



City of Richmond

Report to Committee

To: Public Works and Transportation Committee

Date: April 27, 2015

From: John Irving, P.Eng. MPA
Director, Engineering

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Vol 01

Re: Smart Thermostats Pilot Program

Staff Recommendation

That the development and implementation of a “Smart Thermostats Pilot Program” for homes be endorsed.

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REPORT CONCURRENCE	
CONCURRENCE OF GENERAL MANAGER 	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS:
APPROVED BY CAO 	

Staff Report

Origin

This report proposes a Smart Thermostats Pilot Program as part of City efforts to reduce energy and emissions in Richmond.

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

To demonstrate leadership in sustainability through continued implementation of the City's Sustainability Framework.

Analysis

Background

Richmond's Climate Action Commitments

Richmond's 2041 OCP includes aggressive targets to reduce the community's energy use 10 per cent by 2020, and to reduce community GHG emissions 33 per cent by 2020 and 80 per cent by 2050. Additionally, the City has a target to reduce energy use 10 per cent by 2020. The 2014 Community Energy and Emissions Plan (CEEP) identifies that residential buildings account for over 22 percent of Richmond's GHG emissions, and that significant energy improvements to most existing buildings are necessary for Richmond to meet the City's emissions reduction targets. Accordingly, Strategy #3 in the CEEP is to "Improve the Performance of the Existing Building Stock," and includes the following actions:

- Action 7: Promote building efficiency through outreach and education
- Action 8: Provide incentives for building retrofit action
- Action 9: Develop a residential energy conservation program to support housing affordability

Additionally, as a signatory to the Climate Action Charter, the City has committed to being "carbon neutral" in its corporate operations. Carbon neutrality is achieved by reducing emissions, and balancing remaining emissions with carbon credits. The Joint Provincial-UBCM Green Communities Committee has established protocols for how local governments can generate carbon balancing credits by supporting energy projects in their communities.

City Action to Promote Energy Improvements

Different home energy improvement programs are available to Richmond households, through BC Hydro's PowerSmart suite of programs, FortisBC's energy programs, and other organizations. These programs will typically offer households cash incentives and rebates for adopting energy efficiency measures, as well as provide guidance on appropriate energy measures for various households depending on the equipment and construction of their home.

As part of implementing the CEEP and pursuing community GHG reduction targets, the City has promoted energy conservation programs, complementing energy utilities' own outreach and

promotions. The City's efforts include operating the Richmond Building Energy Challenge, outreach at events, web and social media, and printed promotions. Moreover, the City has provided financial consumer incentives as part of some of its programs, such as the Clothes Washer Rebate Program.

About Smart Thermostats

“Smart” or “learning” thermostats are a new technology that can help save energy while improving a home's comfort. Smart thermostats:

- Use motion sensors or other technologies to determine when users are away, and thereby “self-program” temperature setbacks to optimize energy savings
- Have internet connectivity
- Use web interfaces and user feedback to provide information and encourage better energy decision making

Smart thermostats thus differ from “programmable thermostats,” which cannot self-program and typically have less interactive features. Firms currently offering smart thermostats include Nest, Ecobee, and Honeywell.

Studies from different jurisdictions across North America indicate that households that implement smart thermostats save an average of 11 per cent on their heating energy use; further analysis is needed to confirm savings levels that can be expected locally.

Smart thermostats currently cost approximately \$250 each. Assuming an 11 per cent savings on natural gas heating, City staff estimate that investing in a smart thermostat entails a 4.6 year simple payback period for the average single detached home, without any subsidy. Likewise, this average home would save approximately 3.7 tonnes of carbon dioxide (a greenhouse gas) from entering the atmosphere, assuming a 10 year lifespan of the thermostat.

Pilot Program Design

The proposed pilot program promotes the smart thermostat, in order to advance the City's climate action goals. The goals of the program are to:

- test and demonstrate the energy and GHG savings of smart thermostats
- compare the performance of different smart thermostat technologies
- identify barriers to adoption of the thermostats
- evaluate opportunities for an expanded smart thermostats program
- determine if “carbon balancing” credits can be generated via the program, to count towards the City's carbon neutral commitments
- evaluate the performance of different smart thermostat products

Through the pilot program, the City will provide participants with an incentive of half the price of the thermostat. The pilot will serve a maximum of 150 Richmond participants, targeting existing ground-oriented housing (e.g. detached, attached, and/or townhousing). Participants will be recruited and pre-screened to ensure eligible housing, and then assigned households

thermostats. Disbursement of incentives will occur when Richmond participants provide proof of payment and installation of eligible thermostats, along with energy data and survey responses necessary to evaluate the pilot program.

The City of Vancouver is intending to move forward with a similar program, and City staff will coordinate with Vancouver staff on an administrative level to maximize efficiencies.

The following table outlines key milestones for the pilot program:

Action	Timeline
Initiate participant recruitment	May/June 2015
Screen applicants	June – October 2015
Customer purchase and install complete	October 2015
Surveying and data collection	October 2015 – December 2016
Final reporting and analysis	April 2017

Financial Impact

This program is funded in the 2015 operating budget as part of the broader Neighbourhood Retrofit Programs initiative.

Conclusion

Increasing uptake of sustainable energy improvements in existing buildings is critical to the City of Richmond meeting its climate and energy goals. This report proposes a pilot Smart Thermostat incentive program for ground-oriented homes.



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