

# Edmonton's Energy Transition Strategy - Targets

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## Recommendation

That the July 12, 2019, Urban Form and Corporate Strategic Development report CR\_7208, be received for information.

## Previous Council/Committee Action

At the August 19, 2019, Executive Committee meeting, the following motion was passed:

That Executive Committee recommend to City Council:

That Administration take steps to bring back a revised Community Energy Transition Strategy by end of third Quarter 2020, that aligns the emissions targets and actions with the local carbon budget, for City Council's approval.

This is to include:

1. Additional technical analysis on the levers to be used for deep emissions reductions.
2. Stakeholder engagement to develop clear pathways for the achievement of the actions to be included in the plan, following a market transformation approach including possible regulatory tools that can be employed to facilitate the transition.
3. A comprehensive economic analysis of the costs and benefits of the updated plan.
4. A funding strategy that outlines the investment required by all levels of government to catalyze private investment necessary to achieve the local carbon budget.
5. An updated Community Energy Transition Strategy with a ten-year action plan that captures the results of the above while achieving the level of ambition aligned with a 1.5 degree global average temperature increase.
6. Continuing implementation, and where possible, further leveraging current program initiatives and projects identified in the current Community Energy

Transition Strategy, the Climate Resilient Edmonton: Adaptation Strategy and Action Plan, and integrate the applicable Climate Shifts into other policy documents, such as the developing City Plan.

7. Implementation of a carbon accounting system for municipal operating and capital budgeting decisions and priorities.
8. An interim report back from the Energy Transition Advisory Committee and Administration on pieces of the climate action plan that can be sped up and implemented prior to the 2020 plan.

At the July 12, 2019, Executive Committee meeting, the following motion was passed:

That the July 12, 2019, Edmonton's Energy Transition Strategy – Targets, be postponed to the August 19, 2019, Executive Committee meeting.

At the April 25, 2019, Executive Committee meeting, the following motion was passed:

That Administration bring back a report showing:

1. Whether Edmonton's current Energy Transition Strategy targets are aligned with a maximum of a 1.5 degree Celsius global average temperature increase, as outlined in the Edmonton Declaration.
2. If the strategy does not meet this level of ambition, provide preliminary recommendations for possible changes and outline a process that could be followed to establish new targets, engage stakeholders and conduct a robust financial analysis with the intent of updating the Energy Transition Strategy with actions that reflect these new target levels.

### **Executive Summary**

Edmonton's approved reduction target, as outlined in the Community Energy Transition Strategy, is not sufficient to keep Edmonton's greenhouse gas emissions aligned with the 1.5 degree limit.

This report provides the results of an evaluation completed to determine whether Edmonton's Community Energy Transition Strategy targets are aligned with keeping greenhouse gas emissions to levels that would limit global average temperature increase to a maximum of 1.5 degrees Celsius (°C). To conduct this evaluation, Administration prepared a local carbon budget, an upper limit of total carbon dioxide emissions associated with remaining below a specific global average temperature, for

Edmonton. In order for Edmonton to meet the 1.5 degrees Celsius target, the carbon budget threshold should not be exceeded. At Edmonton's current emissions levels the carbon budget threshold would be exceeded within eight years. If the Community Energy Transition Strategy emissions reduction trajectory is achieved, the carbon budget will be exceeded in just over ten years from now.

This report also provides six illustrative climate shifts for Council's consideration. These climate shifts, are directional in nature and could be used as a basis for an updated Community Energy Transition Strategy. Lastly, the report provides a conceptual project plan, outlining a process that could be followed to establish new targets, engage stakeholders and conduct an economic/financial analysis with the intent of updating the strategy with actions that reflect new target levels.

### **Report**

Climate Resilience is one of four goals in ConnectEdmonton, Edmonton's strategic plan. The plan highlights the need for Edmonton to transition to a low carbon future with clean air and water while adapting to climate change. Edmonton's Community Energy Transition Strategy and the work conducted to evaluate the City's actions in light of a 1.5 degree Celsius average global temperature increase target, is work that is aligned with the Climate Resilience goal. This is one of the approaches the City is taking to comprehensively achieve this goal.

Edmonton's Community Energy Transition Strategy was developed as a risk management response to a carbon-constrained world prior to the international goal of 1.5 degrees Celsius average global temperature increase was contemplated. The strategy was designed to accelerate Edmonton along a low carbon pathway by taking actions to reduce greenhouse gas emissions, increase renewable energy, and increase energy efficiency across all sectors.

The following targets, relative to a 2005 baseline, were set in 2015 when City Council approved the strategy:

- Reduce community-based greenhouse gas emissions by 35 percent by 2035.
- Reduce energy consumption by 25 percent per person by 2035.
- Generate 10 percent of Edmonton's electricity, renewably and locally by 2035.

The actions recommended in the Community Energy Transition Strategy were designed to support market transformation. As a programming and policy approach, market transformation uses a series of interventions that aim to alter market behavior by removing barriers and leveraging opportunities.

In 2018, City Council approved the Edmonton Declaration, a bold call to action for municipalities to keep greenhouse gas emissions levels within a global average temperature increase to a maximum of 1.5°C. This call to action has since been endorsed through member networks, by over 4500 cities around the world.

### **The Local Carbon Budget**

To assess the Community Energy Transition Strategy alignment with a maximum 1.5°C global average temperature increase, a local carbon budget needed to be developed. A carbon budget is the total amount of carbon dioxide equivalent emissions permitted over a period of time to stay within a temperature threshold. The latest science indicates that, to restrict warming to less than 1.5°C, total global carbon dioxide equivalent emissions from all human-caused sources cannot exceed 2500 Gigatonnes. Between 1870 and 2011, approximately 1900 Gigatonnes were emitted, leaving 600 Gigatonnes as a global carbon budget.

Using an internationally accepted methodology, Edmonton's carbon budget has been calculated to be 155 Megatonnes between 2017 and 2050. This equates to a per capita emissions rate of a maximum of 3.2 tonnes of greenhouse gas emissions by 2030 and zero tonnes (or carbon neutrality) by 2050. Administration's work indicates that Edmonton's approved reduction target, as outlined in the Community Energy Transition Strategy, is not sufficient to keep Edmonton's greenhouse gas emissions aligned with the 1.5 degree limit. At Edmonton's current emissions levels, approximately 20 Megatonnes per year, the carbon budget threshold will be exceeded within eight years. In order for Edmonton to meet the 1.5 degrees Celsius target, the carbon budget threshold should not be exceeded. Edmonton has a relatively large per capita carbon emissions footprint at 20 tonnes of carbon dioxide equivalents per person compared to other jurisdictions like Vancouver's per capita emissions which are under three tonnes of carbon dioxide per person. This is largely because of the carbon intensity of the electricity grid, colder climate which increases heating demand, magnitude of industrial emissions, and increased transportation emissions (less trips taken through active and public transportation).

### **Evaluating Possible Changes to the Community Energy Transition Strategy**

In order to determine preliminary recommendations for possible changes to Edmonton's Community Energy Transition Strategy, Administration used the CityInSight model. CityInSight is a state of the art, city-scale, energy emissions and finance model that allows for actions to be evaluated in the context of their emissions reduction potential. The technical approach used is outlined in detail in Attachment 1, including the results of the illustrative pathway modelled through CityInSights. It is important to note that the analysis provided, including the specific measures and interventions, represents a starting point. Through additional consultations and analysis, they will more than likely require modification.

### **The Climate Shifts**

The modelling suggests that, for Edmonton to achieve the level of ambition aligned with a 1.5°C scenario, the actions in the Community Energy Transition Strategy must be amended to reflect a more ambitious speed and scale of change. Also, each policy intervention will need to be accompanied by a clear pathway to the outcome, or a commitment to develop a clear pathway over the near term. The modelling results, combined with jurisdictional scans, and guided by a set of principles developed to assist the grouping of the potential actions have resulted in six proposed “climate shifts”. These climate shifts contextualize the specific actions coincident with the 1.5°C commitment. They are listed here and more fully explained in Attachment 1.

- Climate Shift 1 - Tool and Targets
- Climate Shift 2 - Low Carbon City and Zero Emissions Transportation
- Climate Shift 3 - Emissions Neutral Buildings
- Climate Shift 4 - Renewable Revolution
- Climate Shift 5 - Just and Equitable Transition
- Climate Shift 6 - Negative Emissions

### **City Plan: A Climate Shift Opportunity**

Many of the specific actions and initiatives modeled within the climate shifts can be realized through city planning processes. How the city is planned and built and the transportation system developed directly relates to Edmonton’s ability to reduce its emissions. Integrating the climate shifts into the emerging City Plan, both conceptually in support of the “Big City Moves” (February 12, 2019 Urban Planning Committee report CR\_6408 City Plan Phase 3) and as specific policy intentions and directions, provides a potential opportunity to facilitate emissions reductions. As part of the City Plan development, Administration is evaluating various scenarios for their emissions reduction potential.

### **Conclusions**

Edmonton’s carbon budget was calculated to be 155 Megatonnes. At Edmonton’s current emissions levels, the carbon budget threshold would be exceeded within eight years and in just over 10 years if the current Community Energy Transition Strategy emissions reduction trajectory is achieved. In order for Edmonton to meet the 1.5 degrees Celsius target, the carbon budget threshold should not be exceeded. The findings of this work indicate that Edmonton’s target as outlined in the Community Energy Transition Strategy is not sufficient to keep Edmonton’s greenhouse gas emissions within the 1.5 degree limit aspired to in the Edmonton Declaration. Accelerating emissions reductions aligned with this level of ambition will require more emphasis on the implementation of regulatory approaches as well as

the faster scaling up of innovation (i.e. pilot to community scale) then has been pursued in the past.

**Next Steps**

If directed, Administration would use the ideas presented in this report as a foundation for additional technical analysis, economic/financial assessments and deeper more fulsome engagement with stakeholders and the residents of Edmonton to fully understand the challenges and opportunities of the achievement of the categories of actions outlined above. A conceptual project plan has been provided as Attachment 2.

**Budget**

To proceed with the work outlined in this report and summarized in Attachment 2, a budget of \$300,000 (not including staff time) and 2.5 full-time employees are required for the duration of the project (18 months). This work could be funded through the reallocation of Economic and Environmental Sustainability Branch 2019 to 2022 operating budget originally provided by Council to continue the implementation of Community Energy Transition Strategy.

**Legal**

Part 16.1 of the City of Edmonton Charter, 2018 Regulation outlines the requirements for Edmonton to establish a plan for the purposes of addressing and mitigating the effects of climate change. Specifically, 615.4(4) indicates that the climate mitigation plan must be adopted by a resolution of the council and 615.4(9) indicates the City must establish its first climate change mitigation plan on or before December 31, 2020. Edmonton's Community Energy Transition Strategy is its current climate change mitigation plan that was formally endorsed by Council in 2015; however, if the strategy is updated to reflect the level of ambition aligned with a 1.5 degree Celsius scenario, the updated Community Energy Transition Strategy could be used to satisfy these requirements. As such, the conceptual project plan was designed with consideration for the December 31, 2020 deadline.

**Corporate Outcomes and Performance Management**

<b>Corporate Outcome(s): The City of Edmonton's operations are environmentally sustainable</b>			
<b>Outcome(s)</b>	<b>Measure(s)</b>	<b>Result(s)</b>	<b>Target(s)</b>
Advance a thriving, resilient, sustainable economy and environment	City operations greenhouse gas emissions	400,000 tonnes of carbon dioxide equivalents (2018). A decrease of 6 percent from 2005 levels	50 percent reduction below 2005 levels (213,000 tonnes of CO2e) by 2030

**Corporate Outcome(s): Edmonton is an environmentally sustainable and resilient city**

Outcome(s)	Measure(s)	Result(s)	Target(s)
Advance a thriving, resilient, sustainable economy and environment	Community greenhouse gas emissions	19,167,000 tonnes of carbon dioxide equivalents (2018). An increase of 5 percent above 2005	35 percent below 2005 levels (11,871,000 tonnes of CO <sub>2</sub> e) by 2035

**Attachments**

1. Getting to 1.5°C - A Discussion Paper
2. Planning for 1.5°C - Conceptual Project Plan

**Others Reviewing this Report**

- R. Kits, Acting Deputy City Manager, Financial and Corporate Services
- C. Owen, Deputy City Manager, Communications and Engagement
- G. Cebryk, Deputy City Manager, City Operations
- A. Laughlin, Deputy City Manager, Integrated Infrastructure Services
- R. Smyth, Deputy City Manager, Citizen Services
- B. Andriachuk, City Solicitor