Shore Power at Canada Place
Canada Port Authority Mandate and Role

- Facilitate Canada’s trade
- Protect the environment
- Consider local communities
- Operate safely
- Be commercially viable
- Invest revenue back into the gateway

Work for the benefit of all Canadians
Most diversified port in North America

trade with

170+ economies

142 million tonnes of cargo annually
Port Jurisdiction

- +300km of shoreline
- Five business sectors
- 16 Municipalities and one Treaty First Nation
- 27 Major marine terminals
- 3 Class 1 railways
Our Mission and Vision

- To enable Canada’s trade objectives, ensuring safety, environmental protection and consideration for local communities.
Ensuring a Healthy Environment

- Project and Environmental Review
- Internationally recognized ECHO Program to reduce effects of underwater noise on whales
- Fee discounts and awards for environmental responsibility
- Shore power for cruise ships and container ships
- International collaboration on ship environmental programs
- Facilitating the use of LNG as a marine fuel
- Container trucking strategy
- Habitat enhancement
Enhancing Cetacean Habitat and Observation (ECHO) Program

• ECHO is a collaboration of industry, NGO’s, governments, scientists to understand and reduce acoustic impacts of commercial vessel activities

• Incentives available for shipping lines through Harbour Dues for quiet vessel qualifications

• 50+ participants during two-month voluntary vessel slowdown trial from Aug. 7 to Oct. 6:
  • Total vessel participation rate: 61%

Photo credit: Joan Lopez
Vancouver’s Cruise Business is Growing

- Homeport for the Vancouver-Alaska Cruise: May to September
- 2018: 889,162 passengers on 241 calls
- 2019: 1,077,000 F passengers on 290 calls
- 2020: 1,200,000 F passengers on 314 calls
- Nearly 50% of all calls are shore power enabled in 2019!
Port of Vancouver Itineraries

EXPERIENCE CANADA'S INSIDE PASSAGE AND SPEND MORE TIME IN ALASKA.

Roundtrip Itinerary
One-Way Itinerary
Land Tour
Economic Benefits of Vancouver’s Cruise Business

$ 3 million of direct economic benefit per homeported call

Direct Spending
$810 M

Total Jobs
(Direct & Indirect)
12,000

Total Wages
(Direct & Indirect)
$549 M

Total GDP
(Direct & Indirect)
$840 M

TOTAL
$1.6B
Direct & Indirect Economic Impact
Canada Place Shore Power: Collaborative Investment

Government of Canada

BRITISH COLUMBIA
The Best Place on Earth

PRINCESS CRUISES
escape completely

Holland America Line
A Signature of Excellence

Disney Cruise Line

PORT of Vancouver
Project Summary

• In 2009, it became the third cruise ship shore power installation in the world and most technically advanced at time of installation

• In 2013, additional shore power connection was installed on West berth

• Can supply two ships simultaneously @ up to 14MW per ship; dual voltage transformers supply power to 11kV or 6.6kV class ships

• Clean energy!
### 20,757 MT of GHG Emissions Reduced Since 2009!

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</thead>
<tbody>
<tr>
<td>Successful Connections</td>
<td>11</td>
<td>44</td>
<td>35</td>
<td>60</td>
<td>82</td>
<td>76</td>
<td>77</td>
<td>54</td>
<td>54</td>
<td>62</td>
</tr>
<tr>
<td>Calls capable of connecting</td>
<td>58</td>
<td>58*</td>
<td>74</td>
<td>106</td>
<td>98</td>
<td>92</td>
<td>70</td>
<td>68</td>
<td>68</td>
<td>91</td>
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<tr>
<td>Electricity consumed (MWh)</td>
<td>353</td>
<td>2,024</td>
<td>1,762</td>
<td>2,960</td>
<td>3,975</td>
<td>3,545</td>
<td>3,572</td>
<td>2,766</td>
<td>2,865</td>
<td>3,048</td>
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<td>Net GHG emissions reduction (tonnes)</td>
<td>289</td>
<td>1,521</td>
<td>1,318</td>
<td>2,266</td>
<td>3,092</td>
<td>2,656</td>
<td>2,811</td>
<td>2,185</td>
<td>2,126</td>
<td>2,493</td>
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<td>CACs reduced (tonnes)</td>
<td>7</td>
<td>54</td>
<td>47</td>
<td>80</td>
<td>91</td>
<td>78</td>
<td>66</td>
<td>51</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Fuel Savings (tonnes)</td>
<td>93</td>
<td>476</td>
<td>424</td>
<td>725</td>
<td>978</td>
<td>841</td>
<td>885</td>
<td>689</td>
<td>671</td>
<td>785</td>
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* The 20 Calls in 2011 by Disney Wonder were not included as the configuration did not allow them to connect to the equipment. In 2013 they were able to connect due to installation of additional jib on West berth.*
2019 Weekly Cruise Schedule: 139 shore power calls

<table>
<thead>
<tr>
<th>Berth</th>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
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<tbody>
<tr>
<td>CP West</td>
<td>Noordam (13 calls)</td>
<td>Disney Wonder (19 calls)</td>
<td>Volendam (21 calls)</td>
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<td>Nieuw Amsterdam (22 calls)</td>
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<td></td>
<td>Westerdam (12 calls)</td>
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<tr>
<td>CP East</td>
<td>Celebrity Eclipse (22 calls)</td>
<td>Norwegian Jewel (13 calls)</td>
<td>Coral Princess (12 calls)</td>
<td>Island Princess (12 calls)</td>
<td>Radiance of the Seas (10 calls)</td>
<td>Golden Princess (13 calls)</td>
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<tr>
<td>CP North</td>
<td></td>
<td>Crystal Symphony (10 calls)</td>
<td>Seven Seas Mariner (10 calls)</td>
<td>Silver Muse (8 calls)</td>
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</table>

**Various Days:** Amsterdam (2), Asuka II (1), Carnival Legend (3), Celebrity Solstice (2), Emerald Princess (2), Eurodam (3), Grand Princess (2), L'Austral (1), Le Soleal (4), Maasdam (2), Norwegian Bliss (2), Oosterdam (2), Regatta (4), Ruby Princess (2), Seabourn Sojourn (8), Silver Explorer (1), Star Princess (4), Sun Princess (1), Windstar Legend (7)

**New Vessels Various Days:** Azamara Quest (5), Norwegian Joy (2), Ovation of the Seas (2), Queen Elizabeth (5), Roald Amundsen (1), Viking Orion (5)

**Forecast:** 290 calls and 1,064,880 passengers (F)

**New in 2019**

**Shore Power Equipped**
Challenges and Lessons Learned

- Development and regulatory approval of a commercially viable interruptible electricity rate
- Change in delivery date of the transformers and design changes to the jibs
- ILWU – BCMEA Work Jurisdiction Arbitration
- Flexibility in designing jib locations to maximize connections
- Contracts and agreements (funding, development, operating and maintenance, third party usage, construction management and procurement, end-user agreements, etc.)
Criteria For A Successful Project

- Availability of adequate supply of electricity at a reasonable cost
- Frequency of calls of cruise vessels equipped to connect to shore power
- Availability of same dock and pier facility for these vessels for every call
- Adequate dock and upland space for the equipment
- Willing partners: utility company, port, government agencies and....cruise lines!

Source: Tom Dow, Carnival Corp.
portvancouver.com/cruise