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Advancing the energy transition at the Port of Vancouver

Manish Soni, Industrial Energy Manager, VFPA

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Canada

Port of Vancouver

- 29 major marine cargo terminals
- 3000+ annual vessel calls
- 60+ off dock facilities
- 680 km of rail lines
- 1,560 km major truck routes
- 1600 licensed drayage trucks

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Northwest Ports Clean Air Strategy

NORTHWEST PORTS CLEAN AIR STRATEGY

A collaborative strategy launched in 2007 with Ports of Seattle and Tacoma to reduce port-related emissions in Georgia Basin - Puget Sound air-shed.

Vision

Phase out emissions from seaport-related activities by 2050, supporting cleaner air for our local communities and fulfilling our shared responsibility to help limit global temperature rise to 1.5°C.

PORT of vancouver | Port of Seattle | Port of Tacoma | THE NORTHWEST SEAPORT ALLIANCE

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Port's Growing Electricity Demand

Energy Action Initiative

- The port authority has partnered with BC Hydro to enable the Energy Action Initiative:
  - Connects port tenants and terminal operators with an *industrial energy manager* to help reduce energy consumption and make the switch from fossil fuel to electrical energy sources.

Energy conservation measures by port tenants have reduced over 16,000 MWh per year

Services include:

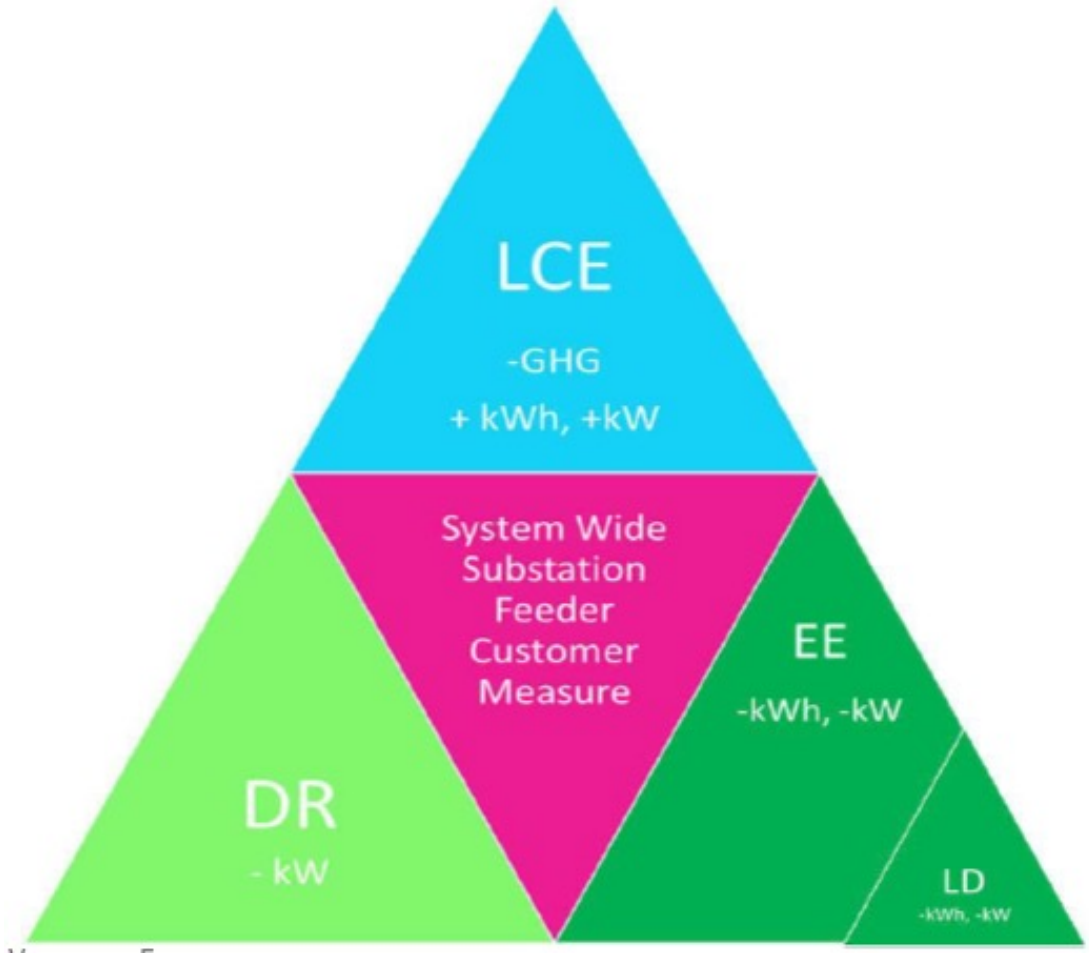
- Strategic guidance
- Energy management assessments
- Energy management studies
- Business case development
- Energy conservation and electrification project implementation guidance
- Financial incentives from BC Hydro (Study & Capital)
- Sharing on best practices

Energy Action Initiative - Incentive Categories

Audit
- Funding to identify energy conservation and electrification opportunities

Study
- Funding to investigate specific opportunities in detail

Project
- Funding to implement projects



Energy Action Initiative – Study & Capital Incentives Examples

Container Terminal High Mast Lighting Retrofit

- Incentive: ~41% of project cost
- Electricity consumption savings: 1,578 MWh

Warehouse Lighting Retrofit (2 projects)

- Incentive: ~61% of project cost and ~52% of project cost
- Electricity consumption savings: 507 MWh and 2,229 MWh

Integrated Energy Audit

- Incentive: 100% covered by BC Hydro

Compressed Air System Energy Efficiency Feasibility Study

- Incentive: 100% covered by BC Hydro

Compressed Air System Upgrade Project

- 2 new air compressors with variable frequency drive
- Incentive: ~36% of project cost
- Electricity consumption savings: 907 MWh

Over 16,000 MWh per year since start --> ~1600 detached homes

Energy Action Initiative – Blue Circle Award

- **Energy Management Assessment (EMA) Workshop:** Applicable to terminals using > 10 GWh electricity
- **Strategic Energy Management Plan:** plan outlining facility energy systems, roles/responsibilities, targets, actions, timelines etc.
- **Personnel Commitment:** establish clear roles and responsibilities for energy conservation
- **Energy Conservation Target:** Set appropriate targets for energy conservation.
- **Monitoring:** Monitor energy consumption and performance of energy conservation projects.
- **Recognition:** Recognize key personnel/ organizations that demonstrate leadership and achievements in energy conservation.

Energy Master Planning

The objective of energy master planning is to facilitate the timely provision of clean, competitive and reliable energy to support the transition to net zero emissions.

- Improved planning and coordination is needed to deliver the energy required to both grow port business and transition to zero emissions.

- Developing an area specific high-level estimate of port electricity demand for coordination with BC Hydro. Some of the electricity demand sources are:
  - Terminal expansion and developments
  - Partial electrification of cargo handling equipment and tugs
  - Select expansion of shore power facilities
  - Partial electrification of drayage trucking

What?

Where?

When?

Low Emission Technology Initiative

- Purpose: To facilitate the trial and adoption of low and zero emission technology in trucks, terminal locomotives and tractors, and vessels at the port
- Joint funding partnership between the port authority and Province of B.C. with a number of industry partners providing significant in-kind support
- Intended to accelerate transition away from fossil fuel-powered equipment by demonstrating effectiveness of low emission alternatives
- Improve awareness among the industry
- Document performance of technologies and operator experiences to grow support from industry, government, and local communities
- Generate insight into the infrastructure and policies needed to enable broader adoption

Low Emission Technology Initiative – Pilot Projects

- Pilot projects to date:
  - Battery electric-powered terminal trucks
  - 100% Biodiesel in container ferry
  - 100% Renewable diesel in terminal locomotive
  - 100% Renewable diesel in port authority patrol vessel
- Exploring other opportunities including battery-electric powered drayage trucks

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Low Emission Technology Initiative – Pilot Projects

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Hydrogen Pilots in Progress

- BCH2 Ports Project
  - First hydrogen drayage truck and terminal tractor project in Canada
  - 2 drayage trucks and 4 yard haulers
  - HTEC, Ballard Power Systems, Hexagon Purus, BCFerries and Port of Vancouver operators - Harbourlink and Tidewater

BCH2 Project (HTEC)

- Hydrogen fuel cell rubber-tired gantry (RTG) crane
  - First of its kind at the Port of Vancouver
  - POV operator - DP World

DP World Rubber-Tired Gantry Crane at The Port of Vancouver (CNW Group/TYCROP Manufacturing Ltd)

LNG as a marine fuel

- LNG is currently the only commercially viable and scalable alternative to oil-based marine fuels
- Significantly reduces air pollutants and can reduce GHG emissions by up to 27% w/ LNG from FortisBC Tilbury facility
- LNG fueled cruise ship (Silver Nova) due to be homeported in Vancouver this year
- Working with Harbour Master to undertake risk assessment and identify requirements to support LNG bunkering within the port

Thank you!

Manish Soni
Industrial Energy Manager, VFPA
Manish.Soni@portvancouver.com