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To: "Direct to Mayor and Council - DL"

CC: "City Manager's Correspondence Group - DL"

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"Smith, Doug \ (Sustainability)" <doug.smith@vancouver.ca>

Date: 1/10/2019 5:18:39 PM

Subject: Memo - IPCC Report

Attachments: Memo to Mayor and Council - What the IPCC Special Report on Global Warmi...pdf

Dear Mayor and Council,

Please find attached a memo from Gil Kelley regarding the recent Intergovernmental Panel on Climate Change (IPCC) report.

In summary:

- The signatory countries to the Paris Climate Agreement (including Canada) have committed to keeping global warming below 2°C and as close to 1.5°C as possible. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a report examining the impacts of 1.5°C versus 2°C of warming, and the actions required to limit warming to 1.5°C.
- To limit global warming to 1.5°C, the necessary changes to global energy systems will be immense and will require an unprecedented degree of technological change and cooperation. The world must achieve close to zero net emissions by 2050 to have reasonable chance of limiting global warming to 1.5°C.
- The benefits of limiting warming to 1.5°C are commensurate with the challenge, because of the risks of catastrophic and runaway climate change impacts that could overwhelm our capacity to adapt if global warming reaches or exceeds 2°C.
- Vancouver's targets are largely consistent with 1.5°C until mid-century. To achieve our 100% renewable energy target, we anticipate carbon pollution would be reduced by approximately 75% in 2040 and greater than 95% in 2050.
- Vancouver needs to reduce carbon pollution faster. While our modelling indicates our targets are achievable, the progress we have made to date needs to be accelerated significantly. The actions in the Renewable City Action Plan are intended to accelerate our progress, with the expectation that they would be regularly refreshed to increase our ambition where possible.

If you have any questions related to this issue please contact the Director of Sustainability, Doug Smith, at 604.829.4308 or doug.smith@vancouver.ca.

Best,
Sadhu

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MEMORANDUM

January 10, 2019

TO: Mayor and Council

CC: Sadhu Johnston, City Manager
Paul Mochrie, Deputy City Manager
Lynda Graves, Administration Services Manager, City Manager's Office
Rena Kendall-Craden, Communications Director
Katrina Leckovic, City Clerk
Neil Monckton, Chief of Staff, Mayor's Office
Alvin Singh, Communications Director, Mayor's Office
Anita Zaenker, Chief of Staff, Mayor's Office

FROM: Gil Kelley
General Manager, Planning, Urban Design and Sustainability

SUBJECT: What the IPCC Special Report on Global Warming of 1.5°C means for cities

Summary

The signatory countries to the Paris Climate Agreement (including Canada) have committed to keeping global warming below 2°C and as close to 1.5°C as possible. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a report examining the impacts of 1.5°C versus 2°C of warming, and the actions required to limit warming to 1.5°C. In December 2018, C40 Cities, the Global Covenant of Mayors, and 18 IPCC scientists released a follow-up Summary for Urban Policymakers explaining what 1.5°C of warming means for cities.

To limit global warming to 1.5°C, the necessary changes to global energy systems will be immense and will require an unprecedented degree of technological change and cooperation. However, the benefits of limiting warming to 1.5°C are commensurate with the challenge, because of the risks of catastrophic and runaway climate change impacts that could overwhelm our capacity to adapt if global warming reaches or exceeds 2°C.

This memo reviews the Summary for Urban Policymakers report and positions the findings in a Vancouver context. The full report is available here:

https://www.globalcovenantofmayors.org/wp-content/uploads/2018/12/Summary-for-Policy-Makers_Final_Online.pdf.

Impacts of 1.5°C versus 2°C of warming

Every additional degree of warming increases risk meaning the risk of runaway changes to the climate will increase, the impacts will become more severe and it will become increasingly likely our efforts to adapt will be insufficient.

The impacts of climate change do not plateau at 2°C, so any warming beyond that would mean even more severe impacts. For context, even with the commitments made by Paris-signatory countries to date, the world is currently on track for more than 3°C of warming by the end of this century.

Even half a degree is significant. The IPCC compared the impacts from climate change in a world with 2°C of warming relative to one with 1.5°C and found the following:

- As many as 457 million more people exposed to climate risks and related poverty.
- Twice as many people suffering from water scarcity.
- Twice as many plants and three times as many insects losing their habitat.
- An ice-free Arctic every 10 years instead of every 100 years.
- 2.6 times as many people exposed to extreme heat at least every five years.
- Double the decline in global fisheries.

In all scenarios there is a need to adapt to the impacts of climate change. Society is already dealing with the impacts from 1.0°C of warming (e.g. more frequent wildfires, increased coastal flooding and more intense storms). Even in a best-case scenario, those impacts will become more severe.

Vancouver is no exception. For example, an estimated \$1 billion in investment is needed to adapt to the sea level rise that is already projected to occur between now and 2100. In response to these threats, the City recently adopted the updated adaptation strategy to 2023 and will be producing annual progress reports on the issue.

Global response needed to limit warming to 1.5°C

The IPCC examines different scenarios (referred to as “pathways”) that describe the rate at which fossil fuel use declines and carbon dioxide removals (e.g. reforestation and carbon capture and storage) increase. The resulting net emissions are used to estimate changes in global average temperature.

By grouping the scenarios that limit warming to 1.5°C, the IPCC is able to characterize the global response needed to achieve that outcome. The faster net emissions decline, the greater the likelihood of limiting warming to 1.5°C.

The world must achieve close to zero net emissions by 2050. The middle 50% of the IPCC pathways that limit global warming to 1.5°C rely on a 94% to 107% reduction in global net carbon dioxide emissions by 2050 (relative to 2010 levels). A reduction of greater than 100% means that more emissions are being removed from the atmosphere than are being added to it. In 2030, the corresponding range is a 40% to 58% reduction.

Limiting warming to 1.5°C in a Vancouver context

Vancouver’s climate plans have historically focused on reducing the carbon pollution the City has the greatest influence over: residential and commercial buildings, the vehicles on our roads, and our landfill. These sources (also referred to as scope 1 and scope 2 emissions) accounted

for 2.6 million tonnes of carbon pollution in Vancouver in 2017. The City's targets for reducing those sources are set out in the Renewable City Action Plan as follows:

	2020	2030	Before 2050
Percentage of energy from renewable sources (including hydro power)	No target	55%	100%
Reduction in carbon pollution (relative to 2007)	33%	50%	At least 80%

Vancouver's targets are largely consistent with 1.5°C until mid-century. The emissions pathways modelled to meet Vancouver's 2030 and 2050 targets roughly fall in the middle of the range of global emissions pathways the IPCC found to be consistent with 1.5°C. To achieve the 100% renewable energy target, we anticipate carbon pollution would be reduced by approximately 75% in 2040 and greater than 95% in 2050.

Vancouver will need negative emissions targets after mid-century. The IPCC also points to the need to achieve negative net emissions near mid-century and continue declining thereafter. This will require eliminating most sources of carbon pollution and ensuring emissions removals exceed the remaining emissions. Vancouver's current targets extend to 2050, and will likely need to aim for negative net emissions in the second half of the century to remain consistent with 1.5°C. Examples of how this could be achieved include reforestation projects, projects that enhance carbon storage in aquatic ecosystems, and projects that capture and store carbon from wood waste combustion.

Vancouver needs to reduce carbon pollution faster. While our modelling indicates our targets are achievable and consistent with 1.5°C, the progress we have made to date needs to be accelerated significantly to get on track for our 2030 and 2050 targets. Vancouver has reduced carbon pollution by an average of 19,000 tonnes per year over the past decade (achieving a total reduction of 7%). That rate will need to increase to 92,000 tonnes per year to achieve our 2030 target. The actions in the Renewable City Action Plan are intended to accelerate our progress, with the expectation that the actions would be regularly refreshed to increase our ambition where possible.

Beyond buildings, transportation and solid waste, there are other sources of carbon pollution that the City bears some responsibility for, but occur outside of the City's boundaries (referred to as scope 3 emissions). Examples include the emissions associated with air travel, the cement used in Vancouver, and the food consumed in the city. These sources will also need to be eliminated or offset to achieve a global pathway consistent with limiting warming to 1.5°C.

The City has less ability to influence these sources, and has not historically attempted to do so. The Renewable City Action Plan directs staff to evaluate scope 3 emissions and opportunities to reduce them as a medium-term action. While Vancouver has some ability to influence those emissions (e.g. encouraging plant-based diets), eliminating them will rely heavily on the actions in the jurisdictions where those emissions are created (e.g. BC's policies to reduce emissions from food production in the province).

Conclusion

The IPCC findings can be overwhelming given the potential impacts we are facing and the challenges involved in minimizing those impacts. While Vancouver is not able to solve all of those challenges, we are well positioned to contribute to a global effort. At the December 2018 global climate talks in Poland, the IPCC framed the challenge as follows:

Every Action Matters
Every Bit of Warming Matters
Every Year Matters
Every Choice Matters

If Vancouver successfully increases our efforts to reduce carbon pollution in line with our targets, we will be meeting the intent of the above statement while improving the quality of life of residents in our city and continuing to take advantage of the economic opportunities associated with these choices.

If you have any questions related to this issue please contact the Director of Sustainability, Doug Smith, at 604.829.4308 or doug.smith@vancouver.ca.

A handwritten signature in black ink, appearing to read 'Gil Kelley', with a long horizontal line extending to the right.

Gil Kelley, FAICP
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