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CORPORATE REPORT

NO: R048 COUNCIL DATE: March 11, 2019

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**March 6, 2019**
FROM:	**General Manager, Parks, Recreation & Culture** **General Manager, Engineering** **General Manager, Planning & Development**	FILE:	**0512-02**

SUBJECT: **Update on Implementation of Community Climate Action Strategy**

RECOMMENDATION

It is recommended by the Parks, Recreation & Culture Department, the Engineering Department and the Planning & Development Department that Council receive this report for information.

INTENT

The purpose of this report is to provide Council with an update on the implementation of the Community Climate Action Strategy (the "Strategy").

BACKGROUND

There is a firm understanding among the public that climate change represents a significant threat to established social, economic, and infrastructure systems and must be met with equally significant mitigation efforts (reducing greenhouse gas ("GHG") emissions) and adaptation efforts (preparing for the anticipated and existing impacts of climate change). In 2016, Canada joined nearly 200 countries as a signatory to the Paris Climate Agreement, which commits nations to pursuing mitigation actions to keep warming to under 1.5°C above preindustrial levels. In 2018, the United Nations Intergovernmental Panel on Climate Change ("IPCC") released a Special Report on Global Warming of 1.5°C. The Report outlines the consequences of continued GHG emissions and describes the rapid and unprecedented transition required to keep warming to safe levels, as well as the multitude of benefits that result from doing so. If GHG emissions and associated warming are not addressed at all levels of government, it will have very real consequences including here in Surrey, such as the potential loss of farmland and biodiversity, rising health impacts from extreme heat and wildfire smoke, and significant infrastructure failure.

Leading governments around the world continue to ramp up both mitigation and adaptation policies and actions. Climate change has been identified as both a National and Provincial priority, most notably through the Pan-Canadian Framework on Clean Growth and Climate Change and CleanBC, both of which focus on reducing GHG emissions while expanding the clean-growth economy.

Cities are reducing community-wide GHG emissions to meet global targets, reducing the energy cost burdens for residents and businesses, and ensuring adaptation to the existing and anticipated impacts of climate change including sea level rise, flooding, wildfires, and increased heat. Through 2018 and early 2019, a growing number of local governments have been revising community-wide GHG reduction targets to align with the updated IPCC findings.

Local governments have a unique interest and opportunity in planning for a changing climate. Communities are vulnerable to climate change due to extensive infrastructure supporting high concentrations of people and economic activity. As the level of government closest to community-scale circumstances, municipalities are well-placed to proactively plan for and respond to affected services. Municipalities can also influence and lead GHG reductions through land use planning (e.g., densification along major transit corridors), energy supply (e.g., local district energy solutions), and buildings (e.g., through new construction and retrofits of existing buildings). In the long term, as rising energy costs act against local government efforts to maintain affordability in their communities, reducing energy use will become an increasing priority.

Efforts to accelerate climate action are shared and discussed across networks of local governments regionally, nationally, and across North America. Regionally, City staff collaborate to coordinate and accomplish shared priorities, maximize external funding, and share the distribution of effort required to move forward. Nationally and continentally, the City leverages the experience and resources of other leading jurisdictions to more quickly and cost-effectively move forward with climate action.

City Commitments

The City of Surrey has signed on to several climate-related commitments at the Provincial, Federal, and global levels, and has developed plans to guide climate change mitigation and adaptation.

The City has been a member of the Partners for Climate Protection Program ("PCP") of the Federation of Canadian Municipalities ("FCM") since 1998. This national program brings municipal governments together to reduce both corporate and community-wide GHG emissions. Subsequently, the City joined a complementary, adaptation-focused program known as Building Adaptive and Resilient Communities ("BARC") overseen by ICLEI-Canada, a global organization which focuses on climate and sustainability issues at the local government level. In 2016 and 2017, the City was awarded the highest milestone levels under BARC and PCP, respectively, for the City's progress in addressing climate change adaptation and mitigation, both corporately and community-wide. Surrey is one of only three cities in Canada to have achieved all three Milestones. In 2015, the City signed on to the Global Covenant of Mayors, a global agreement among leading cities reaffirming the need to take broad climate action on both mitigation and adaptation and reinforcing the City of Surrey's ongoing presence among cities working to lead the way on climate change.

In 2010, the City adopted community-wide GHG reduction targets in the City's Official Community Plan ("OCP"), in part to meet the Provincial requirements of Bill 27, the *Local Government (*Green Communities*) Statutes Amendment Act*:

- A 33% per capita GHG reduction by 2020, excluding agriculture and industry; and
- An 80% per capita GHG reduction by 2050, excluding agriculture and industry.

To pursue these targets, Council approved Surrey's Community Climate Action Strategy in 2013, which includes an overarching document and two complementary climate action plans:

- The Community Energy and Emissions Plan ("CEEP"), which provides a guide to reduce community energy spending and GHG emissions, and
- The Climate Adaption Strategy ("CAS"), which identifies how the City may be vulnerable to climate change impacts and proposes actions to mitigate risk and cost.

Together, these two plans reinforce the City's broader efforts toward establishing Surrey as a thriving, green, inclusive City. The City won an FCM 2015 Sustainable Communities Award for this Community Climate Action Strategy.

An update on the Community Climate Action Strategy implementation was last provided to Council in 2017, when Council considered Corporate Report No. R115; 2017 on May 29, 2017 (attached as Appendix "I").

DISCUSSION

As noted above, the Community Climate Action Strategy includes both the Community Energy & Emissions Plan and Climate Adaptation Strategy. A status update is provided below on progress in implementing both plans.

Community Energy & Emissions Plan ("CEEP")

The CEEP includes policy tools that support desired energy outcomes, including a growing and comprehensive rapid transit network, improvements to new building energy performance, building retrofit opportunities, and district energy. Strategies were developed in the CEEP to redirect Surrey's energy and emission trajectory: by 2020 achieving a 22% per capita GHG reduction, increasing to a 47% per capita reduction by 2040, with the largest reductions being made within the transportation sector. Annual community-wide energy savings were projected at $832 million by 2040. These more refined CEEP targets complement the City's aspirational GHG targets as outlined in the OCP and reflect the City's efforts to define an assertive and pragmatic low-carbon path that will slow emissions growth. While technological advances will continue to accelerate further progress towards these targets, the growing body of research discussed above demonstrates that deeper GHG reductions will be necessary.

The following key CEEP initiatives were completed over 2017 and 2018:

<u>District Energy</u>

- The City expanded the District Energy network to a total 12 buildings (255,170 $m^{2)}$ and connected the City's first renewable heating source, the geo-exchange field below New City Hall Plaza, to the district energy network.
- The City completed construction of the West Village District Energy Centre which will allow the utility to grow beyond the capacity of the two existing temporary energy centres.
- The City also completed the District Energy low-carbon generation feasibility study to evaluate the technology costs and viability of biomass, sewer-heat recovery, and renewable natural gas as low-carbon options to reach Surrey's district energy carbon intensity target of 0.07 T CO2e/MWh.

Buildings

- In 2018, the City adopted the BC Energy Step Code, a framework for reducing energy use in all new construction and moving to near net-zero construction by 2032, including an optional low-carbon path for multifamily residential buildings. Implementation of the Step Code in Surrey will take effect April 1, 2019 and a Corporate Report is being prepared for Council consideration with these details. City staff are also involved in guiding the BC Energy Step Code Council and Step Code Local Government Peer Network, providing leadership on this policy initiative and helping to achieve consistency across local governments.
- The Empower Me program has been delivered to 611 Surrey households, targeting behaviour change and energy retrofits for newcomers living in the city.
- The City completed planning and design for and began construction on Clayton Community Hub, a new recreation centre to serve residents of East and West Clayton. The building is targeting passive-house levels of energy performance (very high energy efficiency), is intended to be a flagship municipal building for Surrey, and during construction may be used as an educational opportunity for other local Part 3 builders of large complex buildings.

Transportation

- In 2018, TransLink's Mayor's Council agreed on a funding model that would support the regional share of Phase 2 of the 10 Year Investment Plan. This will help deliver widespread bus service improvements for the frequent transit network, support the implementation of B-Line service on Scott Road/120 Street and the extension of the SkyTrain Expo Line on Fraser Highway to Langley.
- TransLink released their 2017 Transit Service Performance Review and found that the 96 B-Line was the fastest growing B-Line in the region and had doubled ridership since its implementation in 2013. Surrey now has two of the top 20 Bus Routes in the region. With over 5,000,000 annual boarding's each, the 319 service on Scott Road and the 96 B-Line now carry more riders than notable bus routes in region like Granville, Nanaimo, Willingdon, and Marine.
- Electric vehicle ("EV") charging continues to increase throughout the city, including at key City facilities like City Hall and busy community centres. In 2018, the City added 19 new public charging ports to bring the citywide total to 52, a 58% increase from 2017 in a year that saw public charging sessions increase by 60%. The need for public EV charging will continue to increase after BC saw EV sales increase 53% in 2017 and 2018 sales great than 2015, 2016, and 2017 combined.
- In 2017, the Sustainability Office hired a FortisBC-supported Climate & Energy Analyst to explore opportunities to reduce emissions and energy use through ongoing energy conservation and management, renewable natural gas, and vehicle fuel conversion.
- In 2018, new City Centre road standards were adopted that include raised and separated bike lanes that will provide protected and more comfortable cycling routes. These standards are now being applied to road improvement projects outside the City Centre.
- In 2018, the City's Safe and Active School Program spent $2.1 million on infrastructure improvements and expanded the number of schools participating in School Travel Planning, all to promote active travel and improve road safety around Surrey's elementary schools.

- Continued investment in the development of a comprehensive, connected, and safe multi-modal infrastructure was made throughout the City and included:
    - Bike lanes increased by 5 km;
    - Greenways increased by 2 km;
    - Sidewalks increased by 25 km; and
    - 18 new accessible bus stops established.

Waste

- In 2018, the City completed construction and began operation of the Surrey Biofuel Facility. This facility will provide measurable reductions to both community and corporate GHG emissions and generate carbon offsets the City can use to become carbon neutral. The renewable natural gas ("RNG") will fuel the City's vendor waste collection fleet and help reduce the GHG intensity of the district energy system in City Centre.

GHG Emissions Update & Trends

In 2018, City staff produced a new community-wide GHG inventory for the year 2016 in alignment with the requirements of the Global Protocol for Community-Scale GHG Emission Inventories (GPC). The GPC is a best practice for community GHG inventories and facilitates comparison between cities and better alignment with national inventories. Figure 1 below shows Surrey's community-wide GHG inventories from 2007 (baseline) through to 2016 (latest data), while Figure 2 shows GHG emissions per capita over the same time period, in comparison to the City's current GHG targets.

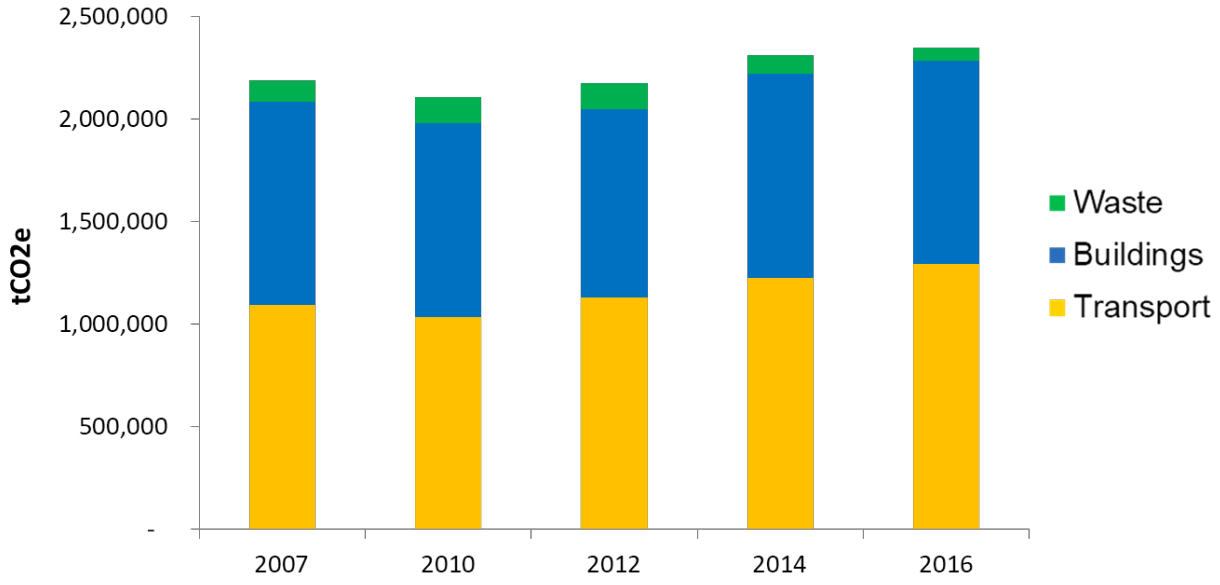

Figure 1 Community-wide GHG emissions, 2007-2016

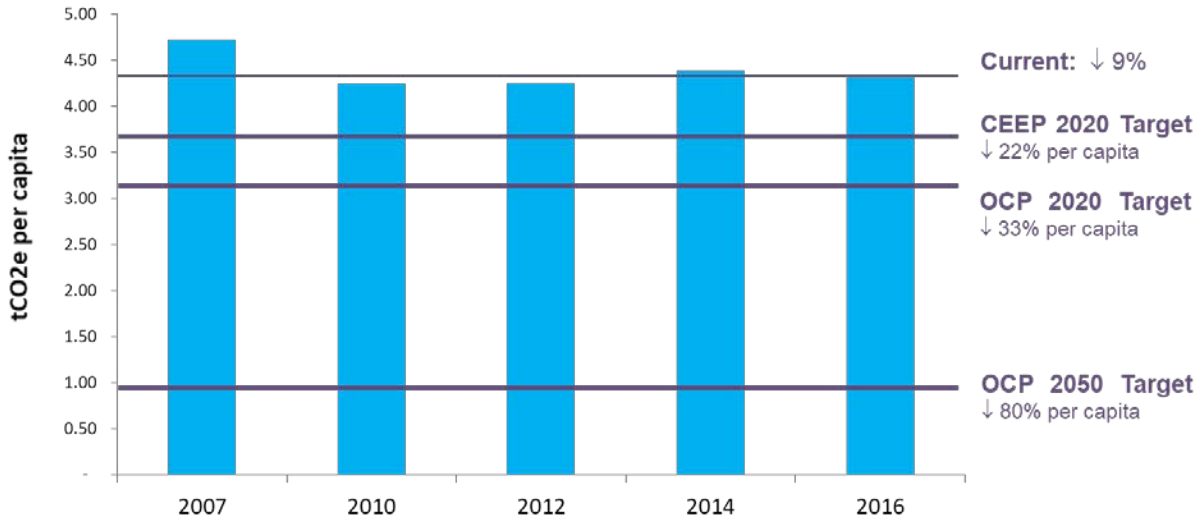

Figure 2 Community-wide GHG emissions per capita relative to GHG reduction targets, 2007-2016

Annual (2016) community-wide GHG emissions totalled 2.36 million tonnes of carbon dioxide equivalent (MTCO2e). Compared to the baseline year of 2007, absolute emissions increased by 160,000 T CO2e, or 7%, in 2016. Surrey's population increased by approximately 83,000 people over the same period, so per capita emissions decreased by 9%. The largest contributors to Surrey's GHG emissions are transportation (54%), with buildings and on-site equipment a close second (42%).

Transportation emissions increased 14%, while remaining stable on a per capita basis. These primarily come from passenger vehicles. The Federal Corporate Average Fuel Economy ("CAFE") Standard and the Provincial Low Carbon Fuel Standard ("LCFS") improved fuel efficiency and reduced fuel GHG intensity, respectively, putting downward pressure on GHG emissions over this period, and will continue to do so through at least 2025. However, SUV ownership increased significantly across North America, and particularly in Surrey, reducing the GHG reduction impact that CAFE and LCFS had on transportation emissions. A large portion of heavy duty vehicles that serve the region are registered in Surrey, and the community saw a 35% increase in emissions from these vehicles over the past ten years.

Building GHG emissions remained relatively stable in absolute terms, despite substantial growth in new construction, leading to a 13% reduction in per capita GHG emissions between 2007 and 2016. Two key factors driving GHG reductions include BC Hydro using less fossil fuel to generate electricity, and the ongoing shift towards more multi-family buildings and townhomes, which tend to use electricity for space heating rather than natural gas. However, the reduction in per capita GHG emissions is significantly buoyed by 2016 being a much milder winter than 2007, reducing natural gas consumption from home heating. Data shows the 2017 and 2018 winters required more space heating use than in 2016, very likely increasing natural gas consumption and shrinking the per capita GHG reduction for those years.

It is important to note that changes in community-wide GHG emissions are a result of various forces including changes in population, market conditions, Federal and Provincial policies, and local initiatives. On the transportation side, continued investment in multi-modal infrastructure, expanded transit service, and increased uptake of electric vehicles will help to reduce transportation emissions over time. Ongoing policy initiatives and major infrastructure projects, which come into effect past 2020, are expected to be major contributors to emission reductions at the community level. This includes the adoption of the BC Energy Step Code for highly energy efficient new buildings, and a provincial Zero Emission Vehicle ("ZEV") Standard mandating minimum increases in the percent of annual ZEV sales, reaching 100% by 2040.

Climate Adaptation Strategy

Using ICLEI-Canada's five-milestone Building Adaptive and Resilient Communities framework, the Climate Adaptation Strategy assessed projected climate impacts to Surrey in terms of risk and then developed goals and actions for six sectors: Infrastructure; Flood Management and Drainage; Ecosystems; Urban Trees; Human Health and Safety; and Agriculture and Food Security.

The following are climate adaptation initiatives in progress or completed in 2017 and 2018:

<u>Flood Management & Drainage</u>

- The three-year Coastal Flood Adaptation Strategy ("CFAS") process was launched in 2016 to prepare Surrey for a changing climate and to help our coastal communities become more resilient. Phases 1 through 3 of this participatory process, which involved extensive engagement of residents, stakeholders and partners, explored community values and adaptation options to develop preferred long-term strategies to adapt to sea level rise throughout Surrey's coastal floodplain area. The current Phase 4 of CFAS entails detailing robust, broadly supported adaptation strategies with phasing, based on technical reviews, cost, and partnerships.

- Based on work completed as part of CFAS to date, several key flood mitigation assets nearing the end of their service life have been proposed to be replaced or renewed to increase the resilience of Surrey to natural hazards and meet future climate conditions. Partnerships are a crucial component of City's efforts, which include a suite of traditional and nature-based mitigation approaches. With this suite of projects, the City is seeking funding from Infrastructure Canada's Disaster Mitigation and Adaptation Fund.

- The City continued involvement in the Lower Mainland Flood Management Strategy ("LMFMS") led by the Fraser Basin Council. Phase 1 of LMFMS was completed in 2016 and delivered analysis of future flood scenarios, a regional assessment of flood vulnerabilities and projected impacts, and an assessment of flood infrastructure, policies and practices. Phase 2, initiated in 2017, includes assessments of regional mitigation priorities and options, establishment of agreements among partner organizations and developing an action agenda.

Infrastructure

- While engaging local infrastructure owners and operators (including Ministry of Transportation and Infrastructure, Fortis BC, and BC Hydro), an assessment of infrastructure flood risks has been completed in parallel with the CFAS process. Similarly, collection of Surrey-specific data on natural coastal processes and assessment of shoreline vulnerabilities and ecosystem risks in Mud Bay study area is currently underway, working with local environmental partners. The outcomes of these two processes will feed back into the overall CFAS process to inform detailing of proposed adaptation strategies.

- A rainfall assessment is currently underway to better understand changes in precipitation patterns and inform future servicing requirements. Integrated Stormwater Management Plans ("ISMPs") and Neighbourhood Concept Plans ("NCPs") continue to be used to enhance stormwater management practices.

Ecosystems & Natural Areas

- Amendments to the *Surrey Soil Conservation And Protection By-Law*, 2007 No. 16389 were made to now require Development Permits to be issued and finalized prior to the issuance of a soil permit in sensitive ecosystem and hazardous areas. This ensures full integration of the protection requirements of these areas and reduces the potential for a soil permit to be issued that may not be aligned with the protection guidelines. Amendments were finalized at the end of 2017 and are now in place.

- High value habitats are now better protected through the use of Streamside Setbacks established in the General Provisions section of the *Surrey Zoning By-law* 12000 (Part 7A) and through the creation of a new Sensitive Ecosystem Development Permit Area in the OCP. Amendments to the *Surrey Tree Protection By-law*, 2006 No. 16100 will also be forthcoming to work to implement and enforce the Biodiversity Conservation Strategy by creating new protection measures in Sensitive Ecosystem and Hazard Land Development Permit Areas and by modifying penalties to better protect high value habitats.

- An Environmental Planner who is a registered professional biologist ("R.P.Bio"), has been hired to support the implementation of the Sensitive Ecosystem Development Permit Area Guidelines. Recruitment is also underway to hire a Biodiversity Conservation Strategy ("BCS") Coordinator R.P.Bio, who will lead the broader implementation of the BCS.

- 39 acres of Surrey park land were added to the BCS Green Infrastructure Network ("GIN") through land development applications (conveyance) and NCP implementation. Total GIN protected as Park land is now 5,075 acres.

Urban Trees & Landscaping

- The Shade Tree Management Plan (2016) continues to guide urban forestry management practices on public property. Early success includes design guidelines for new development in City Centre requiring enough soil volume to support growth of large trees. In addition, a standard of one street tree every 10 metres is being applied in new developments.

- From 2017 to 2018, Surrey's urban forest and habitat were enhanced with the planting of over 48,488 plants, including 16,446 trees and 32,042 shrubs. Invasive plants were removed from over 21.75 ha of park land and road allowance and 3.25 ha of passive or degraded park land was converted to natural area. Despite tree planting efforts on both private and municipal land, tree canopy in the city has decreased slightly in recent years, with most current data from 2013 showing the canopy at 28% (the City's goal is to maintain canopy at 30%).

- The City participated in the Advisory Panel for Metro Vancouver's Urban Forest Climate Adaptation Framework, and the supporting Design Guidebook for Maximizing Climate Adaptation Benefits with Trees. The publications support decision making around species suitability and site design to maximize adaptation benefits and increase the urban forest's resilience to climate change.

Agriculture & Food Security

- Completed the third year in support of Young Agrarians to deliver FarmableNOW, an agricultural land matching program for landowners and new or young farmers in Surrey.

- Supported Seeds of Change Surrey, a collective impact initiative focussed on increasing food security in the neighbourhoods of Newton and Guildford.

- Since 2016, as part of City efforts to allow residents to get involved in their own urban food production, chickens can be kept in backyards on single family urban area lots meeting specific requirements.

- Three farmers markets took place in Surrey where vendors make, bake, grow or raise the products they sell, with an emphasis on the sale of farm products from British Columbia. Markets are organized by the local community and take place in City Centre, Clayton and Cloverdale.

Human Health & Safety

- In partnership with Portland State University ("PSU"), the City has collected data on Surrey's urban heat during a high degree day in summer, to begin to understand extreme heat trends and inform potential vulnerability mapping. Staff continue to collaborate with PSU faculty and Health partners to gain a better appreciation of approaches to support staff and partners in this work.

- The City is a partner on the 2-year Climate Resilience and Well-being Through Neighbourhood-scale Green Design project examining the synergies between green infrastructure, climate change adaptation, and human health, with a focus on community co-benefits at a local scale.

Cross-Cutting Actions

- The City completed the third year of the award-winning integrated environmental education program in Surrey classrooms that focuses on waste, water and energy reductions.

- In 2017, the City launched Newton Sustainability in Action, a pilot neighbourhood engagement project to develop a collaborative neighbourhood-level sustainability action plan to further advance the goals of the Sustainability Charter 2.0. The planning process is in its final stages, with an anticipated report to Council in Spring 2019.

Mitigation & Adaptation Linkages

The Community Climate Action Strategy identifies linkages between climate mitigation and adaptation, given that these activities have the potential to be mutually supportive when carefully planned and carried out. In other words, strategies to reduce GHG emissions can simultaneously increase the city's resilience to climate change impacts. These mutually reinforcing actions are categorized into four areas: Ecosystem Protection, Hazard Avoidance and Compact Land Use; Ecosystem Health and Carbon Sequestration; Heat Management and Passive Solar; and Community Energy Systems and Self-Sufficiency. The Sustainability Office was recently invited by Simon Fraser University ("SFU") Adaptation to Climate Change Team ("ACT") to participate in the development of a Low Carbon Resilience framework for integrating municipal mitigation and adaptation actions to improve cost-effectiveness and avoid unintended consequences.

SUSTAINABILITY CONSIDERATIONS

The work of the Community Climate Action Strategy supports the objectives of the Sustainability Charter 2.0. In particular, this work relates to the Sustainability Charter 2.0 themes of Built Environments & Neighbourhoods, and Infrastructure. Specifically, the initiatives support the following Desired Outcomes ("DO"):

- Neighbourhoods & Urban Design - DO 9: All aspects of planning, design and construction include climate change impacts, GHG mitigation, adaptation, and resiliency strategies.
- Buildings & Sites - DO 13: Buildings are healthy and energy and resource efficient.
- Emergency Preparedness & Prevention - DO 8: The community's critical infrastructure and systems are designed to withstand climate change impacts, natural events and disasters, and include emergency response and reconstruction plans.
- Energy & Climate - DO 6: The City anticipates changing weather patterns and sea level rise as a result of climate change, and implements appropriate infrastructure, land use planning and emergency response solutions that will be resilient over the long term.
- Energy & Climate - DO 7: Per capita emissions are low and align with global GHG reduction targets.
- Energy & Climate - DO 8: Neighborhood-scale district energy systems provide low-carbon energy in dense urban neighborhoods.
- Energy & Climate - DO 9: Energy is produced locally, using distributed and renewable sources when economically feasible.
- Energy & Climate - DO 10: Buildings in the community are energy-efficient and offset their own energy with onsite energy generation.
- Transportation – DO 12: Surrey residents have access to sustainable and active transportation options, enabling them to participate fully in society without the use of a private automobile.
- Transportation – DO 13: Low-emission vehicles predominate and are supported by the necessary fueling infrastructure.

CONCLUSION

The Community Climate Action Strategy is an integrated action plan to reduce community energy costs and GHG emissions, and effectively manage risk and increase the City's resilience to the effects of climate change. Surrey's innovative approach brings the two plans together and identifies the important cross-linkages between mitigation and adaptation actions. Several key projects over 2017 and 2018 have advanced the Climate Strategy's goals and actions. It is recommended that Council receive this report for information.

Laurie Cavan
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Parks, Recreation & Culture

Fraser Smith, P. Eng.
General Manager,
Engineering

Jean Lamontagne
General Manager,
Planning & Development

Appendix "I" – Corporate Report No. R115; 2017

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APPENDIX "I"

CITY OF SURREY
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CORPORATE REPORT

NO: R115 COUNCIL DATE: **May 29, 2017**

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**May 25, 2017**
FROM:	**General Manager, Planning & Development** **Manager, Sustainability**	FILE:	**0512-02**
SUBJECT:	**Update on Implementation of Community Climate Action Strategy**		

RECOMMENDATION

The Planning & Development Department recommends that Council receive this report for information.

INTENT

This report presents an update on the implementation of the Community Climate Action Strategy (the "Strategy").

BACKGROUND

In 1998, the City of Surrey became a member of the Partners for Climate Protection Program (PCP) of the Federation of Canadian Municipalities (FCM), a national program that brings Canadian municipal governments together to act on climate change and reduce the local production of greenhouse gas (GHG) emissions.

In May 2010, to meet the provincial requirements of Bill 27, the *Local Government (Green Communities) Statutes Amendment Act,* the City included the following aspirational GHG reduction targets in the City of Surrey Official Community Plan (OCP), modelled on provincial targets:

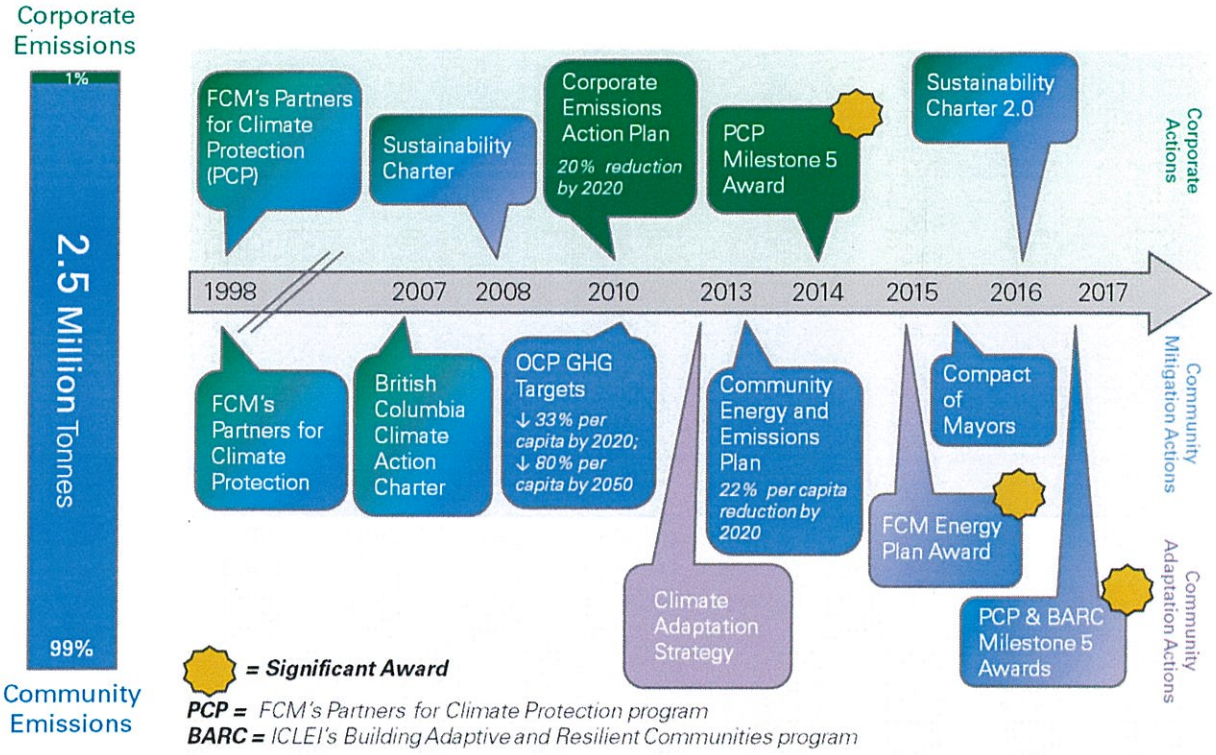
- 33% per capita GHG reduction by 2020, excluding agriculture and industry; and
- 80% per capita GHG reduction by 2050, excluding agriculture and industry.

On November 25, 2013, Council considered Corporate Report No. R233; 2013 titled "Community Climate Action Strategy" and approved the final Strategy. An update on the Climate Strategy implementation was last provided to Council in 2016, when Council considered Corporate Report No. R042; 2016 on February 22, 2016.

The City has moved through the milestones of the PCP Program under FCM (for climate mitigation), and the Building Adaptive and Resilient Communities (BARC) program under ICLEI-Canada (for climate adaptation). In September 2016, the City received the final Milestone 5 under the BARC program. At the upcoming FCM conference in June 2017, Surrey will receive the final Milestone 5 under the PCP Program for community-wide GHG reduction progress.

Both of these final milestone awards mark significant progress, and we are awaiting confirmation that Surrey is the first Canadian city to have achieved both Milestone 5 awards for mitigation and adaptation efforts. Figure 1 illustrates Surrey's significant commitments and achievements related to corporate and community climate action over the past decade.

Figure 1: City of Surrey Climate Action Milestones



DISCUSSION

Local governments have a unique interest and opportunity in planning for a changing climate. Communities are vulnerable to climate change due to extensive infrastructure supporting high concentrations of people and economic activity. As the level of government closest to community-scale circumstances, municipalities are well-placed to proactively plan for and respond to affected services. Municipalities also have the ability to influence and lead GHG reductions through land use planning (e.g., densification along major transit corridors), energy supply (e.g., local district energy solutions), and buildings (e.g., through new construction and retrofits of existing buildings). In the long term, as rising energy costs act against local government efforts to maintain affordability in their communities, reducing energy use will become an increasing priority.

The City has developed two complementary climate action plans that make up the Community Climate Action Strategy:

1. The *Community Energy and Emissions Plan* (or CEEP) provides a guide to reduce community energy spending and greenhouse gas emissions; and

2. The *Climate Adaption Strategy* (CAS) identifies how the City may be vulnerable to climate change impacts and proposes actions to mitigate risk and cost.

Together, these two plans reinforce the City's broader efforts toward establishing Surrey as a prosperous and resilient 21st Century urban centre. **The City won a FCM 2015 Sustainable Communities Award in the Energy category, for the Community Climate Action Strategy.**

Community Energy and Emissions Plan (Mitigation)

The CEEP includes policy tools that support desired energy outcomes, including a viable rapid transit network, improvements to new building energy performance, building retrofit opportunities, and district energy. Strategic directions in the CEEP include the following:

- Complete, compact, connected corridors supporting a high quality rapid transit network and low carbon district energy systems;
- A framework to meet steadily rising building energy standards through capacity building efforts, the exploration of local incentives, and connecting the development community with existing incentives available for energy efficiency;
- Rapid transit development, improved bus service, and walking and bike infrastructure around and between Town Centres and the City Centre;
- A suite of green car strategies; and
- Initiatives that build on the City's Rethink Waste program, including the development of an organic waste biofuel facility.

Strategies have been developed in the CEEP to redirect Surrey's energy and emission trajectory by 2020, achieving a 22% per capita GHG reduction, increasing to a 47% per capita reduction by 2040 with the largest reductions being made within the transportation sector. Annual community-wide energy savings are projected at $832 million by 2040. These more refined CEEP targets complement the City's aspirational GHG targets as outlined in the OCP. The CEEP targets reflect the City's efforts to define an assertive and pragmatic low-carbon path that will slow emissions growth; they also move the City towards the aspirational GHG reduction targets in the OCP. Technological advances will accelerate further progress towards these targets.

Of particular note are the following initiatives in progress or completed over the past year:

District Energy

- The addition of four new customer buildings to the district energy system, bringing the total floor area served to over 1.5 million ft^2.
- Completion of the design of the West Village District Energy Centre which will allow the utility to grow beyond the capacity of the two existing temporary energy centres.
- A carbon intensity target of 0.07 T CO2e/MWh was established for the heat delivered by the district energy system as part of the Sustainability Charter update.

Buildings & Land Use

- A new Building Energy Specialist position was created to help ensure compliance of energy sections of BC Building Code.

- The Sustainability Office secured funding from FortisBC to pilot a new Energy Analyst staff position to explore opportunities to reducing emissions through ongoing energy conservation and management, renewable natural gas and vehicle fuel conversion.
- The "Empower Me" program was delivered to 117 households, targeting behaviour change and energy retrofits for newcomers living in single family homes. Since the inception of the program in 2012, a total of 422 Surrey households have participated.
- The first applications were submitted in alignment with the West Clayton building energy efficiency density bonus policy, by Garcha Homes.
- Training sessions were delivered to over 125 builders on construction techniques for energy efficient buildings.
- Building energy design guidelines were prepared to help inform design considerations to reduce building operational energy requirements.
- The Sustainability Development Checklist was updated to reflect changes to technologies, codes and standards.
- Staff contributed to the development of BC Energy Step Code, which grants new authority to local governments to include building energy efficiency performance requirements in bylaws.

Transportation

- Initial funding for Phase 1 of Surrey LRT was secured, which advanced design closer to procurement readiness.
- Bike lanes were increased by 35 km.
- Greenways were increased by 26 km.
- Sidewalks were increased by 20 km.
- 27 new accessible bus stops were established.

Waste

- Construction commenced on the biofuel facility in 2016 and is scheduled for completion in 2017.

In 2016, a new community greenhouse gas inventory was prepared for year 2014 and in alignment with the requirements of the Global Protocol for Community-Scale GHG Emission Inventories (GPC). The GPC is best practices for community GHG inventories and facilitates comparison between cities and better alignment with national inventories. Previous inventories for the City of Surrey were prepared by the Province of British Columbia's Climate Action Secretariat in the form of the Community Energy and Emissions Inventory (CEEI). The primary difference between the GPC and CEEI is the inclusion of additional emissions activity sources, notably industrial processing, agricultural activities, fugitive emissions from natural gas systems and rail and off-road vehicle emissions.

Compared to the City of Surrey's baseline year of 2007, community-wide annual GHG emissions increased by 97,000 T CO_2e, or 4%, in 2014. However, population has increased by approximately 75,000 people over this period and as a result **per capita emissions have dropped 11%**. The biggest reduction in GHG emissions has been associated with the building sector, which has reduced annual emissions by 61,000 T CO_2e (8%) despite substantial growth in new construction. Transportation emissions increased by 158,000 T CO_2e/year (10%) from 2007 to 2014. At the time the CEEP was developed, the projected reductions for transportation emissions assumed higher level government intervention on fuel standards, which have not been introduced.

Nevertheless, **the City is on track to meet the CEEP target of a 22% per capita reduction by 2020.** Changes in community GHGs are a result of various forces including changes in population, market conditions, federal and provincial policies and local initiatives. In 2016, an evaluation was conducted to estimate the projected direct impacts that the City of Surrey's major initiatives – including LRT and district energy - will have on community GHGs. Results of this evaluation suggest that actions taken or currently underway by the City of Surrey will reduce total emissions by approximately 125,000 T CO_2e/year (5% of 2014 emissions levels) by 2025.

Climate Adaptation Strategy (Adaptation)

Using ICLEI-Canada's five-milestone climate adaptation framework, staff assessed projected climate impacts to Surrey in terms of risk and then developed goals and actions for six sectors: Infrastructure; Flood Management and Drainage; Ecosystems; Urban Trees; Human Health and Safety; and Agriculture and Food Security. Priority actions identified in the *Climate Adaptation Strategy* include the following:

- Conducting detailed analysis on timelines and extent of sea level rise and related effects on flood construction levels and floodplain designations;
- Supporting the development of a Regional Flood Management Strategy;
- Enhancing data collection and monitoring specific to Surrey;
- Continuing to improve and protect the quality and quantity of habitat;
- Planting tree species for conditions of a future climate;
- Ensuring adequate tree canopy and root space;
- Encouraging passive building design features; and
- Continuing to build community capacity to reduce vulnerability and increase resilience.

Of particular note are the following initiatives in progress or completed in 2016:

- The Coastal Flood Adaptation Strategy was launched to prepare Surrey for a changing climate and to help our coastal communities become more resilient. Adaptation options will be explored to develop preferred strategies to adapt to sea level rise throughout Surrey's coastal floodplain area. Technical floodplain studies previously conducted are being used to build awareness and inform the adaptation options being explored. Phase 1 of the three-year process involves extensive engagement with residents, stakeholders and partners.

- The City continued involvement in the Lower Mainland Flood Management Strategy (LMFMS), which completed Phase 1 on analysis of future flood scenarios, a regional assessment of flood vulnerabilities, and an assessment of flood infrastructure, policies and practices. Phase 2 of LMFMS was initiated, which will deliver an action agenda, regional mitigation priorities, and agreements among partner organizations.

- A rainfall assessment is currently underway to better understand changes in precipitation patterns and inform future servicing requirements. ISMPs and NCPs continue to be used to enhance storm water management practices.

- New and upgraded infrastructure is being designed to meet future climate conditions; in 2016, three pump stations were upgraded to better control flooding with changing water

levels, and were designed so further modification can take place as conditions continue to change.

- High value habitats are better protected by the adoption of Streamside Setbacks through amendments to the General Provisions section of the Zoning Bylaw and amendments to the OCP with the incorporation of new Sensitive Ecosystem Development Permit Area Guidelines. Forthcoming amendments to the City's Tree Protection By-law and Soil Conservation and Protection By-law will enshrine Biodiversity Conservation Strategy definitions and maps, reference the Sensitive Ecosystem and Hazard Land DPAs, and modify penalties to better protect high value habitats.

- 29 acres of parkland were added to the BCS Green Infrastructure Network (GIN) through land development applications (conveyance) and NCP implementation. Total GIN protected as Parkland is now 5,036 acres.

- The Shade Tree Management Plan was adopted by Council and guides urban forestry management practices on public property. Early success includes design guidelines for new development in City Centre requiring sufficient soil volume to support growth of large trees. In addition, a standard of one street tree every 10 metres is being applied in new developments.

- The City participated in the Advisory Panel for Metro Vancouver's *Urban Forest Climate Adaptation Framework*, and the supporting *Design Guidebook for Maximizing Climate Adaptation Benefits with Trees*. The publications support decision making around species suitability and site design to maximize adaptation benefits and increase the urban forest's resilience to climate change.

- Surrey's urban forest and habitat was enhanced with the planting of over 4,500 new shade trees and the removal of invasive plants from 10.75 ha of park land and road allowance. In addition, over 10,500 m2 of passive or degraded park land was converted to natural area.

- Published *Designing for Energy Efficient Buildings: A Reference for Planners and Designers*, to guide development in using more passive design elements in buildings. Passive design will protect health and mitigate rising energy costs as cooling demand increases with rising temperatures.

- An interdepartmental Neighbourhood Team continues to support resident-driven initiatives that build resilience through a greater sense of community and more neighbourhood connections.

Staff continue to monitor progress on both mitigation and adaptation using indicators from the City's Sustainability Dashboard. As specific projects are developed to advance this work, Council will be kept apprised of further progress.

SUSTAINABILITY CONSIDERATIONS

The *Community Climate Action Strategy* supports many of the Desired Outcomes (DO) identified in the Sustainability Charter 2.0:

- Built Environment & Neighbourhoods DO 9: All aspects of planning, design and construction include climate change impacts, GHG mitigation, adaptation, and resiliency strategies.
- Built Environment & Neighbourhoods DO 13: Buildings are healthy and energy and resource efficient.
- Public Safety DO 8: The community's critical infrastructure and systems are designed to withstand climate change impacts and natural events and disasters, and include emergency response and reconstruction plans.
- Infrastructure DO 6: The City anticipates changing weather patterns and sea level rise as a result of climate change, and implements appropriate infrastructure, land use planning and emergency response solutions that will be resilient over the long term.
- Infrastructure DO 7: Per capita emissions are low, and align with global GHG reduction targets.
- Infrastructure DO 8: Neighborhood-scale district energy systems provide low-carbon energy in dense urban neighborhoods.
- Infrastructure DO 9: Energy is produced locally, using distributed and renewable sources when economically feasible.
- Infrastructure DO 10: Buildings in the community are energy-efficient and offset their own energy with onsite energy generation.
- Infrastructure DO 12: Surrey residents have access to sustainable and active transportation options, enabling them to participate fully in society without the use of a private automobile.
- Infrastructure DO 13: Low-emission vehicles predominate and are supported by the necessary fueling infrastructure.

CONCLUSION

The *Community Climate Action Strategy* provides an integrated action plan to reduce community energy costs and GHG emissions, and effectively manage risk and increase the City's resilience to the effects of climate change. Surrey's innovative approach brings the two plans forward together and identifies the important cross-linkages between mitigation and adaptation actions. A number of key projects over 2016 and into 2017 have advanced the Climate Strategy's goals and actions.

It is recommended that Council receive this report for information.

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