

How to Get Net-Zero Right

Principles, tools and steps for safe,
inclusive net-zero pathways

EXECUTIVE SUMMARY

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Executive summary

While the “what” of Canada’s commitment to net-zero carbon emissions by 2050 is seemingly simple, the “how” is much more complex. There are infinite scenarios compatible with reaching net-zero, but not all are compatible with keeping global temperature rise below 1.5 degrees Celsius and delivering a more inclusive, resilient, and competitive economy. The Pembina Institute puts forward four principles that should guide the development of pathways that acknowledge the challenges, opportunities, and choices before us and reflect the needs of all Canadians. We also identify key steps in decision-making (moments when the principles could be embodied or ignored), and offer recommendations on tools necessary to set Canada up for success.

Principles guiding robust pathways to net-zero

1. **Canada’s pathways to net-zero must put people first, prioritizing systemic change in the economy for the benefit of all.** Realizing the potential of the 2050 commitment requires a greater focus on social justice and inclusion achieved through conversations with Canadians in Indigenous communities, the private sector, workers and trade unions, local and racialized communities, as well as with youth, new Canadians, women and economically vulnerable populations. This will ensure that Canada’s net-zero pathways respect Indigenous rights and reconciliation. It will also enable broader understanding of risks faced by different

groups in the transition to a net-zero economy and how targeted policies can be developed to avoid disproportionate impacts and create an economy that works for every Canadian.

2. **Canada's pathways must be anchored in science and respect a carbon budget.** While the net-zero by 2050 target speaks to the destination, the 1.5-degree goal speaks to the journey. There are infinite scenarios compatible with reaching net-zero emissions, but not all are compatible with keeping global temperature rise safely below 1.5 degrees Celsius. The real measure of success of a net-zero pathway is whether it keeps cumulative emissions to a level that is in line with this 1.5-degree goal. A carbon budget — the amount of emissions that can enter the atmosphere if we wish to limit warming to 1.5 degrees Celsius — is a key tool to ensure safe pathways.
3. **Canada's pathways must prioritize early, deep, sustained, and technologically feasible direct emissions reductions in every sector.** Robust pathways to net-zero must see emissions peak as soon as possible, decline rapidly thereafter and reach a balance of human-caused (anthropogenic) sources and sinks. Delay leads to higher atmospheric carbon concentrations and higher temperatures, producing increasingly costly economic damages from climate change, and requiring more aggressive and likely costlier action later to limit even higher levels of atmospheric carbon. Moving boldly can secure Canada a spot at the starting line of the race to a low-carbon, global economy.
4. **Canada's pathways must define an appropriate role for carbon removal and offsets.** Achieving net-zero will require the use of carbon removal to address hard-to-decarbonize sectors or essential end uses that cannot yet be decarbonized. Carbon removal and offsets, however, cannot be approached as an alternative to mitigation, but rather in addition. Given the high cost, long lead time and other potential limitations on development of carbon removal technologies, Canada needs a framework in which decisions about the development and prioritization of use of removal technologies can be made in the context of overall economic decarbonization. Further, breaking down net-zero targets into three parts — direct reduction, carbon removal, and emissions neutralized through offsets — can help create transparency and robustness in a mitigation portfolio.

Steps for integrating net-zero principles

Unless they are integrated at key points in decision-making processes determining pathways to net-zero emissions by 2050, principles alone won't drive change. Canada needs a clearly articulated, shared approach toward achieving net-zero emissions at all levels of decision-making. That approach should require the following iterative steps to ensure guiding principles are put into action:

1. Set ambitious, national and sectoral targets and budgets for each five-year milestone period from 2025 to 2050, separating mitigation from removal.
2. Identify and clearly articulate plans to act on all available opportunities for direct emissions reductions for each sector for each milestone period. (For example, at the government decision-making level, uptake can be incentivized through regulations and financial support.)
3. Identify future direct emissions reductions opportunities and implement policies that incentivize aligned research and development efforts, including capital and supply chain mobilization, to make technologies that allow for direct reductions commercially available in the medium and long term, for each sector for each milestone period.
4. Having determined all available and future opportunities for direct emissions reductions and planned for incentivizing the deployment and development of direct mitigation technologies for each sector and for each milestone period, clearly articulate plans for appropriately scoped (based on removal capabilities and offset inventory expected to be available in each milestone period) and scaled deployment of carbon removal and offsets for those technically challenging or prohibitively expensive emissions in each sector.

While these steps speak to the second, third and fourth guiding principles (carbon budget, deep reductions, appropriate role for carbon removal, respectively), decision-makers must also account for the first principle (putting people first while advancing systemic change) through each cycle of planning and decision-making for each milestone period. Simply put, without thoughtful and thorough planning for the social justice and inclusion dimensions of energy transformation and the development of a skilled, inclusive workforce, Canada won't fully realize market and mitigation opportunities in the low-carbon economy.

Tools to keep Canada on track

Along with embodying guiding principles at key steps in decision-making processes, the following tools will be critical to the success of a shared approach to pathways decision-making:

1. Implementation of the United Nations Declaration on the Rights of Indigenous Peoples.
2. A strategy for maintaining worker and community livelihood in the transition to a low-carbon economy.
3. Broad public forums to identify solutions and build consensus on net-zero priorities and pathways.
4. National and provincial carbon targets and accompanying carbon budgets set within a robust accountability framework.
5. A strategic assessment of climate change that adequately determines whether projects assessed are compatible with net-zero pathways.
6. A national 1.5 degrees Celsius energy supply and demand scenario to ensure government and corporate decision-making is compatible with global efforts to limit warming and Canada's net-zero goal.
7. Incentivized adoption of robust corporate net-zero commitments.
8. Offset programs and allocation mechanisms that ensure carbon credits are used to offset the hardest-to-abate emissions and meet the highest level of environmental integrity.

The Pembina Institute considers these guiding principles, key steps, and tools for integrating net-zero considerations as a solid basis for determining robust, safe and inclusive pathways to net-zero by 2050. We look forward to building on these and other efforts with communities of decision-makers and stakeholders across Canada as we strive for a less divisive, more resilient, and healthier future.