



# City of Richmond

## Report to Committee

**To:** Public Works and Transportation Committee      **Date:** October 16, 2013  
**From:** John Irving, P.Eng. MPA      **File:** 10-6600-10-01/2013-  
 Director, Engineering      Vol 01  
**Re:** **Alexandra District Energy Utility Bylaw No 8641 Amendment Bylaw No 9073  
 and 2013 Performance Summary**

### Staff Recommendation

That the Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 9073 be introduced and given first, second and third readings.

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

Att. 1

REPORT CONCURRENCE		
<b>ROUTED TO:</b> Finance Division	<b>CONCURRENCE</b> <input checked="" type="checkbox"/>	<b>CONCURRENCE OF GENERAL MANAGER</b> 
<b>REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE</b>	<b>INITIALS:</b> DW	<b>APPROVED BY CAO</b> 

## 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 heating within the Alexandra District Energy Utility (ADEU) service area.

The purpose of this report is to recommend the 2014 ADEU service rates.

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

#### *2013 Performance Summary*

The ADEU Phases 1 and 2 were commissioned in July 2012 and currently provide energy to two developments (Mayfair Place and Remy) with over 600 residential units. The ADEU will potentially service up to 3100 residential units and 1.1 million sq. ft. of commercial uses at build out in approximately 10 to 15 years.

Since the start up of the system in July 2012, the system demand has been gradually increasing. Both Mayfair Place and Remy developments were occupied in phases and it took 12 months until both buildings were completely occupied.

As of September 30, 2013 (end of third billing quarter), the ADEU system has delivered 1,829 MWh of energy to customers for space heating, cooling and domestic hot water heating. While some electricity is consumed for pumping and equipment operations, all of this energy (100%) was produced locally from the geo-exchange field in the greenway corridor. The backup and peaking natural gas boiler in the energy centre has not operated once in this period. Staff estimate that this reduced 339 tonnes of GHG emissions<sup>1</sup> in the community.

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<sup>1</sup> Assumed that all energy was provided for heating. The business-as-usual (BAU) assumed that 40% of the building heating load would be provided from electricity and the remaining 60% would be from gas make-up air units.

Since system start up and initial adjustments, the system operation has been smooth and constant without service interruptions. Corix Utilities is engaged under contract as the system operator to perform system functional verification to ensure continuous operation.

Incoming revenue from ADEU customers has been gradually increasing in pace with the gradual occupancy of serviced buildings. Total revenue for 2013 is projected to be approximately \$480,000.

The actual revenue, when compared with the projected revenue in the ADEU financial model, is within acceptable ranges with projected expenses lower than expected. This is due to multiple reasons:

- **Equipment is Still Under Warranty:** Maintenance expenses are minimal due to new system components and one year warranty period.
- **Lower than Expected Utility Expenses:** Utility expenses (natural gas and electricity) are low due to phased development occupancy which resulted in a gradual increase in demand. The 2012/2013 winter was also very mild and short.
- **Reduced Financing Costs for Expansion:** Financing expenses projected in the financial model for expansion planned for this year are zero since the capacity of the Phase 1 and 2 is adequate to service existing two developments plus a third development (Omega by Concord Pacific) that is scheduled for connection early next year.

It is estimated that this will result in a surplus at the end of the year that is approximately \$135,000 greater than originally budgeted. As per the financial model approved by Council, surpluses for up to ten years are set aside to build a reserve fund. Staff will bring forward recommendations to Council in 2014 for the system expansion and financing as required to service new developments currently under consideration, including the Smart Centres development.

For its 1<sup>st</sup> year of operations and in the context of a small customer base, the above financial, operational and environmental results show as expected and outstanding performance of the ADEU system.

### **Analysis – 2013 Rates**

The 2013 rate is comprised of:

1. Capacity Charge (Fixed) - monthly charge of \$0.078 per square foot of the building gross floor area, and a monthly charge of \$1.04 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 (Variable) - charge of \$3.328 per megawatt hour of energy consumed by the building.

Factors that are considered when developing 2014 ADEU 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.
- **Cost Recovery:** The ADEU was established on the basis that all capital and operating costs would ultimately be recovered through revenues from user fees. The financial model included recovery of the capital investment over time and built in a rate increase year over year to cover for the fuel cost increases, inflation, etc. to ensure the financial viability of the system.
- **Forecasted Utility Costs:** Utility cost (electricity and natural gas) increases are outside of the City's control. Nonetheless, these commodity costs directly impact the operation cost of the ADEU. Media have recently reported that the BC Hydro electricity rate will increase 26.4% from 2014 to 2016 (8.2% annually). Fortis BC increased the natural gas rate in July by 7%<sup>2</sup>. However, due to a decline in the natural gas prices, the Fortis BC lowered their rate in October. US Energy Information Administration estimates that the natural gas price will increase 7.9% on average from 2013 to 2014.
- **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 2%, while municipal price index (MPI) is estimated at 3.2%.

As a comparison to conventional system energy costs, the proposed 4% ADEU rate increase is below estimated electricity cost increase (up to 8.2%) and natural gas cost increase (approx. 7.9%).

Taking into consideration the above factors, three options are presented for consideration.

#### **Option 1 – No increase to ADEU rate for services (Not recommended).**

The rate under the “status quo” option would not change from the 2013 rate.

The ADEU is in early days of its operation, and as a result the utility (electricity and natural gas), operation and maintenance costs are still largely based on projections of the original financial model. Variation from the model will affect the long term performance of the ADEU. For example, the revenue may vary from the projected revenue in the financial model depending on the speed of development and occupancy. The financial modeling of the ADEU has taken into consideration modest rate increases similar to projected increase rates for conventional energy. A status quo approach may have a negative impact on the financial performance of the ADEU if it does not follow market trend. For example, it may cause an extension of the payback period, reduction of internal rate of return, etc.

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<sup>2</sup> Based on an average residential customer using approximately 95 GJ annually.

**Option 2 – 2% increase to ADEU rate for services (Not recommended).**

The rate under this option would increase modestly to follow consumer price index (CPI). While a 2% rate increase will partially cover the estimated fuel (electricity and natural gas) and operation and maintenance cost increases, it is below the increase projected in the ADEU financial business model and below the estimated increase of conventional energy commodities (electricity and natural gas). Even though ADEU system has operated now for one full heating and on full cooling season, the first two buildings were being occupied in phases. Complete occupancy of both buildings happened only in August this year. This affects the collection of actual building's energy consumption data and provides some level of uncertainty on electricity and natural gas consumption. Since the natural gas and electricity costs are expected to increase over the CPI, this option is not recommended.

**Option 3 – 4% increase to ADEU rate for services (Recommended).**

The 4% rate increase under this option follows the ADEU financial model. This rate will cover estimated increases in fuel (electricity and natural gas) cost and operation and maintenance costs.

The ADEU financial model follows the principle of full cost recovery. As a new utility service, with the limited information about the connected building's energy loads and consumption and only estimated operation and maintenance costs projections, ADEU business case heavily relies on the developed financial model. Inevitably, there are inherent business and financial risks with the ADEU business model that uses advanced capital financing. One of the ways to mitigate these risks is to follow the financial model as much as possible in the early years of the utility operation and annually adjust the rates as per model. As the utility collects more actual data about the connected building's energy loads and consumption, operation and maintenance costs, the model will be continuously updated and annual rate adjustment may follow more judicious year to year financial indicators to ensure that the financial performance continues to meet its obligations.

	2013	2014	2014	2014
		Option 1	Option 2	Option 3
		0%	2%	4%
		Increase	Increase	Increase
Capacity Charge One - monthly charge per square foot of the building gross floor area	\$0.078	\$0.078	\$0.0796	\$0.081
Capacity Charge Two - monthly charge per kilowatt of the annual peak heating load supplied by DEU	\$1.04	\$1.04	\$1.061	\$1.082
Volumetric Charge - charge per megawatt hour of energy consumed by the building	\$3.328	\$3.328	\$3.395	\$3.461

The recommended rate outlined in the proposed Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 9073 (**Attachment 1**), represents full cost recovery for the delivery of energy within the ADEU service area.

The above rates were developed based on the residential type of customers. With the anticipated introduction of commercial and institutional customers in 2014/2015, staff will bring forward a report to Council recommending appropriate rates structures for these customers.

**Financial Impact**

None.

**Conclusion**

Since the start up in July 2012 and initial adjustments, the ADEU system operation has been smooth and constant without service interruptions. The revenue received at the end of the 2013 is projected to be as budgeted. It is estimated that the system has reduced 339 tonnes of GHG emissions in the community.

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The recommended 2014 ADEU rate for services 4% increase (Option 3) supports Council's objective to keep the annual energy costs for ADEU customers at less than or equal to conventional system energy costs based on the same level of service. At the same time, the proposed rate ensures cost recovery to offset the City's capital investment and ongoing operating costs. Staff will continuously monitor energy costs and review the rate to ensure rate fairness for the consumers and cost recovery for the City.



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

AP:ap



Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 9073

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. 9073".

FIRST READING

SECOND READING

THIRD READING

ADOPTED

Four horizontal lines for signatures or dates.

Approval stamp: CITY OF RICHMOND, APPROVED for content by originating dept., APPROVED for legality by Solicitor.

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 \$0.081 per square foot of gross floor area, and a monthly charge of \$1.082 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 \$3.461 per megawatt hour of Energy returned from the Heat Exchanger and Meter Set at the Designated Property.