CITY OF VANCOUVER

REPORT

Report Date: November 1, 2022
Contact: Mark Schwark
Contact No.: 604.871.6721
RTS No.: 15151
VanRIMS No.: 08-2000-25
Meeting Date: November 29, 2022

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: 2023 False Creek Neighbourhood Energy Utility Customer Rates

RECOMMENDATION

A. THAT Council approve, in principle, the proposed amendments to the Energy Utility System By-law (the "By-law"), generally as set out in Appendix A, including:

   i) updated 2023 customer levies and charges, with a 3.2% increase over 2022

   ii) updated Initial Connection Levy, with a 5% increase over 2022 rates; and

   iii) miscellaneous amendments to clarify the terms and conditions related to meter testing.

B. THAT Council instruct the Director of Legal Services to bring forward for enactment the necessary amendments to the Energy Utility System By-law, generally as set out in Appendix A.

REPORT SUMMARY

This report seeks Council approval of the recommended 2023 customer rates for the False Creek Neighbourhood Energy Utility ("NEU"), which incorporate a 3.2% net increase over 2022. This will result in a cost increase of $34 per year (from $1,024 to $1,058 per year) for an average 75 square metre (800 square feet) suite.

Staff also seek Council approval for a 5% increase in the Initial Connection Levy. This is to reflect market price cost increases due to supply chain pressures to deliver Energy Transfer Stations.

The rate increases have been endorsed by the Neighbourhood Energy Expert Panel, which provides the City with independent, expert advice on NEU rate setting.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

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

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

In July 2010, Council approved the establishment of an independent Neighbourhood Energy Expert Panel (referred to as the "Expert Panel" in this report) to advise staff and Council on future NEU rate adjustments and 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.

In April 2014, Council approved a transition strategy to adjust the 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, Council adopted key performance indicators and targets for NEU rate setting under the commercial utility rate model, based on a comprehensive rate review of the NEU.

In February 2018, Council adopted the NEU investment decision framework to guide NEU expansion and in April 2018, Council enacted an amendment to the Energy Utility System Bylaw to expand the service area (see Figure 1).

In December 2018, Council approved updated KPIs to accommodate the NEU service area expansion and the addition of an Initial Connection Levy for new buildings connecting to the system, similar in concept to connection fees used for water and sewer utilities.

In November 2020, Council approved the Climate Emergency Action Plan, which included adoption of a target to convert the NEU to 100% renewable energy by 2030, subject to evaluation and competitiveness with other low carbon energy options for buildings.

CITY MANAGER'S COMMENTS

The City Manager supports the above recommendations.

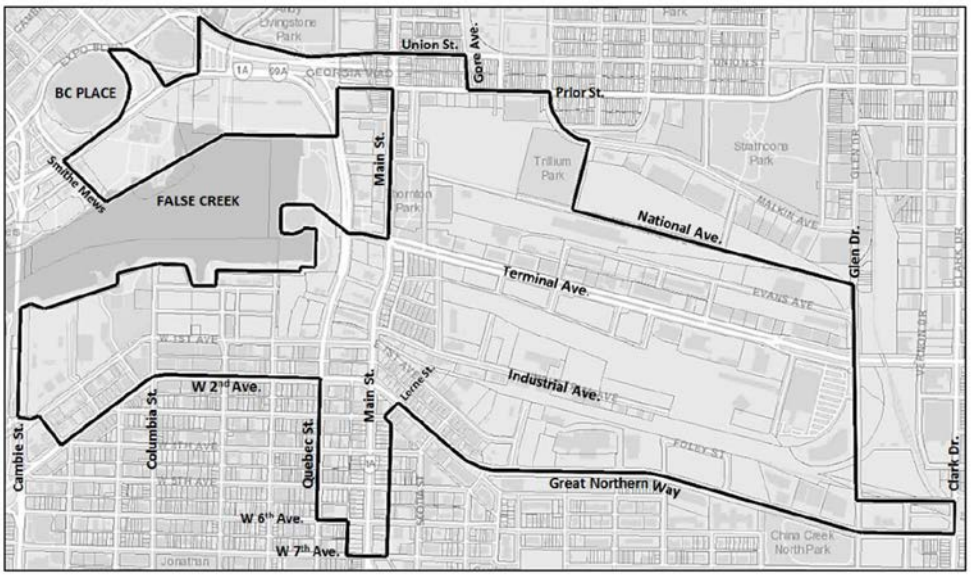
REPORT

Background/Context

The NEU provides low carbon thermal energy (heat and hot water) to buildings in the False Creek area of the City. NEU Customer Rates are set via a commercial utility model and are reviewed annually. Key performance indicators ("KPIs") and targets, adopted by Council, guide rate setting for the NEU under the commercial utility rate model.

The NEU began operation in January 2010 and currently services 44 residential, commercial and institutional buildings, with 619,000 square metres (6,660,000 square feet) of floor area. The total build-out is forecast at 1,900,000 square metres (20,450,000 square feet) of floor area.

FIGURE 1. MAP OF NEU SERVICE AREA



As part of the City's Climate Emergency Action Plan, staff are evaluating options to transition the NEU's energy supply from its current target of 70% to a new target of 100% renewable energy sources by 2030, which will be presented to Council in 2023. Note that all forecast costs and rate assumptions provided in this report are based on the current target of 70% renewable energy.

Strategic Analysis

The NEU recovers its costs using three different rate classes to ensure that NEU costs are equitably distributed among different customers, based on a cost of service model:

i. Residential and Mixed Use Residential buildings within the Southeast False Creek ("SEFC") Official Development Plan area;

ii. Residential and Mixed Use Residential buildings outside of SEFC; and

iii. Non-Residential Buildings.

Staff recommend that NEU customer rates increase by 3.2% over 2022 rates, as shown in Table 1. A 3.2% increase is equivalent to a 1.2% increase above the system's long-term inflation forecast of 2%. This 1.2% escalation factor enables the NEU to maintain rates that are predictable and affordable while keeping the NEU on track to recover its costs over time in accordance with the commercial utility rate model.

While general inflation in 2022 is expected to be higher than 2%, the impact of this can be managed with the 3.2% rate increase, while staying within the Council approved KPIs (see Appendix B). Approximately half of the current annual revenue requirements are related to servicing historical capital expenditures and are not impacted by current inflation; however, if high inflation persists, future capital investments and associated borrowing costs going forward

are likely to put pressure on inflationary rate increases over time. This approach is supported by the Expert Panel given the benefits of maintaining predictable rates, where possible.

This 3.2% increase will result in a cost increase of $34 per year (from $1,024 to $1,058 per year) for an average 75 square metre (800 square feet) suite with an average energy demand of 8.2 megawatt hours per year.

TABLE 1. NEU 2022 AND RECOMMENDED 2023 CUSTOMER RATES[1]

	2022	2023 PROPOSED	% CHANGE
Class 1 (Residential and Mixed Use Residential within SEFC)			
Fixed Capacity Levy	$0.613 per m^2 per month	**$0.633 per m^2 per month**	3.2%
Variable Energy Use Charge	$57.446 per MW.hr	**$59.296 per MW.hr**	3.2%
Net Effective Rate[2]	**$124.6 per MW.hr**	**$128.67 per MW.hr**	**3.2%**
Class 2 (Residential and Mixed Use Residential Outside SEFC) and Class 3 (Non-Residential)			
Fixed Capacity Levy	$9.225 per KW peak demand per month	**$9.522 per KW peak demand per month**	3.2%
Variable Energy Use Charge	$57.446 per MW.hr	**$59.296 per MW.hr**	3.2%

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 will vary due to differences in building energy performance.

Appendices B and C provide additional details on the NEU's services, technology, levelized rate structure, environmental performance indicators, financial performance indicators, NEU rates compared to other energy providers and its ownership, operating and governance model.

NEU Expert Panel Input

The Expert Panel, established by Council in 2010, provides objective expert advice to ensure that the rate structure, annual rates and any new rate policy for the NEU are consistent with Council's approved rate setting principles. The Panel has endorsed the 2023 rate increases as recommended in this report (Appendix D).

Staff would like to acknowledge the contributions of the Expert Panel in which their advice helps ensure that rate increases reflect an appropriate balance between cost recovery and fair and competitive rates for energy services delivered.

Environmental Performance Update

The NEU currently targets to produce 70% of its energy from renewable sources. The NEU is forecasting to be on target in 2022 using a blend of renewable sources including sewage heat recovery, renewable natural gas, and waste heat recovered from customer buildings.

Financial Implications

Table 2 compares 2022 revenues and expenses as forecast at the end of August for the 2022 Operating and Capital Budgets under the commercial utility model. The main causes for the difference between 2022 budget and the 2022 actuals projected to year-end are as follows:

1. *Energy Use Charges*: These revenues are forecast to be 7% ($218K) higher than budgeted due to higher than expected energy demand in Q1 2022
2. *Gas and Electricity Costs:* Fuel costs are forecast to be 19% ($471K) higher than budgeted due partially to the higher energy demand seen in Q1 2022.
3. *Financing Costs*: Slower than forecast capital outlay due to progress on the low carbon expansion project resulting in financing costs being 6% ($240K) under budget.

Overall, NEU revenues are forecasted to closely align with expenses with an operating shortfall of $41K, $16K lower than budgeted.

TABLE 2. 2022 NEU REVENUES AND EXPENSES, BUDGET COMPARED TO YEAR-END FORECAST BASED ON THE COMMERCIAL UTILITY RATE MODEL ($ MILLIONS)

	2022 Budget	2022 Forecast	$ Variance	% Variance	2023 Proposed
Revenues and Recoveries					
Capacity Levies	$ 4.4	$ 4.4	$ 0.0		$ 4.6
Energy Use Charges	3.2	3.5	0.2		3.5
Pump Station Recoveries	0.0	0.0	(0.0)		0.0
Total Revenues	**$ 7.6**	**$ 7.9**	**$ 0.2**	**3%**	**$ 8.2**
Insurance Proceeds	-	0.1	0.1		
Total Revenues	**$ 7.6**	**$ 7.9**	**$ 0.3**	**4%**	**$ 8.2**
Operating Expenses					
Natural Gas & Electricity	$ 2.4	$ 2.9	$ 0.5		$ 2.7
Staff, Maintenance, Overhead & Other[1]	1.4	$ 1.4	(0.0)		1.5
Total Non Flood-Related	**$ 3.8**	**$ 4.3**	**$ 0.4**	**12%**	**$ 4.2**
Flood-Related	-	$ 0.1	0.1		
Total Operating Expenses	**$ 3.8**	**$ 4.4**	**$ 0.5**	**14%**	**$ 4.2**
Financing Expenses[1]					
Interest Expense	$ 1.0	$ 0.9	$ (0.0)		$ 1.2
Return on Equity	1.6	$ 1.5	(0.1)		1.8
Depreciation	1.3	$ 1.2	(0.1)		1.4
Total Financing Expense	**$ 3.9**	**$ 3.6**	**$ (0.2)**	**-6%**	**$ 4.4**
Total Expenses	**$ 7.7**	**$ 8.0**	**$ 0.3**	**4%**	**$ 8.6**
Operating Shortfall	**$ 0.1**	**$ 0.0**	**(0.0)**	**-28%**	**$ 0.5**
Capital Costs	**$ 13.4**	**$ 9.0**	**$ (4.4)**	**-33%**	**$ 15.7**

[1.] Reflects costs under the commercial utility model

Initial Connection Levy for New NEU Service Connections

All new buildings to the NEU system pay a levy to connect, which is similar in concept to connection fees for waterworks and sewer utilities and is a standard practice in the energy utility sector.

Starting in 2021, the NEU experienced a significant increase of 15% in the cost to deliver an Energy Transfer Station. Staff has verified with municipal partners and other district energy providers that this increase is industry wide, and linked to ongoing supply chain pressures. For 2023, staff recommend that the Initial Connection Levy to increase by 5%.

TABLE 5. NEU CONNECTION LEVY STRUCTURE

COMPONENT	2022 Rates	Proposed 2023 Rates
Fixed Portion	$92,856	$97,499
Variable Portion	$109/kW of peak energy demand required for a building	$115/kW of peak energy demand required for a building

The information presented in this report assumes that the NEU will continue to implement the approved 2018 expansion plan. To support the NEU expansion plan, capital investments in the order of magnitude of $60M for generation infrastructure and $40M for distribution infrastructure will be required (expressed in 2021 dollars). The City's future investments will be determined through the approved NEU expansion decision framework which at each major investment decision point, considers the optimal NEU business, ownership and operating model with respect to energy generation and distribution, emerging technology and options to best achieve desired GHG outcomes and funding availability.

CONCLUSION

This report recommends that NEU rates increase by 3.2% in 2023 that is consistent with Council's approved rate-setting principles and methodology, recovers the NEUs long-term costs under the commercial utility rate model and has been endorsed by the Neighbourhood Energy Expert Panel, which provides the City with independent, expert advice on NEU rate setting.

This report also recommends a 5% increase to the initial connection levy to provide for significant cost escalation to deliver an Energy Transfer Station at the building level, observed across the district energy sector since 2021.

* * * * *

ENERGY UTILITY SYSTEM BY-LAW DRAFT AMENDMENT

BY-LAW NO.

A By-law to amend Energy Utility System By-law No. 9552 regarding 2023 Fees and Miscellaneous Amendments

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

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

2. Council strikes section 7.8 and replaces it with the following:

"7.8 Upon application by the owner, the City Engineer must test a meter at the energy transfer station provided:

(a) the City Engineer first provides the owner with an estimate of the cost;

(b) the owner pays the city the amount of the estimate before commencement of the work.

7.8A After completion of a test under section 7.8:

(a) the City Engineer must notify the owner of the actual cost;

(b) if the actual cost is more than the estimated cost, the owner must pay the city the difference within 30 days of the City demanding the money in writing; and

(c) if the actual cost is less than the estimated cost, the city must pay the owner the excess unless the owner owes the city money under this By-law, then the city may apply the excess against such debt.

3. Council strikes the word "fee" from section 7.10 (a) and replaces it with "costs".

4. Council strikes "Schedule C", and replaces it with the "Schedule C" attached to this By-law.

5. In Schedule D, Council:

(a) strikes the heading "APPLICATION AND MISCELLANEOUS FEES" and replaces it with "METER TEST COSTS AND MISCELLANEOUS FEES";

(b) strikes the following row:
"

7.8	Application for meter test	$200.00

”.

and replaces it with the following:

“

7.8	Meter Test	All actual costs to administer, replace, and/or test the meter(s). Refer to section 7.8 and 7.8A.

”.

6. This By-law is to come into force and take effect on January 1, 2023.

ENACTED by Council this day of , 2022

Mayor

Acting City Clerk

"SCHEDULE C

LEVIES AND CHARGES

PART 1 – Connection levy

Fixed Portion per Energy Transfer Station	$97,499
Variable Portion per Energy Transfer Station	$115 per KW of the peak heat energy demand as approved under section 4.3

PART 2 – Monthly capacity levy

Class 1 - SEFC residential or mixed use residential building	$0.633 per m^2
Class 2 - Residential or mixed use residential building located outside SEFC	$9.522 per KW of peak heat energy demand
Class 3 - Non-residential building	$9.522 per KW of peak heat energy demand

PART 3 – Monthly energy charge

Monthly energy charge	$59.296 per MW hour

PART 4 – Monthly energy credit

Credit for heat energy returned to energy transfer station	$59.296 per each MW hour multiplied by 50%

Bills are to be issued monthly and should be sent out within 60 days of the end of the billing period."

OVERVIEW OF THE CITY OF VANCOUVER'S FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY, BY-LAW AND PERFORMANCE INDICATORS

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 currently targets producing 70% of its energy from renewable sources, such as sewage waste heat and renewable natural gas (RNG). This results in substantial GHG emission reductions compared to traditional methods of providing heat and hot water to buildings in which the NEU offers the following unique benefits:

- it provides long-term flexibility to adapt to new low-carbon technologies and provides the City with direct long-term control to secure a 100% renewable energy target for connected buildings;
- it enables the utilization of local renewable energy that may not otherwise be economically viable at the building scale; and
- it provides opportunities to retrofit existing gas-heated buildings with renewable energy.

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 False Creek 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. In 2021, a satellite peaking plant was installed in Mount Pleasant to support growth of the system in the area and enhance system resiliency.

From the False Creek Energy Centre, a network of underground pipes (termed the "Distribution Pipe System," or DPS) delivers the heated water to buildings connected to the network. 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. Four of the ETS's also enable customer-generated energy (from solar and waste heat) to be distributed to the wider neighbourhood.

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

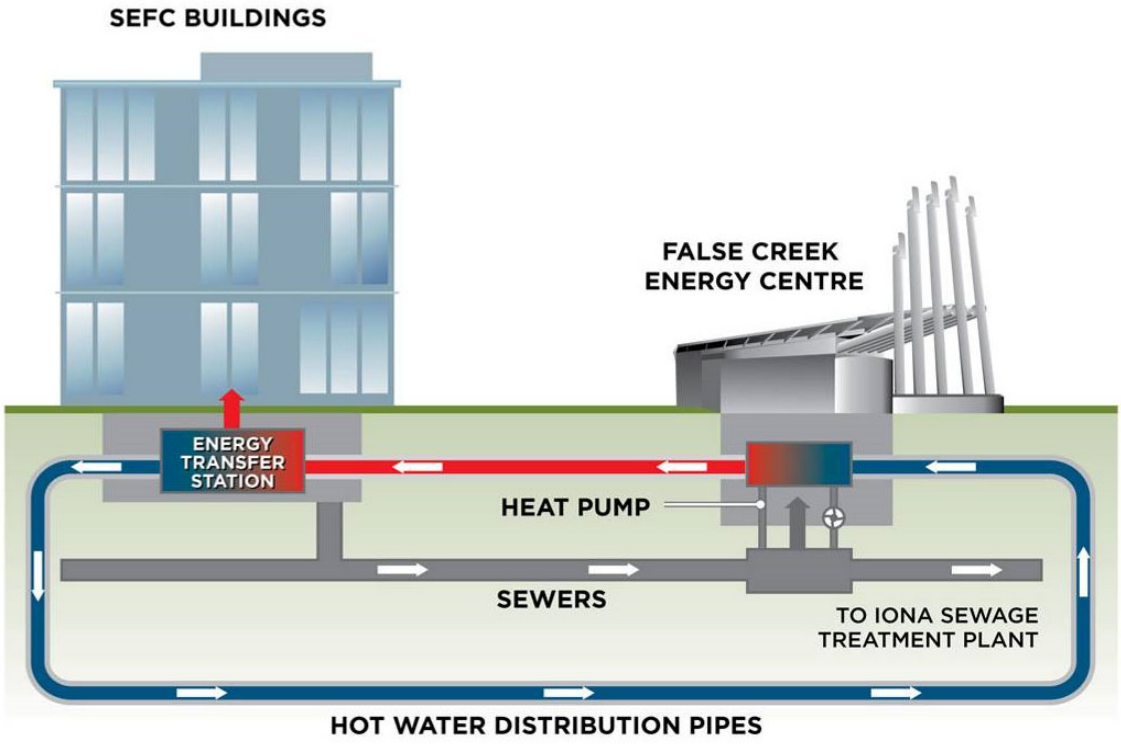
- *False Creek Energy Centre & Satellite Peaking Plants*: Generates hot water through sewer waste heat recovery and natural gas boilers (which use a blend of renewable and conventional natural gas). Owned and operated by the NEU.
- *Distribution Pipe System* (DPS): A set of underground pipes that deliver 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 service area which includes Southeast False Creek, Great Northern Way Campus, and parts of False Creek Flats, Mount Pleasant, and Northeast False Creek.

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 By-law

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

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

In April 2018, Council approved the amendment to the By-law to expand the NEU service area to include parts of Mount Pleasant, the False Creek Flats, and Northeast False Creek.

Levelized Rate Structure

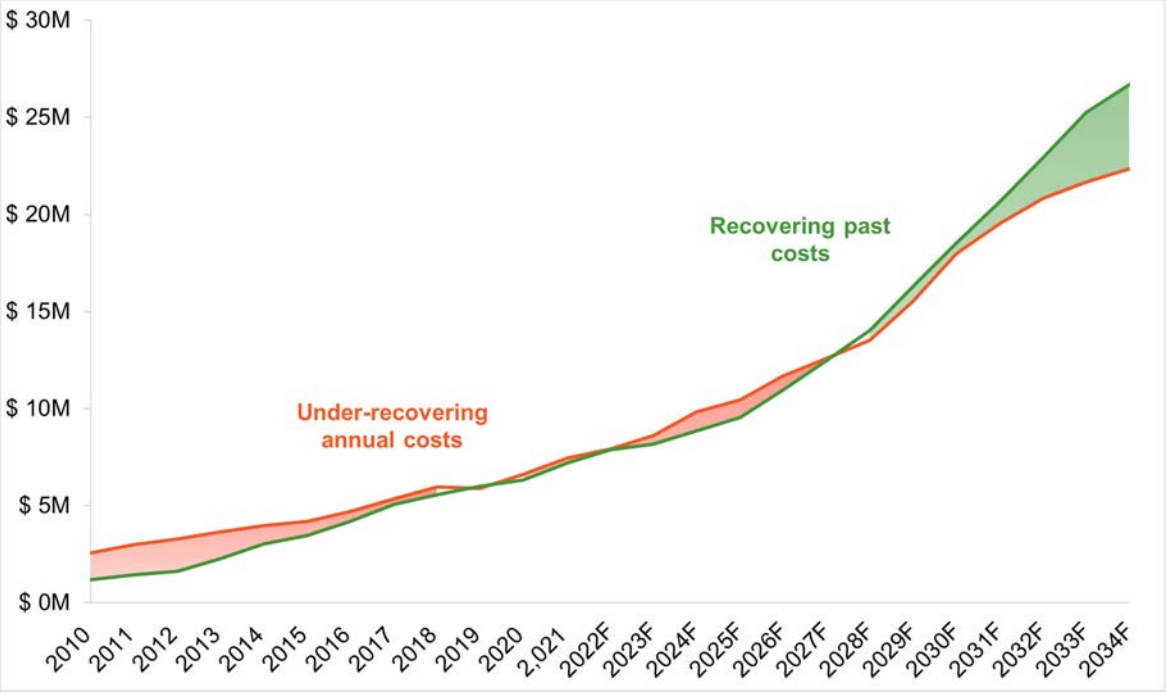
To provide competitive and stable rates for the NEU customers, rates are established based on a levelized rate approach and are comprised of two components:

i. A fixed capacity levy based on the customers subscribed energy demand; and

ii. A variable energy use charge related to customers' actual energy consumption.

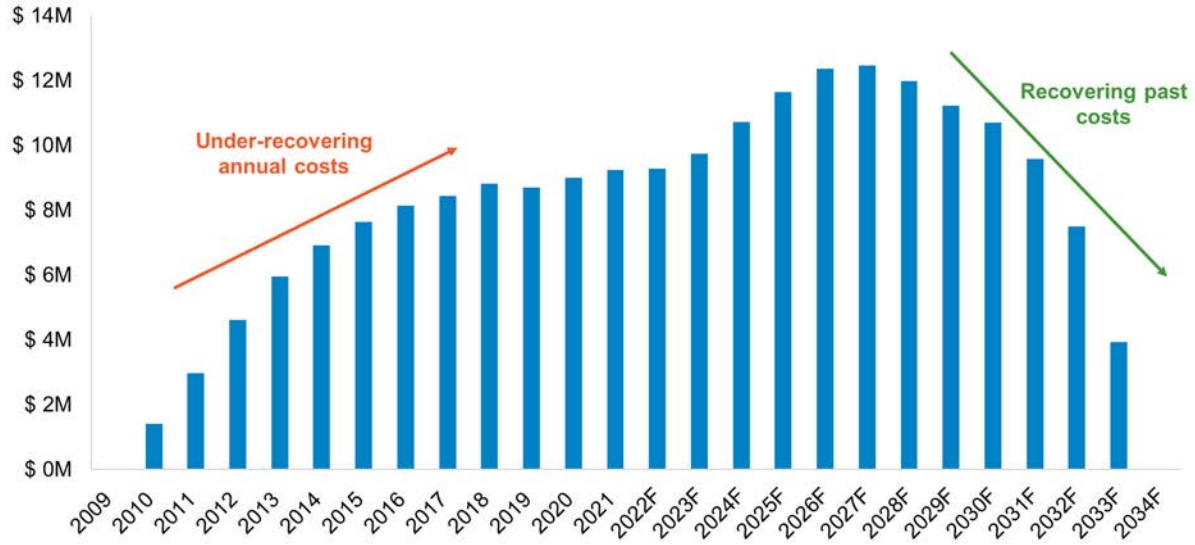
As illustrated in Figure 2 below, rates are set to under-recover annual costs in the early years of the NEU's operation when the customer base is small, and to gradually recover past costs when the customer base is fully established. This approach ensures that infrastructure costs are more equitably distributed between the initial customers and those who connect in later years. This is a common practice by privately owned utilities regulated by the BC Utilities Commission ("BCUC").

FIGURE 2: LEVELIZED RATE APPROACH



To ensure that the balance of under-recovered costs (Figure 3) can be recovered within a reasonable timeframe and in line with the Council adopted KPIs, annual rate increases under the levelized rate approach include two components: an inflationary increase and a Rate Escalation Factor. The Rate Escalation Factor is applied above inflation, to ensure all of the system costs under the NEU's commercial utility model are met over the long-term. Using this approach enables the NEU to maintain rates that are competitive and predictable. The existing KPIs and rate setting principles are currently being reviewed as part of the NEU's regular comprehensive rate review process which is expected to report back in 2023.

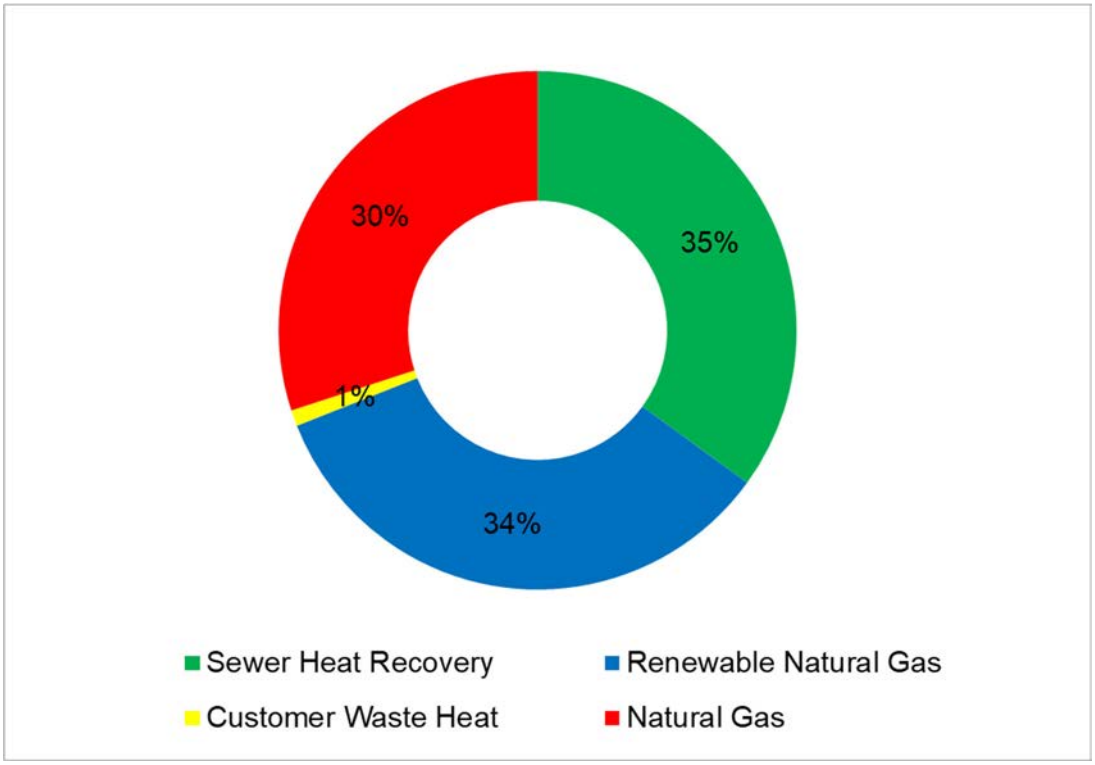
FIGURE 3: CUMULATIVE BALANCE OF UNDER-RECOVERED COSTS UNDER LEVELIZED RATE APPROACH



Environmental Performance Indicators

The NEU currently targets to produce 70% of its energy from renewable sources. The NEU is forecasting to be on target in 2022 using a blend of renewable sources including sewage heat recovery, renewable natural gas, and waste heat recovered from customer buildings as shown in Figure 4. The NEU's GHG reduction forecast for 2022 is 6,600 tonnes CO_2, compared to a 2007 baseline.

FIGURE 4: 2022 ENERGY GENERATION SOURCES



Between 2018-2019, two events resulted in a significant temporary reduction in NEU environmental performance:

1. On October 28, 2018, flooding triggered by a 1-in-25-year rainfall event caused a prolonged outage of the sewage heat recovery system at the False Creek Energy Centre. Although this event did not disrupt service to customers, it did cause the NEU's renewable energy supply to drop to 56%. The sewage heat recovery system was repaired in Q1 2020 and has been fully operational since.
2. On August 1, 2019, the City received notice from FortisBC that the supply of RNG would be halted for the remainder of the year because of production shortages. This combined with ongoing repairs to the sewage heat recovery system caused renewable energy supply to drop to 15% in 2019. RNG supply in 2020 was limited to 40% of the volume of the supply agreement. Fortis announced an end to the curtailment in 2021.

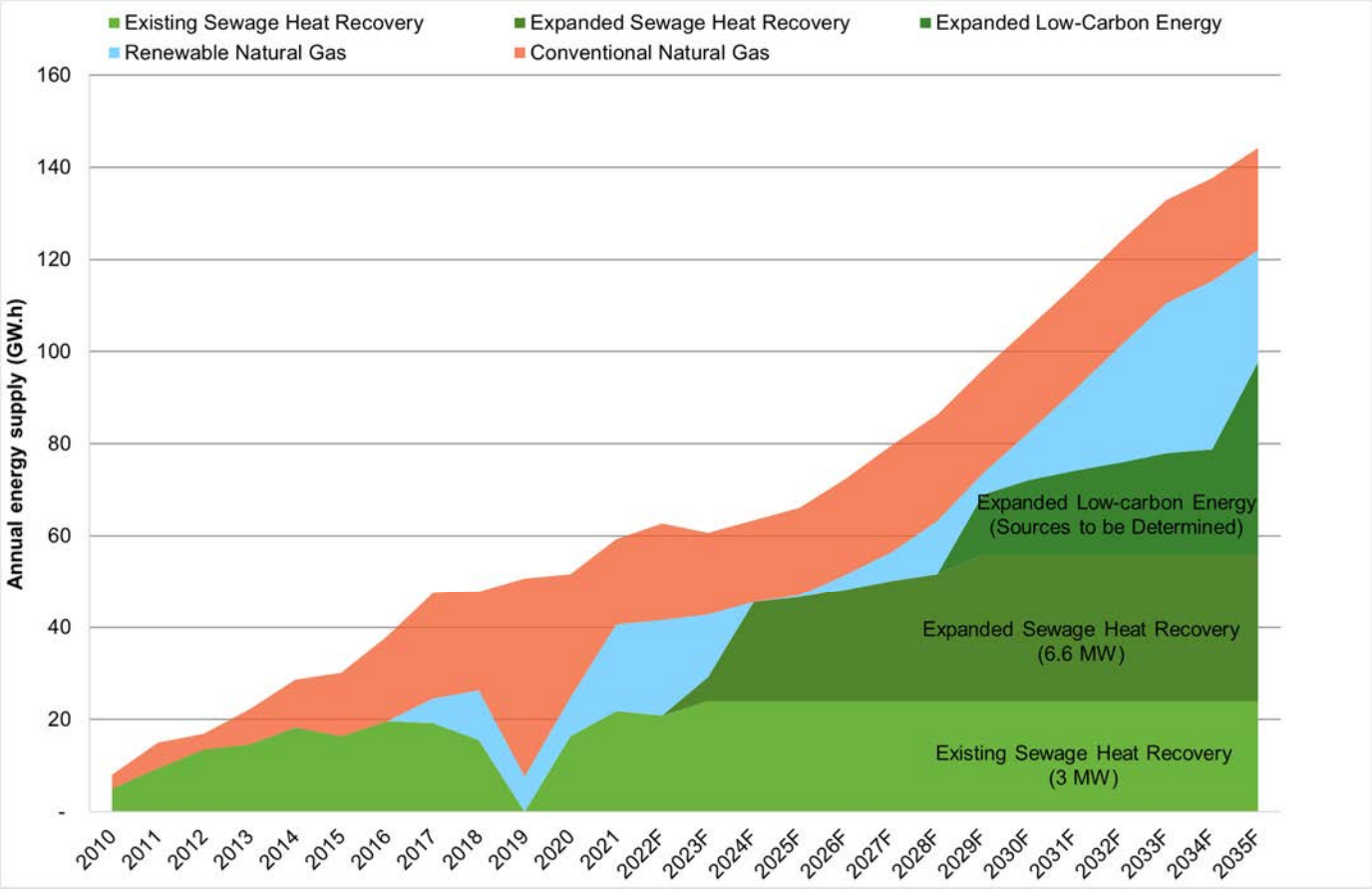
In 2021, the NEU was able to return to its performance target, delivering 74% of its energy from renewables. The system is forecasting to deliver 70% of its energy from renewables in 2022.

While the NEU is back on track delivering low carbon energy, it has a growing customer base and energy demand that will require additional sources of low carbon energy generation. At the time of build-out of the customer base, the NEU is forecast to provide low carbon heating and hot water to approximately 1,900,000 square metres (20,450,000 square feet) of floor area of mixed use floor area. Figure 5 below illustrates the forecast energy demand and required energy sources over time.

Projects/initiatives underway to maintain environmental performance of 70% renewable energy while meeting increased customer loads include:

- Expansion of the sewage heat recovery system: This project will add 6.6MW of renewable capacity and is targeted to be online in Q4 2023. This project secured $10.2 million in grant funding and is now at the construction stage. This expansion address the NEU's immediate low carbon energy needs and will be critical for enabling the NEU to achieve its long-term GHG performance targets by supplying reliable, high efficiency baseload energy.
- Long-term RNG agreement: Fortis has removed the RNG curtailment in place since August 2019. In addition, the Vancouver Landfill gas project is expected to be online in late 2023 to 2024 and the City will have first right of refusal for those RNG quantities.
- Decarbonization Road Map: The NEU has initiated a study to identify low carbon resources and technologies best suited to meet the future energy demand of the system and establish a roadmap for fully transitioning the utility away from fossil fuels by 2030.

FIGURE 5: NEU ENERGY SUPPLY FORECAST



Beyond the greenhouse gas emissions benefits, the NEU also provides environmental co-benefits:

- the economies of scale associated with NEU allow the utility to tap into local renewable heat sources that would otherwise not be available to an individual building, such as waste heat recovery from sewage, commercial cooling, and data centres;
- the NEU offers a platform for the recovery of waste heat from customer buildings, providing an opportunity for customers to earn a modest revenue stream by selling their

waste heat into the NEU system while allowing the waste heat to be reused locally by the neighbourhood;

- the NEU allows buildings to minimize the need to locate heating equipment on roof-tops, leaving more space for green roofs which help to reduce rainwater run-off and the heat island effect;
- with continued urban growth and the electrification of buildings and transportation, the provision of thermal energy through the NEU reduces future burden on the electrical grid and contributes to the resiliency of our broader energy systems; and
- the NEU has proven to be an effective platform to apply City leadership and demonstrate new low-carbon technologies to enhance adoption by others as is evident by the significant increase in sewer heat recovery utilization across BC since the NEU pioneered the technology in Canada in 2010. The NEU routinely hosts tours and workshops to share lessons learned with Municipalities, Universities, Consultants, Developers, and the like to help enable confident investments in low-carbon outcomes.

Financial Performance Indicators

This section provides an update on the financial performance of the 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 KPIs and targets for the NEU. These KPIs are used to track long-term financial performance of the utility, and to guide future rate setting. One KPI (maximum balance of under-recovered costs) was updated in December 2018 to accommodate NEU expansion areas approved by Council in February 2018.

There were three main changes in 2022 that impacted NEU financials and the associated KPIs:

1. Updates to the development forecast for two sites within the NEU service area:
    a. The City waived NEU connection requirements on the Plaza of Nations development site as part of the development permit application process due to a lack of available energy supply in Northeast False Creek, making servicing the site unfeasible
    b. The City secured NEU connection requirements to 1628 Scotia Street as part of the development permit application process based on a positive financial extension test and the ability to service the site with an extension of the existing distribution network
2. Capital cost budget adjustment to the low carbon expansion project: the budget for expanding the sewage heat recovery capacity at the False Creek Energy Centre was increased based on construction/installation tender results coming in over the consultant's estimate. This project continues to benefit from $10M of grant funding and even with the observed cost escalation remains a cost effective source of low carbon energy supply for the NEU.
3. Interest rates: the forecast interest rates for financing new capital investment was increased in-line with recent Bank of Canada increase, increasing the forecast cost of borrowing.

Table 1 below compares the KPIs associated with the levelized rate approach under the original forecast included in the 2010 rate report, the forecast in 2018 after the expansion plan, the last forecast, and the current forecast. The NEU remains on target for all KPIs.

TABLE 1: NEU KPIs

	Original Forecast Feb '09[2]	**Forecast Nov'18**[3,4]	**Last Forecast Nov '22**[4]	**Current Forecast**[4]
Maximum Balance of Under-Recovered Costs *Target: not to exceed $15.0 M*	$ 7.3 M	$12.5 M	$9.1M	**$ 12.5 M**
Recovery Timeline for Under-Recovered Costs *Target: not to exceed 25 years*	22 years (2031)	20 years (2029)	24 years (2033)	**25 years (2034)**
Escalated Rate Increases[1] *Target: Rate Escalation Factor to be eliminated when annual revenues exceed annual costs*	3.2% thru 2035[2]	3.2% thru 2023	3.2% thru 2022	**3.2% thru 2030**

Notes to table

1. Includes long-term average inflation of 2%
2. Original forecast maintained escalated rate increase over entire timeline, until 2035
3. Forecast from NEU 2019 Customer Rates (RTS 12728) following February 2018 expansion plan
4. Includes expansion areas added in February 2018 that were not factored into original forecast

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."* When the NEU started operation in 2010, a target was set to limit its rates to no greater than a 10% premium above the BC Hydro rate.

To assess the competitiveness of the NEU, staff examined what a typical NEU customer would pay compared with other energy providers. Table 2 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 2023 effective rate for the NEU is $129 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 proposed 2023 NEU rate is 4% higher than the forecast 2022 BC Hydro effective rate. The NEU effective rate continues to be within the target maximum 10% premium over BC Hydro.

TABLE 2. COMPARISON OF 2023 EFFECTIVE RATES, NEU WITH OTHER PROVIDERS

Energy Provider	GHG Emission Intensity (kg CO_2/ MW.h)	Estimated Effective Rate [1] ($/MW.h)	Notes
NEU (Hot Water)	**70**	**$129**	**The NEU bills strata corporations, not individual suites; any incremental strata sub-metering costs incurred by NEU consumers are not included here.**
BC Hydro[2] (Electricity)	24	$124	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 basic charge.
FortisBC[3] (Natural Gas)	220	$115	Fuel costs, based on FortisBC Lower Mainland Rate 3, with high efficiency boiler system and factoring in conversion losses as well as carbon tax = $65 per MW.h. Installation and replacement of boiler equipment plus maintenance = $50 per MW.h. Total effective cost = $115 per MW.h
Creative Energy Ltd. (Steam)	268	$70[5]	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 Neighbourhood DES (Hot Water)	220	$116[4]	UBC Neighbourhood DES operations began in 2015, using temporary natural gas boilers, and plans to use waste heat from the Triumf particle accelerator facility once the customer base is sufficiently established.
SFU UniverCity Energy (Hot Water)	44	$164[4]	SFU UniverCity Energy operations began 2012, using temporary natural gas boilers. This commissioned a biomass facility for low carbon energy supply in late 2021**.**
River District Energy (Hot Water)	220	$112[4]	River District Energy operations began in 2012, using a temporary natural gas boiler, and plans to switch to a low carbon energy supply once the customer base is sufficiently established.
Richmond Oval Village District Energy (Hot Water)	220	$114	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.
Surrey City Energy (Hot Water)	132	$122	Surrey City Energy operations began in 2015, using temporary natural gas boilers and plans to use Sewer Heat Recovery once customer base is sufficiently established. The system is currently achieving emission reductions with the use of RNG.
PCI Marine Gateway (Heating & Cooling)	42	$155[4]	The PCI Marine Gateway development utilizes a geo-exchange heating and cooling system provided by FortisBC Alternative Energy Services.
Shannon Estates Utility Ltd.	61	$189[4]	The Shannon Estates Thermal Energy System began operations in 2016, using a combination of natural gas boilers, solar panels, and heat recovery from waste sewage and cooling systems.

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. Effective rate estimates may be based on proposed 2023 rates that are pending regulatory or Council approvals and are thereby subject to change.

2. Based on the Feb 2019 BC Auditor General's Report, BC Hydro's current rates may not be sufficiently high enough to recover BC Hydro's operating costs, and the electric utility's deferral account debt is significant. Also, electric baseboard heat is often used in conjunction with natural gas for ventilation air and hot water, and that natural gas may supply more than 50% of the building heat demand.
3. FortisBC rates (and rates of other providers listed that rely on natural gas supply) are largely dependent on the commodity cost of natural gas and are subject to 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. While Fortis conventional natural gas rates are listed in the table, note that under the current Green Buildings Policy for Re-zonings and recent updates to Vancouver's Building Bylaw, a typical building connecting to the NEU has a GHG intensity performance limit that effectively requires the use of electricity or a low carbon energy system to supply space heating.
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.
5. 2023 rate forecast unavailable at time of report. Estimated effective rate is based on 2022 rates.

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 03, 2022

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

RE: False Creek Neighbourhood Energy Utility ("NEU") 2023 Customer Rates

Dear Mayor Sim and Councilors:

The purpose of this letter is to provide City Council with the opinion of the independent Neighbourhood Energy Utility Expert Panel ("NEU Expert Panel", "Panel") on the rates proposed to be charged by the NEU to its customers for the 2023 calendar year.

The Panel met with City Staff via teleconference on September 28, 2022 to review the operations of the NEU over the previous year, in terms of its financial performance, environmental goals, customer growth and future expansion plans, as well as the rates proposed to be charged for 2023. The Panel also met with City Staff and Midgard Consulting Inc., by teleconference, in respect of Midgard's engagement to prepare a comprehensive rates review for the NEU in 2023. This comprehensive review will address both current and future rates and rate design as the NEU matures and potentially expands its operations.

As noted in prior reports to Council, the Panel's mandate is to provide independent expert advice on the rates and rates structures proposed for the NEU, taking into consideration established rate-setting principles and viewed in the context of certain parameters or targets, specific to the NEU, known as "key performance indicators" ("KPIs"). These KPIs are intended to ensure that the NEU can remain financially viable, recovering its total costs over a reasonable period of time.

Based on the information provided in the draft Administrative Report to Council and discussions with City staff, the Panel endorses the proposed 3.2% increase to customer rates across all customer classes, and the 5% increase in the Initial Connection Levy.

As discussed in the draft Report, the rates proposed for 2023 include an inflationary increase of 2% as well as an escalation factor of 1.2% above 2022 rates. The intent of the escalation factor is to allow the NEU to collect extra monies, beyond inflationary increases, in the early years, to enable it to recover its operating costs and its capital investment over the life of the utility, without putting unfair cost pressure on early users, when the customer base is smaller.

With respect to the inflationary increase of 2%, the Panel notes that this increase is below the current rate of inflation. The Bank of Canada has been increasing interest rates significantly over the past year in an effort to bring inflation under control, and closer to its target of 2%. The Panel is of the view that it makes sense to limit the inflationary increase to the proposed 2% at this time in part because heat and hot water are necessities and other consumer prices have been escalating significantly. It is also uncertain at this time where inflation will go. The Panel also notes staff's advice that approximately one half of the current annual revenue requirement is related to the recovery of historical capital expenditures and therefore not impacted by current inflation. Maintaining the inflationary portion of the rate increase at 2% will also serve to keep rates relatively stable, in accordance with Council- approved rate-setting principles. Any under-recoveries can be handled by way of the existing deferral account for under-recovered costs. The inflationary increase component of rates can be reviewed again next year.

The 1.2% escalation factor remains appropriate and is consistent with prior years.

In years past, the rate increase was divided unequally between the fixed capacity levy and the variable energy use charge components of the rate, with the greater portion going to the variable component. The purpose of this unequal distribution was to provide an enhanced energy conservation price signal. At this point, in the Panel's view, the variable energy use charge has been escalated sufficiently to provide whatever price signal is viewed as necessary, and, if it were to be continued, could begin to affect the NEU's ability to cover its fixed costs, which is, of course, critical to the survival of the NEU. The current rate components will therefore now be escalated equally, pending further analysis as part of the comprehensive rates review.

With respect to the Initial Connection Levy, the Panel agrees with City staff that a 5% increase in this fee is appropriate for 2023, given the significant increase in the cost to connect an Energy Transfer Station, which increase has been experienced throughout the industry. This increase is apparently due to ongoing supply chain pressures. The Panel notes that staff will continue to monitor the costs associated with connecting an Energy Transfer Station and this increased fee, which is below the actual cost increase, can be reviewed again next year.

As noted in the draft Report, the NEU uses a "levelized cost approach" which is common in utility rate-setting. Under this approach, as noted above, rates are designed to under-recover costs in the early years of operation, when the customer base is smaller, and to over-recover in later years, so that all costs are recovered over a reasonable length of time. In this case, the time period for recovery is set at 25 years, by way of one of the NEU's KPIs.

The other KPI sets a limit on the quantum of unrecovered costs in the deferral account entitled "Maximum Balance of Under-Recovered Costs" with a target cap of $15.0 Million.

The Panel notes that the proposed 2023 rates will allow the NEU to continue to operate within the boundaries set by its KPIs. In particular, the Maximum Balance of Under-Recovered Costs is now forecast to be $12.5 Million, which is within its maximum target balance of $15.0 Million, and the Timeline for Recovery of Under-Recovered Costs is 25 years, which is at the target maximum. It is forecast that the rate escalation factor will be needed through 2030, which is tracked as a further KPI.

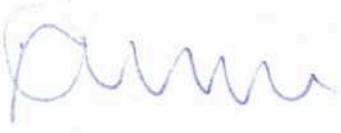
From the Panel's review of the material provided and discussions with City staff and its consultant, Midgard, it is clear that there remains uncertainty surrounding the timing and costs associated with the potential expansion of the NEU, particularly in light of these uncertain economic times. There are also rate design issues associated with bringing on new capacity and new customers. In its last report, the Panel noted that a comprehensive review of the NEU's rates and rate design was overdue, largely because of the pandemic and its associated effects on City staff's work plan. As noted, this comprehensive review is now underway and will continue into 2023.

The Panel has also reviewed the information provided on the rates charged by other neighbourhood energy systems in the Lower Mainland, as well as those charged by FortisBC and BC Hydro. The Panel finds that the rates proposed by the NEU for 2023 are not inconsistent with those charged by other comparable utilities, and remain within the target maximum 10% premium over those charged by BC Hydro, which at this point, continue to offer a useful comparison.

In summary, the Panel finds that the proposed rate increases of 3.2%, across all customer classes, together with the 5% increase in the Initial Connection Levy are reasonable. The Panel also finds that the rates themselves remain reasonable, stable, and predictable, and compare favourably with those charged by other, similar neighbourhood energy systems.

The Panel would also like to take this opportunity to thank City staff for its thorough preparation, analysis and cooperation throughout the review process.

Yours sincerely,



Alison Rhodes
Chair, NEU Expert Panel