

# Intelligence MEMOS



From: Glen Hodgson  
To: Canadian Emission Watchers  
Date: February 10, 2021  
Re: **THREE DRIVERS WILL SHAPE OUR LOW-CARBON FUTURE**

---

Shaping a successful economy with much lower GHG emissions will be an ever-present challenge for the next three decades. The low-carbon transition has begun, but is still at a very early stage. We have only a broad idea of what the transition might look like in the years ahead. Nevertheless, legislative assemblies all over are charging ahead and declaring their ambition for net-zero economies by 2050.

There will not be a single common path – many already exist or will emerge, and will compete for market positioning for consumers and businesses. Rather than referring to pathways, it would be more accurate to refer to an evolving energy-transition road map, with many interconnected possible routes that become more fully formed as the emission reducing journey proceeds.

Three key drivers will define the map: technology and investment, market forces, and policy choices. Let's briefly examine each.

Known technologies with low or no GHG emissions already exist in a number of important areas – both well established or newly commercially viable alternatives. For example, hydroelectricity production is a well-developed and mature technology, while renewables – solar and wind in particular – are set for explosive growth. Similarly, carbon-capture and storage technology and management systems are increasingly used in the conventional energy sector.

On the demand side, viable low-emissions technologies are already in commercial use for electric and hybrid light vehicles, with further improvements to come. Similarly, electricity-based commercial technologies exist for public transit, home and commercial heating. Zero-emission homes and buildings, and electric medium and heavy trucks, are entering the market.

In many other areas, however, technology with low or no emissions is either not yet commercially viable, not well developed, or still an aspiration. Significant improvements to electricity storage will be critical if electricity from renewables is to increase significantly. The production and use of geothermal energy and hydrogen is technically viable, but has yet to attain convincing commercial use at scale. Aircraft and shipping are among the priority areas facing significant technological and commercial viability challenges. Technology innovators have work to do in order to reach a net-zero target in these and other areas.

The transformation in technology will need to be facilitated by large-scale investment by business and government. There is no consensus on the scale of investment required, but it will be significant – hundreds of billions of dollars in Canada alone over the coming decades.

Next, market forces matter fundamentally to the choices we make on what to produce and consume. In energy production, options with low or no emissions are quickly gaining a price advantage over many traditional sources of energy. Wind, solar and hydro are generally cheaper than thermal and nuclear.

Similarly, coal is being crowded out by cheaper natural gas as a feedstock for thermal production and the share prices of miners have collapsed as coal generation comes to an end in North America.

Price signals play an equally important role for energy consumers. For example, electric and hybrid vehicles are generally more expensive to purchase than comparable vehicles with internal combustion engines, but recharging is much cheaper than refilling and maintenance costs could be lower, too. As electric and hybrid vehicle production expands, unit production costs and purchase prices will fall and market share rise.

Public policy is the third key element defining the road map to net-zero emissions. A policy decision to close coal-fired power plants, such as in Ontario and Alberta, is one direct way to use policy to reduce emissions. In terms of sustained climate policy, putting a price on carbon is by far the most economically efficient option. Economic modelling shows that Canada's interim 2030 target can be met with a steadily rising carbon price, with limited effect on long-term growth. The federal government's decision to gradually increase the price to \$170 a tonne goes a long way to meeting that interim goal.

Complementary regulations (such as building codes) can be useful to accelerate the low-carbon transition and regulations can fill a gap where carbon pricing is not effective (such as for methane emissions). However, extensive use of regulation would have a more severe effect on economic growth.

Public spending, including tax incentives and subsidies, can be used to nudge consumption and production choices, but costs money. Sufficient carbon pricing would reduce the need for such subsidies and incentives.

In sum, the impact and interaction of three elements – technology and investment, market forces, and policy choices – will ultimately provide the transition road map to net zero. Defining and articulating that map would provide some clarity and stability for consumers and business, which in turn would help the economy perform at the highest possible level.

*Glen Hodgson is a senior fellow at the C.D. Howe Institute.*

*To send a comment or leave feedback, email us at [blog@cdhowe.org](mailto:blog@cdhowe.org).*

*The views expressed here are those of the author. The C.D. Howe Institute does not take corporate positions on policy matters.*

*A version of this Memo first appeared in [The Globe and Mail](#).*