



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** February 20, 2017
From: John Irving, P.Eng. MPA **File:** 10-6125-07-02/2015-Vol 01
 Director, Engineering
Re: **Community Energy and Emissions Plan - 2017 Update**

Staff Recommendation

That the staff report titled "Community Energy and Emissions Plan – 2017 Update," dated February 20, 2017, from the Director, Engineering, be received for information.

[Handwritten signature]
 John Irving, P.Eng. MPA
 Director, Engineering
 (604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Development Applications	<input checked="" type="checkbox"/>	<i>[Handwritten signature]</i>
Economic Development	<input checked="" type="checkbox"/>	
Policy Planning	<input checked="" type="checkbox"/>	
Transportation	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: <i>[Handwritten initials]</i>	APPROVED BY CAO <i>[Handwritten signature]</i>

Staff Report

Origin

In January 2014, Council adopted the Community Energy and Emissions Plan (CEEP). This report provides an update on implementation of the CEEP as committed when the plan was adopted.

This report supports Council's 2014-2018 Term Goal #4 Leadership in Sustainability:

Continue advancement of the City's sustainability framework and initiatives to improve the short and long term livability of our City, and that maintain Richmond's position as a leader in sustainable programs, practices and innovations.

4.1. Continued implementation of the sustainability framework.

Background

In 2010, Council adopted targets in Richmond's Official Community Plan to reduce community greenhouse gas (GHG) emissions 33% below 2007 levels by 2020, and 80% below 2007 levels by 2050. The 2041 Official Community Plan also includes a target to reduce energy use 10% by 2020 below 2007 levels. In January 2014, Council adopted Richmond's Community Energy and Emissions Plan (CEEP). The CEEP identifies key strategies and actions to reduce community energy use and GHG emissions, organized across five themes:

- Neighborhoods and Buildings
- Mobility and Access
- Resilient Economy
- Sustainable Infrastructure and Resources
- Climate Change Leadership

The CEEP included modeling of the impacts of these strategies and actions on Richmond's community emissions out to 2050. This modeling suggests implementing CEEP actions will reduce emissions approximately 25% below 2007 levels by 2050. This would comprise an important contribution to climate action, but is still below the City's 80% target.

In order to achieve the 80% emissions reduction target, the CEEP identifies three "Big Breakthroughs" that the City can pursue in partnership with other stakeholders:

- Near universal adoption of zero carbon vehicles (such as plug-in electric vehicles).
- Zero carbon new building construction by 2025.
- Deep energy improvements to most existing buildings, sufficient to reduce emissions by over 70% by 2050.

The CEEP recognizes that these reductions are not achievable by the City alone; rather, they require provincial and federal regulatory changes and funding, market innovation, increasing carbon pricing, and more coordinated and effective efforts between all levels of government and industry. The CEEP specifies that the City work to pursue the "Big Breakthroughs" in coordination with other levels of government, and the private and non-profit sectors.

In November 2015, the Public Works and Transportation Committee received a Community Energy and Emissions Plan - 2015 Update report, outlining progress in implementing the CEEP.

This 2017 Update report summarizes achievements and ongoing initiatives to pursue the actions and breakthroughs identified in the CEEP.

Analysis

Energy Use and Emissions Trends

As noted in the Community Energy and Emissions Plan 2017 Update (Attachment 1), in 2008 the province committed to providing local governments with a Community Energy and Emissions Inventory (CEEI), summarizing energy and emissions trends. The latest year for which complete CEEI data has been released is 2012, though the province has released electricity and natural gas consumption data for 2014; the province has yet to release 2014 Transportation GHG emissions data.

Between 2007 and 2012, Richmond's emissions declined by 6%, despite population growth of 7% during this timeframe. Important reasons for these emissions reductions include:

- The City's compact urban development policies;
- The City's success in diverting community solid waste from landfills;
- City and utility energy efficiency and "water-wise" programs;
- The introduction of the provincial carbon tax;
- An increased percentage of zero-emission "green" electricity;
- The introduction of BC's low-carbon fuel regulation for vehicle fuels; and
- The opening of the Canada Line in 2009.

Between 2007 and 2014, electricity consumption increased 1% while population increased 11%. Natural gas consumption declined 4% during this time. This increase in community energy efficiency is estimated to save Richmond residents \$13 million per year.

Achievements Implementing the CEEP

This 2017 Community Energy and Emissions Plan Update highlights key achievements that have been made since the CEEP was adopted from across the different themes noted above, including:

- Continuing to secure energy performance in new developments through the Townhouse Rezoning Policy and City Centre Sustainability Package, the latter of which currently includes a policy for LEED Silver equivalency design and district energy ready design.
- Contributing to the development of BC's Energy Step Code, a forthcoming provincial standard that local governments may apply to new construction in their communities.
- Improving walking, biking and rolling transportation infrastructure, including the Parkside Neighbourhood Bikeway, pedestrian walkway improvements on 7th Avenue, and extension and enhancement of the Railway Greenway.

- Continuing the City's commitment to providing improvements on emission-friendly transportation modes such as transit shelters and stops, pedestrian connections and cycling infrastructure / education as alternatives to driving.
- Initiating implementation of a project to nearly quadruple the number of bus shelters and double the number of street benches within the next ten years through the new street furniture contract to significantly improve on transit and walking.
- Delivering of cycling skills training to over 1,300 elementary school students at 12 schools and 85 recent immigrants since 2013.
- Delivering energy programs for Richmond businesses, which include: The Building Energy Challenge, a friendly competition to reduce energy use with over 95 buildings representing over 7 million square feet of property participating; the ClimateSmart for Businesses Program; and an Efficient Water Fixtures program delivered in 2016 that is saving food service businesses \$220,000 in utility costs each year.
- Expanding district energy systems. The Lulu Island Energy Company is a corporation wholly owned by the City of Richmond and manages district energy systems in Richmond. The Alexandra District Energy Utility (ADEU) expanded to serve the Smart Centers development in 2016, and the Oval Village District Energy Utility (OVDEU) now provides space heating and domestic hot water to over 1,224 residential units with a total area of 1.39 million sq. ft.
- Receiving recognition for excellence in district energy systems. The Alexandra District Energy Utility has received multiple awards, including the 2016 International District Energy Associations (IDEA) System of the Year Award— IDEA's highest honour.
- Informing the BC Climate Leadership Plan. The City has taken multiple opportunities to engage with the province of BC in the development of the BC Climate Leadership Plan. This includes being a signatory to the "Call for Action on Energy and Climate in the Building Sector", which is considered partially responsible for the province committing to the BC Building Code requiring "net zero ready" performance by 2032.
- Improving green fleet performance. In 2016, the City of Richmond became the first municipality to receive a Platinum Rating from E3 fleet, a national program that recognizes excellence in fleet management and environmental performance.
- Taking action to achieve deep emissions reductions in City buildings by 2020. In 2016, Council endorsed a target of reducing GHG emissions from City owned buildings by 65% from 2007 levels by 2020.

Communicating Climate Action

The City's progress on climate action, outlined in this Community Energy and Emissions Plan – 2017 Update, will be communicated via social media, press release, newspaper publications and other channels. The City will also continue to communicate to Richmond residents and businesses about opportunities that can save money on energy and reduce GHG emissions.

February 20, 2017

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Financial Impact

None.

Conclusion

This report presents the Community Energy and Emissions Plan – 2017 Update, outlining key achievements implementing the CEEP to date, and noting ongoing efforts to pursue Richmond GHG emissions and energy reduction targets.



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BM:bm

Att. 1: Community Energy and Emissions Plan - 2017 Update

City of Richmond

Energy Action in Richmond

Community Energy and Emissions Plan

2017 Update

PWT - 94



RICHMOND'S COMMITMENT TO CLIMATE ACTION

Richmond's 2041 Official Community Plan (OCP) commits the City to greenhouse gas (GHG) reduction targets of 33% by 2020, and 80% by 2050, below 2007 levels. Additionally, the OCP includes a target to reduce energy use 10%. The Area Plans support these commitments.

Richmond's Community Energy and Emissions Plan (CEEP) includes detailed strategies and actions organized around five themes to achieve City targets:

- **Neighborhoods and Buildings**
- **Mobility and Access**
- **Resilient Economy**
- **Sustainable Infrastructure and Resources**
- **Climate Change Leadership**

Additionally, the CEEP identifies three "Big Breakthroughs" necessary to achieve Richmond's targets: 1) Near universal adoption of zero carbon vehicles; 2) Zero carbon new building construction by 2025; 3) Deep energy improvements to most existing buildings.

This document summarizes achievements to date in implementing the CEEP, and notes additional opportunities to achieve targets and pursue "Big Breakthroughs".

Based on 2007 levels
City GHG reduction targets

33%
by 2020

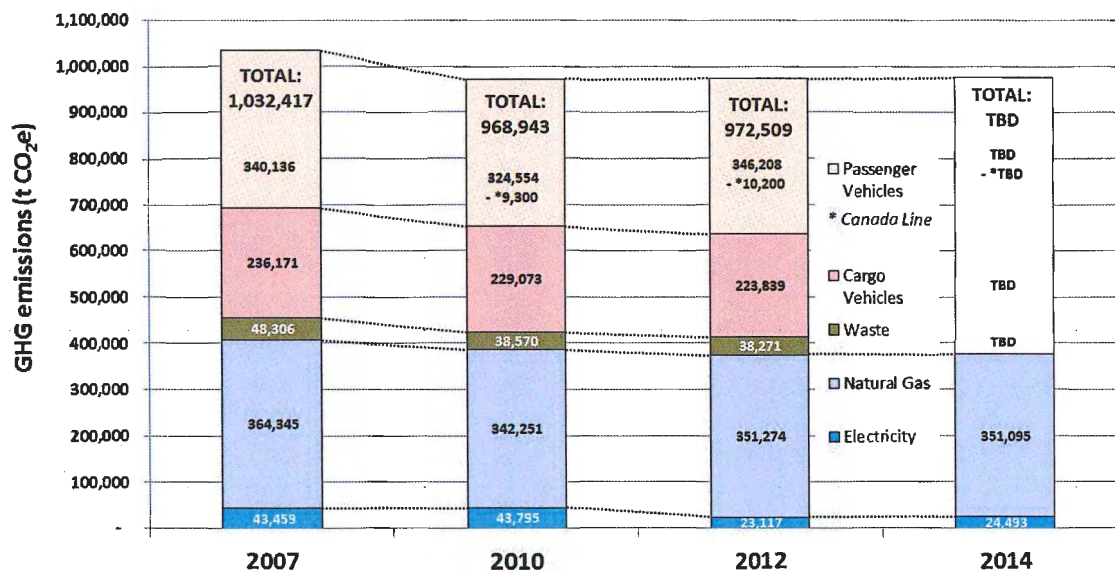
80%
by 2050

PROGRESS TOWARDS TARGETS

GHG emissions: According to the province’s Community Energy and Emissions Inventory, total GHG emissions from the City of Richmond in 2007 were equivalent to 1,032,417 tonnes of carbon dioxide (t CO₂e). By 2012, the City’s population had increased by 7%, but overall GHG emissions actually decreased by over 63,000 tonnes to 968,943 t CO₂e – a 6% decline.

Different initiatives contributed to this success, including:

- the City’s compact urban development policies;
- City and utility energy efficiency and “water-wise” programs;
- the City’s success in diverting community solid waste from landfills;
- an increased percentage of zero-emission “green” electricity;
- the introduction of BC’s low-carbon fuel regulation for vehicle fuels; and
- the opening of the Canada Line in 2009



Energy use: Between 2007 and 2014, Richmond’s population increased by approximately 11%. During this same time, the total amount of electricity used in Richmond increased by only 1%, while natural gas consumption use declined by 4%. Increased energy efficiency provides cost savings as well as greenhouse gas emission reductions. Electricity consumption by the average Richmond household was over 10% lower in 2014 than it was in 2007; during the same period, the average Richmond residential household using natural gas reduced its consumption by over 12%. In 2014 alone, these energy efficiency gains resulted in \$12.8 million of savings off of Richmond residents’ utility bills.



NEIGHBOURHOODS AND BUILDINGS

DIRECTIONS

The CEEP supports Richmond towards the following:

1. **Compact, Complete Neighbourhood Design**
2. **Increase Energy Efficiency in New Buildings**
3. **Increase Energy Efficiency in Existing Buildings**

KEY ACHIEVEMENTS

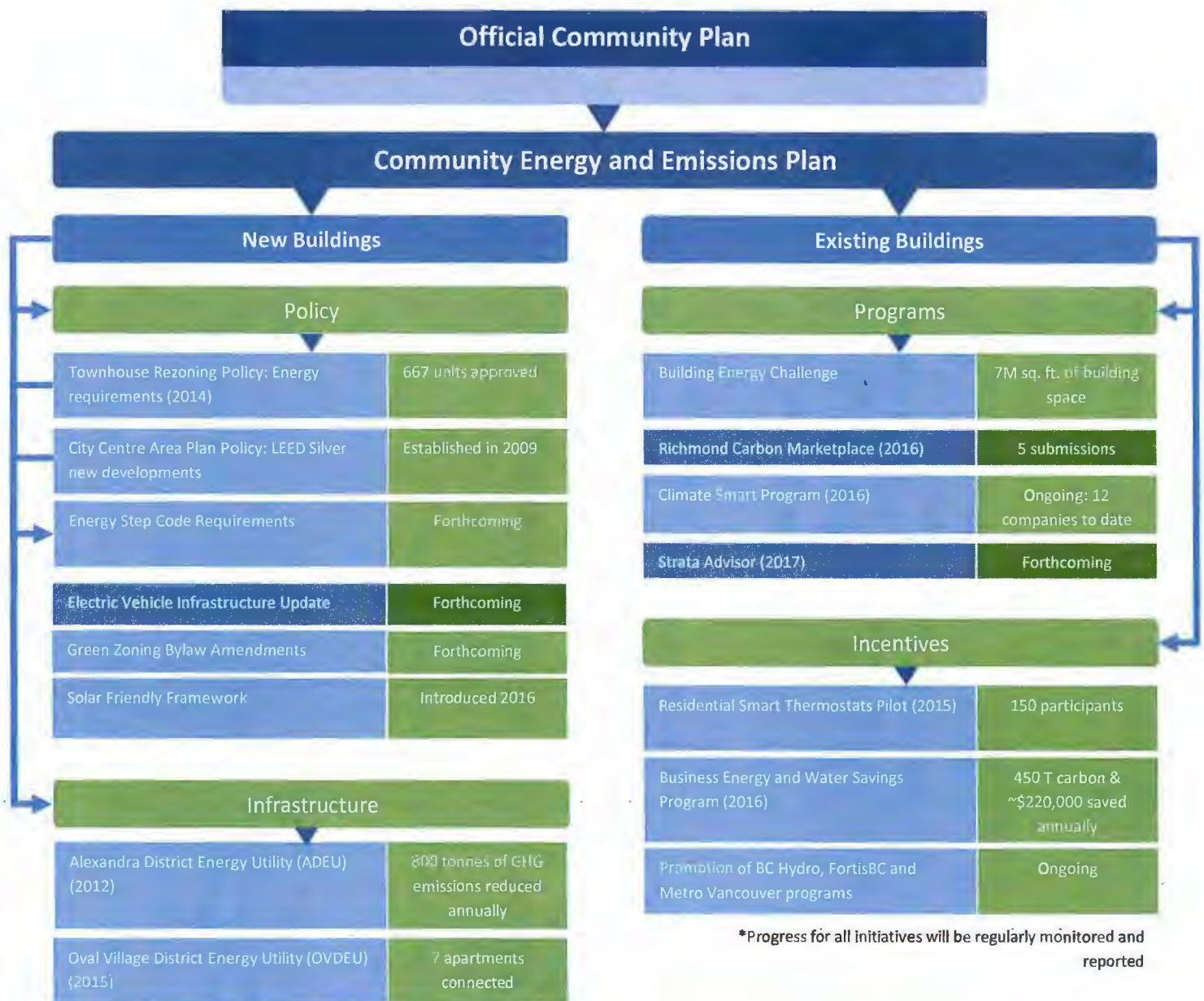
Supporting a fundamental shift in how Richmond grows: In recent years the City has advanced key transit-oriented development initiatives aimed at reducing sprawl and encouraging compact, vibrant, high-amenity, mixed use communities. Neighbourhood planning for Alexandra, The Gardens, and along arterial roads has encouraged new low-rise apartment, townhouse, and duplex growth in proximity to parks, amenities, and transit. Inside the City Centre, density bonus and amenity strategies in use since 2009 have facilitated over 10,000 new apartments, two new community centres, child cares, waterfront and neighbourhood parks, office, hotel, and employment uses, and funding towards the new Capstan Canada Line station.

Continuing to secure energy performance requirements for new developments: The City secures energy performance for new developments as part of rezonings and development approvals. Notably, the [2009 City Centre Area Plan](#) established a LEED Silver standard for new large buildings, and in 2014 Council adopted a policy of EnerGuide 82/Energystar performance for townhouses. Going forward, options to reference BC's forthcoming Energy Step Code (see below) will be brought for Council's consideration.

Developing the Energy Step Code: City of Richmond staff represented the Union of BC Municipalities at the provincial Energy Efficiency Working Group, which provided recommendations on BC's forthcoming Energy Step Code, a new provincial standard to create more efficient, healthy and comfortable new buildings. Local governments will be able to apply the Energy Step Code to new construction in their communities.

667

New townhouse units approved with beyond-Code energy efficiency performance since 2015



FUTURE ACTIONS

Implement the Energy Step Code: In 2017, Council will consider options to implement the Energy Step Code for new development in Richmond.

Lead on Building Energy Benchmarking: Energy Benchmarking is the process of tracking energy performance, and comparing it to similar buildings. Benchmarking is considered a key energy management practice, and is associated with large reductions in buildings' energy and emissions. The City is working with other local governments and the province to develop benchmarking tools and requirements to ensure that all large buildings undertake this key best practice.

MOBILITY AND ACCESS

DIRECTIONS

1. **Prioritize and Fund Walking, Rolling and Cycling**
2. **Promote Low-Carbon Personal Vehicles**
3. **Facilitate Car-Sharing**

KEY ACHIEVEMENTS

Active transportation infrastructure: The City continues to expand the network of active transportation facilities. Recent projects in 2016 include:

- Parkside Neighbourhood Bikeway: completion of a 2.85-kilometre cycling route linking South Arm Park to Garden City Park via Ash Street and off-street connecting pathways.
- Pedestrian walkway improvements on 7th Avenue (east side between Regent Street and Pleasant Street) and Bridgeport Road (Viking Way to No. 6 Road).
- Extension and enhancement of the Railway Greenway with the upgrade of the crossing at Westminster Highway-McCallan Road to a pedestrian signal and a new ramp to the Middle Arm Dyke Trail at River Road.
- Implementation of 5 new special crosswalks to support walking and access to transit.
- Upgrade of 24 bus stops to become accessible and implementation of Accessible Pedestrian Signal features at 27 signalized intersections.

Partnership with TransLink and HUB Cycling: Delivery of cycling education courses to approximately 400 Grade 4-7 elementary school students and 14 new immigrants in 2016. Since 2013, over 1,300 elementary school students at 12 schools plus 85 new immigrants have received cycling skills training.

Expansion of transit shelters and benches: Transit shelters provide weather protection, a more comfortable and safer waiting area particularly at night due to shelter lighting, and improved visibility of a bus stop, all of which encourage transit use. As part of the new street furniture contract signed in 2016, the number of transit shelters and benches will expand to 200 and 600 respectively over the next 10 years.

Facilitating car sharing in Richmond: In 2016, for the first time as part of the development process, MODO the Car Co-Op stationed two vehicles in the off-street parking area of the City Centre Community Centre. The City also entered into a 6-month pilot program with MODO to evaluate City use of MODO car-share vehicles during business hours as part of the City's Green Fleet Action Plan to meet emission reduction targets.



New Ramp to the Middle Arm Dyke Trail at River Road

As of 2016

71 km
of bike routes and

71.9%
of bus stops are
accessible

96
special crosswalks



The City supports Electric Vehicles in Richmond with home charging provisions in new multifamily developments. The City is exploring updating standards for new developments and DC Fast Charging Infrastructure.

FUTURE ACTIONS

Continue to support electric vehicle charging in new developments: To meet the City's 2050 emissions targets, the majority of vehicle trips will need to be zero carbon. Since 2012, the City has required that a minimum of 20% of parking stalls in new multifamily developments provide electric charging outlets, with an additional 25% constructed to accommodate future installation. In January 2017, Council directed that staff consult with stakeholders on options for revising EV charging infrastructure requirements in new developments.

Consider DC Fast Charging to Support Electric Vehicles: A DC Fast Charging network can support adoption of electric vehicles. In November 2016, Council directed that staff investigate opportunities to expand the City's public charging network, including DC Fast Charging.

Expansion of Active Transportation Infrastructure: Walking and cycling projects over the next 1-2 years will feature "Triple A" (all ages and abilities) facilities, providing paved off-street multi-use paths that protect users from adjacent motor vehicle traffic at the following locations:

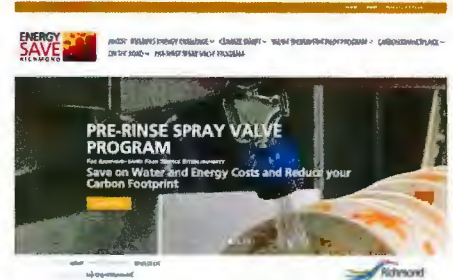
- River Drive (No. 4 Road-Van Horne Way):
- Great Canadian Way (Bridgeport Road-Van Horne Way):
- Westminster Highway (No. 8 Road-Nelson Road):

Southwest Area Transport Plan: TransLink's original Richmond Area Transit Plan, completed in 2000, is currently being updated through the Southwest Area Transport Plan, which will be TransLink's first sub-area plan that is multi-modal (reviews the entire transportation network rather than just transit). Phase 1, completed in 2016, identified current issues and opportunities such as areas with existing unmet travel demand. Phase 2 is targeted for completion in Fall 2017 will prioritize strategies and actions to address the issues and opportunities.

RESILIENT ECONOMY

DIRECTIONS

1. Encourage Energy Efficient Businesses
2. Encourage Businesses to Reduce GHG Emissions
3. Promote Investment in Sustainable Energy and Green Jobs



KEY ACHIEVEMENTS

Building Energy Challenge: Now beginning its third year, the Challenge is a friendly competition between buildings to reduce energy use. In the first year of the program, participating buildings reduced GHG emissions by 12 percent. The City provides workshops and supports energy management training for building operators.

Climate Smart Businesses: In 2016, with support from the City of Richmond, 13 Richmond-based businesses participated in the Climate Smart program. Climate Smart helps businesses measure and profitably reduce their carbon emissions through small-group training sessions, and expert one-on-one advising. Three previous Richmond-based participant firms have achieved 245 t of GHG reductions, and \$17,560 in annual cost savings. A total of 43 Richmond-based businesses have participated in the Climate Smart program to date.



Climate Smart
Businesses

Efficient Water Fixtures Program: In 2016, the City delivered an efficient water fixture program for businesses in partnership with FortisBC. The City's net contribution was less than \$25,000. The fixture upgrades are projected to save participating businesses a total of \$220,000, 465 tonnes of CO₂, and 63 Million liters of water *each year*.

Green Business Attraction: Richmond continues to attract new clean technology businesses. Innovative solutions being developed by the private sector locally include greenhouse nutrient recovery systems, electronics waste recycling, hybrid energy storage systems, and wastewater treatment processes.

Metro Vancouver Clean Technology Expo: In 2016 Richmond partnered in the regional clean technology expo by providing an opportunity for local businesses to showcase their innovations and including a Richmond stop on a bus tour of venture capital delegates.

Strong Green Business Sector: Green Business continues to be one of Richmond's top 10 sectors, delivering a range of products and services including clean transportation, energy management technologies, building materials and environmental consulting.

Results from the
**Efficient Water
Fixtures Program**
Annual Savings:
\$222,000 business cost
63 Million L Water
465 Tonnes CO₂



The City of Richmond partnered in the delivery of the 2016 Metro Vancouver Clean Tech Expo

FUTURE ACTIONS

Continue to offer sustainability and energy savings opportunities to businesses: The City will continue to deliver energy savings programs for businesses in our community, including continuing to offer the Building Energy Challenge. The City will also communicate the benefits of a range of opportunities, including energy upgrades, electric vehicles, and solar power.

Support the green economy: The City will continue to attract green economy leaders to Richmond.



SUSTAINABLE INFRASTRUCTURE AND RESOURCES

DIRECTIONS

1. Continue Advancement of District Energy Systems
2. Utilize Local Energy Sources
3. Continue to Utilize Waste Management and Minimize the Use of Waste



KEY ACHIEVEMENTS

Expansion of the Alexandra District Energy Utility (ADEU): The ADEU provides renewable heating, cooling, and hot water to 1.4 million square feet of residential and commercial spaces by utilizing geo-exchange energy source. Completed in 2016, the ADEU Phase 4 expansion included a satellite energy plant with high efficiency air source heat pumps to connect its first commercial customers, adding an additional 500,000 sqft of floor space. This new energy plant also allows for potential energy sharing with the main ADEU distribution system. As of the end of 2016, it is estimated that the ADEU has resulted in a savings of 1,653 tons of GHG emissions.

Expansion of the Oval Village District Energy Utility (OVDEU): The OVDEU now provides space heating and domestic hot water to seven multifamily developments. Energy is currently supplied from the two interim energy centres with natural gas boilers which combined provide 11 MW of heating capacity. A future energy centre will harness low carbon energy from the Gilbert Trunk sanitary force main sewer. Over the project's lifetime, the OVDEU system is anticipated to reduce the GHG emissions by more than 52,000 tonnes of CO2 compared to business as usual.

Lulu Island Energy Company: In 2013, the City incorporated Lulu Island Energy Company (LIEC) for the purposes of managing district energy utilities on the City's behalf. As of January 2017, all district energy assets are being transferred under the LIEC, and LIEC is now managing both Oval Village District Energy Utility (OVDEU) and Alexandra District Energy Utility (ADEU), as well as future district energy opportunities.

Solid waste diversion: In 2016, the City introduced bi-weekly garbage collection service for more than 33,000 single-family homes and townhomes as part of promoting greater recycling and waste diversion. Residents are able to reduce the fees they pay for garbage service by selecting smaller cart sizes. The City also introduced Demolition Waste and Recyclable Materials Bylaw No. 7516, which requires that 70% of waste from single-family home demolitions be recycled or diverted from waste disposal. Donation Bin Bylaw 9502 was also introduced, which restricts donation bin placement to registered charities only and establishes suitable, safe locations for bin placement to promote reuse of used household clothing and other items.

At build out
Oval Village District
Energy Utility will
meet

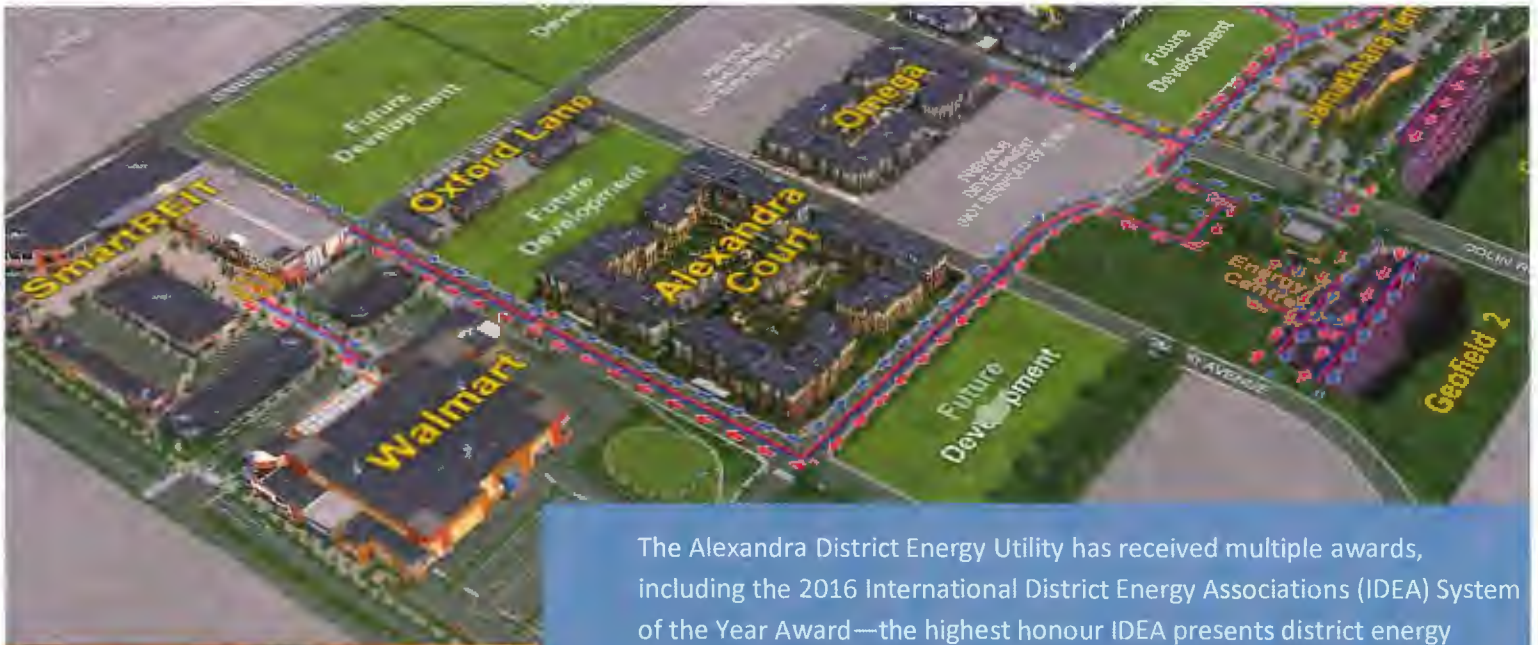
70%

of the
neighbourhood's
thermal energy
needs

Oval Village District Energy
Utility is now provides
energy to over

1,224

residential units



The Alexandria District Energy Utility has received multiple awards, including the 2016 International District Energy Associations (IDEA) System of the Year Award—the highest honour IDEA presents district energy system.



FUTURE ACTIONS

Expanding on existing district energy systems: The City will continue to serve new developments in the service areas of the Alexandria and Oval Village District Energy Utilities as they occur.

Exploring further district energy nodes: Through Lulu Island Energy Company, the City is evaluating partners to establish district energy systems in the Capstan and Bridgeport Village neighbourhoods of Richmond’s City Centre.

Explore implementing innovative technologies throughout the community: The City is currently assessing opportunities for smaller-scale sewer energy recovery facilities within the City’s municipal sanitary system, as well as potential synergies with sewer grease extraction. The City will conduct costing and feasibility studies on the top-ranked opportunities to provide low-carbon heating to new urban developments that are identified in the study.

CLIMATE ACTION LEADERSHIP

DIRECTIONS

1. Maintain a Leadership Position on Climate Action
2. Continue to Advocate for Support from Senior Levels of Government
3. Engage Community on Climate Action

KEY ACHIEVEMENTS

Informing the BC Climate Leadership Plan: Achieving a low carbon society requires action by the provincial and federal governments. The City has taken multiple opportunities to engage with the province of BC in the development of the BC Climate Leadership Plan. This includes being a signatory to the “Call for Action on Energy and Climate in the Building Sector”, which is considered partially responsible for the province committing to the BC Building Code requiring “net zero ready” performance by 2032 and the establishment of the Energy Step Code.

Achieving carbon neutrality: As a signatory to the Climate Action Charter, Richmond is committed to being carbon neutral in its corporate operations. For the third straight year, Richmond achieved carbon neutrality in 2015, and anticipates achieving neutrality in 2016.

Low Carbon buildings: In 2016, the City endorsed a target of reducing GHG emissions from City owned buildings by 65% from 2007 levels by 2020. Through its Sustainable High Performance Building Policy and specific targets for energy optimization, the City is well on its way to achieving this target and will continue to work towards lowering emissions in corporate buildings.

Green Vehicle Fleets: In 2016, the City became the first municipality to receive a Platinum Rating from E3 fleet, a national program that recognizes excellence in fleet management and environmental performance. Guided by efforts in the City’s [Green Fleet Action Plan](#), the department is now retrofitting some vehicles with solar panels; supporting an interactive anti-idling campaign; piloting GPS use to manage fuel consumption; and supporting car-sharing services.

Recent
LEED Gold® City
Buildings



City Centre
Community Centre



Steveston Fire Hall



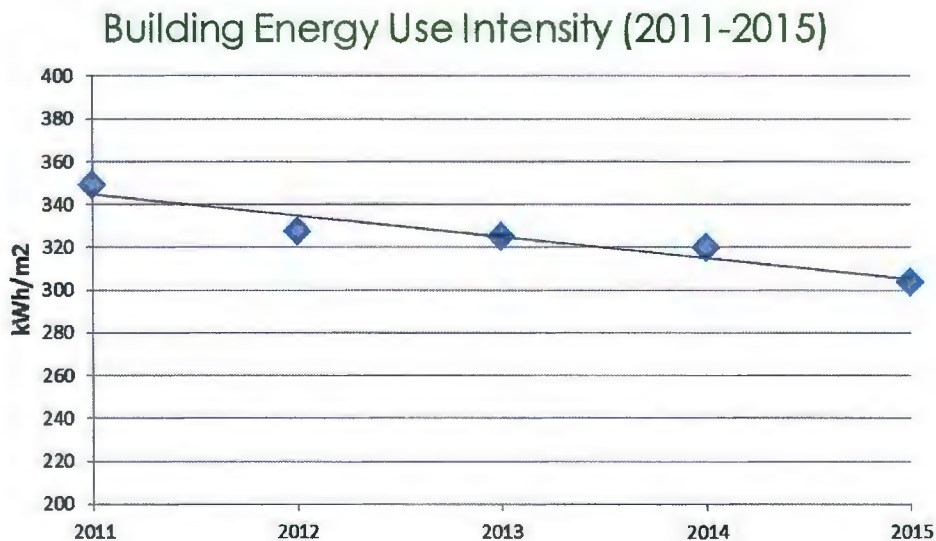
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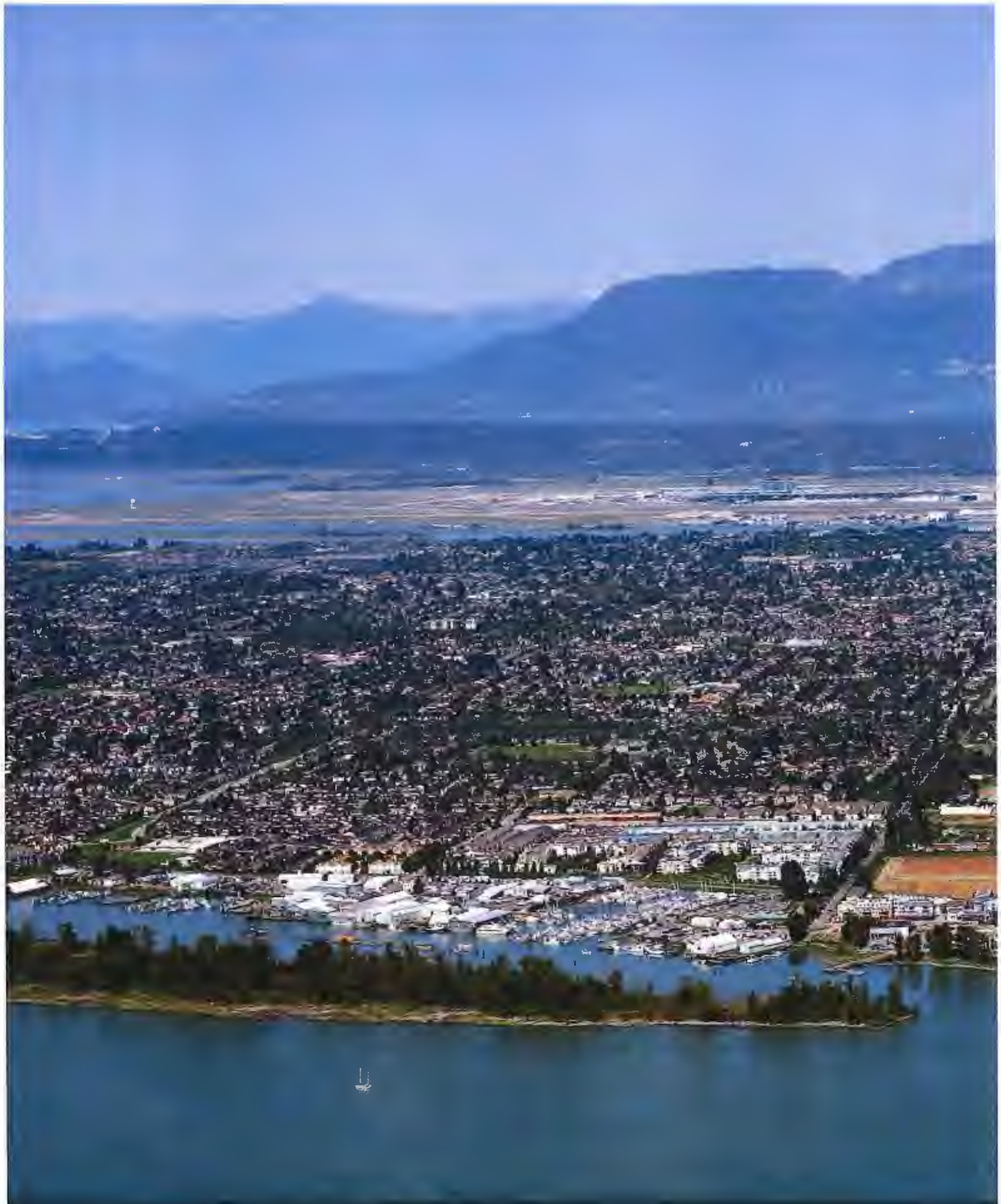
FUTURE ACTIONS

Continue to evaluate green building standards for City buildings: The City will continue to review appropriate standards that measure green building performance, such as Passive House, and evaluate whether to reference them in City policy.

Monitor green building performance in new buildings: The City is nearing completion of several new corporate buildings, built to high sustainability standards. It is imperative that as those buildings are commissioned and become fully operational they are monitored and fine-tuned so that energy and GHG emissions saving measures are effective as possible.

Coordinate with regional stakeholders to maximize sustainability outcomes: The City will work with other local governments and regional stakeholders to ensure that high impact policies such as building benchmarking, stretch energy standards, and transportation policy can be scaled across jurisdictions for maximum impact.





City of Richmond

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