CITY OF VANCOUVER

REPORT

Report Date: November 23, 2023
Contact: Mark Schwark
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RTS No.: 15730
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Meeting Date: December 5, 2023

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: 2024 False Creek Neighbourhood Energy Utility Customer Rates

Recommendations

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 2024 customer levies and charges, with a 3.2% increase over 2023; and

   ii) updated Initial Connection Levy, with a 5% increase over 2023 rates.

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.

Purpose and Executive Summary

This report seeks Council approval of the recommended 2024 customer rates for the False Creek Neighbourhood Energy Utility ("NEU"), which incorporate a 3.2% net increase over 2023. This will result in a cost increase of $33 per year (from $1,057 to $1,090 per year) for an average 75 square metre (800 square feet) suite.

Staff also seek Council approval of a 5% increase in the Initial Connection Levy. This reflects observed market price cost increases for building connections.

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 to advise staff and Council on future NEU rate adjustments and the establishment of customer rate classes and rate formulas.

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 2018 Council adopted the NEU investment decision framework to guide NEU expansion, enacted an amendment to the Energy Utility System By-law to expand the service area, and approved an update to the maximum balance of under-recovered costs KPI.

In November 2020, Council approved the Climate Emergency Action Plan, which included the development of a de-carbonization roadmap to transition the NEU to 100% renewable energy by 2030, subject to evaluation and competitiveness with other low carbon energy options for buildings.

In June 2023, Council approved recommendations from the NEU Comprehensive Rate Review, which included adoption of updates to the NEU rate design and KPIs.

City Manager's Comments

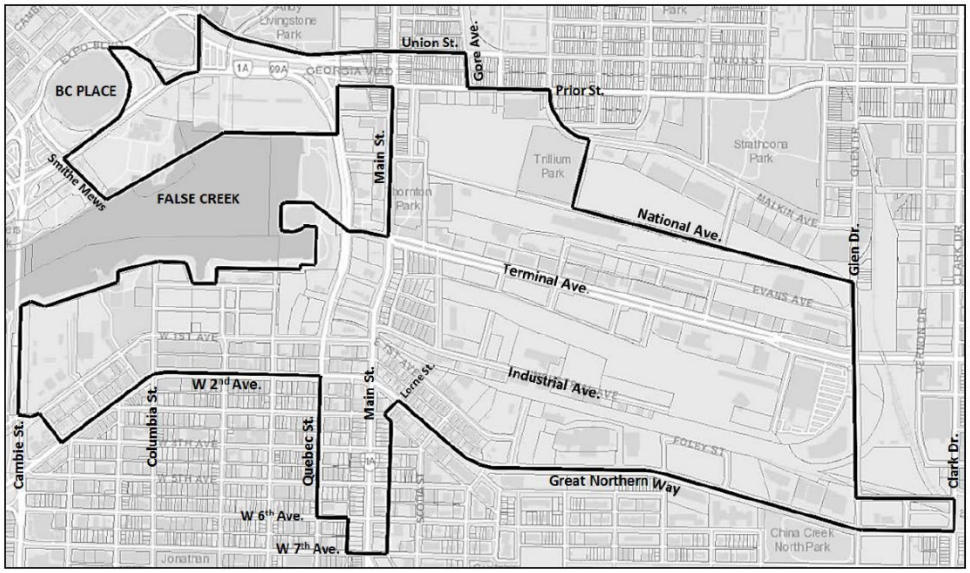
The City Manager supports the above recommendations.

Context and Background

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 in which all NEU costs are recovered over time. Key performance indicators ("KPIs") and targets, adopted by Council, guide annual rate setting for the NEU under the commercial utility rate model.

The NEU began operation in January 2010 and currently services 46 residential, commercial and institutional buildings, with 643,000 square metres (6,920,000 square feet) of floor area. The total build-out is forecast at 2,040,000 square metres (21,960,000 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 2024. Note that all forecast costs and rate assumptions provided in this report are based on the current target of 70% renewable energy.

Discussion

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

i. Residential and Mixed Use Residential buildings within the Southeast False Creek ("SEFC") Official Development Plan area that applied for building permit prior to July 1, 2023;

ii. Residential and Mixed Use Residential buildings outside of SEFC and SEFC residential or mixed use residential buildings that applied for building permit on or after July 1, 2023; and

iii. Non-Residential Buildings.

Staff recommend that NEU customer rates increase by 3.2% over 2023 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 2023 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 $33 per year (from $1,057 to $1,090 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 2023 AND RECOMMENDED 2024 CUSTOMER RATES[1]

	2023	2024 PROPOSED	% CHANGE
Class 1 (Residential and Mixed Use Residential within SEFC)[3]			
Fixed Capacity Levy	$0.633 per m^2 per month	**$0.653 per m^2 per month**	3.2%
Variable Energy Use Charge	$59.296 per MW.hr	**$61.193 per MW.hr**	3.2%
Net Effective Rate[2]	**$128.7 per MW.hr**	**$132.8 per MW.hr**	**3.2%**
Class 2 (Residential and Mixed Use Residential Outside SEFC) and Class 3 (Non-Residential)			
Fixed Capacity Levy	$9.522 per KW peak demand per month	**$9.827 per KW peak demand per month**	3.2%
Variable Energy Use Charge	$59.296 per MW.hr	**$61.193 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.
3. Residential and Mixed Use Residential buildings in SEFC applying for a building permit after July 1, 2023 are classified as Class 2 customers

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 2024 rate increases as recommended in this report (Appendix D).

Staff would like to acknowledge the contributions of the Expert Panel in which its because its 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 deliver 69% of its energy 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 2023 revenues and expenses as forecast at the end of September for the 2023 Operating and Capital Budgets under the commercial utility model. The main causes for the difference between 2023 budget and the 2023 actuals projected to year-end are as follows:

1. *Gas and Electricity Costs:* Fuel costs are forecast to be 12% ($324K) higher than budgeted due to higher than forecast gas prices and deployment of addition renewable natural gas.
2. *Financing Costs*: Slower than forecast capital outlay on the low carbon expansion project resulting in financing costs being 20% ($865K) under budget.

Overall, NEU revenues are forecasted to exceed expenses by $147K, $602K higher than budgeted.

TABLE 2. 2023 NEU REVENUES AND EXPENSES, BUDGET COMPARED TO YEAR-END FORECAST BASED ON THE COMMERCIAL UTILITY RATE MODEL ($ MILLIONS)

	2023 Budget	2023 Forecast	$ Variance	% Variance	2024 Proposed
Revenues and Recoveries					
Capacity Levies	$ 4.6	$ 4.6	$ (0.0)		$ 4.8
Energy Use Charges	3.5	3.5	0.0		3.6
Total Revenues	**$ 8.2**	**$ 8.2**	**$ (0.0)**	**0%**	**$ 8.5**
Operating Expenses					
Natural Gas & Electricity	$ 2.7	$ 3.1	$ 0.3		$ 3.0
Staff, Maintenance, Overhead & Other[1]	1.5	$ 1.5	(0.1)		1.8
Total Operating Expenses	**$ 4.2**	**$ 4.5**	**$ 0.3**	**6%**	**$ 4.8**
Financing Expenses[1]					
Interest Expense	$ 1.2	$ 0.9	$ (0.3)		$ 1.1
Return on Equity	1.8	$ 1.4	(0.4)		1.8
Depreciation	1.4	$ 1.2	(0.2)		1.6
Total Financing Expense	**$ 4.4**	**$ 3.5**	**$ (0.9)**	**-20%**	**$ 4.5**
Total Expenses	**$ 8.6**	**$ 8.0**	**$ (0.6)**	**-7%**	**$ 9.3**
Operating Shortfall	**$ 0.5**	**$ (0.1)**	**(0.6)**	**-132%**	**$ 0.8**
Capital Costs	**$ 15.7**	**$ 8.8**	**$ (6.9)**	**-44%**	**$ 14.7**

[1] Reflects costs under the commercial utility model

[2] Table may not sum due to rounding

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.

In recent years, the NEU has observed a significant increase in the cost of delivering an Energy Transfer Station. Staff have verified with municipal partners and other district energy providers that this increase is industry wide. Consistent with last year, Staff recommend that the Initial Connection Levy be increased by 5% in response to the market price cost increases for building connections.

TABLE 5. NEU CONNECTION LEVY STRUCTURE

COMPONENT	2023 Rates	Proposed 2024 Rates
Fixed Portion	$97,499	$102,374
Variable Portion	$115/kW of peak energy demand required for a building	$121/kW of peak energy demand required for a building

The information presented in this report assumes that the NEU will continue to implement the Council approved 2018 expansion plan. To support the expansion plan, future capital investments in the scale of $60M for thermal energy generation and $40M for distribution infrastructure are estimated based on modelled development forecasts and the associated generation facilities, distribution network, ancillary infrastructure and resources that is required. Future investments will be determined through the Council 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.

Legal Implications

Amendments to the Energy Utility System By-law are necessary to implement the proposed rate changes. The proposed amendments are authorized by section 300.1 of the Vancouver Charter.

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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 2024 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 “Schedule C”, and replaces it with the “Schedule C” attached to this By-law.

3. This By-law is to come into force and take effect on January 1, 2024.

ENACTED by Council this day of , 2023

_____
Mayor

_____
Acting City Clerk

"SCHEDULE C

LEVIES AND CHARGES

PART 1 – Connection levy

Fixed Portion per Energy Transfer Station	$102,374
Variable Portion per Energy Transfer Station	$121 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 where the first building permit for the building is applied for before July 1, 2023	$0.653 per m^2
Class 2 - Residential or mixed use residential building located outside SEFC, and SEFC residential or mixed use residential building where the first building permit for the building is applied for on or after July 1, 2023	$9.827 per KW of peak heat energy demand
Class 3 - Non-residential building	$9.827 per KW of peak heat energy demand

PART 3 – Monthly energy charge

Monthly energy charge	$61.193 per MW hour

PART 4 – Monthly energy credit

Credit for heat energy returned to energy transfer station	$61.193 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."

APPENDIX B

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.

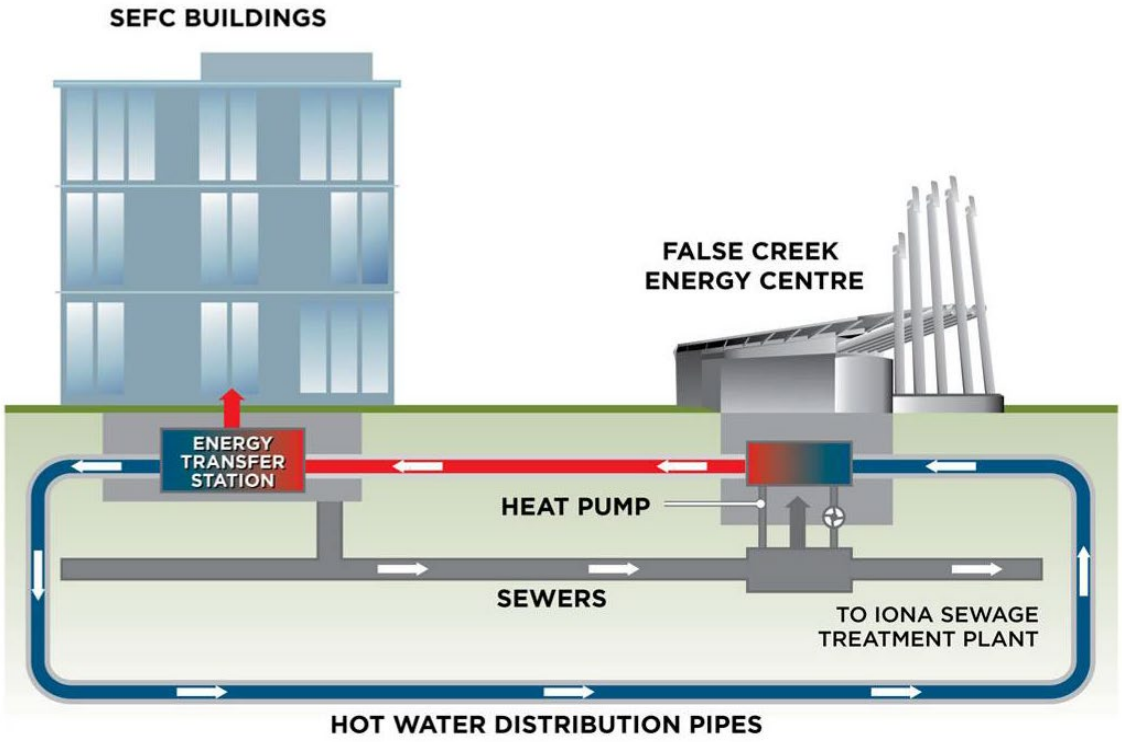
In summary, there are four components to the NEU's infrastructure, illustrated in Figure 1 below.

- *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"). 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.

In June 2023, Council approved recommendations from the NEU Comprehensive Rate Review, which included adoption of updates to the NEU rate design and KPIs.

NEU Rate Design

The NEU currently recovers its costs using three different rate classes to ensure that NEU costs are equitably distributed among different customers:

i. Residential and Mixed Use Residential buildings within the Southeast False Creek ("SEFC") Official Development Plan area that applied for building permit prior to July 1, 2023;

ii. Residential and Mixed Use Residential buildings outside of SEFC and SEFC residential or mixed use residential buildings that applied for building permit on or after July 1, 2023; and

iii. Non-Residential Buildings.

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

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

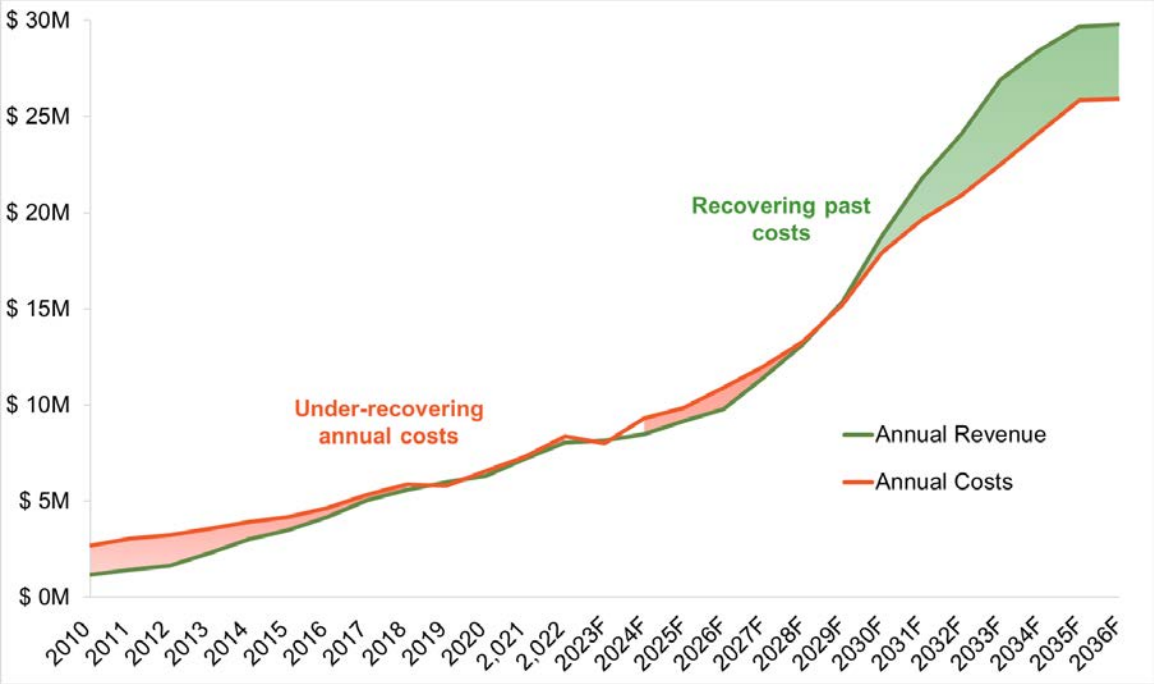
CAPACITY LEVY – This monthly charge is based on either floor area, which is measured in square metres, or subscribed capacity (measured in kilowatts) depending on rate class. This charge reflects each buildings peak energy demand; the NEU's fixed costs are recovered via the Capacity Levy, and this charge does not vary with a customer's energy use.

Levelized Rate Structure

To provide competitive and stable rates for the NEU customers, rates are established based on a levelized rate approach. 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

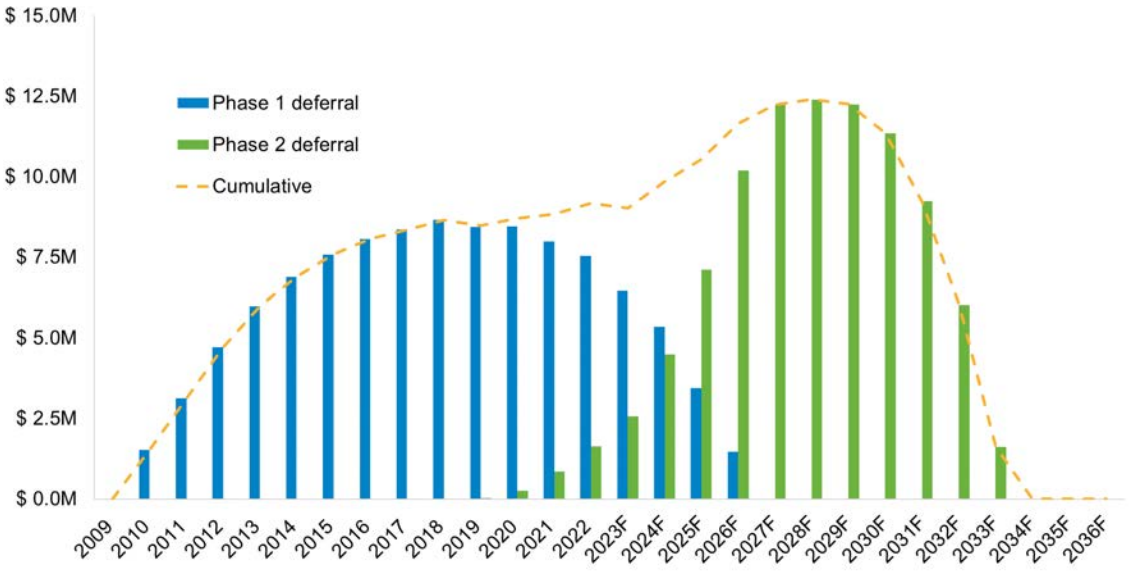
and those who connect in later years. This is a common practice by privately owned utilities regulated by the BC Utilities Commission ("BCUC").

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 the systems long-term inflation forecast of 2%, 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.

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

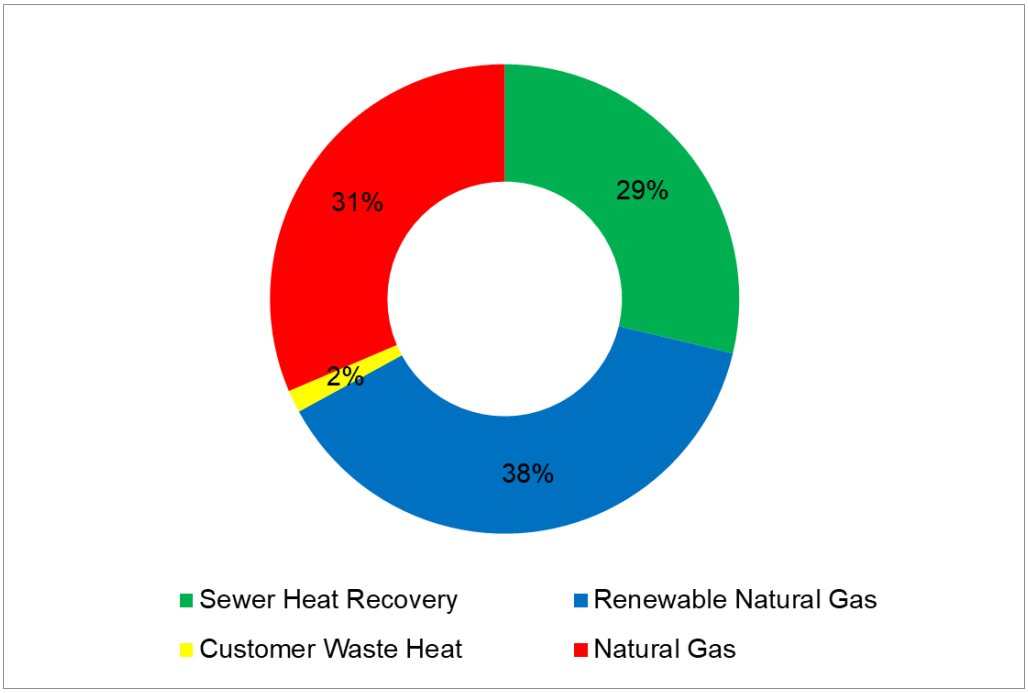


NOTES TO FIGURE:
Phase 1 deferral: original investment in the false creek energy centre and distribution network in SEFC
Phase 2 deferral: investments to expand the distribution network beyond SEFC and expand generation capacity

Environmental Performance Indicators

The NEU currently targets to produce 70% of its energy from renewable sources. The NEU is forecasting to deliver 69% of its energy in 2023 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 2023 is 6,500 tonnes CO_2, compared to a 2007 baseline.

FIGURE 4: 2023 ENERGY GENERATION SOURCES

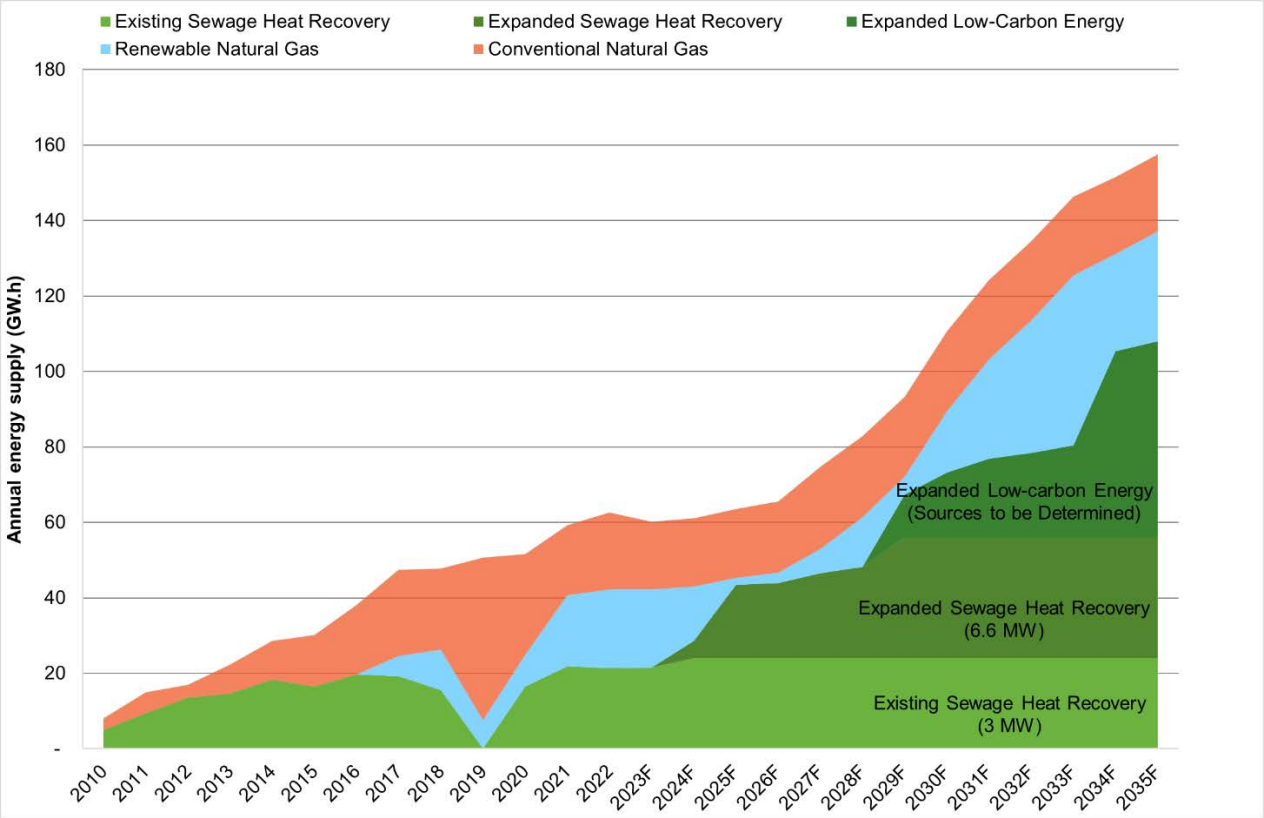


Looking ahead, the NEU has a growing customer base and energy demand that will require additional sources of low carbon energy generation. Figure 5 below illustrates the forecast energy demand and required energy sources over time.

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 6.6 MW of renewable capacity and is targeted to begin commissioning in Q3 2024. This project secured $10.2 million in grant funding and is now at the construction stage. This expansion will 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: In 2023, the NEU extended its long-term RNG supply agreement with Fortis for 5-years, ensuring continued access to RNG at a discounted rate. In addition, the Vancouver Landfill Gas project will provide the City with a first right of refusal over any RNG generated. This resource can be used as a bridging fuel between investments in low carbon energy sources and support decarbonization of peak loads.
- Decarbonization Road Map: As part of the City's climate emergency action plan, the NEU is nearing completion of 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. In June 2023, based on the recommendations from the Comprehensive Rate Review, the KPI's were updated to include a distinct deferral account for NEU expansion with its own recovery timeline of 25 years.

There were two main changes in 2023 that impacted NEU financials and the associated KPIs:

1. Updates to the development forecast to reflect the best available planning information:
    a. Development timelines were updated, pushing out the development schedule of two large developments sites in the NEU service area
    b. Development density forecasts were updated, increasing total forecast connected floor area by 120,000 m2.
2. Capital cost budget adjustments:
    a. Capital cost unit rates and forecasts for future generation infrastructure were updated to reflect recent observed cost escalations
    b. The budget for delivering the Thornton Street Satellite Peaking Plant, required to meet the growing peak demand of the system and enhance system resiliency, was increased to account for site conditions better understood at the detailed design phase
    c. A new project to loop the NEU distribution network at Lorne Street was initiated for implementation in 2024. This project is required to relieve hydraulic constraints in the distribution network and enhance system resiliency.

Table 1 below illustrates the impacts of these changes by comparing the current KPIs to last years forecast. The NEU remains on target for all KPIs.

TABLE 1: NEU KPIs

	Last Forecast Nov '22[4]	**Current Forecast**[4]
Maximum Balance of Under-Recovered Costs *Target: not to exceed $15.0 M*	$12.5M	**$ 12.4 M**
Recovery Timeline for Under-Recovered Costs *Target: Deferral 1: not to exceed 25 years (2034) Deferral 2: not to exceed 25 years (2044)*	25 years (2034)	**Deferral 1: 18 years (2027) Deferral 2: 16 years (2034)**
Escalated Rate Increases[1] *Target: Rate Escalation Factor to be eliminated when annual revenues exceed annual costs*	3.2% thru 2030	**3.2% thru 2029**

Notes to table

1. Includes long-term average inflation of 2%

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 2024 effective rate for the NEU is $133 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.

On a 3-year rolling average, the NEU effective rate is 4% higher than BC Hydro. The NEU effective rate continues to be within the target maximum 10% premium over BC Hydro.

TABLE 2. COMPARISON OF 2024 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**	**$133**	**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)	11.5	$126	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	$102	Fuel costs, based on FortisBC Lower Mainland Rate 3, with high efficiency boiler system and factoring in conversion losses as well as carbon tax = $52 per MW.h. Installation and replacement of boiler equipment plus maintenance = $50 per MW.h. Total effective cost = $102 per MW.h
Creative Energy Ltd. (Steam)	268	$90[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	$122[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	$174[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	$116[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.

Energy Provider	GHG Emission Intensity (kg CO_2/ MW.h)	Estimated Effective Rate [1] ($/MW.h)	Notes
Richmond Oval Village District Energy (Hot Water)	220	$121	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[5]	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	$161[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	$193[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 2024 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.
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 2 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, given recent updates to the Vancouver 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. 2024 rate forecast unavailable at time of report. Estimated effective rate is based on 2023 rates.

APPENDIX C

FALSE CREEK NEIGHBOURHOOD ENERGY UTILITY OWNERSHIP MODEL, GOVERNANCE AND RATE-SETTING PRINCIPLES, AND INVESTMENT DECISION FRAMEWORK FOR NEU EXPANSION

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.

Guiding Principles for NEU Expansions

In 2018 Council approved the NEU Expansion Investment Decisions Framework. Expansion of the NEU incorporates the following guiding principles, which are generally aligned with the original NEU governance principles that Council approved in 2006.

- **Renewable Energy**: the NEU will be used to accelerate 100% renewable energy outcomes for connected buildings, maximizing use of local resources like waste heat
- **Long-term Financial Viability**: expansions of the NEU must be financially viable, earning a return on investment commensurate with a commercial utility model
- **Customer Cost**: the NEU will provide a service that is cost competitive with other low carbon heating options available to customers
- **Resiliency**: the NEU will utilize a design approach that maximizes the reliability of the service and maintains the long-term flexibility to adapt to future technologies
- **Business Model**: to maintain control over GHG outcomes, the City will own the distribution system, with flexibility for private sector to own, operate and finance new energy centres

NEU Expansion Investment Decision Framework

Table 1 below summarizes the analyses staff will undertake to guide major capital investment decisions.

TABLE 1. INVESTMENT DECISION FRAMEWORK

Aspect of Evaluation	Analysis Required
1. Options Analysis	• Update evaluation of NEU alongside alternative options to achieve desired GHG outcomes
2. Financial Analysis	• Evaluate financial implications (fiscal capacity, NEU financial KPIs etc.) of continued operations and expansion
3. Ownership Analysis	• Evaluate City role with respect to ownership and operations of all or a portion of NEU infrastructure, including both existing infrastructure and future energy centres
4. Risk Assessment	• Update evaluation of risks using the City's standard risk assessment framework

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APPENDIX D

LETTER FROM THE CITY OF VANCOUVER NEIGHBOURHOOD ENERGY EXPERT PANEL, REGARDING 2024 PROPOSED NEU RATES

SEE FOLLOWING PAGE

November 08, 2023

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

RE: False Creek Neighbourhood Energy Utility ("NEU") 2024 Customer Rates

Dear Mayor Sim and Councilors:

The purpose of this letter is to advise City Council as to 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 2024 calendar year.

The Panel met with City staff via teleconference on October 06, 2023 to review the operations of the NEU over the previous year, in terms of its financial performance, achievement of environmental goals, customer growth and future expansion plans, as well as the proposed rates for 2024. Prior to that, the Panel also met with City staff and representatives of Midguard Consulting Inc. in respect of the Comprehensive Rate Review, recommendations from which were presented to and approved by Council in June, 2023.

As noted in previous reports to Council, the Panel's mandate is to provide independent expert advice on the rates and rate 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 from its customers over a reasonable period of time.

Based on the information provided in the draft Report to Council and discussions with City Staff, the Panel endorses a rate increase of 3.2% across all customer classes, as well as the proposed 5% increase to the Initial Connection Levy.

The Panel notes that there are now two deferral accounts, based on the recommendations flowing from the Comprehensive Rate Review. This modification to the KPIs will allow the NEU to continue to grow while ensuring that customer rates remain fair and reasonable and consistent with inter-generational equity principles.

As in prior years, the rate increase includes an inflationary increase of 2% and a temporary escalation factor of 1.2% above 2023 rates.

The intent of the escalation factor is to allow the NEU to collect additional monies, beyond inflationary increases, in the early years to ensure that the NEU can recover its operating costs and its capital investment over the life of the utility, without putting unfair cost pressure on early users, when there is a smaller customer base. The escalation factor is eliminated once annual revenues exceed annual costs.

With respect to the inflationary increase of 2%, the Panel notes that this increase is below the current rate of inflation. However, this 2% increase is consistent in large measure with the long term target rate of the Bank of Canada, and it would seem that there is a chance that inflation is on its way down. 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 escalated significantly. The Panel also notes staff's advice that approximately one half of the current annual revenue requirement is related to servicing historical capital expenditures and is therefore not impacted by current inflation. Maintaining the inflationary portion of the rate increase at 2% will also serve to keep rates relatively stable and therefore predictable, in accordance with Council-approved rate-setting principles. Further, any under-recoveries can be managed by way of the existing deferral accounts for under-recovered costs.

The 1.2% escalation factor remains appropriate and is consistent with prior years. The duration of this escalation factor is also tracked as one of the NEU's KPIs. It is currently due to be eliminated in 2029.

The rate increases will be divided equally between the fixed capacity levy and the variable energy use charge, which is consistent with the allocation made last year and accords with the recommendation contained in the Comprehensive Rate Review.

With respect to the Initial Connection Levy, the Panel agrees with City staff that a 5% increase in this fee for 2024 is appropriate, given what has been described as a "significant increase in the cost of delivering an Energy Transfer Station", which increase has been experienced industry-wide. This increase is also consistent with that of last year.

As noted in Appendix B to the draft Report, and as discussed in relation to the escalation factor above, the NEU uses a "levelized approach" such that 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, ensuring that the NEU's total costs are recovered over a reasonable time period. In this regard, one of the NEU's KPIs allows a maximum 25 year period for recovery of the balance in a deferral account, which is the account used to track and accumulate under-recovered costs. The Panel notes that the original deferral account is on track to be eliminated in 18 years (2027), which is ahead of its 25 year timeline (2034) and the second deferral account is due to be eliminated in 16 years (2034), also ahead of its 25 year timeline (2044).

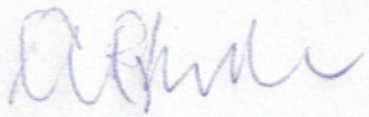
The other KPI sets a limit on the quantum of unrecovered costs in the deferral accounts. This KPI is entitled "Maximum Balance of Under-Recovered Costs". This KPI limit is $15.0 Million per deferral account. The Panel notes that there is currently no issue in terms of exceeding this cap.

The Panel has reviewed the information provided on the rates charged by other neighbourhoood energy systems in the Lower Mainland, as well as those charged by BC Hydro and FortisBC. The Panel finds that the rates proposed to be charged by the NEU for 2024 are not inconsistent with those charged by other comparable utilities and remain within the target maximum of a 10% premium over those charged by BC Hydro. The Panel agrees that it is appropriate to use a 3 year rolling average when considering BC Hydro rates for comparison purposes.

In summary, the Panel finds that a rate increase of 3.2% across all customer classes, together with a 5% increase in the Initial Connection Levy are reasonable. The Panel also finds that the rates themselves remain reasonable, stable, understandable 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 analysis and cooperation throughout the review process.

Yours sincerely,



Alison Rhodes
Chair, NEU Expert Panel