

ASHRAE PUGET SOUND CHAPTER/WSPE JOINT EVENT
Tues Nov 16, 2021

TFBD Trg & Ed WG
Update and Canadian Efforts

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Decarb Task Force Trg & Ed Working Group

TRAINING AND EDUCATION UPDATE

4 Seminars for the ASHRAE Las Vegas Winter Meeting at Caesars Palace

1. Update on the Task Force on Decarbonization
2. Introduction to Building Decarbonization
3. Building Grid and Carbon Sequestration on Site
4. Research Knowledge Hub and Building Standards

1 seminar at AHR expo site on Appliance and Equipment Standards

Plus working on seminar prior to Las Vegas to cover the other working groups of task force

TRAINING AND EDUCATION UPDATE

Toronto Annual Meeting June 25-29, 2022 working on 3 ASHRAE Learning Institute (ALI) courses on Decarbonization

1. Fundamentals – Introduction of Decarbonization
2. Systems & Equipment – Focus on Design and various Equipment types
3. Applications – Focus on Operation of Buildings

International Decarbonization Conference in Athens Greece Oct 6,7 2022

TRAINING AND EDUCATION UPDATE

Working on papers on Decarbonization efforts in Different Countries Globally. These can be journal articles or papers used in the global decarbonization conference.

Framework is in place so that there is consistency of the papers.

Canada is the first one currently underway. Rest will follow

Bill Dean (REG XI PAST DRC, DAL, VP) Saskatoon is doing overview of Canada (National)

Erich Binder (REG XI PAST DRC, DAL) Calgary doing Western Canada (provincial, municipal)

Doug Cochrane (REG II PAST DRC) Toronto doing Eastern Canada (provincial, municipal)

CANADA

In 2018 Canada produced 647.7 terawatt hours of electricity

61% of electricity generated from hydro sources. Rest is natural gas, nuclear, coal, biomass, solar, petroleum, wind

Regulation at provincial level. Only deregulated in Alberta, Ontario

BC, Manitoba, Quebec, Newfoundland & Labrador, Yukon all over 80% from hydro electric. Quebec is 95%

Ontario, New Brunswick, NWT rely on nuclear, hydro, wind, biomass, coal, natural gas, petroleum

CANADA

Goal to be net zero emissions by 2050. Canadian net zero emissions accountability act

Series of interim emissions reduction targets at 5 year milestones to reach goal

Set up a net zero advisory body of 14 individuals across the country

Committed 3 billion dollars to establish a net zero accelerator fund to help large emitters reduce their emissions

Carbon tax of \$40 per tonne (\$45 in BC) rising \$10 per tonne till 2022, then \$15 per tonne to maximum of \$170 per tonne in 2030.

CANADA

COP 26 Canada Made a number of promises

1. agreed to 1.5 degrees C global warming target
2. establish plans for international shipping
3. cut emissions by 40-45 % by 2030 (was 30%)
4. clean electricity grid by 2035
5. cap oil and gas emissions at current levels
6. Cut methane emissions from oil and gas by 75% by 2030
6. stop deforestation
7. sustainably manage all oceans under its jurisdiction in 5 years
8. all vehicles electric by 2035

CANADA

National Building Code(NBC)- streamlining with provinces to adopt and they can have their more stringent requirements. Changes due out end of this year. The National Energy Code for Buildings (NECB) is part of this. This is a 4 tiered code that is performance based.

CAGBC has their own zero carbon standard ver 2 which can be chosen to be followed. Officially recognized by BC

CANADA

Canada Initiatives

<https://www.canada.ca/en/environment-climate-change/news/2020/12/a-healthy-environment-and-a-healthy-economy.html>

<https://www2.deloitte.com/ca/en/pages/strategy/articles/how-canada-can-decarbonize-by-2050.html>

<https://www.mondaq.com/canada/renewables/1018318/all-of-the-above-canada-reveals-15-billion-plan-to-accelerate-decarbonization>

ONTARIO

56.8% nuclear, 24.4% hydro electric, 6.3% natural gas, 8.7% wind, 2.4% solar, 0.5% bioenergy

Province has energy reporting including water for buildings 50,000 sq ft and larger (EWRB). Save on Energy program since 2011. In 10 years 220,000 projects to save 13.6 TWh of energy and reduce demand by nearly 2000 MW.

In Ontario introduced nov 1 green button a platform where all utilities within 24 months must introduce a price plan that best suits consumers lifestyle and use.

Transportation sector accounts for roughly 30% of emissions in province.

In 2018 2.9 gw of solar produced with 98% in Ontario

TORONTO

Toronto Green Standard since 2006 voluntary to today where version 4 was passed in July with new requirements for developments in city starting May 1, 2022. It includes a net zero existing buildings strategy for decarbonization of all buildings which will be mandatory in 2025. Transform TO goal is net zero GHG by 2050 and reduce emissions by 30.6 Mt by then.

It is a 4 tier approach with tier 1 being mandatory while if you meet tier 2 or above may get refund on development charges.

Toronto also has an energy loan retrofit program which offers low interest loans up to 100% of costs up to 20 year terms.

ALBERTA

Alberta's dream of becoming a petrochemical powerhouse took another step forward as Dow Inc. announced plans for the "world's first net-zero carbon emissions" ethylene cracker and derivatives complex, which could cost \$10 billion or more to complete.

Calgary-based TC Energy unveiled plans with electric truck manufacturer Nikola Corp. to co-develop and operate large-scale hydrogen production hubs in North America.

These follow a spate of announcements from companies such as Suncor Energy, ATCO, Air Products, Petronas, Mitsubishi, Shell and Pembina Pipeline to embrace the energy transition. They're eyeing proposed Alberta investments in areas such as hydrogen, as well as carbon capture, utilization and storage (CCUS) developments.

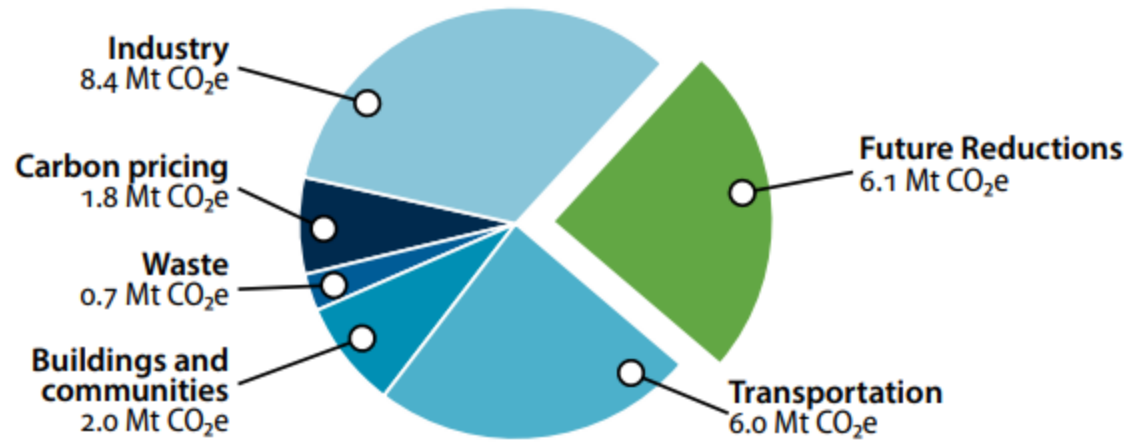
BRITISH COLUMBIA

cleanBC plan to reduce climate pollution, build a low-carbon economy

- Reducing climate pollution by shifting homes, vehicles, industry and business off burning fossil fuels and toward greater use of clean B.C. electricity and other renewable energies;
- Boosting energy-efficient solutions, like zero-emission vehicles and home heat pumps, by making them more affordable and available for British Columbians; and
- Becoming a destination for new investment and industry looking to meet the growing global demand for low-carbon products, services and pollution-reducing technologies.

CleanBC Plan

Reductions to achieve 2030 target



Highlights of the CleanBC plan include:

- By 2040, every new car sold = will be a zero-emission vehicle. Provide cleaner cars and save money on fuel with incentive programs, and making it easier to charge or fuel them:
1.3 Mt of carbon pollution reduced by 2030
- Speeding up the switch to cleaner fuels at the gas pump – with further reductions to the carbon intensity of transportation fuels: **4.0 Mt of carbon pollution reduced by 2030**
- **Every new building constructed in B.C. will be “net-zero energy ready” by 2032.** Requiring new buildings to be more efficient, and ramping up funding for renovations and energy retrofits to existing homes and offices, including \$400 million to support retrofits and upgrades for B.C.’s stock of publicly funded housing: **2.0 Mt of carbon pollution reduced by 2030**
- Reduce residential and industrial organic waste, turning it into a clean resource:
0.7 Mt of carbon pollution reduced by 2030
- The Province is helping industry lower its emissions and reduce its pollution:
8.4 Mt of carbon pollution reduced by 2030

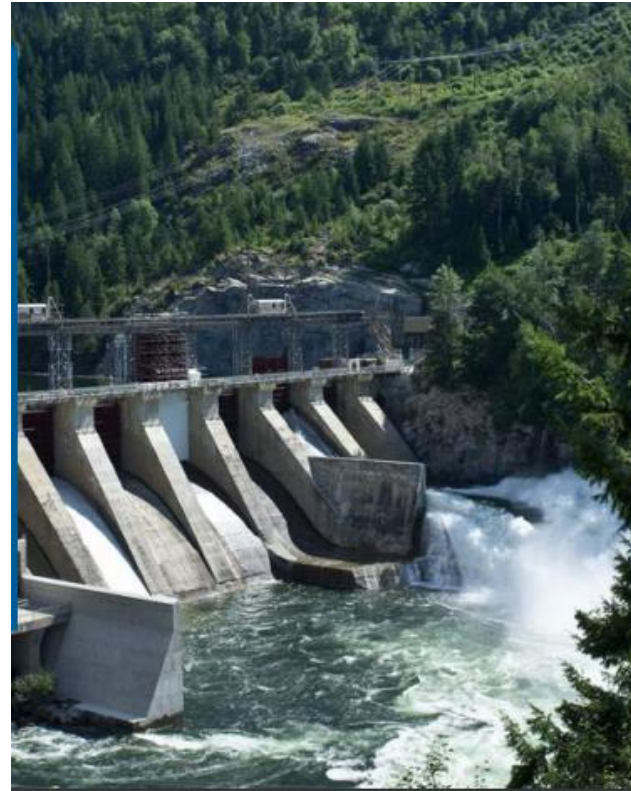
FROM FOSSIL FUELS TO CLEAN ENERGY

B.C. is a clean-energy powerhouse.

Almost all the electricity we produce is from clean and renewable resources.

Energy consumed in our buildings, cars and industrial operations – nearly three quarters of the energy used across our economy still comes from fossil fuels.

Increase use of cleaner energy, especially renewable hydro-electricity, shifting away from our reliance on fossil fuels for transportation, industry, and housing.



Better Buildings

- Make every building more efficient by improving the BC Building Code and increasing efficiency standards – until every new building is “net-zero energy ready” by the year 2032. 20% better by 2022, 40% better by 2027, 80% better by 2032 (NZER)
- Support for better buildings and home retrofits.
- Incentives to make heat pumps more affordable and homes more energy-efficient
- Upgrade stock of 51,000 public housing units to make these homes less polluting, more energy-efficient, and more affordable
- Make residential natural gas consumption cleaner by putting in place a minimum requirement of 15% to come from renewable gas
- Help remote communities reduce dependence on diesel
- Support public infrastructure efficiency upgrades and fuel switching to biofuels

Reduce carbon pollution by 2.0 Mt by 2030

Cleaner Industry

- Direct a portion of carbon tax paid by industry into incentives for cleaner operations

Improve air quality by cutting air pollution

Partnering with the Vancouver Fraser Port Authority on a Clean Trucking pilot project to reduce emissions from the short-distance hauling of goods

Reduce methane emissions from natural gas development

Reduce methane emissions from upstream oil and gas operations by 45%

Industrial electrification

Provide clean electricity to planned natural gas production in the Peace region

Increase access to clean electricity for large operations with new transmission lines and interconnectivity to existing lines

Carbon capture and storage

Ensure a regulatory framework for safe and effective underground CO₂ storage and direct air capture

Cleaner fuels for industry

Make industrial natural gas consumption cleaner with a minimum 15% to come from renewable gas

Reduce carbon pollution by 8.4 Mt by 2030.

Reduce Emissions from Waste

Reduce waste and turn it into a clean resource

Help communities to achieve 95% organic waste diversion for agricultural, industrial, and municipal waste – including systems in place to capture 75% of landfill gas

Waste less and make better use of it across all sectors of our economy, like forestry, agriculture, and residential areas, including renewing the B.C. Bioenergy Strategy and building out the bioenergy and biofuels cluster

Reduce carbon pollution by 0.7 Mt by 2030

VANCOUVER

Heating and Hot water systems zero emission by 2025
and transition to zero carbon starting Apr 2022

2030 goal is 40% reduction in carbon emissions over
2007 levels.

Improved energy efficiency for residential (3 stories and
under) Jan 2022, meet step bc code for residential (4-6
stories) Jan 2021

QUESTIONS ?

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