

# Nuclear: A Part of Canada's Energy Transition

The Generation Energy Council Report released last month is an important milestone in the continuous dialogue that must occur around energy innovation at the federal level. The Report highlights the importance of swift yet thoughtful decarbonization and proposes strategies to achieve the low-carbon future we all want.

The Canadian nuclear industry fully supports the spirit of the Report, and much of the advice. However, the industry would like to emphasize the greater role that nuclear energy can have in leading the energy transition.

Below are four ways in which nuclear can contribute to an energy future that is affordable, reliable and clean.

## 1) Small modular reactors for resource extraction, energy to remote communities and grid power

Small modular reactors (SMRs) have a smaller electrical capacity than most current power reactors, anywhere from 1-300 MW, and are modular in both construction and deployment.

SMRs are perfectly suited for on- and off-grid resource extraction, such as Canada's oil sands operations and Ring of Fire mining. Substituting nuclear-generated heat into these processes would reduce greenhouse gases and conserve our natural gas wealth for higher-value uses.

SMRs also hold great potential for regions that currently rely on dirty diesel fuel, such as Canada's remote and off-grid communities. Not only could SMRs provide clean energy to these communities, it could in many instances alleviate energy poverty.

Canada is already recognized internationally as a favourable market and regulatory environment for SMRs. Establishing a leadership position early would enable Canada to secure a significant share of the projected \$400-600 billion global market for SMR technology.

**Canadians “shared a collective vision of our energy future built on three pillars: it must be affordable, reliable and clean.”**

[GEC Report, pp. 4.]

**“For a Canadian company cutting logs, digging minerals or exporting natural gas these days, there is real value in being able to demonstrate that its products came from a country with an almost entirely emissions-free grid...”**

[GEC Report, pp. 18.]

## 2) Nuclear energy to produce hydrogen for fuel and energy storage

Not only can nuclear energy provide clean heat and electricity, it can also be used to produce hydrogen. Technologies that employ hydrogen as fuel or for energy storage are well established in Canada. Hydrogen-powered vehicles are on the rise, but unless the hydrogen is produced using clean energy sources like nuclear, they risk being just as polluting as gas-powered vehicles.

The comprehensive Trottier Energy Futures Project of the Canadian Academy of Engineering lays out in stark terms the magnitude of the challenge of decarbonization and concludes that to meet the government's 2050 targets will require a massive increase in electrification of energy supply through a diverse set of low-carbon technologies, including nuclear.

**“There is a bigger challenge – and substantial opportunity – in growing our supply of clean and non-emitting electricity to build on our headstart by switching more of our heating systems, transportation and industrial processes to electricity...”**

[GEC Report, pp. 11.]

### 3) New nuclear power reactors for on-grid power

The use of nuclear energy has allowed Canada to achieve a mostly clean energy portfolio. Nuclear energy is the largest source of clean energy after hydro, providing approximately 15% of Canada's electricity, and 60% of Ontario's electricity. Between 2005 and 2015, nuclear energy enabled Ontario to completely phase out coal, improving air quality and reducing respiratory illnesses and deaths.

Additional nuclear reactors could provide the same clean air benefits to other provinces that currently burn large amounts of fossil fuels, such as Alberta, Saskatchewan, New Brunswick and Nova Scotia.

As well as being a clean energy option, grid-based nuclear is affordable and reliable. In Ontario, only hydro is more affordable. Wind is about twice as expensive as nuclear, and solar is more than six times as expensive.

Nuclear generating stations are also extremely reliable, producing electricity day and night, regardless of the weather.

**“Owing to our abundant hydropower, growing renewable power and storage capacity, and various nuclear facilities, nearly 80 percent of our electricity already comes from emissions-free sources.”**

[GEC Report, pp. 7.]

**Generation Energy envisions “spurring innovation and entrepreneurship to create jobs, attract the best talent, provide opportunities for retraining, and enhance Canadian competitiveness in a carbon-constrained global marketplace”**

[GEC Report, pp. 12.]

### 4) Social and economic advantages of a strong nuclear industry in Canada

Through clean nuclear energy generation in Ontario (60%) and New Brunswick (30%), radioisotope production for nuclear diagnoses and therapy, and numerous other technology applications throughout the country, the Canadian nuclear industry is an undeniable source of revenue, jobs and economic prosperity.

The nuclear industry employs 60,000 Canadians directly and indirectly. Careers in the nuclear industry offer challenging work, competitive salaries and benefits, and opportunities for advancement. Because many of the jobs require highly developed skills and advanced education, the nuclear industry offers a homegrown job market for skilled graduates and attracts international talent to Canada.

The nuclear industry is also in the process of refurbishing 10 of its reactors so that they can continue to provide another 30 to 40 years of clean, reliable electricity. The refurbishments are currently Canada's largest infrastructure projects, and are progressing on time and on budget.

**Switching to clean power “will require major infrastructure investments nationwide, as well as restoring public confidence that this expansion can occur in an environmentally responsible way without causing a spike in electricity costs.”**

[GEC Report, pp. 28.]

### About Vision 2050: Canada's Nuclear Advantage

The nuclear industry has developed a vision of nuclear technology's role in Canada's clean energy future. The vision ([cna.ca/vision2050](http://cna.ca/vision2050)) describes how Canada can become a world leader in producing clean, reliable energy for all Canadians, while stimulating the economy and creating jobs. It also explains how nuclear and renewable energy can work hand-in-glove to tackle climate change. Most importantly, it sets out a pathway of partnership between industry and government which would help Canada achieve its energy policy goals.

### About the Canadian Nuclear Association

Since 1960, the Canadian Nuclear Association (CNA) has been the national voice of the Canadian nuclear industry. Working alongside our members and all communities of interest, the CNA promotes the industry nationally and internationally, works with governments on policies affecting the sector and works to increase awareness and understanding of the value nuclear technology brings to the environment, economy and the daily life of Canadians.