



PORT METRO  
**vancouver**

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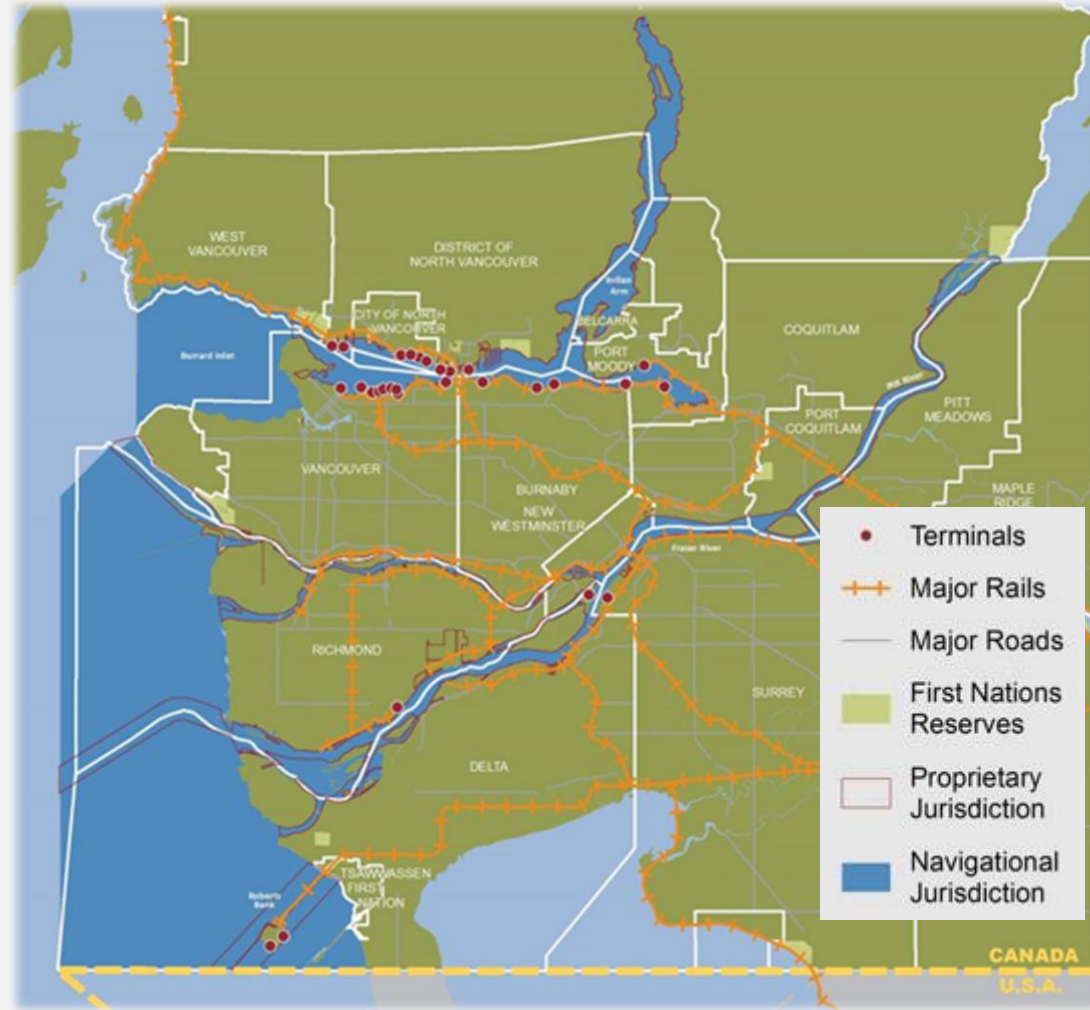
The background of the slide is a photograph of a large cruise ship, likely a Costa Concordia, sailing on a body of water. The ship is white with a dark hull and is moving towards the left. In the background, a city skyline with various skyscrapers is visible under a blue sky with some clouds. A dark red rectangular box is overlaid on the right side of the image, containing the title text.

## Overview of PMV Latest Emissions and Energy Conservation Initiatives

EMA of BC – Energy Management & Conservation  
October 15, 2015

# PMV Overview

- **Largest port in Canada**
- **Most diversified and 4th largest in North America**
- **140 million tonnes of cargo**
- **20% of Canada's goods in trade**



# Northwest Ports Clean Air Strategy Approach & Targets

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- **Relative to 2005 baseline:**
  - Reduce diesel particulate matter (DPM) emissions per ton of cargo by 75% by 2015 and 80% by 2020, to decrease immediate and long-term health effects on adjacent communities.
  - Reduce greenhouse gas (GHG) emissions per ton of cargo by 10% by 2015 and 15% by 2020, to limit contributions to climate change and reduce associated environmental, health, and economic impacts.

# Addressing Marine Emissions

## Shore Power

- Offer shore power facilities at the Canada Place Cruise Terminal.
- Since 2009, reduced 11,056 tonnes of greenhouse gases (CO<sub>2</sub>e)
- In 2014, reduced 78 tonnes of criteria air contaminants and 2,656 tonnes CO<sub>2</sub>e.

## EcoAction

- Discounted Harbour Due Rates to vessels that have implemented emission reduction measures and other environmental practices



# Non Road Diesel Emissions Initiative

**PMV has initiated a program to reduce diesel particulate matter (DPM) from non-road equipment operating on port lands.**

- The NRDE initiative will reduce DPM emissions by:
  - Phasing out high-emitting equipment
  - Advancing idle reduction
  - Promoting innovative clean technologies



# NRDE Program Effective January 1, 2015



- Fees for T0/T1 engines (>25 HP) applicable January 1, 2015
- Report fleet data to PMV annually (age, HP, hours)
- Annual fees paid for T0 and T1 engines in Q1 2016
- 80% fees returned when engine retrofitted/replaced with verified technologies





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## Energy Action Initiative



Our Gateway is growing to meet Canada's future trade demand – more energy will be needed

# Port Energy - What's at Stake?

Port-related industries account for a large proportion of the industrial energy consumed in the Vancouver area

Major tenants - PMV Classification	# Sites /Accounts	Electrical Consumption (Total GWh/y)	Terminals
<b>Major terminals</b>	6	<b>99</b>	GCT (Deltaport & Vanterm); Westshore; DP World; FSD; Western Stevedoring
<b>Medium Terminals</b>	8	<b>144</b>	Neptune; Viterra (Cascadia & Pacific); Alliance; Richardson; Cargill; PCT; WCR;
<b>Minor terminals</b>	7	<b>51</b>	Kinder Morgan Van. Wharves; Fibreco; Lantic (Rogers Sugar); Suncor – Burrard Terminal); Chevron; Imperial Oil (Ioco); Shell;
<b>Main tenants</b>	6	<b>195</b>	Lafarge cement; Lehigh cement; Howe Sound P&P Chip Plant; Seaspan (Ferries, Drydock and Shipyard); Vancouver Pile Driving
<b>TOTAL</b>	27	<b>489</b>	

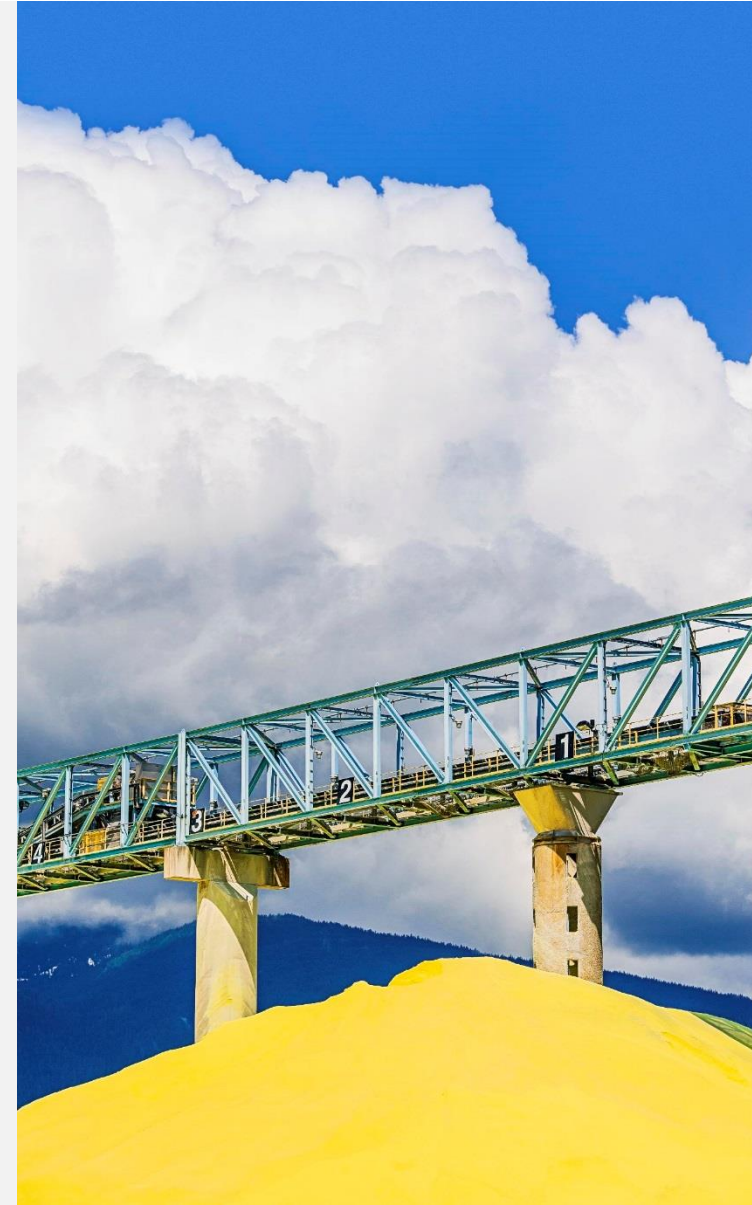
*Not included – electrochemical plants (Canexus and Erco)*

The total Port uses approximately **2,000 GWh/y** - more electrical energy than 200,000 single family houses!!!



# Why Energy Conservation at Ports?

- Energy efficient equipment, buildings, and operational practices are good business decisions that reduce costs and exposure to energy pricing
- Energy conservation culture can be a powerful driver of corporate responsibility that in turn helps advancing social acceptance to operate or grow
- Using less energy per tonne of cargo can create competitive advantage for Gateway



# PMV Energy Action Initiative

## PMV Strategic Energy Management Plan

- Port Metro Vancouver believes clean hydroelectric energy is an asset to our Gateway
- Launched in partnership with BC Hydro in 2013
- PMV created position of Energy Manager (member of BC Industrial Energy Managers Group)



Dorota Kwasnik, P.Eng, MSc, CEM

- Energy Manager, Port Metro Vancouver
- Chemical (Process) Engineer
- 15 years – Industrial Manufacturing
- Professional Engineer
- Certified Energy Manager

# PMV Energy Action Initiative

- Potential for saving energy within the Port jurisdiction is considerable
- Port-based companies receive consulting and financial (utility) support to:
  - Implement energy-saving measures
  - Install energy measurement and control strategy
  - Introduce Energy Management Systems



## How Do We Help?

- Facilitate exchange of tenant experiences and knowledge, e.g. workshops, training sessions, resources portal
- Perform energy assessments and facilitate energy studies
- Assist tenants in to development of business case for energy conservation measures (e.g. life cycle cost analysis of a project)
- Support applications for financial incentives from BC Hydro





# Business Case for Energy Conservation

- Can you afford not to invest in energy conservation?  
E.g. Quay crane lighting – Metal-Halide vs LED

Life Cycle Cost	
Life Cycle Cost	\$117,514
Initial Cost	\$10,822
Energy Cost	\$73,381
Annual Energy Use (kWh)	143,654
Annual Operating Cost	\$13,508
Annual Operation Savings	—
Simple Payback (years)	—
Discounted Payback (years)	—
Life Cycle Return On Investment	—
Net Present Value	—
Internal Rate Return	—
Life Cycle Cost Details - 20 years	

Life Cycle Cost	
Life Cycle Cost	\$61,000
Initial Cost	\$42,533
Energy Cost	\$18,467
Annual Energy Use (kWh)	36,152
Annual Operating Cost	\$2,169
Annual Operation Savings	\$11,338
Simple Payback (years)	3.24
Discounted Payback (years)	4.78
Life Cycle Return On Investment	132.9 %
Net Present Value	\$56,514
Internal Rate Return	29.1 %
Life Cycle Cost Details - 20 years	

## Project data

### Existing system

Demand (kW)	Energy (kWh)
41.0	143,640

### Proposed system

10.3	36,148
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### Projected savings

Demand (kW)		Energy (kWh)	
Site	BC Hydro Peak	Site	Potentially incentiveable
30.7	-	107,492	107,492

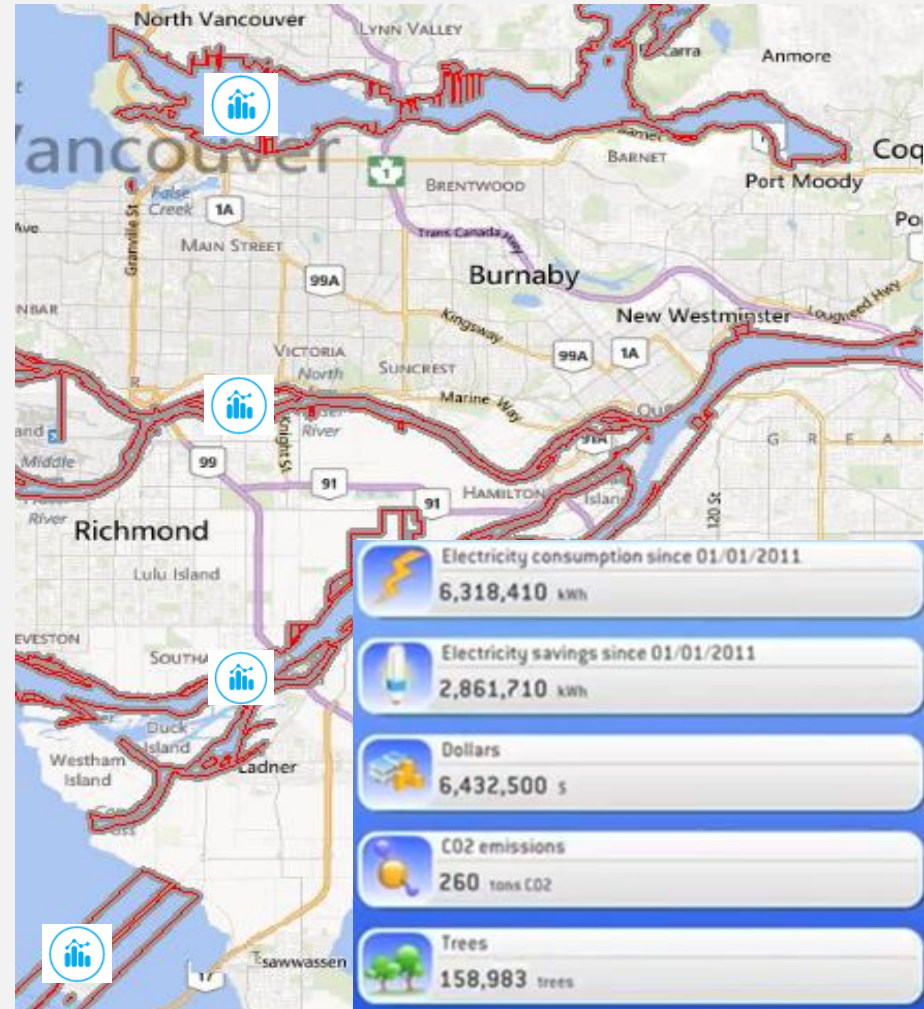
- Utility Incentives of \$30K covered total product cost. Terminal operators provided installation.



# Gateway Energy Monitoring System

You can only manage what you can measure!

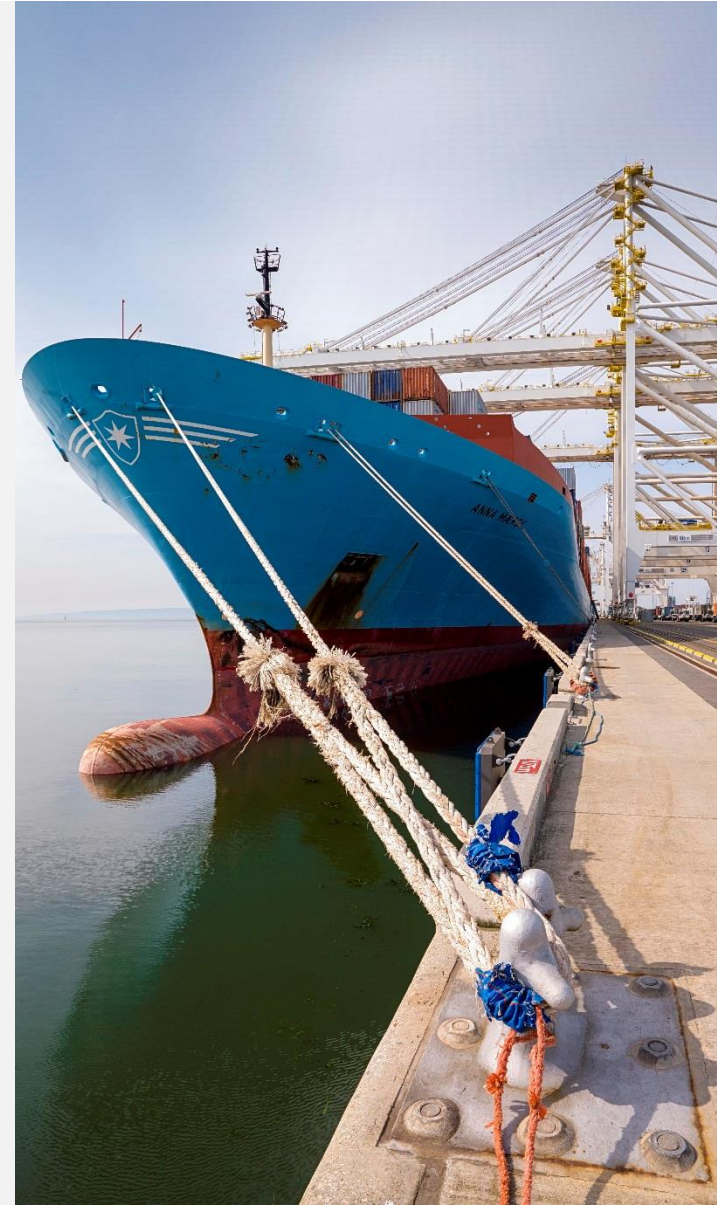
- Connecting all PMV and available tenant electricity consumption data into the **Gateway Power Monitoring Expert**
- Benchmarking
- Improvement targets
- Report on sector specific and overall Gateway performance



# Energy Conservation in Project Permit Application

## Energy efficiency study included in Project and Environmental Review

- An assessment of how the proposed development (buildings, motorized equipment, and lights) will affect electrical energy consumption levels
- Include energy modeling, demonstrate consideration of BATNEC (Best Available Technology Not Entailing Excessive Cost) energy efficient equipment





Balancing economic, environmental  
and social performance

**We have a mandate to  
facilitate Canada's  
trade, to safeguard  
the environment and  
respond to local  
needs and interests.**

**Thank you!**



**Dorota Kwasnik**

Energy Manager

Environmental Strategic Initiatives

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