

## Appendix C

### Additional Public Feedback on the Climate Action Plan and Staff Response

Who?	Comment/feedback	Response
Staff	Need clear milestones in the plan. There are some figures attached to the program areas which perhaps can be broken into actual charts in the appendix showing how many homes to be retrofitted, etc. Some of the other areas may be more difficult.	Done
Staff	Could you show a graph or chart showing 5 or 10 year increments of where our overall emissions should be as milestones for us to meet?	Done
Staff	The city just signed onto the Global Covenant of Mayors and apparently they require the target to be a percentage below a baseline by a certain date. Could we reframe our net carbon neutral target by 2050 a different way. Have you heard this before?	SOG - My understanding is that the targets need to align with the NDC for Canada- so a target needs to be identified for 2030- Canada's 2050 target is also net zero so the carbon neutral target is aligned.
Resident	Increased RNG use figures significantly in the wedge diagram. Is there a significant risk about this quantity of RNG being available to COB? Do you think it would be sourced from Enbridge or sourced by the renewable energy co-op or both?? Could you comment on the risk around the carbon accounting of RNG (i.e. the confidence on whether it will continue to be considered to have zero embodied carbon)?	There is indeed a risk with respect to the availability of RNG. Enbridge and others are very active in developing RNG projects, however, the feedstock is limited. If sufficient quantities of RNG are not available, it is possible that hydrogen can be used to address a gap. Hydrogen would require an update of the distribution network and appliances in households and buildings, which implies a significant capital expenditure. Further, the source of hydrogen is not yet clear.

Resident	I think it would be helpful to state more clearly in the report that this is one scenario/one pathway and then, in an appendix, give a table showing the assumptions by year around energy prices (electricity, gasoline and NG price (broken down by each of commodity price and carbon price)) and carbon price. The costs, savings and NPV's are all based on one scenario. You may want to establish certain triggers (e.g. relative price of elec and NG, or policy triggers) that would cause you to re-run the SSG model. Would you plan to re-run the model at least every 5 years? Does the City have an analytics service?	A new appendix has been added with electricity, NG, gasoline, and RNG costs, and carbon price.
Resident	Heat pumps look poor on the marginal cost curve. What would be the strategy in performing retrofits (pg. 50)? Would you do other work first and heat pumps later? Or bundle the work?	Heat pumps on their own do not perform well from a financial perspective as they have a higher capital cost than a natural gas furnace and they use electricity which is more expensive than natural gas. However, if a dwelling is retrofitted first, the size of the heat pump can decrease, as does the operating cost (less energy required for heating and cooling) and a heat pump can also be used for air conditioning. When these aspects are combined, the economics of heat pumps is improved, if not better than natural gas, depending on the projected future costs of natural gas, carbon and electricity.
Resident	What is the definition of the carbon cost shown in the bar chart on page 38?	Carbon cost is a projection of the future cost of carbon (i.e. carbon price). Actions which reduce GHG emissions avoid an associated carbon price.

Resident	Would you elaborate on why it is expensive for new ICI buildings to achieve passive performance?	The cost of passive house levels of performance for ICI buildings is declining, but there is a learning curve as the industry develops the capabilities to achieve this level of performance.
Resident	In light of the above, I would like to ask why solar water heating is being proposed. I have been involved with the solar industry for some time and understand that solar water heating is not the preferred approach in climates such as Canada. An article is attached for reference which shows that the cost of solar pv has come down to the point of where it is less expensive than solar thermal to heat water. I have also found that using solar pv under net metering can be more efficient when it can provide energy for multiple loads that are distributed over the daytime period and that an electric water heater can provide storage of thermal energy.	Agreed, solar hot water is likely a less effective strategy than an integrated PV- electric hot water heating approach. We introduced solar hot water in the model to target remaining natural gas in the system that was not being addressed by other actions, but this approach should be a secondary priority.
Resident	My second question is regarding the cost of retrofits. It appears the average cost to retrofit residential buildings is \$2262 per home as a net present value over 30 years. Is there an estimate for single, semi and row housing? My analysis shows that the average retrofit cost is about \$22,000 in current dollars or ten times as much. The plan shows savings costs of \$280 per year for all residential. My analysis shows about \$1200 in current dollars for single. semi and row housing. Can you clarify these numbers?	SSG has provided calculations for this, but perhaps the text needs updating to reflect this. We are unable to recreate the calculations here, but have included details on costs in the appendix.

Resident	<p>I have prepared two scenarios for retrofitting existing homes in Burlington. The first is for electric baseboard heated homes and the second is for natural gas heated homes with gas water heaters. For both of these situations, the cost of retrofits and energy cost savings are about the same. However, for the gas heated homes, the carbon reductions are far greater as would be expected. Electrically heated homes show a 50% reduction while the gas homes show an 86% reduction.</p> <p>The Ontario government offers free retrofits for electrically heated homes in Burlington and no incentives for fossil fueled homes.</p> <p>Can you provide guidance on how homeowners can proceed to reduce carbon by retrofitting their homes?</p>	<p>I think your scenarios are appropriate. The general approach we seek to apply is maximize the efficiency of the dwellings with energy savings of 50% or more and second fuel switch away from fossil fuels (primarily natural gas). A key recommendation is for the municipality to develop a much more aggressive retrofit program as the Province's targets are inadequate to achieve the level of GHG emissions reductions required.</p>
Sustainable Development Committee	<p>The SDC supports the adoption of the goal of the Burlington community being net carbon neutral by, or before, 2050.</p>	<p>Thank you for your support.</p>
Sustainable Development Committee	<p>The SDC supports the program areas as identified in the CAP, and agrees with prioritizing deep retrofits of buildings, electrification of vehicles and equipment, and the renewable energy co-operative.</p>	<p>Thank you for your support.</p>
Sustainable Development Committee	<p>The SDC strongly encourages Council to adequately resource the programs through the hiring of City staff and provision of funds for program development.</p>	<p>Comment noted.</p>

Sustainable Development Committee	Carbon neutrality will be difficult for existing housing. The energy reduction targets are possible as are the switching to heat pumps and solar PV. But carbon neutrality will not be achieved until the grid is 100% carbon neutral. In the interim, projects that do not show carbon neutrality should not be excluded from the deep retrofit program. This includes fossil fuel heated homes that can transition to hybrid heat pumps before converting to full heat pumps.	SSG- Agreed. The electrification needs to happen simultaneously with grid improvements to maximize benefit from the greening of the grid.
Sustainable Development Committee	The requirement for 80% of residential homes to have solar thermal water heating by 2050 would not be as efficient and cost effective as solar electric (PV) water heating and the SDC requests that water heating be part of a solar PV integrated system through net metering.	Agreed! Please see other comment related to solar hot water. It should be a secondary priority in cases in which net metering does not work, targeting natural gas heating hot water.
Sustainable Development Committee	As a result of the Climate Emergency Declaration, Council directed staff to prepare a CAP that: “include[s] performance metrics to track progress and timelines for achieving key deliverables/major milestones, and a strategy to report back publicly on progress.” Metrics and timelines were lacking in the report that was tabled in December. The SDC would like to see the City: <ul style="list-style-type: none"> <li>● Establish interim targets (e.g. 2025, 2030, 2040)</li> <li>● Ensure that the targets being established and promoted are reviewed with a variety of stakeholders to ensure they are challenging but also realistic and achievable as there are factors which are outside of the City’s and the community’s control.</li> </ul>	Included in report

	<ul style="list-style-type: none"><li>● Establish targets both for GHG emissions as well as for the completion of milestones (e.g. retrofit of buildings). The SSG model has embedded assumptions that can be used as a starting point to create interim targets for the priority areas (Table 2, pages 24-26 of the SSG report) e.g.:<ul style="list-style-type: none"><li>i. 100% of new residential buildings achieve passive house level of performance by 2030</li><li>ii. 98% of pre-2017 dwellings retrofit by 2050</li><li>- The SSG Low Carbon Scenario (LCS) model assumes retrofits achieve thermal and electrical annual savings of 50%. To give benefit to homes that have already made reductions, this could be revised to:<ul style="list-style-type: none"><li>a. 'with retrofits achieving thermal and electrical annual savings of 50% or a maximum limit of 300 MegaJoules per square metre of heated area annually per dwelling (whichever is the greatest reduction), and,</li><li>b. carbon emission annual savings of 50% for electrically heated dwellings and 85% for fossil fuel heated dwellings or a maximum of 3 kg per square metre per dwelling (whichever is the greatest reduction).'</li></ul></li></ul></li></ul>	
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	<ul style="list-style-type: none"> <li>iii. 100% of new passenger vehicles are electric beginning in 2030</li> <li>iv. 50% of existing passenger vehicles are plug-in electric or all electric by 2030</li> <li>v. Addition of 5 MW of solar PV (ground mount) per year between 2018 and 2050</li> <li>● Review overarching targets every five years based on IPCC updated reports.</li> </ul>	
Sustainable Development Committee	<p>Buildings and infrastructure built today will last for 50 years or more, therefore today's planning and investments will "lock-in" the greenhouse gas emissions that will incur for decades to come. Replacing and retrofitting buildings and infrastructure will be far more expensive than building for a changing climate in the first place.</p> <ul style="list-style-type: none"> <li>● The SDC strongly supports enhancing, and making mandatory, the Sustainable Building and Development Guidelines. This should be moved forward as quickly as possible.</li> </ul>	The Sustainable Development & Building Guideline will be reviewed to determine how to strengthen it to require low carbon buildings. Senior levels of government support may be required.
Sustainable Development Committee	<p>The SDC is supportive of "complete neighbourhoods". New residential buildings should have one or more floors of commercial space on street level. High quality commercial/office space is needed to create well paying jobs downtown and along the intensification corridor so that people can walk or cycle or take transit to work. Land use planning, while not specifically identified in the CAP, remains a priority.</p>	The importance of land use planning and how the city grows is included in the new Climate Action Plan. The city's policy positions are stronger now, particularly when the new OP is approved and the Integrated Mobility Plan is completed.
Sustainable Development Committee	<p>COB staff and Council should immediately begin promoting the shift away from fossil fuels.</p>	Burlington will continue to promote a shift away from fossil fuels under the CAP.

Sustainable Development Committee	<p>The SDC supports the Community Engagement Strategy. The Climate Action Plan should be made available in an accessible, plain language format that can be easily and widely understood. Effective community engagement is an essential element of success and whatever supportive tools can be brought to bear to help the community at large understand the challenge, the community's plan to address the challenge, and the role of the individual within the plan, can only help. The simple visuals that explain challenging concepts (like those on pages 31-32 of the SSG report) can be very powerful in helping the general public grasp the challenge and each individual's role in creating and resolving it.</p>	<p>Thank you for the comments. This will be considered.</p>
Sustainable Development Committee	<p>The discussion around the 1.5 and 2°C carbon trajectories is somewhat confusing (pages 29-30 of the SSG report). The 1.5 or 2°C trajectories are global targets with each municipality, state or country contributing to the achievement of those targets. Burlington's contribution, and the municipality's target, is its Low Carbon Scenario (LCS) by 2050. That is what this report should emphasize. The LCS can be related the contribution to the °C trajectories and the effect on the trajectory if Burlington's targets are not met.</p>	<p>This section compares the LC scenario with the carbon budgets related with global efforts to keep temperatures below 2.0 and 1.5 °C respectively. The carbon budget allocation methodology of C40 was applied for Burlington and compared with the LC scenario.</p>
Sustainable Development Committee	<p>Wherever possible, an integrated approach to support the CAP should be adopted that considers interdependencies with other policy, planning and program development activities/instruments and promotes alignment with the CAP's principles, priorities and</p>	<p>Agreed.</p>



	targets (e.g. COB supply chain management and procurement policies and directives).	
Sustainable Development Committee	It is recommended that the annual indicator report be a public facing report. Public reporting on progress should detail gains made toward achieving discrete targets and clearly demonstrate progress against baseline data. KPIs that encourage/support meaningful inter-jurisdictional comparisons should be considered and adopted.	Agreed – staff have reported annually to city council on progress under the previous Community Energy Plan, which is publicly available. But we will endeavor to improve the look and reporting for the public.
Sustainable Development Committee	The SDC would like to see a dedicated web page on the City web site as part of the online portal mentioned in the Engagement Strategy that records actions of residents by category and presents individual success stories similar to the web page of the City of Edmonton, Alberta ( <a href="https://changeformclimate.ca/action">https://changeformclimate.ca/action</a> ) .	Thank you for the suggestion. This will be considered.
Sustainable Development Committee	The SDC would like to see the city fund, and move forward as quickly as possible, with adaptation planning: <ul style="list-style-type: none"> <li>● Building retrofits, new construction and infrastructure projects ideally should consider mitigation and adaptation together.</li> <li>● The City may want to consider best practice risk assessment tools such as ICLEI, ISO 30000 and PIEVC.</li> </ul>	The climate adaptation strategy will take time to properly complete to assess the projected impacts of a changing climate and what are the risks and vulnerabilities within city operations and services as well as within the broader community.
Sustainable Development Committee	The SSG report represents only one scenario/one pathway. The technologies, costs, savings and NPV's are all based on one scenario.	A new appendix has been added with electricity, NG, gasoline, and RNG costs, and carbon price.

Sustainable Development Committee	It would be helpful to include in an appendix a table showing the assumptions by year around carbon price and energy prices (electricity, gasoline and natural gas price (broken down by each of commodity price and carbon price)).	Added
Sustainable Development Committee	Note that the scenario given results in expected retrofit costs of \$4,554 per home which is much lower than current estimated costs of approximately \$21,000 including heat pumps. The scenario given results in costs savings by retrofits to be \$304 per year which is much lower than current estimated savings of \$1,300 per year including heat pumps. These assumptions should be reviewed.	The average cost of retrofitting varies over time, but the average for all dwelling types and years is \$34,170 per unit, and \$719 per sqm. Also, average savings are estimated at \$631 per unit.
Sustainable Development Committee	The speed of electrification of vehicles is dependent on the electrical grid infrastructure and manufacturers being able to meet demand. Macro issues like resource availability (e.g. rare earth mineral scarcity) and the potential cost implications of a tightening supply/demand balance resulting from a worldwide effort to address climate change could have an impact on the assumptions behind the models used to establish the CAP targets.	Agreed - There are many factors and assumptions considered in the model. The model is based on current conditions and technology.
Sustainable Development Committee	Biofuels sourced from waste is a possible future energy source that should be considered.	Agreed – this area could be considered under the renewable energy program area.
Sustainable Development Committee	The City should consider periodically re-evaluating assumptions (e.g. relative price of electricity and natural gas, policy, technologies) on which the model is based, revisiting programs and targets/timelines if needed.	Agreed – these factors can change over time.

<p>Consultant</p>	<p>I am writing because your Climate Action Plan does not include any discussion on use of biomass or waste for heat. I understand building heat is the largest source of emissions for the City of Burlington, as is the case for most municipalities in Canada. We can learn much from the decarbonization efforts of the EU. In the EU, solid biomass has an 84% share of the renewable heat market and the amount of energy generated by solid biomass heating is equal to all renewable electricity generation, including hydropower, combined. Much of this heat is generated by central combined heat and power plants, with the heat distributed by district energy pipes. To give you an idea of what is possible, there is a 400 MWth plant in Stockholm, fuelled entirely by sustainable wood chips delivered by rail and marine, that heats 190,000 residences. Most DE system are municipality-owned and generate a significant amount of income for the municipality. After all, district energy is just another two water pipes and municipalities are already in the water pipe business (potable water, sewer).</p> <p>I have attached a presentation I gave to the City of Toronto in 2019. It is important to note that bioenergy represents 60% of all renewable energy in the EU and is responsible for more GHG reductions than any other renewable. In Canada, bioenergy provides 4.5x the amount of energy of wind and solar combined.</p>	<p>Thank you for the information. The city has looked at district energy and Europe's experience; staff representatives have visited energy plants in Denmark and Sweden, including both biomass plants and energy from waste. Europe has taken a different pathway primarily due to the fact that many countries were significantly impacted back in the 1970s due to the energy crisis.</p> <p>The city has also completed a district energy feasibility study for the downtown district. It would be technically feasible to implement but staff time and financial resources are required to further develop this initiative. In addition, McMaster University is using Central Park as a case study for an integrated energy system using waste heat, shared energy and energy storage. Staff are looking forward to seeing the results of this study.</p>
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	<p>Canada is a world leader in sustainable forestry and the sector has been decimated by the decline of the pulp and paper sector. Without a market, such as heat, for low grade wood, it is not possible to manage a forest sustainably. Sweden has a very significant forestry sector, but their forests grow at an even greater rate, thereby reducing national net GHG emissions by 80%.</p>	
Resident	<p>(Comments have been paraphrased from original submission)</p> <p>Garbage into Oil: Technology to turn waste hydrocarbons into oil is already here – needs to be scaled up. Products include Syngas, oils, bio-char, carbon black. Processes include Catalytic Hydrothermal Reactor (cat-htr), High and low tech Pyrolysis. Now we can ‘leave fossil fuels in the ground’.</p> <p>Promote production of Terra Preta: Bio-char combined with compost to produce Terra Preta. Restores Carbon to the world's depleted soils and sequesters carbon for thousands of years. Is a true carbon sink. Mitigates drought conditions by releasing water to plants when needed most. Up to eight-fold increase in farming productivity.</p> <p>Build local bio-char production sites – transform clean biomass into bio-char as a raw material to make Terra Preta. Include yard waste, wood manufacturing industry waste, invasive species,</p>	<p>Thank you for your comments. This is very interesting information and may be something for a local business to consider or Halton Region as the lead on waste management.</p>

	<p>crop residue including dead livestock.</p> <p>Permit backyard and environmental event Pyrolysis pits.</p> <p>End habitat destruction.</p> <p>Deregulate all restrictions on HEMP farming.</p>	
Staff	<p><b>Page 10 – Program # 2 – Burlington Deep Energy Retrofit Program (line 11) (Note this also refers to program information on page 48)</b></p> <p>Recommend including agriculture as a sector here. There are federal/provincial funding programs available to support agricultural innovation/viability which could have shared benefits in terms energy efficiency and GHG reductions. This also flags the need to consider the nuances between the urban and rural area when it comes to incentive program design.</p>	<p>Agreed – SSG to add ‘agriculture’ as a sector</p>
Staff	<p><b>Page 10 - Program # 3 – Renewable Energy Co-op</b></p> <p>Recommend adding biofuels here, to reflect an additional renewable energy stream available through purpose grown biomass crops, as well as biomass materials diverted from the waste stream. Burlington has an active biomass sector, focused on switchgrass production <a href="http://www.ontariobiomass.com/">http://www.ontariobiomass.com/</a></p> <p>Similar to comment 1 above, there are unique opportunities for program design in the rural area. Biomass has the potential to</p>	<p>SSG – add biofuels in program area for consideration.</p>

	<p>support a biofuel renewable energy cooperative if economy of scale can be achieved. A community bond based Public-Private Partnership model for renewable natural gas already exists in Ontario and the program recently received a substantial federal grant (through the Low Carbon Economy Fund) to advance the program  <a href="https://www.zooshare.ca/wp-content/uploads/2019/11/OPUCES_Zooshare_Toronto-Zoo_Press-Release-FINAL.pdf">https://www.zooshare.ca/wp-content/uploads/2019/11/OPUCES_Zooshare_Toronto-Zoo_Press-Release-FINAL.pdf</a></p> <p>There may also be potential to support such a program from a rural economic development perspective, through a Community Improvement Plan. There is Regional funding available for these kinds of programs.</p>	
Staff	<p><b>Program # 3 – Renewable Energy Co-op – page 51 – Under ‘Design’ – re: increased use of renewable natural gas</b></p> <p>There are RNG programs based on methane capture from municipal landfills and waste water facilities as well, Regional partnership could be valuable in this regard  <a href="https://www.bullfrogpower.com/green-energy/green-natural-gas/learn-more/">https://www.bullfrogpower.com/green-energy/green-natural-gas/learn-more/</a></p> <p>Biomass can be utilized for electricity production as well. Additional info on renewable energy opportunities and agriculture is available here  <a href="http://www.omafra.gov.on.ca/english/engineer/facts/greenergy.htm">http://www.omafra.gov.on.ca/english/engineer/facts/greenergy.htm</a></p>	Agreed – staff expect that these opportunities will be assessed as needed.

Staff	<p><b>Program #4 – Integrated Mobility – page 53 – re: Partners for Collaboration</b></p> <p>Since Metrolinx canceled funding for Smart Commute and revised its mandate to remove the focus on multi-modal, some of the GTHA municipalities are working toward a revised Smart Commute MOU that would be municipally led. Hamilton and Peel Region are leading this and the new group would be a critical partner. Burlington is currently seeking approval to sign the MOU along with Oakville, Milton and Halton Hills (as a single member) as Halton Region has indicated that they will not be participating. Could be helpful to check in with Transportation staff for an update on this.</p>	<p>Thank you for the suggestion. Metrolinx is still involved in transit initiatives so would also continue to be a potential partner.</p>
Staff	<p><b>Program #7 – Industrial Innovation Program – pg 57 - general comment</b></p> <p>No edit suggested, just flagging that this another area with potential for collaboration with the agricultural sector. Larger scale facilities such as greenhouses etc. For example, SaveON Energy has a program focused on greenhouses  <a href="https://saveonenergy.ca/For-Business-and-Industry/Industry-knowledge-centre/Greenhouse-energy-efficiency">https://saveonenergy.ca/For-Business-and-Industry/Industry-knowledge-centre/Greenhouse-energy-efficiency</a>  Census of Agriculture data is available to help inform which sectors are most prevalent in Burlington and where investments would be logical. Partnership with Halton Region (particularly if a Regional climate action plan is developed, or through the Rural</p>	<p>Thank you.</p>

	Agricultural Strategy) could helpful as well.	
Bay Area Climate Change Council (BACCC)	2030 and 2050 Goals - It is strongly recommended that both community and corporation (City) targets in each City be aligned with the most up-to-date IPCC targets as the science supports this level of reduction. Overarching targets should be reviewed every three years based on updated IPCC reports. The current IPCC targets are: – A ~50% reduction by 2030 (2010 baseline) – Carbon neutrality by no later than 2050 ii	Included
BACCC	It is recommended that interim targets be set (e.g. annual and three-year targets).	Included (5 year increments)
BACCC	Targets should be established both for GHG emissions as well as for the completion of milestones (e.g. retrofit of buildings). In order to achieve the IPCC targets, BACCC recommends that the cities use community-based data and projections to determine the level of action that is required. For example, the SSG models have embedded assumptions that can be used as a starting point to create interim targets for the priority areas (e.g. from Table 2, pages 24-26 in the Burlington SSG Report): <ul style="list-style-type: none"> <li>– 100% of new residential buildings achieve passive house level of performance by 2030</li> <li>– 98% of pre-2017 dwellings retrofit by 2050, with retrofits achieving thermal and electrical savings of 50%</li> <li>– 100% of new passenger vehicles are electric beginning in 2030</li> </ul>	Included



	<p>– Addition of 5 MW of solar PV (ground mount) per year between 2018 and 2050</p> <p>Interim targets and timelines will help in program planning, understanding what resources are required and forecasting when GHG reductions will be achieved.</p>	
BACCC	There needs to be an indication of how frequently the GHG inventory will be updated and how often the plan will be revisited.	It is recommended by the Global Covenant of Mayors to update the GHG emissions inventory every two years due to the resources and time needed to collect and assess the data.
BACCC	It is recommended that there be ongoing progress shared with the public with more comprehensive annual reporting.	City staff report annually on progress of activities and actions at the city and within the community.
BACCC	The BACCC supports the program areas and the three priorities identified.	Thank you.
BACCC	The “Vision for the Future” section in the SSG report is very moving and is a helpful communication tool, as are the visuals and equivalencies. The references to other cities’ programs are also helpful.	Thank you.
BACCC	BACCC looks forward to seeing the City of Burlington’s adaptation plan. Among other benefits, folding it into the CAP sooner versus later will aid in presenting a complete and cohesive plan to the broader community from the onset. Building retrofits, new construction and infrastructure projects ideally should consider mitigation and adaptation together. The City may want to consider best practice risk assessment tools such as ICLEI, ISO 30000 and PIEVC.	The climate adaptation strategy will take time to properly complete to assess the projected impacts of a changing climate and what are the risks and vulnerabilities within city operations and services as well as within the broader community.

BACCC	The framework of reduce, improve, and switch is very good. However, there is some inconsistency when talking about electric vehicles and heat pumps. Reduction should be prioritized over fuel switching, including reducing overall car use and encouraging walking and biking. Similarly, for buildings, they should be built to passive house standard and with district energy and/or solar ready rather than relying on heat pumps.	Actions to reduce consumption are performed before energy switching in the model to maximize efficiency and savings from the action.
BACCC	The Marginal Abatement Cost Curve and IRR are excellent analyses of the cost of the various actions. However, the SSG report represents only one scenario/one pathway. It would be helpful to include in an appendix a table showing the assumptions by year around carbon price and energy prices. The City should consider periodically re-evaluating assumptions (e.g. relative price of electricity and natural gas, or policy) on which the model is based.	A new appendix has been added with electricity, NG, gasoline, and RNG costs, and carbon price.
BACCC	It is noted that there is no specific program related to land use planning and the creation of “complete neighbourhoods”. These are implied but without details. Fostering higher density, complete neighbourhoods and active transportation and transit will be essential to reduce the City’s GHG emissions. The cycling network must be improved to increase connectivity to transportation hubs and amenities.	Staff agreed that this information was included in the 2014 Community Energy Plan. However the city’s policy positions are much stronger now on these areas, particularly when the new OP is approved and the Integrated Mobility Plan is completed.
BACCC	It is noted that there are no references to green procurement, or the purchased products and services side, or biodiversity and	The CAP is focused on reducing the use of fossil fuels in the community through the program areas. The city does have a

	food, all essential components that should be included in the Plan	green procurement policy and guide for staff.
BACCC	In the section on Net Carbon Neutrality, reference is made to purchasing offsets to “subtract” any emissions remaining after GHG emissions have been reduced to the extent possible. It would be preferable to invest locally in carbon sequestration measures like tree planting, which would also contribute co-benefits such as wildlife habitat and improved air quality, in addition to supporting other elements of Burlington’s policy framework related to tree canopy and the Natural Heritage System.	Comments noted.
BACCC	Consider including Conservation Halton as a Community Stakeholder with a role to play in providing education, community outreach, landowner stewardship programs and directly mitigating the effects of GHG emissions through environmental restoration.	Thank you for the suggestion – we are looking at what additional stakeholders are required on the Stakeholder Advisory Committee.
BACCC	There will likely need to be training given to city staff and council related to GHG terminology, GHG inventory and programs (mitigation and adaptation).	Agreed – anticipate training on climate change will be an ongoing activity.
BACCC	Will the City be preparing planning reports with timelines and targets for each of the program areas to maximize effectiveness?	A high level report for timelines will be presented in March to council but a more detailed reports will be drafted when the task groups have been formed with community stakeholders.

BACCC	<p><b>1. Low carbon new buildings (Green Building Standard)</b>  BACCC supports this program area. It is good that this recognizes the expense of retrofitting existing buildings and references Toronto's tiered approach. Would like to see more specifics on ongoing building performance and maintenance. It will be necessary to work with local businesses and educational institutions to increase the supply of skilled tradespeople.</p>	<p>Comments noted. Building performance and maintenance practices are important, as the city has experience with its own facilities. Human behaviour is a significant part of the success for improving building efficiency. Agree that there is a need to work with local stakeholders involved in this area of work.</p>
BACCC	<p><b>2. Deep energy retrofits of existing buildings</b>  BACCC supports this program area. Interim targets need to be set.  The City should support development and/or promotion of educational tools and resources for conducting and financing retrofits. It will be necessary to work with local businesses and educational institutions to increase the supply of skilled tradespeople.</p>	<p>SSG – targets included in the report  Agree with comment about developing outreach materials for this area and working with local stakeholders involved in this area of work.</p>
BACCC	<p><b>3. Renewable energy</b>  BACCC supports this program area. A cooperative approach will be helpful in sourcing renewable energy in a cost efficient manner. Interim targets need to be set (e.g. minimum % renewable energy, annual addition of MW of renewable energy). Suggest adding Sustainable Hamilton Burlington as a potential collaboration partner.</p>	<p>SSG – targets included in report  Comment noted about SHB as a potential collaboration partner. Staff will be looking for a diversity of stakeholders to support this initiative.</p>
BACCC	<p><b>4. Integrated Mobility Plan</b>  BACCC supports this program area. Interim targets need to be set. More specifics needed on transit and active transportation actions.</p>	<p>The Integrated Mobility Plan will be completed by the city's Transportation Services Department. SSG – The targets were derived from the discussion with the transportation group during the</p>

		second round of modelling, and are shown in the table of actions in the report.
BACCC	<b>5. Electric mobility and Equipment program</b> Good synergy with other plans. Interim targets need to be set.	SSG- targets shown in report
BACCC	<b>6. Waste reduction</b> Pleased to see this is recognized. Interim targets needed. The City may be able to do more to advance this goal, alongside the community and partners. If not better profiled in the Plan, the community may also view their role to be a low priority as well. Suggest Sustainable Hamilton Burlington as potential partner focusing on business/ICI sector.	Staff agree that waste reduction is important but note that waste has much lower carbon footprint compared to the 3 priority actions. Halton Region is the lead on waste management. Burlington will continue to focus its resources on city operations and services.
BACCC	<b>7. Industrial processes</b> BACCC agrees this is a lower priority area in Burlington's context.	Comment noted.
BACCC	Burlington should consider designating key staff leads from each department to take responsibility for achieving related climate change goals.	Comment noted.
BACCC	A climate emergency/GHG reduction lens must be applied by staff in all departments when researching and reporting on issues to ensure the CAP is not considered to be a planning tool limited to sustainability staff. It must function as a top priority, living, integrated driver of the change that is required if the ambitious (necessary) IPCC aligned targets are to be achieved.	Agreed – council has directed that a climate lens be applied to decision making. Staff reports now require information about climate implications. Staff are working on how to raise awareness with city staff on how to apply a climate lens to decision making. Staff participated in a recent workshop hosted by the Clean Air Partnership with municipalities to discuss best practices for applying a climate lens.

BACCC	<p>The Burlington plan clearly identifies community partners to assist with achievement of stated goals.</p> <p>Burlington outlined the City's role vs. the community's role, which was helpful for clarity, preventing duplication of work and demonstrating potential synergies.</p>	<p>Thank you – community collaboration and partnerships will be important for the success of the plan.</p>
BACCC	<p>City budget – Program funds and consulting funds will be needed for implementation. – It is noted that both municipalities have stated they will provide funding to BACCC.</p>	<p>City council approved \$32,000/per year to support BACCC in 2020 and 2021</p>
BACCC	<p>City staffing – Recommend dedicating more City staff to climate change action, particularly in Burlington. It will be labour intensive to get programs up and running. Once established, there will be an ongoing need to monitor performance.</p>	<p>Comment is noted – as programs are developed for the priority program areas, there will be a clear indication of resources required.</p>
BACCC	<p>It is recommended that each City find and implement some quick wins e.g.:</p> <ul style="list-style-type: none"> <li>i. Increase community engagement activities</li> <li>ii. Identify and complete pilot building retrofits</li> <li>iii. Lower carbon footprint of City fleet</li> <li>iv. Work with developer(s) to commit to build net zero development(s)</li> </ul>	<p>Agreed – quick wins will be needed to build momentum in the community. Suggestions are noted.</p>
BACCC	<p>Community education, engagement and transparency are critical for achieving goals and targets of this magnitude. These measures will require major shifts in behaviour: the more educated the public becomes on the issues and how they will be/are being impacted personally, the more likely they will be to support the necessary changes.</p>	<p>Agreed – a collaborative effort will be required across all community stakeholders to engage the community and drive behaviour change. An engagement strategy will be part of each priority program area in the plan.</p>

BACCC	Messaging must be inclusive, clear and user-friendly, promoting a city-wide collective approach to action on climate. It should be consistently presented as a community action plan, not one that the City is solely responsible for. Opportunities for residents, businesses and organizations to measure and share their actions, contributing to the overarching GHG reduction target will ensure the Plan is an inclusive and collective effort.	Agreed
BACCC	It will be necessary for the cities to allocate resources and staff to this effort. It will not be possible to rely solely on other partners or organizations. Funds will need to be allocated to hold community outreach events.	Noted.
Burlington for Accessible Sustainable Transit - BFAST	<p>We believe that a community can make its greatest contribution to the environment by reducing the number of personal vehicles on the roads within its boundaries. At average GHG emissions of 4.6 metric tonnes per year, reducing the use of personal vehicles is an obvious target for reduction in GHG emissions.</p> <p>Are electric cars the solution? Cities are beginning to realize that while they are part of it, the real solution is to reduce the number of private cars on the road. Toronto's Globe and Mail, for example, editorialized on January 3 that "Canada's cities are about to add millions of new residents. They can't all drive to work."</p> <p>The contribution of private automobiles to total GHG emissions is not only significant in terms of direct pollution. Private vehicles require huge, heat-</p>	<p>Agreed- behaviour change is an essential part of reducing GHGs from vehicles, even EVs. The reduce-improve-switch method for this analysis captures that, but it is more difficult to model behaviour change quantitatively. The model for the Climate Action Plan recognizes the current modal split in Burlington and that car ownership is high. Therefore there is a significant opportunity to reduce emissions in Burlington through EVs.</p>

	<p>radiating infrastructure in the form of roads and parking lots, regardless of the fuel they use. This infrastructure requires large quantities of petrochemical products to build and maintain. Electric vehicles begin their lives with a carbon deficit, the result of extracting the lithium used in their batteries at an even greater environmental cost than that of oil and gas. Some experts say that there is simply not enough lithium or cobalt (another essential ingredient in lithium-ion batteries) to satisfy anticipated needs.<sup>2</sup> And the additional demand to charge the vehicles could, under current circumstances, be met with electricity produced from burning fossil fuels.</p> <p>This is not to disagree with the idea of converting to electric-powered vehicles, but to argue that electric vehicles cannot be the extent of a strategy for a sustainable transportation system. We also need to focus on reducing the number of vehicles on the roads. BFAST suggests that this goal should be among the most important of our transportation priorities.</p> <p>Reducing the number of vehicles will enhance the quality of life in our city at the same time as it cuts GHG emissions. Imagine Burlington with parking lots converted to green space, or our wider roads shaded by medians planted with trees. Both of these actions would cool our cities, absorb CO<sub>2</sub> and release oxygen into the local environment. But none of this can happen if we continue our pattern</p>	
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	<p>of over reliance on personal vehicles that carry only one person.</p> <p>Relying on electric vehicles to provide one of the greatest savings in GHG emissions is, in our view, a potential weakness in the draft Plan. Consumers have been much slower to buy electric vehicles than optimistic forecasts predicted.<sup>3</sup> This trend could well continue into the future.</p> <p>Will drivers ever embrace transit? The answer is being demonstrated in Burlington by the response to even the modest improvements made in the system over the past year. We are informed that the majority of ridership lost to the disastrous and irresponsible transit cutbacks of 2012-2013 has been recovered in less than a year. Moreover, seniors have responded in droves to the free transit pilot project. Could this be a sign that more drivers are prepared to forego the stress and expense of automobile commuting in favour of transit?</p> <p>Persuading drivers to leave their cars at home for just work commutes would result in significant reduction in greenhouse gases (whether caused by the vehicles themselves, their manufacture or the generation of electricity) no matter how the cars are fueled. It's a measure that works because of its simplicity: promoting transit as an alternative to individual commutes by personal vehicles doesn't rely on the development and acceptance of a new technology and an entire transportation infrastructure that exists today only in its infancy.</p>	
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BFAST	<p>We are pleased to see that the economic benefits of reducing GHGs are included in the draft Plan. (Building the Economy, pages 36-40). In our view, however, the draft Plan understates both the GHG savings and economic benefits that can be achieved by transit. We would suggest that the benefits of increasing transit also should include benefits found in previous economic studies by Kubursi and the Canadian Urban Transit Association. Also, consideration should be given to the methodology of determining transit benefits developed by the Victoria Transportation Institute.</p> <p>In particular, the Kubersi study enumerates economic benefits of transit that are not mentioned in Burlington's draft plan. Increasing the share of transit ridership by 15-20%, for example, would save Hamilton's commuters more than \$19 million per year. These savings would have a multiplier effect, as most of the money would likely be spent in the community, supporting local business and employment.</p> <p>It has been our belief for some time now that Burlington would benefit from a study on the economic impact of increased transit ridership. Such a study, when combined with the modelling being developed as part of the Integrated Mobility Plan, would provide realistic targets and projections of how investment in transit would reduce our community's carbon footprint and generate local economic benefits.</p>	
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BFAST	<p>We are pleased and encouraged to see that Council plans an extensive process of consultation and engagement on how Burlington can help in the fight against global warming. However, we note that in some instances, the strategy can be more aggressive in encouraging people to adopt public transit rather than relying on electric vehicles to reduce their carbon footprint.</p> <p>On page 4, for example, the strategy seems to write off young families as candidates for transit use. However, an improved transit system could potentially allow a young family to get by with one personal vehicle instead of two, or two instead of three. Again, we strongly believe that switching from over-reliance on personal vehicles will yield greater results in terms of carbon footprint than simply switching to alternate fuels for existing vehicle use. And adopting transit can save a family more than \$9,000 per year (based on operating cost of a compact car) if it allows them to get by with one fewer vehicle, according to the Canadian Automobile Association.</p> <p>In addressing the needs of employees (page 5), the strategy again focuses on conversion of ICE vehicles to electric rather than reducing motor vehicle use. It does not discuss transit and active transportation at all. Many employers now are having difficulty in recruiting and maintaining staff because of lack of transit. This issue should be further examined with reference to the Integrated Mobility Plan.</p>	<p>Burlington Transit recognizes the importance of transit for families. The Integrated Mobility Plan will look at all demographic profiles as it plans for the movement of people in Burlington.</p>
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BFAST	<p>Another way on which transit can provide further assistance in mitigating climate change is in reducing the need for parking. Parking facilities and infrastructure are a significant contributor to warming in our cities.</p> <p>Also, the cost and availability of parking is a key determinant of how workers choose to get to work. Matt Pinder's analysis of the availability of free or paid parking affects commuter mode revealed that employees in Hamilton and Burlington who had to pay for parking were much more likely to use transit. The impacts of parking on travel choices is described in detail in Donald Shoup's book "The High Cost of Free Parking."</p>	<p>Agreed – this is a co-benefit of improving sustainable and active transportation options.</p>
BFAST	<p><b>Page 18:</b> Please review the calculation of needed growth rates i.e. "98% growth" and "19.6% per year". Our calculation, based on these ridership numbers, would show greater than 200% total growth is needed to achieve an 8.3% target modal split for transit. The annual rate of increase should not be one fifth of the total five year increase, but instead should be the compounded annual rate; i.e. 15% annual growth over 5 years results in a doubling (100% increase) of ridership and a 25% annual growth over 5 years results in a tripling (200% increase) of ridership.</p>	<p>SSG- we are unclear on this question.</p>
BFAST	<p><b>Page 28:</b> Figure 6 shows a very large increase in electricity use for electric vehicles. What are the environmental effects? A significant increase in electricity demand would currently be</p>	<p>The emissions from the electrical grid are included in the analysis, including projected changes to the grid in the future.</p>

	supplied by plants burning fossil fuels.	
BFAST	<b>Page 45:</b> "Table 5 – Programs of Activity:" This table shows that vehicle electrification will have over 30 times the effect of reducing motor vehicle emissions by reducing car use and increasing the modal share of transit/cycling/walking. Is this reasonable? What is this based on?	Vehicle emissions account for a large part of community emissions,
BFAST	<b>Pages 52-53:</b> "Program 4 – Integrated Mobility Plan:" This table is very confusing. How does a projected decrease of 60% in motor vehicle trips (from present modal share of over 90% to 2050 projection of 31%) translate into a 1% reduction in GHG emissions?	The model assumes that vehicles have already transitioned to electric vehicles, instead of switching from vehicles with internal combustion engines.
BFAST	<b>Page 60:</b> "Community Stakeholders:" Given our work on the transit file, we believe BFAST should be included as a stakeholder.	Staff believe that BFAST should continue its involvement in the development of the Integrated Mobility Plan being led by the city's Transportation Services Department. BFAST has significant knowledge and engaged members to contribute to this important strategy.
BFAST	<b>Page 67:</b> "Monitoring and Evaluation:" We are pleased to see the use of Burlington Transit's service standard ("number of new buildings that are within 400 metres of a bus stop").	Thank you.
Burlington-Green	<b>Goals, Targets and Key Indicators</b> BurlingtonGreen recommends aligning both the city and community carbon reduction targets with the most up to date IPCC targets, and to plan for even more stringent targets as	Completed, with the exception that Burlington's baseline for the interim target is 2016.  Annual reporting will be made on the progress of actions in the plan using the suggested indicators in the plan. The GHG

	<p>developments arise on the global front, calling for stronger carbon targets. The most up to date recommendation from the IPCC is a 50% carbon reduction by 2030 and achieving carbon neutrality by no later than 2050.</p> <p>Reduction targets should be reviewed every 3 years or sooner to keep up with the pace of science and climate change developments. We recommend interim targets for all program areas to be set on an annual or 3 years basis depending on the program area, to allow for resource planning and to measure the success of the different program areas.</p> <p>Key performance indicators for all program areas must be shared with the community on an ongoing basis to ensure transparency and accountability, in addition to annual progress reports.</p>	<p>emissions inventory is recommended to be updated every two years.</p>
Burlington-Green	<p><b>An Outward Facing Campaign – Engaging the Community for a More Sustainable Future</b></p> <p>A strong community engagement strategy must be at the heart of the climate action plan. Applying a climate lens to all decision-making frameworks is essential. Communications and messaging to internal and external stakeholders will drive and support the City’s reduction goal and unify the community around a shared goal.</p> <p>Effectively engaging the community and securing buy in and support for the climate action plan will require good strategy,</p>	<p>Agreed - Community engagement is an important part of the plan.</p> <p>The first priority will be to engage key stakeholders and partners to develop a deep energy retrofit program as well as a renewable energy cooperative (or equivalent type of program). Guides for homeowners and businesses also need to be developed on actions they can take.</p> <p>There are many community groups, businesses and partners that will be involved in</p>

	<p>dedicated effort and community partner participation. How to effectively tackle climate change can be confusing and overwhelming and communicating the technical aspect of the climate action plan may be a challenge. An inclusive approach, providing user-friendly 'tools' (such as a one-stop web platform, social media &amp; outreach communications tactics) for all sectors to learn about and report on their actions to address climate action will be key. Continuous, widespread and targeted communications reinforcing action on climate change to be Burlington's top priority will need to be understood and disseminated from all City departments and staff.</p> <p>All sectors will need to be actively engaged in advancing solutions. Building partnerships with key stakeholders and industry players will help establish Burlington as a leader in sustainable growth and development.</p> <p>Buildings are one of Burlington's largest GHG emitters, and it is essential the city incent and work with progressive developers to establish smart community, net carbon places to live, work and play, with one example being the proposed demonstration project located at 901 Guelph Line. The outward facing demonstration project could potentially invite the community to guided tours and presentations, showcasing state of the art design features and cutting-edge sustainability technologies, thereby inspiring the adoption of similar low carbon living features at</p>	<p>engaging the community on climate action.</p> <p>Staff are in discussions about the possible development of a demonstration centre to showcase technologies and building measures that can be employed to improve energy efficiency, utilize renewables and lower the carbon footprint.</p>
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	<p>their homes. The project would also provide an established example for other less progressive developers to follow.</p> <p>Establishing and showcasing 'living' examples of what sustainable design and living looks like, particularly in highly visible locations, will provide residents a glimpse of what a sustainable future can look like while influencing the less progressive developers to see more clearly what the needs and expectations are for buildings in a city where a climate emergency has been declared.</p>	
Burlington-Green	<p><b>Burlington Low Carbon New Building Guideline</b>          BurlingtonGreen supports a model that reflects Toronto's tiered approach and incorporates incentives.          It will be necessary to work with local businesses and educational institutions to increase the supply of skilled tradespeople. Please see our above comments regarding the value of demonstration project(s) in Burlington.</p>	Agreed
Burlington-Green	<p><b>Burlington Deep Energy Retrofit Program</b>          BurlingtonGreen supports this program area. We urge the city to provide the policy framework necessary to move the program forward building on best practices and successes of other municipalities in the region.          The program lacks interim targets and timeline.          More clarity is needed on how the city will work with the trades and</p>	<p>This is a priority program area still to be developed. It is expected that partnerships with other organizations and support from senior levels of government will be necessary to support this initiative.          Targets/milestones have been added.</p>



	industry to supply the market with the required skills to carry out retrofits on a wide scale.	
Burlington-Green	<p><b>Renewable Energy Cooperative</b> BurlingtonGreen supports this program area. The program will help to source renewable energy in a cost-efficient manner. The program lacks interim targets and timeline (e.g. minimum % renewable energy, annual addition of MW of renewable energy).</p>	Targets/milestone have been added.
Burlington-Green	<p><b>Integrated Mobility Plan</b> BurlingtonGreen supports this program area. We urge the City to provide the funding and policy framework to move the program forward, and to set interim targets.</p>	This project is just about to start led by the Transportation Services Department.
Burlington-Green	<p><b>Electric Mobility and Equipment Program</b> BurlingtonGreen supports this program area. We urge the city to consider all aspects of an EV strategy that include incentives, investing in public charging infrastructure and working with utility partners to ensure the demand on the grid is effectively managed.</p>	Agreed.
Burlington-Green	<p><b>Waste Reduction Initiative</b> Recognizing that waste authority and management is a Halton Region responsibility, it is essential the City recognize, act on and showcase to the community how it is leading by example in this area and how waste and the circular economy link to action on climate here in Burlington.</p>	Thank you for the comments. As noted in the plan, sustainability and energy staff will be focusing efforts on three priority program areas – deep energy retrofits; renewable energy and electric mobility and equipment.
Burlington-Green	<p><b>Industrial Innovation Program</b> BurlingtonGreen recognizes this is a lower priority area in Burlington’s context, and encourages the city to</p>	Agreed – to be explored in the future with other potential collaborators.

	engage industry stakeholders for further consultations.	
Burlington-Green	Recognizing the City's current plan to include green infrastructure and biodiversity in 'phase 2' (adaptation) of the Climate Action Plan, we believe it important to include 'natural solutions' as an 8 <sup>th</sup> Program Area within the current draft plan. "In nature-based climate change mitigation, ecosystem services are used to reduce greenhouse gas emissions and to conserve and expand carbon sinks" and furthermore "compared to technology-based solutions to climate challenges, nature-based solutions are often lower cost, longer lasting, and have multiple synergistic benefits for a variety of sectors and political goals."	Thank you for the comment. As noted in the plan, information related to trees and green infrastructure will be considered under Part 2 in the Climate Adaptation Strategy.
Burlington-Green	<p><b>Financial Commitments and Investments</b></p> <p>The success of the proposed climate action program areas relies on the investments and commitments that the city invests to ensure its success.</p> <p>City Council's Declaration of a Climate Emergency demonstrated that Council recognizes how serious of a threat climate change is and why we need to urgently invest in effective solutions to mitigate its worst effects. All levels of government play a role in fighting climate change and need to come together. Please review BurlingtonGreen's feedback on the city's 2020 budget for our recommendations.</p> <p>Allocating funds to climate action must go hand in hand with reviewing the proposed climate action plan.</p>	As programs are developed for the action areas, funding and financing mechanisms will be recommended.

	<p>The plan identifies 23 actions spread over 7 programs that will reduce Burlington’s carbon emissions and transition the community to net carbon neutrality. If the plan is approved and adopted by Council, a financial commitment must be reflected in the City’s budget, both in the short term and the long term. Top priority picks for climate change investments should speak to curbing emissions from the largest emissions sectors.</p> <p>Recommendations for the buildings sector include providing incentives for developers that implement green standards in their buildings and advancing low carbon smart communities / projects, in addition to financing a deep retrofit program similar to Toronto’s HELP program. Investment priorities in the transportation section include financing the expansion of transit services, electrifying urban transit and the municipal fleet and investing in charging infrastructure throughout the City. Additionally, investing in partnerships with environmental non-profits and the business community will accelerate climate action and help to achieve the overarching target.</p>	
Burlington-Green	<p><b>Conclusion</b> Climate change is here, and the time to act was yesterday. At no time in our history has the phrase “think global; act local” been more true. There is no greater ‘gift’ that the city can provide to current and future generations than clean air to breath, safe water to drink, healthy food to eat and a stable climate to sustain life of all forms.</p>	Agreed - thank you for your comments.

	<p>We trust you will find BurlingtonGreen's input on this most critical issue to be helpful and we look forward to future opportunities to collaborate to ensure City and community action on climate change is effective and a front and centre priority.</p>	
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