A6

CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Report Date:	June 29, 2010
Contact:	Brian Crowe Ken Bayne
Contact No.:	604.873.7313
RTS No.:	08723
VanRIMS No.:	08-2000-20
Meeting Date:	July 20, 2010

TO: Vancouver City Council

FROM: General Manager of Engineering Services
General Manager of Business Planning and Services

SUBJECT: Neighbourhood Energy Utility ("NEU") - Rate Setting Review Process and New Customer Classes

RECOMMENDATION

A. THAT Council approve the implementation of a third-party Expert Rate Review Panel to advise staff and Council on future NEU rate adjustments, as per the terms of reference as defined in Appendix A, and direct staff to report back to Council by December 2013 with an evaluation of the efficacy of this Panel.

B. THAT Council approve the amendments to the Energy Utility System By-law ("the By-law"), generally as set out in Appendix B, including the establishment of separate customer rate classes and capacity levies for residential and mixed-use residential buildings located outside the Southeast False Creek Official Development Plan Area (SEFC) and non-residential buildings;

FURTHER THAT Council instruct the Director of Legal Services to bring the By-law amendment, generally as set out in Appendix B, forward for enactment.

COUNCIL POLICY

On March 2, 2006, Council approved in principle the creation of the Southeast False Creek Neighbourhood Energy Utility (NEU), to provide space heating and domestic hot water to multi-family residential, commercial, institutional and industrial buildings in SEFC.

On December 14, 2006, Council assessed various ownership and operating options for the NEU, and approved the continued ownership and operation of the NEU by the City, with operations managed by the Engineering Services Department, and ongoing governance, operational and financial responsibilities related to the NEU shared by the General Manager of Engineering Services and the Director of Finance. At that time, Council instructed staff to report back on

the merits of continued ownership before any significant expansion of the NEU, and, in any event, within three years of the commencement of commercial operations.

In March 2009, Council instructed the General Manager of Business Planning and Services and the General Manager of Engineering Services to report back to Council annually on adjustments to the Neighbourhood Energy Utility rates, and to bring a comprehensive NEU rate review to Council every five years.

On December 1, 2009, Council instructed the General Manager of Business Planning and Services and the General Manager of Engineering Services to report back to Council with the terms of reference and membership criteria for an expert panel that could enhance the transparency and provide an independent review of the annual rate-setting process for the NEU.

PURPOSE

This report responds to Council's December 1, 2009 instruction to the General Manager of Engineering Services and the General Manager of Business Planning and Services to report back with the terms of reference and membership criteria for an NEU rate-setting expert panel. In addition, this report makes recommendations for the establishment of new NEU rate classes for non-residential buildings and residential buildings located external to the SEFC neighbourhood.

BACKGROUND

The NEU began pre-commercial operations in December 2008, providing heat and hot water to unoccupied buildings using a temporary natural gas boiler. In January 2010 the system became fully operational, delivering energy from its sewage heat recovery system. The NEU currently serves all buildings in the Olympic Village plus two occupied SEFC private lands developments. Expansion of the NEU's distribution system is ongoing to connect new SEFC development sites and potentially other buildings close to SEFC. Expansion to connect buildings outside the SEFC neighbourhood is evaluated on a case-by-case basis, to determine whether each connection is economically beneficial to the NEU.

Strategic Objectives of the NEU

The fundamental goal of the NEU is to minimise GHG emissions via a financially self-sustaining, commercially operated utility that delivers competitively priced energy services. More broadly, the NEU is based on the following environmental, social and economic strategic objectives.

Environmental: The NEU has economies of scale and flexible infrastructure that can adapt to using a wide variety of renewable "waste energy" options that would otherwise not be available to an individual building heating system. Through its high system efficiencies and by using sewage heat recovery to supply approximately 70% of the annual energy demand, it is anticipated that the NEU will produce at least 56% less greenhouse gas emissions compared to conventional energy sources. In addition, the NEU uses surplus energy generated by solar thermal modules located on the roof tops of three connected buildings.

Social: The NEU supports the use of radiant hot water heating systems in buildings that provide customers with a higher level of comfort at a lower energy use, as compared to conventional space heating options. Also, the centralization of thermal energy production results in improved reliability of service and individual building owners no longer need to manage complex heating and hot water production equipment.

Economic: The NEU is a self-funded utility that has been structured in a fashion similar to private sector utilities, including the provision of an appropriate return on investment to the City, while at the same time providing competitive rates to NEU customers. The NEU helps building developments meet the energy efficiency and green building requirements for SEFC more cost effectively as compared to the use of distributed stand-alone green energy options, such as geo-exchange.

Appendices C and D provide detail on the NEU's services and technology, and its ownership, operating and governance model.

Approved Rate-Setting Principles, Methodology and Rate Structure

On March 5, 2009, Council approved the rate structure as well as 2009 customer rates for the NEU. These rates were established in accordance with Council-approved governance and rate-setting principles.

Rates are comprised of a fixed and a variable component, as is common practice in the utility industry:

- ENERGY USE CHARGE - This monthly charge is based on amount of energy consumed (measured in megawatt-hours, or MW.h), and varies with energy use accordingly (termed the "Charge" in the By-law).The NEU's variable cost of energy will be recovered via the Energy Use charge, and through this, a property will be charged for the amount of energy consumed in each billing period.

- CAPACITY LEVY – This monthly charge is based on floor area, which is measured in square metres, and indicated in building permits (termed the "Levy" in the By-law). This charge reflects each buildings peak energy demand; the NEU's fixed costs are recovered via the Capacity Levy, and this charge does not vary with a customer's energy use.

A detailed overview of the NEU rate structure, methodology and rate-setting principles is provided in Appendix E of this report.

The rates for 2010 were approved by Council on December 1, 2009. Proposed 2011 rates will be reported to Council in late November 2010.

DISCUSSION

A. Third-Party Expert Rate Review Panel

The City has a long-standing set of policies and practices concerning rates for its water, sewer and solid waste utilities. Council has also approved a separate methodology and a set of principles specific to the NEU, to ensure that over the long run the rates achieve the City's environmental, social and financial objectives.

As is typical for municipal utilities, City Council has the dual roles of utility owner and utility regulator. However, as the NEU is a relatively new undertaking and serves only a small area of the city, Council has instructed staff to report back with recommended terms of reference and membership criteria for an expert panel to participate in the annual rate-setting process.

Appendix A contains the proposed terms of reference for the NEU Expert Rate Review Panel ("Expert Panel"), including selection criteria for the three Expert Panel members. These terms of reference were developed with the following objectives:

- To provide independent review and advisory services to staff and Council to ensure that NEU rate adjustments are in keeping with Council's approved rate setting principles.

- To ensure that NEU ratepayers are paying a fair price for service, while also ensuring the NEU is financially self-sustaining over the long term.

- To ensure that the scope of the review is appropriately scaled to the rate setting exercise, and that the cost of the rate review process is not overly burdensome on the NEU operating budget.

As detailed in Appendix A, candidates for Expert Panel membership will be recommended by staff to Council, on the basis of their demonstrated expertise and objectivity necessary to carry out the review. The proposed term of the each member is three years. It is proposed that the terms of the initial members appointed to the Expert Panel vary to create a schedule of staggered term renewals over time.

Upon completion of the rate setting process each year, the chair of the Expert Panel will deliver a letter to communicate the Panel's objective opinion on the proposed rate adjustments. This letter will be attached to the appropriate staff report to Council, and the chair of the Expert Panel will be available to speak directly with Council should there be any need for dialogue.

B. New Customer Rate Classes and Associated Capacity Levies

Currently, there is only one rate class for the NEU, which applies to all residential, commercial and mixed-use buildings within the SEFC neighbourhood. Since the inception of the NEU, it was anticipated that there would be at a minimum two rate classes, and this is one of the rate-setting principles approved by Council (Appendix D).

Recommendation B in this report proposes the establishment of two new customer rate classes and associated capacity levies, which will bring the total number of rate classes for the NEU to three, described in Table 1.

TABLE 1. PROPOSED NEW RATE CLASSES FOR THE NEU

RATE CLASS	APPLIES TO	STATUS	BASIS FOR THE FIXED CAPACITY LEVY	BASIS FOR THE VARIABLE ENERGY USE CHARGE
1. Residential and Mixed Use Residential Within SEFC	Residential or mixed-use buildings located within SEFC	Existing	Floor area (square metres)	Amount of energy consumed, megawatt-hours
2. Residential and Mixed Use Residential Outside of SEFC	Residential and mixed-use residential buildings located outside SEFC	Proposed new	Peak energy demand (megawatts)	Amount of energy consumed, megawatt-hours
3. Non-Residential	Non-residential buildings located both inside and outside SEFC	Proposed new	Peak energy demand (megawatts)	Amount of energy consumed, megawatt-hours

NOTES TO TABLE

1. For the purposes of establishing the Capacity Levy for the two new rate classes, actual peak energy demand in megawatts will be submitted for each building by the building owner, based on actual data if available, or projected figures if not. For the two new rate classes, such peak capacity calculations are passed through a peer review process to evaluate their accuracy. This figure will be monitored by the NEU and adjusted over time as appropriate.

2. For the purposes of classifying buildings to apply these rate classes, the following definitions apply:

   Residential: Residential uses comprise 100% of building net floor area.

   Mixed-Use Residential: Residential uses comprise less than 100% and greater than or equal to 50% of net floor area.

   Non-Residential: Building use is either industrial, commercial or institutional, and, if residential uses are included, residential uses comprise less than 50% of net floor area.

Rationale for New Rate Classes

The two new proposed rate classes are required in order to maintain equitable and cost-competitive rates for buildings that, due to their design, use and/or their age, have different peak energy demands than do the brand new, energy efficient residential buildings in SEFC.

It is proposed that for the two new rate classes, the basis for calculating the fixed Capacity Levy be actual peak energy demand (megawatts) rather than floor area (square metres), which is used in existing rate class. For all classes, the Energy Use charge remains based on amount of actual energy consumed (megawatt-hours). The Capacity Levies for the new rate classes have been designed so that overall, the Capacity Levy charged to each building is an

appropriate reflection of the peak energy demand of that building, which ensures equity among the NEU's various customers.

Currently, all customer buildings connected to the NEU are charged both a Capacity Levy and an Energy Use Charge. The Capacity Levy is a fixed monthly charge that recovers the NEU's fixed costs associated with providing adequate capacity to serve the peak energy demand of the building.

For SEFC residential and mixed-use residential buildings, the Capacity Levy is based on floor area, which is appropriate because these buildings do not vary significantly in their energy performance, and therefore the capacity requirements of each building closely correlate with floor area.

However, the correlation between floor area and peak energy demand is not consistent for non-residential buildings, or for residential/mixed-use residential buildings located outside the SEFC area, as explained below:

1) Non-Residential Buildings (both inside and outside SEFC)

For the proposed non-residential class (e.g., institutional, commercial and industrial), the peak energy demand relative to floor area varies significantly from building to building as a result of differing occupancy uses, building configurations, and building code standards at time of construction. Therefore, for non-residential buildings, Capacity Levies need to be established based on the real peak energy demand requested by the building owner or designer. Following are two examples of the benefits of the proposed new rate classes for these building types.

Floor area over-represents actual energy demands due to building design and use: City staff are presently working with representatives of Science World and VanCity to investigate connection of their buildings located at the intersection of Quebec Street and Terminal Avenue. In the case of these buildings, the current NEU Capacity Levy (if assessed on net floor area rather than actual peak energy demand) would represent much more than their actual peak capacity requirements and would result in an NEU service that is more expensive for these building owners than their current natural gas boiler systems. By establishing the NEU Capacity Levy based on their current systems' peak demand, the NEU service will be cost competitive with their gas boilers that would be replaced, while maintaining rate equitability with other NEU customers.

Floor area under-represents actual energy demands due to building design and use: The Salt Building in SEFC has a high peak energy demand relative to floor area, based on its mechanical system design. This is because the Salt Building has a small floor area relative to the building's overall volume. If assessed on net floor area rather than actual peak energy demand, the NEU Capacity Charge for this building would be inappropriately low, relative to actual energy use.

2) Residential and Mixed-Use Residential Buildings Located Outside SEFC

For residential buildings located outside SEFC, the peak energy demand relative to floor area varies significantly depending on the type of residential construction building code requirements in place at time of construction (e.g., concrete high-rise versus wood-frame low-rise). Following are two examples of the benefits of the proposed new rate classes for these building types.

Floor area under-represents actual energy demands due to age of buildings: Existing False Creek residential buildings located to the west of the Cambie Street bridge have heating loads that are potentially serviceable by the NEU. These buildings were built to different energy efficiency codes and thus it is expected that energy performance would be very different from new buildings within SEFC. By assessing the Capacity Levy based on real peak energy demand, the NEU would be able to provide service to such buildings without any subsidy from other SEFC NEU rate payers.

Floor area over-represents actual energy use due to provision of partial heat and hot water service: There will likely be cases where the NEU will be able to supply only *part* of the energy load to an existing building outside SEFC. For example, the NEU could provide for the domestic hot water and common-space heating for a building that has electric baseboard heaters within each individual suite. By establishing the NEU Capacity Levy based on the customer building peak energy demand, the NEU would be able to charge appropriately for the level of energy services provided.

Equity Among Rate Classes

The proposed rates for the new rate classes have been designed to maintain equity among rate classes, which is to say that in all rate classes, customers will pay approximately the same amount per unit of energy consumed and amount per unit of peak energy supply capacity required from the NEU. (Total amounts paid will vary among customers based on actual amount of energy consumed, and on total peak energy requirements.)

The fixed rate structure for the two new rate classes provides an incentive for building owners and developers to ensure energy efficient buildings and accurately size their heating infrastructure to match peak energy demands.

Table 2 summarizes the existing and the proposed customer classes and associated Capacity Levy and Energy Use Charge. *While the basis of the Capacity Levy assessment is different for the new classes (peak energy demand vs. floor area), the new Capacity Levy is calculated such that the amount paid for the Capacity Levy will be equivalent and proportional to peak energy supply required for a building regardless of which customer class it is in.* The variable (metered) energy use charge will remain the same across different customer classes.

TABLE 2. ILLUSTRATION OF CAPACITY LEVY COMPARISONS AMONG PROPERTIES IN EXISTING AND PROPOSED NEW RATE CLASSES, USING 2010 RATES

RATE CLASS	APPLIES TO	NEW/EXISTING RATE CLASS	MONTHLY FIXED CAPACITY LEVY, 2010 RATES	VARIABLE ENERGY USE CHARGE, 2010 RATES	APPROXIMATE MONTHLY CAPACITY LEVY BILLED TO OWNER
1. Residential and Mixed Use Residential Within SEFC	Residential or mixed-use buildings located within the SEFC	Existing	$0.44 per square metre net floor area per month	$37 per megawatt-hour	$44
2. Residential and Mixed Use Residential Outside of SEFC	Residential and mixed-use residential buildings located outside SEFC	Proposed new	$6.62 per Kw peak energy demand per month	$37 per megawatt-hour	$44
3. Non-Residential	Non-residential buildings located both inside and outside SEFC	Proposed new	$6.62 per Kw peak energy demand per month	$37 per megawatt-hour	Not suitable for comparison – see Note 4 below.

NOTES TO TABLE

1. Estimated monthly levy for an individual 100 square meter (1,076 square foot) strata unit. For comparative purposes, monthly levy bill for residential and mixed-use residential building located outside SEFC assumes same building energy performance as residential building located inside SEFC.

2. The NEU bills strata corporations, not individual suites.

3. Levy is shown before sales taxes.

4. Approximate monthly bill for non-residential buildings not included due to variability in occupancy type and building construction.

5. In addition to the Capacity Levy, customers are also charged an Energy Use Charge, based on actual energy consumption, measured in megawatt-hours. It is proposed that the Energy Use Charge be the same for all three rate classes, $37 per megawatt-hour for 2010. The amount billed to each building owner associated with the Energy Use Charge will vary from customer to customer, as a function of energy consumed each month.

For any building located outside SEFC geographical boundaries, connection to the NEU will only be made in cases where the business case is positive for the NEU and the building owner agrees to connection. Benefits which will be assessed in considering the NEU connect these buildings include:

- Financial impact on the NEU is positive.
- Greenhouse gas emissions are reduced considerably for the building connected.
- NEU costs are distributed across a larger customer base.
- Energy demand diversification for the NEU is improved, benefiting overall system performance.

To establish the new customer classes and associated fixed Capacity Levies, the proposed amendments to the *Energy Utility System By-law* are attached in Appendix B.

FINANCIAL IMPLICATIONS

It is anticipated that the implementation of a third-party expert rate review process will add a cost not to exceed $10,000 annually to the NEU Operating Budget from 2010 onwards, to be recovered through NEU customer fees. Staff will report back to Council for budget adjustment approval as part of the report recommending the appointment of the Expert Rate Review Panel.

The implementation of new rate classes for non residential buildings and residential buildings external to SEFC will enable the NEU to be cost competitive with the natural gas boiler systems typically used in such buildings, without resulting in any subsidization of such new buildings. Connection of such buildings will increase NEU revenues and allow the NEU to distribute its fixed costs over a broader customer base.

CONCLUSION

This report recommends the terms of reference for a third-party expert rate review process for the NEU, to be implemented in time to report back to Council late 2010 with recommendations for 2011 NEU rates. In addition, this report recommends establishing new customer classes to better enable existing buildings external to SEFC to utilize NEU services.

* * * * *

APPENDIX A

CITY OF VANCOUVER NEIGHBOURHOOD ENERGY UTILITY
EXPERT RATE REVIEW PANEL
TERMS OF REFERENCE
APPROVED BY VANCOUVER CITY COUNCIL: <INSERT DATE>

1. Objective and Scope

This Neighbourhood Energy Utility (NEU) Expert Rate Review Panel (referred to as the "Expert Panel" in these Terms of Reference) is established by Vancouver City Council, with the objective of advising City staff and City Council on the annual establishment of user rates for the NEU in Southeast False Creek and for any other areas of the City where City-managed neighbourhood energy utility services are be provided.

This Expert Panel provides objective, expert advice to the City to ensure that the rate structure and annual rates for the NEU are consistent with Council's approved rate setting principles (reference Section 8), within the long-term levelised rate structure established by City Council for the NEU (reference Council report on NEU Rates March 2009, RTS7292).

The scope of the Expert Panel's rate review would include the following factors used to establish annual rates for the NEU:

- long-term forecasted cost inputs, including forecasted fuel costs and the NEU's cost of capital, including debt charges and return on equity premiums,

- revenue forecasts,

- the rate escalation factor that underlie the levelised rate structure, and annual inflationary rate increases,

- rate stabilization reserve requirements, and

- comparisons of the NEU rates to other appropriate energy benchmarks to evaluate competitiveness.

The Expert Panel will also review staff's recommendations concerning any changes to the fundamental rate structure and design that may arise out of the comprehensive rate review Council has instructed staff to undertake every five-years.

Upon completion of the rate setting process each year, the chair of the Expert Panel will deliver a letter to communicate the Panel's objective opinion on the proposed rate adjustments, attached to the appropriate staff report to Council. The chair of the Expert Panel may also attend the annual City Council meeting at which the NEU rates are approved.

2. Selection Criteria for the Expert Panel

The Expert Panel has three members. The selection criteria for the Expert Panel are:

- EXPERTISE: The Expert Panel shall have within its membership a variety of expertise to ensure a balanced review process. Expertise should be divided amongst Expert Panel members as follows:
    - Utility Pricing and Regulation(Chairperson): Demonstrated expertise and experience in the area of utility finance/pricing, ideally with past experience working for or reporting to British Columbia Utilities Commission or another similar regulatory body.
    - Finance: A sophisticated understanding with demonstrated expertise and experience in finance and financial modelling, ideally in the field of utility finance and pricing.
    - Green Energy: Demonstrated expertise in the area of renewable energy production and demand management.
- OBJECTIVITY: Each Expert Panel member must be able to carry out the work objectively, have the demonstrated ability to make complex decisions that equitably balance the interests of various stakeholders, and be perceived as a credible, objective expert.

In the interest of avoiding any conflicts of interest, Expert Panel members should not be:

- an employee of the City of Vancouver,
- an elected official for the City of Vancouver,
- a customer of the NEU,
- an employee or major shareholder of a competing energy utility, or
- in any position or role that would be perceived as a conflict of interest as related to the responsibilities described in these Terms of Reference.

3. Selection Process and Membership Term

Candidates for Expert Panel Membership will be recommended to City Council by the General Manager of Engineering Services and either of the General Manager of Business Planning and Services or the General Manager of Financial Services. Recommendations will be made based on each individual's demonstrated expertise and objectivity, as described in Section 2. City Council is responsible for appointing members to the Expert Panel.

The term of each Expert Panel member is three years. The terms of initial members appointed to the Panel may be varied to create a schedule of staggered term renewals.

4. Primary Liaison with City Staff

The City of Vancouver's NEU Manager will be the primary liaison between City staff and the Expert Panel, and will provide administrative support to the Expert Panel as needed. While the primary liaison will be with City staff, the Expert Panel's final recommendation letter goes direct to City Council attached to the annual staff rate report.

5. Budget

At the time of Expert Panel appointment, Council also approves the budget and stipend for the Expert Panel. All expenses submitted by the Expert Panel members will be reviewed and approved by the General Manager of Engineering Services, or designate, provided that the expenses are within the approved budget.

6. Approved Rate Setting Principles

On December 14, 2006, Council approved the following rate-setting principles for the NEU. These principles are used as guidelines for further rate adjustments.

1. That NEU rates are structured so as to recover the following costs incurred by the City, based on forecasted costs:

    i. all direct operating costs associated with the NEU,

    ii. all debt service and repayment costs associated with the NEU,

    iii. the share of City administrative overheads that are attributable to the NEU,

    iv. property taxes and/or payments-in-lieu of property taxes, as appropriate,

    v. a reserve fund for NEU rate stabilization,

    vi. an appropriate level of compensation for the risks and liabilities assumed by the City associated with the ownership and operation of the NEU, and

    vii. credits for any benefits provided by the NEU to City taxpayers (e.g., contribution to corporate GHG reductions goals), as determined by Council.

2. That NEU rates fairly apportion the aforementioned costs among customers of the NEU.

3. That NEU rates be understandable to customers, practical and cost-effective to implement.

4. That at least two separate rate classes (commercial and residential) be established to distinguish different types of NEU customers, with rates reflecting each class's proportional contribution to total costs.

5. That, where feasible, NEU rates provide price signals that encourage energy conservation by NEU customers.

6. That the methodology for calculating NEU rates provides year-to-year rate stability for NEU customers to the greatest extent possible.

7. That the methodology for calculating NEU rates provide year-to-year revenue stability for the City to the greatest extent possible, and include the use of a rate stabilization reserve similar to that used by the City for other utility operations.

8. That rates be updated by Council annually based on forecasted costs, and adjusted to reflect any deviation from target levels of reserves, with annual rate changes requiring review and approval by Council followed by enactment of the necessary amendments to the NEU by-law.

APPENDIX B
ENERGY UTILITY SYSTEM BY-LAW DRAFT AMENDMENT

BY-LAW NO. _____

A By-law to amend Energy Utility System By-law No. 9552 regarding miscellaneous amendments

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions and schedule of the Energy Utility System By-law.

2. Council repeals the definition of "levy" in section 1.2, and substitutes:

‘ "levy" means:

(a) for any residential or mixed use residential building located in Southeast False Creek, a fixed capacity fee based on net floor area determined by the city at the time of issuance of the building permit for that building, and

(b) for any residential or mixed use residential building not located in Southeast False Creek, and for any non-residential building, a fixed capacity fee based on the greater of the estimated peak heat energy demand of the building determined by the city at the time of application for service, or the actual peak heat energy demand of the building determined by the city by reading the meter;’.

3. Council repeals Schedule C, and substitutes:

"SCHEDULE C

LEVIES AND CHARGES

PART 1 – Excess demand fee

Excess demand fee for each 1 W per m^2 of the aggregate of the estimated peak heat energy demand referred to in section 5.3(b) (i), (ii), and (iii) that exceeds 65 W per m^2	$1.50

PART 2 – Monthly levy

SEFC residential or mixed use residential building	$0.44 per m²
Residential or mixed use residential building located outside SEFC	$6.62 per KW of peak heat energy demand
Non-residential building	$6.62 per KW of peak heat energy demand

PART 3 – Monthly charge

Monthly charge	$37.00 per MW per hour

PART 4 – Credit

Credit for heat energy returned to energy transfer station	$37.00 per each MW per hour multiplied by 50%

PART 5 – Billing frequency particulars

Each of the levy and charge is billable monthly."

4. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

5. This By-law is to come into force and take effect on the date of its enactment.

ENACTED by Council this day of , 2010

Mayor

City Clerk

APPENDIX C
OVERVIEW OF THE CITY OF VANCOUVER'S SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY

On March 2, 2006, Council approved in principle the creation of the NEU to provide space heating and domestic hot water services to Southeast False Creek (SEFC) buildings. Council's decision was based on a business case that was developed with consulting support from experts in district energy and utility economics.

The NEU Technology

The primary energy source for the NEU is sewage waste heat recovery, in which sewage waste heat is captured and used to heat water at the False Creek Energy Centre (referred to in this appendix as the Energy Centre). This facility, located under the south end of the Cambie Street Bridge, at 1890 Spyglass Place, also includes an integrated sewage pump station. While the Energy Centre derives most of its energy from sewage heat recovery, natural gas boilers are used for back-up purposes, and to provide supplemental energy on the coldest days of the year.

From the Energy Centre, a network of underground pipes delivers the heated water to SEFC buildings (termed the "Distribution Pipe System," or DPS). Energy Transfer Stations (ETS) located within each connected building control space heating and domestic hot water for distribution by the (customer owned) building mechanical system.

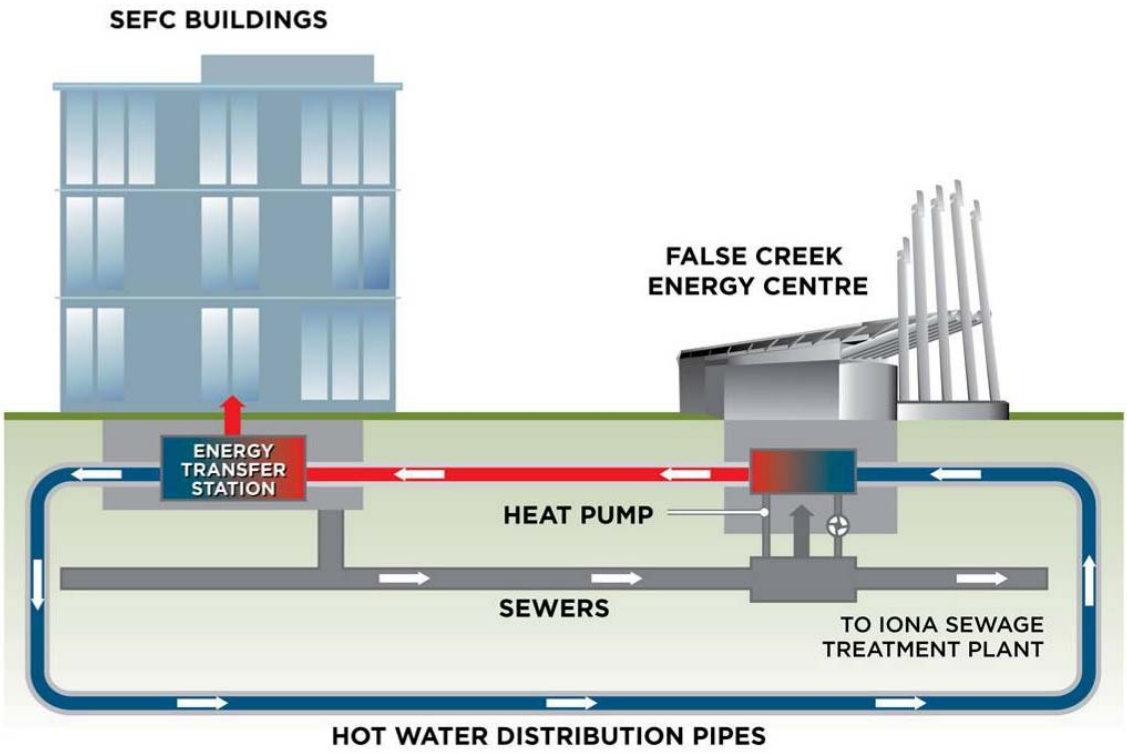
Metering is incorporated in the ETS's for energy measurement and billing purposes. Three of the ETS's also enable customer-generated solar thermal energy to be distributed to the wider neighbourhood.

In summary, there are four components to the NEU's infrastructure, illustrated in Figure 1 below.

- *False Creek Energy Centre*: Generates hot water through sewer waste heat recovery and natural gas boilers. Owned and operated by the NEU.
- *Distribution Pipe System* (DPS): A set of underground pipes that deliver hot water to connected buildings. Owned and operated by the NEU.
- *Energy Transfer Stations (ETS):* Heat exchangers within each connected building that use hot water delivered to the building via the DPS to generate heat and domestic hot water for individual consumers and building common spaces. Owned and operated by the NEU.
- *Building Mechanical Systems:* All infrastructure within a building (except for the ETS) that comprises the system that delivers heat and hot water to individual consumers and building common spaces. Owned and operated by the building owner(s).

It is noted that, for market residential buildings, the NEU bills strata corporations, and they in turn are responsible for allocating NEU costs among individual unit owners. It is up to each strata corporation to determine the basis for these allocations. Some buildings connected to the NEU have sub-metering systems installed that measure energy consumed by each unit. NEU rates do not include any costs associated with sub-metering systems owned by strata corporations.

FIGURE 1. NEU CONCEPT DIAGRAM



Legislative Authority & Governance

The Province of British Columbia amended the Vancouver Charter in the spring of 2007 to provide the City with authority to provide energy utility services. Subsequent to this, the City enacted the *Energy Utility System By-law* ("By-law"). Beyond basic provisions required to regulate energy services, the by-law makes connection to the NEU mandatory for all new buildings within the SEFC Official Development Plan area (which is generally bounded by Cambie Street, Main Street, 2nd Avenue and the False Creek waterfront).

As with the City's water, sanitary sewer and solid waste utilities, City Council is the regulatory body for the NEU; municipal utilities are not regulated by the BC Utilities Commission.

History of By-law Amendments

On November 15, 2007, Council approved the creation of the *Energy Utility System By-law*. On October 28, 2008 Council approved an amendment to this by-law, primarily in order to enable the NEU to recover costs associated with the supply of pre-occupancy heat services to the Olympic Village, and to base the monthly levy on floor area.

On March 5, 2009, Council approved amendments to the *Energy Utility System By-law*, including the establishment of 2009 rates and fees for the Neighbourhood Energy Utility (NEU).

On December 1, 2009, Council approved further amendments to the *Energy Utility System By-law*, including the establishment of 2010 rates and fees for the Neighbourhood Energy Utility (NEU). With the system fully functional, the separate rates for pre-occupancy heat services was also eliminated.

Potential Expansion in Southeast False Creek

Southeast False Creek is well suited to implementation of the NEU, because the size and timing of the neighbourhood development provides an adequate customer base to make the project economically feasible. Cost savings have been achieved through coordinating NEU distribution pipe installation activities with the construction of SEFC roads and utilities. And, as well, the new buildings in the SEFC have, from the outset, been designed to integrate with the NEU.

The NEU's service area extends to all of the SEFC Official Development Plan area, which at build-out is projected to contain approximately 6 million square feet of development. The first phase of NEU development will serve the Olympic Athletes' Village, plus a number of SEFC privately-held land developments. Phase 1 comprises approximately 20% of the total SEFC land area. In addition, the City may extend the NEU system to serve properties outside of the SEFC Official Development Plan area, in cases where the economic test is positive.

APPENDIX D
SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY
OWNERSHIP MODEL, GOVERNANCE AND RATE-SETTING PRINCIPLES
APPROVED BY CITY COUNCIL IN DECEMBER 2006

Approved Ownership and Operating Model

On December 14, 2006, Council assessed various ownership and operating options for the NEU, and approved the continued ownership and operation of the NEU by the City, with the following conditions:

- That the NEU be integrated into the Engineering Services Department.
- That the ongoing governance, operational and financial responsibilities related to the NEU be shared by the General Manager of Engineering Services and the Director of Finance.
- That the merits of continued ownership be reviewed before any significant expansion of the NEU, and, in any event, within three years of the commencement of commercial operations.

Approved Governance Principles

At that same time, Council approved the following governance principles for the NEU:

1. That the NEU will seek to minimise greenhouse gas emissions, consistent with the directions established in the Community Climate Change Action Plan.
2. That the NEU will be operated to ensure long-term financial viability based on a commercial model.
3. That the NEU will strive to establish and maintain customer rates that are competitive with the long-term capital and operating costs of other heating options available to customers.
4. That the City, where feasible, will support the development and demonstration of flexible, innovative and local technologies through the NEU.
5. That the City will consider and evaluate the potential to expand the NEU to other neighbourhoods and developments, with the merits and feasibility of each expansion phase to be determined separately.

Approved Rate-Setting Principles

Council also adopted the following eight principles, to be applied to setting rates and terms of service for NEU customer:

1. That NEU rates are structured so as to recover the following costs incurred by the City, based on forecasted costs:

    i. all direct operating costs associated with the NEU,
    ii. all debt service and repayment costs associated with the NEU,
    iii. the share of City administrative overheads that are attributable to the NEU,
    iv. property taxes and/or payments-in-lieu of property taxes, as appropriate,
    v. a reserve fund for NEU rate stabilization,
    vi. an appropriate level of compensation for the risks and liabilities assumed by the City associated with the ownership and operation of the NEU, and
    vii. credits for any benefits provided by the NEU to City taxpayers (e.g., contribution to corporate GHG reductions goals), as determined by Council.

2. That NEU rates fairly apportion the aforementioned costs among customers of the NEU.

3. That NEU rates be understandable to customers, practical and cost-effective to implement.

4. That at least two separate rate classes (commercial and residential) be established to distinguish different types of NEU customers, with rates reflecting each class's proportional contribution to total costs.

5. That, where feasible, NEU rates provide price signals that encourage energy conservation by NEU customers.

6. That the methodology for calculating NEU rates provide year-to-year rate stability for NEU customers to the greatest extent possible.

7. That the methodology for calculating NEU rates provide year-to-year revenue stability for the City to the greatest extent possible, and include the use of a rate stabilization reserve similar to that used by the City for other utility operations.

8. That rates be updated by Council annually based on forecasted costs, and adjusted to reflect any deviation from target levels of reserves, with annual rate changes requiring review and approval by Council followed by enactment of the necessary amendments to the NEU by-law.

APPENDIX E
SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY
RATE STRUCTURE AND METHODOLOGY
APPROVED BY CITY COUNCIL MARCH 2009

Fixed and Variable Charges

The Southeast False Creek Neighourhood Energy Utility (NEU) rates are comprised of the following two elements:

- ENERGY USE CHARGE - This monthly charge is based on amount of energy consumed (measured in megawatt-hours, or MW.h), and varies with energy use accordingly (termed the "Charge" in the By-law).The NEU's variable cost of energy will be recovered via the Energy Use charge, and through this, a property will be charged for the amount of energy consumed in each billing period.

- CAPACITY LEVY – This monthly charge is based on floor area, which is measured in square metres, and indicated in building permits (termed the "Levy" in the By-law). The NEU's fixed costs are recovered via the Capacity Levy, and this charge does not vary with a customer's energy use. Customers are charged this monthly amount, regardless of their energy use levels.

Levelized Rate Approach

The NEU rates are established based on a levelized rate approach. This approach sets rates to under-recover full costs in the early years of the NEU's operations, and then build rates gradually over time, so that over a twenty-five year time horizon, all the NEU's costs are fully recovered via NEU sales revenues.

This methodology was chosen because if rates were set on a strict year-to-year cost recovery basis, they would be very high in the early years of the NEU's operation, and would decrease over time, as the NEU generated more sales revenues. The under-recovery in the earlier years of the NEU is to be financed with a rate stabilization reserve, borrowed from the Capital Financing Fund.

The Annual Levelized Rate Escalation Factor is the percentage by which rates must be increased each year over and above any inflationary increases, in order for the NEU to achieve the present value of all future revenue requirements over a twenty-five year period. It is noted that this approach to structuring rates is commonly used in the capital-intensive energy utility business, and *it is critical to the financial sustainability of the NEU that annual rate adjustments include this escalation over regular inflationary increases.*

The initial Annual Levelized Rate Escalation Factor was set at 1.15% over inflation (March 2009). This rate may be adjusted over time, depending on whether sufficient revenues are being generated by the NEU to ensure the City's return on capital, and as well on how the

NEU effective rates compare to those of BC Hydro and other providers of energy for heat and hot water.

Rate Stabilization Reserve

In March 2009, Council approved an NEU Rate Stabilization Reserve. This reserve serves as a line of credit upon with the NEU can draw upon, with the maximum amount not to exceed $8 million.

The NEU Rate Stabilization Reserve serves two purposes:

1. to finance the NEU's operating shortfall in its early years of operation, that will result from the levelized rate approach, and

2. to finance relatively small year-to-year fluctuations in NEU revenues due to uncontrollable circumstances such as weather, in order to ensure rate stability for the NEU customers.

To meet this first purpose (financing planned operating shortfalls in earlier years of operations), the NEU's cumulative draws against this Reserve are expected to grow until the business starts to generate an operating surplus, at which point it will begin repaying the loan. Projections included in the March 2009 Council report forecasted that the NEU will require approximately $1.6 million in rate stabilization funds in the first year of operations, and a smaller amount in each year thereafter, until Year 12 of operations, with estimated total cumulative draws totalling $7.3 million. It is forecasted that by approximately Year 13 of operations, the NEU will begin to pay down these borrowed funds with the annual surpluses generated by the NEU.

This second function of this Reserve (year-to-year rate stability) is the same as that of the other rate stabilization reserves the City has in place, for the water, sewer and solid waste utilities. This function is expected to continue in perpetuity. Once the City has had experience with several years of operating patterns for the NEU, the Director of Finance will report back on policy target levels for this Reserve.

The following are the terms and conditions of the NEU Rate Stabilization Reserve:

- The Capital Financing Fund (CFF), which is used as a source of internal financing for City projects, will provide the funding for the Reserve.

- The NEU will be charged interest on funds borrowed from the Reserve at the internal lending rate that is established annually by the Director of Finance.

- Once the NEU begins to generate an operating surplus (anticipated to be in approximately Year 12), the full amount of the surplus will be dedicated to repaying the Capital Financing Fund (principal and interest).

Rate-Setting Methodology

The methodology used sets NEU rates to under-recover full costs in the early years of the NEU's operations, and then builds rates gradually over time, so that over a twenty-five year time horizon, all the NEU's costs are fully recovered via NEU sales revenues. This rate calculation is done in the following three steps.

- *Step 1 – 25-Year Pro Forma*: The starting point is a twenty-five year projected operating budget for the NEU (that includes capital financing costs and a target return on investment).

- *Step 2 – Calibrate Starting Rates to BC Hydro Rates*: 2010 NEU rates are calculated to be roughly equivalent to forecasted 2010 BC Hydro electricity rates, plus a 10% increment. (The 2010 NEU rates were discounted by approximately 6% to arrive at 2009 starting rates.)

- *Step 3 – Determine Annual Levelized Rate Escalation Factor*: The Annual Levelized Rate Escalation Factor is the amount by which NEU rates are set to increase over any annual inflationary increases, in order for the NEU to achieve the present value of all future revenue requirements over twenty-five years is determined. *(It is noted that it is critical to the financial sustainability of the NEU that annual rate adjustments include this escalation factor over time.)*

Using this approach, it is reasonably likely that NEU rates will diverge from BC Hydro rates over time. The extent of this divergence will depend on a number of factors, including the rate at which buildings connect to the NEU system (which in turn depends on property development in the neighbourhood), the rate at which the NEU's operating expenses increase over time, and, the rate of increase for BC Hydro comparator residential rates. Through the periodic comprehensive rate reviews, the City may from time to time opt to recalibrate NEU rates relative to those of BC Hydro.