CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Report Date:	December 3, 2013
Contact:	Brian Crowe
Contact No.:	604.873.7313
RTS No.:	10346
VanRIMS No.:	08-2000-20
Meeting Date:	December 10, 2013

TO: Standing Committee on City Finance and Services

FROM: General Manager of Engineering Services

SUBJECT: Southeast False Creek Neighbourhood Energy Utility (SEFC NEU) 2014 Customer Rates

RECOMMENDATION

A. 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 2014 customer rates and fees, with a 3.22% increase over 2013 customer rates;

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

B. THAT Council direct staff to report back by April 30, 2014 with a recommended approach to adjusting the SEFC NEU rate structure starting in 2015 to improve the energy conservation price signal.

REPORT SUMMARY

This report seeks Council approval of the recommended 2014 NEU customer rates, which incorporates a 3.22% increase over 2013. 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.

The proposed 3.22% rate increase is generally supported by the NEU Rate Review Panel. However, the Rate Review Panel in its letter of November 26 2013 recommends that the rate increase be applied wholly to the variable Energy Charge component of the NEU rate, to strengthen the consumption related energy conservation price signal. Staff are supportive of strengthening the price signal, and will report back to Council with a recommended implementation strategy for 2015.

This report also provides a business and environmental performance update, factoring in the growth of the NEU service area and the best available estimates for the forecast cost of electricity. Based on this analysis, rates are forecast to escalate at 3.22% annually until 2015, and at 2.0% annually from 2016 onwards. This is an improvement compared to last year's rate forecast of 3.22% until 2019, and 2.0% from 2020 onward. These estimates will be revised as new information becomes available, and staff notes that the Rate Review Panel has cautioned us about uncertainty in the rapidly changing environment of the energy sector.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

In December 2006, Council approved a set of governance and rate-setting principles for the SEFC NEU, including direction 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 (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 a third-party Expert Rate Review Panel (referred to as the "Rate Review 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. The terms of reference of the Rate Review Panel can be found in Appendix E, and a letter from the Panel Chairperson advising on the 2014 rates in Appendix F.

In June 2012, Council approved the amendment of the *Energy Utility System By-law* 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.

On October 3, 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 deployment of sustainable energy systems for high-density neighbourhoods.

REPORT

Background/Context

Neighbourhood Energy Systems (NES) like the NEU are shared infrastructure platforms which provide heating and/or cooling infrastructure for multiple buildings, and are most suitable in dense urban areas. NES provide the utility business model and economy of scale necessary to make use of a variety of renewable energy resources that are often not available or affordable to implement in individual buildings. These district-wide systems are also capable of serving both new development and existing

gas-heated buildings. Worldwide, NES are undergoing a renaissance in urban development as a result of growing concerns about climate protection, energy security and economic resiliency.

Energy used by buildings generates 55% of Vancouver's total greenhouse gas emissions. A high priority strategy of the Greenest City 2020 Action Plan is to pursue NES for high-density mixed-use neighbourhoods. With a target to achieve a 120,000 tonne/year CO_2 reduction by 2020, the Strategic Approach to Neighbourhood Energy focuses on the following areas of opportunity:

- Converting existing steam heat systems to low carbon energy sources.
- Establishing new systems to serve high density areas undergoing rapid development.
- Expanding established systems to serve existing buildings

The fundamental goal of the SEFC NEU is to minimise 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 CO_2 per year.

The SEFC NEU began operation in January 2010, initially providing energy for heat and hot water to The Village on False Creek and one adjacent development. Since then, the NEU system has been expanded to serve new developments in SEFC, and by the end of 2013 will be connected to 320,000 square metres (3,500,000 square feet) of residential, commercial and institutional floor area, including the Telus World of Science. 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 690,000 square metres (7,400,000 square feet) of floor area.

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

Rate Structure

SEFC NEU 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).

The NEU has been designed with a levelized rate structure ("commercial utility rate model"), which means that rates are set to *under-recover* infrastructure financing costs in the early years of the NEU's operations, and then build gradually over time so that over the long-term, all of the NEU's costs and a modest return on investment are fully recovered via rate revenues. Initial operating cash shortfalls that result from using this commercial utility rate-setting approach are financed using a Rate Stabilization Reserve, which is essentially serving as a line of credit for the utility and

is financed from the Capital Financing Fund. This rate-setting approach is commonly used by privately owned utilities regulated by the BC Utilities Commission, including the SFU UniverCity Energy system and River District Energy located in south-east Vancouver.

Consistent with this rate-setting approach, annual rate increases are made up of two components: an inflationary increase plus the Rate Escalation Factor. The Rate Escalation Factor is applied to customer rates over and above annual inflation to gradually increase rates over time, and eventually recover early-year cash shortfalls through later-year revenues. Using this approach enables the NEU to maintain rates that are over the long term cost-competitive with other energy providers, whose rates tend to escalate at a rate that exceeds core inflation.

If this rate-setting approach were not taken, customer rates would have to be much higher in the early years of the utility's operations, as fixed costs would be distributed over a relatively small initial customer base. This approach also ensures that the NEU infrastructure financing costs are more equitably distributed between the initial customers of the system and those that connect in later years. Further details on the rate-setting methodology are described in Appendix D.

To ensure that the SEFC NEU continues to maintain stable customer rates and the appropriate investment returns to the City, staff will continue to monitor uptake (rate at which new SEFC buildings are developed and connected to the NEU), operating costs and inflation and recommend annual adjustments to rates as appropriate.

Strategic Analysis

2014 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 between different customers, based on a cost of service model. Details on these rate classes are provided in Appendix D.

Staff recommends that SEFC NEU customer rates for all three rate classes be increased by 3.22% over 2013 rates, as shown in Table 1. As in prior years, staff recommends that for 2014, this 3.22% increase be uniformly distributed between the fixed Capacity Levy and variable Energy Use Charge components of the rate. This uniform allocation of the increase to the Capacity Levy and Energy Charge has helped the NEU maintain stable and predictable revenues during the initial years of operation when energy demand was less predictable.

A 3.22% increase is equivalent to a 1.22% real rate increase to customers above a forecast average inflation rate of 2.0% over the next four years (source: *Conference Board of Canada Metropolitan Outlook – Autumn 2013*). This 1.22% above inflation value is the Rate Escalation Factor required to maintain the levelized rate structure

over time, and keep the NEU on track to achieve long term financial targets (see Table 2 for information on financial targets).

A 3.22% increase is consistent with Council's approved rate-setting methodology and principles, and the overall increase is supported by the NEU Rate Review Panel. However, as described below under the section titled "NEU Rate Review Panel Input" the Rate Review Panel would prefer that the increase for 2014 only be applied to the variable Energy Use Charge component of the rate.

Applied as recommended by staff, this 3.22% increase will result in a cost increase of $25 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 2013 AND RECOMMENDED 2014 CUSTOMER RATES

	2013	2014 PROPOSED	% CHANGE 2014/2013
Class 1 (Residential and Mixed Use Residential within SEFC)			
Capacity Charge (per square meter per month)	$0.484	**$0.500**	3.22%
Energy Use Charge (per MW.h)	$40.664	**$41.973**	3.22%
Class 2 (Residential and Mixed Use Residential Outside SEFC) and Class 3 (Non-Residential)			
Capacity Charge (per KW peak energy demand per month)	$7.276	**$7.510**	3.22%
Energy Use Charge (per MW.h)	$40.664	**$41.973**	3.22%

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.

NEU RATE REVIEW PANEL INPUT

The NEU Rate Review Panel established by Council provides staff with invaluable advice on many elements of the business of the NEU. In their annual letter to Council, the Panel has outlined their recommendations and advice on several issues which staff discuss in the appropriate sections of this report. The Panel has reviewed and endorses the 2014 rate increase of 3.22% recommended in this report. However, while in prior years the distribution of this increase has been applied as an equal percentage to both the fixed Capacity Levy and the variable Energy Charge, the Rate Review Panel recommends a change to this structure in 2014.

In its letter, the Rate Review Panel states "for 2013, 63% of total revenues will come from (fixed) Capacity Levies, which are unaffected by conservation efforts and, by extension, offer no incentive for customers to conserve energy". The Rate Review Panel recommends "that the entire 2014 increase be applied to the (variable) Energy Charge in order to improve the price signal to the NEU customers and thereby encourage conservation."

Staff are supportive of strengthening the price signal of the variable Energy Charge, particularly with a view to its potential impact on energy conservation. However, a change of this magnitude will require more robust scenario planning in regard to the business plan projections for NEU over the coming years as well as the impact on users. Staff have committed to pursue this work over the first 6 months of 2014 and ensure we are informed for rate setting in 2015 and beyond in terms of the energy conservation signal. Given that we are currently ahead of our GHG reduction targets, staff feel comfortable with recommending this to Council.

FINANCIAL PERFORMANCE UPDATE

This section provides an update on the financial performance of the SEFC NEU, based on the commercial utility rate model, with updated capital and operating costs, financing costs, electricity and natural gas price projections, as well as rates at which buildings are expected to be developed and connected to the SEFC NEU (referred to in this report as "uptake," which is directly related to the timing of real estate development in SEFC).

Since the last financial performance update was presented to Council in November 2012, a number of variables have changed in the business outlook. Electricity and natural gas spending forecasts have increased, but have been offset by an increased forecast rate of uptake and a larger forecast service area customer base at build-out.

Changes that reduce business performance:

- *Energy Costs*: The NEU uses electricity to operate the sewage heat recovery process and natural gas for peaking and backup-energy supply. While BC Hydro has not provided a rate forecast, recent information released by BC Hydro and the BC Government indicate that BC Hydro will require substantial rate increases to satisfy revenue requirements. The NEU Rate Review Panel has recommended that the NEU business forecast factor in a BC Hydro rate that increases by 10% per year for the next five years. This assumption will be updated when BC Hydro publishes a long-term rate forecast.

  The NEU also uses natural gas for approximately 30% of its energy supply. Since 2012, the cost of natural gas has increased by 5%.

Changes that improve business performance:

- *Uptake:* Due to an increase in building activity, the rate of uptake has increased slightly over the December 2012 forecast. Since last year, the amount of projected floor area served by the NEU at build-out has increased by 9%, due to greater densities forecast for new developments.

The net impact of these changes to the financial performance of the SEFC NEU based on the commercial utility rate model is described in Table 2. Given current forecasts, all of the long term financial metrics reported in Table 2 are on target. However, as described in the Rate Review Panel Letter (Appendix F), the Rate Stabilization Reserve will approach its Council authorized limit of $8 million over time. Utility costs and revenues, and the corresponding impact to the Rate Stabilization Reserve, will be monitored closely and energy rates will be adjusted as appropriate.

TABLE 2. CHANGES TO LONG TERM FINANCIAL METRICS BASED ON THE COMMERCIAL UTILITY RATE MODEL

FORECAST	ESCALATION RATE REQUIRED TO ACHIEVE TARGETS[5]	INTERNAL RATE OF RETURN (IRR)[1]	FIRST YEAR REVENUES > EXPENSES[2]	PEAK DRAW ON RATE STABILIZATION RESERVE[3]	NET PRESENT VALUE OF RATE STABILIZATION RESERVE[4]
Targets	**n/a**	**6.7 %**	**n/a**	**maximum = ($8.0 M)**	**$0 M**
March 2009 Forecast	3.15%	6.7 %	2021	($7.3 M)	$0 M
October 2012 Forecast[5]	3.22% until 2019 2.00% after 2020	6.7 %	2020	($8.0 M)	$0.3 M
Current Forecast	3.22% until 2015 2.00% after 2016	6.8 %	2016	($8.0 M)	$1.0 M

NOTES TO TABLE

1. IRR: the projected internal rate of return for all NEU cash flows over a 25 year period, beginning in 2010, which includes the terminal value of NEU assets at the end of the 25 year period. The target IRR is 6.7%, which matches the NEU weighted average cost of capital.
2. First Year Revenues Exceed Expenses: includes all NEU costs considered in the commercial utility rate model.
3. Peak Draw on Rate Stabilization Reserve: includes all NEU costs considered in the commercial utility rate model. In March 2009 Council authorized financing of up to $8 M to cover the maximum peak draw anticipated at that time based on the rate stabilization reserve model (RTS#07292).
4. Net Present Value of Rate Stabilization Reserve: includes all projected yearly deficits and surpluses, calculated over a 25 year period beginning in 2010 based on commercial utility rate model. The target value is zero, which is achieved when customer rate revenues fully recover all costs over a 25 year period.
5. Escalation Rate includes both forecast core inflation and the forecast Rate Escalation Factor.

As a result of improvements to the business performance forecast, in the long term rates will not likely need to escalate as rapidly as per previous forecasts. However, any reduction to the escalation rate will not occur before 2016, to ensure that the Rate Stabilization Reserve limit, as set by Council, is not exceeded. Rates are now forecast to continue escalating at 3.22% until 2015, and from 2016 onwards at 2.00% (core inflation). In comparison, the December 2012 NEU Rate report forecast rates to escalate at 3.22% until 2019. These estimates will be revised as new information becomes available, and staff notes that the Rate Review Panel has cautioned us about uncertainty in the rapidly changing environment of the energy sector.

An update to the 30-year detailed cash flow projection based on the commercial utility rate model is included in Appendix H. This cash-flow projection includes yearly forecasts for capital and operating costs and revenues.

Actual vs Budgeted 2013 Costs and Revenues

Table 3 compares 2013 revenues and expenses with the 2013 Operating and Capital Budgets. The main differences between 2013 budget and the 2013 actuals projected to year-end at the time of this report are as follows

- *Operating Revenues:* Revenues are 18% or $476,000 under budget. The Rate Review Panel raised concern in regard to this variance and has emphasized the importance of reliable revenue forecasts . The revenue variance for 2013 relates to the overestimation of revenues related to bringing on line three new customer buildings in 2013 as well as lower than forecast energy use due to warm weather. Staff agree that our modelling needs to be more robust and the rate model has been updated to incorporate more accurate monthly forecasting of future revenues and refined demand assumptions.

- *Operating Shortfall:* the operating shortfall as a result of the decreased revenues has in part been offset by operating savings, and will be financed from the Rate Stabilization Reserve which as a result is forecast to be 41% or $432,000 over budget.

TABLE 3. 2013 NEU REVENUES AND EXPENSES, BUDGET COMPARED TO YEAR-END FORECAST ($000s) BASED ON THE COMMERCIAL UTILITY RATE MODEL

	2013 BUDGET	2013 FORECAST TO YEAR-END	$ OVER BUDGET (UNDER BUDGET)	% OVER BUDGET (UNDER BUDGET)
	2013 OPERATING BUDGET			
REVENUES				
Capacity Levies	$1,765	$1,388	($377)	(21%)
Energy Use Charges	$907	$808	($99)	(11%)
Total Revenues	$2,672	$2,196	($476)	(18%)
EXPENSES				
Fixed Operating Costs	$881	$812	($69)	(8%)
Variable Operating Costs	$725	$740	$15	2%
Financing Costs including Return on Equity	$2,112	$2,122	$10	0%
Total Expenses	$3,718	$3,674	($44)	(1%)
OPERATING SHORTFALL (TO BE FINANCED FROM RATE STABILIZATION RESERVE)	**$1,046**	**$1,478**	**$432**	**41%**
	2013 CAPITAL BUDGET			
Capital Expenditures	$853	$805	($48)	(6%)

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 test 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 3.22%, the proposed 2014 effective rate for the NEU is $97 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 2014 NEU effective rate continues to be well within the target maximum 10% premium over electricity. The proposed 2014 NEU rate is 7% lower than the forecast 2014 BC Hydro effective rate.

The proposed 2014 NEU effective rate will be 11% 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 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	$97	Proposed 2014	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]	$95[2] $104[2]	2013 Proposed 2014	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]	$87[3]	2013	Fuel costs, with high efficiency boiler and factoring in conversion losses = $38 per MW.h. Installation and replacement of boiler equipment plus maintenance = $49 per MW.h. Total effective cost = $87 per MW.h
Central Heat Distribution Ltd. (Steam)	300[3]	$56[3]	Proposed 2014	Actual effective rate varies depending on size of building and building efficiency of converting steam to energy. Rates fluctuate with the commodity price of natural gas.
SFU UniverCity Energy (Hot Water)	220 (Existing) 43 (Future)	$148[4]	2014	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.
River District Energy (Hot Water)	220 (Existing) 32 (Future)	$100[4]	2014	River District Energy operations began 2012, using a temporary natural gas boiler. This system will use waste heat from the existing Metro Vancouver Waste to Energy Facility (Burnaby) once customer base is sufficiently established.
PCI Marine Gateway (Heating & Cooling)	58 (Future)	$109[4]	2015	The PCI Marine Gateway development will utilize a geo-exchange heating and cooling system, which will be provided by FortisBC Alternative Energy Services. Development is expected to be completed in 2015.

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 from high-carbon imported electricity, or new high-cost low carbon sources (e.g. proposed Peace River Site "C' project). 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. The estimated 2014 rate is based on an assumed 9% increase, as communicated by news release by the Province of BC on November 26, 2013.
3. FortisBC and Central Heat Distribution Ltd current rates are largely dependent on the commodity cost of natural gas, which is currently at a 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 recommend a 3.22% increase to the NEU customer rates for 2014. 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. With this increase, the $8 million limit on the Rate Stabilization Reserve will not be exceeded in 2014.

Staff acknowledge the request of the Rate Review Panel to provide additional information to demonstrate that the Rate Stabilization Reserve will not exceed its Council authorized limit of $8 million. In 2009, Council authorized a maximum limit of $8 million for the Rate Stabilization Reserve based on the City's financing model which considered the anticipated financing structure and revenue and cost forecast at that time. As a municipality, the City has a different capital financing structure compared to a commercial utility provider. As such, staff has been diligent in ensuring that the authorized limit of the Rate Stabilization Reserve is not exceeded under the commercial utility rate model (for rate-setting purposes) as well as the City's internal financing model. Given the significant growth to the NEU's customer base and associated capital requirements, staff will undertake further analysis to determine whether $8 million continues to be the appropriate limit for the Rate Stabilization Reserve and will provide greater clarity in future reporting of the annual reserve balance.

Staff agree with the Rate Review Panel's recommendation that policies on risk compensation (return on the City's investment in the NEU) and the deemed financing rate for the Rate Stabilization Reserve remain unchanged until after the ownership

decision is made. Considering that the City may choose at a future date to divest the NEU, it will be prudent to continue to set rates based on the commercial utility rate model as the core model for the ongoing operations of the NEU until the ownership review is completed.

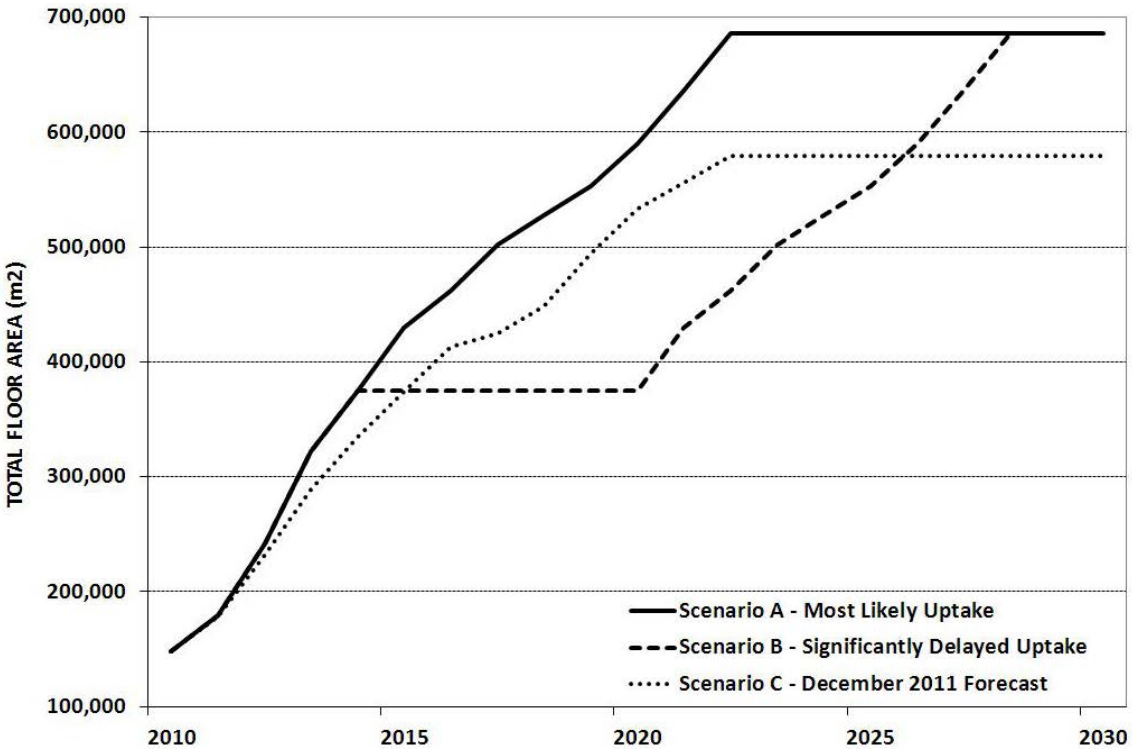
Sensitivity Analysis

This section provides a summary of the sensitivity analysis undertaken to evaluate the impact of the rate of uptake (pace that new buildings connect to the NEU) over the coming years. Since connection to the utility is mandatory within the service area, uptake depends largely on the rate of development. This analysis compares two scenarios:

- *Scenario A. Most likely uptake forecast* – This is the scenario that represents the most likely uptake pattern over the next twenty-five years.

- *Scenario B. Significantly delayed uptake* – This is the scenario that staff believes is a plausible worst case scenario, assuming no further development in Southeast False Creek until 2020, with ultimate connected load reaching the same levels as Scenario A by 2028.

FIGURE 1. FORECAST NEU LOAD ("UPTAKE"), MOST LIKELY VS. SIGNIFICANTLY DELAYED SCENARIOS



This sensitivity analysis assumes no change to the current forecast rate increases, with 3.22% increase forecast until 2019, and 2.00% from 2020 onwards. For the two scenarios, this analysis compares:

- the twenty-five year internal rate of return, or IRR for the utility,

- the length of time it takes for the SEFC NEU annual revenues to exceed annual expenses under the commercial utility rate model,
- the amount of the peak draw from the Rate Stabilization Reserve (to fund the operational cash shortfall in the early years of operations), and
- the estimated annual increase to customer rates required to maintain a maximum peak draw on the Rate Stabilization Reserve of $8 M.

The results of this sensitivity analysis are summarized in Table 5. These results show that while the SEFC NEU business performance is sensitive to uptake, upward adjustment of rates could compensate for the slower uptake and control the size of the peak draw on the Rate Stabilization Reserve at $8 M.

TABLE 5. RESULTS OF SEFC NEU SENSITIVITY ANALYSIS BASED ON THE COMMERCIAL UTILITY RATE MODEL (ALL RESULTS ARE ESTIMATES)

SCENARIO	INTERNAL RATE OF RETURN (IRR)	FIRST YEAR REVENUES > EXPENSES[1]	PEAK DRAW ON RATE STABILIZATION RESERVE IF ANNUAL RATE INCREASES MAINTAINED AT 3.22%[2]
A: Most Likely Uptake	6.8 %	2016	$8.0 M
B: Significantly Delayed Uptake	6.0 %	2021	$7.8 M[3]

NOTES TO TABLE

1. First Year Revenues Exceed Expenses: includes all NEU costs considered in the commercial utility rate model.
2. Peak Draw on Rate Stabilization Reserve: includes all NEU costs considered in the commercial utility rate model. No change has been made to the annual forecast rate increase (3.22% until 2015, and 2.00% after 2016) in this scenario.
3. Peak Draw on Rate Stabilization Reserve under the Significantly Delayed Uptake scenario: is less than the Most Likely Uptake scenario. This is because, under the Significantly Delayed Uptake scenario, $2.1 M cost of extending the SEFC NEU to the Great Northern Way Campus is delayed by six years, which reduces the SEFC NEU's short-term financing costs.

The projected financial impacts arising from the Significantly Delayed Uptake scenario have reduced since March 2009. This is due to a higher level of uptake security arising from new SEFC developments completed or underway. While the degree of this risk has reduced, it continues to be the recommendation of staff and the Rate Review Panel that the City pursue economically feasible connections of properties external to SEFC. Connection of such properties has the added benefit of increasing the amount of greenhouse gas emissions avoided by the NEU.

FIGURE 2. MAP OF SCENARIO A – MOST LIKELY UPTAKE

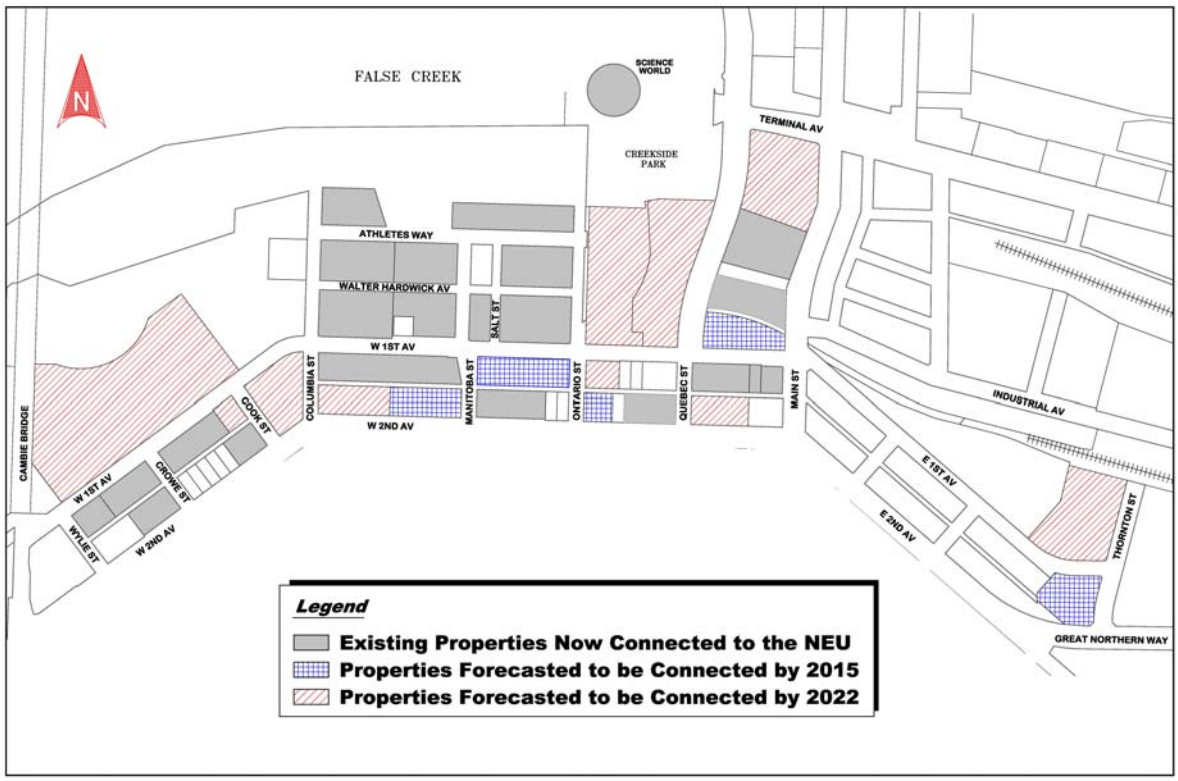
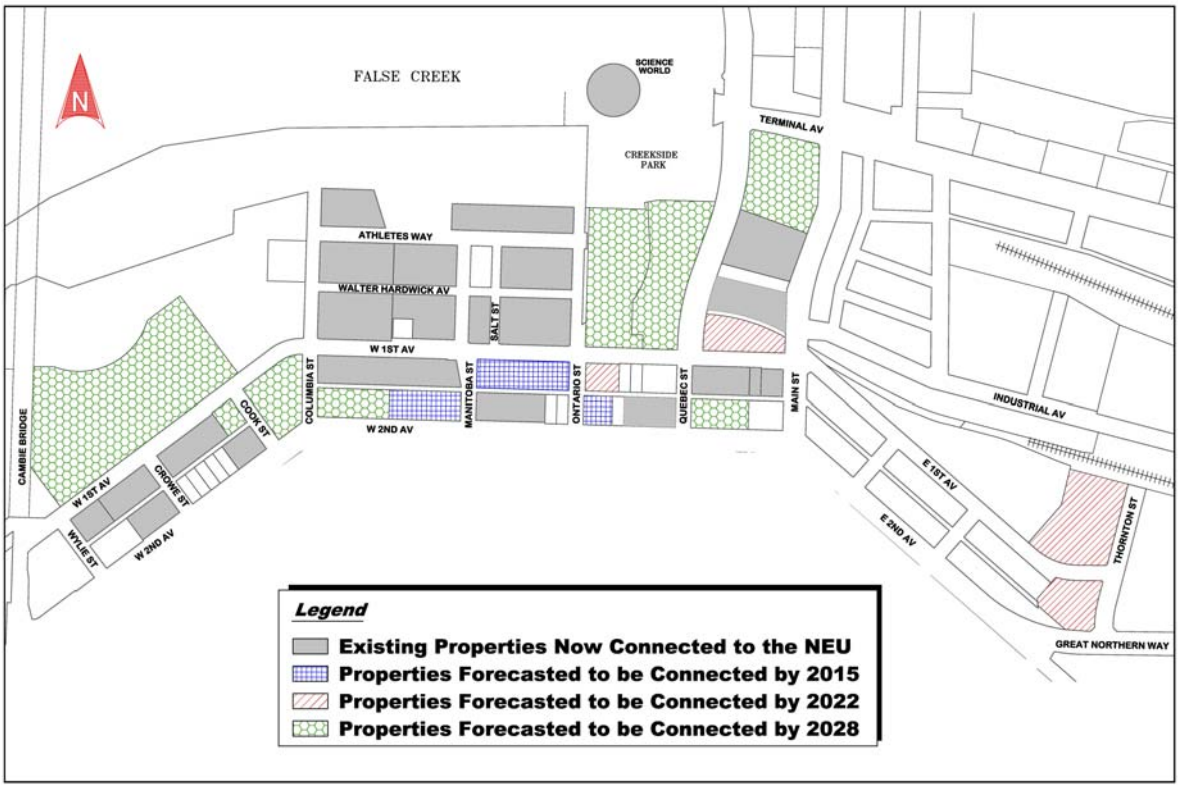


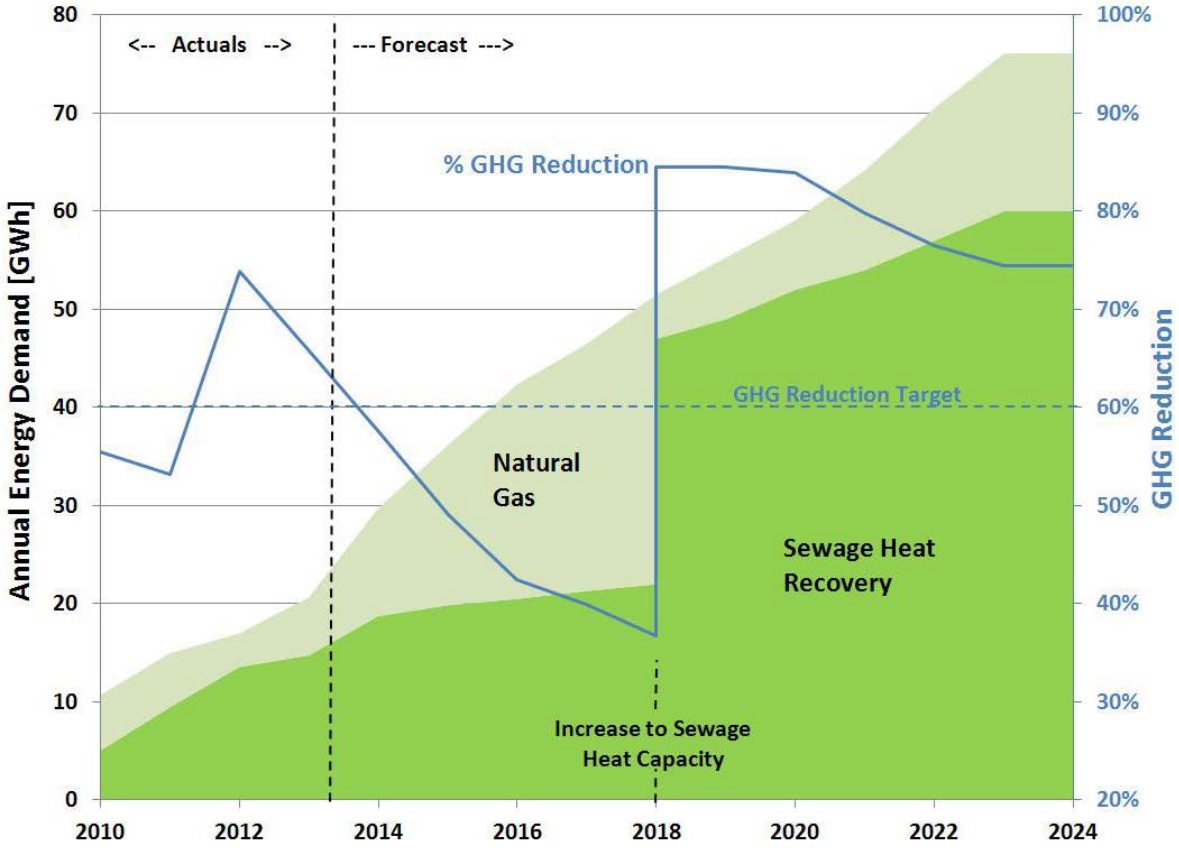
FIGURE 3. MAP OF SCENARIO B – SIGNIFICANTLY DELAYED UPTAKE



Environmental

The NEU seeks to achieve a 60% GHG reduction compared to Business-as-Usual[1]. This target is based on 70% of the annual energy supply coming from the sewage heat recovery process. For the year 2013 it is anticipated that GHG emission reduction will be 64% below the Business-as-usual benchmark, which is 4% better than target.

FIGURE 3. LONG-TERM SEFC NEU ENERGY DEMAND AND GHG REDUCTIONS FORECAST



This 4% better-than-target performance is a result of reliable operation of the sewage heat recovery system and the present energy demand conditions. A long-term forecast of energy demand and GHG reductions is provided in Figure 3. As a result of energy demand growth, GHG reductions are forecast to be below the long-term target between 2015 and 2018. This is a short-term situation that has always been expected in the NEU business plan. Beginning in 2018, through growth of the customer base, revenues are expected to be sufficient to finance the expansion of sewage heat capacity at the False Creek Energy Centre, which will enable the NEU to achieve its long-term GHG reduction targets.

[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 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

At the time of SEFC build-out, when the NEU is forecast to serve 686,000 square metres (7,385,000 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 the estimated emissions if the NEU was not operational. 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 energy from sewage heat recovery than was anticipated in prior years.

CONCLUSION

This report recommends that SEFC NEU rates be increased by 3.22% in 2014. 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.

The NEU is entering a period of more stability and certainty in terms of its customer base, with some encouraging opportunities for expansion. The GHG performance targets are ahead of original projections and the system reliability is strong. The NEU Rate Review Panel continues to provide staff with much appreciated advice and feedback on various issues related to the business plan and rate structure for the NEU. Staff will be working over the next few months to address a number of issues raised by the Panel in preparation for next year.

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

* * * * *

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	$0.500 per m^2
Class 2 - Residential or mixed use residential building located outside SEFC	$7.510 per KW of peak heat energy demand
Class 3 - Non-residential building	$7.510 per KW of peak heat energy demand

PART 3 – Monthly charge

Monthly charge	$41.973 per MW per hour

PART 4 – Credit

Credit for heat energy returned to energy transfer station	$41.973 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, 2014.

ENACTED by Council this day of , 2013

_____
Mayor

_____
City Clerk

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.

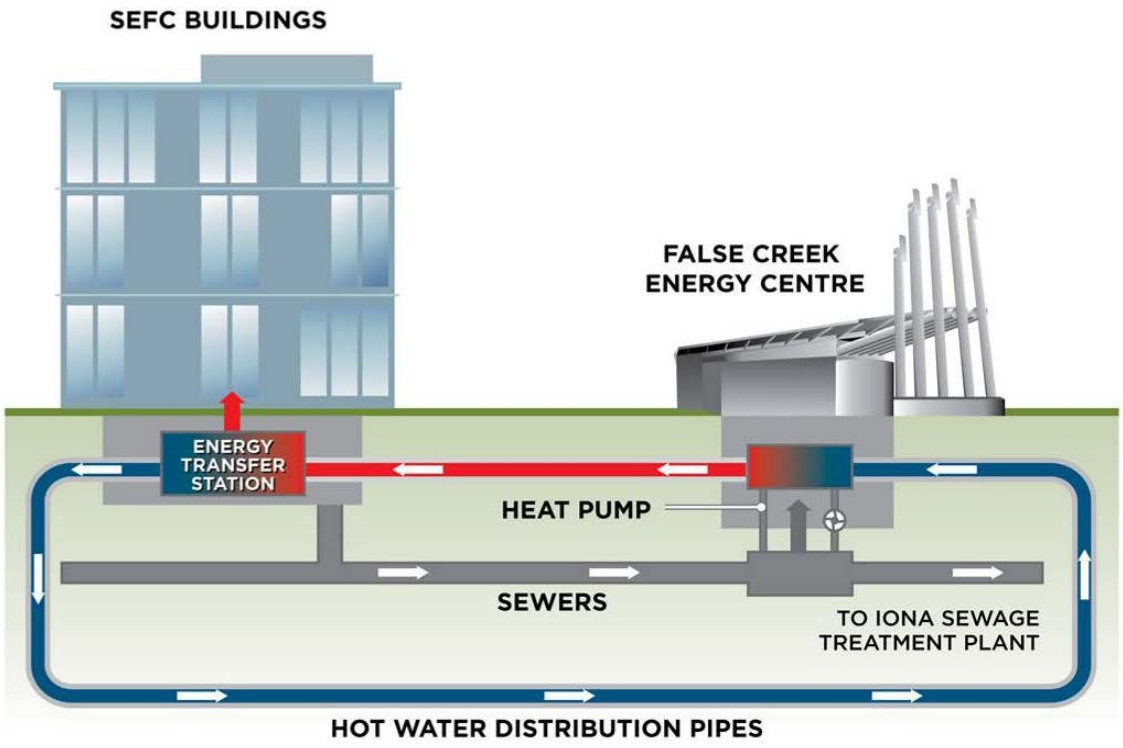
Metering is incorporated in the ETS's for energy measurement and billing purposes. Three of the ETS's also enable customer-generated solar thermal energy to be distributed to the wider neighbourhood.

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 provides 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 690,000 square metres (7,400,000 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 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 D
SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY
RATE STRUCTURE AND METHODOLOGY
APPROVED BY CITY COUNCIL MARCH 2009 AND JULY 2010

Fixed and Variable Charges

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

- ENERGY USE CHARGE (termed the "Charge" in the By-law) - This monthly charge is based on amount of energy consumed (measured in megawatt-hours, or MW.h), and varies with energy use accordingly. 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 (termed the "Levy" in the By-law) – For residential and mixed-use residential buildings in SEFC, this monthly charge is based on floor area, which is measured in square metres, and indicated in building permits. For non-residential buildings and all buildings located outside SEFC, the Levy is based on peak energy demand, measured in kilowatts. 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.

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.

This approach is commonly used by privately owned utilities, and has been approved by the British Columbia Utilities Commission. Examples include the SFU UniverCity Energy system and the River District Energy system located in south-east Vancouver.

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, to ensure that over the long term revenues

recover all costs including debt service and return on equity. The Levelized Rate Escalation Factor was increased from 1.15% to 1.22% in December 2011 to keep long-term revenues in line with expenses.

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.

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*: The NEU starting rates in 2010 NEU rates were calculated to be roughly equivalent to forecasted 2010 BC Hydro electricity rates, plus a 10% increment.

- *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.

Rate Classes

In July 2010, Council established three separate rate classes for the Southeast False Creek Neighbourhood Energy Utility. For all three classes, the variable Energy Use Charge is calculated as a function of energy consumed. However, for Class 1, the fixed Capacity Levy is calculated based on the floor area connected to the SEFC NEU, but it is based on actual peak energy demand for Classes 2 and 3.

Since residential buildings within SEFC are relatively uniform, floor area serves as an appropriate proxy for each building's NEU capacity requirements. However, residential and mixed use buildings outside of the SEFC, as well as non-residential buildings within SEFC, are much less uniform and therefore, for these buildings, floor area does not generally correlate with capacity requirements. This is the reason Classes 2 and 3 have been added to the SEFC NEU rate schedule. This is also the reason why, for these two rate classes, actual peak energy demand is used, rather than floor area, to calculate fixed Capacity Levies.

TABLE 1. SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY RATE CLASSES AND RATE STRUCTURES

RATE CLASS	APPLIES TO	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	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	Peak energy demand (megawatts)	Amount of energy consumed, megawatt-hours
3. Non-Residential	Non-residential buildings located both inside and outside SEFC	Peak energy demand (megawatts)	Amount of energy consumed, megawatt-hours

NOTE 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.

APPENDIX E
CITY OF VANCOUVER NEIGHBOURHOOD ENERGY UTILITY
EXPERT RATE REVIEW PANEL
TERMS OF REFERENCE
APPROVED BY VANCOUVER CITY COUNCIL: JULY 20, 2010

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 levelized 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 levelized 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 F
LETTER OF ENDORSEMENT FROM THE
CITY OF VANCOUVER NEIGHBOURHOOD ENERGY UTILITY
EXPERT RATE REVIEW PANEL, REGARDING 2014 PROPOSED RATES

Mayor and Council
City of Vancouver
453 West 12th Avenue
Vancouver, BC V5Y 1V4

November 26, 2013

Re: NEU Expert Rate Review Panel Review

Dear Mayor Robertson and Councillors,

The purpose of this letter is to advise Council of the Rate Review Panel's views and recommendations regarding the NEU 2014 customer rates.

The Panel met with NEU staff in October and November to discuss the utility's financial projections and rate options for 2014. The Panel has reviewed the October 31, 2013 draft of the Administrative Report to Council on SEFC NEU 2014 rates ("the Report") and the supplementary information provided on November 8, 2013.

Based on the information provided by City staff, the Panel supports the proposed rate increase of 3.22%. However, the Panel does not endorse the proposed rates because we have recommended that the full rate increase be applied to the Energy Charge in order to encourage conservation. The Panel believes that the concerns raised by staff concerning the recommended rate structure can be readily mitigated by the City, and that the benefits of the preferred allocation are very significant to the utility. Our concerns about the rate structure and some of the forecasted numbers in the Report are set out below.

The 2014 Rates

In order to protect the City's taxpayers, the NEU must set rates at a level that will cover all of the utility's forecasted costs over a 25 year period. Based on the results of the City's model, the proposed 2014 rate increase is consistent with this long-term goal and with the Council-approved $8 million peak draw on the Rate Stabilization Reserve.

The ratemaking approach underlying the NEU rate structure is consistent with most of the rate setting principles established by City Council. The exception is the principle that rates should provide price signals to encourage conservation. In prior years, the rate increase has been applied as an equal percentage to both the fixed Capacity Levy and the variable Energy Charge.

The result is that, for 2013, 63% of total revenues will be come from Capacity Levies, which are unaffected by conservation efforts and, by extension, offer no incentive for customers to conserve energy.

Capacity Levies offer the advantage of stable and predictable revenues so, during its first few years of development, it was appropriate to favour managing the utility's financial risk over conservation. However, customer connections are now at a level where the NEU rate structure can begin to move toward a better balance between these objectives.

The Panel recommends that the entire 2014 increase be applied to the Energy Charge in order to improve the price signal to the NEU customers and thereby encourage conservation. The Panel is concerned about the adverse rate consequences of not encouraging more conservation, and is of the view that failure to make appropriate adjustments to the rate structure now could lead to higher bill impacts in the future. The City and NEU customers as a whole will benefit if energy is used more efficiently, although customers who do not adjust their consumption will pay slightly more. Any concerns about bill impacts are best addressed through education.

In comparison with other energy providers, the proposed NEU rates are toward the high end, but the proposed increase is both modest and consistent with prior years. The Panel is of the view that there is value in stable rates that provide customers with predictable energy costs.

Longer Term Issues

Revenue and Costs Forecasts

The Panel is concerned about the significant difference between the budgeted and actual operating shortfall for 2013. The actual shortfall is expected to be 41% over budget, largely due to the inaccuracy of the revenue forecast; actual revenues for 2013 are expected to be 18% under budget. This discrepancy is of particular concern because it follows a similar problem in 2012, when actual revenues were 14% under budget.

It appears that NEU staff has taken this problem seriously and taken additional steps to improve its forecasting accuracy. We commend these steps but wish to emphasize the importance of this information in the rate making process of the NEU. It will be critical to monitor the accuracy of budgeting in the coming years to ensure that the efforts taken by staff actually translate into real improvements in forecasting accuracy.

The NEU cost forecasts are vulnerable to changes in electricity and natural gas rates. Electricity rates are expected to increase significantly over the next several years and the Panel supports the assumption of 10% per year increases in BC Hydro rates. The NEU's electricity costs

continue to be affected by BC Hydro's conservation rate, which penalizes the NEU for expanding. The Panel is pleased that the City has filed a complaint with BC Utilities Commission regarding the NEU's treatment under BC Hydro's conservation rate. We note, in addition, that arguments raised in seeking relief from BC Hydro's conservation rate will be strengthened to the extent that the City pursues its own conservation-focussed rate design initiatives, as discussed above.

The recent problems with the revenue forecast and the significance of NEU's future electricity and gas costs make it difficult to develop a reliable forecast of revenue shortfall/surplus. Therefore, while the Panel believes that a 3.22% is sufficient for 2014, there is not enough certainty about future costs and revenues to endorse a forecast of 2% annual rate increases from 2016 onwards. This is particularly true in light of the predicted balance in the Rate Stabilization Reserve (RSR) this year relative to the allowed cap for that account.

Rate Stabilization Reserve Balance

The Panel has based its endorsement of the proposed rate increase, in part, on the understanding that, on a forecast basis, the Council-imposed $8 million cap on the RSR will not be violated. Recently, the Panel was informed that while this is true on the basis of how the NEU calculates the RSR balance, the City may use an accounting approach that produces a result that exceeds the $8 million cap. We have since been informed that the City's accounting does not, in fact, have that result. We will rely on this final assurance for the purposes of this letter, but will expect a more comprehensive explanation of the issue next year. Given the expectation that the RSR balance will, by NEU calculations, approach the $8 million limit, it is critical to the Panel that it can evaluate next year's rates based on a single estimate of the RSR balance that it knows to be consistent with Council's expectations.

Operating Risks

Improvements in operating risks are acting to offset concerns about forecasting error and fuel cost risks. In particular, uptake is performing slightly better than expected, while the risk of delayed build out is declining as developments advance. In addition, stability increases as the NEU gains operating experience, so the risk of unexpected problems is slightly reduced.

The Panel continues to recommend that policies on risk compensation and the deemed financing rate for the RSR remain unchanged until after the ownership decision is made. Nevertheless, we note that these issues are being managed in anticipation of a possible sale, and different approaches would likely be taken were it known that the Utility would remain under City ownership.

Future Capital Costs

It appears that the future rates are sensitive to the timing and amount of capital expenditures needed to develop the NEU. In addition, the RSR is extremely sensitive to capital expenditure assumptions. Large future costs include main extensions and additional waste heat recovery capacity. The Panel encourages NEU staff to continue their diligence in monitoring the timing, need and cost of these future capital expenditures.

Separation of the NEU and the City

It is understood and accepted that the operation of the NEU is fully integrated with the City of Vancouver's Engineering Department at this time. The Panel believes that more effort should be made to take steps to isolate the assets, finances and operations of the NEU in order to assure full transparency and to allow appropriate assessment of the NEU in its continued development.

Suggested steps include developing stand-alone financial statements. The Panel would find this information helpful in the rate making process. It will also assist NEU staff, the City, and other stakeholders in understanding and assessing future decisions about the NEU.

Yours truly,

Nadine Nicholls

Chairperson of the Expert Rate Review Panel

APPENDIX G
CITY OF VANCOUVER SOUTHEAST FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY
FINANCIAL PRO FORMA

NOTES TO PRO FORMA

1. "Insurance, Property Tax & Other Internal Transfers" line item includes the following expenses: Property and liability insurance premiums, property taxes, other taxes and credits, municipal access fees, customer service and billing, carrying cost on working capital, land rent and corporate overheads.
2. This pro forma assumes a straight-line annual levelized Rate Escalation Factor. In actuality, the City will regularly compare rates to those of BC Hydro and other suitable benchmark(s) to ensure SEFC NEU rates remain competitive. In addition, the forecasted NEU revenue requirements that relate to operations and financing are subject to future change. Therefore in any given year, actual escalation may be more or less than that assumed in this pro forma.
3. All values in this pro forma are expressed in nominal dollars (or, “dollars of the day”). This means that inflation has been incorporated into future costs and expenses.

Southeast False Creek Neighbourhood Energy Utility - Financial Pro Forma ($000's)

	2013	2014	2015	2016	2017	2018	2019
EXPENSES (REVENUE REQUIREMENTS)							
Fixed Operating Costs							
System Maintenance	$130	$139	$148	$156	$165	$175	$182
Heat Pump Maintenance Contract	$48	$49	$50	$51	$52	$53	$54
Total Maintenance	$178	$188	$198	$207	$217	$228	$236
Management and Staff (Including Overheads)	$370	$368	$375	$383	$391	$398	$844
Insurance, Property Tax & other Internal Transfers	$247	$267	$284	$298	$309	$321	$365
Total Fixed Operating Costs	**$795**	**$823**	**$857**	**$888**	**$917**	**$947**	**$1,445**
Variable Operating Costs							
Natural Gas	$269	$381	$586	$828	$1,026	$1,224	$265
Electricity (Total)	$412	$483	$562	$619	$681	$749	$1,554
Heat Plant Non-Fuel Costs	$48	$40	$41	$42	$42	$43	$44
Total Variable Operating Costs	**$729**	**$904**	**$1,190**	**$1,488**	**$1,749**	**$2,016**	**$1,863**
Financing and Depreciation Costs							
FCM Loan Interest	$77	$73	$70	$66	$62	$58	$54
Other Debt Interest	$427	$448	$465	$461	$456	$451	$575
Return on Equity	$954	$1,011	$1,005	$998	$991	$984	$1,348
Depreciation	$664	$717	$732	$746	$761	$776	$1,029
Total Utility Financing and Depreciation	**$2,122**	**$2,250**	**$2,272**	**$2,271**	**$2,270**	**$2,269**	**$3,006**
TOTAL EXPENSES (UTILITY ACCOUNTING METHOD)	**$3,646**	**$3,978**	**$4,318**	**$4,647**	**$4,936**	**$5,232**	**$6,314**
REVENUES							
Fixed Capacity Levies	$1,388	$1,952	$2,503	$2,916	$3,230	$3,466	$3,705
Variable Energy Use Charges	$808	$1,215	$1,568	$1,823	$2,041	$2,306	$2,524
TOTAL REVENUES	**$2,196**	**$3,167**	**$4,071**	**$4,739**	**$5,271**	**$5,772**	**$6,228**
SURPLUS (SHORTFALL)							
Annual Surplus (Shortfall)	(1,450)	(811)	(247)	92	335	540	(85)
Cumulative Surplus (Shortfall)	(6,934)	(7,745)	(7,992)	(7,900)	(7,565)	(7,025)	(7,111)
Internal Rate of Return	6.85%						

Major Assumptions							
A. Uptake							
Net Connected Floor Area (m2)	321,753	374,655	429,655	461,939	501,660	527,632	552,963
Energy Sales (MW.h)	20,116	28,958	35,218	41,247	45,270	50,166	53,818
B. Forecasted Customer Rates							
Fixed Capacity Levy ($/m^2)	$0.484	$0.500	$0.516	$0.526	$0.537	$0.547	$0.558
Year over Year Rate Adjustment	3.22%	3.22%	3.22%	2.00%	2.00%	2.00%	2.00%
Variable Energy Use Charge ($/MW.h)	$40.664	$41.973	$43.324	$44.191	$45.075	$45.976	$46.896
Year over Year Rate Adjustment	3.22%	3.22%	3.22%	2.00%	2.00%	2.00%	2.00%
C. Capital Expenditures							
Total Capital Expenditures	$ 805	$ 2,140	$ 566	$ 577	$ 589	$ 601	$ 10,135
Less: Capital Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Expenditures, Net of Grants	$ 805	$ 2,140	$ 566	$ 577	$ 589	$ 601	$ 10,135

Southeast False Creek Neighbourhood Energy Utility - Financial Pro Forma ($000's)

	2020	2021	2022	2023	2024	2025	2026
EXPENSES (REVENUE REQUIREMENTS)							
Fixed Operating Costs							
System Maintenance	$192	$202	$213	$217	$222	$226	$231
Heat Pump Maintenance Contract	$108	$108	$108	$108	$108	$108	$108
Total Maintenance	$300	$310	$321	$325	$330	$334	$339
Management and Staff (Including Overheads)	$860	$878	$895	$913	$931	$950	$969
Insurance, Property Tax & other Internal Transfers	$383	$400	$421	$433	$441	$450	$459
Total Fixed Operating Costs	**$1,543**	**$1,588**	**$1,637**	**$1,671**	**$1,702**	**$1,734**	**$1,766**
Variable Operating Costs							
Natural Gas	$303	$446	$601	$729	$742	$756	$770
Electricity (Total)	$1,682	$1,782	$1,918	$2,060	$2,101	$2,143	$2,186
Heat Plant Non-Fuel Costs	$45	$46	$47	$48	$49	$50	$51
Total Variable Operating Costs	**$2,030**	**$2,274**	**$2,566**	**$2,836**	**$2,892**	**$2,949**	**$3,006**
Financing and Depreciation Costs							
FCM Loan Interest	$50	$45	$41	$37	$32	$28	$23
Other Debt Interest	$695	$683	$682	$671	$641	$611	$581
Return on Equity	$1,331	$1,315	$1,328	$1,284	$1,240	$1,197	$1,153
Depreciation	$1,045	$1,061	$1,097	$1,097	$1,097	$1,097	$1,097
Total Utility Financing and Depreciation	**$3,121**	**$3,103**	**$3,148**	**$3,089**	**$3,010**	**$2,932**	**$2,853**
TOTAL EXPENSES (UTILITY ACCOUNTING METHOD)	**$6,695**	**$6,965**	**$7,351**	**$7,597**	**$7,604**	**$7,615**	**$7,626**
REVENUES							
Fixed Capacity Levies	$4,030	$4,430	$4,876	$4,974	$5,073	$5,175	$5,278
Variable Energy Use Charges	$2,751	$3,050	$3,416	$3,760	$3,835	$3,912	$3,990
TOTAL REVENUES	**$6,781**	**$7,480**	**$8,293**	**$8,734**	**$8,909**	**$9,087**	**$9,269**
SURPLUS (SHORTFALL)							
Annual Surplus (Shortfall)	86	515	942	1,137	1,304	1,472	1,643
Cumulative Surplus (Shortfall)	(7,025)	(6,509)	(5,567)	(4,430)	(3,126)	(1,653)	(10)

Major Assumptions							
A. Uptake							
Net Connected Floor Area (m2)	589,700	635,582	685,898	685,898	685,898	685,898	685,898
Energy Sales (MW.h)	57,508	62,508	68,643	74,077	74,077	74,077	74,077
B. Forecasted Customer Rates							
Fixed Capacity Levy ($/m^2)	$0.569	$0.581	$0.592	$0.604	$0.616	$0.629	$0.641
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Variable Energy Use Charge ($/MW.h)	$47.834	$48.790	$49.766	$50.761	$51.777	$52.812	$53.868
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
C. Capital Expenditures							
Total Capital Expenditures	$ 625	$ 638	$ 1,439	$ -	$ -	$ -	$ -
Less: Capital Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Expenditures, Net of Grants	$ 625	$ 638	$ 1,439	$ -	$ -	$ -	$ -

Southeast False Creek Neighbourhood Energy Utility - Financial Pro Forma ($000's)

	2027	2028	2029	2030	2031	2032	2033
EXPENSES (REVENUE REQUIREMENTS)							
Fixed Operating Costs							
System Maintenance	$235	$240	$245	$250	$255	$260	$265
Heat Pump Maintenance Contract	$108	$108	$108	$130	$130	$130	$130
Total Maintenance	$343	$348	$353	$380	$385	$390	$395
Management and Staff (Including Overheads)	$988	$1,008	$1,028	$1,049	$1,070	$1,091	$1,113
Insurance, Property Tax & other Internal Transfers	$469	$478	$488	$498	$508	$518	$528
Total Fixed Operating Costs	**$1,800**	**$1,834**	**$1,868**	**$1,927**	**$1,962**	**$1,999**	**$2,036**
Variable Operating Costs							
Natural Gas	$836	$851	$867	$883	$900	$916	$934
Electricity (Total)	$2,229	$2,274	$2,319	$2,366	$2,413	$2,461	$2,511
Heat Plant Non-Fuel Costs	$52	$53	$54	$55	$56	$57	$58
Total Variable Operating Costs	**$3,117**	**$3,178**	**$3,240**	**$3,304**	**$3,369**	**$3,435**	**$3,502**
Financing and Depreciation Costs							
FCM Loan Interest	$18	$14	$9	$4	$0	$0	$0
Other Debt Interest	$550	$520	$490	$459	$659	$629	$599
Return on Equity	$1,109	$1,065	$1,021	$977	$933	$890	$846
Depreciation	$1,097	$1,097	$1,097	$1,097	$1,097	$1,097	$1,097
Total Utility Financing and Depreciation	**$2,774**	**$2,696**	**$2,617**	**$2,537**	**$2,689**	**$2,615**	**$2,541**
TOTAL EXPENSES (UTILITY ACCOUNTING METHOD)	**$7,691**	**$7,708**	**$7,725**	**$7,768**	**$8,020**	**$8,049**	**$8,080**
REVENUES							
Fixed Capacity Levies	$5,384	$5,492	$5,602	$5,714	$5,828	$5,944	$6,063
Variable Energy Use Charges	$4,127	$4,209	$4,293	$4,379	$4,467	$4,556	$4,647
TOTAL REVENUES	**$9,511**	**$9,701**	**$9,895**	**$10,093**	**$10,295**	**$10,501**	**$10,711**
SURPLUS (SHORTFALL)							
Annual Surplus (Shortfall)	1,820	1,993	2,170	2,325	2,274	2,452	2,631
Cumulative Surplus (Shortfall)	1,810	3,803	5,973	8,298	10,572	13,024	15,655

Major Assumptions							
A. Uptake							
Net Connected Floor Area (m2)	685,898	685,898	685,898	685,898	685,898	685,898	685,898
Energy Sales (MW.h)	75,106	75,106	75,106	75,106	75,106	75,106	75,106
B. Forecasted Customer Rates							
Fixed Capacity Levy ($/m^2)	$0.654	$0.667	$0.681	$0.694	$0.708	$0.722	$0.737
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Variable Energy Use Charge ($/MW.h)	$54.946	$56.045	$57.166	$58.309	$59.475	$60.665	$61.878
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
C. Capital Expenditures							
Total Capital Expenditures	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Less: Capital Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Expenditures, Net of Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Southeast False Creek Neighbourhood Energy Utility - Financial Pro Forma ($000's)

	2034	2035	2036	2037	2038	2039	2040
EXPENSES (REVENUE REQUIREMENTS)							
Fixed Operating Costs							
System Maintenance	$270	$276	$281	$287	$292	$298	$304
Heat Pump Maintenance Contract	$130	$130	$130	$130	$130	$130	$144
Total Maintenance	$400	$406	$411	$417	$422	$428	$448
Management and Staff (Including Overheads)	$1,135	$1,158	$1,181	$1,205	$1,229	$1,253	$1,278
Insurance, Property Tax & other Internal Transfers	$539	$549	$560	$571	$583	$594	$607
Total Fixed Operating Costs	**$2,074**	**$2,113**	**$2,153**	**$2,193**	**$2,234**	**$2,276**	**$2,333**
Variable Operating Costs							
Natural Gas	$951	$969	$987	$1,006	$1,025	$1,044	$1,064
Electricity (Total)	$2,561	$2,612	$2,664	$2,717	$2,772	$2,827	$2,884
Heat Plant Non-Fuel Costs	$59	$61	$62	$63	$64	$66	$67
Total Variable Operating Costs	**$3,571**	**$3,642**	**$3,713**	**$3,786**	**$3,861**	**$3,937**	**$4,015**
Financing and Depreciation Costs							
FCM Loan Interest	$0	$0	$0	$0	$0	$0	$0
Other Debt Interest	$568	$538	$508	$478	$447	$417	$387
Return on Equity	$802	$758	$714	$670	$626	$582	$539
Depreciation	$1,097	$1,097	$1,097	$1,097	$1,097	$1,097	$1,097
Total Utility Financing and Depreciation	**$2,467**	**$2,393**	**$2,319**	**$2,244**	**$2,170**	**$2,096**	**$2,022**
TOTAL EXPENSES (UTILITY ACCOUNTING METHOD)	**$8,112**	**$8,147**	**$8,184**	**$8,224**	**$8,266**	**$8,310**	**$8,371**
REVENUES							
Fixed Capacity Levies	$6,185	$6,308	$6,434	$6,563	$6,694	$6,828	$6,965
Variable Energy Use Charges	$4,740	$4,835	$4,932	$5,030	$5,131	$5,234	$5,338
TOTAL REVENUES	**$10,925**	**$11,143**	**$11,366**	**$11,594**	**$11,825**	**$12,062**	**$12,303**
SURPLUS (SHORTFALL)							
Annual Surplus (Shortfall)	2,812	2,996	3,182	3,370	3,560	3,752	3,933
Cumulative Surplus (Shortfall)	18,467	21,463	24,645	28,015	31,575	35,327	39,260

Major Assumptions							
A. Uptake							
Net Connected Floor Area (m2)	685,898	685,898	685,898	685,898	685,898	685,898	685,898
Energy Sales (MW.h)	75,106	75,106	75,106	75,106	75,106	75,106	75,106
B. Forecasted Customer Rates							
Fixed Capacity Levy ($/m^2)	$0.751	$0.766	$0.782	$0.797	$0.813	$0.830	$0.846
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Variable Energy Use Charge ($/MW.h)	$63.115	$64.378	$65.665	$66.979	$68.318	$69.685	$71.078
Year over Year Rate Adjustment	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
C. Capital Expenditures							
Total Capital Expenditures	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Less: Capital Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Expenditures, Net of Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -