

## **COUNCIL INNOVATION FUND: CALGARY ENERGY EFFICIENCY INNOVATION LAB**

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### **EXECUTIVE SUMMARY**

City-wide energy use in Calgary could be reduced by 25 per cent solely through actualizing energy efficiency opportunities in residential, commercial, institutional, and industrial sectors. While there is no single solution, several options exist which could deliver noticeable energy savings on a community scale and make progress on The City's environmental goals. To support the exploration of options, on 2013 March 18, through Aldermen MacLeod and Pincott's application to the Council Innovation Fund, Council approved The Alberta Energy Efficiency Alliance's request for funding in the amount of \$120,000 for the Calgary Energy Efficiency Innovation Lab (CEEIL) project. The purpose of the CEEIL project was to itemize, prioritize, select and then advance an energy efficiency project tailored for Calgary.

Specifically, the CEEIL proposal committed to meeting four objectives:

1. Researching and publishing the current state of energy efficiency in Calgary,
2. Identifying opportunities for increasing energy efficiency,
3. Quantifying the expected costs and benefits of energy efficiency opportunities, and
4. Pursuing the development of high priority opportunities.

The results of the research and options analysis lead to the selection of 'consumer feedback programs' as the priority option to pursue. If fully implemented, home energy reports have the potential to reduce energy use in Calgary by 45,900 MWh a year, or approximately 2per cent of current residential energy demand. This translates to greenhouse gas reductions of 38,556 tonnes of CO<sub>2</sub>e per year and cost savings for residential customers of approximately \$4.5 million per year.

### **ADMINISTRATION RECOMMENDATION(S)**

Administration recommends that the Priorities and Finance Committee recommend that Council receive this report for information.

### **PREVIOUS COUNCIL DIRECTION / POLICY**

On 2013 March 18, Council approved the report Council Innovation Fund, The Calgary Energy Efficiency Innovation Lab (Aldermen MacLeod and Pincott), PFC2013-0242 to provide funding in the amount of \$120,000 from The City of Calgary Council Innovation Fund

On 2011 November 7, Council approved the report UE2011-24 to approve the Calgary Community Greenhouse Gas Reduction Plan.

### **BACKGROUND**

In 2011, Council approved the Calgary Community Greenhouse Gas (GHG) Plan. This plan identifies community-wide GHG reduction targets of:

- 20per cent reduction from 2005 levels by 2020
- 80per cent reduction from 2005 levels by 2050

Four priority areas were identified in the GHG plan for emissions reduction activities, including the provincial electricity grid, energy efficiency and conservation, distributed energy, and transportation choices and compact development.

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In 2013 February, The Alberta Energy Efficiency Alliance applied to the Council Innovation Fund to support the proposed Calgary Energy Efficiency Innovation Lab project. The intention of the project was to support progress in the priority area of energy efficiency and conservation.

**INVESTIGATION: ALTERNATIVES AND ANALYSIS**

In the research report *Advancing Energy Efficiency in Calgary* (Attachment 1) key program opportunities to improve energy efficiency in the residential, commercial and industrial sectors were identified. Specifically, six program options were identified as having high potential to improve energy efficiency in Calgary:

1. Incentives for energy efficiency upgrades
2. Consumer feedback systems
3. Requirement for energy audits of large industrial facilities
4. Requirement for energy labelling of houses at time of sale
5. Requirement for southward orientation of new residences
6. Regulations for higher energy efficiency in buildings and industrial facilities.

A set of seven indicators were developed further to prioritize these six program options:

- the magnitude of potential GHG emissions reductions
- cost of implementation
- potential cost savings
- timeline of implementation
- perceived ease of approval
- City authority
- alignment with Council priorities

The details of the prioritization exercise are outlined in *Prioritizing Energy Efficiency Program Options* (Attachment 2).

The results identified consumer feedback programs as the highest priority energy efficiency program option for Calgary. The reports *Energy Savings Through Consumer Feedback Programs* (Attachment 3) and *Home Energy Reports – Initial Program Design* (Attachment 4) are the further investigation and development of this program option respectively. An example of a home energy report is shown in Attachment 5.

A summary of the Attachments are described in the table below.

Attachment 1	Summary	Result
<i>Advancing Energy Efficiency in Calgary</i>	<ul style="list-style-type: none"> <li>• Identified current energy use, greenhouse gas (GHG) emissions and costs of energy use in the residential, commercial and industrial sectors in Calgary.</li> <li>• Identified key opportunities in each sector for improvements in energy efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Six program options were identified as having high potential for wide-scale energy efficiency improvements.</li> </ul>
Attachment 2	Summary	Result

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<i>Prioritizing Energy Efficiency Program Options</i>	<ul style="list-style-type: none"> <li>Potential implementation options identified in Attachment 1 were evaluated using seven indicators.</li> </ul>	<ul style="list-style-type: none"> <li>Highest ranked program was consumer feedback programs</li> </ul>
Attachment 3	Summary	Result
<i>Energy Savings Through Consumer Feedback Programs</i>	<ul style="list-style-type: none"> <li>Performed background research on the different types of feedback programs, such as direct vs. indirect feedback programs that have been successfully implemented in other jurisdictions.</li> <li>Identified best-practice program elements that are common to effective feedback programs.</li> </ul>	<ul style="list-style-type: none"> <li>Consumer feedback programs are one of the lowest cost ways to reduce energy use, costs and GHG emissions, and benefit all households including low and fixed income, renters and owners.</li> </ul>
Attachment 4	Summary	Result
<i>Home Energy Reports – Initial Program Design</i>	<ul style="list-style-type: none"> <li>Further research, including a half-day workshop with invited stakeholders, yielded a Conceptual model for how a Home Energy Report program could be implemented in Calgary.</li> <li>Preliminary findings are outlined and show that a program of this type is possible for Calgary</li> </ul>	<ul style="list-style-type: none"> <li>Further work needs to be done to advance this program selection.</li> </ul>
Attachment 5	Summary	Result
<i>Home Energy Report – Example</i>	<ul style="list-style-type: none"> <li>Provides an example of a consumer feedback program.</li> </ul>	<ul style="list-style-type: none"> <li>Mock-up of how home energy reports could be designed for Calgary</li> </ul>

**Stakeholder Engagement, Research and Communication**

The Calgary Energy Efficiency Innovation Lab project team consisted of representatives from The City (Environment and Safety Management) and the Alberta Energy Efficiency Alliance. Key stakeholders at Enmax were engaged through a workshop and one-on-one interviews to provide feedback on how a consumer feedback program could be designed and implemented in Calgary. A recommended next step of the project is to expand the list of stakeholders consulted including stakeholders from multiple utility retailers in Calgary and residential consumers.

**Strategic Alignment**

This report supports UEP 2012-2014 Business Plan action 3P4.1 Deliver brownfield redevelopment, Corporate waste management, greenhouse gas and air quality programs that align to environmental goals.

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This report also supports UEP 2012-2014 Business Plan action 1C4.1 Leverage relationships with partners, stakeholders and The Corporation to deliver programs and services.

This project aligns with the Council Innovation Fund purpose of “one-time start up or “seed” funds for initiatives or programs which will support or contribute to Council’s priorities.”

### **Social, Environmental, Economic (External)**

If fully implemented, home energy reports have the potential to reduce energy use in Calgary by 45,900 MWh a year, or approximately 2per cent of current residential energy demand. This translates to greenhouse gas reductions of 38,556 tonnes of CO<sub>2</sub>e per year and cost savings for residential customers of approximately \$4.5 million per year.

Consumer feedback programs are one of the lowest cost ways to reduce energy use, costs and GHG emissions, and benefit all households – including low and fixed income, renters and owners. In fact, home energy report programs have been implemented in other jurisdictions with a net cost-savings. For example, it is estimated that a pilot program of up to 100,000 households in Calgary would cost between \$0.06 and \$0.08 per kilowatt-hour saved. This is below the average cost of electricity in Calgary, with Enmax’s regulated rate averaging \$0.10 per kilowatt-hour in 2012.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

The Calgary Energy Efficiency Innovation Lab project was managed within the approved total budget of \$120,000. To date the project has been completed \$14,000 under-budget.

#### **Current and Future Capital Budget:**

The project does not require a capital budget. Any work resulting from the project research will be planned and funded as a new project.

### **Risk Assessment**

If the program is implemented on a City-wide scale there are potential risks related to consumer uptake and data and privacy concerns. These risks would be addressed in the program design phase and with stakeholder involvement.

### **REASON(S) FOR RECOMMENDATION(S):**

The objectives of the Calgary Energy Efficiency Innovation Lab (CEEIL) proposal have been met through the four deliverables presented as attachments to this report therefore on behalf of the Calgary Energy Efficiency Innovation Lab project team, Environmental and Safety Management (ESM) recommends that this report be received for information.

### **ATTACHMENT(S)**

1. *Advancing Energy Efficiency in Calgary*
2. *Prioritizing Energy Efficiency Program Options*
3. *Energy Savings Through Consumer Feedback Programs*
4. *Home Energy Reports – Initial Program Design*
5. *Home Energy Report – Example*