

Net Zero Advisory Body

Attention:

Marie-Pierre Ippersiel (Co-chair)

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Submission via [NZAB Online Portal](#)

December 22, 2021

Dear Net Zero Advisory Body,

Canadian Nuclear Association's Submission to NZAB

The Canadian Nuclear Association (CNA) appreciates the opportunity to provide comments on the Net-Zero Advisory Body's (NZAB) recent request for input on their proposed value and principles.

The CNA has approximately 100 members, representing over 70,000 Canadians employed directly and indirectly in exploring and mining uranium, generating electricity, advancing nuclear medicine, and promoting Canada's leadership worldwide in science and technological innovation.

In this submission we address the following four questions:

- 1: How should the NZAB implement or refine its existing 10 values and principles to help ensure 2030 puts Canada on the mostly likely pathways to net-zero by 2050?
- 2: What key guiding principles should the NZAB consider in its advice on milestones for the oil and gas sector?
- 3: What key guiding principles should the NZAB consider in its advice on the transportation sector?
- 4: What key guiding principles should the NZAB consider in its advice on the buildings sector?

As well as providing comments on these questions, the CNA provides some high-level but important insights regarding the nuclear sector's potential contributions to the climate change crisis.

The CNA and nuclear sector look forward to continued engagement with the NZAB as your work progresses. We encourage the NZAB to follow up with the CNA and the nuclear sector as they progress with their policy work and engagement activities. CNA would like to be involved in future round table meetings, as we believe our sector has many potential solutions to the climate change issues facing Canada and the world. Furthermore, we extend an open invitation to the NZAB to connect with the nuclear sector as they explore the pathways to net zero.

[Net Zero Advisory Board's Ten Values and Principles](#)



CNA appreciates the efforts that the NZAB took to explain the development of the Values and Principles through the publication *Net Zero Pathways – Initial Observations (June 2021)* and appreciates that the group is accelerating their work through the consideration of learnings of other similar advisory bodies across the globe.

Values	Principles
Seize the upsides	Act early, and urgently
Put people first	Be bold and proactive
Motivate and empower Canadians	Acknowledge there is more certainty than uncertainty
Collaborate every step of the way	Don't get caught in the "net" Prioritize emissions reductions and use removal and offsets when necessary.
Recognize and respect regional differences and circumstances	Beware of dead-ends Avoid locking-in systems and technologies that will become emissions liabilities before 2050

Question 1: How should the NZAB implement or refine its existing 10 values and principles to help ensure 2030 puts Canada on the mostly likely pathways to net-zero by 2050?

The CNA provides comments on some, but not all, of the values and principles.

VALUES

The first value – **Seize the upsides** – could be better defined, as it is not clear what is meant in the description. The description touches on multiple issues: environment, economic and social benefits; costs of delayed climate action; environmental justice; rights and self-determination of Indigenous rights; importance of Indigenous partnerships; and ends with a nod to Environmental, Social and Governance (ESG) criteria. The thread amongst these various considerations is not clear and could be strengthened.

We do agree with the concluding statement that “the most likely pathways are those that have the broadest benefits” as this speaks to the policy criteria of *political acceptability* – whereby the public and decision-makers are more likely to be supportive of a pathway that benefits more Canadians. However, the descriptor “Seize the upsides” does not reflect this concluding statement, and a reconsideration of it may help clarify the intent.

The second value – **Put people first** – is important as it recognizes that action on climate change has the potential to unevenly affect Canadians. The CNA supports this value as it acknowledges the policy criteria of *distributional effects*, a measure of impact on equity and the extent to which some stakeholders may be more affected than others. The inclusion of this value is important, and the CNA supports it. Fairness and equity can be addressed in policy choices.

The fourth value – **Collaborate every step of the way** – is critical in the multi-stakeholder Canadian reality. CNA would encourage the NZAB to explicitly include collaboration with the provinces and territories in their description of this value, as moving forward on energy and environmental policies in this country require F/P/T collaboration. In addition, the CNA would

recommend that further emphasis put placed on collaboration with Indigenous communities across the country.

Working with the provinces and territories, as well as Indigenous communities and leaders, will support the fifth value – **Recognize and respect regional differences and circumstances** – as it will allow the NZAB to fully understand the spectrum of not only regional differences, but regional opportunities. The CNA supports this fifth value.

There appears to be values and principles missing from the NZAB’s list. Specifically the NZAB should consider adding a value that focuses on the critical importance of a healthy natural environment, and valuation of intact ecosystems. The policy decisions and actions that are taken should include consideration of the potential impacts on the environment. In policy terms, the pathways chosen by the NZAB should consider they *environmental effectiveness* – both in terms of GHG emission reductions and climate change, but also important related components of the natural environment such as biodiversity and the protection of natural ecosystems. The value of nature seems to be missing from the list of values, which the CNA encourages the NZAB to reconsider as they finalize this list.

As well, the NZAB might consider a principle that recognizes the need to take a fact-based approach to evaluation of technologies and another that recognizes areas of proven Canadian expertise. The dominant refrain of the environmental movement is, “trust the science,” and yet the facts behind nuclear are often pushed aside amidst misinformation and stigma. Regarding Canadian expertise—our nation is small but has demonstrated global excellence in specific areas, including nuclear. Nuclear strength and innovation is something that will continue to contribute strongly to reducing carbon and creating jobs at home, but we should consider the ways Canada can bring its expertise to helping other nations address the climate crisis.

PRINCIPLES

The CNA supports the **Act early, and urgently** principle. Doing so will require political decisiveness. However, the CNA suggests that the early actions may not also be those that will achieve “deep reductions.” The development and expansion of larger nuclear energy options will require some time and are not considered “early” options on any pathway but if included in the pathways in the near term, larger nuclear plants have the proven ability to significantly replace fossil fuel sources of electricity. Ontario is a great example of how nuclear energy can provide an opportunity to achieve the “deep” reductions that will be necessary to meet net zero. For these reasons we encourage the NZAB to include forward-looking preparatory work under this principle. This could include pathway studies, technology development and regulatory work that prepares the way for the deployment of technologies require a longer lead time.

The longer time frame does not apply to small modular reactors (SMRs). Contrary to popular belief, the potential use of SMRs is not far into the future – it is a reality, now. In fact, the world’s first SMR came online yesterday in China. On December 20, 2021 China connected its first SMR to its power grid. China Huaneng Group Co.’s 200-megawatt unit 1 reactor at Shidao Bay is now feeding power to the grid in Shandong province, according to the China Nuclear Energy Association. A second reactor is undergoing tests before being connected to the grid, putting the nuclear plant into full commercial operation in mid-2022. The US, Russia, UK and Canada are also advancing SMR

technologies, with the potential for some to come online in the next 5 years if not sooner. SMRs in Canada are under development, with the SMR technology at the Darlington site having been selected and a target date of 2028 for connection to the grid. Current plans by Ontario Power Generation and SaskPower envision the possibility of multiple units of the same technology in Ontario and up to four subsequent units in Saskatchewan, with the first unit in Saskatchewan being in service in 2032.¹

CNA supports the second principle – **Be bold and proactive**. Specifically, we support the concluding statement of this principle “The most likely pathways detail the steps required to attain a defined future state, and have a clear description of the type and magnitude of change required to get there.” The CNA and the nuclear sector encourage the NZAB to focus on this goal, as we believe that a detailed road map is important to develop so that all can understand what the options look like on the ground. We encourage the consideration of all possible sources of energy in the pathway scenarios, including nuclear energy.

Question 2: What key guiding principles should the NZAB consider in its advice on milestones for the oil and gas sector?

The key principles related to the oil and gas sector are:

- Be bold and proactive; and,
- Don’t get caught in the “net.”

There are opportunities to reduce the carbon emissions of the industrial sectors using SMRs. SMRs are uniquely positioned to provide clean electricity and heat to decarbonize our extraction and heavy industries, including the oil and gas sector. The CNA encourages the NZAB to read the findings of a recent 2021 study which details these specific opportunities – [Emission and Economic Implications for Canada of Using Small Modular Reactors \(SMRs\) in Heavy Industry](#). The research was conducted by EnviroEconomics and Navius Research, both highly regarded research consultancies in the Canadian climate change mitigation field. The use of SMRs in the oil and gas sector would support both noted principles above, as their use would be “bold and proactive,” as well as directly capable of helping reduce real GHG emissions from the sector, and thus avoiding the use of offsets.

Question 3: What key guiding principles should the NZAB consider in its advice on the transportation sector?

The CNA does not have a view on which guiding principles the NZAB should consider specifically in the transportation sector.

The move to greater electrification of the economy and specifically the transportation sector is critical for the expansion of hybrid and electric vehicles (EVs). The same is true for a greatly expanded use of hydrogen in heavy transport. Nuclear power allows for the expansion of

¹Feasibility of Small Modular Reactor Development and Deployment in Canada. March 2021. Available at: <https://www.opg.com/innovating-for-tomorrow/small-modular-nuclear-reactors/#:~:text=OPG%20is%20a%20partner%20on%20Canada%E2%80%99s%20first%20SMR,Power%E2%80%99s%20Micro%20Modular%20Reactor%20ProjectTM%20at%20Chalk%20River>.

electrification and fuel-switching (i.e., hydrogen production) of the economy and the transportation systems, providing clean energy that is essentially zero GHG emissions. Therefore, the implementation of more nuclear power across the country and in relation to the transportation sector will support the value of “Don’t get caught in the net” as this energy source will allow for absolute reduction of GHG emissions.

The electrification of the economy is a feat which needs to be fully explored and quantified. The enormity and scale of such a transition should be quantified so that it is clear to all the challenge that lies ahead for the federal government to meet its goal of having a net-zero electricity grid by 2035. Nuclear can be a part of the solution to this enormous challenge.

Question 4: What key guiding principles should the NZAB consider in its advice on the buildings sector?

The CNA does not have a view on which guiding principles the NZAB should consider specifically in the building sector.

As with our response to Question 3, the move to greater electrification of the economy is relevant in the building sector. A move to increase electrification for the building sector could result in significant absolute GHG emission reductions. Nuclear power allows for the expansion of such electrification of the economy, providing electricity that is essentially zero GHG emissions.

Other Recommendations for NZAB

The CNA encourages the NZAB to move quickly to start the important work of understanding the potential pathways that will achieve the targets; while principles and values have a role at setting the stage for the work of the NZAB should focus on their research and consultations that will be necessary to start understanding the challenges and opportunities.

CNA is of the view that a holistic and systems thinking approach should be taken when undertaking this work, starting with:

- understanding and modeling Canada’s future energy and electricity demands (and breaking these down by province and territory) to create an energy road map to 2050;
- linking this energy road map with Canada’s GHG emissions reductions targets for 2035 and 2050;
- developing technology scenarios, with detailed road maps, that can realistically provide the energy requirements, and achieve the GHG emission targets, and net-zero electricity target;
- ensuring that a full Life Cycle Assessment is used in conducting the above analysis, when comparing potential electricity sources. A recent example of such an analysis was provided by the United Nations Economic Commission for the Environment (UNECE) – [Life Cycle Assessment of Electricity Generation Options](#) (2021).

The NZAB research should take into consideration the energy-environment-economy-societal linkages and relationships. Similarly, the policy advice provided to the federal government should be grounded in agreed upon policy evaluation criteria. We suggested the NZAB develop such criteria and be transparent regarding what they are and how they will (or won’t) be weighted when evaluating the most likely pathways.

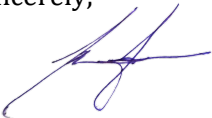
Finally, there are many ‘myths’ about the nuclear sector that prevail in Canada, and these need to be corrected and brought to the attention of the NZAB as you move forward in 2022. The facts are detailed in a recent Op Ed in the Hill Times (December 6, 2021), also posted on our website, here: [*Net Zero Needs Nuclear: The Reality Behind Canada’s Fight Against Climate Change*](#). The key messages are:

- Nuclear energy is a clean, energy-dense, carbon-free, reliable energy available around the clock.
- Small modular reactors (SMRs) are uniquely positioned to provide clean energy.
- Nuclear energy is safe.
- Canadian nuclear energy technology today has no connection to weapons programs or proliferation.
- Nuclear is the only energy industry that accounts for all its by-products.
- Nuclear creates minimal by-products.
- Radioactivity is natural and is all around us.
- Rigorous industry oversight, including for spent fuel and recycling processes.
- Leveraging sites for deep geological repositories is a collaborative process.

Decarbonization experts around the world have concluded that if we have any chance of reaching emission reduction goals in time, we must have nuclear in the mix. There just isn’t any other viable path. Canada is uniquely positioned to lead the world in leveraging clean nuclear to drive significant environmental benefit, to ensure that all Canadians – including remote and Indigenous communities – have equal access to reliable clean energy, and to drive economic and employment opportunities as part of the green economy.

The CNA is encouraged by the openness and collaborative spirit of the NZAB, and we look forward to working with you in the future.

Sincerely,



John Gorman
President and CEO