SURERUS MURPHY

A JOINT VENTURE COMPANY

NET ZERO 2050

Supporting our clients through the energy transition

Achieving net zero emissions means our economy either emits no greenhouse gas emissions or offsets its emissions by employing technologies that can remove carbon directly from the air, or by removing carbon before it is released into the air.

Almost every country has joined the Paris Agreement on climate change to reduce greenhouse gases produced by human activities. The Paris Agreement calls for the prevention of global temperatures exceeding 1.5°C above pre-industrial era levels.

Our Commitment

Among the actions we are taking, Surerus Murphy works with our supply chain and clients to minimize landfill waste, material, and water use, while increasing recycling opportunities and trialing new products with high-recycled content.

From reducing our emissions through idling policies and utilizing energy efficient equipment, to minimizing the waste we send to landfill, we are working hard to ensure we are leaders in constructing the low-carbon economy.

We support all aspects of construction in the net-zero energy future, including:

- Pipeline Construction
- Facilities and Fabrication
- Installations, Integrity, and Maintenance
- Front End Engineering and Design (FEED)

Canada's Commitment

Canada has joined over 120 countries, including all other G7 nations, in committing to be net zero emissions by 2050.

The Canadian Net Zero Emissions Accountability Act formalized Canada's target of achieving net zero emissions by 2050. It also enshrined the 2030 greenhouse gas emissions target under the Paris Agreement of 40-45% below 2005 levels by 2030.

As a nation where fossil fuels provide 70% of our energy, getting to net zero is challenging—but not impossible.

The magnitude of the challenge is a 729 Mt-CO_2e (megatonnes of CO_2 equivalent) reduction over the next 30 years (based on 2018 emissions levels). The challenge facing efforts to decarbonize is amplified by other forces including increasing global population and economic growth. There is no silver bullet solution when it comes to reaching net zero and many different factors will play key roles, like:

- Policies and funding decisions
- Increasing the energy efficiency of commercial and residential buildings
- Energy supply diversity
- Commercially viable renewable energy options

Detailed below are a few commercially proven solutions that are viable today, as well as a couple of emerging technologies that will play key roles in Canada's decarbonization.

Hydrogen

As an alternative fuel, hydrogen is plentiful, non-toxic, efficient, and safe. It is currently used mainly as a feedstock for chemical production, metal refining and hydrocarbon upgrading, however, several new hydrogen applications will play a role in helping Canada decarbonize. Research is underway to confirm the viability of hydrogen as a fuel source in fuel cell electric vehicles, trains, and marine vessels as well as in power generation and space heating applications. It also serves as a promising renewable energy storage method, known as power-to-gas which uses excess renewable energy to electrolyze water, forming pure H_2 and O_2. This gas can then be stored and used as required. In the Hydrogen Strategy for Canada, the federal government is forecasting H_2 to represent 30% of Canada's end use energy by 2050.

Direct Air Capture (DAC)

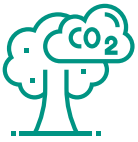
An area in which Canada is emerging as a world leader, Direct Air Capture (DAC) technology captures and uses carbon dioxide from the atmosphere. The process uses industrial sized fans to direct air through a chemical process that strips away carbon. It is then sequestered underground or sold to industrial customers.

Once thought to be unrealistic, several pilot projects are now either in operation or under construction globally—this includes a pilot plant in Squamish, B.C., which captures over one ton of CO_2/day. DAC can contribute to Canada's technological exports while reducing greenhouse gas emissions on a global scale.

Biofuels and Renewable Energy

Despite rapidly falling costs, wind and solar power remain under-utilized and represent only 7% of the renewable energy from non-hydro sources in Canada. Usage of wind and solar can be scaled up and when combined with emerging energy storage solutions, support the integration of energy from renewable sources into the electrical grid while strengthening the shift away from generation of electrical power from fossil fuels.

Biofuels and renewable natural gas from biowaste feedstocks are carbon neutral fuels that can heat buildings and power transportation. Meanwhile, low-carbon fuel innovations, such as hydrogen, can support emission reductions in the difficult to decarbonize heavy transportation sector.



Carbon Capture, Utilization, and Storage (CCUS)

Carbon Capture, Utilization, and Storage (CCUS) is the process of capturing carbon dioxide emissions at point sources such as power plants, cement production facilities, or oil sands upgrading facilities and either reusing it or sequestering it so it will not enter the atmosphere.

Canada has the second largest CCUS capacity in the world. With projects such as Shell Quest and the Alberta Carbon Trunk Line, Canada is already well positioned as a world leader in this sector. CCUS will be utilized to not only decarbonize our oilsands, steel, and cement industries but will also play a vital role in the production of blue hydrogen.

Electrification

The transportation sector accounts for approximately 25% of Canada's greenhouse gas emissions. The electrification of passenger vehicles will be a key strategy in eliminating these emissions.

Turning to electricity as a source of energy for passenger vehicles will require upgrades to the existing infrastructure. This includes the modernization and expansion of electricity grids to make widespread electric vehicle use an affordable and attractive option. A growing list of countries, including Canada, are taking steps to ban the sale of new internal combustion engines by 2035.

FURTHER READINGS

HYDROGEN STRATEGY FOR CANADA

www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/environment/hydrogen/NRCan_Hydrogen-Strategy-Canada-na-en-v3.pdf

CANADA'S NET ZERO FUTURE

climatechoices.ca/wp-content/uploads/2021/02/Canadas-Net-Zero-Future_FINAL-2.pdf

NET ZERO EMISSIONS BY 2050

www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html

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