals were not deemed priorities for shore power installations at this time because their vessel fleets contained fewer, or in many cases no, shore power capable vessels and/or their future uses are uncertain.

Installing shore power at two berths was considered for each terminal. Only installing shore power at 2 berths at T-18, where there are 4 total berths, may create some scenarios where a shore power capable vessel must berth at a non-shore power equipped berth for operational reasons. While this is not optimal, the significant cost of installing infrastructure at two additional berths outweighed the benefits of plugging in ships at every berth; even in California, not all container ship berths are equipped with shore power infrastructure. This prioritization can be revisited in the future if desired. The cost estimates, shown below, were used for the development of the gateway-wide plan. The total cost to install shore power at the major international container terminals is \$33.4 million in present dollars for on-terminal and off-terminal upgrades. As shown below, the total costs are \$38.6 million, given an escalation rate of 3% per year.

Terminal	Number of Berths	On-Terminal Infrastructure Costs	Utility Distribution Network Upgrade Costs
T-18	2	\$5.51 million ^a	\$100,000 ^c
T-5	2	\$4.36 million ^a	\$592,250
Husky	2	\$5.43 million ^b	\$7.5 million ^d
PCT	2	\$4.05 million ^b	
WUT	2	\$5.83 million ^b	
Total	10	\$25.18 million	\$8.2 million
		Total:	\$33.4 million

^aNorth Harbor on-terminal costs estimates were performed by Port of Seattle Engineering.
^bSouth Harbor on-terminal cost estimates were performed by Cross Engineering in June 2018.
^cSCL System impact study for providing power to 2 berths. If more than two berths are desired the distribution network upgrade costs increase significantly.
^d Assumes that a new substation is necessary to simultaneously provide power at 2 berths at all 3 South Harbor terminals, as suggested by Tacoma Power. This will be studied further as part of the NWSA South Harbor Electrification Roadmap. Shore power can be provided to at least 1 berth (likely 2 during all but the heaviest load days) at Husky with minimal upgrades to distribution outside the fence.

Proposed Timeline of Shore Power Installations:

To understand the costs over time of installing shore power at NWSA’s major international container terminals, a draft timeline was developed detailing when infrastructure installations could take place. The timeline, along with all other aspects of this planning effort, are subject to Managing Member review/approval, and the level of external funding will be carefully considered before moving forward with any aspect. In addition, internal funding of these projects will need to be carefully balanced against other competing priorities, some of which are environmental including stormwater treatment and emerging orca recovery demands. The timeline was developed to begin all shore power projects by the Federal VW Settlement’s 2028 deadline to obligate funds, but also spread out project costs as much as possible during that timeframe to minimize year-to-year budgetary impacts. Project order was determined by considering possible emission reductions, a key indicator of a project’s competitiveness for external funding. It was assumed that each project would take 2.5 years for design and construction. Staff expect the timeline and individual project durations to continue to evolve as external funding opportunities materialize and further planning and design is performed on the individual elements.

	T-5	Husky	T-18	WUT	Evergreen	South Harbor Substation *
2020	Construction	Design				
2021		Construction				
2022						
2023	Operational	Operational	Design			
2024			Construction			
2025						
2026			Design			
2027			Construction			
2028						
2029						
2030	Operational	Operational	Operational	Design	Construction	
2031+				Operational		Operational

* Assumes \$7.5 million in 2020 dollars needed for a new substation. This investment will be informed by the South Harbor Electrification Roadmap.

***NOTE: Terminals 30, 46, and West Sitcum are not included in this timeline because their future use is still uncertain and/or the environmental benefits of installing shore power are likely to be less than the terminals shown above. Shore power installations at these terminals will be re-evaluated as new information arises.

Budgetary Impacts of Shore Power Installations:

Along with the proposed timeline for shore power projects, staff have estimated the year-by-year impacts on the capital budget associated with the gateway-wide shore power program. The table below summarizes the costs to NWSA (impact on CIP) to construct shore power infrastructure at the NWSA’s major international container terminals. Cost estimates for the individual projects, detailed above, were used to project year-by-year costs, escalated by 3% per year with 2020 as the baseline year. If these projects are 50% grant funded, the cost to NWSA for on-terminal infrastructure would be roughly between \$1 million and \$2 million per year. Per guidance from TPU, a new substation on the utility side of the meter may be necessary to support a full build out of shore power in Tacoma, reflected in the costs for 2027 and 2028. As part of the NWSA South Harbor Electrification Roadmap study, staff plan to further study the most effective way to meet all our needs.

	Total Cost	Impact on CIP	
		w/ 25% grant funding	w/ 50% grant funding
2020	\$3.4*	\$1.90	\$1.00
2021	\$3.6*	\$1.60	\$1.10
2022	\$3.1*	\$1.10	\$0.90
2023	\$2.40	\$1.80	\$1.20
2024	\$2.50	\$1.90	\$1.30
2025	\$2.70	\$2.00	\$1.30
2026	\$2.90	\$2.20	\$1.50
2027	\$7.6**	\$5.7**	\$3.8**
2028	\$6.8**	\$5.1**	\$3.4**
2029	\$2.20	\$1.70	\$1.10
2030	\$1.20	\$0.90	\$0.60
Total	\$38.60	\$26.00	\$17.10

Costs are in millions of dollars

* T-5 is included in the total cost through 2022, but is fully grant funded.

** Assumes a new TPU substation is required to support shore power. The substation accounts for \$4.6 million and \$4.8 million of the total costs in 2027 and 2028 respectively.

Environmental Benefits:

Plugging vessels in to shore power would result in significant emission reductions, thus moving the NWSA towards meeting the GHG Resolution targets and ensuring substantive progress towards reducing air quality and climate impacts under the Northwest Ports Clean Air Strategy. The table below details the annual emission reductions (tons per year) that would have resulted from all shore power capable vessels that called in 2018 using shore power.

	NO _x	VOC	PM _{2.5}	CO ₂ e
T-18	75	2.2	1.3	3,778
Int. T-30 & T-46	61	1.8	1	3,065
Husky	63	1.8	1.1	3,163
PCT	38	1.1	0.63	1,906
WUT	37	1.1	0.62	1,878
Total	274	8	4.65	13,790
T-5*	33	1	0.55	1,666

Emission reduction estimates are in tons per year

* T-5 emission estimates based on T-5 EIS assumptions for vessel activity

Shore Power Implementation Plan:

The implementation of shore power at Husky Terminal will follow the NWSA's Shore Power Program, provided as an attachment. As a landlord port, the NWSA has stevedoring tenants (terminal operators) who will be responsible for implementing shore power as it is installed. Shore power requires additional labor, vessel commissioning and administration that all add cost and complexity for the stevedore. To apply a common policy for all terminals and avoid putting any stevedore at a competitive disadvantage, the NWSA's shore power policy allows for voluntary, but encouraged and supported, adoption until all terminals have the capability. At that time, all vessels would be required to connect.

Roles and responsibilities when implementing shore power

Because the NWSA's marine terminal operator tenants are not required by lease or law to provide shore power infrastructure at their facilities, it is assumed that NWSA will be responsible for coordinating funding for the necessary infrastructure investments and managing construction. NWSA will also be responsible for working with the utilities to develop electricity rates for shore power that will incentivize use. Additionally, because NWSA will own the shore side infrastructure, it follows that NWSA would coordinate the commissioning procedure for new vessels, which ensures that there are no compatibility issues between the vessel side and shore side infrastructure that could damage either. Though the roles and responsibilities are still subject to negotiation, based on precedent at other facilities in Tacoma and Seattle currently using shore power, it can be assumed that the terminal operator would manage the operation of the shore power system after it is built. A draft list of roles and responsibilities for each party can be found below.

For each ship call, the terminal operator will:

1. Coordinate with incoming vessels to determine if shore power is desired.
2. Contact the utility to schedule the power use, communicating estimated time of arrival and departure, if shore power is desired.
3. Follow best management practices to ensure the vessel is positioned properly in relation to the shore power connection.
4. Contact NWSA to arrange commission the vessel's shore power system (assure compatibility with the shore side system) if it is a vessel's first time using shore power at a terminal.
5. Coordinate all labor required to connect and disconnect the vessel to shore side power.
6. Bill the vessel for the power used.
7. Report monthly to NWSA the number of hours connected to shore power for each vessel call.

For each ship call, the NWSA will:

1. Arrange for commissioning of the shore power systems for first time users. This process ensures compatibility between the ship side and shore side systems and is an important safety precaution.

2. Facilitate information sharing to develop and continually update vessel berthing best management practices, ship to shore connection procedures, and vessel commissioning procedures.

D. HUSKY SHORE POWER PROJECT DESCRIPTION

This project will retrofit shore power infrastructure at Husky Terminal, including installation of connection points on the wharfs and distribution infrastructure to supply power to these connection points.

Scope of work:

The scope of this project is to design and build electrical power supply elements including wiring, ship connection boxes, vaults, 6.6 kV transformers, switchgear, and any necessary trenching and wharf modifications, to provide ship-to-shore power for vessels at Husky Terminal. The shore side system will be built to safely supply power to the existing fleet of international container vessels serving NWSA terminals, and vessels anticipated to be put into service in the coming years. Onboard ship-side systems must comply with the international codes and standards (i.e., ISO/IEEE/IEC) per plug-in requirements in California. The NWSA will build the shore side equipment in compliance with the IEC standard, using Cavotec connection boxes as used in California.

Schedule:

Date	Task/Milestone
January 2020	Executive authorization for up to \$300,000 for design
January 2020	Begin procurement of design consultant
Q1-Q3 2020	Design
Q1-Q3 2020	Request project authorization
Q3 2020	Begin procurement of construction contractor
Q4 2020	Award contract, begin project implementation
Q4 2022	Project completion

Environmental Outcomes/Benefits:

Use of shore power by vessels at Husky Terminal would significantly reduce use of fossil fuels for a sector that has historically been very difficult to influence, greatly reducing air pollution impacts on neighboring communities as well as impacts on climate change. If all 54 shore power capable calls from 2018 had used shore power, combustion of 1,025 metric tons of fuel oil could have been averted. This translates to the following emission reductions, calculated using the EPA Shore Power Calculator, assuming an average 1156 kW hoteling load.

Emission Reductions (tons/year)			
DPM	NO _x	CO ₂	VOC
1.1	63	3,163	1.8

E. PROJECT BUDGET/COSTS

The total budget for the Husky Shore Power project is \$5,431,119, to be spent over three years (2020 – 2022). The physical elements to be constructed include: shore power

connection boxes, transformers, conduit and wiring for bringing power to the wharf, and the vessel connection boxes. The costs for these items include materials and labor. Port of Tacoma Engineering project management will oversee the design and construction tasks for the project. Itemized costs are shown in the Table below.

	T3	T4	Total
Ship Connection Boxes	\$101,750	\$101,750	\$203,500
6.6 kV transformers	\$85,000	\$85,000	\$170,000
Switchgear, circuit breakers, and wiring	\$165,000	\$165,000	\$330,000
SS Switch Houses	\$300,000	\$300,000	\$600,000
Wharf Modifications	\$35,000	\$0	\$35,000
Conduit and trenching work	\$105,000	\$105,000	\$210,000
Inspection, Testing, Permitting	\$14,000	\$14,000	\$28,000
TPU Metering Upgrades	\$50,000	\$50,000	\$100,000
Materials/Labor Sub-Total	\$855,750	\$820,750	\$1,676,500
Contractor OH and P (25%)	\$213,938	\$205,188	\$419,126
Sub-Total	\$1,069,688	\$1,025,938	\$2,095,626
Construction Contingency (75%)	\$802,266	\$769,453	\$1,571,719
Construction Sub-Total	\$1,871,954	\$1,795,391	\$3,667,345
General Conditions (7.25%)	\$135,717	\$130,166	\$265,883
Sales Tax (10.2%)	\$190,939	\$183,130	\$374,069
Construction Total	\$2,198,610	\$2,108,687	\$4,307,297
Design (10%)	\$219,861	\$210,869	\$430,730
Engineering Staff (design [5%] and construction [10%], 15%)	\$329,791	\$316,303	\$646,094
Air Quality Staff	-	-	\$47,000
Total Fully Burdened	\$2,748,262	\$2,635,859	\$5,431,121

Source of Funds:

The Capital Investment Plan (CIP), for financial year 2020 and beyond, allocates \$5,431,000 for this project. This includes \$1,242,000 in 2020, \$2,393,000 in 2021, and \$1,796,000 in 2022. Grant funds would offset these costs and be recorded to non-operating income

TransAlta Centralia Coal Transition Grant:

To further support the installation of shore power at Husky Terminal, staff applied for funding in late September to the TransAlta Centralia Coal Transition Energy Technology grant program¹. TransAlta is a Canadian electricity generation company that owns and operates the coal generation facility in Centralia, WA. The TransAlta grant fund was created as part of TransAlta's agreement with the State of Washington to phase out coal power generation at their facility in Centralia, WA. The Energy Technology grant fund is one of three separate funds created by TransAlta which funds projects in Washington State that support clean air and clean energy, such as alternative fuels, green energy technologies, or other products or processes that increase conservation or minimize pollution. This presentation is to request

¹ Trans Alta Centralia Coal Transition Grants: Energy Technology. <https://cctgrants.com/grants/energy-technology/>

Managing Member authorization to accept a grant award in the amount of \$1 million to support the Husky shore power project.

Additional Grant Funding Opportunities:

DERA Grant:

In spring of 2019, staff applied for a \$1 million grant, the maximum award that EPA Region 10 can grant, to help fund installation of shore power at Husky Terminal. Husky was prioritized because shore power was already funded at Terminal 5 through the state budget and staff recognized the importance of parity between the environmental investments in both harbors. In summer 2019, preliminary approval was granted by the EPA for NWSA's application and the final award offer was presented to NWSA in September for consideration by Managing Members. Managing Members Authorized acceptance of this grant on November 5, 2019.

Department of Ecology \$1.2 million Clean Truck Fund Grant (remaining funds, \$1.1 million):

After completing implementation of the January 1, 2019 deadline for the Clean Truck Program, NWSA was left with funds remaining in four separate grants; the \$1.2 million grant from Ecology for backing truck loans (from the state VW settlement fund, \$1.1 million remains), the state Clean Diesel grant from the Department of Ecology of which \$134,000 remains, \$189,000 in remaining grant funds from the Puget Sound Clean Air Agency (PSCAA), and \$138,000 in remaining grant funds from the City of Seattle.

Recognizing the importance of continuing to offer support to truckers, especially drivers serving the domestic terminals who have not had access to previous funding opportunities, staff are working with the respective agencies to continue using grant funds from the Ecology Clean Diesel, PSCAA, and City of Seattle to incentivize truck replacements and for other trucker support.

Continuing to use the funds in the \$1.2 million Department of Ecology grant on trucks would be more complicated than the other grants because the language in the bill appropriating the funds to NWSA in the state budget specifically states that the funds must be used for a loan program backed by a CDFI. Further, the ILA with Ecology states that continued use of the funds past spring 2019 is contingent on Ecology approval of the new application of funds. Ultimately, the NWSA must work with legislators and the Department of Ecology to change the Bill language to maintain access to the funds for a meaningful program. Considering the small size of the domestic truck population not meeting the 2007 model year standard, staff recommends that the Clean Diesel, PSCAA, and City of Seattle funds be used for continued truck replacements and other trucker support (approximately \$461,000 in total) and that the remaining funds in the \$1.2 million grant (\$1.1 million) would be better used on a shore power project.

After receiving initial award notification on the DERA grant from the regional EPA office, staff began discussions with Ecology about appropriating the \$1.1 million for shore power (a decision that would be subject to Managing Member approval). The government affairs team is working with local lawmakers to gain support and a legislative sponsor to reallocate the funds for shore power.

Federal VW settlement and other state grant programs.

From 2008-2015, the automaker Volkswagen sold vehicles designed to cheat emission tests and those vehicles emitted up to 40 times the allowable amount of nitrogen oxides as a result. Through the resulting lawsuit, a fund was established to mitigate these emissions through replacement of diesel engines and the construction of infrastructure that circumvents the use of diesel fuel, with a priority to facilitate electrification. Washington State is eligible for \$112.7 million and the Washington State Department of Ecology will administer the funds, which must be obligated by 2028. A parallel lawsuit with Washington State yielded a \$28.4 million fund from which the \$1.2 million grant for the Clean Truck Fund originated. From the \$112.7 million federal settlement, up to 45% (roughly \$50.4 million) can be allocated to marine vessels, including shore power for ocean-going vessels, though a substantial proportion of this money is expected to be allocated to the electrification of Washington State Ferries. The Department of Ecology is also able to fund projects through state Clean Diesel grants and may be able to help facilitate funding opportunities through programs managed by other agencies, such as the Department of Commerce's Clean Energy Fund.

To better understand the readiness and interest of ports in Washington State to install shore power infrastructure, the Department of Ecology issued a Request for Information (RFI) in late August titled "Potential grants for ship to shore power for ocean going vessels." NWSA staff responded to the RFI in September 2019. Within the RFI, Ecology asked ports to identify terminals that are candidates for shore power installations, information on the vessel fleets calling these terminals and their shore power readiness, the cost of installing shore power infrastructure at each of the terminals identified, and the state of planning efforts related to shore power. The responses to this RFI will likely influence the amount of money Ecology will make available for shore power projects from the VW settlement and other funding sources.

It is important to note that the \$4.4 million appropriation in the state budget for shore power at T-5 is contingent on NWSA applying for Federal VW funding (administered by Department of Ecology) and being rejected. If NWSA's T-5 application for VW funding is not rejected, it would reduce the overall amount of VW funds available for other shore power projects. If it is rejected, T-5 shore power would still be funded by the state through the appropriation. Because Ecology must evaluate projects on an objective basis (i.e., considering factors like possible emission reductions, shovel readiness, other funding sources, etc.), willingness to move forward with other more competitive projects within the VW funding time horizon (i.e., before 2028) increase the likelihood of T-5 being rejected.

F. NEXT STEPS

If Managing Members authorize acceptance of the TransAlta grant, staff plan to use executive authorization of up to \$300,000 to begin design tasks associated with the project. Staff plan to request project authorization from Managing Members in Q1-Q3 2020.

G. ATTACHMENTS TO THIS REQUEST

- Computer slide presentation.
- TransAlta Grant Agreement
- NWSA Shore Power Program Document

TRANSALTA CENTRALIA BOARD FUNDING, LLC
Energy Technology Fund
GRANT AGREEMENT

This Grant Agreement (the "Grant Agreement") is entered between TransAlta Centralia Board Funding, LLC, acting through its Energy Technology Board ("Grantor"), and the Northwest Seaport Alliance ("Grantee"), together the "Parties", to establish the terms and conditions of a grant of funds from Grantor to Grantee to install shore power connection points for two vessel berths at Husky Terminal in Tacoma, Washington. In consideration of the mutual covenants, conditions, and agreements that follow, the parties hereby agree:

1. *Grant.* Grantee will receive the sum of \$1,000,000.00 subject to all the terms and conditions of this Grant Agreement.
2. *Disbursement Schedule.* The grant funds will be paid to Grantee in accordance with the disbursement schedule set forth on Exhibit A to this Grant Agreement, provided that Grantee returns a countersigned original of this Grant Agreement prior the date of the first such disbursement.
3. *Grant Activities; Budget.* Grantor agrees to perform the activities described in its grant proposal as finally accepted, a copy of which is attached to this Grant Agreement as Exhibit B (the "Grant Proposal"). Grantor approves the budget included in the Grantee's Grant Proposal.
4. *General Conditions.* Attached as Exhibit C to this Grant Agreement are the TransAlta Centralia Board Funding, LLC Grant Terms and Conditions. Grantee acknowledges that it has read the TransAlta Grant Terms and Conditions and agrees to comply with them.
5. *Grantee Reports.* Grantee agrees to provide to Grantor the narrative reports and financial reports in accordance with paragraph 7 of the Grant Terms and Conditions. Such reports shall be in the form set forth on Exhibit D to this Grant Agreement.
6. *Special Conditions.* The award of the Grant is subject to the additional conditions and agreements between Grantor and Grantee that are set forth on Exhibit E to this Grant Agreement.
7. *Term; Grant Period.* This Grant Agreement shall be effective upon signature by Grantor and Grantee and shall expire on December 31, 2022 unless extended by mutual consent or terminated earlier in accordance with this Grant Agreement (the "Grant Period"). Any funds not expended as of the

end of the Grant Period shall be returned to Grantor unless permission has been obtained from Grantor.

8. *Governing Law.* This Grant Agreement shall be governed by and construed in accordance with the laws of the State of Washington, without reference to its conflict of laws provisions. Grantor and Grantee agree that any disputes or proceedings arising from or concerning this Grant Agreement shall be brought in a federal or state court of competent jurisdiction sitting in the Western District of Washington, in the United States, and hereby consents to the personal jurisdiction and venue of such courts.

9. *Entire Agreement.* Grantee acknowledges and agrees that this Grant Agreement and the exhibits hereto (all of which are incorporated herein by reference and made a part of this Grant Agreement) represent the entire agreement between Grantee and Grantor with respect to the subject matter addressed herein. The terms of this Grant Agreement may be modified only by a writing signed by duly authorized representatives of both parties.

Accepted by:

Northwest Seaport Alliance

Authorized Representative

Date

Authorized Representative

Date

Approved by:

Energy Technology Board of TransAlta Centralia Board Funding, LLC

Board Member

Date

Board Member

Date

EXHIBIT A

DISBURSEMENT SCHEDULE

Date	Disbursement Amount
TBD	\$1,000,000.00

The payment date will be determined once Grantee receives conditions and approvals as set out on page 12 of the Grant Application. Specifically,

Conditions/Approvals:

All projects totaling \$300,000 or greater must be authorized by the NWSA Managing Members at one of their regularly scheduled, monthly, public meetings. This process requires NWSA's staff to present the project for consideration in a public meeting, approval is determined through a Managing Member vote (a majority is required within both 5 member commissions). The Husky Shore Power Project will need to be approved in this manner. In addition, approval to enter into any grant agreements must follow a similar process to be accepted by Managing Members.

EXHIBIT B

ACCEPTED GRANT PROPOSAL

See attached.



Grant Application

Applicant Information:

Project Name: Container Vessel Shore Power at Husky Terminal

Organization: Northwest Seaport Alliance Main Point of Contact: Graham VanderSchelden

Org. Address: One Sitcum Plaza Contact Title: Environmental Project Manager

Org. City, State ZIP: Tacoma, WA 98421 Contact Telephone: (253) 592-6791

Org. Telephone: (800) 657-9808 Contact Cell Phone: N/A

Org. Fax: N/A Contact Fax: N/A

Org. Website: <https://www.nwseaportalliance.com/> Contact E-mail address: gvanderschelden@nwseaportalliance.com

Is the applicant a 501(c)(3)? Yes No

Proposed Grant Information:

Summary Description of Project: The Northwest Seaport Alliance is requesting funds from the TransAlta Centralia Coal Transition Grant Fund to install shore power connection points for two vessel berths at Husky Terminal in Tacoma, Washington. Providing shore power to vessels while at berth allows them to switch off their auxiliary generators, avoiding the combustion of about 10.5 metric tons of fuel oil per day while a vessel is at berth in Tacoma. Ships would instead use electrical power from the Tacoma Power grid while at port, which is primarily hydroelectric and emission free. Based on the current number of visits at Husky Terminal by vessels equipped with the necessary onboard infrastructure for accepting shore power, 5,306 tons of CO₂, 107 tons of NO_x, and 1.77 tons of fine particulate matter (PM_{2.5}) can be avoided annually if these vessels use shore power, greatly reducing climate impacts as well as the exposure of dock workers and the local population to harmful diesel pollution. By CO₂ emissions, this is the equivalent of taking roughly 660 cars off the roads.

Amount of Request: up to \$4,295,575

Applicable Fund (select one):

- Weatherization Fund
- Economic and Community Development Fund
- Energy Technology Fund

Proposed Grant Period: January 1, 2020 – December 31, 2022

Total Project Budget: \$5,495,575

Additional Sources of Funding: The EPA is providing \$1,000,000 through a Diesel Emission Reduction Act [DERA] Grant and Tacoma Power is providing \$200,000 towards distribution network upgrades.

Please attach additional sheets of paper if the space above is insufficient for any item.



Additional Information:

Please attach the following components of the grant proposal to this application form, labeled as the following exhibits:

- Schedule A: A description of the applicant organization, including history, goals and objectives, programs and services and organizational structure.
- Schedule B: A detailed description of the program or project, including a description of the need being addressed, geographic area served, objectives and goals, the timeline of the project, a description of the affected population, and anticipated outcomes or measures of success.
- Schedule C: An itemized project budget, including an indication of how the proposed grant funds would be applied within the budget.
- Schedule D: A list of milestones and deliverables in connection with the project and the proposed grant.
- Schedule E: A detailed description of (a) any additional sources of funding to be utilized in connection with the proposed project, (b) other organizations who have agreed to collaborate on the proposed project, and (c) any conditions or approvals that must be obtained in order to proceed with the proposed project.
- Schedule F: The balance sheet of the recipient as of the most recently ended fiscal year, accompanied by statements of income and cash flow for such fiscal year.

I hereby verify that the information provided is accurate and honest to the best of my knowledge.

Authorizing signature (President of the Board or Executive Director):


Name: John Wolfe
Title: CEO

9-24-19
Date

TransAlta Coal Transition Grant Application: Ocean Going Vessel Shore Power at Husky Terminal Additional Information

Schedule A: *A description of the applicant organization, including history, goals and objectives, programs and services and organizational structure.*

The Northwest Seaport Alliance (NWSA) is a marine cargo operating partnership of the Ports of Seattle and Tacoma, Washington. The NWSA is an independent municipal corporation that operates under Title 53 of the revised code of Washington and is classified as a special purpose district. The NWSA has jurisdiction to construct, maintain, and operate marine terminal facilities, including jurisdiction over transportation and air quality throughout its facilities.

The Port of Seattle was formed in 1911 and the Port of Tacoma was formed in 1918 through public referendums. Both ports have a long and storied history of facilitating international and domestic trade, creating jobs, and stimulating economic activity in the Puget Sound region. Competition intensified between the two ports towards the end of the 20th century and into the 21st century, causing both to lose cargo volume and revenue to other ports on the West Coast. In an effort to increase competitiveness in the marine shipping marketplace, the two ports decided to merge their marine cargo operations in 2015, creating the NWSA.

The NWSA is the fourth largest container gateway in North America and is also a major center for bulk, breakbulk, project, heavy lift, and automobile cargo. The NWSA participates in two-way international trade, primarily with Asia, in addition to domestic trade with Alaska and Hawaii. The NWSA's primary function is to serve as an economic engine for Pierce and King Counties, creating jobs and stimulating trade.

The NWSA is a separate legal entity from the home ports of Tacoma and Seattle, governed by the elected commissions of the two home ports, together called the NWSA's "Managing Members". These commissions are each made up of 5 members that are elected by the citizens of Pierce and King County respectively. The NWSA's day to day operations are managed by a CEO, separate from the executive leadership of the home ports, which each have their own Executive Leaders.

The NWSA, along with the home ports, are committed to sustainable responsible growth and have been consistently recognized for our efforts to minimize air quality and climate impacts, clean up legacy contamination, restore habitat, and find innovative solutions to manage stormwater runoff. In particular, the NWSA, Port of Tacoma, and Port of Seattle, along with the port of Vancouver B.C. have made substantial reductions in both air pollutant and greenhouse gas (GHG) emissions through the Northwest Ports Clean Air Strategy. Since 2005, the ports have collectively reduced diesel particulate matter emissions per ton of cargo throughput by 80% and GHG emissions per ton of cargo by 17%¹. Examples of programs that have resulted in substantial emission reductions under the Northwest Ports Clean Air Strategy are the NWSA's Clean Truck Program, installation of shore power at the TOTE Terminal in Tacoma, and retrofitting emission control devices on cargo handling equipment. The Clean Truck Program requires all drayage trucks serving NWSA's international terminals to have model year 2007 engine or equivalent pollution control devices, reducing emissions greater than 90% when compared with older trucks. The ports are currently updating the Northwest Ports Clean Air Strategy to

¹ Northwest Ports Clean Air Strategy 2017 Implementation Report.
https://www.nwseaportalliance.com/sites/default/files/nwpcas_implementation_report_2017-final-2019-02-01.pdf

set the direction for the next 10 years and beyond². In addition to the Northwest Ports Clean Air Strategy, the NWSA Managing Members also passed a GHG resolution in 2017³, setting aggressive targets to reduce GHG emissions by 50% by 2030 and 80% by 2050.

Schedule B: *A detailed description of the program or project, including a description of the need being addressed, geographic area served, objectives and goals, the timeline of the project, a description of the affected population, and anticipated outcomes or measures of success.*

The NWSA is requesting assistance from the TransAlta Energy Technology Grant Fund to install shore power connection points for two vessel berths at Husky Terminal in Tacoma, Washington. Providing shore power to vessels allows them to switch off their auxiliary generators, avoiding the combustion of about 10.5 metric tons of fuel oil per day while a vessel is at berth in Tacoma. With shore power infrastructure available, the ship could instead use electrical power from the local grid while it is at the port. In the Tacoma Power electrical grid, where hydropower accounts for most of the generation capacity, carbon dioxide (CO₂) and nitrogen oxide (NO_x), emissions would be reduced by greater than 99%, and sulfur oxide (SO_x) emissions would be reduced by greater than 70%, when compared with burning onboard fuel oil.

Currently, ships burn 0.1% sulfur fuel when at berth at NWSA’s terminals in their auxiliary engines to satisfy onboard power demands. The emission factors for ship auxiliary engines (taken from the EPA shore power emission calculator)⁴ and TPU’s power mix (from EPA’s eGrid)⁵ are shown below.

Emission Factors (g/kWh)			
	NO _x	SO _x	CO ₂
Ship Auxiliary engines (0.1% sulfur fuel)	13.9	0.44	690
Shore Power (Tacoma Power)	0.044	0.127	0.677

Description of Need:

Ocean going vessels, especially container ships, are a key source of diesel pollution that have historically been extremely difficult to influence, since ports themselves do not own or operate the vessels. Due to existing regulations in California and shore side infrastructure installations in Asian ports, container vessels serving the Pacific Rim have begun to install equipment onboard vessels that allows them to use power from the local grid while at berth. Use of this onboard equipment is dependent on there being adequate infrastructure on the terminal side to allow them to connect. Many container vessels that visit these Californian and Asian ports are also visiting Tacoma as part of their existing vessel strings. The NWSA seeks to leverage this existing vessel side infrastructure to reduce emissions at berth, reducing air pollution for the local population in Tacoma and Pierce County as well as climate impacts. Because law in Washington State does not require shore power use, this would be a voluntary initiative that goes above and beyond regulations.

² Northwest Ports Clean Air Strategy Update Page. <https://www.nwseaportalliance.com/NWPCAS>

³ NWSA GHG resolution. <https://vecportal.blob.core.windows.net/nwseaportalliance/Documents/d58b3918c42038b22ffdeb8154458043/4A-RES-2017-02-GHG%20Policy-Cederberg.pdf>

⁴ EPA Shore Power Calculator. <https://www.epa.gov/ports-initiative/shore-power-technology-assessment-us-ports>

⁵ EPA eGRID Database. <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

As one of the few methods for reducing emissions from ocean going vessels and the most thoroughly demonstrated and robust method for doing so, shore power, or cold ironing, is a key component of NWSA’s strategy for reducing air pollutants and GHG emissions. The only other demonstrated method to reduce vessel emissions is emission capture and treatment, which, while effective at reducing air pollutant emissions, is more expensive and does not provide co-benefits for greenhouse gas emissions. Additionally, shore power has been demonstrated in many port locations in the U.S. and globally, including California, Seattle, China, and others, while emission capture and treatment systems have not been as broadly applied.

While shore power is a well demonstrated method for greatly reducing emissions from large ocean-going vessels, installing the infrastructure on port terminals is very capital intensive and does not present a clear business case for the port. Operational cost savings are projected to be small relative to the capital investment for the port itself, and would only be realized by the shipping lines through reduced energy costs. Offsetting the initial capital investment through grant funding is vitally important to overcome these funding barriers.

Project Description:

Husky Terminal is a modern container terminal located in Tacoma, with recently installed cranes, capable of accommodating the Pacific Trade’s largest container vessels (up to 18,000 twenty-foot containers in capacity) as well as on dock rail facilities. Husky Terminal is one of NWSA’s two “strategic terminals”, meaning that it is expected to handle an increasingly larger share of the container business in the coming years. This project will retrofit shore power infrastructure on a currently operating terminal, including installation of connection points on the wharfs and distribution infrastructure to supply power to these connection points including wiring, ship connection boxes, vaults, 6.6 kV transformers, switchgear, and any necessary trenching and wharf modifications.



Entrance to the Blair Waterway with Husky Terminal depicted on the right of the photo. The two sets of blue container cranes mark the two vessel berths at Husky Terminal.

The shore side system will be built to safely supply power to the existing fleet of international container vessels serving NWSA terminals, and vessels anticipated to be put into service in the coming years. Onboard ship-side systems must comply with the international codes and standards (i.e. ISO/IEEE/IEC)

per plug-in requirements in California. The NWSA will build the shore side equipment in compliance with the IEC standard, using Cavotec connection boxes as used in California.

Vessel Readiness:

The proposed shore power connection system would serve a diverse fleet of internationally flagged container vessels at Husky Terminal in Tacoma, Washington. NWSA keeps detailed logs of vessel calls at its terminals, allowing the current fleet calling at Husky Terminal to be analyzed.

In 2018, 28 unique container vessels made a total of 100 calls at Husky Terminal, of which 57% of vessels and 54% of calls (54 calls) were shore power capable – vessels that could have plugged in while at Husky, if the infrastructure had been there. The fraction of shore power capable vessels and calls were assessed by comparing NWSA’s vessel call logs with shore power usage and commissioning logs from Port of Oakland, Port of LA, and Port of Long Beach. In addition, the Environmental Ship Index (ESI)⁶ has a scored reporting field for ship side infrastructure and this data was referenced for each ship that had a current ESI rating.

During shore power capable vessel calls at Husky, vessels were at berth an average of 73 hours per call. The Clarkson Fleet Register⁷ provided auxiliary engine characteristics for this fleet of vessels that visit Husky. The average auxiliary engine rated power for shore power capable vessels was 11,654 kW. When scaled by the default container ship load factor in the EPA’s shore power emission calculator (0.17), the expected auxiliary load is 1981 kW and the expected power use for an average vessel call is 144,613 kWh. If all 54 shore power capable calls in 2018 had plugged in to the grid, 7,697,966 kWh of energy generated using fuel oil could have instead been provided by the clean Tacoma Power grid.

Shore Power Implementation Plan:

The implementation of shore power at Husky Terminal will follow the NWSA’s Shore Power Program, provided as an attachment. As a landlord port, the NWSA has stevedoring tenants (terminal operators) who will be responsible for implementing shore power as it is installed. Shore power requires additional labor, vessel commissioning, and administration that all add cost and complexity for the stevedore. In order to apply a common policy for all terminals and avoid putting any stevedore at a competitive disadvantage, the Port’s shore power policy allows for voluntary, but encouraged and supported, adoption until all terminals have the capability. At that time, all vessels would be required to connect.

The NWSA has past and present experience installing and implementing shore power for ocean-going vessels at the TOTE Terminal in Tacoma that handles roll on/roll off containerized cargo and are closely connected with cruise ship shore power at Pier 91 in Seattle operations through the relationship with the home port. The installation of shore power at the TOTE Terminal was grant funded by the EPA. The experience operating shore power systems and managing grants for their installation demonstrate the NWSA’s ability to deliver this project successfully.

⁶ Environmental Ship Index (ESI). <http://www.environmentalshipindex.org/Public/Home>

⁷ Clarkston World Fleet Register. <https://www.clarksons.net/wfr>



Workers connecting a vessel at the TOTE Terminal to shore power.

Project Timeline:

The NWSA will build shore power infrastructure for two berths between 2020 and 2022. To align with the NWSA budget cycle, design and construction would begin in 2020. Prior to this, during 2019, NWSA will obligate grant funds (EPA DERA grant funds) and begin preparing for procurement of a design consultant. Construction is expected to begin in October of 2020 and finish in late 2022.

Date	Task/Milestone
January 2020	Begin procurement of design contractor
March 2020	Begin design
July 2020	Complete design
August 2020	Begin procurement of construction contractor
October 2020	Begin construction of Husky Berth 1.
September 2021	Complete construction of Husky Berth 1, begin implementing shore power at Husky Berth 1.
October 2021	Begin construction of Husky Berth 2.
September 2022	Complete construction of Husky Berth 2, begin implementation of shore power at Berths 1 and 2. This signifies the administrative project end date

Expected Outcomes/Benefits:

Use of shore power by vessels at Husky Terminal would significantly reduce use of fossil fuels for a sector that has historically been very difficult to influence, greatly reducing air pollution impacts on neighboring communities as well as impacts on climate change. The project also accelerates adoption of alternative fuels by providing a substitute for fossil fuels. Specifically, if all 54 shore power capable calls from 2018 had used shore power, combustion of 1,732 metric tons of fuel oil could have been averted. This translates to the following emission reductions, calculated using the EPA Shore Power Calculator⁴. Based on CO₂ emissions, this is the equivalent of taking roughly 660 cars that drive 20,000 miles per year at 30 miles per gallon off the road.

Emission Reductions (tons/year)			
DPM	NO _x	CO ₂	SO _x
1.77	107	5,306	2.04

Performance Measures: In addition to engineering project managers overseeing construction, the NWSA will assign an environmental project manager to oversee the shore power program. The project manager will:

- Track progress on the construction of shore power infrastructure at Husky terminal
- Track usage of shore power by vessels calling Husky including at berth hours and at berth hours using shore power. Activity data will also be translated into emission reductions
- Track lessons learned and progress towards perfecting processes and procedures for executing shore power connections and commissioning new vessels. Best management practices will be developed to maximize the use of shore power.
- After the grant completion, NWSA will continue to monitor emission reductions through emission inventories, performed every 5 years.

Description of the Project Location and Affected Population:

This project will take place in Tacoma, Washington, located in Council District 2 of Pierce County. Husky Terminal is located in the NWSA South Harbor. Husky terminal is shaded orange in the map of the NWSA’s South Harbor port complex below.



Diesel exhaust is Washington’s most harmful toxic air pollutant and Pierce County is an area designated in the 2011 National Air Toxics Assessment⁸ as an area where diesel particulate matter is a significant public health risk. The port/industrial area and commercial districts of Tacoma receive a disproportionate quantity of air pollution from diesel fleets, which would be reduced by installing shore

⁸ 2011 National Air Toxics Assessment. <https://www.epa.gov/national-air-toxics-assessment/2011-national-air-toxics-assessment>

power at Husky Terminal.

In addition to impacts on the local community, port workers bear a disproportionate burden of the health impacts associated with diesel exhaust. International Longshore and Warehouse Union (ILWU) Local #23 represents 1,500 longshore workers at the Northwest Seaport Alliance. ILWU workers handle billions of dollars of cargo imported and exported from around the world including containers, automobiles, logs, grain and break bulk. ILWU workers face the most immediate exposure to diesel exhaust as they work in close proximity to vessels that burn diesel continuously and most containers at the port are moved by equipment that run on diesel. ILWU workers routinely exposed to diesel exhaust are negatively impacted by through increased risk of health impacts and associated decreased productivity. ILWU is a strong partner of the NWSA and supports initiatives that reduce emissions.

Schedule C: *An itemized project budget, including an indication of how the proposed grant funds would be applied within the budget.*

The proposed budget for the Northwest Seaport Alliance Husky Terminal Shore Power project is \$5,495,575, of which NWSA is requesting up to \$4,295,575 from the TransAlta Centralia Coal Transition Grant. The TransAlta grant funds would cover design, construction, and administrative costs not covered by other funding partners. Our other funding partners include the EPA, who is providing \$1,000,000 through the Diesel Emission Reduction Act (DERA) grant fund and Tacoma Power, who will be funding electric grid distribution and metering upgrades estimated at \$200,000. Itemized costs and funding distribution are shown in the Table below.

Line Item	Cost	TransAlta Funding	EPA Funding	Tacoma Power Funding
Ship connection boxes (4)	\$356,125			
6.6 kV transformers (2)	\$297,500			
Switchgear, circuit breakers, and wiring	\$577,500			
Stainless steel switch houses (2)	\$1,050,000			
Wharf modifications	\$61,250			
Conduit and trenching	\$367,500			
Inspection, testing, permitting	\$49,000			
Metering upgrades	\$200,000			\$200,000
Construction Sub Total	\$2,958,875			
Contractor overhead and profit (25%)	\$739,719			
Contractor Sub Total	\$3,698,594			
General Conditions (7.25%)	\$268,148			
Sales Tax (10.1%)	\$373,558			
Total Construction	\$4,340,300	\$3,140,300	\$1,000,000	\$200,000

Design (10%)	\$434,030	\$419,361		
Engineering Staff (design and construction, 15%)	\$651,045	\$651,045		
Environmental Project Manager (\$48/hr, 5hr/week, 156 weeks)	\$37,440			
Senior Environmental Manager (\$56/hr, 1 hr/week, 156 weeks)	\$8,736			
Total Personnel	\$46,176	\$46,176		
Environmental Project Manager (\$25/hr, 5hr/week, 156 weeks)	\$19,500			
Senior Environmental Manager (\$29/hr, 1 hr/week, 156 weeks)	\$4,524			
Total Fringe Benefits	\$24,024	\$24,024		
Total Funding		\$4,295,575	\$1,000,000	\$200,000
Total Project Cost			\$5,495,575	

The cost estimate was created by the Port of Tacoma project management team using standard rates for design, contingency, escalation, project management, and other associated costs. The physical elements to be constructed include shore power connection boxes, transformers, conduit and wiring for bringing power to the wharf, and the vessel connection boxes. The costs for these items include materials, labor, and contractor overhead. Engineering project management will oversee the design and construction tasks for the project. Air Quality staff will administer the grant and will conduct monthly meetings with the engineering and project management teams who will manage construction, to rigorously track project progress and expenditures and ensure that the awarded grant funds are expended in a timely manner. Fringe benefits for air quality staff include medical, dental, pension, and vacation and sick leave and are included for completeness.

Schedule D: *A list of milestones and deliverables in connection with the project and the proposed grant.*

Shore power infrastructure at Husky Terminal will be designed and installed between 2020 and 2022. A detailed list of major project tasks and milestones are detailed below. TransAlta grant funding would contribute funds to the design and construction elements of the project.

Date	Task/Milestone	Responsible Entity
December 2019	Execute grant award agreements and obligate funds. Complete Request for Proposals for engineering design contractor	NWSA
January 2020	Begin procurement of design contractor – issue RFP	NWSA
March 2020	Close RFP; Complete procurement of design contract, begin design	NWSA
July 2020	Complete design	NWSA
August 2020	Begin procurement of construction contractor – issue RFP	NWSA
October 2020	Complete procurement of construction contractor, begin construction of Husky Berth 1. Progress towards the milestones stated below will be tracked and documented in quarterly reports. <ul style="list-style-type: none"> - Complete installation of connection boxes on the wharf - Complete installation of transformers and switchgear - Complete installation of all wiring and connections 	NWSA
September 2021	Complete construction of Husky Berth 1, begin implementing shore power at Husky Berth 1.	NWSA
October 2021	Begin construction of Husky Berth 2. Progress towards the milestones stated below will be tracked and documented in quarterly reports. <ul style="list-style-type: none"> - Complete installation of connection boxes on the wharf - Complete installation of transformers and switchgear - Complete installation of all wiring and connections 	NWSA
September 2022	Complete construction of Husky Berth 2, begin implementation of shore power at Berths 1 and 2. This signifies the administrative project end date	NWSA

Schedule E: *A detailed description of (a) any additional sources of funding to be utilized in connection with the proposed project, (b) other organizations who have agreed to collaborate on the proposed project, and (c) any conditions or approvals that must be obtained in order to proceed with the proposed project.*

Additional Sources of Funding:

NWSA has applied for and been selected for a Diesel Emission Reduction Act (DERA) grant from the EPA, in the amount of \$1,000,000 for the Husky Shore Power Project. The \$1,000,000 amount was the

maximum funding level for projects in EPA Region 10 for the 2019 funding year. Tacoma Power will also be providing \$200,000 to fund necessary electric grid upgrades to distribution and metering for the project.

Collaboration:

NWSA and Tacoma Power have been working together for the past year or more to conceptualize and develop an electricity rate design to help facilitate the sale of shore power to serve ships docked at the NWSA's South Harbor (Port of Tacoma). As the NWSA has the desire to reduce its environmental impacts and Tacoma Power is interested in utilizing excess generation capacity, both partners are interested in installing and implementing shore power. However, Tacoma Power's current rate structure contains high per kilowatt demand charges that substantially complicate billing procedures for passing electricity charges on to the shipping lines and may make connecting to shore power more expensive for vessel operators in many cases than burning onboard fuel. In order to simplify billing and guarantee that using shore power presents cost savings for vessel operators, thereby incentivizing its use, Tacoma Power is designing a special rate for shore power, one that would eliminate demand fees. The Tacoma Public Utility Board passed resolution U-11062 in spring 2019, authorizing staff to develop this new shore power rate and partner with NWSA on applications for funding of shore power projects.

The NWSA's home ports (Tacoma and Seattle) are founding members of the Northwest Ports Clean Air Strategy (NWPCAS)⁹, along with Port of Vancouver B.C. The NWPCAS is a regional policy adopted by the ports and developed in collaboration with environmental government agencies, the EPA, Washington State Department of Ecology, and Puget Sound Clean Air Agency. The Strategy lays out a framework for the ports to voluntarily and proactively reduce their air pollutant and GHG emissions. The partnerships developed and the direction provided by the NWPCAS help drive and support the air pollution reduction and sustainability efforts at all four ports.

Conditions/Approvals:

All projects totaling \$300,000 or greater must be authorized by the NWSA Managing Members at one of their regularly scheduled, monthly, public meetings. This process requires NWSA's staff to present the project for consideration in a public meeting, approval is determined through a Managing Member vote (a majority is required within both 5 member commissions). The Husky Shore Power Project will need to be approved in this manner. In addition, approval to enter into any grant agreements must follow a similar process to be accepted by Managing Members.

Schedule F: *The balance sheet of the recipient as of the most recently ended fiscal year, accompanied by statements of income and cash flow for such fiscal year.*

The Husky Shore Power Project has been budgeted in the NWSA's Capital Budget for years 2020 through 2022, pending approval from the elected Managing Members.

Detailed financials are available on request.

⁹ Northwest Ports Clean Air Strategy. <https://www.epa.gov/ports-initiative/northwest-ports-achievements-reducing-emissions-and-improving-performance>



3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

TransAlta Coal Transition Grant Selection Committee,

Tacoma Power has collaborated with the Northwest Seaport Alliance since 2014 to support their efforts to install shore power connection points at Husky Terminal in Tacoma, WA. Tacoma Power, which serves Husky Terminal, provides the Northwest Seaport Alliance with clean, renewable hydroelectricity that is 97% carbon free.

A key component of our collaboration has been to remove barriers that discourage shore power adoption. Working with the Northwest Seaport Alliance, we identified three areas our General Service rate could hinder adoption.

- Peak demand charges make it difficult for the terminal operator to reallocate energy costs to ship owners, potentially confusing ship owners and discouraging adoption.
- Demand ratchet charges would levy costs to the terminal operator during months when no power is used, posing a financial risk to terminal operator.
- Washington State law and Tacoma Municipal Code prohibit reselling of electricity unless rate language specifically authorizes resale. This language is missing from our current General Service rate.

The Tacoma Public Utility Board approved Resolution U-11062 on February 27, 2019. The resolution supports development of a shore power rate that would eliminate peak demand and the demand ratchet charges by combining these costs into the energy portion of the bill (similar to a residential bill). Additionally, the new rate would include specific language to allow the terminal operator to reallocate costs to shipping lines based on energy usage. We are committed to creating a rate structure that works economically and has buy-in from key stakeholders, subject to City Council approval.

In addition to modifying our rate structure, Tacoma Power is willing to provide an in-lieu contribution up to \$200,000 to pay for infrastructure upgrades required on the utility side of the meter.

Installing shore power connection points at Husky Terminal has positive environmental and economic benefits for all of Tacoma Power's ratepayers. We will continue to work and support the Port of Tacoma in its efforts to build the infrastructure necessary to make shore power a reality.

Sincerely and best regards,

Cam LeHouillier
Assistant Power Manager
Tacoma Power



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

AIR & RADIATION
DIVISION

June 20, 2019

Mr. Jason Jordan
The Northwest Seaport Alliance
One Sitcum Plaza
Tacoma WA 98421

RE: FY 2019 Clean Diesel Funding Assistance Program
Announcement Number: EPA-OAR-OTAQ-19-01

Dear Mr. Jordan,

On December 20, 2018, the U.S. Environmental Protection Agency issued a Request for Applications (RFA) under the Clean Diesel Funding Assistance Program – FY 2019. A regional review panel reviewed, scored, and assessed the proposals for projects that were submitted in response to this RFA.

I am pleased to inform you that your proposal requesting \$1,000,000 in federal assistance to support the Northwest Seaport Alliance Husky Terminal Shore Power project was selected by the regional review panel and we are recommending the proposal be fully funded. Please keep in mind, this does not mean that you are being offered a grant, only an EPA award official can make a monetary offer. However, your proposal is being referred for further consideration, which is an important step towards an offer.

I have been assigned as the Project Officer, in the Air & Radiation Division, to negotiate elements of your proposal, a budget, the proposed project start date, and other application requirements. Upon completion of the workplan negotiations you will be asked to submit your signed, official grant application to myself and your assigned Grants Specialist.

Please contact me via email: Frederick.Sarah@epa.gov or phone: (206) 553-1601 should you have any questions regarding this correspondence.

Sincerely,

A handwritten signature in blue ink that reads "Sarah Frederick".

Sarah Frederick, EPA Project Officer

cc:

Graham VanderSchelden, Project Manager – Air Quality & Sustainable Practices, NWSA
Karl Pepple, EPA Region 10 DERA Lead
Kelly McFadden, Branch Chief – Air Permits and Toxics Branch
Debra Suzuki, Branch Chief – Air Planning and State/Tribal Coordination Branch

Cover Memo: NWSA Shore Power Program

Background

Use of shore power is a growing trend in the Pacific Rim. Policy has been enacted in California that requires 80% of qualifying container ship fleets (i.e. fleets that visit California ports greater than 25 times in a calendar year) to use shore power. Port of Vancouver B.C. has installed shore power at two of its container terminals and infrastructure and incentive programs have been put in place in many ports in China. About 51% of container vessels currently calling at NWSA's major international container terminals are shore power capable.

There may also be a competitive advantage to be gained by the NWSA and its customers during implementation of the IMO's low sulfur fuel regulations to be enacted in 2020. There is significant uncertainty surrounding distillate fuel prices, which is likely to affect the price of fuel burned by vessels when they are in Port. There is also growing momentum to regulate exhaust scrubbers that would allow compliance with the regulation without using cleaner fuels. Providing cheap energy and cost certainty through shore power could lower operational costs for vessels if fuel prices rise and scrubbers are not allowed or not widely implemented.

The NWSA has committed to reducing its scope 3 GHG Emissions by 50% by 2030 and by 80% by 2050 through the GHG Resolution enacted by the elected Commission in 2017. In addition, the Northwest Ports Clean Air Strategy will be updated by the end of 2019, setting new air pollutant and GHG emission reduction goals and programmatic direction for the NWSA, Port of Seattle, Port of Tacoma, and Port of Vancouver B.C. Shore power is an effective way to reduce emissions from ocean-going vessels, a sector that has been very difficult for ports to influence.

NWSA Shore Power Program



1. DEFINITIONS

Terms & Acronyms

Shore Power – Provision of electricity to a vessel at berth, allowing it to turn off its auxiliary engines.

Terminal Operator – Port tenant or other entity who hires labor to perform vessel docking and cargo handling activities.

Vessel Operator – Captain and/or crew on board each vessel

Shore power capable – Ships that have infrastructure and equipment on board that allows them to use auxiliary power from a shore side system.

Shore power ready – terminals that have conduit and vaults installed for shore power, but would need wiring, vessel connection boxes, and other infrastructure to be installed before being capable of providing electricity to ships

Major international container terminals - Terminal 5, Terminal 18, Terminal 30, Husky Terminal, Pierce County Terminal, and Washington United Terminal. This definition may change as facilities and lines of business shift.

NWSA – Northwest Seaport Alliance: Joint Marine Cargo Operating Partnership between Port of Seattle and Port of Tacoma

POT – Port of Tacoma

GHG – Greenhouse Gas

Homeport - Two Ports forming the NWSA, Port of Seattle and Port of Tacoma

Air Quality Team – Group of NWSA employees within the Environmental Department that manage air quality related projects

2. PURPOSE

Background

Through the Northwest Ports Clean Air Strategy and the NWSA and homeport GHG Resolutions, the NWSA has made substantial commitments to reduce air pollutant and GHG emissions. Shore power is a technology that has been robustly demonstrated, reduces emissions substantially, and is a key component of the NWSA meeting the commitments made under these policies.

Shore power is preferable to other methods of emission reductions, i.e. on-board scrubbers or external exhaust capture and treatment systems, because emissions from the auxiliary power generation on the ship are zero, including GHG emissions.

Goals

Emission Reductions: Reduce air quality impacts and Greenhouse gas emissions consistent with NWSA's environmental stewardship commitments to responsible, sustainable growth that protects public health and the environment as well as the Northwest Ports Clean Air Strategy and the NWSA GHG Resolution.

Efficiency: Reduce fuel use and operating costs for NWSA's commercial partners. Using Washington's green and inexpensive energy, it may cost less for vessels to use shore power than burn onboard fuel.

Consistency with Other Major West Coast Ports: Ensure that NWSA offers a modern suite of facilities for its customers, consistent with other regional competitors. Shore power is mandatory for container vessels in California and available on a voluntary basis at the Port of Vancouver B.C and the Port of Prince Rupert.

3. SCOPE

Audience This program applies to the NWSA, terminal operators and vessel operators who manage vessel docking and operation while at berth at NWSA’s major international container terminals.

Activities The Shore Power Program includes the installation of infrastructure and equipment at NWSA’s major container terminals to provide shore power to ships, collaboration with utilities to develop rates and billing structures, and implementation of shore power at the terminals.

4. PREREQUISITES/RESOURCES/FORMS/LINKS

- Required Processes and procedures**
- Vessel Commissioning Procedure [*to be developed with first installation*]
 - Shore Power Vessel Berthing Best Management Practices [*to be developed with first installation*]
 - Shore Power Ship to Shore Connection Procedure [*to be developed with first installation*]
-

5. RESPONSIBILITIES

Responsible Parties **Terminal operators** will be responsible for executing the ship to shore electrical connections for ships that choose to use shore power, billing vessels for electricity used while at berth, and reporting the number of hours that each vessel call uses shore power.

Vessel operators will likely be responsible for paying commissioning costs and following best management practices to ensure that the vessel is positioned properly to use shore power.

The NWSA will be responsible for coordinating the funding and construction of shore power infrastructure and working with the utilities to develop electricity rate structures for shore power.

6. PROCEDURE

Step by Step Actions

Planning

The NWSA's Air Quality Team will work with the engineering team of the home ports to assess the upgrades necessary for shore power at each major international container terminals, and the associated costs. The Air Quality Team will assess the vessel fleet to determine how many shore power capable vessel calls occur at each terminal and quantify the potential emission benefits possible if vessels were to use shore power. Shore power installations will be prioritized based on the business priorities of the port, emission reductions, cost, and operational considerations. The Air Quality Team will facilitate continuous update of these priorities over time in the form of recommendations to executive and elected leadership.

Coordinate with Utilities

NWSA will coordinate with utilities to set up rate structures for electricity that will provide cost savings for vessels when compared with burning fuel onboard for auxiliary power. Lower energy costs can help incentivize use. In addition, the NWSA will facilitate billing procedures between the utility, terminal operator, and ocean carriers.

Design

Port development, redevelopment, and/or property acquisitions may present the opportunity to add to the Port's electrical infrastructure and increase the Port's shore power capability. As terminals are redeveloped, i.e. significant repair or replacement of wharfs or backlands between the existing electrical switch gear and the vessel berth, the designs will include infrastructure required to make terminals "shore power ready" at a minimum and will consider installation of all shore power infrastructure. Making a terminal shore power ready means installing conduit, vaults, and transformer pads to support shore power equipment. Installing these elements while the terminal is already under construction will minimize costs of retrofitting these elements. Exceptions may be granted if installation of these elements is impracticable or if the use of the terminal is expected to change within the next 10 years.

Construct Infrastructure

NWSA coordinates infrastructure investments at its major container terminals that allow ships to use shore power. Grant funding is pursued to help pay for these investments. Terminals are prioritized for shore power installations based on the port's business strategy, expected shore power capable vessel traffic, willingness of

terminal operators to implement the program, and cost to install infrastructure. Terminals that have been made shore power ready in previous redevelopment projects or are planned for redevelopment may be the most cost-effective locations for shore power installations and should be prioritized accordingly. Shore power installations will meet ISO standard 8005-1:2012 to ensure compatibility with the international vessel fleet.

Operations

As a landlord port, the NWSA has many stevedoring tenants who will be responsible for implementing shore power. Shore power requires additional labor, vessel commissioning, and administration that all add cost and complexity for the stevedore. In order to apply a common policy for all terminals and avoid putting any stevedore at a competitive disadvantage, the Port's shore power policy allows for voluntary, but encouraged and supported, adoption until all terminals have the capability to supply shore power.

The program will be implemented in two phases.

Phase 1: Voluntary implementation

The first phase of the shore power program aims to facilitate the installation of shore power at NWSA's major container terminals and develop the knowledge and expertise for the terminal operators and NWSA to implement shore power progressively more effectively, efficiently, and comprehensively. Because using shore power adds operational and administrative complexity, implementation will be voluntary initially, to avoid putting any terminal operator at a competitive disadvantage. It is expected that voluntary implementation will end when all major container terminals have been outfitted with shore side infrastructure.

Phase 2: Mandatory Implementation

After all major international container terminals are equipped with shore power, NWSA will begin phasing in requirements for shore power capable vessels not deemed exempt (exemptions described below) to connect.

Implementation: Phase 1

At terminals equipped to provide shore power, terminal operators will make shore power available to vessels. Initially shore power use is voluntary but encouraged and supported by NWSA. Once all terminals are equipped with shore power capability, shore power capable ships will be required to utilize shore power (phase 2). For each vessel call, the Terminal Operator will:

- A. Coordinate with incoming vessels to determine if shore power is desired.
- B. Contact the utility to schedule the power use, communicating estimated time of arrival and departure, if shore power is desired.
- C. Follow best management practices to ensure the vessel is positioned properly in relation to the shore power connection.
- D. Contact NWSA to commission the vessel if it is a vessel’s first time using shore power at a terminal, in accordance with the Shore Power Commissioning Procedure.
- E. Coordinate all labor required to connect and disconnect the vessel to shore side power.
- F. Bill the vessel for the power used, if applicable.
- G. Report to NWSA the number of hours connected to shore power for each vessel call on a monthly basis.

For each ship call, the NWSA will:

- A. Facilitate vessel commissioning
- B. Facilitate information sharing to develop and continually update vessel berthing best management practices, ship to shore connection procedures, and vessel commissioning procedures.

Implementation: Phase 2

Once all major container terminals have shore power capability and/or as dictated by a lease, NWSA will begin phasing in requirements for vessels with shore power capability to utilize shore power infrastructure. After the 5th year of phase 2 all nonexempt vessel calls will be required to use shore power. The following table indicates the fraction of non-exempt shore power capable calls that must use shore power.

Program Year	Percentage of Capable Vessels that Must Use Shore Power
1-3	50%
4-5	70%
6+	100%

See above for roles and responsibilities of the Terminal Operator and NWSA.

Exemptions from Usage Requirements: If a vessel does not participate in regular service to NWSA terminals, the commissioning effort and cost may make shore power use impractical. In cases where an individual shore power capable vessel is expected to call less than once in a calendar year and hasn't been previously commissioned and/or is part of a fleet whose operator calls NWSA terminals in total less than 20 times in a calendar year, the vessel will be exempt from the usage requirement. NWSA reserves the right to grant additional exceptions for extenuating circumstances.

Evolution

The NWSA will continuously evaluate this program to ensure substantial progress towards environmental goals, compliance with regulations, best utilization of technology, and alignment with business priorities. NWSA reserves the right to modify this program as needed to meet its environmental and business goals.

7. REFERENCES

Policies, RCWs & Standards

- Northwest Ports Clean Air Strategy
- NWSA GHG resolution
- ISO/IEC/IEEE 80005-1:2012(E)



RESOLUTION NO. U-11062

1
2 A RESOLUTION directing staff to pursue grant funding for shore power and
3 expressing the Public Utility Board's support of the creation of a rate design
4 to facilitate the sale of power for the exclusive purpose of serving ships
5 docked at the Port of Tacoma ("Shore Power Rate").

6 WHEREAS the Port of Tacoma is an international shipping port served by
7 Tacoma Power, and

8 WHEREAS Tacoma Power has surplus generation capacity and would be
9 able to reduce rates to all customers if it could increase its sale of retail power, and

10 WHEREAS many ships dock at the Port of Tacoma have systems that can
11 accept power from shore (otherwise known as "shore power") rather than use
12 onboard power generation systems that burn fossil fuels, and

13 WHEREAS the number of ships that are capable of receiving and using
14 shore power is increasing, and

15 WHEREAS the Tacoma-Pierce County Clean Air Task Force identified
16 emission from ships burning fossil fuels in onboard generators as a contributor to
17 local air emissions, and

18 WHEREAS the City of Tacoma's Environmental Action Plan and Governor
19 Jay Inslee's Executive Order 14-04 seek to reduce fossil fuel emissions, and

20 WHEREAS substantial costs to upgrade port side infrastructure and utility
21 side distribution systems create a barrier to implementing shore power at the Port
22 of Tacoma, and

23 WHEREAS grant funding resources, including the Washington State
24 Department of Ecology's VW Mitigation Fund, Department of Commerce's Clean
25 Energy Fund, US Environmental Protection Agency's Diesel Emissions Reduction
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Act, or other funding sources yet to be identified that offer grant funding could be used to provide electrical service to ships at dock in order to reduce fossil fuel emissions, and

WHEREAS the three-part rate by which Tacoma Power recovers its costs from customers located at the Port of Tacoma is a barrier to adoption of shore power due to the "demand charge" in the calculation of the monthly amount payable, and

WHEREAS the "demand charge" makes it uneconomic for shipping companies to use shore power during times of infrequent use, and

WHEREAS the "demand charge" makes it difficult for terminal operators to allocate energy charges incurred by ships that dock at their terminals, and

WHEREAS if the Department of Ecology as trustee of the VW Mitigation Fund, Department of Commerce's Clean Energy Fund, US Environmental Protection Agency's Diesel Emissions Reduction Act, or other funding sources yet to be identified, may approve a grant for shore power related infrastructure, the proposed rate design for shore power of removing the demand charge will be re-estimated using up to date costs and estimates of power demand, and brought for approval of the Public Utility Board at a future session; Now, Therefore,

BE IT RESOLVED BY THE PUBLIC UTILITY BOARD OF THE CITY OF TACOMA:

That the Board directs utility staff to pursue grant funding to facilitate adoption of shore power at the Port of Tacoma and hereby expresses support of a Shore Power Rate concept that would reconfigure the current three-part rate into a

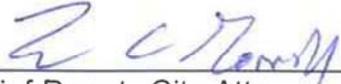


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two-part rate by removing the demand charge and increasing the energy charge,
and allow terminal operators to reallocate costs to shipping lines based on their
energy usage.

Approved as to form and legality:

Chair



Chief Deputy City Attorney

Secretary

Clerk

Adopted _____

EXHIBIT C

TRANSALTA CENTRALIA BOARD FUNDING, LLC GRANT TERMS AND CONDITIONS

The following are the general terms and conditions of grants by TransAlta Centralia Board Funding, LLC, acting through its Grant Review Boards (the "Grantor"):

1. REPRESENTATIONS AND WARRANTIES OF GRANTEE. By executing and delivering the Grant Agreement, Grantee represents and warrants to Grantor as follows:
 - a. Grantee has the requisite legal authority and power to execute and deliver and to carry out the terms of the Grant Agreement.
 - b. To the knowledge of Grantee, the statements made by Grantee in the Grant Proposal (other than forward-looking statements related to the proposed project and application of grant proceeds) are true and correct in all material respects.
 - c. Grantee understands that there is no correlation or connection between Grantor's award of grants and Grantee's business relationship or potential business relationship with Grantor or its affiliates. Participation in Grantor's grant program does not require or impose any *quid pro quo* condition. If Grantee believes that a *quid pro quo* condition exists or may exist, it shall contact Lori Schmitt, c/o TransAlta Centralia Board Funding, LLC, 913 Big Hanaford Road, Centralia, Washington, 98531 to report the condition.
2. REPRESENTATIONS AND WARRANTIES OF GRANTOR. By executing and delivering the Grant Agreement, Grantor represents and warrants to Grantee as follows:
 - a. Grantor has the requisite legal authority and power to execute and deliver and to carry out the terms of the Grant Agreement.
 - b. There is no correlation or connection between Grantor's award of grants and the Grantee's business relationship or potential business relationship with Grantor or its affiliates. Participation in Grantor's grant program does not require or impose any *quid pro quo* condition.
3. FUND DISTRIBUTION. Funds awarded will be distributed in accordance with the disbursement schedule attached as Exhibit A to the Grant Agreement.
4. BUDGET REVISION. Grant funds shall be used as set forth in the budget included in the final grant proposal, attached as Exhibit B to the Grant Agreement (the "Grant").

Proposal”). Any transfer of funds from one budget item to another that exceeds 10% of the approved budget item requires Grantor’s prior written consent.

5. NO COST EXTENSION. If needed, Grantee may submit a request for a no-cost extension to Grantor before the end of the Grant Period. The request should contain the reason for the extension, any unexpended funds identified and how the funds will be used, and the length of time requested for the extension. Grantor may in its sole discretion approve or deny such request for an extension, and if such extension is approved, then the Grant Period (as such term is defined in the Grant Agreement) shall be accordingly extended.
6. ANNUAL FINANCIAL INFORMATION. Within six (6) months of the close of the fiscal year in which Grantor funds are received, Grantee must provide ~~one of the~~ following:
 - a. an audit and management letter (for grantees receiving greater than \$500,000 in funds in the aggregate from Grantor);

If for any reason a Grantee funded by Grantor obtains an audit or financial review during a fiscal year, that audit or review shall be provided to Grantor, regardless of the amount of funding Grantee received. Additionally, Grantor may require that any Grantee submit an audit or financial review to Grantor upon 90 days’ notice.

7. GRANTEE REPORTS. Grantees must submit periodic reports to Grantor.
 - a. Narrative Report. An annual narrative report concerning the nature and use of funds awarded pursuant to this grant is to be submitted in the format set forth on Exhibit D to the Grant Agreement, unless otherwise specified in the Grant Agreement. The narrative report is due by March 31, 2020. A final narrative report is to be submitted in the format set forth on Exhibit D to the Grant Agreement within ninety (90) days following the end of the Grant Period.
 - b. Financial Reports. Quarterly financial reports for the project consisting of an unaudited balance sheet and unaudited statements of income and cash flows for the quarter then ended shall be submitted by Grantee in the format set forth on Exhibit D to the Grant Agreement within 30 days for the quarter then ended. The Grantor may request audited financial statements from the Grantee.
8. REPORTING REQUIREMENT; WAIVER. Failure to submit reports required under paragraphs 6 or 7 of these Grant Terms and Conditions in a manner satisfactory to Grantor on a timely basis may result in delay or loss of funds. Under exceptional circumstances, a waiver of Grantor’s obligation to submit such may be available. A

written request to waive this requirement must be made to Grantor on or before the end of the period covered by such reporting requirement.

9. GRANT EVALUATION. Grant performance will be evaluated during the year for which the grant is made. The information received in the reports described in paragraphs 6 or 7 of these Grant Terms and Conditions and any Special Conditions required in the Grant Agreement, and, at the discretion of Grantor, from other sources, will form the basis for the report. Grantees must provide further information if requested by Grantor.
10. RECORDS; RIGHT TO INSPECT. Original receipts and invoices must be maintained by Grantee. Grantee agrees to maintain adequate financial records consistent with generally accepted accounting practices, and to retain such records for at least five years after the conclusion of the Grant Period. Grantor staff and trustees may review Grantee's data, records, or materials relating to the administration and performance of a grant at any time on five (5) business days notice. Grantee will not be required to produce data, records, or materials that would be confidential information under the attorney-client privilege or work product doctrine.
11. TERMINATION. Grantor has the right to terminate the Grant Agreement, after 30 days written notice to cure, if it determines that any of the following events has occurred:
 - a. such funds have not been or will not be expended reasonably or prudently for the purposes specified in the Grant Agreement;
 - b. Grantee has violated any federal, state, or local law or regulation;
 - c. Grantee has failed to fully comply with these Grant Terms and Conditions and the Grant Agreement, including an unapproved deviation from the Grant Proposal; or
 - d. Grantor has insufficient funds available for distribution.

In the event the Grant Agreement is terminated under clauses (a), (b) or (c) of this Section 11, Grantor reserves the right to require Grantee to refund any and all grant funds awarded to Grantee under the Grant Agreement, and Grantee agrees to refund Grantor all such funds upon request.

12. UNUSED FUNDS. At the conclusion of the Grant Period, Grantee agrees to return any unexpended or unaccounted for funds to Grantor, or to submit a written request for an extension of the Grant Period. Grantee agrees to return all disbursed funds (1) if grant funds have not been used for their intended purpose, or (2) if grant funds have been used inconsistently with the terms of the Grant Agreement or these Grant Terms and Conditions, or (3) if the activities or outputs

set forth in the Grant Proposal are materially incomplete by the end of the Grant Period, as determined by Grantor in its sole discretion.

13. NO LOBBYING. Grantee confirms that the grant funds will not be used for the purposes of lobbying, carrying on propaganda, or otherwise attempting to influence legislation. If Grantee is in doubt about whether its proposed activities may constitute lobbying, Grantee must consult with Grantor prior to undertaking them.
14. LIABILITY INSURANCE. Grantee shall maintain commercial liability insurance that protects Grantee and its officers, agents, and employees from any and all claims, demands, actions, and suits for damage to property or personal injury, including death, arising from Grantee's work under the Grant Agreement. The insurance shall provide coverage for not less than \$2,000,000 per occurrence. If the insurance is canceled or terminated prior to completion of the Grant Agreement, Grantee shall provide a new policy with the same terms. Grantee agrees to maintain continuous, uninterrupted coverage for the Grant Period. The insurance shall include coverage for any damages or injuries arising out of the use of automobiles or other motor vehicles by Grantee.
15. USE OF NAME. The Parties shall acquire prior written consent from each other for any use of their name or logo in association with its project or the grant.
16. PUBLICITY. Grantee will notify Grantor of any publications or other materials resulting from the grant no later than five (5) days in advance of distribution or publication. Grantee will acknowledge Grantor's support in the beginning of any publication (including film and electronic publications) referring to or resulting from this grant, as follows: "Supported [in part] by a grant from TransAlta Centralia Generation LLC." Grantee agrees that Grantor may include information about Grantee and its activities in its own annual reports and may distribute such information to third parties upon receipt of Grantee's written approval. Such approval will not be unreasonably withheld.
17. FUTURE FUNDING. This grant of funds implies no agreement of any kind by Grantor to grant additional or future funds to Grantee.
18. NO GRANTOR RESPONSIBILITY FOR GRANTEE OBLIGATIONS. Nothing in the Grant Agreement shall be deemed to authorize Grantee to enter into any contract, lease, or other agreement on behalf of Grantor. All obligations undertaken by Grantee pursuant to the Grant Agreement shall be on its own behalf. Grantor shall have no responsibility to third parties in connection with the Grant Agreement.
19. INDEMNITY. Grantee shall and hereby does indemnify and hold Grantor, TransAlta Centralia Generation LLC, their affiliates, and their respective employees, officers, agents and representatives (together, the "Indemnitees") free and harmless from

liability from any and all suits, claims, demands, losses, damages, actions or judgments of every kind and description (including attorneys' fees and other costs of defense) arising out of the funds granted hereunder, including Grantee's use or administration of the funds, or suffered by the Indemnitees, directly or indirectly, on account of actions or omissions by Grantee in the performance of its obligations hereunder or otherwise.

20. LIMITATION OF LIABILITY. IN NO EVENT SHALL GRANTOR BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR EXPENSES FOR ANY NEGLIGENCE, BREACH OF CONTRACT, OR ANY OTHER ACT ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE ACTIVITIES COVERED HEREIN.
21. AMENDMENTS; WAIVERS. Amendments to the Grant Agreement must be in writing and signed by both parties. No waiver by either party or any breach, default, or series of breaches or defaults, and no failure, refusal, or neglect of either party to exercise any right, power, or option given to it under the Grant Agreement or to insist upon strict compliance with the terms of the Grant Agreement shall constitute a waiver of these provisions with respect to any subsequent breach or waiver by either party or its right at any time thereafter to require exact and strict compliance with provisions of the Grant Agreement.
22. NO ASSIGNMENT. Grantee may not assign the Grant Agreement or delegate performance of the terms of the Grant Agreement or of the project to any other person or entity without Grantor's prior written consent.

EXHIBIT D

FORMS OF GRANTEE REPORTS

As prepared by Grantee and accepted by Grantor. The narrative report due by March 31, 2020 shall provide Grantor with an update on the project, if not already submitted.

EXHIBIT E

SPECIAL CONDITIONS AND AGREEMENTS

Does not apply.

Cover Memo: NWSA Shore Power Program

Background

Use of shore power is a growing trend in the Pacific Rim. Policy has been enacted in California that requires 80% of qualifying container ship fleets (i.e. fleets that visit California ports greater than 25 times in a calendar year) to use shore power. Port of Vancouver B.C. has installed shore power at two of its container terminals and infrastructure and incentive programs have been put in place in many ports in China. About 51% of container vessels currently calling at NWSA's major international container terminals are shore power capable.

There may also be a competitive advantage to be gained by the NWSA and its customers during implementation of the IMO's low sulfur fuel regulations to be enacted in 2020. There is significant uncertainty surrounding distillate fuel prices, which is likely to affect the price of fuel burned by vessels when they are in Port. There is also growing momentum to regulate exhaust scrubbers that would allow compliance with the regulation without using cleaner fuels. Providing cheap energy and cost certainty through shore power could lower operational costs for vessels if fuel prices rise and scrubbers are not allowed or not widely implemented.

The NWSA has committed to reducing its scope 3 GHG Emissions by 50% by 2030 and by 80% by 2050 through the GHG Resolution enacted by the elected Commission in 2017. In addition, the Northwest Ports Clean Air Strategy will be updated by the end of 2019, setting new air pollutant and GHG emission reduction goals and programmatic direction for the NWSA, Port of Seattle, Port of Tacoma, and Port of Vancouver B.C. Shore power is an effective way to reduce emissions from ocean-going vessels, a sector that has been very difficult for ports to influence.

NWSA Shore Power Program



1. DEFINITIONS

Terms & Acronyms

Shore Power – Provision of electricity to a vessel at berth, allowing it to turn off its auxiliary engines.

Terminal Operator – Port tenant or other entity who hires labor to perform vessel docking and cargo handling activities.

Vessel Operator – Captain and/or crew on board each vessel

Shore power capable – Ships that have infrastructure and equipment on board that allows them to use auxiliary power from a shore side system.

Shore power ready – terminals that have conduit and vaults installed for shore power, but would need wiring, vessel connection boxes, and other infrastructure to be installed before being capable of providing electricity to ships

Major international container terminals - Terminal 5, Terminal 18, Terminal 30, Husky Terminal, Pierce County Terminal, and Washington United Terminal. This definition may change as facilities and lines of business shift.

NWSA – Northwest Seaport Alliance: Joint Marine Cargo Operating Partnership between Port of Seattle and Port of Tacoma

POT – Port of Tacoma

GHG – Greenhouse Gas

Homeport - Two Ports forming the NWSA, Port of Seattle and Port of Tacoma

Air Quality Team – Group of NWSA employees within the Environmental Department that manage air quality related projects

2. PURPOSE

Background

Through the Northwest Ports Clean Air Strategy and the NWSA and homeport GHG Resolutions, the NWSA has made substantial commitments to reduce air pollutant and GHG emissions. Shore power is a technology that has been robustly demonstrated, reduces emissions substantially, and is a key component of the NWSA meeting the commitments made under these policies.

Shore power is preferable to other methods of emission reductions, i.e. on-board scrubbers or external exhaust capture and treatment systems, because emissions from the auxiliary power generation on the ship are zero, including GHG emissions.

Goals

Emission Reductions: Reduce air quality impacts and Greenhouse gas emissions consistent with NWSA's environmental stewardship commitments to responsible, sustainable growth that protects public health and the environment as well as the Northwest Ports Clean Air Strategy and the NWSA GHG Resolution.

Efficiency: Reduce fuel use and operating costs for NWSA's commercial partners. Using Washington's green and inexpensive energy, it may cost less for vessels to use shore power than burn onboard fuel.

Consistency with Other Major West Coast Ports: Ensure that NWSA offers a modern suite of facilities for its customers, consistent with other regional competitors. Shore power is mandatory for container vessels in California and available on a voluntary basis at the Port of Vancouver B.C and the Port of Prince Rupert.

3. SCOPE

Audience This program applies to the NWSA, terminal operators and vessel operators who manage vessel docking and operation while at berth at NWSA’s major international container terminals.

Activities The Shore Power Program includes the installation of infrastructure and equipment at NWSA’s major container terminals to provide shore power to ships, collaboration with utilities to develop rates and billing structures, and implementation of shore power at the terminals.

4. PREREQUISITES/RESOURCES/FORMS/LINKS

- Required Processes and procedures**
- Vessel Commissioning Procedure [*to be developed with first installation*]
 - Shore Power Vessel Berthing Best Management Practices [*to be developed with first installation*]
 - Shore Power Ship to Shore Connection Procedure [*to be developed with first installation*]
-

5. RESPONSIBILITIES

Responsible Parties **Terminal operators** will be responsible for executing the ship to shore electrical connections for ships that choose to use shore power, billing vessels for electricity used while at berth, and reporting the number of hours that each vessel call uses shore power.

Vessel operators will likely be responsible for paying commissioning costs and following best management practices to ensure that the vessel is positioned properly to use shore power.

The NWSA will be responsible for coordinating the funding and construction of shore power infrastructure and working with the utilities to develop electricity rate structures for shore power.

6. PROCEDURE

Step by Step Actions

Planning

The NWSA's Air Quality Team will work with the engineering team of the home ports to assess the upgrades necessary for shore power at each major international container terminals, and the associated costs. The Air Quality Team will assess the vessel fleet to determine how many shore power capable vessel calls occur at each terminal and quantify the potential emission benefits possible if vessels were to use shore power. Shore power installations will be prioritized based on the business priorities of the port, emission reductions, cost, and operational considerations. The Air Quality Team will facilitate continuous update of these priorities over time in the form of recommendations to executive and elected leadership.

Coordinate with Utilities

NWSA will coordinate with utilities to set up rate structures for electricity that will provide cost savings for vessels when compared with burning fuel onboard for auxiliary power. Lower energy costs can help incentivize use. In addition, the NWSA will facilitate billing procedures between the utility, terminal operator, and ocean carriers.

Design

Port development, redevelopment, and/or property acquisitions may present the opportunity to add to the Port's electrical infrastructure and increase the Port's shore power capability. As terminals are redeveloped, i.e. significant repair or replacement of wharfs or backlands between the existing electrical switch gear and the vessel berth, the designs will include infrastructure required to make terminals "shore power ready" at a minimum and will consider installation of all shore power infrastructure. Making a terminal shore power ready means installing conduit, vaults, and transformer pads to support shore power equipment. Installing these elements while the terminal is already under construction will minimize costs of retrofitting these elements. Exceptions may be granted if installation of these elements is impracticable or if the use of the terminal is expected to change within the next 10 years.

Construct Infrastructure

NWSA coordinates infrastructure investments at its major container terminals that allow ships to use shore power. Grant funding is pursued to help pay for these investments. Terminals are prioritized for shore power installations based on the port's business strategy, expected shore power capable vessel traffic, willingness of

terminal operators to implement the program, and cost to install infrastructure. Terminals that have been made shore power ready in previous redevelopment projects or are planned for redevelopment may be the most cost-effective locations for shore power installations and should be prioritized accordingly. Shore power installations will meet ISO standard 8005-1:2012 to ensure compatibility with the international vessel fleet.

Operations

As a landlord port, the NWSA has many stevedoring tenants who will be responsible for implementing shore power. Shore power requires additional labor, vessel commissioning, and administration that all add cost and complexity for the stevedore. In order to apply a common policy for all terminals and avoid putting any stevedore at a competitive disadvantage, the Port's shore power policy allows for voluntary, but encouraged and supported, adoption until all terminals have the capability to supply shore power.

The program will be implemented in two phases.

Phase 1: Voluntary implementation

The first phase of the shore power program aims to facilitate the installation of shore power at NWSA's major container terminals and develop the knowledge and expertise for the terminal operators and NWSA to implement shore power progressively more effectively, efficiently, and comprehensively. Because using shore power adds operational and administrative complexity, implementation will be voluntary initially, to avoid putting any terminal operator at a competitive disadvantage. It is expected that voluntary implementation will end when all major container terminals have been outfitted with shore side infrastructure.

Phase 2: Mandatory Implementation

After all major international container terminals are equipped with shore power, NWSA will begin phasing in requirements for shore power capable vessels not deemed exempt (exemptions described below) to connect.

Implementation: Phase 1

At terminals equipped to provide shore power, terminal operators will make shore power available to vessels. Initially shore power use is voluntary but encouraged and supported by NWSA. Once all terminals are equipped with shore power capability, shore power capable ships will be required to utilize shore power (phase 2). For each vessel call, the Terminal Operator will:

- A. Coordinate with incoming vessels to determine if shore power is desired.
- B. Contact the utility to schedule the power use, communicating estimated time of arrival and departure, if shore power is desired.
- C. Follow best management practices to ensure the vessel is positioned properly in relation to the shore power connection.
- D. Contact NWSA to commission the vessel if it is a vessel’s first time using shore power at a terminal, in accordance with the Shore Power Commissioning Procedure.
- E. Coordinate all labor required to connect and disconnect the vessel to shore side power.
- F. Bill the vessel for the power used, if applicable.
- G. Report to NWSA the number of hours connected to shore power for each vessel call on a monthly basis.

For each ship call, the NWSA will:

- A. Facilitate vessel commissioning
- B. Facilitate information sharing to develop and continually update vessel berthing best management practices, ship to shore connection procedures, and vessel commissioning procedures.

Implementation: Phase 2

Once all major container terminals have shore power capability and/or as dictated by a lease, NWSA will begin phasing in requirements for vessels with shore power capability to utilize shore power infrastructure. After the 5th year of phase 2 all nonexempt vessel calls will be required to use shore power. The following table indicates the fraction of non-exempt shore power capable calls that must use shore power.

Program Year	Percentage of Capable Vessels that Must Use Shore Power
1-3	50%
4-5	70%
6+	100%

See above for roles and responsibilities of the Terminal Operator and NWSA.

Exemptions from Usage Requirements: If a vessel does not participate in regular service to NWSA terminals, the commissioning effort and cost may make shore power use impractical. In cases where an individual shore power capable vessel is expected to call less than once in a calendar year and hasn't been previously commissioned and/or is part of a fleet whose operator calls NWSA terminals in total less than 20 times in a calendar year, the vessel will be exempt from the usage requirement. NWSA reserves the right to grant additional exceptions for extenuating circumstances.

Evolution

The NWSA will continuously evaluate this program to ensure substantial progress towards environmental goals, compliance with regulations, best utilization of technology, and alignment with business priorities. NWSA reserves the right to modify this program as needed to meet its environmental and business goals.

7. REFERENCES

Policies, RCWs & Standards

- Northwest Ports Clean Air Strategy
- NWSA GHG resolution
- ISO/IEC/IEEE 80005-1:2012(E)



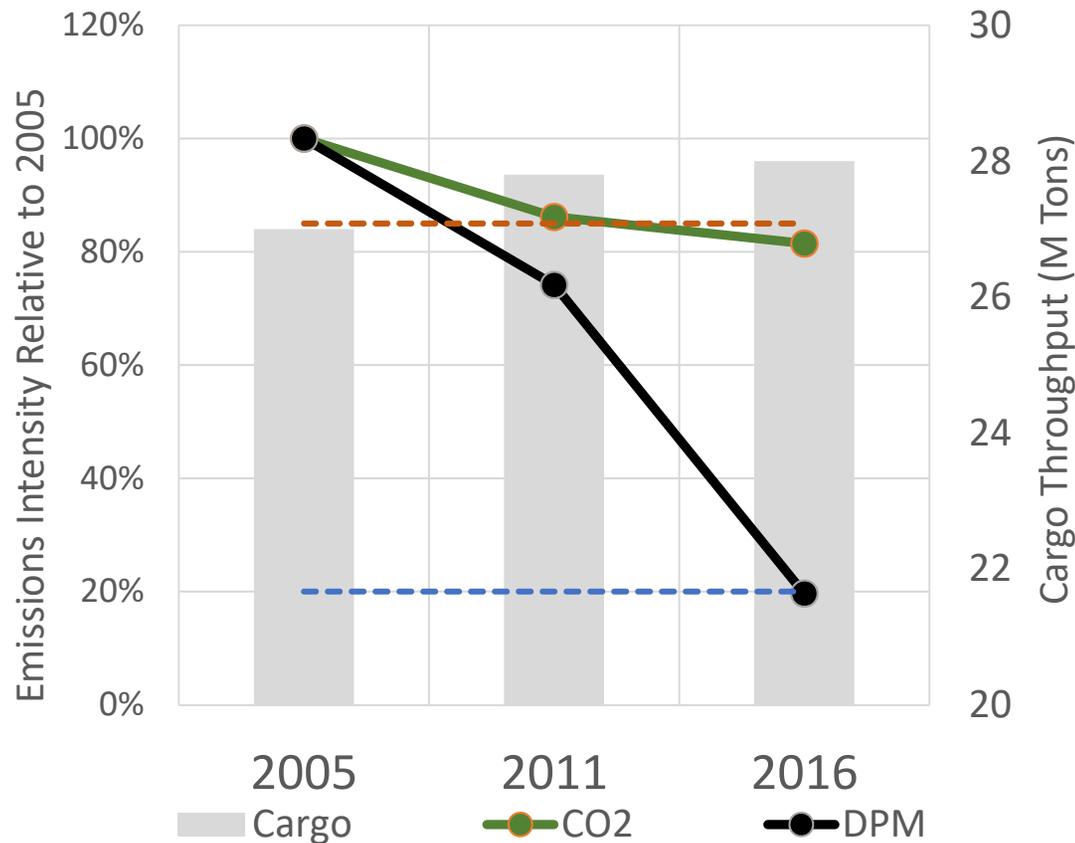
Item No: 5B_supp
Date of Meeting: January 14, 2020

Authorization to Accept TransAlta Grant for Shore Power at Husky Terminal

Presenter: Graham VanderSchelden
Title: Environmental Project Manager II

Background: Emissions

Progress Towards 2020 NWPCAS Targets



2017 GHG Resolution

By 2030:

- Reduce emissions by 50% relative to 2005 (scopes 1, 2, and 3)

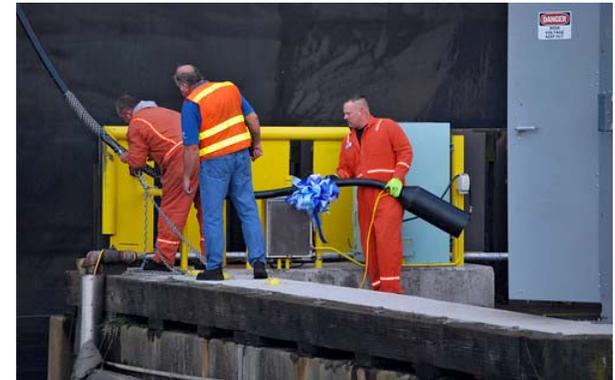
By 2050:

- Reduce scope 3 emissions by 80% relative to 2005
- Scopes 1 and 2 carbon neutral

Background: Shore Power

Ships are increasingly shore power capable

- 50% of calls at major international terminals
- 57% of calls at Husky



Significant potential to reduce emissions

- In 2018, potential to avoid 13,790 tons of GHGs, 4.7 tons DPM
- At Husky, potential to avoid 3,163 tons of GHGs, 1.1 tons DPM

Best opportunity for significant emission reduction project today

- We have control over infrastructure
- Broadly, ZE trucks and CHE are still being developed and demonstrated for port applications

WH1

Shore Power Gateway-Wide Plan

	T-5	Husky	T-18	WUT	Evergreen	South Harbor Substation**	Total Cost	Cost with 50% Grant Funding	
2020	Construction	Design					\$3.4 M*	\$1.0 M	
2021		Construction							
2022									
2023	Operational	Operational	Design				\$2.4 M	\$1.2 M	
2024			Construction				\$2.5 M	\$1.3 M	
2025								\$2.7 M	\$1.3 M
2026						Design		\$2.9 M	\$1.5 M
2027						Construction		\$7.6 M**	\$3.8 M**
2028					Operational	Design	Design/ Construction		
2029						Operational	Construction	\$6.8 M**	\$3.4 M**
2030							Operational	\$2.2 M	\$1.1 M
2031+							Operational	\$1.2 M	\$0.6 M
								Total:	\$38.6 M

* T-5 is included in the total cost through 2022, but is fully grant funded

** Assumes \$7.5 million in 2020 dollars needed for a new substation. Energy planning will inform this potential investment.

Sources of Funding

DERA Grant [Accepted 11/2019]

- \$1 million for the Husky Project

TransAlta Energy Technology Grant [This Request]

- Offer of \$1 million to support the Husky project

Department of Ecology Existing Clean Truck Fund Grant

- \$1.1 million remaining in grant from Ecology for Clean Truck Fund
- 2020 Legislative Session, working to re-appropriate to Husky project

VW Settlement Funding [could fund future projects]

- Up to ~ \$50 million for marine vessels to be distributed by 2028
- NWSA responded to an RFI from Ecology in September



Husky Shore Power – Project Summary

	T3	T4	Total
Ship Connection Boxes	\$101,750	\$101,750	\$203,500
6.6 kV transformers	\$85,000	\$85,000	\$170,000
Switchgear, circuit breakers, and wiring	\$165,000	\$165,000	\$330,000
SS Switch Houses	\$300,000	\$300,000	\$600,000
Wharf Modifications	\$35,000	\$0	\$35,000
Conduit and trenching work	\$105,000	\$105,000	\$210,000
Inspection, Testing, Permitting	\$14,000	\$14,000	\$28,000
TPU Metering Upgrades	\$50,000	\$50,000	\$100,000
Materials/Labor Sub-Total	\$855,750	\$820,750	\$1,676,500
Contractor OH and P (25%)	\$213,938	\$205,188	\$419,126
Sub-Total	\$1,069,688	\$1,025,938	\$2,095,626
Construction Contingency (75%)	\$802,266	\$769,453	\$1,571,719
Construction Sub-Total	\$1,871,954	\$1,795,391	\$3,667,345
General Conditions (7.25%)	\$135,717	\$130,166	\$265,883
Sales Tax (10.2%)	\$190,939	\$183,130	\$374,069
Construction Total	\$2,198,610	\$2,108,687	\$4,307,297
Design (10%)	\$219,861	\$210,869	\$430,730
Engineering Staff (design [5%] and construction [10%], 15%)	\$329,791	\$316,303	\$646,094
Air Quality Staff	-	-	\$47,000
Total Fully Burdened	\$2,748,262	\$2,635,859	\$5,431,121



Project Schedule/Next Steps

Date	Task/Milestone
January 2020	Executive authorization for up to \$300,000 for design
January 2020	Begin procurement of design consultant
Q1 – Q3 2020	Design
Q1 – Q3 2020	Request project authorization
Q3 2020	Begin procurement of construction contractor
Q4 2020	Award contract, begin project implementation
Q4 2022	Project completion

* Updates will be provided to EPA via quarterly reports and TransAlta through annual reports

Request TransAlta Grant Acceptance

Request Managing Members of The Northwest Seaport Alliance (NWSA) authorization to accept grant funds in the amount of \$1 million from the TransAlta Centralia Coal Transition Grant Program Energy Technology Fund, to support installation of shore power at Husky Terminal, project number 2020-19.

