

WaterPower Canada Fact Sheet: Waterpower and Electrification

“If Canada is serious about meeting its emissions-reduction targets, experts project that electricity demand will at least double because of the electrification of transportation, buildings and industries that currently rely on fossil fuels. And the demand will need to be met only with zero-emissions supply.”

– The Globe and Mail, August 2021

The Electrification Imperative

When dealing with as complex and urgent a challenge as climate change, there will always be debate about the precise mix of policies and actions needed in response. But there is consensus on a few fundamentals – one being that “electrification” (switching end-uses from fossil fuels to electricity) is central to any credible climate change strategy.

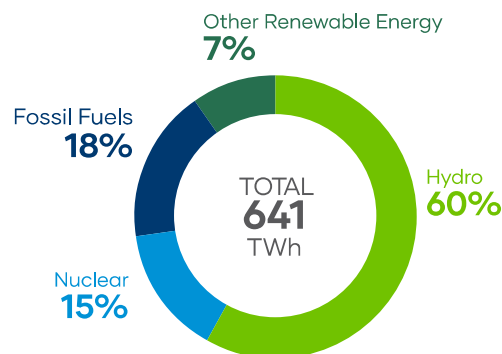
For Canada, the benefits of electrification are even more immediate and compelling than for many other countries since – largely thanks to vast waterpower resources – more than 80 per cent of our electricity already comes from non-emitting sources, and it is getting cleaner. This means that the maximum amount of emissions is reduced for every unit of electrification.

The momentum is also there – as evidenced by developments ranging from rapidly growing electric vehicle adoption, to cutting-edge efforts to electrify high-intensity industrial processes such as steel manufacturing.

“Electrification is a central pillar of decarbonization goals in Canada, which is driven by technological change and consumer choice and further bolstered by policy.”

– “Canadian National Electrification Assessment: Electrification Opportunities for Canada’s Energy Future”, Electric Power Research Institute

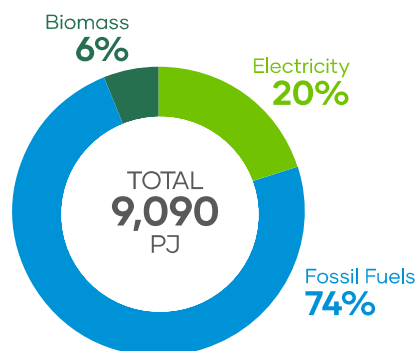
What energy sources are used to produce electricity in Canada?



But in Canada today, we meet only 20 per cent of final energy demand with electricity. With climate targets now enshrined in our federal legal framework, meeting our 2050 net-zero goal will only be possible if we produce two to three times as much clean power as we do currently.

Clearly, we need large-scale investment in green infrastructure projects, and we need to be very strategic in how it’s allocated.

What energy sources are used to meet our energy needs in Canada?



Waterpower already makes up close to 90% of Canada's total renewable electricity generation and is therefore key to Canada's already enviably clean electricity grid. It will be an essential enabler of national electrification and of efforts to achieve net-zero emissions by 2050.

Abundant, Affordable, Available

- Waterpower accounts to approximately 60 per cent of Canadian electricity generation today, and can increase its contribution as demand ramps up. **There is as much undeveloped waterpower generation capacity in Canada today as there is developed.** Meanwhile, the efficiency, capacity and operating lives of many existing projects are being extended through refurbishments.
- Large-scale waterpower projects represent major investments, but produce electricity with a high value at an affordable price. These projects operate for many decades, with low operating and zero fuel costs, and provide a hedge against the price volatility of other forms of generation. **In Canada today, the lowest-electricity prices are in the provinces with the most waterpower generation.**
- Waterpower is the only clean, renewable and abundant source of electricity that is always-available and easily ramped up and down to meet system-wide needs. Waterpower turbines can rapidly go from zero to full power, while storage capacity in waterways and reservoirs can enable these projects to address both time-of-day and seasonal demand variation.

The Backbone of a New Energy System

Beyond the criteria outlined above, waterpower will be an indispensable component of the new and necessarily more complex energy system that is already emerging. This system will feature growing proportions of electricity from widely dispersed, variably scaled, non-emitting and renewable sources.

This system will therefore also need to feature flexible generation sources, with extensive storage capacity, and able to deliver on-demand electricity. Only with that complementarity of system design will we be able to effectively balance supply and demand, and capture the full potential of intermittent sources of electricity such as wind and solar.

There are no better means of providing that complementarity of design than ongoing and accelerated investment in both waterpower generation – with its highly reliable availability – and in the expanded transmission capacity that will enable all regions of Canada to share in the benefits of waterpower.

Waterpower is also uniquely well-positioned to affordably fuel the electrolysis process that will be key to large-scale production of green hydrogen for use as an energy source. Waterpower's importance is therefore poised to grow, even as we leverage new and potentially transformative energy opportunities.



WaterPower Canada is the national voice of the waterpower industry, advocating for the responsible development and use of waterpower to meet our present and future electricity needs in a sustainable manner. Learn more at waterpowercanada.ca.

Data for graphs: NRCan [Energy Fact Book 2020-2021](#).