Neighbourhood Energy in Vancouver --
Strategic Approach and Guidelines

Planning, Transportation & Environment Committee, October 3, 2012

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1. Strategic approach to Neighbourhood Energy
2. Neighbourhood Energy Centre Guidelines
3. Next steps
Stakeholder Input

- Began in February 2011, with two streams of engagement:
  - **Strategic Approach to Neighbourhood Energy**: Workshops with NGOs, development community, Condominium Home Owners Association of BC, utility industry, other government
  - **Energy Centre Guidelines**: NGOs, other government, utility industry, and resident association representatives, with academic support and facilitated workshops
What is Neighbourhood Energy?

Neighbourhood Energy systems supply centralized heating, hot water (and sometimes cooling) for multiple buildings.
Our strategic approach to Neighbourhood Energy

a) Overview

b) Background research and consultation

c) Strategies for target areas
Strategic Neighbourhood Energy Approach

Council will be asked to consider a strategic approach to Neighbourhood Energy that:

- targets areas of the city with the greatest carbon reduction potential
- utilizes a flexible approach tailored to each target area
- provides City leadership and support with the minimum level of regulation required to achieve low carbon outcomes and cost competitive rates
Reaching our 2020 GHG Goal: Neighbourhood Energy’s Role

GCAP goal: 33% carbon reduction by 2020 (reduce 1,110,000 tons CO₂ / year)

- Province: Vehicle Efficiency 207,000 19%
- Province: Renewable Fuel Standard 75,000 7%
- Province: Clean Electricity 162,000 15%
- Neighbourhood Energy 120,000 11%
- Green Buildings 270,000 24%
- Green Transportation 225,000 20%
- Zero Waste 50,000 4%
Neighbourhood Energy Goals - Vancouver

By 2020:

95,000 tonnes + 25,000 tonnes = 120,000 tonnes

Convert existing steam heat systems to low carbon energy sources (such as Central Heat and Hospitals)
Neighbourhood Energy Goals - Vancouver

By 2020:

95,000 tonnes + 25,000 tonnes = 120,000 tonnes

New and expanded systems
(Southeast False Creek, Northeast False Creek, River District and other major development areas)
Background Research, Consultation and Analysis
Swedish transition to low carbon energy

**Background Research: International Example**

- **CO₂**

  - TWh
  - Year
  - CO₂ (kg/MWh)

  - Wood fuel
  - Other
  - Industrial surplus heat
  - Waste
  - Peat
  - Heat pump
  - Electrical boilers
  - Coal
  - Natural Gas
  - Oli
1. Developed comprehensive neighbourhood energy strategy in 2011

2. Successful conversion of downtown steam system:
   - Seattle steam converted to wood chips (biomass) in 2009 in high density residential neighbourhood
   - Reduced GHG emissions by 50%

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NEFC

VGH C & W

SEFC

River District
Regional Initiatives

UBC: modernization of campus system and biomass conversion underway

Richmond: West Cambie system commissioned

North Vancouver: Lonsdale Energy Corp (est. 2005)

SFU: UniverCity implementation in progress

Surrey: City Centre system implementation in progress
SEFC Experience

- GHG reduction target of 60% below business as usual (2012 forecast = 71% reduction)

- Is expanding to serve new SEFC buildings and the Great Northern Way campus.
NE Strategy Consultation

- Consulted utility industry, development community, NGO’s and other levels of gov’t

- Overall support for developing a comprehensive NE strategy - issues to address include:
  - Maintaining affordability for building developers and customers of systems.
  - Limitations of existing connection policy in locations not presently served by NE systems
  - Desire for flexible technology solutions
Neighbourhood Energy is needed to achieve rapid GHG reductions

Opportunities:
- **Convert existing steam heat systems** to low carbon energy (biggest opportunity for GHG reductions)
- **Establish new systems** to serve large, high density areas undergoing rapid development
- **Expand** established systems to serve existing buildings

Low density areas of the city are not a high priority for Neighbourhood Energy
- Site specific solutions can be utilized

Need tailored approach for each area to facilitate systems and address development industry concerns
Strategies for Target Areas
Identifying Target Areas

Energy study has mapped areas of the city with high potential for Neighbourhood Energy systems:

- Existing steam heat systems
- Large development sites and corridors where rapid, high density development will occur
- Areas of the City with existing buildings that could be connected to Neighbourhood Energy
Strategy Target Areas

- Downtown
- Central Broadway
- Cambie Corridor
Need for a Tailored Approach

- Existing systems in Vancouver have different types of ownership (private, public sector and municipal), and regulation
  - BCUC (private) and City Council (municipal - SEFC)
- Some target areas are not served by existing systems, requiring compatible connection policy.
- Business case for development of new systems varies with density, scale, types of land use and pace of development
Enabling City Policy Tools

- **Energy Centre Guidelines**: policy that guides evaluation for new low carbon facilities.

- **Utility Regulatory and Contractual tools**: used to control utility access to CoV streets and infrastructure.

- **Cost Competitiveness Measures**: may include adjustments to property tax policy for utilities, access to senior gov’t grants, capital funding etc.

- **Connection policy tools**: examples include zoning policy, and service area bylaws.
Downtown - Context

Existing Systems:
- Central Heat (largest CO₂ reduction opportunity in City >70,000 tonnes/year)

New Systems:
- NEFC, SEFC

Demand Context:
- Significant development activity including False Creek Flats, West End, Granville Loops, CBD
- Existing gas heated buildings convertible to NE
Downtown - Strategy

- Enable the Conversion of Central Heat:
  - Require any expansion to be low carbon via utility contracts (e.g. NEFC)
  - Create supportive policy for low carbon conversion
  - Utilize rezoning conditions to require low carbon heat for new buildings
  - Investigate complimentary low carbon options through a competitive process

- Implement connection policy for new service areas
Cambie Corridor - Context

**Existing Systems:**
- Children and Women’s Hospital steam system (conversion opportunity to reduce CO$_2$ emissions by 10,000 tonnes/year)

**Demand Context:**
- Large development sites such as Oakridge, Pearson Hospital, Little Mountain not currently served by Neighbourhood Energy
- Corridor-wide redevelopment underway
- Connection policy in place
Cambie Corridor - Strategy

- Convert C&W steam heat system:
  - Require as condition of Children and Women’s hospital rezoning
  - Create supportive policy for low-carbon conversion
- Evaluate business case of establishing NE systems at large development sites and explore competitive process to establish service area contracts
- Clarify connection policy
Central Broadway

- Adjacent to VGH steam system (conversion opportunity to reduce CO₂ emissions by 15,000 tonnes/year)
- Future rapid transit infrastructure work may present opportunities to expand SEFC or VGH systems or to establish new system to serve existing and anticipated corridor loads
- Neighbourhood Energy strategy will follow Broadway land use planning process
Other Areas of the City

• Outside of target areas, pursue building site-oriented strategies to achieve low carbon outcomes. These include:
  - Continued use of Eco-density A-2 policy for large site rezonings to identify low carbon energy supply options.
  - Green building policy

• Encourage neighbourhood-scale systems for larger redevelopments where economically feasible (eg River District)
Enabling Low Carbon Conversions

- Low carbon conversions of existing steam systems represent our largest opportunity to rapidly reduce carbon emissions
- Need policy on City criteria for evaluating low-carbon energy proposals
Neighbourhood Energy Centre Guidelines

a) Use and Objectives

b) Development of the guidelines

c) Requirements of the guidelines
Use of the Guidelines

1. To clarify CoV expectations and set standards for proponents of new Energy Centres

2. To guide CoV evaluation & approval of projects

3. To clarify the roles and responsibilities of the City and other regulatory authorities
Energy Centre Guideline Development

Stakeholders input from...

NGOs
- David Suzuki Foundation
- Pembina Foundation
- Western Wilderness Committee

Government/Agencies
- Chief Medical Health Officer
- Fraser Valley Regional District
- MetroVancouver

Utility
- Canadian District Energy Assc.
- BC Hydro

Other
- Local developer - Parklane
- Resident Assc. reps. (SEFC, NEFC, & Cambie Corridor)

Academia/Research
- UBC - Prof. Douw Steyn, Prof. Michael Brauer, Prof. Stephen Sheppard
- U-Vic - Prof. Andrew Weaver
Energy Centre Guidelines

Objectives

• Climate protection
• Air Quality
• Neighbourhood Fit
• Sustainability of Fuel Source
• Community Engagement
Guideline:

Low-carbon Neighbourhood Energy Centres must:

- optimize GHG reductions
- achieve reductions of at least 50% over a business-as-usual scenario.
Guideline:

Low-carbon Neighbourhood Energy Centres must meet or exceed all applicable air quality regulations, and must demonstrate that the impacts of the facility on ambient air quality do not compromise Provincial and Regional air quality objectives.
Guideline:

*Neighbourhood Energy Centres must have architecture, urban design, and an operations plan that ensures the facility integrates with the character of the surrounding neighbourhood, and addresses impacts of traffic, noise, and/or odour or other nuisance.*
Sustainability of Fuel Source

Guideline:

Optimize use of available waste-heat resources to provide low-carbon energy, and demonstrate sustainable sourcing and supply of all proposed renewable fuels.
Proponents of new Neighbourhood Energy Centres must demonstrate robust consultation has taken place, and use the project to build energy awareness in the community.
Next Steps - Neighbourhood Energy Strategy

At Council today to:

• Endorse Strategic Approach to Neighbourhood Energy
• Approve Energy Centre Guidelines

For report back to Council in spring 2013:

• Develop implementation strategies for Downtown and Cambie corridor
• Review and refine connection policy in consultation with UDI
• Develop strategies to improve economic viability of Neighbourhood Energy systems
• Develop approach to improve regional coordination