Metro Vancouver Regional LC3 Centre

Metro Vancouver Climate Action Committee
May 15, 2020
Purpose of Presentation

1. Provide an overview of Low Carbon Cities Canada (LC3) and the process to establish local LC3 Centre

2. Clarify the role (and opportunity) for Metro and local governments on LC3
Goal of Low Carbon Cities
Canada

To accelerate urban climate solutions through de-risking, demonstrating and building capacity.
LC3 Background

• Proposal was led by The Atmospheric Fund (TAF) with support from federal gov’t
• Workshops were held across the country in 2018
• Strong support for creating TAF-like entities in other cities/regions
LC3 Background

• Non-profit “host” organizations were identified in other cities/regions (based on interest and alignment with mandate)
• For Metro Vancouver region, a suitable host organization was not identified
• City of Vancouver agreed to be proxy host until a suitable organization was found
  – Zero Emissions Building Exchange was being established at the same time
TAF Model

• TAF was created in 1991 through a $23M endowment from City of Toronto
• TAF is a non-profit corporation with a board appointed by City
• TAF serves a unique role in the GTHA by bridging between local government, NGOs and private sector
What Does TAF Do?

• Capacity building:
  – Researching solutions, sharing learning, influencing government policies

• Granting:
  – Providing grants to organizations that are implementing climate solutions

• Financing:
  – Investing endowment fund in carbon-reducing projects
LC3 Background

• Federal funding of $183M announced in March 2019
• FCM is the administrator of funds and will serve as national office
• LC3 Centres to be established in seven cities/regions across the country
  – All to be operated by non-profit organizations
Metro Vancouver Regional LC3 Centre

• Will serve the region
• Subject to meeting FCM requirements, will receive federal funding of:
  – $20M endowment (working capital)
  – ~$1.7M operating grant
• Endowment must be 80% matched within 10 years
Metro Vancouver Regional LC3 Centre

• Mandate is to accelerate GHG reduction within the region

• $20M endowment needs to be sustained
  – Annual interest can support staffing, overhead, programming, etc.
  – Endowment can (and should) be used for impact investing
  – LC3 Centres must secure 80% matching funds within 10 years
Metro Vancouver Regional LC3 Centre

• LC3 Centre will need to focus to be impactful
• Building retrofits has been identified by many stakeholders as a potential early focus area
  – Transportation, renewable energy are other potential opportunities
• Zero Emissions Building Exchange could be expanded to deliver the region-wide capacity-building to support Step Code implementation
  – ZEBx attracted ~$1M in external funding over the past year
Metro Vancouver Regional LC3 Centre

• LC3 Centre will be required to align with and support local government/regional climate action plans

• LC3 Centre must have local government/regional representation on the decision-making body
  – Proposal for local LC3 is for one rep from Metro Vancouver and one rep from City of Vancouver
Process for Establishing Metro Vancouver Regional LC3 Centre

• To date:
  – Workshop held with ~35 local stakeholders (including local government reps) to gather input
  – Presentation to REAC Climate Subcommittee
  – Information shared with local organizations that could potentially serve as host
  – RFEOI for host organization issued in Feb (closed on April 14) through City of Vancouver’s procurement office
Process for Establishing
Metro Vancouver Regional LC3 Centre

• Moving forward:
  – Submissions will be reviewed by City and Metro staff, in consultation with FCM
  – Aim is to identify preferred proponent by June, 2020
  – Staff will report back to Climate Action Committee at that time
  – Proponent will then negotiate funding agreement with FCM
Questions?
Low Carbon Economic Stimulus Funding in Response to COVID-19

Morgan Braglewicz
POLICY ANALYST

Conor Reynolds
DIVISION MANAGER

Climate Action Committee Meeting, May 15 2020

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Governments typically put together large funding packages to reinvigorate struggling economies.

In 2009, under 10% of federal stimulus spending went to low carbon measures.

Many organizations have been advocating for post-COVID-19 stimulus spending to go to low carbon initiatives.
Examples include:

- Job creation and skills training in low carbon sectors;
- Investment in low carbon infrastructure and renewable energy
- Industry investment can be tied to new environmental regulations
- Tax instruments such as tax cuts, credits, exemptions, and subsidies
## Key Departments

### Federal
- Environment & Climate Change Canada
- Infrastructure and Communities
- Natural Resources Canada

### Provincial
- Environment & Climate Change Strategy
- Energy, Mines & Petroleum Resources
- Municipal Affairs & Housing
- Transportation & Infrastructure
“Climate change continues to be the challenge of our time. The wildfire season is starting and the flood season has not yet ended. And as we meet all of these challenges we must recommit to putting CleanBC, our climate action plan, at the centre of our recovery” – Premier John Horgan
Questions?
Project Definition Goals

Wastewater Treatment

Community and Park Integration

Resource Recovery

December 31, 2030 – Federal and Provincial Regulatory Deadline
Wastewater Treatment Options

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<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
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<td></td>
<td>Base Secondary</td>
<td>Tertiary Filtration</td>
<td>Tertiary MBR</td>
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<td><strong>Primary Treatment Options</strong></td>
<td>INCLINED PLATE CLARIFIERS</td>
<td>BIOLOGICALLY ENHANCED CLARIFICATION</td>
<td>INCLINED PLATE CLARIFIERS + CHEMICALS</td>
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<td><strong>Secondary Treatment Options</strong></td>
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<td>MEMBRANE BIOREACTOR</td>
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<td><strong>Tertiary Treatment Options</strong></td>
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<td><strong>Solids Treatment Options</strong></td>
<td>THERMAL HYDROLYSIS + MESOPHILIC DIGESTION</td>
<td>THERMOPHILIC DIGESTION</td>
<td>SLUDGE WASTE-TO-ENERGY</td>
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## Comparison of Options

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Concept 1 Base Secondary</th>
<th>Concept 2 Tertiary Filtration</th>
<th>Concept 3 Tertiary MBR</th>
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<td>Operational Complexity</td>
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<td>Maintenance Requirements</td>
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<td>Health and Safety Risks</td>
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<td>Odour Release Risks</td>
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<td>Footprint</td>
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<td>Ability to Adopt Future Technological Innovations</td>
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<td>Net Energy Use</td>
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<td>Greenhouse Gas Emissions</td>
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<td>Capital Cost (2020 Dollars)</td>
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<td>Medium</td>
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<tr>
<td>Annual Operating Cost</td>
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<td>Lowest</td>
<td>Highest</td>
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Resource Recovery Opportunities

**Inputs**
- Wastewater
- Trucked Liquid Waste

**Potential Products**
- Reclaimed Water
- Biofuels
- Heat
- Nutrients / Biosolids
- Electricity
Reclaimed Water

UBC
Musqueam Indian Band
Canada Post
UPS
YVR?
Golf Courses
City of Vancouver
TransLink
City of Richmond

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Biofuels

Renewable Natural Gas

• Biogas upgrade to biomethane/renewable natural gas (RNG) with injection to natural gas grid
• Equivalent to 3,500 household served
• 2,800 cars taken off the road
• Offset 85% of Corporate GHG emissions
Biofuels

Biocrude
- Pilot testing hydrothermal liquefaction (HTL) technology at Annacis Island WWTP
- Lower capital and O&M costs
- Revenue potential
- Displace 1,400 truck loads of biosolids annually
Effluent Heat Recovery

Heat recovery from plant effluent

- Onsite heating and cooling needs
- Export to district energy system
- Equivalent to heating energy use of 50,000 apartment units
Nutrients

- Biosolids for land application
- Nutrient recovery opportunities through struvite crystallization
Iona Beach Regional Park

Ecological Priorities

- Restore fish habitat
- Improve water quality
- Protect bird habitat
- Enhance terrestrial ecosystems
Disconnected Salmon Migration

Juvenile Salmon Are Forced Out To Deeper Water

Jetties Create ‘Dead Ends’ For Fish Movement

Causeway Creates ‘Dead Ends’ For Fish Movement

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Ecosystem Rehabilitation Strategies

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Sustainable Architectural Features

- Design to a minimum of LEED and Envision Gold
- Consider pursuing other rating systems such as Salmon-safe to protect ecology and aquatic habitat
- Prioritize climate change mitigation and adaptation strategies
Climate Change Mitigation and Adaptation Strategies

Wastewater Treatment and Resource Recovery
• Minimize GHG emissions
• Maximize energy recovery and conservation

Ecological Enhancement
• Planting trees and other vegetation such as wetland plants
• Tidal marsh creation to protect against storms and flooding

Leadership & Innovation
• Improve public understanding of sustainable wastewater treatment
• Promote sustainable transportation connections to and around the island
Next Steps

- Community Engagement (**March – June 2020**)
- Complete Indicative Design (**Dec 2020**)
  - Habitat enhancement projects
  - Resource recovery business cases
  - Project schedule
  - Project procurement options
- Pilot plant options for advanced treatment for micropollutant removal (**post 2020**)
Questions?
Dried Biosolids

- Regional facility with local markets for end product
- Dried pellets can be used as a fertilizer or fuel in cement kilns
- GHG reduction from displacing fossil fuels
- Reduction in volume of hauled biosolids will offset GHGs
Advanced Treatment Pilot Plant

- Example process train for micropollutant removal

Tertiary Influent → Ozone Treatment → Biological Activated Carbon → Granular Activated Carbon