City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	March 23, 2015
From:	John Irving, P.Eng. MPA Director, Engineering	**File:**	10-6600-10-01/2015-Vol 01
Re:	**River Green District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9239**		

Staff Recommendation

That:

a) the name for the River Green District Energy Utility be re-named to the Oval Village District Energy Utility; and

b) the River Green District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9239 be introduced and given first, second and third readings.

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Finance	☑	
Law	☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:**	**APPROVED BY CAO**

Staff Report

Origin

In 2014, Council adopted the River Green District Energy Utility Bylaw No. 9134 establishing governing regulations for Phase 1 development of the River Green District Energy Utility (RGDEU) Service Area.

The purpose of this report is to recommend an amended RGDEU rate structure and rate for 2015, and to change the name of the River Green District Energy Utility to Oval Village District Energy Utility.

This report supports Council's Term Goal #8 Sustainability:

> *8.1. Continued implementation and significant progress towards achieving the City's Sustainability Framework, and associated targets.*
>
> *8.4. Review opportunities for increasing sustainable development requirements for all new developments, including consideration of increasing requirements for sustainable roof treatments (e.g. rooftop gardens, solar panels, etc.) and energy security (e.g. use of local renewable energy sources, use of district energy systems, etc.).*

Background

In 2013, at Council's direction, the Lulu Island Energy Company (LIEC) was established as a wholly-owned corporation of the City for the purposes of managing district energy utilities on the City's behalf. Further to that, a District Energy Utilities Agreement between the City and the LIEC was executed, assigning the LIEC the function of providing district energy services on behalf of the City.

In 2014, Council adopted the River Green District Energy Utility Bylaw No. 9134 (the Bylaw) establishing the regulatory framework for the RGDEU service area. The business which encompasses the RGDEU Service Area and the associated operations, assets and liabilities will be administered through the LIEC. The RGDEU business was established based on the concept that all capital and operating costs would be recovered through revenues from user fees, ensuring that the business would be cost neutral over time. In October 2014, in order to meet these requirements as well as the required service levels defined by the Bylaw, the LIEC and Corix Utilities entered into a concession agreement whereby the LIEC would own the RGDEU and its infrastructure, and Corix would design, construct, finance, operate and maintain the RGDEU, subject to the City as the sole shareholder of the LIEC setting rates to customers.

Analysis

<u>Change of Name to Oval Village DEU</u>

At the time the project was initiated, staff used the River Green DEU name after the largest development in the area – the River Green by Aspac Developments. Recently however, Aspac notified staff that their name River Green has been trademarked and that it should not be used. In

order to conform with the trademark and to promote the City's Oval Village where the system is located, it is recommended that the name be changed from River Green District Energy Utility to Oval Village District Energy Utility. This name change has been reviewed and supported by the LIEC Board of Directors, and is consistent with mapping utility naming to official OCP neighbourhood names. Subject to Council's approval, all future references to the River Green District Energy Utility will now be as the Oval Village District Energy Utility.

Proposed Rate Structure

Schedule D of the Bylaw defines the charges that constitute the rate for the service. These charges include a capacity charge (tied to the building gross floor area), and a volumetric charge (tied to the energy usage of the customer).

In order to provide certainty to developers and their customers with respect to the cost of energy, as well as assurance to the LIEC that the revenue collected would support the utility business case, the rate was set with 100% weight on the charge tied to the floor area of the building. The 2014 rate was set at $0.07 per square foot per month of the gross floor area, with the volumetric charge left at $0.00 per kilowatt hour as adopted by Council.

The City has received energy modeling reports summarizing the expected space heating and domestic hot water heating loads for the first few developments in the area. Although the energy loads vary between the developments, the energy modeling reports have provided an increased understanding of the expected energy loads and consumption. The City has also performed an analysis of different in-building space heating technologies (Water Source Heat Pumps, Hybrid Heat Pumps, Hydronic Perimeter Heating, 4-pipe Fan Coil), comparing how they use electricity to supplement some of the space heating loads.

The industry standard practice is to have a rate structure that is comprised of separate capacity and energy charges aiming to recover fixed (capital and operating) costs and variable (commodity) costs. These charges are based on the building gross floor area and energy usage. With the ability to forecast energy use more accurately, the City is not as reliant on the singular flat rate for certainty. The weighting can be shifted towards the objectives of equity and conservation, from which all customers will benefit.

The OVDEU business was established on the basis that all capital and operating costs would ultimately be recovered through revenues from user fees, ensuring that the business would be financially self-sustaining over the long term. The intent of amending the rate structure is to guarantee the necessary revenue to recover the capital and operating costs, while encouraging the building's high energy efficiency and energy conservation. In addition, the rate structure is designed to provide end users with annual energy costs that are competitive to conventional system energy costs based on the same level of service, as directed by Council.

Other factors that were considered when developing the 2015 OVDEU rate options include:

- Competitive Rate: The rate should provide end users with annual energy costs that are less than or equal to conventional system energy costs, based on the same level of service.

- Forecasted Utility Costs: Utility cost (electricity and natural gas) increases are outside the City's control. Nonetheless, these commodity costs directly impact the operation cost of the OVDEU. BC Hydro's 10 year plan projects an electricity rate increase of 6% in 2015. Natural gas costs are expected to increase 2.5% in 2015, based on National Energy Board estimates.

- Consumer and Municipal Price Indexes: Other factors to consider include various price indexes. For example, the consumer price index (CPI) is estimated by the Finance Department at 1.0% based on the average of recent BC forecasts, while municipal price index (MPI) is estimated at 2.76%.

Two options of the rate structure are presented for consideration as follows:

1. Leave the rate structure as is.
2. Reduce the Capacity (fixed) Charge and add a Volumetric (variable) Charge.

Option 1 – Leave the Rate Structure as is (Not Recommended)

This rate would reflect an approximate 4% increase over the 2014 rate and be comprised of:

1. Capacity Charge - monthly charge of $0.0728 per square foot of the building gross floor area; and

2. Volumetric Charge - charge of $0.00 per megawatt hour of energy consumed by the building.

The rate structure under this option would not encourage developers to build energy efficient buildings over time, which could result in an increased capital cost to the LIEC in order to build energy generation assets to meet the peak energy demand of the "inefficient" buildings. The capacity charge would have to be increased to recover the capital costs, and consequently, over time, the energy cost to the customers may increase above the energy cost for the conventional system.

In addition, this rate structure would not encourage the customers to conserve energy, which could result in higher costs in the electricity and gas required to generate the energy delivered to customers. This would have a negative impact on the variable operating costs of the LIEC.

Option 2 – Reduce the Capacity (Fixed) Charge and add a Volumetric (Variable) Charge (Recommended)

This rate would reflect an approximate 4% increase over the 2014 rate and be comprised of:

1. Capacity Charge - a monthly charge of $0.0458 per square foot of the building gross floor area; and

2. Volumetric Charge - a charge of $28.20 per megawatt hour of energy consumed by the building.

The rate structure under this option follows the industry standard practice of having separate capacity and energy charges based on the building energy capacity and energy usage. The Capacity Charge will aim to recover the capital investment and fixed operating costs, while the Volumetric Charge will aim to recover the cost of consumed electricity and gas required to generate the energy delivered to the customer.

The charge tied to energy use will encourage the customers to conserve energy. At the same time, this rate structure will guarantee the revenue necessary to recover the LIEC's capital investment and operating costs.

The recommended rate structure is based on the buildings' energy use estimates from the energy modeling reports received for the first few developments in the area and estimates for the typical buildings in the region. As the LIEC starts metering the district energy use from individual connected buildings, more accurate data on the actual energy use will become available. Going forward, this information will be used to help calculate annual rate adjustments that continue to encourage energy conservation and efficiency.

It is estimated that the resulting blended 2015 rate to customers will be $94 per MWh or $0.066 per square foot per month. This is in line with Council's objective to provide competitive annual energy costs for the LIEC customers. The conventional energy costs for space heating and hot water heating (called the "business as usual" (BAU) costs that represent electrical baseboard and natural gas heating systems) are estimated to be around $0.068 per ft^2/month ($97 per MWh).

Stakeholder Consultation

City staff have been in contact with developers and landowners throughout the due diligence and business and infrastructure agreements process with Corix. Staff also provide regular updates on the OVDEU and ADEU through the Urban Development Institute (UDI) Liaison Committee. The 2015 OVDEU rate structure was presented by staff at the March UDI Liaison Committee meeting. In addition, a memorandum (Attachment 2) clarifying the proposed amended rate structure and 2015 rate has been distributed to this stakeholder group for review and comment. Comments received are summarized in the table below. Staff are confident that stakeholder concerns have been addressed with the proposed rate structure and 2015 rate as proposed in the bylaw amendment.

Table 1: Summary of Stakeholder Input

UDI Comment/Question	Staff Response
On-going, will the rates be continuously compared to the costs of a conventional system?	Yes. Staff will continuously monitor energy costs and review the rate to ensure rate fairness for the customers and cost recovery for the City.
Will the OVDEU rate structure be the same as the rate for the Alexandra District Energy Utility (ADEU)?	No. ADEU and OVDEU are two different systems. ADEU provides space heating, cooling and domestic hot water heating through an ambient temperature system, while OVDEU provides space heating and domestic hot water heating through a high temperature system. Also, the energy sources for these two systems are different. Due these reasons, the fixed and variable costs break down are different between these two systems and therefore the rate structures will be independent. However, the annual energy costs to the customers of both systems will be competitive to conventional system energy costs based on the same level of service.

Financial Impact

None at this time.

Conclusion

Council adopted an objective to provide end users with annual energy costs that are competitive to conventional system energy costs based on the same level of service. It is anticipated that the proposed revised utility rate structure will achieve this objective. As new developments tie in to the OVDEU system, staff will continuously monitor energy costs and review the rate structures with the objective that the average annual energy costs for end users are competitive with the conventional system energy costs for the same level of service.

Alen Postolka, P.Eng., CP
District Energy Manager
(604-276-4283)

Kevin Roberts
Project Engineer, District Energy
(604-204-8512)

AP:kr

Att. 1: River Green District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9239
2: City of Richmond - Memo to UDI - Oval Village District Energy Utility Rate Consultation

City of Richmond

Bylaw 9239

River Green District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9239

The Council of the City of Richmond enacts as follows:

1. The **River Green District Energy Utility Bylaw No. 9134,** as amended, is further amended:

   (a) by deleting the title and replacing it with the following:

   "OVAL VILLAGE DISTRICT ENERGY UTILITY BYLAW NO. 9134"

   (b) by deleting Section 1 and replacing it with the following:

   "1. **Name of Bylaw**. This Bylaw shall be known and cited for all purposes as "Oval Village District Energy Utility Bylaw No. 9134"."

   (c) by deleting Section 17 and replacing it with the following:

   "17. This Bylaw is cited as "**Oval Village District Energy Bylaw No. 9134**"."

   (d) at Schedule B, by deleting Section 1.1(d) and replacing it with the following:

   "(d) "**Bylaw**" means the Oval Village District Energy Utility Bylaw No. 9134 to which these General Terms and Conditions are attached and form part of;"

   (e) by deleting Schedule D in its entirety and replacing it with Schedule A attached to and forming part of this Bylaw.

2. This Bylaw is cited as **"River Green Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9239".**

FIRST READING	
SECOND READING	
THIRD READING	
ADOPTED	

CITY OF RICHMOND

APPROVED for content by originating dept.

APPROVED for legality by Solicitor

MAYOR

CORPORATE OFFICER

Schedule A to Amendment Bylaw No. 9239

SCHEDULE D

Rates and Charges

PART 1 - RATES FOR SERVICES

The following charges, as amended from time to time, will constitute the Rates for Services:

(a) capacity charge - a monthly charge of $0.0458 per square foot of gross floor area; and

(b) volumetric charge – a monthly charge of $28.20 per megawatt hour of Energy returned from the Heat Exchanger and Meter Set at the Designated Property.

PART 2 - EXCESS DEMAND FEE

Excess demand fee of $0.14 for each watt per square foot of the aggregate of the estimated peak heat energy demand referred to in section 19.1(e) (i), (ii), and (iii) that exceeds 6 watts per square foot.

City of Richmond

Memorandum
Engineering and Public Works
Sustainability and District Energy

To:	Urban Development Institute	**Date:**	March 26, 2015
From:	Alen Postolka, P.Eng., CEM, CP Senior Manager, Sustainability and District Energy	**File:**	10-6600-10-01/2015-Vol 01
	Kevin Roberts Project Engineer, District Energy		
Re:	**Oval Village District Energy Utility Rate Consultation**		

In 2014, Council adopted the River Green District Energy Utility Bylaw No. 9134. The River Green District Energy Utility is now referred to as the Oval Village District Energy Utility (OVDEU), with the name change to be presented for endorsement by Council in April, 2015. Schedule D of Bylaw No. 9134 defines the charges that constitute the rate for service. These charges include a capacity charge (tied to the building gross floor area), and a volumetric charge (tied to the energy usage of the customer).

In order to provide certainty to developers and their customers with respect to the cost of energy, the initial rate was set with 100% weight on the charge tied to the floor area of the building. To achieve this, the rate was set at $0.07 per month per square foot of the gross floor area at the time of the bylaw adoption, with the volumetric charge set at $0.00 per megawatt hour of energy used. This rate was based on a reference building with an annual energy demand of 100 kWh per m^2 of floor area and an energy cost of 90 $/MWh.

Since then, the City has received energy modeling reports summarizing the expected space heating and domestic hot water heating loads for the first few developments in the area. Although the energy loads vary between the developments, the energy modeling reports have provided a better understanding of the expected energy loads and consumption. The City has also performed an analysis of different in-building space heating technologies (Water Source Heat Pumps, Hybrid Heat Pumps, Hydronic Perimeter Heating, 4-pipe Fan Coil) comparing how they use electricity to supplement some of the space heating loads.

Based on the above information, we are not as reliant on the singular flat rate for certainty, and we can shift the weighting towards the objectives of equity and conservation from which all customers will benefit. The new rate structure will have a reduced Capacity Charge (fixed portion) and an increased Volumetric Charge (variable portion):

1. Capacity Charge – a monthly charge of $0.0458 per square foot of the building gross floor area; and

2. Volumetric Charge – a charge of $28.20 per megawatt hour of energy consumed by the building.

The proposed rate structure follows the industry standard practice of having separate capacity and energy charges based on the contract capacity and metered usage. The Capacity Charge will aim to recover the capital cost of the infrastructure, fixed operating and maintenance costs, metering, and invoicing, while the Volumetric Charge will aim to recover the cost of consumed natural gas and electricity required to generate the energy delivered to a customer.

We estimate that the resulting blended 2015 rate to customers will be $94/MWh or $0.066 per square foot per month. This is in line with City of Richmond Council's objective to keep the annual energy costs for OVDEU customers competitive with conventional energy costs, based on the same level of service. The conventional energy costs (called the "business as usual" (BAU) costs that represent electrical baseboard and natural gas heating systems) for space heating and hot water heating are estimated to be around $0.068 per ft^2/month ($97 per MWh).

Staff are planning to bring forward the proposed rate structure for Council's consideration at April's Public Works and Transportation Committee, so we are seeking feedback from UDI members prior to April 7, 2015.

For further information please contact Kevin Roberts at kroberts@richmond.ca or 604-204-8512.

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