CITY OF Burlington . . . Memo

To: Mayor & Members of Council

From: Lynn Robichaud, Sr. Sustainability Coordinator, Environment, Infrastructure & Community Services

cc: Allan Magi, Exec. Director, Environment, Infrastructure & Community Services

Date: April 15, 2020

Re: **Climate Action Plan for Burlington**

There has been a correction to the Climate Action Plan with respect to data in the table located on page 53 related to actions for deep energy retrofits of homes, specifically actions #5 - #7. Apparently, the errors were made during the final design process for the plan. This error was noted by a resident when the report was presented to the Environment, Infrastructure & Community Services Committee in March.

In addition, the consultant SSG has added an additional explanation related to the modelling of costs and emissions for deep energy retrofits of homes and the use of heat pumps in Appendix 1 of the plan:

> Residential retrofits to improve the building envelope, to reduce energy demand, and to switch to low- or zero-carbon fuel sources are an essential part of the low-carbon pathway for Burlington. Facilitation of the wide-spread adoption of these modifications may require support or incentives to encourage the level of uptake required to achieve deep GHG emissions reductions, as not all retrofits or conversions will be financially positive or neutral.
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> The cost of heat pumps, as well as other interventions, were assessed over the period from 2019-2050. Assumptions about the size and timing of installing heat pumps in commercial buildings are less accurate than for residential buildings; Burlington does not have a large commercial building stock.
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> Electricity price projections used in the modelling are obtained from Canada's Energy Regulator, and project that electricity will be more than ten times more expensive than natural gas in the future. Added to this is the complexity of investment required in Ontario's electricity grid, which could result in even higher electricity prices. This increase is the primary driver of the additional cost for heat pumps combined with the capital cost, which is higher than a conventional boiler or furnace- the combination of low natural gas prices and low capital costs,

make the financial case for heat pumps challenging. Groundsource and air-source heat pumps are bundled together in the modelling, which has the effect of lowering the costs of ground-source heat pumps, and raising the cost of air-source systems. Air-source heat pumps will have a better return on investment, and no hybrid or other heat pump types were evaluated.

The cost of retrofits in the model averages between $50,000 and $60,000 per unit, resulting in energy savings of 50% savings. This level of retrofit on one dwelling today will likely be more in the range of $80-$100,000, so the modelling assumption is based on the development of a retrofit industry that achieves economies of scale. Energy savings needs to be significant to provide a return on an investment of $60,000. Retrofits that result in energy savings of 20-30% can be more financially compelling, but once insulation in exterior walls and windows need to be replaced the return on investment is longer. Retrofit investment for the entire plan is $600 million while the savings are $550 million over a 30 year projection, with a margin of error associated with the assumptions for the modelling.

The attached updated Climate Action Plan is presented for approval by Council.