

Pathway assessments

The following sections offer an overview of possibilities for change in systems or sectors that are important for Canada's journey to a net zero GHG emission society. Each analysis reviews how things operate today, options for decarbonization, short-term barriers to change, policy priorities, and longer-term challenges. Not all sectors are treated in the same depth. Nor is every technological option examined. The focus is rather on large systems and on the most widely discussed options for change.

At the end of each section we have included tables which offer capsule assessments of potential pathway elements (particularly technologies, and some practices or approaches). In making this assessment we were guided by the following considerations:

First, the assessment is not concerned with fully elaborated pathways, which require a more elaborate analysis of sequencing change across multiple dimensions. Rather the focus is on key 'pathway elements' – technology or social innovations which can anchor transformative processes.

Second, since the purpose of a transition pathway is to link today's world with a desired future (in this case a future that meets the net zero challenge), promising pathway elements must be able to contribute to the broader system goal of net zero emissions. Either because

- ▶ they will become part of the reorganized system that meets the goal, or because
- ▶ they are a necessary intermediate step to get there (even if they may not continue in the system that achieves net zero), or because
- ▶ they can play a facilitating role (by accelerating the transition, reducing social conflict, and so on).

The fundamental criteria here is not 'can this reduce GHG emissions' (because some approaches to reducing emissions may lead no further), but rather 'can it contribute to accelerating transformation towards a net zero society'.

Third, even when a potential pathway element could in principle play one of these roles, there are questions about technological readiness, economic costs, social acceptability, appeal to critical stakeholders, and so on which may influence its potential uptake.^{32,41,42}

Finally, since there are other problems with existing arrangements, and climate change is not the only social value, or even the principal consideration shaping the evolution of societal systems, it is important to consider the potential of approaches to contribute to other goals including improved services, healthier communities, enhanced resilience, and so on.⁴³

In the evaluation tables we have organized these considerations under general headings which assess the extent to which options can contribute to pathways that are credible, capable, and compelling. The final column offers an overall judgement on the priority status of the approach.

