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Item No. 12.1.1
Environment & Sustainability Standing Committee
December 15, 2021

TO: Chair and Members of the Environment & Sustainability Standing Committee

SUBMITTED BY: ***Original Signed***
Caroline Blair-Smith, Acting Chief Administrative Officer

DATE: October 5, 2021

SUBJECT: **HalifACT – Acting on Climate Together: 2020-2021 Annual Report**

ORIGIN

On June 23, 2020 the following motion of Regional Council was put and passed:

"MOVED by Councillor Austin, seconded by Councillor Mason that Halifax Regional Council:

1. *Authorize the direction contained in the HalifACT 2050: Acting on Climate Together plan, as contained in Attachment A of the staff report dated May 4, 2020;*

2. *Direct the Chief Administrative Officer to carry out the actions contained in the HalifACT 2050: Acting on Climate Together plan as part of the multi-year budgeting and business planning process, including establishing a target of net-zero municipal operations by the year 2030;*

3. *Direct the Chief Administrative Officer to prioritize efforts in the following critical core areas:*

    a. *Create new energy retrofit and renewable energy programming;*

    b. *Develop a detailed and costed plan for retrofitting existing municipal buildings to be net-zero ready and climate resilient;*

    c. *Develop an electric vehicle strategy, increase charging infrastructure and replace fleet vehicles with electric vehicles;*

    d. *Explore opportunities to require net-zero standards for new buildings in the municipality;*

    e. *Develop a framework for assessing and protecting critical infrastructure;*

RECOMMENDATION ON PAGE 2

f. Support communities for climate adaptation and climate-related emergencies; and

g. Develop a financing strategy to operationalize the HalifACT 2050 plan over 30 years.

4. *Accept in principle the need to resource the plan and direct the CAO to return to Council with a resource plan for consideration in the 2021/2022 budget; and*

5. *Request that the Chief Administrative Officer provide annual progress reports on the implementation of the HalifACT 2050: Acting on Climate Together plan, to Regional Council through the Environment and Sustainability Standing Committee."*

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter, Section 34(3): "The Council shall provide direction on the administration, plans, policies, and programs of the Municipality to the Chief Administrative Officer."

RECOMMENDATION

It is recommended that Environment and Sustainability Standing Committee accept this report and forward to Halifax Regional Council for information.

EXECUTIVE SUMMARY

In 2019, thousands of cities across the globe, including the Halifax Regional Municipality, declared climate emergencies, acknowledging that climate change is a serious and urgent threat. HalifACT is the Municipality's response to the declaration, providing ambitious emissions targets towards the path to keep within 1.5 degrees of warming as recommended by the Intergovernmental Panel on Climate Change (IPCC) to avoid the worst impacts of the climate crisis.

The HalifACT plan was unanimously approved by Halifax Regional Council on June 23, 2020 during the middle of the COVID-19 pandemic, which required a rapid response by communities and governments around the world. Recognizing the need for the Municipality to react and adjust to the new financial circumstances caused by the pandemic, staff continued implementing HalifACT as best as possible with existing resources until the communities and economies began to recover.

In August 2021, the IPCC released its Assessment Report 6 (AR6), replacing the previous report published in 2013. Titled a "code red for humanity", it is the most comprehensive assessment of climate change to date and outlines the latest findings from leading scientists around the world. The findings are clearer and more critical than ever: **human activity is changing the climate in unprecedented and sometimes irreversible ways.**

This warming is already causing weather and climate extremes in every region across the globe. This includes extreme heatwaves, precipitation events, droughts, and cyclones, which are predicted to worsen. The rate of ice-sheet loss has increased four-fold, the oceans are warming at an accelerated rate, tropical cyclone occurrences have increased, and moved farther north, and the global rate of sea-level rise has nearly doubled. A 2 metre (m) rise in sea level by the end of this century is plausible, as is a 5 m rise by 2150. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep emissions reductions occur in the coming decades.

As is outlined throughout this first annual HalifACT progress report, staff are advancing the implementation of HalifACT. Work on 30 of the 46 HalifACT actions has begun and staff are working to mainstream climate thinking across the organization. **Still, staff estimate that HalifACT actions are only 20% on track and only 14% adequately resourced.** Despite current efforts and commitments to staff and resources, targets will not be met at the present pace and level of resources; our carbon budget will be exceeded by 2028.

As communities reopen from the pandemic, there is an opportunity to consider how the social and economic changes that have been adopted in response to COVID-19 can align with the environmental goals and action areas outlined in the HalifACT plan. How might the behaviours that were adopted during COVID-19 - changes to our daily routines, how we use energy, and how we move people and goods - become more permanent fixtures in our post-COVID-19 lives?

In the same way that the Municipality and its partners mounted an effective response to COVID-19, HRM's response to the climate crisis creates an opportunity to retain and improve the social, environmental and economic factors that will result in safe and connected, vibrant and healthy communities across our municipality.

Since the passing of HalifACT in June 2020, 30 of the 46 actions have been started. Of the actions that have started, only 7 are on track and 5 are adequately resourced. Despite current efforts and commitments to staffing and resources, the plan's targets will not be met at the current pace, and the carbon budget will be exceeded by 2028. To be successful in reaching the stated climate targets, HalifACT needs to be prioritized across Business Units, integrated into municipal budgeting, work planning, and reporting processes. The resources and level of effort outlined in this report and its attachments are critical to ensure the successful implementation of HalifACT. While the investment needed is substantial, it will result in a net benefit through increased adaptation measures that reduce the cost of climate impacts, avoided energy costs, lower operations and maintenance costs, carbon pricing costs and increased revenues from energy generation.

BACKGROUND

June 23, 2021 marked one year since Council approved one of the most ambitious climate plans in the country. As noted in the Origin section of this report, Regional Council has directed the CAO to return to Council with annual HalifACT progress reports and any related resource requirements identified to increase the pace and scale of our progress.

The purpose of this report and its attachments is to provide both Council and the public with a summary of how the HalifACT implementation is progressing as well as to identify the resources required over the next three years to implement the plan. The report highlights gaps in the current state of implementation and capture the progress that has been made, both internally and externally, to support the collective goals of HalifACT.

The content in this report captures progress from June 23rd, 2020 to March 31st, 2021. While this does not represent a full 12-month period, it aligns HalifACT reporting with the Municipality's fiscal year, which will allow integration of climate planning and budgeting more easily in the coming years. As this annual report only represents 9 months of work during the COVID-19 pandemic, it will also highlight a few initiatives and successes that occurred after March 31st, 2021, which will be reported on in greater detail in next year's annual report.

Where HalifACT Fits

Climate is a cross-cutting issue and has been prioritized as part of HalifACT and included in the Council Priority of Environment. The actions and key performance indicators identified in this strategic priority will be reported on separately, through the reporting process led by Corporate Planning.

HalifACT: Acting on Climate Together is a priority plan under the current Regional Municipal Planning Strategy (Regional Plan). It contains 46 actions, all to begin within the first 6 years of the plan. However, recognizing the sheer magnitude of action required to address the climate crisis and the fact that existing staff capacity and governance structures cannot support all actions immediately, staff prioritized the following seven Core Action Areas:

- Retrofit and renewable energy programming (Actions 2, 4)
- Retrofit municipal buildings to be net-zero ready and climate resilient (Actions 11,12,17)
- Electrification of transportation (Actions 8, 9,10)
- Net-zero standards for new buildings (Actions 1,19)
- Risk and vulnerability assessments (Actions 14,15,16, 27)
- Capacity building for climate adaptation (Actions 20, 21, 22, 25, 26, 29, 30, 31, 32, 35)

HalifACT: Acting on Climate Together

HalifACT: Acting on Climate Together is the Municipality's long-term climate action plan to reduce emissions and enhance resiliency to a changing climate, while also promoting social equity and economic development. HalifACT was unanimously approved by Halifax Regional Council in June 2020 and contains three themes of action; Decarbonized and Resilient Infrastructure, Prepared and Connected Communities, and Governance and Leadership. Within these theme areas, there are 17 subareas and 46 actions that are necessary to meet the targets established in the plan. HalifACT addresses the Municipality's climate emergency declaration put forward by Council in January 2019 and aligns with the 1.5°C pathway recommended by the Intergovernmental Panel on Climate Change (IPCC).

With the support of internal Business Units (BUs) and the HalifACT stakeholder network, implementation has been occurring since adoption. Successful implementation has relied on shared collaboration as the climate crisis is not a problem that can be solved by any one organization alone.

Intergovernmental Panel on Climate Change Assessment Report 6

In August 2021, the IPCC released its Assessment Report 6 (AR6)[1], replacing the previous report published in 2013. Labeled as a "code red for humanity", it is the most comprehensive assessment of climate change to date and outlines the latest climate change findings from leading scientists around the world. The findings are clearer and more critical than ever: **human activity is changing the climate in unprecedented and sometimes irreversible ways.** Since 1970, global surface temperatures have risen faster than in any other 50-year period over the past 2,000 years and in 2019, atmospheric CO_2 concentrations were higher than at any time in at least 2 million years. Even if we cease using emitting sources tomorrow, global temperatures will continue to increase until at least the mid-century. This warming is already causing weather and climate extremes in every region across the globe including extreme heatwaves, precipitation events, droughts, and cyclones, which will only become worse. The rate of ice-sheet loss has increased four-fold, the oceans are warming at an accelerated rate, tropical cyclone occurrences have increased, their paths have moved further north, and the global rate of sea-level rise has nearly doubled. A 2 metre (m) rise in sea level by the end of this century is plausible, as is a 5m rise by 2150.

Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in equivalent carbon dioxide (CO_2e) occur in the coming decades.

[1] Intergovernmental Panel on Climate Change, Climate Change 2021 – The Physical Science Basics
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

Greenhouse Gas Emission Reductions

HalifACT establishes a municipal target of net-zero municipal operations by 2030, a community-wide emission reduction of 75% from the baseline year of 2016 by 2030, and net-zero emissions by 2050. The technical modeling results displayed in *Figure 1* identify action areas that are needed to meet net-zero emissions. The largest portion of the diagram shows that the biggest impact to reduce emissions comes from retrofitting existing buildings, both residential and non-residential. However, it's important to understand that all actions must take place within the timeframe and at the scale and pace laid out in the plan to achieve net-zero emissions by 2050.

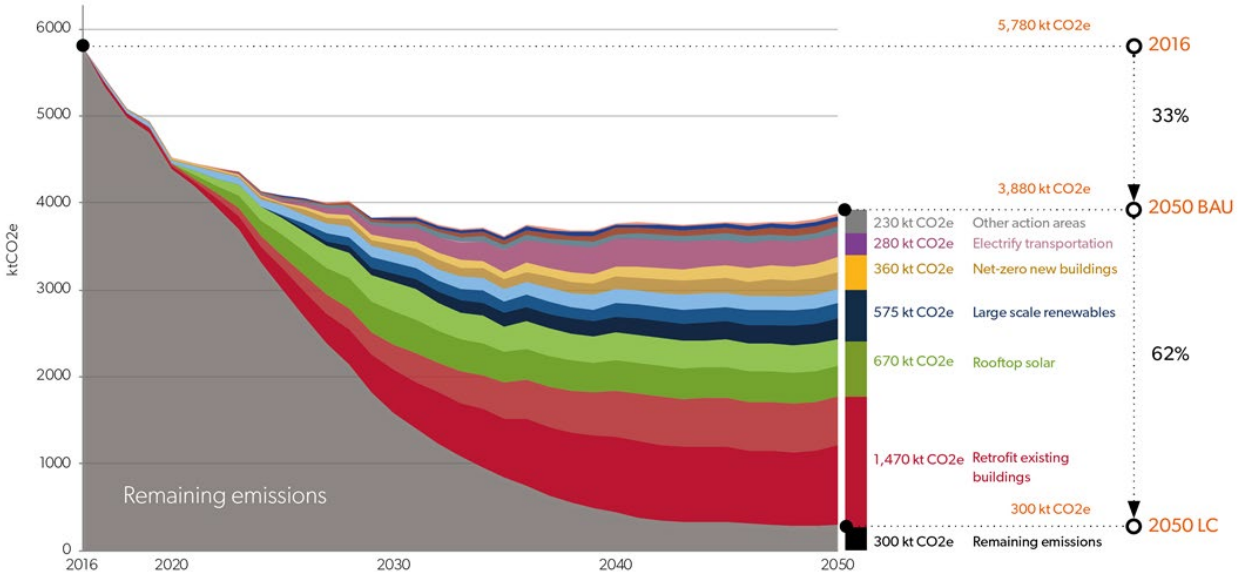

Figure 1: Wedge diagram of actions top achieve net-zero emissions by 2050

Currently, corporate operations make up about 1.5% of total community-wide emissions. While this number is low, the Municipality can influence much more than this, and has the responsibility to lead and demonstrate practices that will encourage broader emission reductions within the community and positively impact economic development.

Enhancing Climate Resiliency

The approval of HalifACT is a commitment to enhance the resiliency of our people, infrastructure, and environment to the impacts of a changing climate. Coastal communities in Atlantic Canada have the highest adaptation costs in the country[2] and as a municipality with over 2,000 kilometres (km) of coastline, prioritizing climate adaptation is critical for short and long-term resiliency.

In Halifax, by 2050, the number of days above 25°C will more than double, the length of the hot season will quadruple, and the number of below freezing days will be reduced by 35% (relative to 1976-2005).[3] Precipitation will increase throughout every season, but more will fall as rain throughout the year than snow, which means a decrease in winter snowpack and a higher likelihood of summer drought. Furthermore, there is a high likelihood that events ranging from extreme heat and precipitation, to extreme flooding and storms,

[2] Intergovernmental Panel on Climate Change, Climate Change 2021 – The Physical Science Basics https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

[3] Climate Adaptation Baseline Report, HalifACT https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/Adaptation%20Baseline%20Report_0.pdf

will be more prominent. The single day rainfall will increase by 10%, meaning increased chances of flash floods, overwhelmed water systems and a projected increase in intensity and frequency of hurricanes, along with rising sea levels, will result in substantially more flooding along our coastal areas[3]. *Figure 2* shows the projected average monthly changes in precipitation and temperature for the municipality from 1976-2005 to 2021-2050 under a Business-as-Usual (BAU) path.

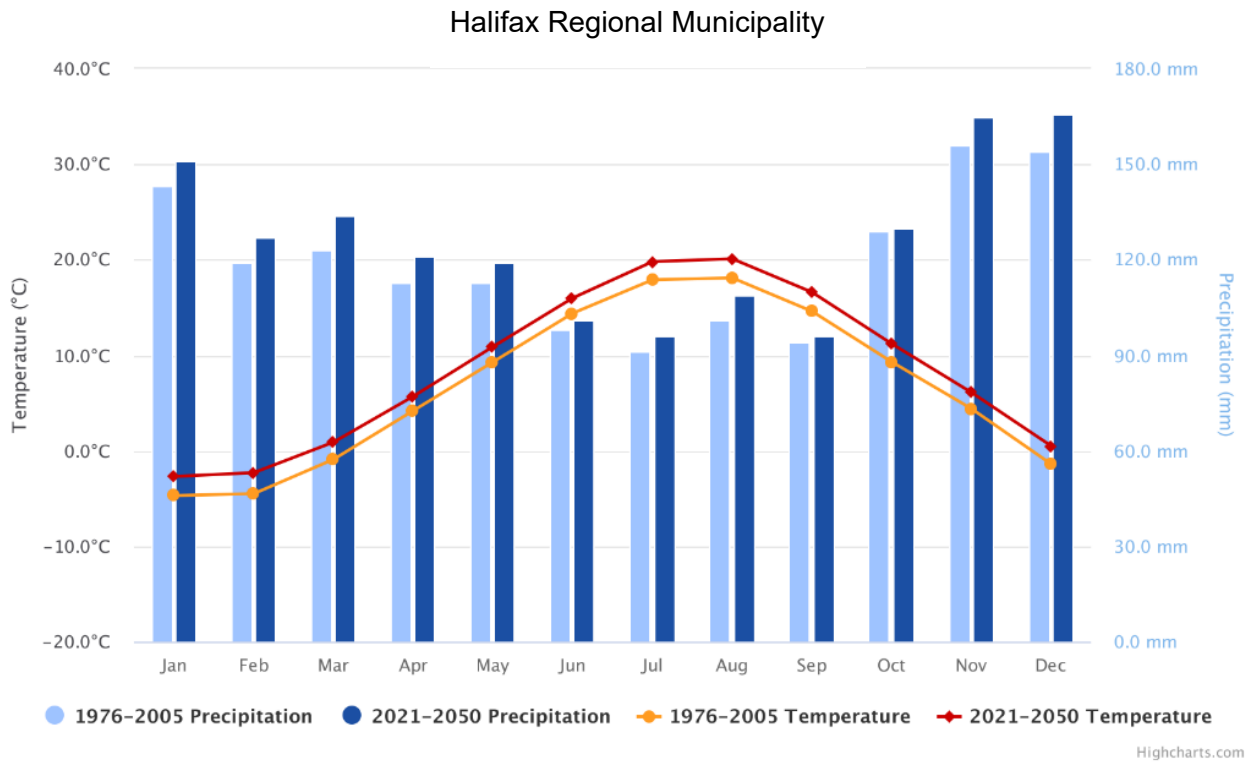

Figure 2: Projected average monthly change in precipitation and temperature for the municipality from 1976-2005 to 2021-2050 under a Business as Usual scenario of RCP 8.5[4]

Costs & Opportunity

While the implementation of HalifACT will require a significant financial contribution from all levels of government and the community, the cost of inaction will continue to grow substantially. The economic impacts of climate change for Canada have been estimated at $5 billion per year starting in 2020 and between $21 and $43 billion per year by 2050[5]. As the owners of 60% of the public infrastructure in Canada, municipalities have a significant role to play investing in solutions to protect Canadians from current and future climate impacts. Best practice for public and private investment for climate adaptation measures is 0.6%-1.25% of gross domestic product (GDP), to minimize the worst impacts of climate change only.[6] **At a GDP of $19.2 billion (2018), the municipality should collectively – from government to corporate organizations – be spending between $115 and $240 million annually on climate change adaptation.** Although this is a large upfront investment, research also shows that the benefits of investing in adaptation and resilience can outweigh the cost of these investments by a ratio of 6 to 1[7]. This means that by investing $240 million in adaptation measures in one year, the region could avoid $1.44 billion in future costs associated with climate impacts.

[4] Climograph Data for Halifax, Climate Atlas of Canada https://climateatlas.ca/data/city/463/annual_precip_2030_85/climo
[5] Investing in Canadas Future: The Cost of Climate Adaptations at the Local Level, FCM https://data.fcm.ca/documents/reports/investing-in-canadas-future-the-cost-of-climate-adaptation.pdf
[6] Ibid.
[7] Ibid.

The public and private investment for emissions reductions, which are incremental to BAU, is estimated at roughly $22 billion over the next 30 years. Although there is significant upfront investment, the businesses, residents, and governments will realize a net benefit of approximately $21.9 billion in avoided energy costs, operations and maintenance costs, carbon pricing costs, and increased revenues from energy generation. By 2030, the savings will begin to offset the investment.

DISCUSSION

PART A - PROGRESS SUMMARY

Corporate and Community Emission Target Progress

As mentioned above, the passing of HalifACT established a municipal target of net-zero emissions by 2030 and a community-wide target of a 75% emission reduction from the baseline year of 2016 by 2030, and net-zero emissions by 2050. *Figures 3 and 4* summarize the progress to date for corporate and community targets, respectively. More detail and a breakdown of the sectors that make up the emission totals can be found in the full progress report in Attachment A.

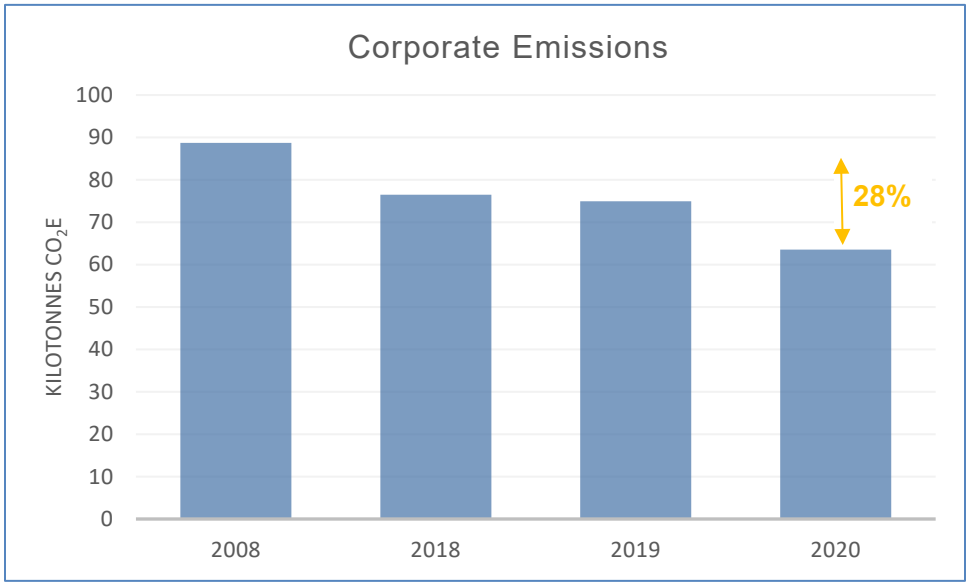

Figure 3: Corporate Emissions in kilotonnes of CO_2 equivalent

Corporate emissions are a direct result of energy use related to buildings, street lighting, and vehicles (public works, fleet, rentals, etc.) owned and operated by the Municipality. Adopted by Halifax Regional

Council in 2011, the Corporate Plan to Reduce Greenhouse Gas Emissions 2012-2020[8] committed to reducing emissions by 30% below 2008 levels by the year 2020. Emissions decreased by 28% over this 12-year period. However, this decrease can be partially attributed to the COVID-19 pandemic. Between 2008 and 2019, the relative emission decrease was approximately 17%. This decrease was the result of installing LEDs in all streetlights, adding solar to municipal buildings and performing efficiency retrofits in partnership with Efficiency Nova Scotia. The decrease between 2019 and 2020 is a result of continued efficiency work but also the fact that many municipal offices operated on reduced hours due to the pandemic.

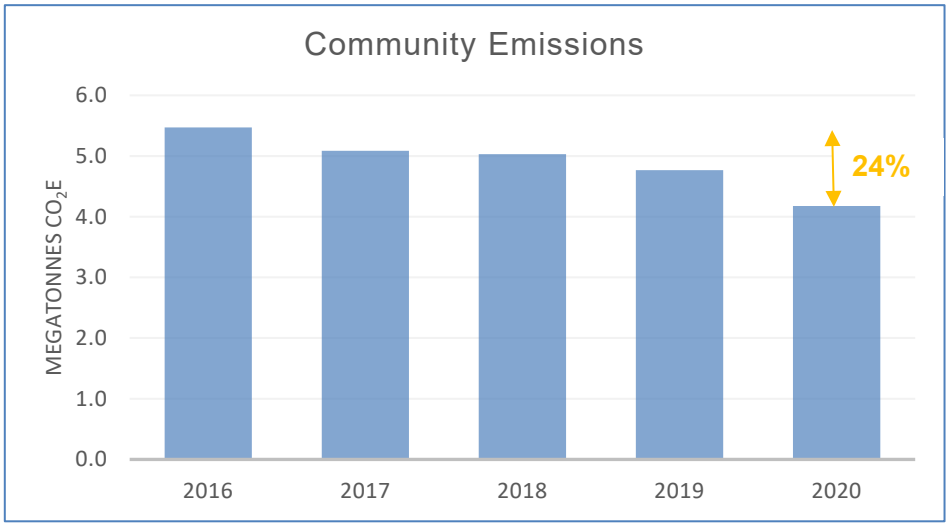

Figure 4: Community Emissions in megatonnes of CO_2 equivalent

Community emissions are a direct result of all other energy use within the boundaries of the Halifax Regional Municipality. This includes public transportation, private commuter vehicles, heavy transport, energy generation and buildings. Like corporate emissions, community emissions are trending downward, primarily from the continued decarbonization of the provincial electricity grid, improved fuel efficiency in vehicles, marginal electrification of transportation, and decreased energy demand for space heating due to a warming climate. Emissions decreased by 24% over this 4-year period. This downward trend was expected as outlined in the HalifACT Baseline and Business as Usual Report[9].

HalifACT Action Progress

HalifACT contains 46 actions grouped into 17 sub-areas based on general theme areas. This section describes the state of action across the 17 subareas of HalifACT, for the period from June 23rd, 2020 to March 31st, 2021**.** Further detail on action progress can be found in Attachment A.

The Report Card *(Table 1)* provides a high-level overview of the 46 HalifACT actions, targets, the intended start date, and the current state of progress. The current state of progress is measured on three factors:

1. ***Started/Not Started –*** Has the action been started or not? Any progress on a HalifACT action will result in an affirmative scoring. As is outlined in the "Intended Start Date" column, some actions are not intended to begin until a future date and therefore, it is expected that not all actions will be started.

[8] Corporate Plan to Reduce Greenhouse Gas Emissions 2012-2020, Halifax Regional Municipality
https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM%20Corporate%20Plan%20to%20Reduce%20GHG%20Emissions%202012-2020_0.pdf
[9] Baseline Inventory, 2016 & Business-as-Usual Scenario to 2050, HalifACT
https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/Baseline%20and%20BAU%20Report_1.pdf

2. ***On Track/Not on Track –*** Is the action progressing at the pace required to meet our targets? This is a subjective factor intended to capture whether the progress for an action is occurring at a pace and scale that will allow targets to be met in the timeframe required. Those actions with future intended start dates, and have not yet started, will not be ranked.

3. ***Adequately Resourced –*** Does the action have the required financial and human resources to be on track? Often human capacity and/or lack of funding are at the core of why actions are not on track. This factor helps to identify resource gaps in HalifACT implementation. Those actions which have future intended start dates, and have not yet started, will not be ranked.

Ideally, all 46 actions would start immediately, but realistically there are resource constraints and other barriers to implementation. The timing and length of actions can be adapted to respond to changes in policy, technology, and funding, but initially we have assigned start times to each action as defined here:

Legend - Intended Start Date

Immediate: action to begin right away	
Short: action should be initiated within 2-3 years	
Medium: action should be initiated in the next 4-5 years	
Long: action should be initiated in the next 6-10 years	
Ongoing: action has been initiated and will continue throughout the life of the plan	

Table 1: HalifACT Action Progress Report Card

HalifACT Sub-Areas & Actions	Target	Intended Start Date		Started	On Track	Adequately Resourced
EFFICIENT BUILDINGS						
1. Net-zero & climate resilient new construction	Net-zero new construction by 2030		2020	✓	×	×
2. Residential and non-residential deep retrofit program	Retrofit all existing buildings by 2040		2020	✓	×	×
3. Industrial coalition and support program	Improve industrial process efficiency 75% by 2040		2026	×	--	--
RENEWABLE ENERGY						
4. Rooftop solar PV and energy storage program	Install 1,300 MW of rooftop solar PV with storage by 2030		2020	✓	×	×
5. Community scale solar PV and wind generation	Significantly expand local community-scale renewable energy generation: • 300 MW ground mount solar by 2050 • 280 MW wind by 2050 • 100% renewable district energy by 2050		2022	✓	×	×
6. Create Coalition to expand and decarbonize district energy systems			2026	×	--	
7. Advocate and support provincial electricity grid decarbonization			2020	✓	✓	
DECARBONIZING TRANSPORTATION						
8. Expand transit and active transportation infrastructure	Plan and build the transit and active transportation infrastructure needed to achieve the 2030 mode share targets in the Integrated Mobility Plan		2020	✓		×
9. Community-wide EV strategy	By 2030, 100% of new vehicle sales are electric		2024	✓	×	×
10. EV planning and policy			2020		✓	✓
GREENING GOVERNMENT OPERATIONS						
11. Net-zero municipal operations	Achieve net-zero municipal operations by 2030		2022		✓	×
WATER						
12. Net-zero water and wastewater operations	Achieve net-zero water and wastewater operations by 2030			✓	×	×
13. Climate-informed water supply strategy	Future-proof water systems and supply		2024	✓	✓	×

HalifACT Sub-Areas & Actions	Target			Started	On Track	Adequately Resourced
			2020	✓	×	×
15. High-level risk assessment (HLRA) for critical infrastructure	Reduce risk to critical infrastructure		2020		×	×
16. HRM critical infrastructure risk and vulnerability analysis			2020	×	×	×
17. Zero emissions back-up power in critical infrastructure			2026	×	--	--
			2026	×	--	
19. Updated and climate-informed design standards for new infrastructure			2022	✓	×	
NATURAL AREAS AND GREEN INFRASTRUCTURE						
20. Fund and implement Green Network and Urban Forest Master Plans	Protect, restore, maintain and expand natural areas and green infrastructure assets		2020		×	×
21. Implement region-wide naturalization program			2020	✓	×	×
22. Implement region-wide tree planting and re-greening program			2020	×	×	×
23. Integrate climate into land-use planning	Plan and build a low-carbon resilient region		2022	✓		✓
24. Planning policy to enable district energy and microgrids			2024	✓	×	
25. Land protection and conservation on private lands			2020	✓	×	×
26. Preservation of natural areas			2020		×	×
COASTAL PREPAREDNESS						
27. Detailed coastal risk and vulnerability analysis	Better prepare for climate related coastal changes and impacts		2020	✓	✓	✓
28. Develop coastal adaptation strategy			2024	×	--	--
EMERGENCY MANAGEMENT						
29. Integrate climate into emergency planning	Better prepare for increased climate-related emergencies		2020	✓	×	×
30. Improve emergency management communication and coordination			2020	✓	✓	×
COMMUNITY CAPACITY						
31. Neighbourhood resilience and disaster support hubs	Enhance the capacity of neighbourhoods to prepare for and recover from climate events		2020	✓	×	×
32. Widely available emergency management training			2020	✓	×	×
33. Undertake neighbourhood climate planning			2024	×	--	--

HalifACT Sub-Areas & Actions	Target		Started	On Track	Adequately Resourced
34. Broad, deep, and collaborative engagement with Mi'kmaq and other groups seeking reconciliation	Engage deeply and collaboratively	2020		×	×
FOOD					
35. Improve food security and food-systems resilience	Create and implement a Food Action Plan, and include climate change as a core component	2020	✓	×	×
BUSINESS AND ECONOMY					
36. Workforce and technology development for building decarbonization and resilience		2024	×	--	--
37. Resilient decarbonized business program		2026	×	--	--
MAINSTREAMING CLIMATE INTO MUNICIPAL OPERATIONS					
	Integrate climate thinking into municipal decision-making and governance	2020	✓		×
39. Establish new mechanisms for financing climate action		2020	×	×	×
40. Green municipal investments		2020	×	×	×
GOVERNANCE AND CAPACITY FOR ACTION					
41. Establish a central Climate Change Office	Integrate climate thinking into municipal decision-making and governance	2020	×	×	×
42. Increase staff capacity for implementation		2020	✓	×	×
MONITORING AND REPORTING					
43. Annual Indicators Report	Monitor and report on climate action and impact	2020	✓	✓	✓
CARBON ACCOUNTING					
44. Carbon offsets framework	Get ready for neutrality and step up the carbon scope	2024	×	--	--
45. Consumption-based emissions inventory		2026	×	--	--
46. Include embodied carbon in new construction standards		2026	×	--	--

State of Progress

The scale of effort and resources required to implement HalifACT is important, but the timing is critical. If operations continue in a business-as-usual manner, the municipality's carbon budget will be exceeded by 2028. While HalifACT has actions that will extend to 2030 and beyond, the bulk of the work needs to begin right away. As *Table 1* illustrates, all actions must be started within the next six years, with 27 of them to be started immediately and 39 started within the next three years.

While 30 actions have been initiated, not all these actions are progressing at the pace required to meet the targets, nor do they have the financial and human resources required for success. As shown in *Figures 5 and 6*, of the 35 actions that have been started or should have been started, only 7 of those are on track, with 5 being adequately resourced. This means that at present, HalifACT actions are approximately 20% on track and 14% adequately resourced.

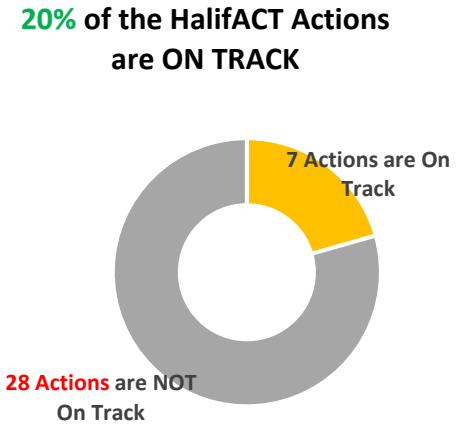

Figure 5: Percentage of HalifACT actions that are on track

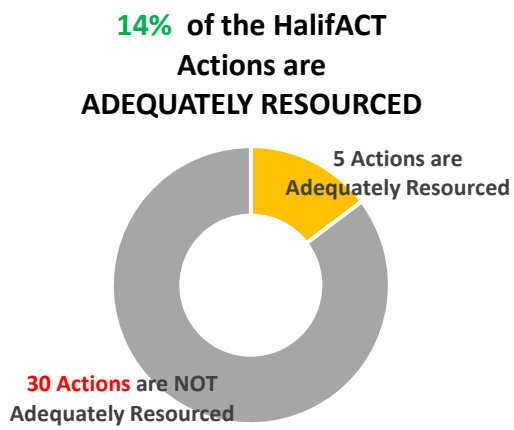

Figure 6: Percentage of HalifACT actions that are adequately resourced

Here's the Gap - Scale of Effort Required

While 30 of the 46 HalifACT actions have been started, the Municipality is not currently on track to meet the climate targets set out in the Plan. Contributing factors range from municipal authority limitations and governance structure to the pace of climate mainstreaming across the organization and inadequate human and financial resources as outlined in *Table 1*. Thus, while many community stakeholders and BUs are taking action (Attachment A), the Municipality will not meet the climate targets at the present pace of action and level of municipal resources.

From the beginning, HalifACT was always intended to be a climate action movement for Halifax; a community and corporate response to the climate crisis. The targets cannot be met if communities, organizations, governments, individuals, and businesses are not all working together. The scale of effort required to meet the targets necessitates commitment to action and shared accountability at its core. Furthermore, it requires action that is on pace and adequately resourced. The following section highlights a few examples of the current scale of pace, staffing, and financing in support of HalifACT.

Scale of Pace

The level of effort and timelines of HalifACT are ambitious and unprecedented. With this comes the need for immediate and rapid action. While it may be a 30-year plan, the majority of effort needs to happen within the first ten years if targets are going to be met. At the current pace, which can be characterized as "business as usual", the Municipality's carbon budget will be exceeded by 2028 (*Figure 7).* Here are a few examples to illustrate the Municipality's current scale of pace:

- HalifACT modelling illustrates that deep energy retrofits on just over 5,000 buildings per year, from now to 2040, are required. In 2020, Efficiency Nova Scotia reported that 1,200 general retrofits were performed across the municipality. This level of retrofits is unlikely to increase significantly until the municipal deep energy retrofit program is fully launched in 2023.

- All Municipally-owned and operated critical infrastructure needs to be assessed for vulnerability to climate impacts and will require adaptation planning, with high anticipated costs. There is currently an unknown amount of at-risk critical infrastructure in the municipality.
- The HalifACT target of reaching 100% new vehicle EV sales by 2030, will require significant investment and policy changes, as the current metric is 1%.
- Over 1,250 km of shoreline across the municipality require a coastal vulnerability assessment. Currently, the Municipality has assessed 60 km of shoreline within a portion of the municipal core, but has not addressed the rest of the municipality, including the remote areas along the Eastern Shore which have the highest coastal vulnerabilities.
- HalifACT modelling recommends a target to install 1,300 megawatts (MW) of rooftop solar electric with storage by 2030, which means an increase of 130 MW annually. Currently, 6MW has been installed.

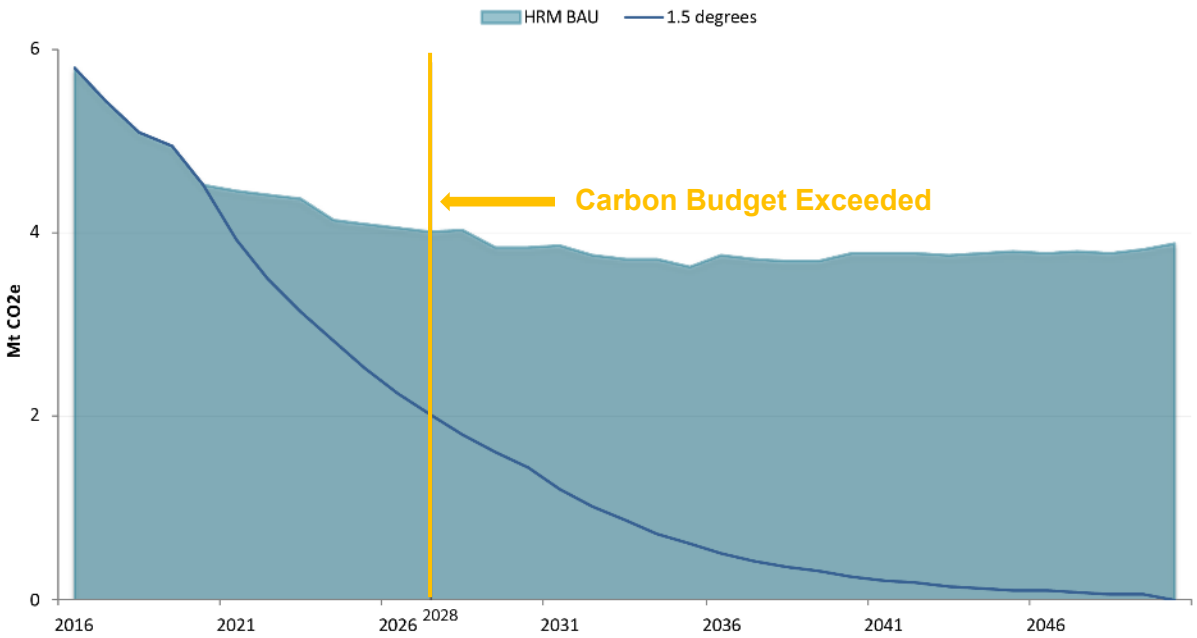

Figure 7: Date of an exceeded carbon budget under the municipality's BAU pathway

Scale of Staffing

To keep up with the scale of pace required to implement HalifACT, an increase in staff capacity is required. HalifACT Action 42 is to "significantly increase staff capacity for implementation" and recommends a minimum of 30 full time equivalent staff positions (FTEs) as a starting point. There are currently 16 funded fulltime positions across the organization dedicated to the implementation of the first seven core areas of HalifACT. As per Attachment B, an additional 25 FTEs over the next three years will be needed, distributed across the organization to support collective action on HalifACT.

Scale of Finances

HalifACT will require a financial contribution from all orders of government and the community. As outlined in the Background section of this report, the public and private investment for emissions reductions total $22 billion and resiliency measures between $3.34 and 6.96 billion over the next 30 years. While the collective investment in adaptation and mitigation action is significant, the cost of inaction will continue to grow. To meet the targets set out in HalifACT, adequate financial resources are critical.

At the municipal government level, it is anticipated that the initial level of resources required over the next three years to take action on projects outlined in the Resource Plan (Attachment B) will be $3,450,000 in operating and $78,330,000 in capital. Additional funding in the amount of $2,500,000 will be required to support 25 new positions over the next three years.

PART B – RESOURCE PLAN

Mainstreaming HalifACT into the Municipal Budgeting, Work Planning, and Reporting Processes

For all BUs to be successful in reaching climate targets, HalifACT needs to be integrated into the municipal budgeting, work planning and reporting processes. Each BU will need to both lead and support multiple HalifACT actions. Climate thinking must be mainstreamed across the organization. While this process is ongoing and continued work is needed, the administration has made progress over the past year, focusing primarily on shared accountability, as outlined in *Figure 8.* Throughout the entire process, the role of

Environment & Climate Change staff is to lead on many HalifACT actions while also advising BUs in leading their own actions and tracking progress to report to Council, key stakeholders, and the public.

Step 1: In June 2021, the Senior Leadership Team considered the HalifACT actions to be led or supported by each BU. Each BU has been assigned proposed HalifACT actions that they are responsible for leading/co-leading as well as proposed actions that they are responsible for supporting.

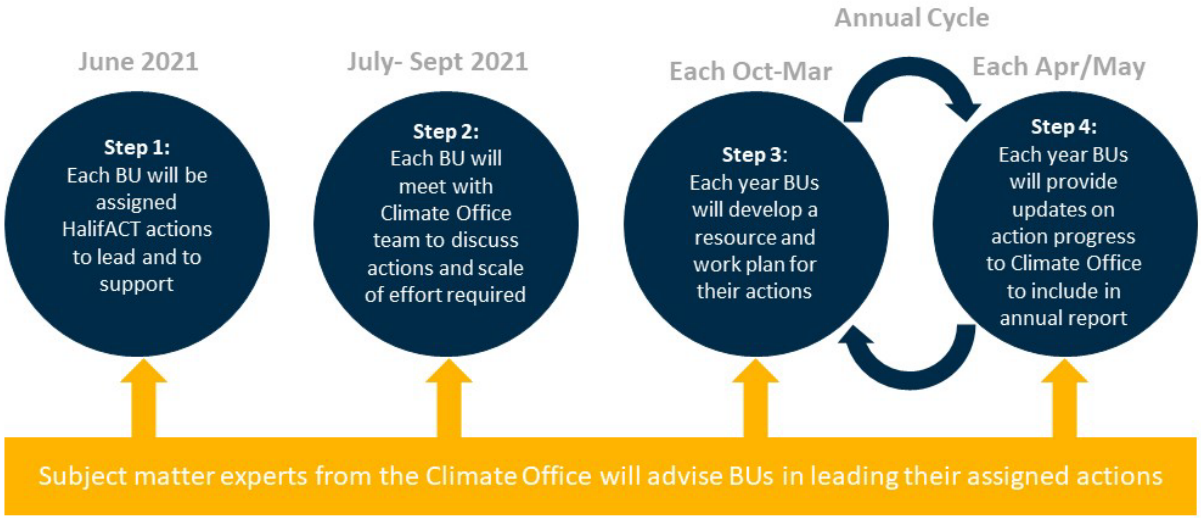

Figure 8: Conceptual diagram of first iteration of business unit shared accountability process for HalifACT implementation

Step 2: Throughout the summer months and early fall, Environment & Climate Change staff separately met with most BUs and Halifax Water to review the assigned actions and begin discussions around required resources, current barriers to implementation, and the state of current action. The team will continue discussions with remaining BUs. While some BUs are further ahead in the climate mainstreaming process, most BUs are still at the stage of working to understand the actions set out in HalifACT and how they relate to their current work. The breakdown of BU responsibilities by HalifACT actions is captured in the Business Unit Reference Document and has been updated to reflect their input during our recent discussions.

Step 3 & 4: Every October through March going forward, BUs will develop a resource and work plan for their respective HalifACT actions, including resources required for staff. Every April through May of each

year, they will provide updates on action progress to Environment & Climate Change to include in the annual report.

HRM is at the beginning of the mainstreaming and resource planning process, and much more work is required for successful integration. To allow BUs time to consider their areas of responsibility and begin planning, all major costs for climate action across the organization are included in the climate change capital account, 10-year capital plan and strategic initiative work.

3-Year Resource Plan (2022-23 to 2024-25)

The successful implementation of HalifACT at the pace and scale required necessitates the following:

- Mainstreaming climate action into municipal budgeting, work planning and reporting processes;
- Shared accountability of the actions in the plan across BUs along with measurable KPIs;
- Adequate resources – staff and funds for both the Environment & Climate Change team as well as across BUs;
- Continued leadership and commitment to climate action;

- Continued prioritization of the work; and
- Increased access to funding, particularly from other levels of government.

This 3-year resource plan, included as Attachment B, is intended to demonstrate the initial level of commitment and resources required internally to progress the 7 critical core areas of action that the Municipality committed to prioritizing when HalifACT was adopted in June 2020. It is intended to address the known gaps in resources currently and can be flexible over time as projects continue to be refined and HalifACT is mainstreamed into everyday work. The estimated financial and human resource requirements over the next three fiscal years are outlined in *Table 2.* The financial estimate includes both the operating and capital dollars.

Financial estimates for Core Areas 2, 3 and 5 are included in the 2022/23 draft capital budget, under the HalifACT Strategic Initiative. The cost estimates for the other Core Areas are currently high level and need to be refined by individual BUs through the budgeting and business planning processes. There will be additional staff requirements as the plan moves through implementation, and the numbers will be updated and adapted on a yearly basis depending on the state of progress, secured funding, and how we are tracking towards our targets.

The role of Environment & Climate Change staff will be to lead more than half of the HalifACT actions, provide subject matter expertise, provide ongoing training, guidance and mentoring, lead stakeholder engagement, and coordinate and track progress on HalifACT actions. Staff will also be integral to mainstreaming climate thinking across the organization and will support other BUs in developing annual budget and business plans and reporting on metrics and progress for the annual report.

Six new positions were approved as part of the 2021/22 operating budget. Three have been filled as indicated below, while the others are currently being reviewed by Human Resources:

1. Environmental Performance Officer – Climate Adaptation Specialist - FILLED
2. Environmental Performance Officer – Environment Specialist - FILLED
3. Environmental Performance Officer – Climate Change Specialist - FILLED
4. Climate Engagement Lead
5. Project Controller
6. Supervisor, Environment

Based on the attached resource plan (Attachment B), an additional eight positions are anticipated to be required to support HalifACT implementation in 2022/23:

1. Supervisor, Community Energy
2. Supervisor, Climate Adaptation
3. Supervisor, Community Resilience
4. Clean Energy Technician
5. Junior Climate Change Specialist
6. Climate Finance Specialist
7. HalifACT Implementation Personnel (position TBD)
8. HalifACT Implementation Personnel (position TBD)

In addition to staff in the Environment & Climate Change team, there will also be permanent staff requirements in other parts of the organization to deliver on the plan. *Table 2* provides a summary of the staff resources required across all Business Units for the implementation of the Core Actions in the first three years along with the estimated financial resources discussed above.

Table 2: Summary of Estimated Resources Required over the next 3 years (2022-23 to 2024-25) to Implement Projects Across Core Action Areas

Core Action Areas	Estimated Incremental Financial Resources Required			
	New FTEs Required	Compensation Costs (by 2024/25)	Other Operating Costs (3-year total)	Capital Costs (3-year total)
Core Area 1: Create new energy retrofit and renewable energy programming	4	$400,000	$1,000,000	---
Core Area 2: Develop a detailed and costed plan for retrofitting existing municipal buildings to be net-zero ready and climate resilient	1	$100,000	---	$35,780,000
Core Area 3: Develop an electric vehicle strategy, increase charging infrastructure and replace fleet vehicles with electric vehicles	1	$100,000	---	$15,950,000
Core Area 4: Explore opportunities to require net-zero standards for new buildings in the municipality *Pending the release of the 2020 National Energy Code for Buildings	2*	$200,000	$200,000	---
Core Area 5: Develop a framework for assessing and protecting critical infrastructure	4	$400,000		$20,600,000
Core Area 6: Support communities for climate adaptation and climate-related emergencies	5	$500,000	$1,650,000	---
Core Area 7: Develop a financing strategy to operationalize the HalifACT plan over 30 years	3	$300,000	$400,000	---

Enabling Actions: Engagement, Reporting, Governance Structure, Support	5	$500,000	$200,000	$6,000,000
Total	**25**	**$2,500,000**	**$3,450,000**	**$78,330,000**

A total of 41 full time equivalent positions are required in the next three fiscal years. There are currently 16 FTEs across the organization dedicated to the implementation of the first seven core areas of HalifACT. Of the 25 positions still required, eight have been requested in the 2022/23 operating budget, leaving a need of 17.

A total of $3.45 million in operating and $78.33 million in capital is required over the next three fiscal years. The capital requirement is included in this year's Strategic Initiative funding ask. Not included in this recommendation is the required FTEs, operating and capital needed to progress the Green Network Plan, JustFOOD project, the Naturalization Strategy, the Urban Forest Master Plan and the National Disaster Mitigation Program. Resource requirements will be requested by the respective BU at a later date.

Conclusion

To meet the scale of effort required by HalifACT, significant resources will be needed over the next three years, as outlined in this report and its attachments, and should be considered in business planning, budgeting, and financing processes. Despite current efforts and commitments to staffing and resources, HRM will not meet its targets at the current pace and will exceed its carbon budget by 2028. While the investment needed is substantial, it will result in a net benefit through increased adaptation measures that reduce the cost of climate impacts, avoided energy costs, lower operations and maintenance costs, carbon pricing costs and increased revenues from energy generation.

Even though there are many challenges to effective climate action, there are also many opportunities. As much as climate change presents risks, the actions that reduce GHG emissions and increase resilience can save money, increase community wellbeing and improve environmental sustainability. Actioning at the scale required will lead to a more equitable, prepared and sustainable community.

Integrating climate across the organization requires a transformational shift in the way HRM collectively approaches its work. Accordingly, mainstreaming climate action across the organization will continue to be a critical and ongoing piece of work requiring sustained leadership and collaboration.

FINANCIAL IMPLICATIONS

Operating

Significant investments in climate action will be required to achieve the targets set out in HalifACT. Initial investments over the next 3 years are outlined in Attachment B. Pending Regional Council approval, operating and staff resource requirements will be included in the organization's 2022-23 business plans. Below are the proposed staffing levels for the next 3 years. Fiscal year 2022/23 is programmed into the proposed operating budget:

HalifACT Staff Resourcing	**2022/23**	**2023/24**	**2024/25**
New FTEs	8	8	9
Cumulative FTEs	8	16	25

The 3-year estimated operating financial implications are summarized as follows:

Operating Costs (in thousands)	2022/23	2023/24	2024/25
Compensation	$825	$800	$900
In-Year Wage Costs	$425	$1,225	$2,075
Other Operating Costs	$1,550	$1,350	$550
Incremental Operating Budget	**$2,375**	**$2,975**	**$3,075**

Capital

HalifACT is one of the Strategic Initiatives being considered by Halifax Regional Council in the 2022/23 budget cycle. As outlined in the 2022/23 Fiscal Framework[10], it is being considered separately from the regular capital budgeting process. To progress on the Core Area's above, $9.96 million has been included in the draft capital budget for 2022-23 in the climate change account as a strategic initiative.

The 3-year estimated capital to be considered by Council as a Strategic Initiative:

HalifACT Strategic Initiative funding	2022/23	2023/24	2024/25
Municipal Building Deep Energy Retrofits	$2,810,000	$10,700,000	$22,270,000
Electric Vehicle (EV) Strategy	$4,550,000	$4,250,000	$7,150,000
Critical Infrastructure	$600,000	$10,000,000	$10,000,000
Small Projects Bundle	$2,000,000	$2,000,000	$2,000,000
Total Gross Budget	$9,960,000	$26,950,000	$41,420,000

In addition to the Strategic Initiative funding, HRM has a base capital budget for Energy Efficiency Initiatives of $2M per year. HRM has applied for Investing in Canada Plan (ICIP) and have received a draft contribution agreement which will be tabled at Audit and Finance Committee in December.

Capital Costs	2021/22	2022/23	2023/24	2024/25
ICIP Funding	$1,539,930	$2,419,890	$2,243,394	$1,099,950
Energy Efficiency Initiatives CB190008	$1,360,499*	$2,000,000	$2,000,000	$2,000,000
Total Gross Budget	$2,900,429	$4,419,890	$4,243,394	$3,099,950

*Fiscal year 2021/22 represents current uncommitted available balance. Years 2022/23-2024/25 are proposed capital budgets. The remainder of funds will be used for other Energy Efficiency Initiatives approved by Council.

RISK CONSIDERATION

The risks associated with climate change are complex and multifaceted. Regional Council has declared a climate emergency and by not reacting promptly and effectively, Halifax could be faced with a reputational risk with its citizens, stakeholders, and other cities and governments. Climate change poses an immediate and long-term risk to human health, the built environment, and the natural environment.

[10] 2022/23 Fiscal Framework, Halifax Regional Municipality https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/211123bc06.pdf

Failure to prepare for the hazards of climate change, will increase the severity of the impacts from both chronic and acute climate events. These impacts can include damage to infrastructure, a reduced ability to deliver essential services, impacts to human health and safety, and damage to essential ecosystem services.

If climate change is not considered in financial decision-making, there is the risk of investing poorly and maladapting, resulting in long-term costs that are exponentially higher. By not investing in and preparing for climate change, resiliency becomes more difficult, and the physical and economic impacts of climate change will have the greatest effect on the most vulnerable sectors of society.

COMMUNITY ENGAGEMENT

Significant community engagement was completed during the development of the HalifACT plan and there has been ongoing stakeholder engagement during the early implementation of the plan. Stakeholders were asked to contribute updates on their respective actions for HalifACT implementation, which are included in the HalifACT Annual Progress Report as Attachment A.

ENVIRONMENTAL IMPLICATIONS

There are significant environmental, economic, and social benefits associated with the implementation of HalifACT, which are outlined in the body of this report as well as the 2020 staff report[11].

ALTERNATIVE

The Environment and Sustainability Standing Committee could choose not to forward this report to Regional Council for information.

ATTACHMENTS

Attachment A – HalifACT Annual Progress Report 2020-21
Attachment B – HalifACT 3-Year Resource Plan

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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[11] See report online at https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/200623rc916.pdf

Attachment A – HalifACT Annual Progress Report 2020-21

1. Capturing our Progress

HalifACT is a community-wide and multi-organizational commitment for ambitious, but critical climate action. The sheer scale of action required to meet our targets means that action cannot only happen at the municipal level, but must also across businesses, other levels of government, non-profits, academia, the community and at the individual level. At its core, HalifACT truly is about Acting on Climate Together. This section captures our progress on corporate and community emissions, showcases the state of our internal progress towards HalifACT targets since HalifACT was passed by Council on June 23rd, 2020 and highlights key external progress that supports HalifACT goals and actions.

1.1 Corporate Emissions

Corporate emissions are a direct result of energy use related to buildings, street lighting, and vehicles (public works, fleet, rentals, etc.) owned and operated by the municipality. These municipal operations emissions are a subset of the broader community emissions. It's important to clearly delineate corporate from community emissions to allow for a more focused approach to energy savings measures. As mentioned above, HalifACT sets a target of net-zero municipal operations by 2030 and net-zero community emissions by 2050.

Each energy source (electricity, natural gas, gasoline, etc) has a different emissions factor for determining the equivalent amount of carbon dioxide released for a given unit of energy. Measuring energy use has improved considerably over the years, but there are some gaps in historical data. Figure 1 shows annual corporate emissions by each source.

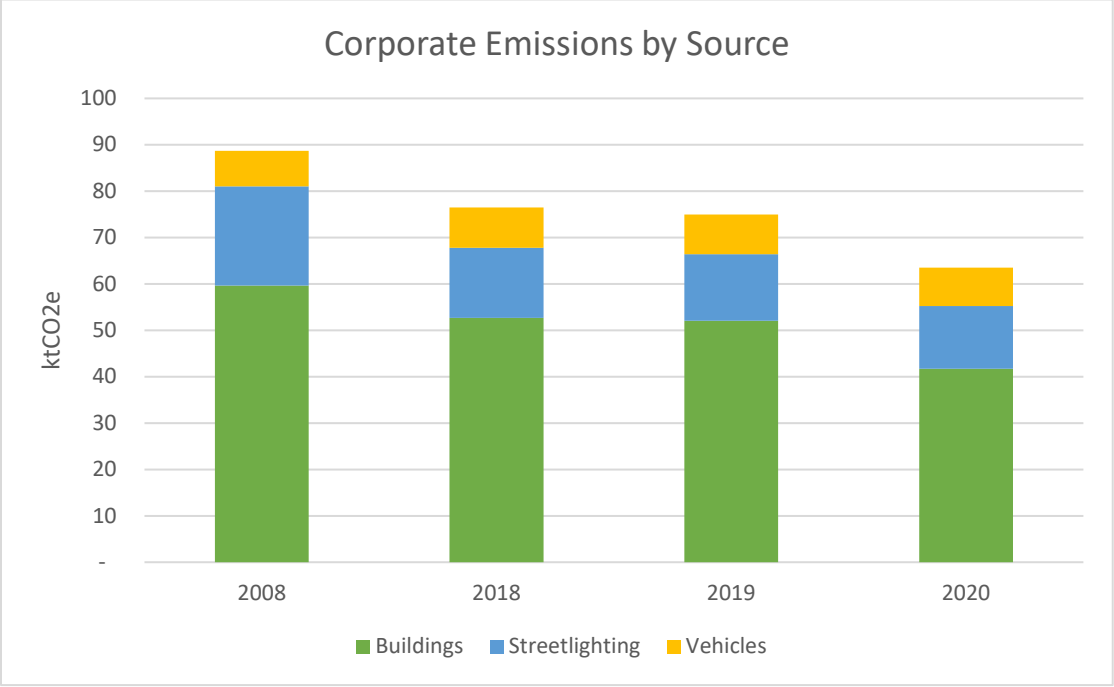


Figure 1: Corporate Emissions by Source

Adopted by Halifax Regional Council in 2011, the Corporate Plan to Reduce Greenhouse Gas Emissions 2012-2020[1] committed to reducing emissions by 30% below 2008 levels by the year 2020. The actual decrease over this 12-year period was 28% however this decrease is partially due to the COVID-19 pandemic. Between 2008 and 2019 the relative emission decrease was approximately 17% while the decrease between 2019 and 2020 was 11%. Reasoning for the decrease is outlined below with the majority of emission reductions coming from buildings.

Buildings

Portfolio Manager has enabled tracking of floor area, electricity use, etc. The Municipality's partnership with Efficiency Nova Scotia has allowed large amounts of building energy data to be uploaded easily and with high accuracy using automation tools. Energy efficiency and fuel switching measures have resulted in a decrease in building energy usage, despite more buildings being added to the portfolio. The year 2020 is a clear outlier for building energy use due to decreased office hours during the COVID-19 pandemic.

Streetlighting

As of mid-2017, each streetlight is being individually metered, resulting in easily accessible energy use reports that are used to calculate emissions with a high degree of confidence. The Municipality operates roughly 46,000 streetlights, almost all of which have been changed over to LED. The emissions in 2008 were significantly greater because of older lighting technology.

Vehicles

The HRM fleet department is responsible for managing a wide array of vehicles used for public works such as snow clearing and fleet vehicles for transporting staff and Halifax Regional Police activities. Vehicle fuel use only varied slightly in 2020 compared to previous years. COVID-19 pandemic restrictions limited activity early in the year, but this activity then increased towards the end of the year, resulting in a typical yearly fuel use for 2020.

The fleet department is using Automatic Vehicle Location hardware and software in addition to enterprise resource planning software to keep track of vehicle fleet fuel usage over the years. Consistent reporting methods are being adopted to ensure GHG emission values are more accurate than in previous periods. In future reports, it can be expected to have more robust data for all years.

Global Covenant of Mayors

A commitment to Global Covenant of Mayors[2] (GCoM) connects the Municipality with a broad global alliance committed to city climate leadership, building on the pledges of over 10,000 cities and local governments from six continents representing more than 800 million citizens worldwide.

Cities committing to GCoM agree to advance climate action in three key areas: reducing greenhouse gas emissions, identifying and adapting to the risks associated with climate change, and increasing access to clean and affordable energy. As the Municipality implements HalifACT, progress will be recognized by a system of badges shared with the global community.

In May 2021, the Municipality was awarded all available badges which includes:

- Mitigation Badge: For performing emission inventories, setting targets, and developing a plan;
- Adaptation Badge: For conducting assessments, setting goals, and developing a plan; and
- Compliance Badge: For accomplishing all steps under the GCoM framework.

[1] Corporate Plan to Reduce Greenhouse Gas Emissions 2012-2020, Halifax Regional Municipality https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM%20Corporate%20Plan%20to%20Reduce%20GHG%20Emissions%202012-2020_0.pdf

[2] Global Covanent of Mayors for Climate & Energy https://globalcovenant-canada.org/

CDP Reporting

The Municipality currently reports annually to the Carbon Disclosure Project (CDP), which is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts. The CDP uses data submitted by organizations to produce analytic and snapshot reports for local and regional governments, allowing them to track their progress and benchmark themselves against their peers.

In 2020, Halifax joined 86 cities across the globe with a combined population of over 125 million, and received an "A" score, demonstrating the implementation of best practice standards across adaptation and mitigation[3]. Of the 86 A-ranked cities, Halifax is one of five in Canada to earn this honour and the only one east of Toronto.

1.2 Community Emissions

HalifACT commits to a community-wide emission reduction of 75% from the baseline year of 2016 by 2030, and net-zero emissions by 2050. An analysis performed by Sustainability Solutions Group found that community-wide emissions are decreasing, as outlined in Figure 2 and Figure 3 below. Both figures show that emissions from all sectors are trending downward over the five-year period, primarily due to the decarbonization of the provincial electricity grid, improved fuel efficiency in vehicles, marginal electrification of transportation, and decreased energy demand for space heating due to a warming climate. This downward trend was expected as outlined in the HalifACT Baseline and Business as Usual Report[4].

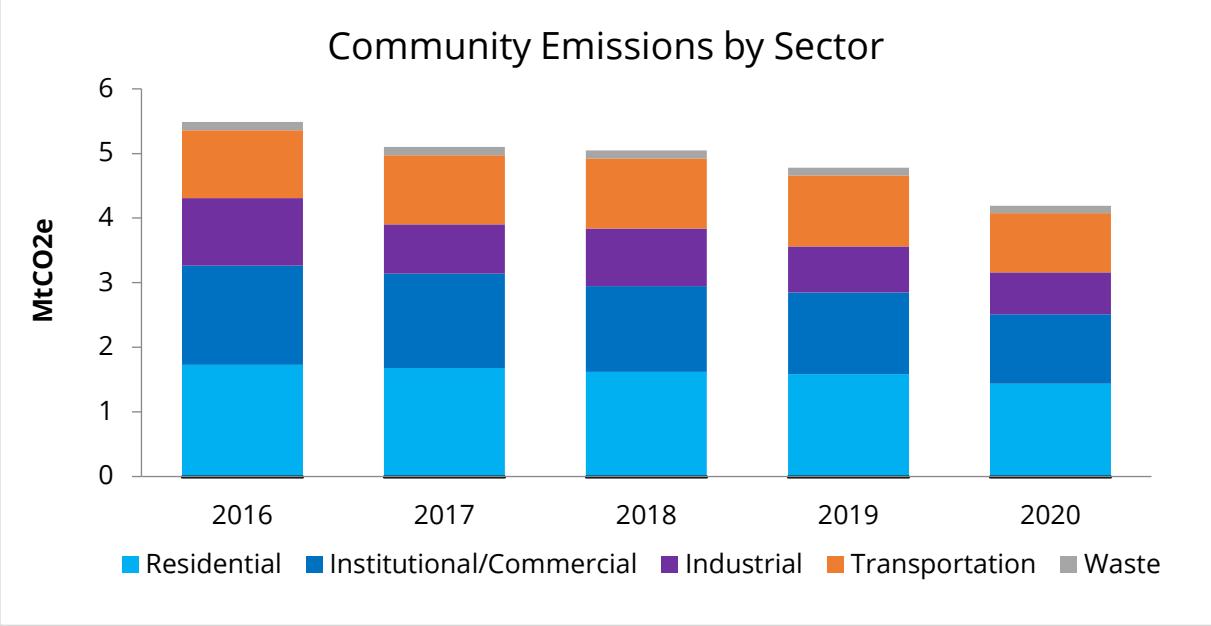


Figure 2: Community Emissions by Sector

[3] Cities A List 2020, Carbon Disclosure Project https://www.cdp.net/en/cities/cities-scores
[4] Baseline Inventory, 2016 & Business-as-Usual Scenario to 2050, HalifACT
https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/Baseline%20and%20BAU%20Report_1.pdf

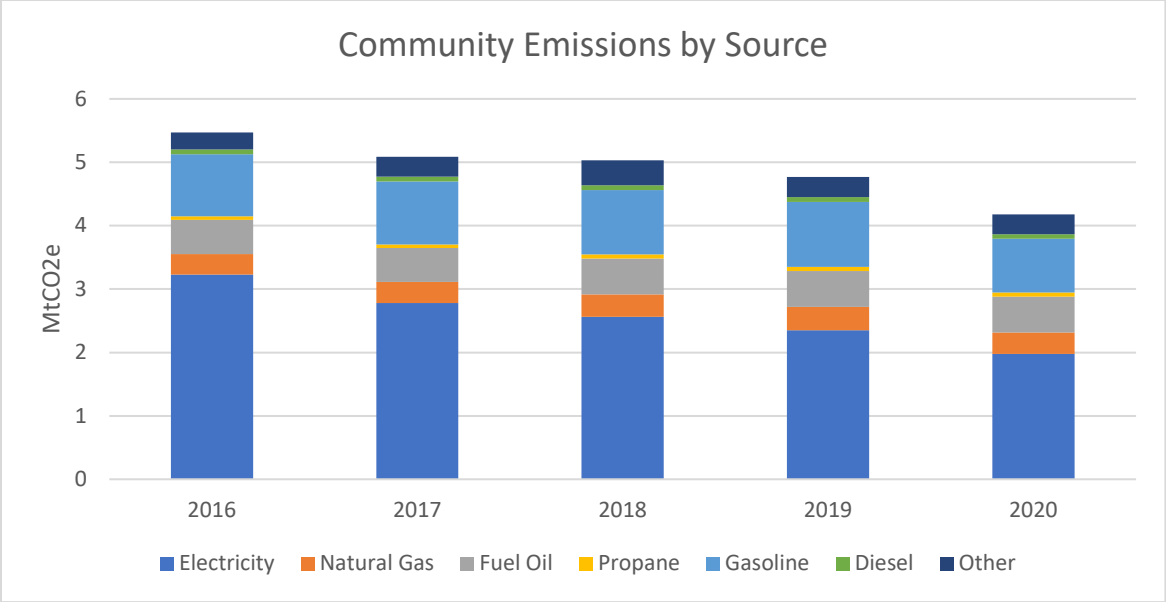


Figure 3: Community Emissions by Source

Between 2016 and 2020, the population of HRM increased by approximately 40,000 residents however both the energy use and emissions associated with that usage decreased. The emission reduction is substantial (24% compared to the 2016 baseline) which can be largely attributed to the ongoing decarbonization of the provincial electrical grid.

1.3 Our Internal Progress on HalifACT Actions

The climate crisis is not vertical in nature, it is horizontal and cross-cutting. If we are going to reach our climate targets, collaborative, prioritized action is required across all municipal Business Units (BU) (*Figure 4)*. Mainstreaming climate thinking requires fundamental adjustments to operations, business plans, budgets, and governance.

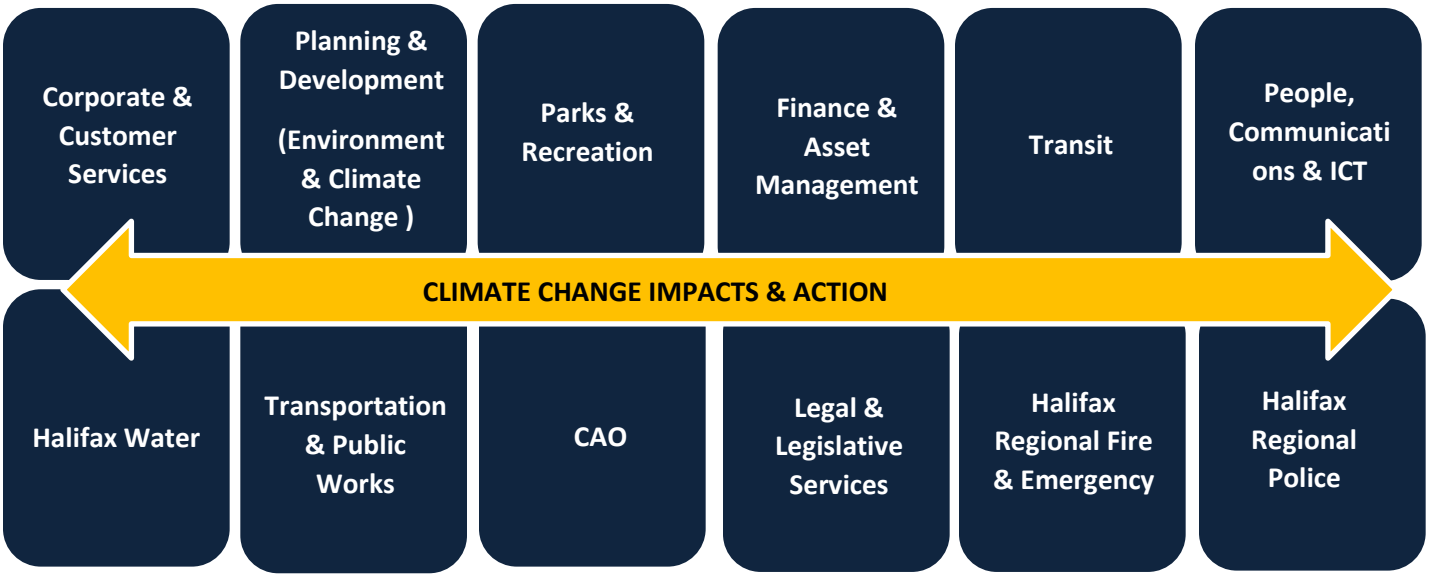


Figure 4: Climate change impacts and action required across all business units

This section captures the highlights and the state of our internal progress on HalifACT. In early June, a progress reporting template was sent out to every BU, via the Executive Directors, to capture action made between June 23rd, 2020 and March 31st, 2021. The Environment & Climate Change team hosted a 3-hr Q&A session for BUs and multiple follow-up meetings with individual BUs to answer any questions.

To the best of our ability, the included content represents progress during the period from **June 23rd, 2020 to March 31st, 2021**. However, since Year 1 only represents 9 months of work and COVID-19 delayed many projects, the report will also highlight a few initiatives and successes that occurred after March 31st, 2021. These will be reported on in greater detail in next year's annual report.

1.3.1 State of Progress

The scale of effort and resources required to get the HalifACT plan off the ground are huge, but the timing is critical. If we continue to operate with a Business as Usual mindset, we will exceed our carbon budget by 2028. This is not acceptable. While HalifACT has actions that will extend to 2030 and beyond, the bulk of the work needs to begin right away. The number of HalifACT actions that need to begin in the next six years is 27 by 2020, 4 by 2022, 8 by 2024, and the remaining 7 by 2026. This means that 85% of the HalifACT actions need to be well under way during this current Council Term, with the remaining 7 actions needing to begin immediately afterwards.

While we have started 30 actions, that does not mean we are progressing at the pace that is required to meet our targets, nor does it mean that the actions have the financial and human resources required for success. As showcased in *Figures 5* and *6*, of the actions that have been started or should have been started (35 of 46) only 7 of those are on track and only 5 of those are adequately resourced. This means that as things currently stand, HalifACT actions are 20% on track and 14% adequately resourced.

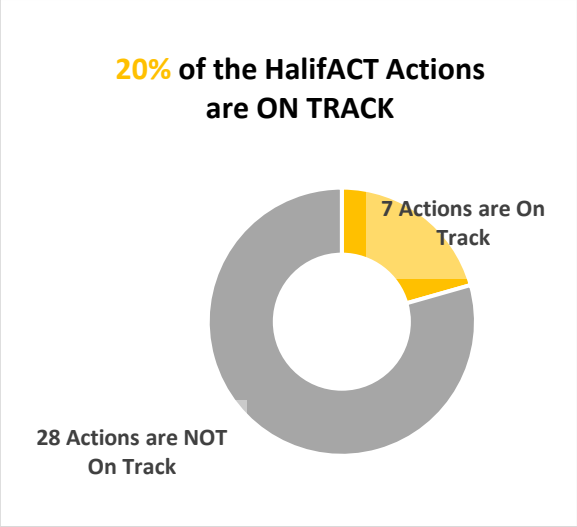


Figure 5: Percentage of HalifACT actions that are on track

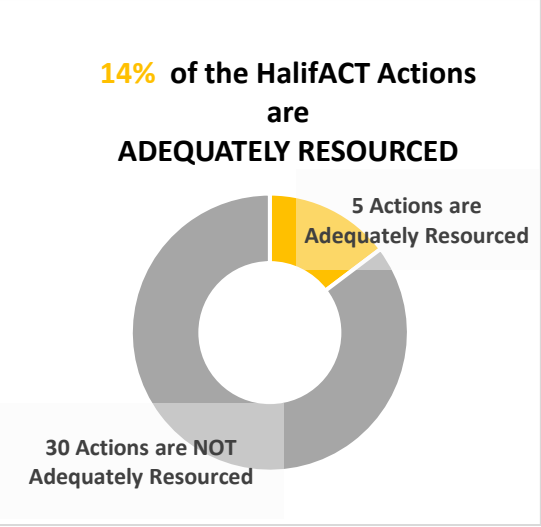


Figure 6: Percentage of HalifACT actions that are adequately resourced

The following tables provide a high-level overview of the action targets, the action start dates, and the current state of progress. The current state of progress is dependent on three factors:

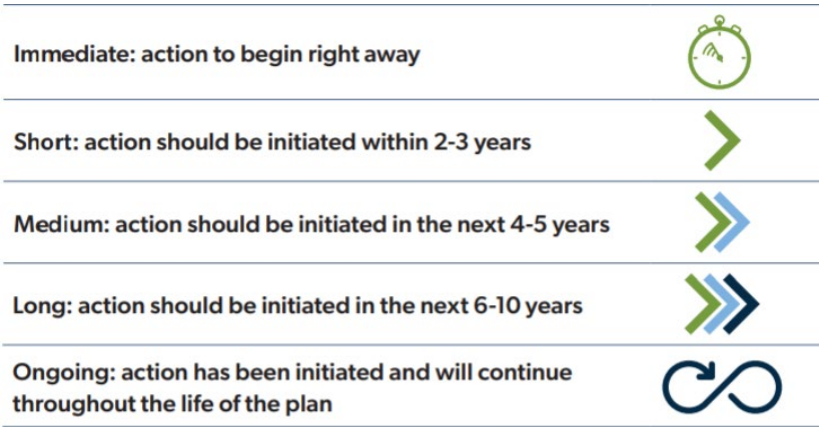
1. ***Started/Not Started –*** Has the action been started or not? Any progress on a HalifACT action will result in an affirmative scoring. As is outlined in the "Intended Start Date" column, some actions are

not intended to begin until a future date and therefore, it is expected that not all actions will be started.

2. ***On Track/Not on Track –*** Is the action progressing at the pace required to meet our targets? This is a subjective factor intended to capture if the progress we are seeing for an action is occurring at a pace and scale that will allow us to meet our targets in the timeframe required. Those actions which have future intended start dates, and have not yet started, will not be ranked.

3. ***Adequately Resourced –*** Does the action have the required financial and human resources to be on track? Often, human capacity and/or lack of funding are at the core of why actions are not on track. This factor helps to identify resource gaps in HalifACT implementation. Those actions which have future intended start dates, and have not yet started, will not be ranked.

The timing and length of actions can be adapted to respond to changes in policy, technology, and funding throughout the implementation of HalifACT. However, we have assigned start times to each action as defined here:



1.3.2 Sub-Area 1: Efficient Buildings

EFFICIENT BUILDINGS						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
1. Net-zero & climate resilient new construction	Net-zero new construction by 2030		2020	✓	×	×
2. Residential and non-residential deep retrofit program	Retrofit all existing buildings by 2040		2020	✓	×	×
3. Industrial coalition and support program	Improve industrial process efficiency 75% by 2040		2026	×	--	--

Sub-Area Summary

Buildings accounted for approximately 70% of total energy use in the municipality in 2016, and 77% of total emissions. Retrofitting residential and non-residential buildings, ensuring that new buildings are more efficient, and working to improve industrial processes are all necessary components of a successful energy transition for the Region. Enhanced performance of new buildings and the improvements made to existing buildings will also make them more resilient to future climate impacts such as severe storms, flooding and extreme heat. To maximize the benefit, the retrofitting should prioritize members of the community who are considered most vulnerable to climate impacts.

Highlights

- **The creation of a Retrofit Design Team to develop a Retrofit, Renewables, and Resilience (R3) pilot program for retrofitting residential buildings**
- **The Municipality is leading by designing and building net-zero and climate resilient corporate buildings**

Action Progress

All municipalities in Nova Scotia currently observe the 2017 National Energy Code of Canada for Buildings (NECB). The federal government is currently developing a tiered energy code, with the most aggressive tier expected to strive for net-zero. The Municipality has been engaging with the former Nova Scotia Department of Energy and Mines to ensure the province adopts this code when released in December 2021 and selects the most appropriate tier that aligns with HalifACT. The Province of Nova Scotia has historically been progressive in adopting new versions of the NECB and based on discussion, a specific tier of the code will be adopted in 2022 after a market-ready assessment is completed. Once the federal code is released, the Municipality will compare it to the technical analysis of HalifACT and determine the best course of action moving forward.

The Municipality has been showing leadership by working to build all new corporate buildings to a net-zero ready or net-zero standard. See section 2.2.4; Net Zero Municipal operations for details on some projects completed this year. The Municipality is demonstrating leadership in the sector by engaging local design firms and construction companies. There has also been the integration of resilience measures into recent retrofits like the Woodside and Alderney Landing Ferry Terminals. These retrofits will/have relocated critical building mechanical & electrical infrastructure from lower levels which are at risk of flooding during storms.

The Regional Plan Review is the second review of the Halifax Regional Municipal Planning Strategy, which is a comprehensive guide for future growth for the entire municipality. The Regional Plan Review will review land use regulations to address any barriers to energy and climate resilience inclusion on new and existing buildings. The Centre Plan and By-law simplification project sets out policies for implementing the environmental directions in the Regional Plan and supports renewable energy and reduced fossil fuel use through retrofitting and constructing climate resilient net-zero buildings.

The Municipality has begun working to develop a retrofit program for residential and non-residential buildings. See section 2.3.3 for more detail.

1.3.3 Sub-Area 2: Renewable Energy

RENEWABLE ENERGY						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
4. Rooftop solar PV and energy storage program	Install 1,300 MW of rooftop solar PV with storage by 2030		2020	✓	×	×
5. Community scale solar PV and wind generation	Significantly expand local community-scale renewable energy generation: • 300 MW ground mount solar by 2050 • 280 MW wind by 2050 • 100% renewable district energy by 2050		2022	✓	×	×
6. Create Coalition to expand and decarbonize district energy systems			2026	×	--	--
7. Advocate and support provincial electricity grid decarbonization			2020	✓	✓	✓

Sub-Area Summary

Many of the actions and recommendations to reduce emissions require switching from higher-carbon fuels to zero carbon sources like green hydrogen or renewable electricity. The Municipality already has a residential rooftop solar program which will be adapted and expanded to include deep energy retrofits and climate resilience measures. In addition, community scale solar and wind generation will increase the supply of local renewable energy, while also stimulating the local economy and building on local business expertise. The municipality has existing district energy networks that will need to be transitioned to 100% renewable energy sources by 2050. By including energy storage with renewable generation, communities will be more resilient to power outages from extreme weather events and will be better able to supply essential services to the community.

Highlights

- **As of June 2021, the Solar City Program has financed $15 million and installed 5.5 mega-watts of solar energy. These systems are expected to save property owners over $1 million in utility costs annually and offset 4,600 tonnes of eCO_2 per year.**
- **The Municipality was successful in securing a $175,000 grant through the Federation of Canadian Municipalities, Community Efficiency Program to determine equitable financing requirements and an evaluation framework for the R3 Program.**
- **Halifax Regional Council passed By-law D-500, Respecting District Energy, to enable mandatory connection to the Cogswell District Energy system planned for the Cogswell Redevelopment area.**

Action Progress

The Halifax Solar City Program has been successful in increasing solar adoption across the Municipality. The current program has been operating since 2016 and as of June 2021, over $15 million in financing has been committed to the install of 5.5 mega-watts of solar energy. These systems are expected to save property owners over $1 million in utility costs annually and offset 4,600 tonnes of eCO_2 per year. While successful, the effort needs to be scaled up significantly and expanded to efficiency and resiliency measures.

To achieve the 50% reduction in energy demand for both residential and non-residential community buildings by 2040, and increase both solar and storage adoption, staff created a Retrofit, Renewables and Resiliency (R3) program design team in January 2020. This team consists of industry experts and have been meeting weekly for several months, building on the successes and lessons learned through the Solar City Program to work through the key barriers facing property owners in actioning deep energy retrofits. These key barriers include expanding financing and ensuring deep energy retrofits are accessible.

To ensure the program is accessible to all property owners and achieves the necessary level of energy and emission reduction, a navigator pilot program was approved by Halifax Regional Council in July 2021[5]. This pilot will be launched using the same financing mechanism as the Solar City program, but participants would be offered a navigator. The navigator would act as a project manager and be the key point of contact for advice and education. The navigator would be responsible for coordinating all subtrades, financing and rebate approvals. Lessoned learned from the pilot will be incorporated into the design of the full R3 program.

To help address the barrier of expanded financing, staff were successful in an application submitted to the Federation of Canadian Municipalities' Community Efficiency Financing program for a grant to perform a program evaluation study. This study will evaluate the Solar City Program through a lens of equitable access, loan product competitiveness and the ability to scale. The intended results of this study are to

[5] Halifax Solar City Program Update and Future Program Recommendation, Halifax Regional Council Recommendation Report https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/210720rc1121.pdf

develop minimum requirements for third-party lenders, private investors or utilities, to enable the investment needed to achieve the goals of HalifACT.

The Regional Plan review will work to reduce barriers to rooftop solar adoption and both large scale solar and wind. It will ensure solar is exempt from set-back and building height limits while also committing to review current wind energy policies so that it reflects current technology and provides opportunities for large-scale wind energy generation. This work will align with the Provinces recent announcement of amendments to the Electricity Act's Net metering program to enable the Shared Solar Program.[6] The Shared Solar Program will reduce barriers to solar adoption for communities, businesses, and those without a suitable roof for solar. The program will support large scale community solar developments for municipalities to help reduce energy poverty and provide residents with greater access to solar. The Municipality has been invited as a stakeholder to provide input as the province develops the specific details of the program.

In August 2020, Halifax Regional Council passed By-law D-500, Respecting District Energy[7], that would enable mandatory connection to the Cogswell District Energy system planned for the Cogswell Redevelopment area. This system will use available waste heat being generated at the Halifax Wastewater Treatment Facility located on Upper Water Street to heat and cool the surrounding buildings. To support this project further, the Federal Government announced that it would be investing more than $5.5 million through its Green Infrastructure Stream of the Investing in Canada infrastructure plan with the Province of Nova Scotia investing more than $4.6 million.[8] While a mandatory connection was required to ensure a positive business case, the success of this project can prove to both developers and building owners that connecting to a district energy system can result in 50% fuel costs for heating and cooling while providing resiliency during severe climate impacts.

The Municipality was a key stakeholder in the Nova Scotia Power Inc. (NSPI) Integrated Resource Plan (IRP) which was finalized in late 2020. The IRP will guide NSPI's long-term electricity supply and demand out to 2045. Through the IRP, various forecast scenarios were modelled and evaluated based on metrics such as cost, emissions reduction, grid reliability and flexibility to accommodate future unknowns and opportunities. The Municipality worked closely with NSPI throughout the IRP process to ensure the goals of HalifACT were considered. The status of the IRP currently unknown since the Province is committed to providing 80% of generated electricity via renewable sources by 2030. The Municipality will continue as an engaged stakeholder.

1.3.4 Sub-Area 3: Decarbonizing Transportation

DECARBONIZING TRANSPORTATION						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
8. Expand transit and active transportation infrastructure	Plan and build the transit and active transportation infrastructure needed to achieve the 2030 mode share targets in the Integrated Mobility Plan		2020	✓	✗	✗
9. Community-wide EV strategy	By 2030, 100% of new vehicle sales are electric		2024	✓	✗	✗
10. EV planning and policy			2020	✓	✓	✓

[6] Amendments to Electricity Act Create New Renewable Energy Opportunities, Nova Scotia Government news release https://novascotia.ca/news/release/?id=20210407004
[7] By-law D-500, Respecting District Energy, Halifax Regional Council Recommendation Report https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/200818rc1117.pdf
[8] Cogswell District Energy System, Halifax Water https://halifaxwater.ca/news/cogswell-district-energy-system-funding-support

Sub- Area Summary

Halifax covers a large geographic area and as a result, communities and citizens are heavily reliant on public and private transportation for daily life. Switching to zero emission vehicles for private, public, and commercial transportation will reduce fuel costs, improve air quality, and reduce maintenance requirements. Wide-spread adoption of zero emission vehicles will require planning for and building of re-fueling infrastructure throughout the Region. Coordination with local partners and industry experts to prepare for a shift to zero emission fuels is crucial. By expanding transit and active transportation networks, more community members will be able to choose lower-carbon transportation methods, reducing congestion, improving air quality, and improving the physical and mental health of residents.

As part of the HalifACT, staff were directed to prioritize efforts in seven critical core areas, one being to **develop a municipal wide electric vehicle strategy**. While a transition to public transit or active transportation is the first step to reducing transport emissions, approximately 90% of that sectors emissions come from light duty cars and trucks. For those who cannot transition, it is crucial the Municipality take significant action to accelerate the transition to electric vehicles.

Highlights

- **The Municipal Electric Vehicle Strategy is complete and will be presented to Halifax Regional Council in November**
- **An application for $1 million in matching funds was submitted to Natural Resource Canadas Zero Emission Vehicle Program to begin public charger deployment**
- **Over one third of the All Ages and Abilities Bike Network is in place with 8 kilometers being built since the IMP was approved in 2017**

Action Progress

Halifax Regional Council adopted the Integrated Mobility Plan (IMP) in 2017 with the vision to direct future investment in transportation demand management, transit, active transportation, and the roadway network. The plan establishes a municipal-wide mode share target of 30% of trips being made by active transportation and transit by 2031. Meeting this mode share target is dependant on the Municipality making the investment and building the transit and active transportation infrastructure necessary to shift trips away from single-occupancy vehicles.

The Municipality has begun implementing street improvement pilot projects by installing temporary features designed to improve the safety and comfort of those walking, rolling, cycling or driving. These projects have included protected bike lanes, curb extensions, temporary raised medians and re-aligning intersections contributing to the safety of the road network and making active transportation a more comfortable option for short and medium-length trips.

The Regional Centre All Ages and Abilities (AAA) Bike Network has approximately 57 km of safer, connected bikeways in the regional center (Halifax peninsula and Dartmouth inside Highway 111). As of Spring 2021, over one third of the network is in place with 8 kilometers being built since the IMP was approved in 2017. 40% of the AAA bike network installed in 2020 were tactical urbanism bikeway projects. Some projects completed to date include the South Park Street Bikeway, Vernon-Seymour Local Street Bikeway, Allan-Oak Local Street Bikeway, Ahern Multi-use Pathway, Barrington Street Bikeway and the Woodside Walking and Bicycling Connections.

Halifax Transit has been implementing transit priority lanes in key corridors to improve the reliability of transit services. Approximately 2.5 km of new bus lanes were added on Robie Street between Quinpool and Young. Phase one of the Young Street transit priority corridor was completed in 2020 with 450 m of new outbound bus lane. The first section of the new Bayers Road transit priority project is complete, widening the formerly 4-lane roadway to include new bus lanes in both directions and a multi-use pathway. A functional design project for Dutch Village Road Complete Streets includes recommendations to improve

safety to address active transportation and transit, adding new sidewalks, enhanced street crossings, raised protected bike lanes connecting to the Chain of Lakes Trail and streetscaping elements.

The Municipal Electric Vehicle Strategy will be presented to Halifax Regional Council in November for consideration. The Strategy will provide recommendations on public infrastructure, policy requirements, education needs and a municipal light duty fleet transition plan that would position Halifax as an EV ready municipality.

To increase coverage across the region, an application has been submitted to the NRCan Zero Emission Vehicle Infrastructure Program[9] (ZEVIP). The ZEVIP offers eligible organizations funding to install electric vehicle chargers in public places, workplaces, municipal fleet depots and multi-unit residential buildings. The fund covers 50% of eligible costs up to a maximum of $5 million. A total of $1 million is being requested through ZEVIP, to install chargers at Municipally owned sites. A funding decision is expected in October 2021.

In Spring 2021, the Municipality partnered with the Clean Foundations Next Ride[10] program to support their EV test drive events through offering Municipal owned parking lots for free. The Municipality has already co-hosted two events since the partnership.

The current Regional Plan review will look at land use regulations to address barriers that may exist for private deployment in zero emission vehicle infrastructure.

1.3.5 Sub-Area 4: Greening Government Operations

GREENING GOVERNMENT OPERATIONS					
HalifACT Actions	**Target**	**Intended Start Date**	**Started**	**On Track**	**Adequately Resourced**
11. Net-zero municipal operations	Achieve net-zero municipal operations by 2030	2022	✓	✓	✗

Sub-Area Summary

Municipal operations include the activity related to roughly two hundred buildings, exterior (street) lighting, and vehicles (public works, fleet, rentals, etc.) used by the Municipality. These operations require a significant amount of energy which subsequently generate emissions. The Municipality's leadership role for greening municipal operations will include retrofitting and future-proofing existing Municipally owned buildings and requiring that new Municipal buildings are built to a net-zero standard; electrifying the municipal fleet, including ferries, by 2030; developing a waste strategy to reduce residential waste and increase waste diversion, to generate renewable electricity in municipally owned projects; and to purchase local zero-carbon electricity. These actions combine to achieve net-zero municipal operations by 2030.

Highlights

- **Municipal staff are working with Efficiency Nova Scotia to benchmark building energy use, perform deep energy retrofits on existing buildings and build all new municipal buildings to a net-zero standard**
- **The Municipality has applied for a cost sharing opportunity with the Investing in Canada Infrastructure Program to complete extensive energy efficiency measures on several large buildings**

[9] Zero-Emission Vehicle Infrastructure Program (ZEVIP). https://www.nrcan.gc.ca/energy-efficiency/transportation-alternative-fuels/zero-emission-vehicle-infrastructure-program/21876
[10] Next Ride NS. https://nextridens.com/

- **The Municipality has submitted an expression of interest to enter the Green Choice Program which allows participating customers to purchase up to 100% of their electricity use from local renewable energy sources**

Action Progress

All buildings have been entered into Energy Stars Portfolio Manager. Energy consumption will be tracked, and specific energy retrofit projects will be identified. In partnership with Efficiency Nova Scotia, completed energy retrofit work as of the end of 2020, will save $1.3 million in energy costs annually, reducing corporate building emissions by 10%, the equivalent of planting 235,000 trees or taking 1,100 vehicles off the road. Full details of this work is outlined in the 2020 Annual Report.[11] Several new municipal buildings have been constructed to Net-Zero Ready standards. The Wiliamswood Fire Station was recently completed with energy efficiency design features including air-to-water heat pumps, LED lighting, 50 kW solar PV array, demand-controlled ventilation, building automation system. The Fort Needham Washroom is under construction and was designed to Net-Zero. The building is all electric with enhanced building envelope, LED Lighting and a solar PV Array. The new energy efficient Mackintosh Depot includes an 80 kW solar PV array, demand controlled ventilation, LED lighting and more.

In September 2020, the Municipality submitted applications to the Investing in Canada Infrastructure Program under their Climate Change Mitigation sub-stream. This stream is offered to Municipal projects, in excess of $1 million, that will reduce emissions in either buildings, electricity generation or transportation. In July 2021 it was announced that the Municipality was successful in a $10 million application for deep energy retrofits of five of the largest Municipal buildings and $112 million for 60 new battery electric buses.[12]

In June 2021, Halifax Regional Council approved the submission of an Expression of interest[13] to the Provinces Green Choice Program (GCP). The GCP offers large electricity consumers (in excess of 10,000 megawatt hours annually) the option of purchasing 100% of their annual electricity need through new, local renewable sources. An expression of interest for 100% (75 gigawatt-hours) will be submitted when the intake opens, estimated for the first quarter of 2022. The timeline for project completion is the first quarter of 2023.

1.3.6 Sub-Area 5: Water

WATER						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
12. Net-zero water and wastewater operations	Achieve net-zero water and wastewater operations by 2030		2024	✓	✗	✗
13. Climate-informed water supply strategy	Future-proof water systems and supply		2024	✓	✓	✗
14. Climate-informed stormwater management plan and program			2020	✓	✗	✗

Sub-Area Summary

An integrated approach to water management, including stormwater, wastewater, and freshwater, that coordinates between the Municipality, the Halifax Regional Water Commission, and the public, is required for water related energy/emission reductions and ensuring water supplies and infrastructure are resilient

[11] HRM Corporate Building Energy Efficiency – Annual report 2020, Halifax Regional Municipality https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM-Efficiency-Report-Final.pdf
[12] HRM to see nearly $10M in energy-efficient building upgrades, Halifax Today https://www.halifaxtoday.ca/local-news/hrm-to-see-nearly-10m-in-energy-efficient-building-upgrades-3964223
[13] Green Choice Program, Halifax Regional Municipality https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/210608rc1112_0.pdf

against changing climate conditions. Community-wide water conservation measures will include infrastructure improvements and water use behavioural changes, as well as reducing the amount of stormwater entering the wastewater system. Biogas recovery from wastewater may be considered to generate electricity to replace other fuel sources, while also reducing emissions released from treating wastewater. Develop a climate informed water supply strategy that considers planned growth, futureproofing the treatment process to address lake recovery, changes in precipitation and temperatures associated with climate change. Green infrastructure is a core component of effective stormwater management.

Highlights

- **There are six new renewable energy projects, estimated to generate over 66,000 MWh annually, being developed or in operation at municipal water operation locations**
- **Rain gardens will be completed on Spring Garden Road and Prince Albert Road as part of naturalized stormwater management by Fall 2021**
- **Halifax Stormwater Management Standards for stormwater runoff from large-scale private developments were completed in September 2020**

Action Progress

Progress on net-zero water and wastewater operations by 2030 includes the development and/or operation of six renewable energy projects (including wind, energy recovery turbine, solar), which will produce an estimated 66,000 MWh annually in various water operation locations. Additionally, Halifax Water, Transportation & Public Works, Planning & Development, and Environment & Climate Change are working to develop and maintain Stormwater Management Best Management Practice standards for use in the public right-of-way. The existing Aerotech Best Practices Framework will be upgraded by 2026 to enhance resource recovery through Renewable Natural Gas generation via anaerobic digestion, which will be produced at a rate of 80,000 GJ annually increasing to 140,000 GJ annually by 2046. Furthermore, climate lens assessments focused on resiliency and emission reduction, have been incorporated into project applications for potential Federal/Provincial funding programs (including ICIP).

To develop a climate-informed water supply strategy, Halifax Water's first Climate Change Vulnerability and Risk Assessment Pilot Project for all water supply plants and dams will be completed in 2021. The project will help develop climate change risk assessment methodology and identify climate threats and vulnerability specific to Halifax's water supply.

Multiple initiatives have been undertaken to support a climate-informed stormwater management plan and program. The Municipality and Halifax Water have implemented projects and studies related to the National Disaster Mitigation Program (announced in 2015) which provides federal funding for disaster mitigation projects. The National Disaster Mitigation Program Project has identified flood mitigation strategies for the top ten flood sites in the municipality (including planning policy, drainage studies, new infrastructure) and will be presented to Halifax Regional Council for consideration this fall. Stormwater design in the municipality will be improved using an adjustment factor for the Shearwater intensity-duration-frequency curve and precipitation data will continue to be monitored with design specifications updated as required.

The Municipality and Halifax Water's Integrated Stormwater Management Policy works on areas including flood resilient design standards and wetlands, with achievements including the Lot Grading Bylaw and Joint Standards for Best Management Practices for Commercial properties. Halifax Stormwater Management Standards for development activities establish standards for reducing quantity and improving quality of run-off via infrastructure and are continuously being improved. The Dartmouth Cove Project which is set for construction in 2022/23, will improve naturalized stormwater management capabilities and rain gardens will be completed on Spring Garden Road and Prince Albert Road as part of naturalized stormwater management by Fall 2021. Furthermore, Halifax Stormwater Management Standards' quality and quantity standards for stormwater runoff from large-scale private developments were completed in September 2020

and the Centre Plan Project includes support for low-impact development design to retain and filter storm water via natural systems, and reduce stormwater runoff and pollution.

1.3.7 SUB-AREA 6: CRITICAL INFRASTRUCTURE AND SERVICES

CRITICAL INFRASTRUCTURE AND SERVICES						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
15. High-level risk assessment for critical infrastructure	Reduce risk to critical infrastructure		2020	✓	✗	✗
16. HRM critical infrastructure risk and vulnerability analysis			2020	✗	✗	✗
17. Zero emissions back-up power in critical infrastructure			2026	✗	--	--
18. Develop inspection procedures for high risk infrastructure			2026	✗	--	--
19. Updated and climate-informed design standards for new infrastructure			2022	✓	✗	✗

Sub-Area Summary

Halifax depends on a complex network of infrastructure whose systems function to produce and deliver a reliable flow of services that are critical to support economic prosperity and social wellbeing. Critical infrastructure, as defined by Public Safety Canada, includes energy, telecommunications, transportation, water supply, wastewater treatment, solid waste management, buildings, and food systems. Growth in the municipality is increasingly putting pressure on existing infrastructure systems, which in some cases, are already at or over capacity and aging. As climate events become more extreme and occur more frequently, increases in disruption and damage to these infrastructure systems, and the subsequent costs to repair or replace them will increase. Critical infrastructure needs to withstand the impacts of climate change, both in the near and long term. This requires proactively protecting and strengthening infrastructure to ensure it can withstand increasingly extreme storms and changing temperatures amongst other impacts that come with climate change. By improving the resilience of infrastructure now, the reactive resources needed for emergency response or to repair or rebuild from future impacts are reduced. Understanding where, what, how, and the action and investment required to reduce the risk to critical infrastructure necessitates a better understanding of the risks and vulnerabilities these systems face in a changing climate.

Highlights

- **Halifax Water has developed a Vulnerability to Climate Change Risk Assessment Framework as part of their Infrastructure Master Plan to identify climate threats and asset classes that are vulnerable to climate change**
- **As part of the Dartmouth Cove Infrastructure Project, Alderney Drive and Canal Street will be raised to account for future sea level rise projections**
- **The HRM Enterprise Risk Framework, updated in September 2020, now incorporates climate change as an impact category**

Action Progress

The critical infrastructure project is a large, ongoing initiative to assess the risk and vulnerability of both municipally owned and operated critical infrastructure as well as our collective critical infrastructure throughout the municipality, with a view to prioritizing and increasing resilience of infrastructure at greatest risk to current and future climate impacts. While still in the beginning stages, an intern with Halifax Regional Fire and Emergency (HRFE), whose internship ended in November 2020, defined critical infrastructure from

an emergency management perspective and began developing a framework for conducting a high-level risk assessment with owners and operators of critical infrastructure throughout the municipality. To date, the municipal emergency management perspective is captured in the high-level risk assessment. Further community engagement will be required once COVID-19 restrictions lift. In February 2020, HRFE and Environment & Climate Change revisited the project to discuss action for next steps. Key next steps involve developing a critical infrastructure working group and completing climate hazard mapping (wildfires, heat, coastal flooding, overland flooding etc.) for all of HRM. Additional staff capacity is required to move this project along.

Halifax Water is developing a Climate Change Vulnerability framework as outlined above in section 2.3.6.

Critical infrastructure projects include the Dartmouth Cove road raising and Alderney and Halifax wharf recapitalization. The Dartmouth Cove project includes the extension of Dundas Street into Dartmouth Cove and the reconstruction of part of Alderney Drive to allow further daylighting of Sawmill Creek. Alderney Drive and Canal street will be raised to account for future sea level rise due to climate change, allowing future developments in the areas to connect to the already raised streets. Detailed design is underway, and construction will begin in 2022. Alderney and Halifax wharf recaps will include replacing decking, wood ladders, boat fenders, and repairs to structural concrete and steel. This will improve the climate resiliency of the assets to better withstand the expected increase in severe weather events. Chebucto Landing upgrades were completed in 2020 and Alderney wharf will be completed in 2021/22.

Some progress has been made on updating design standards for new infrastructure to be climate-informed, however we are not on track to meet our targets. Upgrades include the ongoing development of stormwater management best practice standards with Halifax Water, Transportation and Public Works, and Planning and Development for the use in the public right-of-way. Best Management Practices include climate informed infrastructure, improving water quality and managing increased water volume due to extreme events. Furthermore, as part of Halifax Water's Infrastructure Master Plan and their Climate Change Management Framework, they have updated intensity-duration-frequency curves, rainfall allowance, and sea level rise in long-term planning projections and current Halifax Water design specifications and identified data gaps for considering climate change in surface water yield assessments.

In September 2020, the Municipal Enterprise Risk Framework was updated to include a revised Likelihood and Impact Scale to assess risk that now incorporates the impact category of climate change. The first Enterprise Risk Summary Report, using the updated framework, was presented to Audit & Finance Standing Committee in March 2021. To ensure critical infrastructure is resilient in the event of a weather-driven emergency that results in a power loss, Corporate and Customer Services ensures that all of the facility generators that fall under Facilities Maintenance & Operations are maintained in accordance with *CSA 282: Emergency electrical power supply for buildings*. A new 5-year contract has been procured for maintenance in 2021 and all new generators that are added to the inventory will be maintained to the same *CSA 282* standard.

1.3.8 Sub-Area 7: Natural Areas & Green Infrastructure Assets

NATURAL AREAS AND GREEN INFRASTRUCTURE						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
20. Fund and implement Green Network and Urban Forest Master Plans	Protect, restore, maintain and expand natural areas and green infrastructure assets		2020	✓	✗	✗
21. Implement region-wide naturalization program			2020	✓	✗	✗
22. Implement region-wide tree planting and re-greening program			2020	✗	✗	✗

Sub-Area Summary

Natural areas and green infrastructure increase water infiltration, reduce runoff, reduce the heat island effect, improve water quality, provide shade and sequester carbon. Examples of natural areas and green infrastructure include parks, trees, shrubs, urban forests, green roofs, green walls, gardens, bioswales, natural channels, watercourses, ponds, and constructed wetlands. Naturalization is an ecological approach to landscape management that enhances biodiversity and improves ecosystem health and resilience in an urban environment. Naturalization reduces maintenance requirements and costs, as systems are self-renewing, resilient, and provides more naturalized space to residents and wildlife. Halifax Regional Council provided direction to expand naturalization efforts in parks and rights-of-way areas in January 2019. Both the Urban Forest Master Plan and the Green Network Plan highlight the benefits associated with increased naturalization and biodiversity.

Highlights

- **Four park plans that include naturalized areas have been approved by Halifax Regional Council**
- **The 2020-21 fiscal year saw the acquisition of 1.25 acres of land in addition to providing $750,000 for the Blue Mountain Birch Cove Lakes land acquisition**
- **Contained within the 202/21 budget was funds to complete 75% of the original Urban Forest Master Plan planting target**

Action Progress

The Halifax Green Network Plan, which defines an interconnected open space system, highlights ecosystem functions and benefits, and outlines strategies to manage open space, is being implemented across the organization through the Regional Plan Review, the Red Book Review, parks management work, and other initiatives. The Municipal Design Guidelines (Red Book) update includes a chapter dedicated to street trees including the conditions required to support them in the boulevard. The Regional Plan Review will update policy to implement the Halifax Green Network Plan and the Urban Forest Master Plan and encourage the use of alternative energy systems as part of secondary planning. Additionally, Section 2 and 8 of the Centre Plan calls for the development of a Regional Centre Parks and Open Spaces Plan and sets out policies that align with the Halifax Green Network Plan, the Urban Forest Master Plan, and HalifACT. Performance measures for business planning now include broad service level distance/travel time standards to functional parkland. Functional parkland is parkland with at least one built amenity or enough open space for active play or water access. Furthermore, The Halifax Common Open Space Master Plan, which will guide the Municipality in the provision of open space areas, parks, recreations programs and facilities for the short and long term, is in its final draft phase and is targeted to be reviewed by Halifax Regional Council in the 2021/22 fiscal year.

Through the parkland acquisition program that supports the Green Network Plan, this fiscal year saw the acquisition of approximately 1.25 acres of land through the transfer of a former school in Tangier, new parkland in Middle Musquodoboit, and a contribution of $750,000 to the Nova Scotia Nature Trust's Blue Mountain Birch Cove Lakes land acquisition. Park plans are also being developed to support the Green Network Plan including locations in Lake Echo, Eastern Passage, Gorsebrook, and Viscount Run.

In support of implementing a region-wide naturalization program, four park plans that include naturalized areas, have been approved by Halifax Regional Council. Three naturalization pilot sites have commenced. A naturalization working group has also been established with members from three BUs (Parks & Recreation, Transportation & Public Works, and Planning & Development). The working group, in collaboration with Dalhousie University Environmental Studies' students and community feedback has:

- compiled a map cataloguing naturalization initiatives that have occurred in parks and right-of-way areas within the municipality;

- completed a study on the Implications of the Emerald Ash Borer (Agrilus planipennis) on Riparian Canopy Cover in three HRM Parks, which will help staff with management decisions in these parks; and
- compiled a list of over 30 sites within parks and right-of-way areas that could be suitable for naturalization.

An update on HRM's Naturalization Initiatives was presented to Regional Council in 2021 to support the continuation of the pilot project for the purpose of monitoring and data collection, which would assist staff in development a future naturalization guideline/policy.

In 2013, the Urban Forest Master Plan set out a street tree planting target for the following 10 years. By 2020, 55% of the target, equivalent to 10,700 trees, has been achieved. During 2020/21 budget deliberations, the Budget Committee approved a Capital Budget to achieve 75% of the original UFMP planting target. For 2021, this has resulted in the planting of 3,100 caliper street trees, one of the largest street tree planting efforts in the municipality to date.

In support of the Street Tree Inventory, a multi-year project to collect inventory data for the municipally owned and planted street trees was initiated. Funding has been allocated in the 2021 budget to complete Phase 2 of the inventory. Matching funds have been requested through an application to the Federation of Canadian Municipalities and if successful, Phase 3 should also occur in 2021. Inventory from Phase 1 has already been used to inform projects such as the University Avenue, MacDonald Bridge, and Dartmouth Active Transportation functional plans.

A cyclical pruning program aimed at pruning every ornamental street tree in the municipality every 7 years is intended to improve the health and safety of the street tree inventory, thus retaining trees on the landscape longer and receiving additional benefits of mature trees including carbon sequestration, pollution mitigation and heat island reduction among others. As of Spring 2021, approximately 16,000 mature street trees have been pruned under this program. A 311 data analysis indicates a significant reduction in reactive service request in the years following cyclically pruning.

1.3.9 Sub-Area 8: Planning

PLANNING						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
23. Integrate climate into land-use planning	Plan and build a low-carbon resilient region		2022	✓	×	✓
24. Planning policy to enable district energy and microgrids			2024	✓	×	×
25. Land protection and conservation on private lands			2020	✓	×	×
26. Preservation of natural areas			2020	✓	×	×

Sub-Area Summary

Land use planning plays a critical role in designing and building communities that are prepared and adapted to climate change, while also maintaining physical and mental wellbeing of residents. Planning policies through the regional plan and municipal planning strategies can provide direction to reduce sprawl and allow for efficient use of land, energy and transportation systems. The current Regional Plan review provides an opportunity to strengthen the municipality's role in acquiring and protecting lands that will both sequester carbon to mitigate climate impacts and increase adaptive capacity. HalifACT targets building a low-carbon resilient region through planning processes.

Highlights

- **The proposed Centre Plan will extend the vertical coastal setback requirements, currently required for residential uses, to include commercial and institutional uses as well**
- **The Municipality participated in the Municipal Natural Assets Inventory which will help identify our natural assets and incorporate them into asset management processes**
- **The proposed Centre Plan will allow rooftop solar collectors to protrude above the maximum permitted height for main buildings**

Action Progress

The two-key land-use planning reviews occurring over the past year include the Regional Plan Review and the Centre Plan Update as part of the By-law Simplification Project. The Regional Plan Review will review existing policy and adopt new policy as required to support the consideration of environmental protection and climate change impacts in planning work, based on the direction provided by HalifACT and the Halifax Green Network Plan. The Regional Plan Review Themes & Directions Report, which provides details of the work that will be completed during the full review, was released in early Spring and public engagement has been undertaken. As part of incorporating climate considerations, the Themes & Direction Report incorporated direction to:

- Review current coastal development practices, review latest climate science, update mapping datums from Canadian Geodetic Vertical Datum (CGVD) 28 to CGVD2013, establish guidance for resilient infrastructure design, and complete a spatially-based risk and vulnerability analysis of municipal coastlines;
- Adopt policy to encourage the use of alternative energy systems such as district energy and microgrids, as part of secondary planning; and
- Ensure development regulation in important ecological areas are appropriate, provide guidance for environmental considerations during discretionary planning applications and secondary planning, and develop an approach to the protection of natural corridors.

A draft amendments package will be brought forward following the completion of the current phase of engagement and additional study.

The Centre Plan Project was a process initiated by Halifax Regional Council to establish a new Secondary Municipal Planning Strategy and Land Use By-law for the urban core of the municipality, which is referred to as the Regional Centre. These planning documents play an essential role in guiding the growth and development of the Regional Centre including support for housing, business, institutions, parks, and the environment. The proposed Plan is also intended to implement, and be supported by, municipal priorities plans, such as the Economic Growth Plan, the Urban Forest Master Plan, the Integrated Mobility Plan, the Halifax Green Network Plan, and HalifACT. As part of incorporating climate considerations, the Centre Plan Project incorporated direction:

- Supporting renewable energy sources, reduced reliance on fossil fuels through retrofitting and constructing municipal facilities within the Regional Centre with climate resilient building designs, and developing and incentivizing climate resilient and net-zero building design practices;
- Expanding the minimum coastal elevation setbacks for residential uses to include commercial and institutional uses as well, given the wide-range of developments located along the shoreline in the Regional Centre and the vulnerability of commercial and institutional uses to sea-level rise and storm surge events; and
- Allowing for rooftop solar collectors to protrude above the maximum permitted height for main buildings.

Centre Plan Package A was approved in September 2019, and the proposed Centre Plan Package B is currently going through the adoption process with anticipated public hearing in the Fall of 2021.

The Municipality partnered with Ducks Unlimited to create an inventory of wetlands to understand their function and start prioritizing wetlands in planning processes. Wetlands can be considered as green infrastructure to help with flood mitigation and carbon sequestration. The wetland inventory and prioritization is underway and will inform the Regional Planning Review and ongoing policy work.

This past year, the Municipality participated in the Municipal Natural Assets Inventory (MNAI) Project. The MNAI project represents an opportunity for the municipality to work towards including natural asset management into our decision-making, an important step towards implementing and supporting HalifACT. This work is being done collaboratively with Environment & Climate Change, Parks & Recreation, and the Asset Management Office. The Natural Assets Inventory is complete and the dashboard, which will be available to the public, is under development.

1.3.10 SUB-AREA 9: COASTAL PREPAREDNESS

COASTAL PREPAREDNESS						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
27. Detailed coastal risk and vulnerability analysis	Better prepare for climate related coastal changes and impacts		2020	✓	✓	✓
28. Develop coastal adaptation strategy			2024	✗	--	--

Sub-Area Summary

The municipality's 2,230 km coastlines are at increased risk to climate impacts, specifically coastal infrastructure, property, and natural areas and assets from inundation, saltwater intrusion, and coastal erosion due to sea-level rise, storm surge, and extreme events. Across the country, the highest adaptation costs and some of the greatest impacts are associated with coastal communities in the Atlantic provinces. To protect assets, manage coastal environments, and reduce exposure to climate risks, a detailed coastal risk and vulnerability analysis will be completed for all of the municipality. In future years a coastal-specific adaptation strategy will be implemented to protect and manage at-risk natural and infrastructure assets.

Highlights

- **The Regional Plan Review will direct the completion of a spatially-based risk and vulnerability analysis of the Municipality's coastal waterfront and shoreline area**
- **The Extreme Water Level Mapping project, started in 2019, is on track to provide updated extreme water level hazard maps the municipality, incorporating the latest sea-level rise projections from the IPCC's landmark Assessment 6 report, released this summer**

Action Progress

In alignment with HalifACT, the Regional Plan Review, a comprehensive guide for future growth for the entire municipality, will direct the completion of a spatially based risk and vulnerability analysis of the Municipality's coastal waterfront and shoreline area.

The Extreme Water Level Mapping Project aims to update our coastal flooding maps for all of HRM using the latest sea-level rise projections and newly acquired LiDAR-derived basemaps. Previously, the Municipality has mapped coastal flood hazards around the city centre, however the new maps will identify areas across the whole municipality that are vulnerable to extreme water levels. Extreme water levels are a combination of local sea level rise projections, storm surge, tides, and regional oceanographic effects that create water levels that can cause extreme flooding, like those our municipality has experienced most recently during Hurricane Dorian. The first step of this project was the LiDAR Data Acquisition Project which provided updated and more accurate elevation maps. Using the new LiDAR base maps, the next steps of the Extreme Water Level Mapping Project are to continue working with climatologists and flood modellers

to update extreme water level projections for the entire municipality, use the updated projections to create hazard maps, and make these maps available to the public. A key part of this project will be to incorporate the latest projections from the IPCC AR6. The finalized maps will help to inform the By-law Simplification Project and future planning, development, and adaptation within the municipality.

1.3.11 Sub-Area 10: Emergency Management

EMERGENCY MANAGEMENT						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
34. Integrate climate into emergency planning	Better prepare for increased climate-related emergencies	∞	2020	✓	✗	✗
30. Improve emergency management communication and coordination		∞	2020	✓	✓	✗

Sub-Area Summary

The impacts of climate change are expected to affect the emergency management sector's capacity to support preparedness, response, and recovery efforts. As extreme weather events increase, so will the demands on full-time and volunteer emergency service personnel and nongovernment organizations. Demands are likely to increase from both chronic stresses, such as higher average temperatures, and acute shocks, specifically extreme events such as heat waves and flooding, as a result of the growing impacts on human health. Climate impacts are expected to be greater for vulnerable people and populations, including seniors, children, those experiencing social isolation, individuals with chronic conditions and disabilities, and socially or economically marginalized individuals. In addition to preparing for an increase in extreme climate events, ongoing investment to increase the resilience of infrastructure and to provide supportive service to emergency management will alleviate the pressures on emergency management staff and infrastructure.

Highlights

- **Emergency back-up generators were installed at four community locations to provide emergency comfort centres during extreme weather events**
- **Ten newcomer families have received storm kits as part of a pilot project to help newcomers be better prepared for extreme weather events**
- **Through the 2020/21 HalifACT capital budget account, a refrigerated truck will be purchased to support community resiliency and food security during power outages from extreme weather events**

Action Progress

The Halifax Regional Fire & Emergency (HRFE) office continues to incorporate emergency management planning, severe weather preparation, into all community planning events. All communities have responded very well to engagement and would like to be further engaged. Future steps will include increasing the number of communities visited.

As part of the Emergency Preparedness strategy, emergency comfort centres will be strategically and equitably distributed throughout the municipality and be available to citizens when needed. Back-up generators were installed at the following locations: Musquodoboit Harbour Recreation Centre, Bi-Centennial Theatre, Port Dufferin Community Centre, and Acadia School. Next steps involve installation of generators at Lake Echo Community Centre and Dartmouth North Community Centre.

In collaboration with Halifax Public Libraries, HRFE and Environment & Climate Change launched a pilot program that provides new immigrant families with customized storm kits and accessible information about

what to do in the case of severe weather events. So far, 10 families have received education and storm kits, with content translated into Arabic.

To increase food security in climate-vulnerable communities that can experience large scale power outages during extreme weather events, a refrigerated food truck will be purchased through the HalifACT capital account. As past experiences like Hurricane Dorian have shown us, already vulnerable populations are particularly impacted by extreme weather events. These events often result in large scale power outages causing extensive food loss in communities with no means to replace it. With hurricanes projected to increase in intensity and frequency, power outages and resulting food loss events will also increase. The refrigerated truck will be mobilized to communities during acute power outages to provide a space to store and access their food during the outage. Most importantly, this refrigerated truck initiative is a direct result of consultations with vulnerable communities during past storm events.

1.3.12 Sub-Area 11: Community Capacity

COMMUNITY CAPACITY					
HalifACT Actions	**Target**	**Intended Start Date**	**Started**	**On Track**	**Adequately Resourced**
31. Neighbourhood resilience and disaster support hubs	Enhance the capacity of neighbourhoods to prepare for and recover from climate events	2020	✓	×	×
32. Widely available emergency management training		2020	✓	×	×
33. Undertake neighbourhood climate planning		2024	×	--	--
34. Broad, deep, and collaborative engagement with Mi'kmaq and other groups seeking reconciliation	Engage deeply and collaboratively	2020	✓	×	×

Sub-Area Summary

More resilient neighbourhoods make a more resilient city. While comfort centres exist across the municipality and are critically important for emergency management, neighbourhoods that invest in connections, capacity building, and resources on a sustained basis are better able to withstand crises and address many of the chronic socioeconomic stresses that increase climate vulnerability. Increasing the built and social capacity of neighbourhoods not only empowers them to be more independently resilient but contributes to the resilience of the region as a whole. Each community will identify priorities and leaders to build capacity and connections with other communities to share resources, training, knowledge and solutions. The Municipality will help support capacity building and foster engagement and connectivity across communities.

Highlights

- **Staff hosted a TEDxHalifax virtual watch party event as part of the worldwide TEDx Global Countdown event on October 10, 2020, which included videos of from global experts in energy and climate change as well as local climate activists, artists and a Mi'kmaq Elder**
- **The HalifACT Action Network, with over 400 stakeholders from across the municipality met four times to support collaborative climate action and idea sharing across the city**
- **The Emergency Management Office provides strategically placed caches of food and potable drinking water to support vulnerable communities during an emergency**

Action Progress

In support of emergency management during extreme weather events, HRFE conducts frequent Incident Command System and Emergency Management training to internal BUs, external emergency management groups, and communities. Additionally, emergency food and potable water was placed in strategic locations across the municipality to support vulnerable communities during extreme weather events.

Developed and facilitated by the University of Waterloo, the Halifax Flood Risk Challenge Game was hosted in HRM in April 2021; bringing together flood-risk decision makers and stakeholders from across the municipality to participate in “serious-gaming”, with a view to building capacity within the sector. A public version will be available for community engagement later in 2021.

The HalifACT Action Network, consisting of over 400 members from across the Municipality, has convened for four meetings over the past year to support collaborative climate action and idea sharing across the city. The Network was initially established as part of the HalifACT climate plan development and will continue to meet on a quarterly basis moving forward.

As part of broad engagement, the Municipality’s Environment & Climate Change Team have developed and delivered many presentations and lectures to academia, professional organizations, non-profits, different levels of government, community organizations and youth, in an effort to educate on HalifACT and the associated targets. Staff hosted a TEDxHalifax virtual watch party event as part of the worldwide TEDx Global Countdown event on October 10, 2020. The event included videos of from global experts in energy and climate change as well as local climate activists, artists and a Mi’kmaq Elder. The event also included an overview of the HalifACT plan with an invitation for people to get involved. The event was very well received and remains on the climate website for continued viewing.

1.3.13 Sub-Area 12: Food

FOOD					
HalifACT Actions	**Target**	**Intended Start Date**	**Started**	**On Track**	**Adequately Resourced**
35. Improve food security and food-systems resilience	Create and implement a Food Action Plan, and include climate change as a core component	∞ 2020	✓	×	×

Sub-Area Summary

Climate change poses increased risks to agriculture and food systems, including adverse impacts on agricultural crops (decreased crop yield and decreased nutritional quality of crops grown), increased food prices, contaminated water and food supplies, increases in new and existing pests and diseases, and damage and disruption to food supply and distribution infrastructure from extreme events. Additionally, food production and distribution contribute to emissions, through methane produced by livestock (mainly cattle), manure and fertilizers, pasture management, energy for agricultural vehicles and machinery, conversion of forests, grasslands and other carbon ‘sinks’ into cropland, and energy used in food processing, transport, packaging and retail.

Highlights

- **The JustFOOD food justice and security project was endorsed by Halifax Regional Council and is being implemented despite the impacts of COVID-19**
- **The Regional Plan Review and Centre Plan support food security and resilience**
- **The Food Security Innovation Initiative project team have been developing and testing projects to improve food security in the Municipality with expected completion in 2021**

Action Progress

JustFOOD, co-led by the Municipality and the Halifax Food Policy Alliance, envisions a future where no one is hungry, food and people are celebrated, the local economy is strong, and the environment is protected for generations to come. After being endorsed by Halifax Regional Council in December 2019, JustFOOD

has developed a Background Report, draft Framework and Engagement Plan. They have received a Social Sciences and Humanities Research Council grant to consider models and best practices for collaborative food governance, soft launched the JustFOOD project with an online "*Food Experiences During COVID-19*" survey and creation of Emergency Food Hampers, and hosted two public workshops. Next steps include a third workshop, targeted community engagements, Civic Dinners distribution, development of an Action Plan for Council, and the establishment of a governing body.

The Regional Plan Review will support the creation and implementation of JustFOOD. Furthermore, the Centre Plan Project includes support for urban agriculture and community food security. Urban agriculture uses have been enabled with the approval of Centre Plan Package A, and proposed Package B hopes to expand on this.

The Food Security Innovation Initiative project team (The Outpost, along with consulting firm Davis Pier, the Halifax Partnership, the Municipality's Government Relations & External Affairs team) have been developing and testing 5 project prototypes to improve food security in the Municipality since February 2021 These prototypes include: a project focused on heart health and community gardening with the Dartmouth General Hospital Foundation; a drive-by garden stand and youth gardening and entrepreneurship program with Akoma and the Black Business Initiative; a project supported by Hope Blooms in Halifax's north end to create a community market that is more dignified and discreet; Mealful, an affordable meal service for students; and the Mobile Food Market and Partners' Food Hub, a collaborative local food hub created by the Mobile Food Market, Farmers Markets NS, and Nourish NS. These participants have been connected into the Municipality and the Halifax Food Policy Alliance's work to develop JustFOOD.

1.3.14 Sub-Area 13: Business Economy

BUSINESS AND ECONOMY						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
36. Workforce and technology development for building decarbonization and resilience	Prepare and leverage business for the transition		2024	✗	--	--
37. Resilient decarbonized business program			2026	✗	--	--

Sub-Area Summary

The transition to a low carbon and climate resilient future will require and generate a significant amount of professional and skilled labour positions, alongside revitalizing the local economy. Through HalifACT, approximately 170,000 person years of employment are expected to be generated between 2020 and 2050, an average of 5,500 annually. Partnering with academic institutions and the private sector to develop the skills and training necessary for these new green jobs will be crucial. The private sector has an important role to play in reducing emissions and increasing resilience partnerships and develop a program to support businesses in this transition.

Action Progress

HalifACT actions 36-37 are all future actions (intended to begin in years 2024-2026), and therefore, no progress has been made in this sub-area.

1.3.15 Sub-Area 14: Mainstreaming Climate Into Municipal Operations

MAINSTREAMING CLIMATE INTO MUNICIPAL OPERATIONS						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
38. Integrate climate into financial decision-making	Integrate climate thinking into		2020	✓	✗	✗

39. Establish new mechanisms for financing climate action	municipal decision-making and governance		2020	✗	✗	✗
40. Green municipal investments			2020	✗	✗	✗

Sub-Area Summary

Climate change is having, and will continue to have, a negative financial impact on the Municipality. Decarbonizing and adapting to the impacts of climate change will require major investments and mobilizing funding commensurate with the challenge will be difficult at many levels. However, the cost of inaction will only grow over time. Every dollar invested proactively can save as much as six dollars on recovery.[14] Many decision-makers do not yet recognize the choice they face between paying predictable costs today for mitigation and adaptation, compared to delaying action and paying higher and unpredictable costs later to try and cope with the impacts of climate change. The Municipality will establish new mechanisms for financing climate action, while simultaneously rethinking its own municipal fund investment strategies. Embedding climate resilience considerations into financial decision-making will ensure that these investments contribute to reducing emissions and reducing risk throughout the region.

Highlights

- **Climate change was added as a risk evaluation category of the Project Evaluation Framework**
- **Environmental considerations were included in the newly adopted Social Procurement Policy**

Action Progress

During the 2020/21 Halifax Regional Council budget deliberations, climate change was identified as evaluation criteria that should be considered for capital project planning. As such, climate change was added as a risk evaluation category in September 2020 and informed the 2021/22 budget recommendations. This category will be included in all future Capital Budget Processes.

In early 2020, Halifax Regional Council approved the municipality's Social Value Framework[15], which sets general guidelines to support social value in all municipal operations. As part of this policy, BUs requesting external services will be expected to include an environmental benefits category to tendering documents where applicable. These environmental benefits could include reducing emissions, safeguarding biodiversity and limiting the volume of waste. This policy was used in the procurement of solar design and installation services at the Dartmouth North Community Centre.

In January 2021, the Budget Committee approved the establishment of a strategic initiative funding plan in order to advance city building initiatives that Regional Council have identified as key priorities. This plan has not yet been established however the intention is to include dedicated funding starting in budget year 2022/23 for the implementation of projects like HalifACT, the Integrated Mobility Plan and The Windsor Street Exchange Redevelopment Project.

This year, an Executive Director was hired to lead the Halifax Climate Investment, Innovation and Impact Fund (HCi3), a subsidiary of EfficiencyOne and a non-profit responsible for operating the Halifax arm of the

[14] ICB, Investing in Canada's Future https://data.fcm.ca/documents/reports/investing-in-canadas-future-the-cost-of-climate-adaptation.pdf
[15] Administrative Order 2020-004-ADM, Procurement Administrative Order https://www.halifax.ca/sites/default/files/documents/business/doing-business-halifax/2020-004-ADM%20Procurement%20Policy.pdf

Low Carbon Cities Canada (LC3) partnership.[16] Through FCM, HCi3 has received a $15 million endowment to invest in a combination of local projects that reduce GHG emissions. In the Fall of 2021, a grant program will be launched to assist in the implementation of HalifACT.

1.3.16 Sub-Area 15: Governance And Capacity For Action

GOVERNANCE AND CAPACITY FOR ACTION						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
41. Establish a central Climate Change Office	Integrate climate thinking into municipal decision-making and governance		2020	✗	✗	✗
42. Increase staff capacity for implementation			2020	✓	✗	✗

Sub-Area Summary

Leading on climate action through HalifACT will require the mainstreaming of climate thinking throughout the organization to build the human and technical resource capacity needed to implement climate action both within the organization and in our community. To effectively mainstream climate action, the structure, placement, and functions of a climate change office should be considered.

The organization will need to increase staffing throughout the BUs and must work closely with key partners across the region. Staff resources can reside in the climate office, but some should also be distributed throughout the organization, reporting back to a centralized climate entity with a mandate to unify and streamline the climate response. The HalifACT plan recommends a minimum of 30 FTEs as a starting point to allow for the successful implementation of the climate plan and to adequately address the climate emergency.

Highlights

- **Three new positions were filled in 2020; two clean energy specialists and one climate change specialist**
- **Six new positions were approved as part of the 2021/22 operating budget**
- **Three have been filled while the others are currently being reviewed by Human Resources**

Action Progress

An initial conversation on implementing HalifACT took place in June 2021 with the Senior Leadership Team and focused on shared accountability, mainstreaming climate action, and resourcing requirements.

Work is progressing on developing job descriptions for new positions and reviewing the organizational structure of the Environment & Climate Change team. Some of the new positions are expected to be filled by the Fall of 2021.

1.3.17 Sub-Area 16: Monitoring And Reporting

MONITORING AND REPORTING						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
43. Annual Indicators Report	Monitor and report on climate action and impact		2020	✓	✓	✓

[16] Way to Help Fight Climate Change in Halifax, Efficiency Nova Scotia news release https://www.efficiencyns.ca/about-us/news/federal-government-climate-change-investment/#:~:text=LC3%20is%20a%20partnership%20between,and%202050%20carbon%20reduction%20targets.

Sub-Area Summary

Develop an annual indicators report to report on the progress of implementing the HalifACT plan. The report should highlight the progress of implementing HalifACT actions as well as the emissions and risk reduction, the capacity of the Municipality as an organization to work on climate action and the climate more broadly.

Action Progress

This report serves as the first annual indicators report for the implementation of HalifACT. Future work on this action will include development of a more robust monitoring and evaluation framework.

1.3.18 Sub-Area 17: Carbon Accounting

CARBON ACCOUNTING						
HalifACT Actions	**Target**	**Intended Start Date**		**Started**	**On Track**	**Adequately Resourced**
44. Carbon offsets framework	Get ready for neutrality and step up the carbon scope		2024	✗	--	--
45. Consumption-based emissions inventory			2026	✗	--	--
46. Include embodied carbon in new construction standards			2026	✗	--	--

Sub-Area Summary

Carbon accounting is an approach used to measure how much carbon dioxide equivalents an organization emits. Under our low-carbon LC3 scenario, 95% of Halifax's emissions will be reduced by 2050, however negative emissions and offsets will still need to be considered. As part of a Carbon Accounting practice, the Municipality will consider the development of a values-based framework for carbon offsets that includes guidelines for future policies and programs, and a mandate to explore emerging opportunities. Current GHG emissions inventories, including the one used as the basis for HalifACT, are limited to energy use and emissions produced within the geographical boundary of Halifax. The expansion of the emissions framework to include emissions associated with goods and services generated and produced outside of Halifax, and the carbon emissions embodied within new construction, will identify additional opportunities for GHG emissions reductions.

Action Progress

HalifACT actions 44-46 are all future actions (intended to begin in years 2024-2026), and therefore, no progress has been made in this sub-area.

1.3.19 State of Progress

While we've started 30 of the 46 HalifACT actions, it is apparent from the report card and Figures 5 and 6 that more resources are needed. Thus, despite our current efforts and commitments to staff and resources, we will not meet our targets at the present pace and level of resources. We know that to meet these ambitious targets we need rapid movement and collective action. When compared to the COVID-19 pandemic response, we are not treating climate change like the crisis that it is. From the beginning, HalifACT was always intended to be a climate action movement for Halifax, a community and corporate response to the climate crisis. The targets cannot be met if communities, organizations, governments, individuals, and businesses are not all working together. This means that government departments must work more collaboratively with external partners, BUs must take leadership on climate action, and community partners must be better supported by stakeholders and all levels of government. The scale of effort required to meet our targets necessitates commitment to action and shared accountability at its core.

Furthermore, it requires action that is at pace and adequately resourced. The following section highlights a few examples of our current scale of pace, staffing, and financing in support of HalifACT.

Scale of Pace

HalifACT is one of the most ambitious climate plans in Canada and with that, comes the need for immediate and rapid action. While it may be a 30-year plan, the majority of effort needs to happen within the first ten years if we are going to meet our targets. At our current pace, which can be characterized as BAU, we will exceed our carbon budget by 2028 as shown in Figure 7. Here are a few examples to illustrate the Municipality's current scale of pace:

- Modelling shows we need to perform deep energy retrofits on 5,000 buildings per year by 2040. In 2020, Efficiency Nova Scotia reported that 1,200 general retrofits were performed in the municipality. This level of retrofits is unlikely to increase significantly until our municipal deep energy retrofit program is fully launched in 2023.
- All municipally owned and operated critical infrastructure needs to be assessed for vulnerability to climate impacts and will require adaptation planning, with high anticipated costs. We currently have an unknown amount of at-risk critical infrastructure in HRM.
- We need to reach 100% new vehicle EV sales by 2030 which will require significant investment and policy as we currently are at 1%.
- Over 1,250 km of shoreline across the Municipality requires a coastal vulnerability assessment. Currently, the Municipality has assessed 60 km of shoreline within a portion of the municipal core, but has not addressed the rest of the municipality, including the remote areas along the Eastern Shore which have the highest coastal vulnerabilities.
- We have committed to installing 1,300 megawatts (MW) of rooftop solar electric with storage by 2030, which means an increase of 130 MW annually. We currently have installed 6MW.

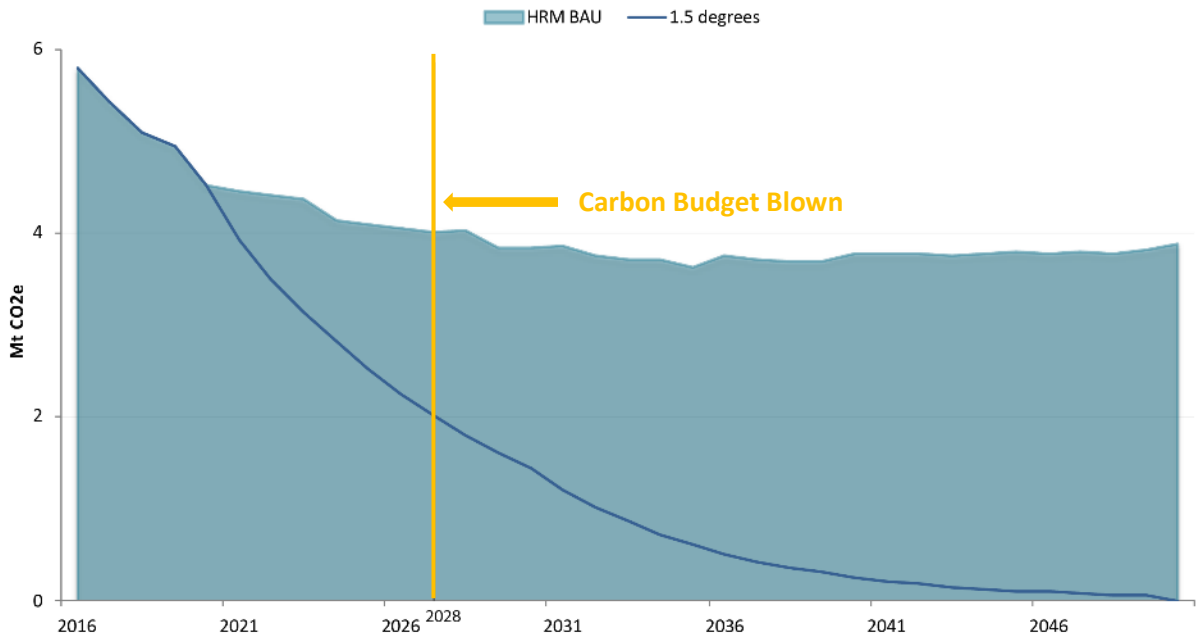


Figure 7 – Date of an exceeded carbon budget under the Municipality's BAU pathway

Scale of Staffing

To keep up with the scale of pace required to implement HalifACT, a substantial increase in staff capacity is required. HalifACT Action 42 is to "significantly increase staff capacity for implementation" and

recommends a minimum of 30 full time equivalents (FTEs) to start with; 10 FTEs working directly in the Climate Change Office and an additional 20 FTE's that will exist in a distributed network between the Climate Change Office and BUs to support collective action. At a population of 431,000, this would result in a ratio of 1 HalifACT FTE for every 14,400 residents in HRM. Currently, the Municipality has one HalifACT FTE per every 72,000 residents. Comparatively, the current ratio of residents to FTEs implementing climate plans for various Canadian cities is 1:12,000 for Saskatoon, 1:15,300 for Victoria, and 1:22,500 for Vancouver.

Scale of Finances

- HalifACT will require a substantial financial contribution from all levels of government and the community. As outlined in the Background section of this report, the public and private investment for emissions reductions total $22 billion and resiliency measures between $3.34 and 6.96 billion over the next 30 years. While the collective investment in adaptation and mitigation action is significant, the cost of inaction will continue to grow. To meet the targets set out in HalifACT, adequate financial resources are critical.

1.4 Our External Progress on HalifACT Targets

The Municipality has been working collaboratively with stakeholders to implement HalifACT with a sense of urgency and innovation. External partnerships and leveraged funding are crucial for success. With over 400 stakeholders, it has proven difficult to adequately capture all of the great work being done. In addition to quarterly stakeholder meetings hosted throughout the year, which provide a forum for sharing climate action updates, on June 10th, as part of the most recent quarterly HalifACT Stakeholder meeting, the stakeholder group was asked to share updates through breakout sessions, a survey, or by emailing the Environment & Climate Change team. Multiple follow-up emails were sent providing supplementary opportunities for input. This section showcases a selection of highlights from external partners who are making huge strides in climate action and helping the Municipality reach our collective HalifACT targets.

1.4.1 Government Agencies

Government of Canada

At the federal level, climate accountability legislation was introduced through Bill-C12, entitled: *An Act respecting transparency and accountability in Canada's efforts to achieve net-zero greenhouse gas emissions by the year 2050*[17]. This Act will set five-year incremental targets to achieve net-zero by 2050.

The 2020 Speech from the Throne highlighted the importance of a stronger and more resilient Canada and committed to protecting 25% of its land and 25% of its oceans by 2024, using nature-based solutions to fight climate change. As outlined in the 2021 Federal budget, over $1.5 billion was committed to resiliency and adaptation efforts with $1.4 billion over 12 years for the Disaster Mitigation and Adaptation Fund.

[17] Bill C-12, Parliament of Canada https://www.parl.ca/DocumentViewer/en/43-2/bill/C-12/royal-assent

As part of the National Knowledge Assessment Initiative[18], Natural Resources Canada released a landmark National Issues Report in June 2021, providing a national perspective on how climate change is impacting our communities, environment and economy, and how we can adapt. This complements the 2019 report, focused on assessing Canada's changing climate and the projected changes in weather events.

This summer, the Greener Homes Grant[19] program was launched which offers residential property owners up to $5,000 in rebates when complete eligible efficiency retrofit measures. In Nova Scotia, this program is being administered by Efficiency Nova Scotia which will ensure property owners can access both federal and provincial incentives.

Government of Nova Scotia

On October 27th, 2021, the *Environmental Goals and Climate Change Reduction Act*[20] was introduced. This Act will replace the previously introduced *Sustainable Development Goals Act* and will legislate provincial emission reduction targets of 53% below 2005 levels by 2030, and net zero emissions by 2050. A public engagement process was launched in the spring of 2021 to gather public input on goals under the Act and accompanying Climate Change Plan. In July 2021, the Municipality submitted recommendations to the Province to inform the development of the Plan. These recommendations would enable the Municipality to progress on several climate actions, benefitting both parties. While there has been a change in government and the status of the Plan is unknown, the municipality will continue to be an engaged stakeholder on climate action including initiatives like the Municipal Flood Line Mapping Project and setting regulations for the new *Coastal Protection Act*.[21]

Develop Nova Scotia

Enabled by the Municipality's 2018 LIDAR data, and guided by detailed sea level rise and storm impact assessments, Develop Nova Scotia has been upgrading coastal infrastructure to meet both the needs of community and to address the challenges of climate change and sea level rise. In downtown Halifax, some public wharves have been rebuilt to both extend and elevate them to account for predicted storm surges and wave run-up. In partnership with the former NS Department of Transportation & Active Transit Peggy's Point Road was raised along with the addition of a new, accessible pedestrian viewing deck and public washrooms. This addition was designed and constructed with coastal resiliency and sea level rise projections in mind. Sea level rise has also informed a recent marine infrastructure upgrade at the Centre for Ocean Ventures & Entrepreneurship.

1.4.2 Utilities

Heritage Gas

Heritage Gas was a key partner in the development of the Maritimes Hydrogen Feasibility study in the Fall of 2020. The study assessed the role that hydrogen can play in the Maritimes' energy transition towards a net-zero-emission future. With key areas being to offset natural gas space heating, decarbonizing heavy transport and electricity generation and storage. This study was supported by the Municipality as new and emerging technologies like green hydrogen will play a key role in achieving the targets of HalifACT. This study led to the creation of the Atlantic Hydrogen Working Group which intends to establish a framework for the development and deployment of low-carbon hydrogen projects in Atlantic Canada. One of these projects could include a hydrogen electrolysis plant powered by 4MW of wind energy which was submitted to the Investing in Canada Infrastructure Program Climate Change Mitigation Sub-Stream for consideration

[18] Canada in a Changing Climate, Government of Canada https://www.nrcan.gc.ca/climate-change/impacts-adaptations/canada-changing-climate/19918
[19] Greener Homes Grant, Government of Canada https://www.nrcan.gc.ca/energy-efficiency/homes/canada-greener-homes-grant/23441
[20] Nova Scotia Legislature, Bill No. 57 Bill NO. 57, Nova Scotia Legislature, https://nslegislature.ca/legc/bills/64th_1st/1st_read/b057.htm
[21] Coastal Protection Act, Nova Scotia Government https://novascotia.ca/coast/

and supported by the Municipality. If successful, the project would be located within HRM and produce 40,000 GJ of green hydrogen annually. Finally, Heritage Gas have been actively engaging with Halifax Water and the Municipality on the design, construction, operation, and maintenance of a potential Regional Biosolids Processing Facility at Aerotech Business Park. This facility would produce renewable natural gas.

Nova Scotia Power Inc.

Nova Scotia Power Inc. (NSPI) is supportive of HalifACT and has been a key stakeholder in its development and will be crucial to its successful implementation. They are actively transitioning to clean energy and have become a demonstrated national Leader in Greenhouse Gas Emission reduction. Since 2005, they've reduced coal use by 33% and are on track to achieve 40-45% emissions reduction below 2005 levels well before 2025. In 2022 approximately 60% of electricity will come from carbon free sources, once the Nova Scotia block of energy starts to flow across the Maritime Link. This pathway aligns with the direction of NSPIs parent company, Emera, which set a commitment of an 80% reduction in the use of coal by 2023 and a vision of Net-Zero by 2050. Specific to action on HalifACT, NSPI has been working closely with the Municipality on transit electrification (including ferries) and the Municipal Electric Vehicle Strategy.

Efficiency NS

In 2020, EfficiencyOne celebrated 10 years offering Energy efficiency rebates and programs saving Nova Scotians over $1.4 billion in energy costs and offsetting over 1 million tonnes of CO_2 annually. In just the past year, Efficiency Nova Scotia's programs helped reduce emissions from residential and non-residential buildings by over 11,000 and 7,780 megatonnes of CO_2 respectively. In March, the Halifax Climate Investment, Innovation and Impact (HCi3) Fund was established as an operating subsidiary of EfficiencyOne. HCi3 is a non-profit responsible for operating the Halifax arm of the Low Carbon Cities Canada (LC3) partnership.[22] Through FCM, HCi3 has received a $15 million endowment to invest in a combination of local projects that reduce GHG emissions. In the Fall of 2021, a grant program will be launched to assist in the implementation of HalifACT.

1.4.3 Collective Impact

Outpost Partnership

The Halifax Civic Innovation Outpost launched in November 2019 and focuses on social innovation, data transparency, and connecting start-ups within the municipality. The Municipality has committed to the next chapter of the Outpost based on the updated mandate that the Outpost support the implementation and progression of HalifACT. The Outpost will make space for accelerated prototyping which is crucial to solving complex problems like climate change. Working with the Outpost has served as a place for collaboration across businesses, governments and organizations.

Gigatonne

Municipal staff and 32 members of the HalifACT Action Network participated in the Gigatonne Strategy, facilitated by Complexity University. The Gigatonne Strategy is a global community focused on moving away from business-as-usual strategic planning, to learning how to effectively prototype and tackle the world's most complex social, environmental, and political challenges. The HalifACT teams were focused around the areas of climate adaptation, operations, and electric mobility. The following prototypes were developed:

- **One More EV on the Road** which focuses on converting drivers to electric vehicles.
- **Building Bedtimes** which focuses on saving building owner's money and reducing emissions by "putting buildings to bed" at night.

[22] Way to Help Fight Climate Change in Halifax, Efficiency Nova Scotia news release https://www.efficiencyns.ca/about-us/news/federal-government-climate-change-investment/#:~:text=LC3%20is%20a%20partnership%20between,and%202050%20carbon%20reduction%20targets.

- **The food waste prototype** which focuses on reducing our FoodPrint! by encouraging less food waste in compost bins.
- **Catch it if you Can** which focuses on rain gardens as Stormwater Management Service for institutions.
- **Storm Kits for Newcomers** which provides information and physical emergency kits to support newcomers to Canada in being more prepared for extreme weather events.

Green Economy

Halifax's Economic Response & Recovery Plan calls for a green recovery and aligns with HalifACT. This plan includes resiliency as a guiding principle, and action 31 states, "Address the climate change emergency in the context of COVID-19, taking advantage of the opportunity to transition to a carbon-neutral economy by 2050." Action 21 states, "Re-assess, advocate for, and proceed with key infrastructure projects that stimulate the economy and address climate change."

This work and collaboration has resulted in the formation of a Green Economy Advisory Group that includes representatives from the Municipality, the Halifax Partnership, Efficiency Nova Scotia, Nova Scotia Power, academic institutions and non-profits. This group is advising on the development of Halifax's new 5-year economic growth plan from a green economy perspective.

The Halifax Partnership hosted its first ever CEO Forum focused on the green economy in November 2020, an event that was oversubscribed due to popular demand. Staff will continue to participate in this working group to build relationships and spur climate action within the business and academic communities. Many of the CEOs who participated supported the idea of creating a CEO Charter for Climate Action and work is underway to finalize this new charter.

Attachment B – HalifACT 3-Year Resource Plan

HalifACT incorporates the principles of adaptive management and collective impact, as the Municipality cannot succeed in addressing the climate crises alone. To successfully implement HalifACT at the pace and scale required, necessitates the following:

- Mainstreaming climate action into municipal budgeting, work planning and reporting process
- Shared accountability of the actions in the plan across BUs
- Adequate resources – staff and funds for both the Environment & Climate Change team as well as across BUs
- Continued leadership and commitment to climate action
- Continued prioritization of the work
- Increased access to funding, particularly from other levels of government

This 3-year resource plan is intended to demonstrate the initial level of commitment and resources required internally to progress the 7 critical core areas of action that the Municipality committed to prioritizing when HalifACT was adopted in June 2020. It is intended to address the known gaps in resources currently and can be flexible over time as we continue to refine projects and mainstream HalifACT into municipal budgeting, work planning and reporting processes.

The financial and human resource requirements outlined in this plan:

- Cover the major pieces of work across the 7 Core Action Areas only and do not cover all work required across all 46 HalifACT actions
- Are, to the best of our knowledge, new position and financial resource asks that have not been captured in other previous Council asks
- Are estimates and need to be refined by individual Business Units through the budgeting and work planning processes

Additional resources will be required as we continue to build our capacity to deliver on HalifACT across Business Units and with the community at large.

PART 1 - Mainstreaming HalifACT into Municipal Budgeting, Work Planning, and Reporting Processes

In order to succeed in reaching our climate targets, HalifACT actions need to be integrated into the municipal budgeting, work planning and reporting processes. Each Business Unit will need to take a leadership role on multiple HalifACT actions and also support many other actions. We need to mainstream climate thinking and action across our organization. While this process is ongoing and more work is needed, progress has been made over the past year, focusing primarily on shared accountability of HalifACT actions across Business Units, as outlined in Figure 1 below. The agreed-upon role of the Environment & Climate Change team is to lead on many HalifACT actions while also advising and supporting Business Units in leading their own actions and tracking progress to report to Council, key stakeholders, and the public.

Step 1: In June 2021, the Senior Leadership Team considered the HalifACT actions to be led or supported by each Busines Unit. Each BU has been assigned proposed HalifACT actions that they are responsible for leading/co-leading as well as proposed actions that they are responsible for supporting.

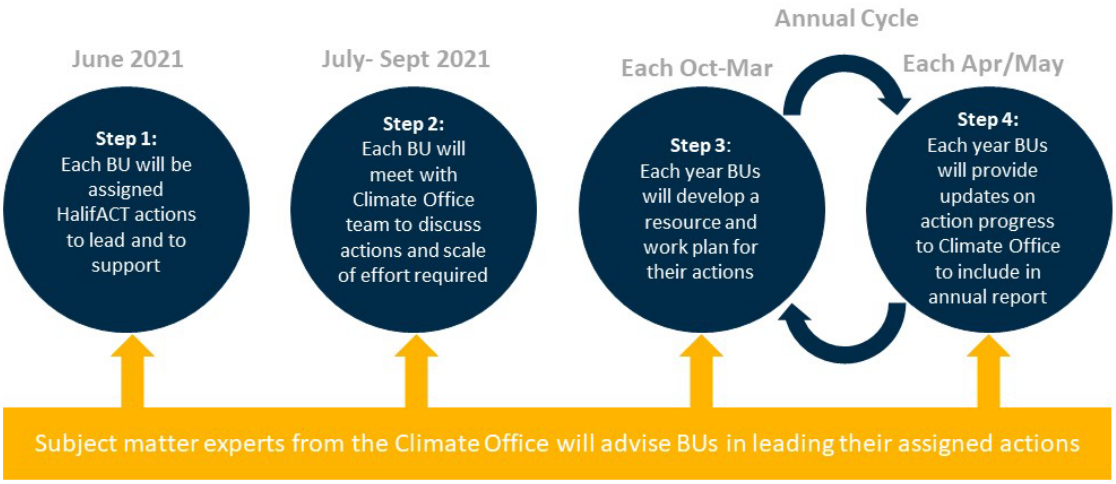


Figure 1: Conceptual diagram of first iteration of business unit shared accountability process for HalifACT implementation

Step 2: Throughout the summer months, the climate team separately met with most BUs and the Halifax Regional Water Commission to review the assigned actions and begin discussions around required resources, current barriers to implementation, and the state of current action. The team will continue discussions with remaining BUs. While some BUs are further ahead in the climate mainstreaming process, most are still at the stage of working to understand the actions set out in HalifACT and how they relate to their current work. The breakdown of BU responsibilities by HalifACT actions is captured in the Business Unit Reference Document which has been updated to reflect their input during our recent discussions.

Step 3 & 4: Every October through March going forward, BUs will develop a resource and work plan for their respective HalifACT actions, including resources required for staff. Every April through May of each year, they will provide updates on action progress to Environment & Climate Change to include in the annual report.

We are at the beginning of the mainstreaming and resource planning process, and a lot more work is required for successful integration. To allow BUs time to consider their areas of responsibility and begin planning, we have continued to include all major costs for climate action across the organization in the 10-year capital plan and strategic initiative work.

PART 2 - Short-term Actions (2022-23 to 2024-25)

While HalifACT calls for immediate work on almost all 46 actions, there are some that the Municipality has strategically chosen to focus on, recognizing the need to ramp up resources and effort over time. Detailed below are the major pieces of work in each of the seven critical core areas, along with the estimated required human and financial resources.

The mechanisms for acquiring these resources will vary, but include regular capital and operating budget requests, new staff position requests, securing funding, and also by requesting funds outside of our current municipal envelope via Strategic Initiatives funding, first discussed at Budget Committee in January 2021[1].

[1] strategic Initiatives Funding Plan, Halifax Regional Municipality https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/210120bc5.pdf

Core Area 1: Create new energy retrofit and renewable energy programming

Project 1.1 Retrofit, Renewables, Resilience (R3) Pilot Program:
The Municipality has begun work to develop a retrofit program for community buildings. The Retrofit, Renewables and Resilience (R3) Program aims to achieve a 50% reduction in energy demand from all existing buildings by 2040, while also integrating on-site renewables and climate resiliency measures. Staff has developed an R3 Design Team that includes municipal staff, non-profit organizations, and building science experts who are working to design and rapidly prototype this program for property owners within the municipality. The R3 Design Team meets on a weekly basis and employs an iterative and prototyping approach to develop a program framework with the support of coaches, industry experts, and input from our broader stakeholder network. The goal of the R3 Design Team is to have a program prototype to test ideas that will eventually lead to a larger program for building retrofits across the municipality.

Project 1.2 Community Efficiency Financing Grant – Financing & Program Evaluation:
To help address the barrier of expanded financing, staff were successful in applying to the Federation of Canadian Municipalities' Community Efficiency Financing program for a grant to perform a program evaluation study. The study will evaluate the Solar City Program through a lens of equitable access, loan product competitiveness and the ability to scale. The intended results of this study are to develop minimum requirements for third-party lenders, private investors or utilities, to enable the investment needed to achieve the goals of HalifACT.

Project 1.3 Continue Delivery of the Solar City Program:
The Halifax Solar City Program has been successful in increasing solar adoption across the Municipality. The current program has been operating since 2016 and as of June 2021, over $15 million in financing has been committed to the install of 5.5 mega-watts of solar energy. These systems are expected to save property owners over $1 million in utility costs annually and offset 4,600 tonnes of eCO_2 per year. The effort needs to be scaled up significantly and expanded to efficiency and resiliency measures. While the R3 Program is being developed, the Solar City Program will continue to operate as is.

Project 1.4 Design and launch a full-suite program:
Taking the lessons learned from the R3 Pilot Program and the information learned through the Community Efficiency Financing study, staff will work to launch a full suite retrofit, renewables and resilience program that offers equitable financing to property owners. A program delivery model has not yet been determined, but there will be significant resource requirements for program development, contractor management, evaluation and quality control from the Environment & Climate Change team as well as supporting Business Units including Finance and Asset Management and Legal and Legislative Services.

Resource Requirements

The R3 program and supporting components will require an operating budget of $1 million to allow for program design, consulting support and program implementation and administration. The program will require six FTEs to work on program design, implementation, administration, and evaluation. This operating amount is not included in the Strategic Initiatives funding request.

Total Budget: $1 million

FTE Resources

Total Required: 6
Current Approved: 2 (Clean Energy Specialist, P&D; Climate Change Specialist, P&D)
2022/23 Request: 1 (Clean Energy Technician, P&D)

Remaining Need: 4

Core Area 2: Develop a detailed and costed plan for retrofitting existing municipal buildings to be net-zero ready and climate resilient

Project 2.1 Building Energy Roadmap
As part of the adoption of HalifACT, Regional Council committed to a net-zero municipal operations target by 2030. A building energy road map is being developed to determine the optimal path to complete building energy retrofits to meet the HalifACT targets. The roadmap will be developed during fall 2021 and will determine roles and responsibilities across the organization, staffing requirements, costs and potential funding sources. The completed Building Energy Roadmap will present detailed resource requirements and will be presented to Regional Council.

Project 2.2 Resilience Retrofit Study and Guidebook
Climate resilience measures need to be included in all new municipal buildings and all building retrofit projects in the future. The first step to get this started is to procure a building resilience retrofit study and guidebook to better understand the resiliency measures that can be integrated into the municipal building stock. This project will engage a consultant and will align with the Building Energy Roadmap to integrate resilience retrofit measures with the energy retrofit plans.

Project 2.3 Building Retrofit Projects
The Municipality will be completing energy efficiency upgrades in five large community facilities in the coming years. These projects will be tailored to each building's specific needs and focus on better heating and cooling systems and the integration of solar photovoltaic systems to offset on-site energy use. Funding has been secured through the Investing in Canada Infrastructure Program and work will be completed in 2024-25. The municipal contribution for the project will be $2.1 million over the four years of implementation.

Resource Requirements

The Building Energy Roadmap will provide a detailed and costed plan for retrofitting existing municipal buildings. This will refine the Strategic Initiatives funding ask of $35.78 million for this project. In addition, this Plan will identify potential funding sources and provide a total lifecycle costing analysis, outlining cost savings relating to energy savings, reduced maintenance, and carbon pricing. This plan will be presented to Regional Council in 2022. The resilience retrofit guidebook will require consulting money to complete in 2022/23.

Budget: $35.78 million (Included in Strategic Initiatives funding request)

FTE Resources

Total Required: 2
Current Approved: 1 (On-site Energy Manager, CCS)

Remaining Need: 1

Core Area 3: Develop an electric vehicle strategy, increase charging infrastructure and replace fleet vehicles with electric vehicles

The Municipal Electric Vehicle Strategy is complete and will go to Regional Council for consideration this fall. The strategy will provide recommendations on public infrastructure, policy requirements, education needs and a municipal light duty fleet transition plan that would position Halifax as an EV-ready municipality.

Project 3.1 Public Charging Infrastructure
One of the most common barriers to EV adoption is range anxiety brought on by the lack of public charging infrastructure. Range anxiety refers to the concern that the vehicle's battery will run out before finding a charging site. While it is anticipated that the utility and private investors will support public

charging deployment as the adoption of EVs increases across the province, the Municipality has the responsibility to lead in the short term. This aligns with other leading jurisdictions like Toronto, Victoria, and Montreal, who have already deployed or have plans to deploy public charging within their communities. To get started on deployment, an application has been submitted to Natural Resources Canada's (NRCan) Zero Emission Vehicle Infrastructure Program, which offers 50% cost charging for public charging. Deployment will consist of:

- Project siting;
- Liaison with Nova Scotia Power and other internal HRM departments as necessary;
- Drafting, issuing and evaluating tender documents;
- Project management for the installations;
- Working with Legal and Legislative Services to set and collect user fees; and
- Ongoing monitoring of site usage.

Project 3.2 Community-wide EV Policy & Education
The total cost of the Public Deployment Plan will not be borne solely by the Municipality as we will work to develop partnerships, secure funding, and encourage private investment. This will be done in part with increased public education and in offering support to private property owners through:

- Partnering with the Clean Foundation's Next Ride program to support their EV test drive and education events;
- Developing support resources for private building owners and condominiums to help develop EV Ready Plans that will guide comprehensive 100% EV Ready retrofits;
- Begin discussions with private and public organizations to encourage deployment of charging infrastructure at sites that are not municipally owned; and
- Act as a delivery agent to provide funding through NRCan's ZEVIP program and other future EV funding sources.

Project 3.3 Fleet Transition
The net-zero municipal operations by the year 2030 target includes decarbonizing corporate fleet. As part of the Electric Vehicle Strategy, Dunsky Consulting looked at electrifying municipal light duty fleet. To ensure all operational needs are met, Dunsky used their Fleet Electrification Optimization model to determine the most cost effective and least disruptive pathway to achieve a full electric light duty fleet by 2030. To complete the transition, the Strategy recommends that a full-time staff person be dedicated to planning and overseeing the light duty fleet transition while developing a plan for heavy duty fleet decarbonization.

Resource Requirements

Implementation of the Electric Vehicle Strategy will require new financial and staff resources and a detailed and costed plan is included in the strategy. The first three years of implementation require $15.95 million for municipal fleet electrification and public charging infrastructure. Cost sharing opportunities will be explored where available. Implementation of these new initiatives will require three FTEs over the first three years.

Budget: $15.95 million. (Included in Strategic Initiatives funding request)

FTE Resources

Total Required: 3
Current Approved: 2 (Clean Energy Specialist, P&D and Sustainable Fleet Analyst, CCS)

Remaining Need: 1

Core Area 4: Explore opportunities to require net-zero standards for new buildings in the municipality

Project 4.1 Federal Tiered Code Analysis
All municipalities in Nova Scotia observe the 2017 National Energy Code of Canada for Buildings (NECB). The federal government is currently developing a tiered energy code, with the most ambitious tier expected to strive for net-zero. The Municipality has been engaging with the Province to ask that it adopt this code when released in December 2021 and select the most appropriate tier that aligns with HalifACT. The Province has historically been progressive in adopting new versions of the NECB and based on recent discussions, a specific tier of code will be adopted in 2022 after a market-ready assessment is completed. Once the federal code is released, the Municipality will compare it to the technical analysis of HalifACT and determine the best course of action moving forward.

Project 4.2 Halifax Green Standard
If provincial direction on the new federal code does not align with HalifACT and a request to the Province to prescribe more stringent standards is unsuccessful, the Municipality can consider an incentive-based program like that of the Toronto Green Standard (TGS). The TGS is a municipal version of the BC Step Code that outlines the most effective path to meeting Toronto's greenhouse gas emission reduction targets through four energy performance tiers. Developing a Halifax Green Standard would consist of:

- Determining clear energy performance targets for various building architypes to achieve net-zero new construction by 2030;
- Determining the appropriate incentive levels while leveraging existing offerings;
- Determining cost premiums and total cost of ownership; and
- Incorporating the standard within the existing permitting and inspection process.

Project 4.3 Resilience in New Construction
In order to encourage resilience considerations in new buildings, a consultant will be hired to determine resilience requirements for future building codes and how to integrate them into new construction projects for both corporately owned buildings and community buildings. These measures can be incorporated into the Halifax Green Standard if that is the route of implementation that the Municipality takes.

Resource Requirements

The pathway for implementation of Core Area 4 is still unknown and will become clearer after the release of the federal step code, anticipated to be released in fall 2021. Resources are required for consulting support to determine the optimal pathway to implement more ambitious energy requirements for new buildings and resilience measures.

Budget: $200,000

FTE Resources

Total Required: 2
Current Approved: 0

Remaining Need: 2* (Contingent on 2020 National Energy Code for Buildings)

Core Area 5: Develop a framework for assessing and protecting critical infrastructure

Project 5.1: Flood hazard maps
Municipal staff, in collaboration with climate scientists and consultants, will complete a comprehensive spatial flood risk analysis to identify areas of coastal and freshwater flood risk across the entire municipality. The resulting maps will be made publicly available and will be integrated into HRM planning processes and policies, including land use by-laws, subdivision by-laws, development permits etc. The maps will also support prioritization of at-risk critical infrastructure for climate-proofing upgrades.

Project 5.2: Spatially based risk and vulnerability analysis for municipally owned and operated critical infrastructure
Future-proofing municipally owned and operated critical infrastructure is a crucial part of adapting to climate change and will be an ongoing priority for the duration of HalifACT implementation. Across Canada municipalities are responsible for 60% of public infrastructure and bear the brunt of current and future climate impacts. Failure to act on this quickly will result in high recovery costs as climate impacts increase in frequency, severity, and intensity. While this project is currently in its infancy, work over the next three years must scale quickly and include creation of an inter-business unit working group, spatial identification of our municipally owned and operated critical infrastructure, risk and vulnerability analysis of our critical infrastructure, prioritization of critical infrastructure requiring future-proofing for various climate impacts, and integration into capital planning and asset management processes. Within the next 3 years, critical infrastructure upgrades should begin and continue until all critical infrastructure is climate-proofed. Best practices suggest that spending between 0.6% and 1.25% of GDP on adaptation measures to minimize the worst impacts of climate change. With a gross municipal budget of approximately $750 million, the municipality as an organization should consider spending up to $10 million annually to future-proof critical infrastructure. The 2022/23 ask for this work is $200,000 to support the completion of a spatial analysis of critical infrastructure in HRM. Beginning in 2023/24, the capital request is $10 million annually to support upgrading critical infrastructure to be climate resilient. This is separate, but complementary to the work being carried out in Project 2.3 above.

Project 5.3: High-level risk assessment for all critical infrastructure in HRM
In concurrence with the identification and prioritization of municipally owned and operated critical infrastructure, a high-level risk assessment for all critical infrastructure in HRM will need to be completed. HFRE has begun this work from an emergency management perspective, but additional capacity and support is required. Over the next 3 years this work would include creating a working group with internal and external stakeholders who own and operate critical infrastructure across the municipality (e.g., utilities, transportation, water, health facilities, telecommunications, etc.), working with a consultant to lead workshops on risk and vulnerabilities of these systems focusing on climate impacts, and the inter-dependencies between systems during climate events.

Project 5.4: Shore Road Flood Risk Resiliency Project
Shore Road in Eastern Passage has been identified across multiple business units as a highly vulnerable piece of critical infrastructure that requires immediate attention and a long-term resilient approach. While conducting the spatially-based risk and vulnerability analysis for municipally owned and operated critical infrastructure, staff will begin work to climate-proof Shore Rd. This requires the completion of a study to identify appropriate long-term approaches for addressing the current and future climate risk to this area and resulting capital work.

Project 5.5 National Disaster Mitigation Program (NDMP) Projects
The NDMP identified 30 sites throughout the HRM core that experience frequent coastal or freshwater flooding. Ten of the 30 sites have been prioritized for flood mitigation work ranging from studies to construction. Over the next 3 years, work will continue on addressing flood risk across prioritized sites.

Resource Requirements

Financial resources are required for the planning and modelling of climate hazards and for the implementation of resiliency upgrades to infrastructure identified under Project 5.2. Resourcing needs for the NDMP Project will be presented to Council at a later date.

Budget: $20.6 million. (Included in Strategic Initiatives funding request)

FTE Resources

Total Required: 6
Current Approved: 2 (Climate Change Adaptation Specialist, P&D and Program Engineer, P&D)
2022/23 Request: 1 (Junior Climate Change Specialist)

Remaining Need: 4

Core Area 6: Support communities for climate adaptation and climate-related emergencies

Action in Core Areas 6 spans across the topics of food systems, emergency management, green infrastructure, integrating climate into planning, and nature and covers 10 HalifACT actions. This section highlights only a few of the many projects needing to be implemented over the course of the next three years to move this important work forward.

Food Systems
Project 6.1 JustFOOD
Supporting community food systems in the context of climate over the next three years will require the development of a Food Emergency Plan to understand the impact of climate on the food system and identify the gaps in the food system during extreme weather events, creation of a Local Food Hub to support emergency food infrastructure, and implementation of JustFOOD. The implementation of JustFOOD will include the creation of a multi-stakeholder working group focused on climate impacts to food systems, the development of a strategy and resource plan, and building community capacity and awareness around sustainable diets and the importance of local food systems in a changing climate.

Emergency Management
Project 6.2 Climate Hazard Maps and Data Gaps
A critical first step for many of the HalifACT adaptation actions, including emergency management, is the creation of climate hazard maps for the entire municipality, including coastal flooding, coastal erosion, freshwater flooding, drought, wind, and wildfires. Without hazard maps we cannot plan for climate impacts, create accurate evacuation plans, or prioritize at-risk infrastructure upgrades. This work will include identification of existing data, data gaps, and the creation of hazard maps for the municipality.

Project 6.3 Evacuation Plans for Extreme Weather Events
Supported by information from the climate hazard maps, evacuation plans need to be developed for every community. This work should be started within the next three years but will be ongoing in nature.

Project 6.4 Storm Kits for Newcomers
Newcomers to Canada are often not prepared for our extreme weather events. The storm kits for newcomers project provides newcomers with customized storm kits and translated information about what to do in the case of severe weather events. This pilot project has been a big success and will be expanded to more newcomer families.

Project 6.5 Disaster Support Hubs
This project focuses on the creation of disaster support hubs to enable community self-sufficiency during and after extreme weather events. Fire and Emergency Services already works closely with many communities to support on an ad-hoc basis, but more resources and a comprehensive plan for creating disaster support hubs across the municipality is required.

Green Infrastructure

Project 6.6 Stormwater management

Green infrastructure projects will include the development and implementation of additional stormwater management pilot projects throughout the municipality, the development of best management practice standards for the right of way, red book updates focusing on public infrastructure, the delivery of a stormwater public education program for private property owners, and the development of standards for naturalized stormwater ponds in conjunction with the Halifax Regional Water Commission.

Integrating Climate into Planning

Project 6.7 Climate Hazard Map Integration

The most critical piece of work on this topic is to adequately incorporate climate hazards into municipal planning. As climate hazard, vulnerability, and risk maps are created and the understanding of climate impacts for the municipality is increased, staff will need to accelerate incorporation of this knowledge into municipal planning processes, policies, plans, and by-laws. Some work in this area will include a comprehensive review of coastal development in the municipality and improvement of current practices to better protect homeowners from coastal climate impacts, integration of the Nova Scotia Coastal Protection Act into municipal processes, adequate integration of climate hazards into the regional plan, development of consistent language for climate hazard integration into MPSs, LUBs and other bylaws, incorporation of hazard maps into planning documents, integration of climate hazard knowledge into the development permitting process, and prioritization of emergency planning.

Nature

Project 6.8 Naturalization Strategy

Naturalization is an ecological approach to landscape management that enhances biodiversity and improves ecosystem health and resilience in an urban environment. Recent naturalization pilot projects in park and ROW areas have highlighted that there are many opportunities for more naturalization in the municipality and growing community interest in naturalization. Work will include development of a municipal-wide approach to naturalization, implementation of naturalization projects across the municipality and expanded education around the benefits of naturalization.

Project 6.9 Green Network Plan

The Halifax Green Network Plan, approved by Council in August 2018, provides land management and community design direction for the municipality prioritizing interconnected open space and ecosystem functions and benefits. Next steps for this plan will be to establish a cross-departmental working group to coordinate implementation of the Plan through the Regional Plan review.

Project 6.10 Urban Forest Master Plan Update

The Urban Forest Master Plan (UFMP), approved by Council in 2012, supports the protection and growth of urban forests in HRM. Work includes the development of a new UFMP that prioritizes both planting and pruning programs, development of landscape design construction standards for green infrastructure and creation of a clear policy for tree preservation during development processes.

Resource Requirements

Resources are required to support engagement activities, creation of hazard maps, completion of studies, and the purchase of storm kits. Resourcing needs for the Green Network Plan, JustFOOD, the Naturalization Strategy, and the UFMP will be presented to Council at a later date.

Budget: $1.65 million

FTE Resources

Total Required: 10
Current Approved: 5 (Environmental Planner, P&D; Climate Change Adaptation Specialist, P&D; Program Engineer, P&D; Supervisor Environment, P&D; Environmental Specialist, P&D)

Remaining Need: 5

Core Area 7: Develop a financing strategy to operationalize the HalifACT plan over 30 years
Decarbonizing and adapting to the impacts of climate change will require significant investment and mobilizing the required funds for the task ahead will be a challenge at many levels. The challenge of climate change requires municipalities to explore and establish new mechanisms for financing climate, report and disclose climate related financial risk, and build partnerships for greater leveraging of public and private dollars.

Project 7.1 Develop a Financing Strategy
A critical first step is to create a detailed financing strategy for the continuous implementation of HalifACT from now until 2050. Climate financing tools that can be explored include: green bonds, environmental impact bonds, catastrophe bonds, and revolving funds. The strategy will explore how these new mechanisms as well as the use of traditional municipal financing strategies to implement specific projects and program to meet the goals of HalifACT in the short term and allow for flexibility for future years of financing.

Project 7.2 Climate-Related Disclosure
Cities across Canada have begun to disclose financial information that is related to climate risk. The Task Force on Climate-related Financial Disclosures (TCFD) provides a framework for annual public reporting. The Municipality will begin to integrate the TCFD framework into annual financial reporting and budget processes and will collaborate with and learn from other Canadian Cities who are already working to implement climate related financial disclosure.

Project 7.3 Corporate Asset Management and Capital Planning
There has been significant progress on developing an asset management system, technology and processes. Initial work to develop a municipal natural assets inventory has been completed through the Municipal Natural Assets Initiative (MNAI). With the inventory, staff will develop a full natural assets management project and implement into asset registry and policies which can be used in decision making. The capital budgeting process will begin to integrate more climate considerations and eventually move to a carbon budgeting process.

Project 7.4 Climate Liability
Across Canada, climate change litigation is increasing against governments and their agencies with growing litigation around government inaction on climate change, around approvals or decisions to build in hazardous locations, and lawsuits seeking compensation related to failure to adequately adapt infrastructure. Initial research is already underway on this topic within the municipality but further work over the next 3 years will include additional research on climate liability, integration into relevant processes and policies across the organization, and education for decision makers and councilors.

Resource Requirements

Resources will be required for studies, asset management implementation and collaboration with other cities.

Budget: $400,000

FTE Resources

Total Required: 3
Current Approved: 0
2022/23 Request: 1 (Sustainable Finance Specialist, FAM)

Remaining Need: 3

Enabling Actions:

While not Core Areas, Engagement, Reporting, and Governance Structure have been identified as enabling actions; those that provide the foundation for success across all critical areas of action. The following enabling actions also require resources and successful implementation of HalifACT depends on these enabling actions.

Enabling Action 1: Engagement
Engagement of key stakeholders and the public are a foundational component of the implementation of HalifACT. In the short-term, staff will continue to support the HalifACT Action Network and expand the collective impact training and project development with internal and external stakeholders. This will include project prototyping to find new ways of getting innovative projects started and engage diverse stakeholders in the implementation of HalifACT. Public outreach and education campaigns will be developed in collaboration with Corporate Communications and have a strong focus on diversity and inclusion.

Enabling Action 2: Reporting
Tracking and monitoring success is integral to knowing how the municipality is tracking towards the HalifACT targets. The HalifACT actions are all diverse and will require different KPIs and data sources to truly understand if they are progressing in the time and at the scale that is required. A rigorous reporting framework with metrics, data sources, and an adaptive management approach is needed to track progress on HalifACT implementation over the 30 years of the plan. Greenhouse gas accounting for the corporate and community emissions is a fundamental piece of the annual reporting, but qualitative and progress related metrics also need to be developed and reported on annually.

Enabling Action 3: Mainstreaming Climate
As described in section one above, all Business Units have actions that they are responsible for implementing and adequately resourcing. Support for BUs to take on this new work and effectively implement HalifACT actions will be supported through training, mentoring, subject matter expertise, and supporting the monitoring and tracking of the annual progress on implementation. Reporting on the annual progress and the information from across the organization will take place in both the annual progress report and reporting on Council's Strategic Initiatives. A thirty-year plan requires rigorous project management, change management and coordination to ensure its success.

Enabling Action 4: Governance Structure
The establishment of a Senior Climate Leadership Team will be necessary to support the mainstreaming of climate thinking and action across the organization and will be able to ensure that Business Units are collaborating and supporting climate work in all areas of the organization. A governance and accountability structure for the implementation of HalifACT will be established and supported by Environment & Climate Change. Funding is required to support engagement activities for the stakeholder network, the public, and focus on diversity and inclusion initiatives. A consultant will be hired to create a reporting framework for the plan that can be used in future years of reporting and will track progress on KPIs. Reporting, mainstreaming climate thinking and establishing a governance structure will be essential functions of the Environment & Climate Change Team.

Resources Required

Funding is required to support engagement activities for the stakeholder network, the public, and focus on diversity and inclusion initiatives. A consultant will be hired to create a reporting framework for the plan that can be used in future years of reporting and will track progress on KPIs. Reporting, mainstreaming climate thinking and establishing a governance structure will be essential functions of the Environment & Climate Change Team.

Budget: $6,200,000 ($6,00,000 is included in Strategic Initiatives funding request)

FTE Resources

Total Required: 9
Current Approved: 4 (Climate Change Specialist, P&D; Clean Energy Specialist, P&D; Project Controller, P&D; Stakeholder Engagement Specialist, P&D)
2022/23 Request: 3 (Supervisor, Community Energy Programs, P&D; Supervisor, Climate Resilience, P&D; Supervisor, Corporate, Climate Action, P&D)

Remaining Need: 5

PART 3 - Resource Summary

Staff resources need to be significantly increased across the organization to deliver on the next three years of HalifACT implementation. The staff requirements that are outlined in the critical areas of action above will allow the organization to take on the new areas of climate work that are being mainstreamed through the work of the BUs. There will be additional staff requirements as the plan moves through implementation, and the numbers will be updated and adapted on a yearly basis depending on the state of progress, secured funding, and if we are tracking towards our targets.

The role of the Environment & Climate Change team will be to lead more than half of the HalifACT actions, provide subject matter expertise, provide ongoing training, guidance, and mentoring, lead stakeholder engagement, and coordinate and track progress on HalifACT actions. The Environment & Climate Change Team will also be integral to mainstream climate thinking across the organization and will support other BUs in developing annual budget and business plans and reporting on metrics and progress for the annual report.

Six new positions, approved as part of the 2021/22 operating budget, are currently being recruited to Planning & Development to implement HalifACT:

1. Environmental Performance Officer – Climate Adaptation Specialist
2. Environmental Performance Officer – Environment Specialist
3. Environmental Performance Officer – Climate Change Specialist
4. Stakeholder Engagement Specialist
5. Project Controller
6. Supervisor, Environment

Based on the above resource plan, an additional eight positions are anticipated to be required to support HalifACT implementation in 2022/23:

1. Supervisor, Community Energy Programs
2. Supervisor, Climate Resilience
3. Supervisor, Corporate Climate Action
4. Clean Energy Technician
5. Junior Climate Change Specialist
6. Sustainable Finance Specialist

7. HalifACT Implementation Personnel (position TBD)
8. HalifACT Implementation Personnel (position TBD)

We are proposing a hybrid model for climate work to be mainstreamed across the organization. In addition to staff in the Environment & Climate Change team, there would be staff resources that are co-reporting to both this team and to their individual BU. These could be short-term contracts to allow a Business Unit to take on a specific climate-related project and ultimately the staff could then become permanent in the BU or be re-assigned to another climate project in another BU. There will also be permanent staff requirements in all BUs to deliver on the plan, and the below table provides a summary of the staff resources required across all Business Units for the implementation of the Core Actions in the first three years.

Table 2: Summary of Estimated Resources Required over the next 3 years (2022-23 to 2024-25) to Implement Projects Across Core Action Areas

Core Action Areas	Estimated Incremental Financial Resources Required			
	New FTEs Required	Compensation Costs (by 2024/25)	Other Operating Costs (3-year total)	Capital Costs (3-year total)
Core Area 1: Create new energy retrofit and renewable energy programming	4	$400,000	$1,000,000	---
Core Area 2: Develop a detailed and costed plan for retrofitting existing municipal buildings to be net-zero ready and climate resilient	1	$100,000	---	$35,780,000
Core Area 3: Develop an electric vehicle strategy, increase charging infrastructure and replace fleet vehicles with electric vehicles	1	$100,000	---	$15,950,000
Core Area 4: Explore opportunities to require net-zero standards for new buildings in the municipality *Pending the release of the 2020 National Energy Code for Buildings	2*	$200,000	$200,000	---
Core Area 5: Develop a framework for assessing and protecting critical infrastructure	4	$400,000		$20,600,000
Core Area 6: Support communities for climate adaptation and climate-related emergencies	5	$500,000	$1,650,000	---
Core Area 7: Develop a financing strategy to operationalize the HalifACT plan over 30 years	3	$300,000	$400,000	---
Enabling Actions: Engagement, Reporting, Governance Structure	5	$500,000	$200,000	$6,000,000
Total	**25**	**$2,500,000**	**$3,450,000**	**$78,330,000**

At total of 41 full time equivalent positions are required in the next three fiscal years. There are currently 16 FTEs across the organization dedicated to the implementation of the first seven core areas of HalifACT. Of the 25 positions still required, eight have been requested in the 2022/23 operating budget, leaving a need of 17. Six of these positions will sit in Environment & Climate Change while the remaining two will work across the organization as required.

A total of $3.45 million in operating and $78.33 million in capital is required over the next three fiscal years. The capital requirement is included in this year's Strategic Initiative funding ask. Not included in this resource plan or the Strategic Initiatives funding ask is the required FTEs, operating and capital needed to progress the Green Network Plan, JustFOOD project, the Naturalization Strategy, the Urban Forest Master Plan and the National Disaster Mitigation Program. Resource requirements will be requested by the respective BU at a later date.