



City of Richmond

Report to Committee

TO PWOT - Apr. 18 2012

To: Public Works and Transportation Committee

Date: March 28, 2012

From: Cecilia Achiam, MCIP, BCSLA
Interim Director, Sustainability and District Energy
John Irving, P.Eng. MPA
Director, Engineering

File: 10-6600-10-01/2012-
Vol 01

Re: **Alexandra District Energy Utility Bylaw No 8641 Amendment Bylaw No 8892**

Staff Recommendation

That the Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 8892 be introduced and given first, second and third reading.

Cecilia Achiam, MCIP, BCSLA
Interim Director, Sustainability and District Energy
(604-276-4122)

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

Att. 2

FOR ORIGINATING DEPARTMENT USE ONLY					
ROUTED TO:		CONCURRENCE		CONCURRENCE OF GENERAL MANAGER	
Budgets		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		<i>please</i>	
Law		Y <input checked="" type="checkbox"/> N <input type="checkbox"/>			
REVIEWED BY TAG		YES	NO	REVIEWED BY CAO	
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				YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	

Staff Report

Origin

In 2010, Council adopted the Alexandra District Energy Utility Bylaw No. 8641 establishing the charges that constitute the rate for the service of delivering the energy for space heating and cooling and domestic hot water within the Alexandra District Energy Utility (ADEU) service area.

The purpose of this report is to recommend an amended ADEU rate structure and the rate for the year 2012.

This initiative aligns with Council Term Goal # 8.1, which states:

“Sustainability – Continued implementation and significant progress towards achieving the City’s Sustainability Framework, and associated targets.”

Background

In 2010, Council adopted the Alexandra District Energy Utility Bylaw No. 8641 establishing the regulatory framework for the ADEU. On January 10, 2011, Council adopted the Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 8688 which expanded the service area of the ADEU to include most of the Alexandra neighbourhood. This gives the ADEU the potential to service up to 3100 residential units and 1.1 million sq. ft. of commercial space at build out over an estimated 10 to 15 year period.

The ADEU was established on the concept that all capital and operating costs will be recovered through revenues from user fees, making the ADEU cost neutral over time.

Council adopted an objective to 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. It is anticipated that the proposed revised utility rate structure will achieve this objective. As new developments tie in to the ADEU system, staff will continuously monitor energy costs and review the rate structures with the objective that the average annual energy costs for end users will not exceed a conventional system energy cost for the same level of service.

Staff are preparing a separate report to Council in Spring 2012 with recommendations related to governance models, financing options, and the incremental implementation of the ADEU.

Analysis

Schedule C of the ADEU Bylaw No. 8641 defines the charges that constitute the rate for the service. These charges are: a fixed capacity charge (tied to the building gross floor area), and a variable volumetric charge (tied to the energy consumed by the customer).

At the time this rate structure was developed, the information about the peak energy demand and annual energy consumption for the buildings to be connected to the ADEU was very limited. The only certain information was the gross floor area of the buildings. In order to provide certainty to

developers and their customers with respect to the cost of energy and assurance to the City that the revenue collected will support the utility business case, the rate was set with 100% weight on the charge tied to the floor area of the building. In 2010 the rate for the 2011 calendar year was set at \$0.08 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.

Since then the City has received energy modeling reports summarizing the expected heating and cooling loads for the first few developments in the area. Even though the energy loads vary to some extent between the developments, the energy modeling reports have given us a better understanding of the expected energy loads and consumption.

As we are now able to forecast energy use more accurately, 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 the ADEU customers, existing and new, will benefit.

The ADEU was established on the basis that all capital and operating costs would ultimately be recovered through revenues from user fees, making the ADEU financially self-sustaining over the long term. The intent of amending the rate structure is to ensure guaranteed revenue necessary to recover the capital and operating costs, and at the same time, to encourage the energy conservation and building's high energy efficiency. The rate structure though, is designed to 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 as directed by Council.

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 (operating) costs. These charges are based on the building capacity and energy usage.

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

1. Leave the rate structure as is.
2. Leave the Capacity Charge as is and introduce the Volumetric Charge.
3. Reduce the charge tied to the gross floor area, and introduce charges tied to the peak energy demand and annual energy demand.

Option 1 – Leave the rate structure as is (Not recommended).

This rate would be comprised of:

1. Capacity Charge - monthly charge of \$0.08 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 the developers to build energy efficient buildings over time. This could result in the increased capital cost necessary to build energy

generation assets to meet the peak energy demand of the “un-efficient” buildings. The capacity charge would have to be increased to recover the capital costs. 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 the 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 ADEU.

Option 2 – Leave the Capacity Charge as is and introduce the Volumetric Charge (Not recommended).

This rate would be comprised of:

1. Capacity Charge - monthly charge of \$0.08 per square foot of the building gross floor area; and
2. Volumetric Charge - charge of \$2.25 per megawatt hour of energy consumed by the building.

This rate structure would increase incentives to conserve energy, but would not encourage the developers to build energy efficient buildings. This could result in the increased capital cost necessary to build energy generation assets to meet the peak energy demand of buildings that are not designed for optimal energy efficiency. As a result, the capacity charge would have to be increased to recover the capital costs. Consequently, over time, the energy cost to the customers may increase above the energy cost for the conventional system.

Option 3 – Reduce the charge tied to the gross floor area, and introduce charges tied to the peak energy demand and annual energy demand (Recommended).

This rate would be comprised of:

1. Capacity Charge - monthly charge of \$0.075 per square foot of the building gross floor area, and a monthly charge of \$1.00 per kilowatt of the annual peak heating load supplied by DEU as shown in the energy modeling report required under Section 21.1.(c); and
2. Volumetric Charge - charge of \$3.20 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 a customer (variable operating costs).

The charge tied to the peak energy demand will encourage the developers to build energy efficient buildings, and the charge tied to the annual energy demand will encourage the

customers to conserve the energy. At the same time, this rate structure will ensure guaranteed revenue necessary to recover the capital investment and operating costs.

At this point, the proposed rate is still mainly based on the gross floor area to amortize the impact of the rate structure change on the developments that are in-stream (various stages of building permit and construction). As the City starts metering the district energy consumption by individual buildings after the system becomes operational, more accurate data on the actual energy loads will become available. This information will be used to help calculate annual rate adjustments going forward that continue to encourage energy conservation and efficiency.

The proposed rate is also in line with the Council objective to provide end users with annual energy costs that are less than conventional system energy costs based on the same level of service. In comparison with the existing rate structure, the proposed rate structure is estimated to increase overall cost for service by 4% for 2012, which would be equal to \$0.083/ft²/month. This increase is in line with the most recent BC Hydro rate increase of 3.91%.

Consultation

Staff have consulted with the Urban Development Institute (UDI), local landowners and developers on this rate structure. Staff presented the rate structure at the monthly UDI meeting in March. In addition, a memorandum (**Attachment 1**) clarifying the proposed amended rate structure and new rate for 2012 has been distributed to these stakeholder groups for review and comment. The only comment received to date was that the customers buying units in the ADEU area want to know if their energy cost will be comparable with the energy costs from the conventional system. Upon further analysis of the estimated annual energy consumption for the first few developments (still under construction), the annual cost of energy with the proposed rate for 2012 will be less than or equal to conventional system energy costs based on the same level of service.

Financial Impact

The rate structure outlined in the proposed Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 8892 (**Attachment 2**), represents full cost recovery for the delivery of energy within the ADEU service area. Considerable effort has been made to minimize the impact of this rate structure change on the developments that are in-stream (various stages of building permit and construction).

Conclusion

The amendment bylaw presented with this report support Council's objective to provide end users within the ADEU service area with annual energy costs that are less than conventional system energy costs based on the same level of service. Staff will continuously monitor energy costs and review the rate structures with the objective of ensuring that the average annual energy costs for end users will not exceed a conventional system energy cost for the same level of service. The proposed rate structure encourages energy conservation and efficiency, while at the same time will ensure some recovery of costs necessary to offset initial capital investment and ongoing operating costs.

Staff will report back to Council towards the end of 2012 to provide recommendations on rate changes for 2013 and any changes with financial projections.



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

Attachment 1	ADEU 2012 Rates – Memo to Developers	REDMS #3498773
Attachment 2	Alexandra District Energy Utility Bylaw No. 8641 Amendment Bylaw No. 8892	REDMS #3501551



City of Richmond

Memorandum Community Services Department Sustainability

To: Urban Development Institute **Date:** March 26, 2012
From: Alen Postolka, P.Eng., CEM, CP **File:** 10-6600-10-01/2012-Vol 01
District Energy Manager
Re: Alexandra District Energy Utility 2012 Rate Consultation

In 2010, Council adopted the Alexandra District Energy Utility Bylaw No. 8641. Schedule C of the Bylaw, defines the charges that constitute the rate for the service. These charges are: a fixed capacity charge (tied to the building gross floor area), and a variable volumetric charge (tied to the energy consumed by the customer).

At the time this rate structure was developed, the information about the peak energy demand and annual energy consumption for the buildings to be connected to the ADEU was very limited. The only certain information was the gross floor area of the buildings. In order to provide certainty to developers and their customers with respect to the cost of energy and certainty to the City that the revenue collected will support the utility business case, the rate was set with 100% weight on the charge tied to the floor area of the building. In 2010 the rate for the 2011 calendar year was set at \$0.08 per square foot per month of the gross floor area, with the volumetric charge left at \$0.00 per kilowatt hour.

Since then the City has received energy modeling reports summarizing the expected heating and cooling loads for the first few developments in the area. Even though the energy loads vary to some extent between the developments, the energy modeling reports have given us a better understanding of the expected energy loads and consumption.

As we are now able to forecast the energy use more accurately, we are looking to move towards the more realistic rate structure from which all the ADEU customers, existing and new, will benefit. In addition the rates need to be adjusted for 2012 to reflect increases in projected operating costs.

The proposed 2012 rate structure is as follows:

1. Capacity Charge changed to consist of:
 - a. Monthly charge of \$0.075 per square foot of the building gross floor area, and
 - b. Monthly charge of \$1.00 per kilowatt of the building peak heating load as showed in the energy modeling report required under Section 21.1.(c)
2. Volumetric Charge increased:
 - a. Charge of \$3.20 per megawatt hour of energy consumed by the building.

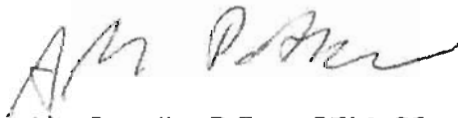
The proposed 2012 rate structure follows the industry-standard practice of having separate capacity and energy charges based on the contract capacity and metered usage. The Capacity Charge will aim to recover the capital cost of the infrastructure, fixed O&M costs, metering and invoicing, while the Volumetric Charge will aim to recover the cost of consumed electricity and gas required to generate the energy delivered to a customer.

In comparison with the existing rate structure, the proposed 2012 rate structure is estimated to increase overall cost for service by 4% for 2012, which would be approximately equal to \$0.083/ft². This increase is in line with the most recent BC Hydro rate increase of 3.91%. This rate is also in line with the City Council objective to provide end users with annual energy costs that are less than conventional system energy costs based on the same level of service.

As the City starts metering the district energy consumption by individual buildings after the system becomes operational, there will be more accurate data on the actual energy loads. This information will be used to help calculate annual rate adjustments going forward that continue to encourage energy conservation and efficiency.

Staff are proposing to bring forward the proposed rate changes for Council's consideration in April, and are seeking feedback from UDI members prior to Wednesday, April 4, 2012.

For further information please contact the undersigned at apostolka@richmond.ca or 604-276-4283.



Alen Postolka, P.Eng., CEM, CP
District Energy Manager

AP:ap



City of
Richmond

Bylaw 8892

**Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw
No. 8892**

The Council of the City of Richmond enacts as follows:

1. **Alexandra District Energy Utility Bylaw No. 8641** is amended by deleting Schedule C in its entirety and substituting Schedule C attached to and forming part of this bylaw.
2. This Bylaw is cited as “**Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 8892**”.

FIRST READING

SECOND READING

THIRD READING

ADOPTED

CITY OF RICHMOND
APPROVED for content by originating dept. <i>[Signature]</i>
APPROVED for legality by Solicitor <i>[Signature]</i>

MAYOR

CORPORATE OFFICER

SCHEDULE C to BYLAW NO. 8641

Rates and Charges

RATES FOR SERVICES

The following charges will constitute the Rates for Services:

- (a) Capacity charge – a monthly charge of \$0.075 per square foot of gross floor area, and a monthly charge of \$1.00 per kilowatt of the annual peak heating load supplied by DEU as shown in the energy modeling report required under Section 21.1.(c); and
- (b) Volumetric charge – a charge of \$3.20 per megawatt hour of Energy returned from the Heat Exchanger and Meter Set at the Designated Property.



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