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04 February, 2023

The Honourable Prime Minister Justin Trudeau  
House of Commons  
Ottawa, Ontario, K1A 0A6

**Subject:** NEAR-zero Emissions, not NET-zero, through Energy Conversions to renewables

Dear Mr. Trudeau:

I am a retired atmospheric/climate scientist concerned about our ability to fight the current climate crisis. It is exactly one year since I last wrote to your office, wherein I agreed with the climate plan emphasizing the need for rapid reductions in carbon emissions. The response (from Sylvie Poulin of Departmental Correspondence), dated 13 December 2022, indicated no change in path on the plan, simply reiterating the strategy to cap and cut emissions from the oil/gas sector “*at the pace needed to reach net-zero by 2050.*” But therein lies the problem: ‘*net-zero*’, based on Canada’s baseline year of 2005 when emissions were 730 MT. The fossil fuel industry assumes this to mean they can maintain emissions at that level, 730 MT, while technology handles any increase, as well as drawing down GHGs from the atmosphere. I question whether we are deluding ourselves, for emissions in 2022 increased globally to just under 40GT from 27 GT in 2005. (I have no data for Canada’s emissions in 2022, and I have no reason to believe that ours have dropped when global values have increased by 50%.)

The reductions suggested in Canada’s Emissions Reduction Plan of April 2022 are not happening because the plan, calling for “*net-zero emissions by 2050*”, is simply the wrong approach; moreover, it is somewhat deceptive, since many in media and the public believe it means going carbon neutral, but that will not happen with the current plan. What we NEED is a plan for ***NEAR-zero emissions by 2050***. The current plan, starting with the baseline year 2005 when Canada’s emissions were 730 MT, allows for the same rate of emissions right through 2050 if the oil/gas sector does not conform to emission reductions, and if presumed carbon sequestration does not occur. If emissions continue at current rates, and if other countries follow suit on ‘*net-zero*’ as appears to be the case, then our climate will reach a *tipping point*, most likely by 2040 when global temperatures will have increased by more than 2°C. If that happens, the world will lose any opportunity to reverse global warming, and humanity at that time will be at risk for extinction – it’s that serious! The fossil fuel industry is organized by market forces only to increase profits, and will use every advantage to achieve just that.

Our climate plan is also based on adopting carbon sequestrations methods – namely, planting more trees, plus the still unproven technologies, Direct Atmospheric capture (DAC) and Carbon Capture and Storage (CCS). In my letter of one year ago, I included an appendix (repeated at the end of this letter) showing how neither of these three techniques can make one iota of difference in terms of countering current emissions. Trees do not reach maturity in Canada for 50-100 years, when their sequestration capability could make some minor difference. A tree seedling does not capture any measurable quantity of CO<sub>2</sub> from the air. Thus, the current plan condemns us to truly achieve net-zero (or more) emissions, 730 GT (+) by 2050. Moreover, CCS is being handled by the fossil fuel industry, and is used only for CCu (Carbon Capture and Utilization), to make existing oil/gas wells more productive, with the CO<sub>2</sub> eventually returned to the atmosphere.

**But there is a better way forward.** I urge you to consider putting the **strongest emphasis on converting our energy sources over to renewable energy** – *wind, solar, geothermal, hydroelectric, and even tidal*. All except the latter are proven through long testing, all inputs/outputs are well understood, and the energy is free. With a little help, those industries concentrating on renewables could easily have us achieve 50% turn-over by 2030, 90% by 2040, and 95% by 2050, along with some expert persuasion to get industry to convert to electric. Meanwhile, you let market forces determine remaining needs for fossil fuels through supply and demand. Tax

money currently available to fossil fuels through grants and tax advantages, would be better used to help make the conversion to renewable energy.

**This conversion would make Canada a true leader in the battle against global climate change, and would become the model to follow.** We could see positive results within a year or two, and there should be no battle with the fossil fuel industry. The appalling alternative is to continue supporting fossil fuels, continue increasing atmospheric greenhouse gases, and continue to increase global warming – in other words, fighting against nature instead of fighting alongside it. That alternative is a war against nature, a war that is 100% guaranteed to be lost.

The oil industry often points out that “*renewables are unreliable because the wind does not always blow, the sun does not always shine, and there are problems with electric energy storage.*” These problems can be easily overcome by using microgrids of two or more renewables in the same grid, with the microgrids tied in with the major electric grids for reliability. Incidentally, whichever way we go, our grids require west-east revamping. As for electric energy storage, huge advances have been made on this problem, even in the past year, so that it will no longer be an impediment.

I urge you to consider these changes in emphasis in the climate plan, changes that would make for a solid plan. The energy conversion would provide a huge boost to Canada’s economy, while any jobs lost from the fossil fuel industry could be easily transferred over to the new energy alternative.

Make our economy and our country truly green.

Sincerely yours,



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cc: The Honourable Steven Guilbeault, Minister of Environment and Climate Change Canada  
The Honourable Jonathan Wilkinson, Minister of Natural Resources

# APPENDIX

## A Summary of Weaknesses in Canada's Current Climate Plan

### A. Carbon Sequestration Methodologies:

- 1) Planting millions of trees – this is not a viable approach for either countering carbon emissions or for drawing down atmospheric CO<sub>2</sub> in the next couple of decades, mainly because most trees in Canada require more than 50 years to mature. New trees are ‘seedlings’, which sequester negligible CO<sub>2</sub> in their first 10-20 years. A 10-year maple, for example, barely captures 4 lb of carbon per year = 0.005 metric tonnes. A 30-year maple can capture 65 lb/yr, or 0.08 tonnes. Considering Canada's annual carbon emissions of ~ 730 MT (= 730,000,000 tonnes), then simply dividing this number by the weight of annual capture yields 9 trillion trees to counter our 730 MT, or 900 million to counter just 10% of annual emissions. A sobering truth here is the realization that there are presently only 3 trillion trees on all of Earth.
- 2) There are approximately 20 DAC facilities operating worldwide, capturing roughly 0.01 MT of CO<sub>2</sub>. The U.S. is hoping to build a single one-MT/yr facility (= 1,000,000 tonnes), although this over-ambitious plant is years away from construction and testing. Since global carbon emissions exceed 35 GT (= 35,000,000,000 tonnes) per year, the world would need 35,000 similar facilities to absorb this, but we no longer have the time to build these before total disaster hits.
- 3) There are presently 27 operational CCS facilities worldwide, capturing CO<sub>2</sub> at industry source. The most successful of these has been the Sleipner Facility in the North Sea offshore Norway, which they claim can capture just under one million tonnes per year. But the world would need 35,000 of these at major industrial sites to capture 35 GT of global emissions, or 3500 of them to capture just 10% of emissions.

It should be clear that these ‘sequestration’ techniques cannot counter even a small fraction of current carbon emissions in the time we may have before the climate ‘tips’. A recent report indicates that DAC and CCS facilities release more carbon to the atmosphere than they extract. CCS facilities might provide a minimal counter to emissions in one or two decades. But by then it would be too late to save the planet. That expense should logically go instead into converting to renewable energy. The fossil fuel industry is already poised to convert to renewables, including BP, Shell, Chevron, Total, Eni and Exxon (<https://www.nsenergybusiness.com/features/oil-companies-renewable-energy/>).

We really have **no alternative but to reduce carbon emissions**. The switch to electric vehicles for transportation is already happening, aided by the incrementally increasing carbon tax. This will counter most (about 20%) of our transportation emissions of 25% after 2030. Converting most other energy production to renewables needs to occur simultaneously. A reasonable goal would be to aim for 40% conversion by 2030, not just from ‘from federal facilities and conventional fleets’ as stated in the climate plan, but throughout the whole of Canada. An additional 30% reduction could then follow by 2050. The total 90% conversion by 2050 would bring emissions back to 1950 levels, assuming stable population levels.

### B. Current Atmospheric CO<sub>2</sub> Concentration

Our climate plan must reflect the gravity of the atmospheric concentration of CO<sub>2</sub> (420 ppm). Many do not realize that the climate warming we experience today is due to carbon emissions of the past 50-100 years. Because the life cycle of CO<sub>2</sub> in the atmosphere is measured in hundreds of years, our climate would continue to warm for many decades, even if all emissions were terminated today. Current CO<sub>2</sub> has the potential to warm our climate by a further 3-5 °C. That's why sequestration techniques are important, not to counter existing emissions, but to draw down atmospheric CO<sub>2</sub> later, a process that will take hundreds of years.

### C. 'NET-Zero Carbon Emissions by 2050'

Rather than 'NET-zero', we need to achieve "NEAR-zero emissions" (or at least 90% reduction as suggested above). This can be achieved mostly through industry and the public converting over to renewables (solar, wind, tidal, geothermal, even, if necessary, nuclear, although that needs to remain a last resort), along with transportation converting to all-electric.

The world needs to drop the 'net-zero' term, which appears to have been devised by the fossil fuel industry in the 1990s, and who then convinced governments to adopt it. If emissions were kept at their current rate of 35 GT/year until 2050, which might please the fossil fuel industry, they could technically still claim a success of net-zero emissions, no change since 2022. And by then (2050), the world would be headed towards apocalypse! Emission reductions would also improve the health of both our atmosphere and citizens, for along with GHGs (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, etc.), fossil fuels are responsible for air pollution (CO, NO<sub>2</sub>, and SO<sub>2</sub>). The latter would eventually reduce medical costs. **Meanwhile, we need Canada's government to champion these concepts among IPCC member countries.**

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