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Time to Refocus our Approach to Climate Change

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In light of the mounting threat posed by climate change, it is imperative that we take urgent action to mitigate greenhouse gas (GHG) emissions. We can no longer wait for governments to reach agreements through the United Nations (UN) climate change negotiations. After countless meetings, the current agreement is to produce a plan by 2015 that would take effect only in 2020. Even if such a plan were a binding accord, the timeline would be too late to stop catastrophic climate change. We must act now to curb emissions. This Briefing Paper summarizes a longer research paper by the same title.

The UN climate change negotiations have been moving backward ever since the Copenhagen conference of 2009. After that conference, Canada announced a new GHG emissions reduction goal that would result in 2020 emissions being 2.5% higher than they were in 1990. Yet by 2020, emissions must be at least 25% lower than 1990 levels if we are to avoid disastrous climate change. Following the 2011 Durban conference, Canada announced its formal withdrawal from the Kyoto Protocol.

An open letter released on the eve of the 2012 Doha conference from three leaders of the climate justice movement – Pablo Solon, Executive Director of Focus on the Global South, Bill McKibben, founder of 350.org, and Nnimmo Bassey, Coordinator of Oilwatch International – lays out the stark reality of what must be done to stop runaway climate change:

If we want a 50-50 chance of staying below two degrees [Celsius increase in global temperatures], we have to leave 2/3 of the known reserves of coal and oil and gas underground; if we want an 80% chance, we have to leave 80% of those reserves untouched. That's not "environmentalist math" or some radical interpretation – that's from the report of the International Energy Agency.

Since the Copenhagen conference, the official goal set by negotiators is to keep temperature increases at less than two degrees Celsius above pre-industrial levels. However, even a two-degree rise is extremely dangerous. NASA climatologist James Hansen declares, "The target ... for two degrees of warming is actually a prescription for long-term disaster."

A report titled *Turn Down the Heat*, issued by the World Bank, confirms that the world is on track for a four-degree Celsius temperature increase by the end of the century. Most alarming is the report's finding that the effects would be more severe for tropical, sub-tropical and polar regions. Extreme weather events are confirming warnings from climate scientists that rising temperatures would inevitably bring not just heat waves, but also more intense storms and droughts. In 2012, more than 70 people perished from torrential rains in Beijing while a million people in Bangladesh had to flee floods and landslides.

Unprecedented Melting of Arctic and Antarctic Ice

The 2011 KAIROS Briefing Paper, Arctic Melting Sounds the Alarm for Life on Earth, examined several scientific studies on the danger posed by temperature increases in the far North. As Arctic ice melts, exposing the darker sea, less sunlight is reflected back into space, contributing to temperature increases in the region that are two or more times higher than the global average.

In 2012, dramatic new evidence emerged concerning accelerating climate change in polar regions. The European Space Agency discovered that sea ice loss in the Arctic is 50% greater than previously estimated.

Moreover, researchers have discovered that temperatures in parts of Antarctica have risen by 2.4^0C between 1958 and 2010 which is three times faster than in the rest of the world. The combination of warmer water eroding the West Antarctic Ice Sheet from below and higher surface temperatures could cause 2.2 million cubic kilometres of ice to melt into the sea.

In July 2012, NASA satellite observations revealed that an unprecedented 97% of the surface of the Greenland ice sheet had undergone melting, although the underlying ice remains intact. The Greenland ice sheet is already losing mass at the rate of 100 cubic kilometres a year.

Scientists calculate that a two-degree temperature increase would melt enough polar ice to raise ocean levels by between 7.5 and 9 metres. Higher temperatures would mean even higher sea levels, with the eastern Antarctica ice sheet containing enough water to raise sea levels over time by an extraordinary 54 metres.

Canadian scientist Charles Tarnocai estimates that there are about 1.5 trillion metric tons of carbon locked in frozen soil in Northern regions, equivalent to two and a half times as much as all the carbon in the atmosphere. When permafrost is exposed to sunlight, bacteria convert soil carbon into carbon dioxide 40% faster than they convert carbon from permafrost that remains in the dark, according to Rose Cory, a researcher at the University of North Carolina.

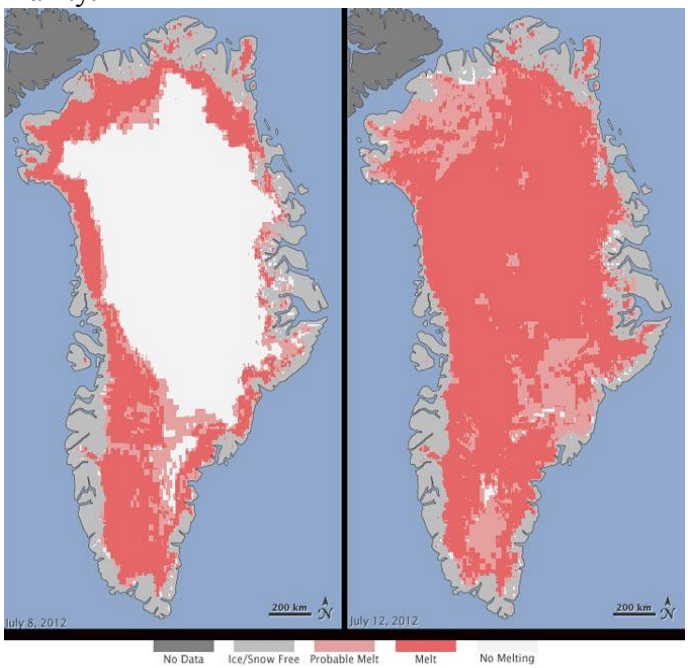
Carbon emissions from permafrost are not included in the projections from the International Energy Agency. Nor are they included in climate change models.

Hence, scientists who study Arctic climate change warn that permafrost melting could release enough carbon to increase global temperatures by three degrees Celsius, in addition to what will result from emissions caused by our combustion of oil, gas and coal.

In addition to the carbon stored in permafrost, there are millions of tons of methane (a GHG that is 72 times more potent than CO_2, measured over a 20-year period) trapped in frozen methane hydrates offshore in the Arctic Ocean.

Hansen warns of the consequences of feedback mechanisms from initially low levels of warming which could push us past irreversible tipping points. He claims that they are already occurring in the Arctic and Antarctic regions.

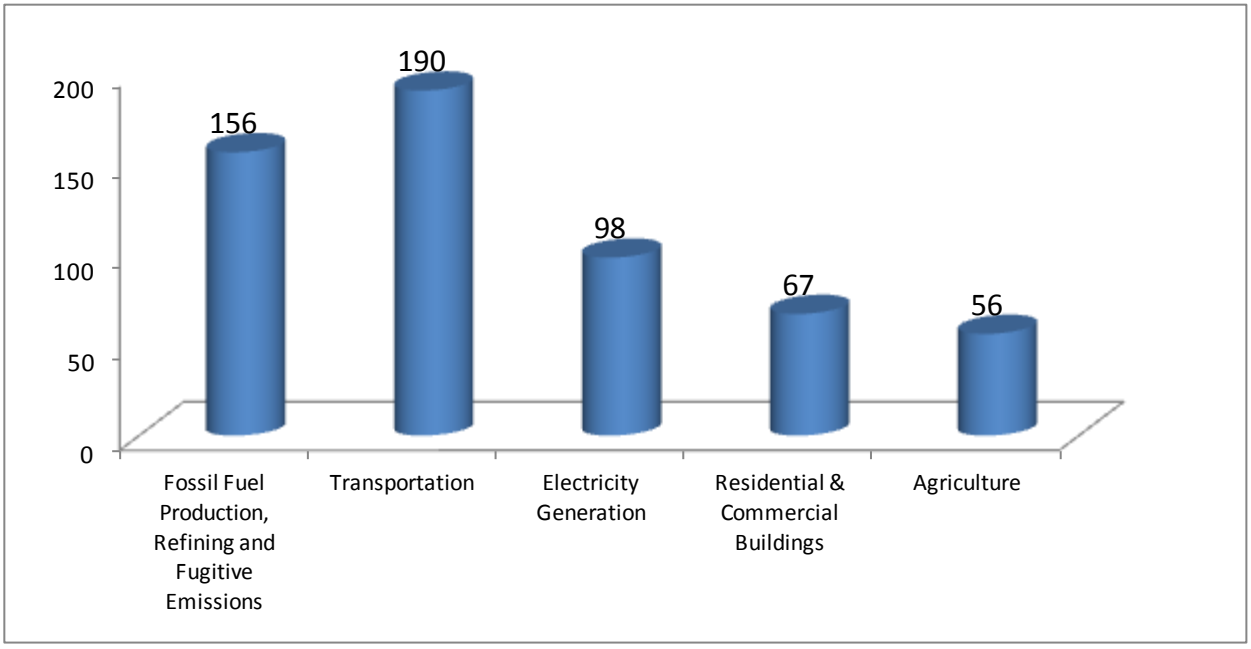
If only a small part of the GHGs stored in permafrost, and methane hydrates now frozen in polar regions are released into the atmosphere, the disastrous consequence, according to Hansen, would be "practically irreversible on time scales of relevance to humanity."



NASA images show the extent of surface melt over Greenland's ice sheet on July 8, 2012 (left) and July12, 2012.

Given what is occurring in polar regions, Robert Watson, former chair of the Intergovernmental Panel on Climate Change, and now science director at the Tyndall Centre for Climate Change research in Britain, says that the world has already missed the chance to hold climate change below two degrees Celsius and should now prepare to face from three to five degrees of warming.

Major Components of Canada's Greenhouse Gas Emissions 2009
(Megatonnes of CO_2 equivalent)



An examination of each of the major sources of Canada's GHG emissions shown above leads to the following agenda for action:

Curbing Emissions from Fossil Fuel Production

The tar sands constitute the fastest growing source of GHG emissions within Canada. Extraction of synthetic fuel from the tar sands releases from 3.2 to 4.5 times more GHGs than conventional oil extraction. Environment Canada projects that GHG emissions from the tar sands will more than double by 2020 unless current federal and provincial policies change.

The carbon footprint from the combustion of fossil fuel products exported from Canada is 115% as large as the emissions from oil, gas and coal products consumed within the country. In 2010, when KAIROS issued its policy paper *Drawing a Line in the Sand: Why Canada needs to limit tar sands expansion and invest in a green economy*, we called for "no further approvals for tar sands projects." At the time, the total capacity of tar sands operation in production, under construction and approved for development was 3.3 million barrels a day (mb/d). According to the International Energy Agency 3.3 mb/d is also the upper limit for tar sands production if global temperature increases are to be kept under two degrees.

Current pipeline capacity for transporting oil from the tar sands is 3.8 mb/d – more than enough to allow for 3.3 mb/d of production. Accordingly, no new export pipelines should be built if tar sands production is to be contained within the limits deemed compatible with a two degree increase in temperatures.

KAIROS stands with Indigenous peoples who are defending their rights to free, prior and informed consent before any pipeline project can traverse their lands or waters. Likewise, our advocacy for no new approvals for tar sands projects leads to opposing new export pipelines proposed for reaching the Pacific, the Atlantic or the Gulf of Mexico.

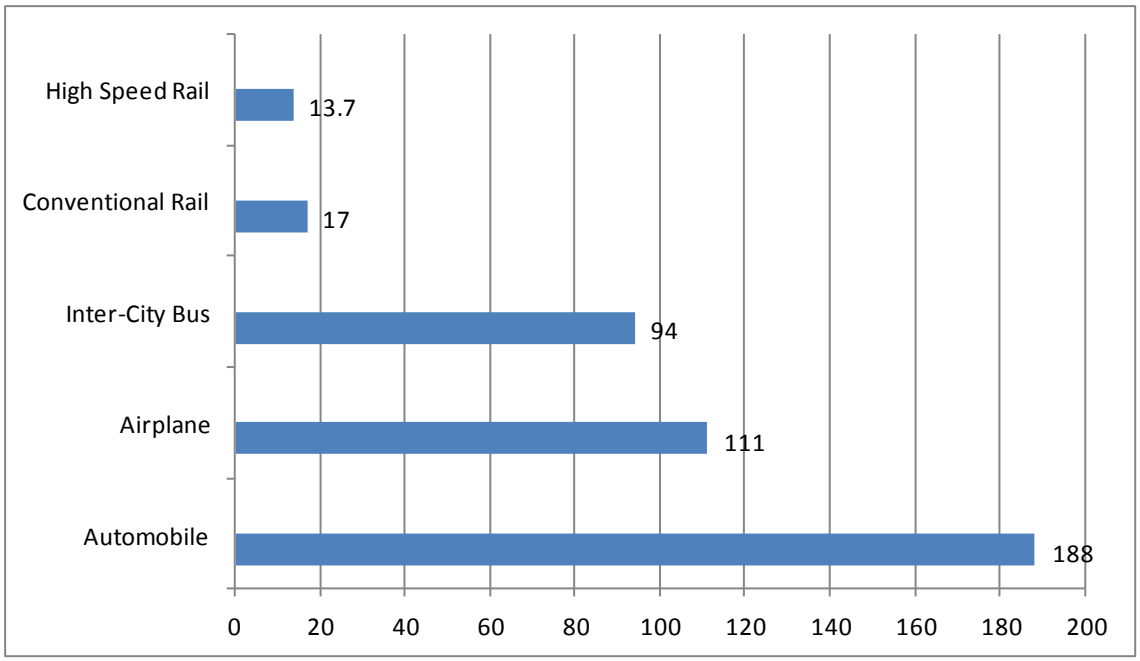
Cutting GHG emissions from Transportation

Public transit produces only 5% to 10% as much GHG emissions as do private automobiles. A number of feasible and cost effective policy measures for reducing automobile use are available. These will require coordinated efforts by all levels of government – municipal, provincial, territorial and federal.

Redirecting the $1.3 billion in annual subsidies the federal government now gives to fossil fuels to public transit and renewable energy projects could create from six to eight times more jobs than those that come from investing the same amount in the oil and gas industry.

Canada is the only G8 country without a plan to provide federal funding for urban transit and without high-speed rail lines. High speed rail passenger transportation emits eight times fewer GHG emissions than airplane travel and over 13 times fewer than automobiles.

Relative Efficiency of Transportation Modes: Grams of CO_2 per Seat per Kilometre



Reducing Emissions from Coal-fired Electricity Generation

In 2009, emissions from coal-fired power plants accounted for 77% of emissions from the electricity sector and 11% of Canada's total GHG emissions. Most of these installations are located in Alberta, Saskatchewan and Nova Scotia. Ontario will have phased out 17 of 19 coal-fired power plants between 2003 and 2013.

Substituting Renewable Energy for Fossil Fuels

Ontario is able to stop producing electricity by burning coal in part because its feed-in-tariff program guarantees producers of wind and solar power remunerative prices for the electricity they sell into the provincial grid. It has attracted over $27 billion in private sector investment and fostered 30 clean energy companies, creating more than 20,000 jobs.

In our study, A Sustainable Energy Economy is Possible, we examine the prospects for renewable energy production within Canada from hydro, wind, solar, geothermal and tidal power sources. We show that Canada has the potential to replace, from renewable sources, all coal and nuclear power currently produced, as well as to generate additional power to run electrified transportation. Our study concludes that the huge potential for geothermal heating and power generation has yet to be explored. Similarly, the potential for generating power from ocean waves and tides deserves more attention.

Building Retrofits

Emissions from residential and commercial buildings account for about 11% of GHG emissions in Canada. The Green Economy Network (GEN), in which KAIROS collaborates with several other civil society organizations, proposes retrofitting 40% of Canadian homes by 2020 to an average level of 30% increased energy efficiency. In addition, efficiency upgrades for 150,000 new low-income homes could reduce their energy bills by 30% by 2015.

For industrial, commercial, business and public buildings, GEN calls for improving energy efficiency by 50% over 10 years and requiring all buildings to be "zero net energy", meaning they would produce as much energy as they consume by 2020.

Conclusion

We cannot wait for negotiators at United Nations conferences to come up with a plan to mitigate climate change. A plan that takes effect only in 2020 will be too late to prevent drastic changes to the Earth's biosphere. We must act now on feasible steps to reduce our emissions even as we work for a deeper transformation of the dominant system to a new ecologically sustainable paradigm.

This Briefing Paper summarizes a longer research paper by the same title available at http://www.kairoscanada.org/wp-content/uploads/2013/03/Sus-CJ-NG-13-03-RefocusClimateResearchPaper.pdf