CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Report Date:	November 4, 2016
Contact:	Chris Baber
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Meeting Date:	December 7, 2016

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: Southeast False Creek Neighbourhood Energy Utility ("SEFC NEU") 2017 Customer Rates

RECOMMENDATION

THAT Council approve the amendments to the Energy Utility System By-law ("the By-law"), generally as set out in Appendix A, including the establishment of 2017 customer rates and fees, with a 3.2% increase over 2016 customer rates. In accordance with Council Policy to improve the energy conservation price signal, this 3.2% increase is to be achieved by increasing the Fixed Capacity Levy by 2.7% and the Variable Energy Charge by 4.0%.

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

REPORT SUMMARY

This report seeks Council approval of the recommended 2017 SEFC NEU customer rates, which incorporates a 3.2% net increase over 2016. This increase enables the NEU to recover its long-term costs under the commercial utility rate model, while providing stable and competitive energy rates for customers. This will result in a cost increase of ~$28 per year for a resident living in an average 75 square metre (800 square feet) suite.

In accordance with Council policy to improve the energy conservation price signal, this 3.2% net increase is to be achieved through a 2.7% increase to the Fixed Capacity Levy and a 4.0% increase to the Variable Energy Charge components of the SEFC NEU rate structure.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

In December 2006, Council approved a set of governance and rate-setting principles for the SEFC NEU (Appendix C).

In March 2009, Council instructed staff to report back to Council annually on adjustments to the SEFC NEU rates, and to bring a comprehensive rate review to Council every five years.

In July 2010, Council approved the establishment of an independent Neighborhood Energy Expert Panel (referred to as the "Expert Panel" in this report) to advise staff and Council on

future SEFC NEU rate adjustments. At this time, Council also approved the establishment of separate customer rate classes and rate formulas for residential and mixed-use residential buildings located outside SEFC, and for non-residential buildings both within and outside SEFC.

In October 2012, Council approved the Vancouver Neighbourhood Energy Strategy and Energy Centre Guidelines, to address the Greenest City 2020 Action Plan objective of reducing 120,000 tonnes carbon dioxide per year through the conversion of existing steam heat systems to low carbon energy sources and the deployment of sustainable energy systems for high-density neighbourhoods.

In April 2014, Council approved a transition strategy to adjust the SEFC NEU rate structure to strengthen the energy conservation price signal while maintaining energy rates at the same level as projected under the commercial utility rate model.

In July 2015, based on the result of the comprehensive review of the SEFC NEU after five years of operation, Council adopted key performance indicators and targets to guide SEFC NEU rate setting under the commercial utility rate model.

REPORT

Background/Context

The fundamental goal of the SEFC NEU is to minimize GHG emissions via a financially self-sustaining, commercially operated utility that delivers competitively priced energy services. Through its system efficiencies and by using sewage heat recovery as its low carbon energy source, the NEU provides substantial greenhouse gas emission reductions relative to traditional methods of providing heat and hot water. At time of system build-out the NEU is forecast to reduce GHG emissions by 60%, or 10,400 tonnes CO2 per year.

The SEFC NEU began operation in January 2010, and since then has rapidly expanded to serve 413,000 square metres (4,450,000 square feet – slightly more than 70% of the original business case projection) of residential, commercial and institutional floor area. Over time, the NEU will continue to be extended to serve new developments in SEFC and Great Northern Way Campus Lands, with total build-out currently forecast at 758,000 square metres (8,160,000 square feet – approximately 30% greater than projected in the original business case) of floor area.

Appendices B and C provide additional details on the SEFC NEU's services, technology, and its ownership, operating and governance model.

Levelized Rate Structure

SEFC NEU customer rates are comprised of two components: a Fixed Capacity Levy (related to the fixed capital and operating costs associated with the NEU) and a Variable Energy Use Charge (related to customers' actual energy consumption). To ensure fair and appropriate rates, all annual rate changes are reviewed by the independent Expert Panel.

To provide competitive and stable rates for the SEFC NEU customers, rates are established based on a levelized rate approach. As illustrated in Figure 1 below, rates are set to *under-recover* annual costs in the early years of the NEU's operation when the customer base is small, and to gradually recover past costs and a modest return on investment when the customer base is fully established. This approach ensures that infrastructure costs are more equitably distributed between the initial customers and those who connect in later years. If

the levelized rate approach were not taken, customer rates would have to be set much higher in the early years of operation.

The levelized rate approach is commonly used by privately owned utilities regulated by the BC Utilities Commission ("BCUC"), including the SFU's UniverCity Energy system, the River District Energy system and the new UBC neighbourhood system.

FIGURE 1: LEVELIZED RATE APPROACH

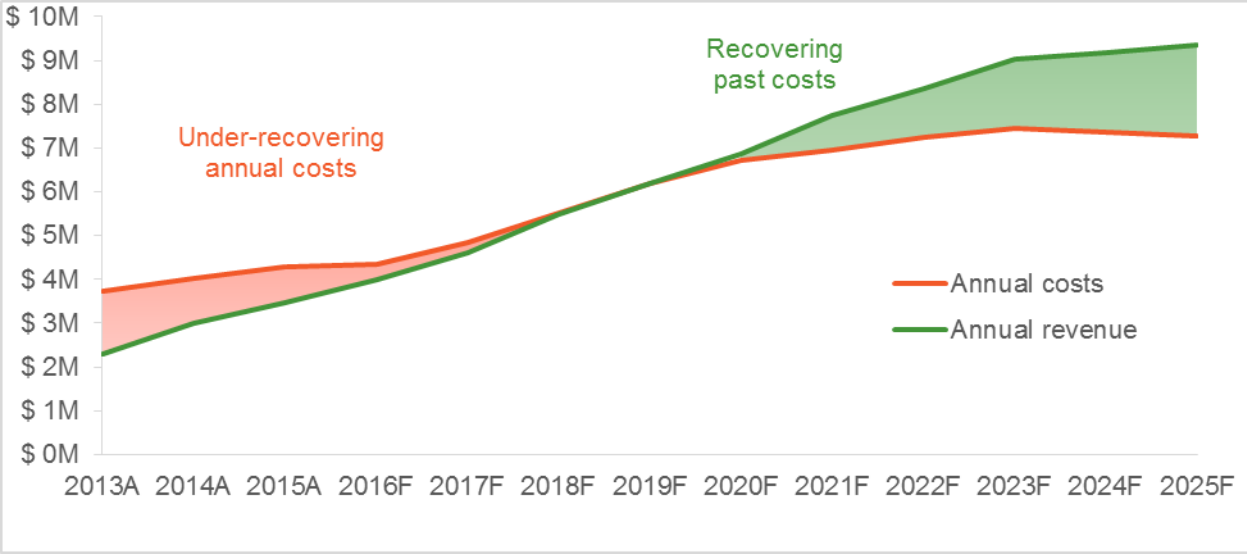
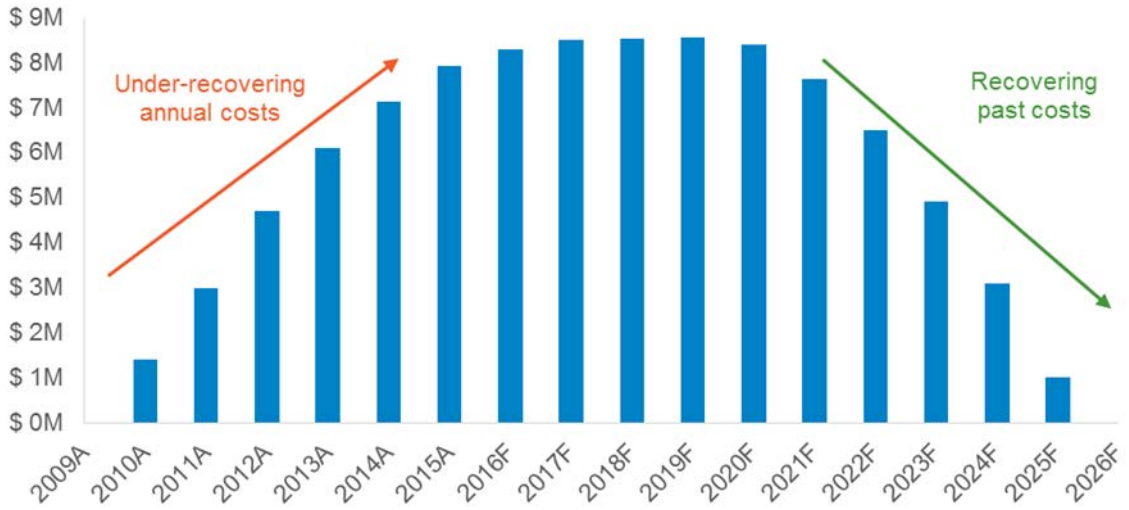


FIGURE 2: CUMULATIVE BALANCE OF UNDER-RECOVERED COSTS UNDER LEVELIZED RATE APPROACH



To ensure that the cumulative balance of under-recovered costs (Figure 2) can be recovered within a reasonable timeframe without impacting the stability and competitiveness of the customer rates, the levelized rate approach contemplates annual rate increases that include two components: an inflationary increase and a Rate Escalation Factor.

The Rate Escalation Factor is applied to customer rates above annual inflation to gradually increase rates over time to ensure all of the NEU's revenue requirements are met over the long-term. Using this approach enables the NEU to maintain rates that are stable, affordable and appropriate for new utilities with large upfront capital investments.

Strategic Analysis

2017 RECOMMENDED CUSTOMER RATES

The NEU recovers its costs using three different rate classes: (1) Residential and Mixed Use Residential Buildings within SEFC; (2) Residential and Mixed Use Residential buildings Outside of SEFC; and (3) Non-Residential Buildings. These separate rate classes were established to ensure that NEU costs are equitably distributed among different customers, based on a cost of service model.

Staff recommends that SEFC NEU customer rates for all three rate classes be increased by 3.2% over 2016 rates, as shown in Table 1. Consistent with Council policy to improve the energy conservation price signal, staff recommends that this 3.2% increase be achieved through a 2.7% increase to the Fixed Capacity Levy and a 4.0% increase to the Variable Energy Charge. This allocation is supported by the Expert Panel, and will improve the conservation price signal while maintaining energy rates at the same level as projected under the commercial utility rate model.

A 3.2% increase is equivalent to a 1.2% real rate increase to customers above a forecast mid-term average inflation rate of 2%. This 1.2% above inflation value is the Rate Escalation Factor, which enables the NEU to maintain rates that are stable and affordable, while keeping the NEU on track to recover its costs in accordance with the commercial utility rate model.

Applied as recommended by staff, this 3.2% increase will result in a cost increase of ~$28 per year for a resident living in an average 75 square metre (800 square feet) suite with an average energy demand of 8.2 megawatt hours per year.

TABLE 1. SEFC NEU 2016 AND RECOMMENDED 2017 CUSTOMER RATES[1]

	2016	2017 PROPOSED	% CHANGE 2017/2016
Class 1 (Residential and Mixed Use Residential within SEFC)			
Fixed Capacity Levy (per square meter per month)	$0.526	**$0.540**	2.7%
Variable Energy Use Charge (per MW.hr)	$45.398	**$47.214**	4.0%
Net Effective Rate[2] (per MW.hr)	**$103.1**	**$106.4**	**3.2%**
Class 2 (Residential and Mixed Use Residential Outside SEFC) and Class 3 (Non-Residential)			
Fixed Capacity Levy (per KW peak energy demand per month)	$7.905	**$8.115**	2.7%
Variable Energy Use Charge (per MW.hr)	$45.398	**$47.214**	4.0%

NOTES TO TABLE

1. 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 industrial, commercial or institutional, and, if residential uses are included, residential uses comprise less than 50% of the net floor areas.
2. Net effective rate is based on a reference building with an annual energy demand of 109 KW.hr per square metre of floor area. Actual effective rates for customers will vary due to differences in energy performance from building to building.

NEU EXPERT PANEL INPUT

The Expert Panel established by Council provides staff with invaluable advice on many elements of the business of the NEU. In their annual letter to Council, as attached in Appendix D, the Panel has endorsed the 2017 rate increase of 3.2%. In accordance with established policy to strengthen the conservation price signal, the Expert Panel also agrees that this 3.2% increase should be allocated by a 2.7% increase to the Fixed Capacity Levy and a 4.0% increase to the Variable Energy Charge components of the rate structure.

Staff would like to acknowledge the contributions of the Expert Panel. Their advice helps to ensure that the rate increases recommended in this report reflect an appropriate balance between the need to recover the City's costs for operating the NEU and the customer's need to receive fair and competitive rates for energy services delivered.

FINANCIAL PERFORMANCE UPDATE

This section provides an update on the financial performance of the SEFC NEU, based on the commercial utility rate model, as well as a comparison of the customer rates against various benchmark utilities.

In June 2015, Council adopted key financial performance indicators ("KPIs") and targets for the SEFC NEU. These KPIs are used to track long-term financial performance of the utility, and to guide future rate setting. Table 2 below compares the KPIs associated with the levelized rate approach under the original forecast included in the 2010 rate report, the last forecast, and the current forecast.

The current forecast also includes a scenario that includes the use of Renewable Natural Gas ("RNG"). RNG can be produced at landfills, composting facilities and sewage treatment plants, and is typically treated then distributed via the Fortis BC natural gas network. The BC Utilities Commission ("BCUC") recently approved Fortis Energy Inc.'s application for a reduced rate for this energy source. The RNG scenario shown in Table 2 assumes that sufficient RNG is used to enable the SEFC NEU to achieve its 60% GHG reduction target, for the interim period until new permanent low carbon energy generating capacity is added to the system (see Environmental Implications section for more info on this).

Under both Current Forecast scenarios (with and without RNG), the SEFC NEU remains on target for all KPIs.

TABLE 2: SEFC NEU KPIs

	Original Forecast Feb '09	Last Forecast Nov '15	Current Forecast	Current Forecast using RNG as a Supplemental Energy Source
Maximum balance of under-recovered costs *Target: not to exceed $9.0 M*	$ 7.3 M	$ 8.2 M	**$ 8.3 M**	**$ 8.5 M**
Recovery timeline for under-recovered costs *Target: not to exceed 25 years*	22 years (2031)	16 years (2025)	**16 years (2025)**	**17 years (2026)**
Escalated rate increases[1] *Target: Rate Escalation Factor to be eliminated when annual revenues exceed annual costs*	3.2% thru 2021[2]	3.2% thru 2018	**3.2% thru 2018**	**3.2% thru 2018**

Notes to table
1. Includes mid-term average inflation of 2%
2. Original forecast maintained escalated rate increase over entire timeline, until 2035.

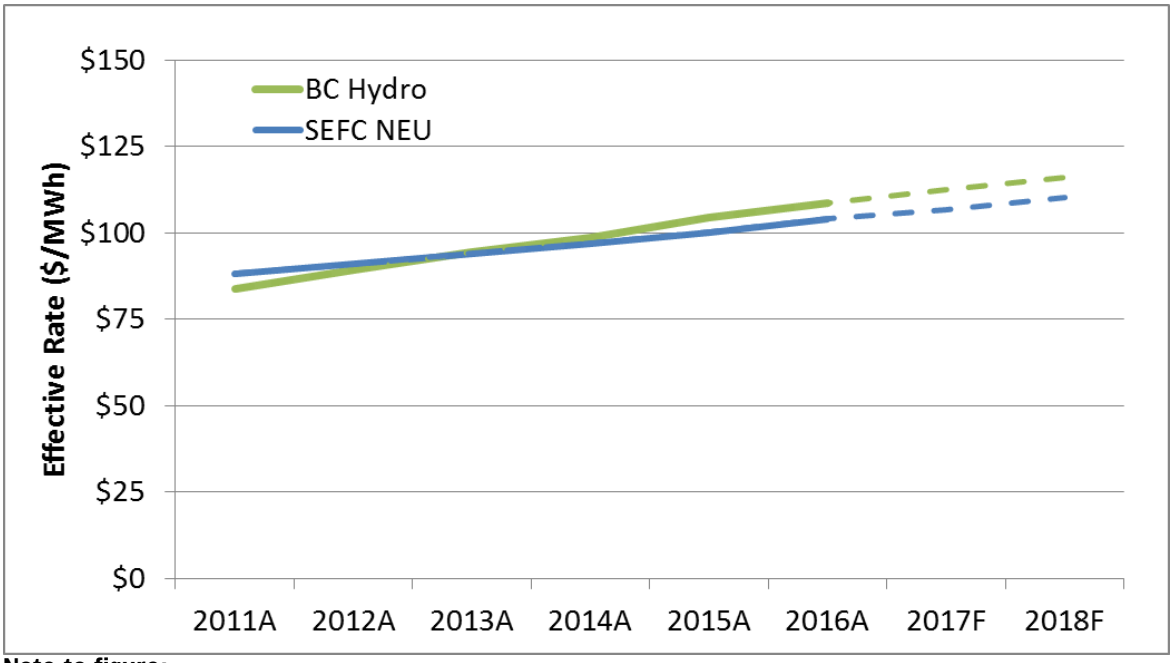
Impact of RNG on KPIs

An estimated 140,000 Gigajoules of RNG (equating to 7,000 tonnes CO_{2e} of GHG emission savings) is required between 2017-2020 to achieve the NEU GHG emission reduction target of 60% below Business-As-Usual[1]. Utilizing RNG to meet this demand is forecast to cost $700,000 over this time period, equating a carbon reduction cost of $100/tonne CO_{2e}. This cost can be recovered without any changes to the SEFC NEU rate forecast, and will extend the recovery timeline for under-recovered costs by approximately 1 year, which is within target. Therefore, RNG is viewed by staff as an economically viable bridging tool for meeting GHG emission reductions targets for the interim period until new permanent low-carbon energy supply capacity is added to the system.

Figure 3 shows the forecast SEFC NEU rates relative to the forecast effective electricity rates. Current projections indicate that SEFC NEU rates will be lower than BC Hydro rates over the remainder of the levelized rate period.

[1] Business-as-Usual is defined as the type of heating and domestic hot water system that would be installed in typical local construction in the absence of the NEU. It assumes electric baseboard heat for residential units and natural gas for ventilation air, domestic hot water and commercial/institutional spaces

FIGURE 3. FORECAST EFFECTIVE RATES ($/MW.H)



Note to figure:

1. Effective rate is based on a reference building with an annual energy demand of 109 KW.hr per m^2 of floor area. Actual effective rates for customers will vary due to differences in energy consumption.
2. BC Hydro rates are projected to increase consistent with the increases published in BC Hydro's 10-year Rate Plan, and at CPI thereafter.

Actual vs. Proforma 2016 Costs and Revenues

Table 3 compares 2016 revenues and expenses with the 2016 Operating and Capital Budgets. Offsetting variances in operating revenues and costs has resulted in a forecast operating budget shortfall that is $178k over budget.

The main differences between 2016 budget and the 2016 actuals projected to year-end are as follows:

- **Energy Use Charge Revenues:** forecast to be 7%, or $131,000 below budget. This is due to above-average temperatures experienced between January – June which resulted in reduced energy demand.

- **System Expansion Capital Costs**: forecast to be $600,000 over budget. This was largely the result of work being advanced from 2017 to 2016 to coordinate with site works at the Great Northern Way Campus lands and connection of a new office building not contemplated in the budget forecast. Design changes were also necessary to avoid conflicts with a future skytrain station planned at this location.

TABLE 3. 2016 NEU REVENUES AND EXPENSES, BUDGET COMPARED TO YEAR-END FORECAST ($000s) BASED ON THE COMMERCIAL UTILITY RATE MODEL

($ 000'S)	2016 BUDGET	2016 FORECAST	$ VARIANCE	% VARIANCE
Revenues				
Capacity Levies	2,521	2,500	(21)	(0.8%)
Energy Use Charges	1,818	1,687	(131)	(7.2%)
Total Revenues	**4,339**	**4,187**	**(152)**	**(3.5%)**
Operating Expenses				
Natural Gas & Electricity	1,238	1,238	-	-
Staffing, Maintenance, Overhead & Other	836	850	14	1.7%
Total Operating Expenses	**2,074**	**2,088**	**14**	**0.7%**
Financing Expenses				
Interest Expense	742	725	(17)	(2.3%)
Return on Equity	1,028	1,046	18	1.8%
Depreciation	744	755	11	1.5%
Total Financing Expenses	**2,514**	**2,526**	**12**	**0.5%**
Total Expenses	**4,588**	**4,614**	**26**	**0.6%**
Operating Shortfall, resulting from levelized rates	**249**	**427**	**178**	**71.5%**
System Expansion Capital Costs	**1,029**	**1,647**	**618**	**60.1%**

Comparison of NEU Rates to Other Energy Providers

One of Council's approved governance principles is that *"... the utility 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."*

To assess the competitiveness of the NEU, staff examined what a typical NEU customer would pay compared with other energy providers. Table 4 includes comparisons with BC Hydro, FortisBC natural gas, and a range of district energy providers.

Because the rate structures and type of service of these energy providers vary, an "effective rate" is calculated for the purposes of comparison. This rate illustrates what customers will pay per megawatt-hour for heating. Based on the recommended rate increase of 3.2%, the proposed 2017 effective rate for the NEU is $106 per MW.h. This effective rate assumes an average residential customer would consume 109 kilowatt hours per square metre of floor area annually, regardless of what energy provider they use.

The 2017 NEU effective rate continues to be well within the target maximum 10% premium over electricity. The proposed 2017 NEU rate is 6% lower than the forecast 2017 BC Hydro effective rate.

The proposed 2017 NEU effective rate will be 23% higher than the cost of using high efficiency natural gas boilers. This is based on the current natural gas commodity price which is at a near historical low and is subject to significant change from year to year. The NEU offers more stable and predictable rates compared to natural gas, and much lower GHG emissions.

TABLE 4. COMPARISON OF EFFECTIVE RATES, SEFC NEU WITH OTHER PROVIDERS

Energy Provider	GHG Emission Intensity (kg CO_2/MW.h)	Estimated Effective Rate [1] ($/MW.h)	Year of Effective Rate	Notes
SEFC NEU (Hot Water)	66	$106	Proposed 2017	The NEU bills strata corporations, not individual suites; any incremental strata sub-metering costs incurred by NEU consumers are not included here.
BC Hydro (Electricity)	24[2]	$113[2]	Proposed 2017	BC Hydro effective rate calculation is based on 50% of consumption at BC Hydro's Residential Step 1 Rate and 50% at Step 2, and includes a rate rider.
FortisBC (Natural Gas)	220[3]	$86[3]	2016	Fuel costs, based on FortisBC Lower Mainland Rate 3, with high efficiency boiler and factoring in conversion losses = $36 per MW.h. Installation and replacement of boiler equipment plus maintenance = $50 per MW.h. Total effective cost = $86 per MW.h
Creative Energy Ltd. (Steam)	300[3]	$60	Proposed 2017	Actual effective rate for this Downtown steam system varies depending on size of building and building efficiency of converting steam to energy. Rates fluctuate with the commodity price of natural gas.
UBC Campus system (Steam/Hot Water)	208 173 (2018)	$98	2015	GHG intensity of UBC campus system reflects 15% of energy from biomass, and remainder from natural gas. UBC is in the process of converting from steam to a more efficient hot water system, which will further reduce GHG intensity. This institutional NES is not operated on a commercial basis.
SFU UniverCity Energy (Hot Water)	220 (Existing) 43 (2018)	$117[4]	2017	SFU UniverCity Energy operations began 2012, using a temporary natural gas boiler. This system will utilize a biomass facility for low carbon energy supply once customer base is sufficiently established (forecast 2018).
River District Energy (Hot Water)	220 (Existing) 32 (Future at time of WTE connection)	$108[4]	2016	River District Energy operations began 2012, using a temporary natural gas boiler, and plans to use waste heat from the existing Metro Vancouver Waste to Energy Facility (Burnaby) once customer base is sufficiently established.
Richmond Oval Village District Energy (Hot Water)	220 (Existing) 23 (2026)	$86	2016	Oval Village District energy operations began 2015, using a natural gas boiler, and plans to use Sewer Heat Recovery once customer base is sufficiently established (forecast 2026)

Energy Provider	GHG Emission Intensity (kg CO_2/MW.h)	Estimated Effective Rate [1] ($/MW.h)	Year of Effective Rate	Notes
Surrey City Energy (Hot Water)	220 (Existing) 53 (2024)	$105	2016	Surrey City Energy operations began in 2015, using temporary natural gas boilers. This system will use an undetermined proportion of renewable natural gas beginning in 2017, and plans to implement a wood waste fuelled energy centre in 2024.
PCI Marine Gateway (Heating & Cooling)	58	$120[4]	2017	The PCI Marine Gateway development will utilize a geo-exchange heating and cooling system, which will be provided by FortisBC Alternative Energy Services.

NOTES TO TABLE

1. Effective rate estimates are based on a reference building with an annual energy demand of 109 KW.hr per m^2 of floor area. Actual effective rates for customers will vary due to differences in energy performance from building to building.

2. Although B.C. Hydro's electricity is on-average a low carbon energy source, new electricity demand is largely served by sources that have a much higher production cost than BC Hydro's retail customer rates (e.g. proposed Peace River Site "C' project has a production cost of ~$120 per MW.hr, not including BC Hydro's transmission, distribution and billing costs). Also, electric baseboard heat is generally used in conjunction with natural gas for ventilation air and hot water, and that natural gas typically supplies more than 50% of the building heat demand.

3. FortisBC, UBC Campus and Creative Energy Steam rates are largely dependent on the commodity cost of natural gas, which is currently at a near historical low and subject to natural gas commodity price volatility. The GHG emission intensity as reported in Table 4 reflects provincial standard methods for calculating GHG emissions, and does not include upstream emissions associated with the extraction and transportation of natural gas.

4. Estimated effective rates sourced from BC Utilities Commission rate filings, which are based on modeled energy performance of buildings served by the reference systems. A high estimated effective rate does not necessarily imply that the customer's total cost of heating will be high, because some new developments consume significantly less energy than others.

Implications/Related Issues/Risk

Financial

As noted above, staff recommends a 3.2% increase to the NEU customer rates for 2017 to be achieved by increasing the Fixed Capacity Levy by 2.7% and the Variable Energy Charge by 4.0%. This recommended increase is in accordance with the Council approved rate setting framework established in July 2015, and is also consistent with the rate forecasts from previous years.

The potential use of RNG to meet the NEU GHG emission reduction target of 60% below Business-As-Usual will be managed within the rates and key performance indicators established for the utility.

Environmental

The SEFC NEU derives most of its thermal energy production from a process that recovers waste heat from sewage, with the remaining energy supplied by high-efficiency natural gas

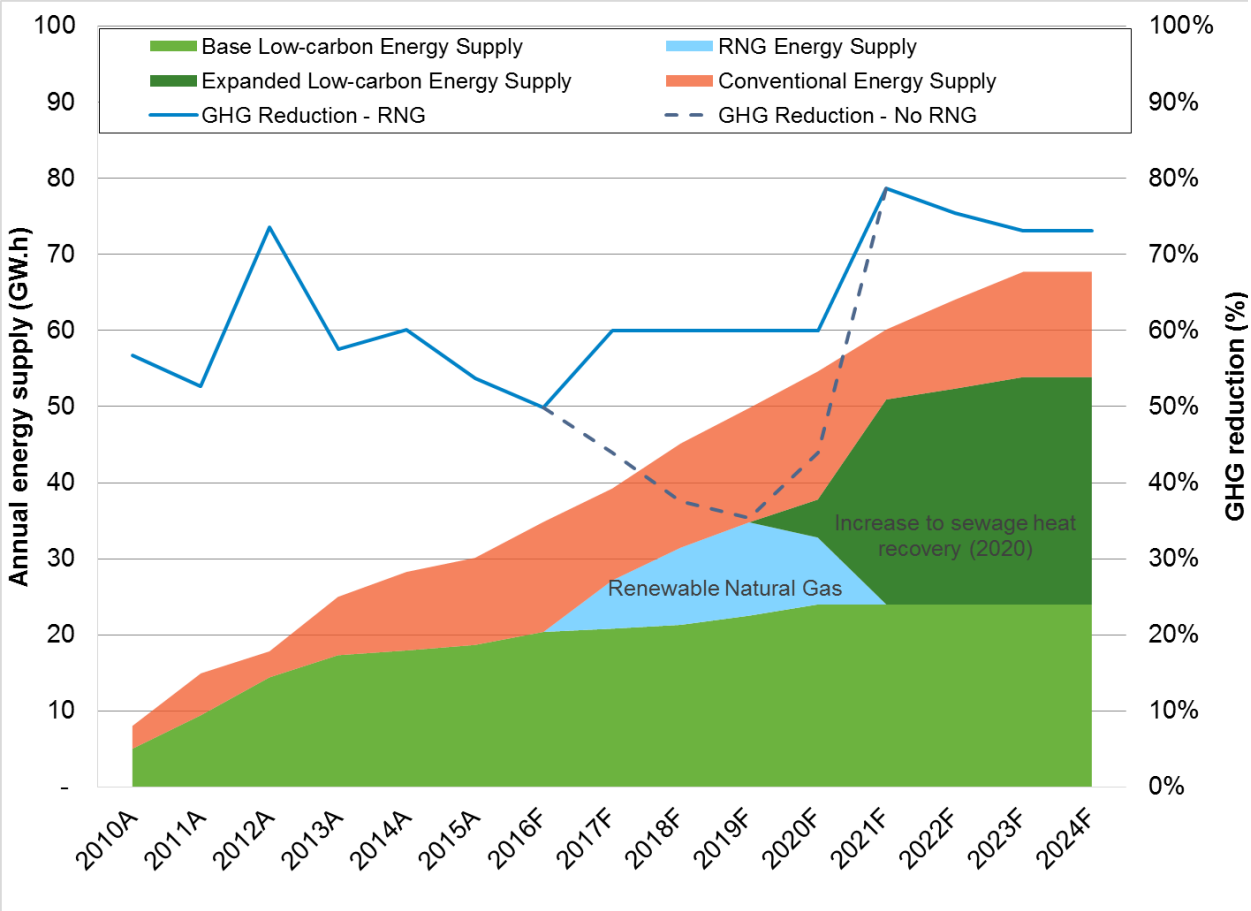
boilers. It seeks to achieve a 60% GHG reduction compared to conventional heating systems. This target is based on 70% of the annual energy supply coming from the sewage heat recovery process. While the system has consistently achieved this target in the early years, in 2016 it is anticipated that the GHG emissions will be 47% below target, which is 13 points below the long-term target.

This below-target performance has always been expected in the SEFC NEU business plan. This is a short-term situation which is the result of new customers being added to the system before expansion of the sewage heat recovery system is economical. Beginning in 2020, through growth in the customer base, revenues are expected to be sufficient to finance the expansion of the sewage heat recovery capacity at the False Creek Energy Centre, which will enable the NEU to achieve its long-term GHG reduction targets. Staff will continue to monitor the timing for the expansion and evaluate other potential low carbon energy sources to optimize the environmental and economic performance of the utility.

As described in the Financial Performance Update, there is a new economically viable opportunity to use RNG as a supplemental fuel for the interim period until new permanent low carbon energy capacity is added to the SEFC NEU. Based on current forecast, and subject to Council approval of the 2017 Operating Budget, the utility is expected to achieve its 60% GHG reduction target in 2017. This interim use of RNG is expected to reduce CO_2 emissions by an additional 7,000 tonnes between 2017-2020.

Figure 4 below illustrates the forecast sources of energy supplied to meet customer loads and the projected annual GHG reduction.

FIGURE 4: SEFC NEU ENERGY SUPPLY & GHG REDUCTION FORECAST



[1] Represents CO2 reduction as compared to conventional heating approach

At the time of SEFC build-out, when the NEU is forecast to serve 758,000 square metres (8,160,000 square feet) of residential, commercial and institutional floor area, GHG emissions are forecast to be reduced by 10,400 tonnes CO_2 annually compared to Business-as-Usual[2]. This is a 37% improvement over the 2011 long-term forecast reduction of 7,600 tonnes CO_2 annually, and is due to expansion of the NEU service area, increases to SEFC floor area, and long-term capacity to source a greater proportion of energy from sewage heat recovery than was anticipated in prior years.

CONCLUSION

This report recommends that SEFC NEU rates be increased by 3.2% in 2017. This proposed increase is consistent with Council's approved rate-setting principles and methodology, and enables the NEU to recover its long-term costs under the commercial utility rate model while providing stable and competitive energy rates for customers. This increase will be allocated to the Capacity Levy and the Energy Charge in a manner consistent with the conservation rate setting policy approved by Council in April 2014.

The NEU continues to be an important contributor to the City's work in achieving the Greenest City goals and carbon-reduction targets.

* * * * *

[2] Business-as-Usual is defined as the type of heating and domestic hot water system that would be installed in typical local construction in the absence of the NEU. It assumes electric baseboard heat for residential units and natural gas for ventilation air, domestic hot water and commercial/institutional spaces

APPENDIX A
ENERGY UTILITY SYSTEM BY-LAW DRAFT AMENDMENT

BY-LAW NO. _____

A By-law to amend Energy Utility System By-law No. 9552
Regarding Updates to Levies and Charges

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 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 4.1(b) (i), (ii), and (iii) that exceeds 65 W per m^2	$1.50

PART 2 – Monthly levy

Class 1 - SEFC residential or mixed use residential building	$0.540 per m^2
Class 2 - Residential or mixed use residential building located outside SEFC	$8.115 per KW of peak heat energy demand
Class 3 - Non-residential building	$8.115 per KW of peak heat energy demand

PART 3 – Monthly charge

Monthly charge	$47.214 per MW per hour

PART 4 – Credit

Credit for heat energy returned to energy transfer station	$47.214 per each MW per hour multiplied by 50%

”

3. 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.

4. This By-law is to come into force and take effect on January 1, 2017.

ENACTED by Council this day of , 2016

Mayor

City Clerk

EXPLANATION

A By-law to amend the Energy Utility System By-law
Re: Levies and Charges

On December 13, 2016, Council resolved to amend the Energy Utility System By-law to establish updated Levies and Charges effective January 1, 2017. Enactment of the attached By-law will implement Council's resolution.

Director of Legal Services
December 13, 2016

APPENDIX B
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.

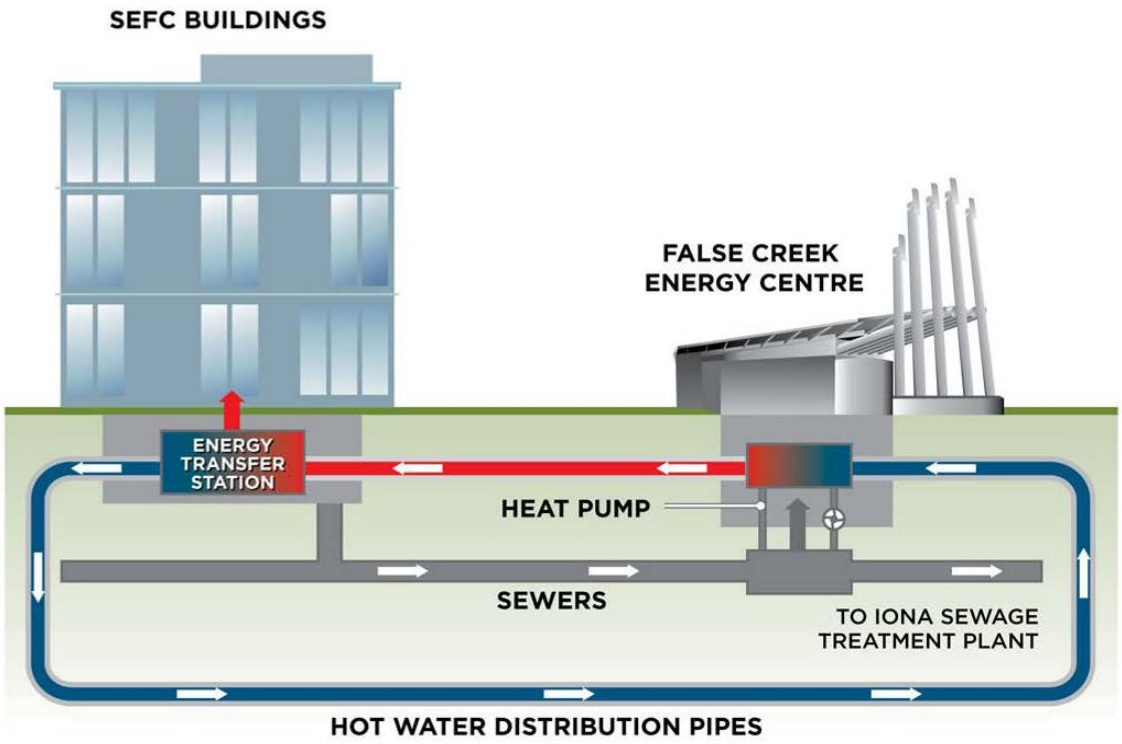
In summary, there are four components to the NEU's infrastructure, illustrated in Figure 1 below.

- *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). In June 2012 this service area was expanded to also include the Great Northern Way Campus and Adjacent Lands in the False Creek Flats South area.

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.

Energy Utility System Bylaw

On November 15, 2007, Council enacted the Energy Utility System Bylaw No. 9552. On March 5, 2009, Council approved amendments to the Bylaw, including the establishment of 2009 rates and fees for the NEU.

In June 2012, Council approved the amendment to the Bylaw to expand the SEFC NEU service area to include the Great Northern Way Campus Lands and adjacent lands in the False Creek Flats South Area.

Expansion in Southeast False Creek

Southeast False Creek is well suited to implementation of the NEU, because the size and density of the neighbourhood development provide an adequate customer base to make the system economically feasible.

The NEU's service area extends to all of the SEFC Official Development Plan area, the Great Northern Way Campus and adjacent lands in the False Creek Flats South area. At build-out, the system is forecast to serve 758,000 square metres (8,160,000 square feet) of floor area.

As with the Telus World of Science and Great Northern Way Campus, the City may extend the NEU system to serve properties outside of SEFC in cases where the new customer rate revenues are sufficient to fund the associated capital and operating costs.

APPENDIX C
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 customers:

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.

November 10, 2016

APPENDIX D - LETTER FROM THE CITY OF VANCOUVER NEIGHBOURHOOD ENERGY EXPERT PANEL, REGARDING 2017 PROPOSED SEFC NEU RATES

Mayor and Council
City of Vancouver
453 W. 12th Ave.
Vancouver, B.C. V5Y 1V4

Re: Southeast False Creek Neighbourhood Energy Utility (SEFC NEU) – 2017 Customer Rates

Dear Mayor Robertson and Councilors,

The purpose of this letter is to advise Council of the opinion of the independent Neighbourhood Energy Expert Rate Review Panel on the rates proposed to be charged by SEFC NEU to its customers for calendar 2017.

The Expert Rate Review Panel met with City staff on October 6, 2016 and has reviewed a draft "Administrative Report to Council" and considered the proposed customer rates for 2017.

The Expert Rate Review Panel's comments are restricted to matters relating to the rate structure and rates to be charged by the NEU. The Panel has not considered extraneous matters for Council's consideration, such as the use of Renewable Natural Gas in place of natural gas as this issue is beyond the scope of the Panel's mandate.

Based on the information provided in the draft Report and discussions with City staff, the Panel supports the proposed rates for 2017. These rates reflect a total rate increase of 3.2% above 2016 rates for all customer classes, including an inflationary adjustment of 2%. The Panel also supports the proposed allocation of the rate increases as between the fixed component (2.7%) and the variable component (4.0%) of the rates. The Panel agrees that such an allocation will provide an improved conservation price signal (as cost to the customer is more strongly connected with usage) while continuing to ensure appropriate cost recovery in accordance with the commercial utility rate model.

The Panel also notes that the proposed 2017 rates are not inconsistent with rates charged by other neighbourhood energy utilities, and remain beneath those charged by BC Hydro. The Panel is satisfied that a total rate increase of 3.2% including inflation represents a relatively modest increase, contributing to the objective of stable and predictable rates.

The Panel is also satisfied that the proposed rate increase is in keeping with other key parameters in that the forecast cumulative balance of under-recovered costs is projected to remain beneath the target maximum of $9.0 Million and the recovery timeline under the levelized rate approach is well within the target maximum of 25 years.

The Panel would also like to take this opportunity to thank City staff for its assistance and cooperation during the review process.

Yours truly,

Alison Rhodes
Chair, SEFC NEU Expert Rate Review Panel