APPENDIX A
NEIGHBOURHOOD ENERGY CENTRE GUIDELINES

Neighbourhood Energy Centre Guidelines

September 24th, 2012

This document provides a foundational policy framework to inform decision-making on the future development of Neighbourhood Energy Centres in the City of Vancouver.

Intent of Guidelines

Neighbourhood Energy systems using heat from low-carbon Neighbourhood Energy Centres are key to achieving Vancouver's greenhouse gas reduction targets, as identified in the Greenest City 2020 Action Plan.

While a variety of technologies can provide low-carbon energy at the scale of individual buildings, these Guidelines anticipate development of Neighbourhood Energy Centres that provide thermal energy at the neighbourhood scale for space heating, domestic hot-water heating, and certain industrial processes. Energy Centres generally use large scale heat-pumps and equipment that combusts or gasifies wood fuels. These Guidelines do not consider proposals for mass-burn incineration of municipal solid waste.

The Guidelines recognize that Neighbourhood Energy Centre development will have a greater chance of success when broadly-held community values are respected. Through a focused stakeholder engagement process, and drawing on the City's experience, key criteria have been identified that describe areas of specific interest and importance regarding Neighbourhood Energy Centre development. The key criteria are:

1. Climate protection
2. Air quality
3. Neighbourhood fit
4. Sustainability of fuel sources
5. Community engagement

Application of Guidelines

These Guidelines will be applied when new Neighbourhood Energy Centres are proposed or when substantial renovation to an existing Energy Centre is proposed. These Guidelines will be used primarily by:

a) Neighbourhood Energy Centre proponents

These Guidelines will shape the development of project proposals for Energy Centres located in Vancouver, and provide project proponents with clear expectations for due diligence in the planning process and for high levels of ongoing operational performance.

b) Elected officials and City staff

These Guidelines provide a tool to assist elected officials and City staff in considering the variety of objectives and issues related to development of Neighbourhood Energy Centres, and will help them to evaluate project proposals. Project proponents apply to the City for approval of rezoning and development permit applications, or look to the City of Vancouver for endorsement of approaches to matters for which the City is not the regulatory authority.

c) Members of the public and stakeholders

These Guidelines respond to public and stakeholder values regarding development of Neighbourhood Energy Centres. They clarify the lead agency for regulation of various matters. They also provide a clear signal to the public and stakeholders that specific objectives and performance criteria regarding Energy Centre development and operation must be met.

d) Other regulatory agencies

Metro Vancouver and the British Columbia Utilities Commission (BCUC) regulate certain aspects of Neighbourhood Energy Centre implementation in Vancouver. These Guidelines affirm policy positions or expectations regarding matters for which the City of Vancouver is not the direct regulatory authority but in which it takes an interest on behalf of its citizens. Examples of these matters are air quality regulation (Metro) and rates for energy charged by utilities (BCUC).

Note - The Guidelines do not supersede any other City policy.

GUIDELINES

1.0 Climate Protection

Low-carbon Neighbourhood Energy Centres must optimize greenhouse gas reductions and achieve reductions of at least 50% over a business-as-usual scenario.

1.1 Rationale

The Greenest City 2020 Action Plan provides a strategy for Vancouver to become the greenest city in the world by 2020. The Greenest City Climate Protection target is to reduce Vancouver's overall greenhouse gas (GHG) emissions by 33% by 2020 (from 2007 levels).[3]

New Neighbourhood Energy Centres and the conversion of existing fossil-fuel based Energy Centres provide a key opportunity to achieve the City's overall climate protection goal - provided they meet or exceed the expectations represented in the above Guideline.

A *business-as-usual (BAU)* emission scenario is a projection of the GHG emissions if a typical blend of electrical and natural gas-fuelled equipment were used to provide heat energy for a development, a neighbourhood area or an industrial process.

[3] The amount of GHG in the atmosphere is not only the result of increased emissions from burning fossil fuels, but is also affected by deforestation and industrial development that limit the planetary ecosystem's ability to absorb GHG. These processes are important but are not easily quantified or able to be directly addressed by these Guidelines.

Neighbourhood Energy Centres can deliver significant GHG reductions over conventional, fossil-fuel based approaches to generating thermal energy. GHG reductions nearing 60% have been demonstrated by the City's *Neighbourhood Energy Utility* in South East False Creek while other low-carbon energy solutions in BC have demonstrated even greater reductions.

The above Guideline recognizes that implementation of low-carbon approaches generally require some conventional energy equipment (fuelled by natural gas) to supplement the low-carbon technologies at times of peak demand, and to provide for system back-up. Conventional equipment is often also required in the early stages of establishing a low-carbon Energy Centre when neighbourhood demand is still low.

In order to see the broad deployment of technology that reduces GHGs, a balance of GHG reduction with reasonable energy rates should be the goal. The City's experience has also shown that this is possible while achieving the above Guideline regarding Climate Protection.

Regulation of energy rates is generally the responsibility of the British Columbia Utilities Commission. The BCUC ensures that rates being charged for energy are just and reasonable for customers, while allowing energy utilities to earn a fair return.

1.2 Implementation

Lead Agency – City of Vancouver

Vancouver's City Charter gives it authority over land-use and development and provides tools to ensure the City's public policy objectives, such as GHG reductions, are being achieved when rezoning or development permits from the City are required.

Other parts of the Vancouver City Charter give authority over distribution of thermal energy. Section 153 of the Charter lets City Council prescribe terms, conditions, and restrictions on delivery of thermal energy that can also include GHG reduction requirements.

Neighbourhood Energy Centre proponents will need to demonstrate that a variety of technology options have been adequately assessed to ensure their proposal optimizes GHG reductions while considering the objectives identified in Section 4.0 of this document regarding taking advantage of readily available sources of waste heat.

The City will use a combination of planning and development powers and control over utility delivery to ensure the above Guideline for GHG reduction is achieved. These policy and regulatory tools also provide mechanisms to ensure the other public interest criteria noted in this document are addressed.

2.0 Air Quality

Low-carbon Neighbourhood Energy Centre proposals must demonstrate that the impacts of the facility on ambient air quality will not compromise Provincial and Regional air quality objectives and must meet or exceed all applicable air quality regulations.

2.1 Rationale

The Greenest City 2020 Action Plan confirmed citizens' and City Council's objective for Vancouver residents to breathe the cleanest air of any major city in the world by 2020.

Although there is variability within the city and across the region, ongoing air quality monitoring indicates that Vancouver already enjoys some of the cleanest air in the world when compared to other major urban centres. Nevertheless, a variety of initiatives that range from deployment of electric vehicles to increased deployment of cycling infrastructure are being implemented to ensure air quality improvements continue in light of population and economic growth.

As the regulatory authority for air quality in the Vancouver area, Metro Vancouver shares the City of Vancouver's air quality ambitions. To this end Metro Vancouver, in partnership with the BC Ministry of Environment, has established strong objectives for ambient air quality. For example, joint Provincial/Metro Vancouver objectives to achieve very low annual average fine particulate matter are even more stringent than the World Health Organization's guideline, and are among the lowest in the world.

Most residential and commercial heating in the Metro Vancouver region is fuelled by natural gas. Air pollutant emissions associated with natural gas combustion are relatively small, particularly when compared to other sources of pollution such as transportation. For instance, approximately 3% of Metro Vancouver fine particulate matter emissions are from natural gas heating vs. 29% from transportation sources.

Neighbourhood Energy Centres offer a compelling alternative to natural gas-fueled heating systems due to their ability to:

- significantly reduce greenhouse gas emissions
- efficiently use waste heat or other local resources
- reduce our dependence on fossil fuels

However, some Energy Centres (particularly those using wood-based fuels) require close attention to air pollutant emissions. The main air pollutants of concern are fine particulate matter (PM 2.5) and ground-level ozone (produced in the atmosphere when emissions of nitrogen oxides (NOx) and volatile organic compounds (VOC) mix and react).

There are two important measures that relate to air quality:
1) stack emissions - which is a measure of pollutant emissions given-off directly by an Energy Centre due to its operations
2) ambient air quality – which is a general measure of air pollution levels in a given area, taking into account all emission sources once they have had a chance to mix and combine in the atmosphere.

Both of these measures will need to be considered in order to satisfy this Guideline.

Vancouver residents and all people living in the Lower Fraser Valley air-shed want to feel secure that strong measures are in place to protect our air quality and that all

emission regulations are being effectively monitored and enforced to protect public health and the environment.

2.2 Implementation

Lead Agency – MetroVancouver

Under authority from the Provincial Government (*Environmental Management Act, Part 3 – Section 31*) Metro Vancouver creates air quality management plans, regulates emission of pollutants that pose a risk to human health, and enforces emission regulations and permits for a wide variety of sources.

The City of Vancouver does not have any direct authority over or jurisdiction for air quality but will work collaboratively with Metro Vancouver to ensure regulations, monitoring, and enforcement of emissions from Energy Centres ensures healthy air for residents of the entire region.

Proponents will be required to comply with Metro Vancouver's air emission regulations for boilers and heaters (*Boilers and Process Heaters Emission Regulation Bylaw No. 1087*) when they propose Energy Centres (with a capacity up to 50 megawatts). Bylaw 1087 contains stringent pollution emission limits, and the specific requirement that any wood fuels must be clean, uncontaminated, and free of substances harmful to humans, plants or animals when combusted.

In addition, as part of the City of Vancouver's land-use or development permit approvals, proponents will be expected to:

1) demonstrate, through detailed, site-specific modelling of primary air pollutant emissions and dispersion, using methods acceptable to Metro Vancouver, that the impacts of the facility on ambient air quality do not compromise Provincial and Regional air quality objectives, and will meet or exceed all applicable air quality regulations

2) commit to enhanced monitoring of air pollutant emissions and other key operational parameters and regularly provide publicly accessible information on system performance (including air quality and GHG emissions).

   The expectation is that monitoring programs which track key operational variables will be continuously in effect and data will be easily accessible to the public. Periodic sampling procedures by certified third-party technicians will take place at an interval that MetroVancouver deems appropriate (monthly, quarterly or annually) to test parameters such as fuel composition, fine particulate matter emissions (that cannot easily be continuously monitored), and to verify the accuracy of operational monitoring. Baseline and subsequent periodic monitoring of ambient air quality near a facility may also be considered beneficial to provide residents information about broad trends in neighbourhood air quality.

3) demonstrate fuel quality assurance by describing procedures and protocols for raw material supply, production processes, and delivery chains (fuel sources and compliance with standards and certification will be evaluated by qualified

professionals with expertise in forestry, engineering, and/or sustainable supply chain management).

Finally, Neighbourhood Energy Centre proponents are encouraged to work with the City and Metro Vancouver to support initiatives such as residential fireplace /woodstove replacement programs that will enhance air quality in Vancouver.

3.0 Neighbourhood Fit

Neighbourhood Energy Centres must have architectural, urban design, and operational characteristics that ensures that the facility integrates with the surrounding neighbourhood and addresses impacts such as traffic, noise, and/or odour.

3.1 Rationale

People's quality of life, along with the comfort and liveability of Vancouver's neighbourhoods is influenced by many factors including sensitive design and thoughtful development of the built environment. Residents take a strong interest in any new development occurring in their neighbourhoods. Neighbourhood Energy Centres must be carefully designed and operated to integrate with the surrounding neighbourhood.

3.2 Implementation

Lead Agency – City of Vancouver

Integrating a neighbourhood energy centre in a neighbourhood shares many of the same issues associated with integrating other types of development in neighbourhoods. The City of Vancouver has jurisdiction over, and widely recognized professional expertise in managing land-use rezoning, development, and building processes. Review by the City's professional and citizen advisory panels, the Development Permit Board, and by City Council are established mechanisms and processes to implement the above criteria regarding neighbourhood fit using conditions of approval and operating agreements.

The City also has control over the regulation of traffic, use of streets, and regulating size and weight of vehicles. These powers allow truck traffic associated with Energy Centre operations to have their frequency and hours of operation controlled to ensure minimal impact on neighbourhoods.

4.0 Sustainability of Fuel Sources

Optimize use of available waste-heat resources to provide low-carbon energy; and, demonstrate sustainable sourcing and supply of all other proposed renewable fuels.

4.1 Rationale

The preferred approach to providing low-carbon energy for heating is to take advantage of readily available sources of waste heat. Waste heat can be recovered

from commercial and industrial operations as well as urban infrastructure such as sewage lines.

Waste heat is not always available or able to match the energy demands of a particular facility or neighbourhood. Where technologies that use other primary fuels (such as wood) are the only viable low-carbon energy alternative, the City's expectation is for only clean waste wood be used. Clean waste wood comes from a variety of sources including: land clearing, construction, tree pruning, wood product manufacturing, sawmilling, and residue from forestry operations.

4.2 Implementation

Lead agency - City of Vancouver

Feasibility studies are required by the City to test and review various low-carbon alternatives to achieving the City's GHG reduction objectives. These feasibility studies will continue to be used in order to ensure the availability and suitability of waste heat resources are being properly assessed.

The City of Vancouver also has influence over the use of various fuels in Energy Centres through approval of development permits, rezoning conditions, and operating agreements – which can include a variety of performance criteria regarding matters ranging from the GHG intensity of delivered heat, to details regarding sources of fuels.

Throughout the approvals process, proponents of Neighbourhood Energy Centres will be required to demonstrate they can secure or have access to the low-carbon energy or fuel supply required by their proposal both in the short and long-term.

Particularly where wood-based fuels are proposed, projects will also be required to present details regarding anticipated sources of wood-based fuel and demonstrate using recognized international standards and/or certification approaches that fuel sourcing will not create or contribute to unsustainable practices and respond to the city's objectives regarding the use of clean wood waste. Conditions of City of Vancouver approval will ensure necessary agreements to ensure ongoing compliance.

5.0 Community Engagement

Proponents of new Neighbourhood Energy Centres must demonstrate robust consultation has taken place with the local community and stakeholders when planning energy facilities, and use the opportunity to ensure the project builds energy awareness in the community.

5.1 Rationale

Citizens need to be informed about and included in decision-making that affects their communities. Neighbourhood Energy Centres have the opportunity to deliver economic and environmental benefits to communities. These benefits must be delivered while maintaining livability and responding to neighbourhood context in planning and implementation of the Energy Centre. Community and stakeholder participation in the

planning process, along with having access to information about ongoing operations, will help build community acceptance and support.

5.2 Implementation

Lead agency - City of Vancouver

Neighbourhood Energy Centre proponents will be required to conduct community engagement activities in advance of any permits or approvals considered by the City.

The City of Vancouver will evaluate the engagement conducted by proponents to ensure they meet the objectives of this Guideline. The proponent is encouraged to work collaboratively with the City to ensure clear understanding of the City's communication and engagement expectations.

The following elements are considered necessary in order for a community engagement process to be effective:

1) Engage with the community in advance of or early in any application process for City approvals

2) Present clear and credible information about the benefits as well as the potential impacts and trade-offs associated with a proposed Neighbourhood Energy Centre

3) Make information regarding the proposal readily available to the public in an easy-to-understand format -through a variety of best-practise communications and engagement approaches such as using online information dissemination and feedback mechanisms, providing information in multiple languages, and providing the opportunity for face-to-face contact and feedback

4) Ensure technical experts or consultants are available to the public in order to respond directly to questions

5) Present clear information regarding which aspects of the proposal the public is able to influence, how public feedback and concerns will be taken into consideration, and at what points in the planning process these opportunities are available

6) Submit documentation that summarizes the engagement process and any continuing engagement activities, and that demonstrates how and which public input has been considered and how issues of concern have been addressed

7) Demonstrate how the project will contribute to community energy awareness and education.

8) Respond to concerns raised in the community engagement process.