



THE SCAN! CLIMATE CRISIS GLOSSARY

Climate activists are encouraged to “talk like a human,” avoiding rhetoric and certain scientific terms without explanation. We are encouraged to “communicate effectively” with seniors and have received many suggestions about how to go about it. But the terms and phrases of climate change are not always accessible unless they are simply defined. Some of us feel like we are not up to the task if we are not comfortable using the language of climate change. Hence, this glossary.

This glossary covers a range of commonly used terms and is intended as a quick reference.

Basic Terms

Climate change

Climate change refers to a global increase in temperature compared to preindustrial times. The increase was and is still caused by burning fossil fuels. Burning fuels releases greenhouse gases (GHGs). These gases warm up the atmosphere.

1.5 Degrees

To prevent worsening and potentially irreversible effects of climate change, the world’s average temperature should not exceed the temperature of preindustrial times by more than 1.5 degrees Celsius.

Carbon Dioxide

Carbon Dioxide (CO₂) is used by trees and other plants during photosynthesis. The gas is released when we burn fossil fuels.

Fossil fuels

Coal, oil, and gas are the three main types. Burning fossil fuels releases CO₂.

Methane

Methane is the greenhouse gas with the most potent heat trapping power for the first 20 years of its life in the atmosphere.

Methane has a lifespan of about 12 years, shorter than CO₂. It is a far more potent greenhouse gas than CO₂. A ton of methane causes more warming than a ton of CO₂.

“Natural” gas vs. methane

“Natural” gas is more accurately described as “fossil gas”.

Methane is a powerful greenhouse gas released when we extract all fossil fuels (“natural” gas, oil and coal). But it is also the main component of “natural gas”, which is often 90 per cent methane.

Natural gas (AKA fossil gas) is the term used for a mixture we extract from the ground. This mixture also contains other fossil gases and some non-fossil gases, such as CO₂ and water.

Greenhouse gases (GHGs)

These are gases that absorb and trap heat in the atmosphere. The main GHGs are carbon dioxide, methane, nitrous oxide and water vapour. They cause the planet to heat up.

350 parts per million

This is the safe concentration of carbon dioxide in the atmosphere.

Net zero and zero

We reach net zero when the amount of greenhouse gas we produce is no more than the amount taken away.

Zero carbon means no carbon is given off at all. This is only possible with total reliance on renewable energy.

Renewable energy

Renewable energy comes from natural sources that are renewed faster than they are consumed. That includes solar, wind, geothermal, hydropower and ocean resources.

Carbon sink

A carbon sink absorbs more carbon from the atmosphere than it releases. Carbon sinks can include forests, oceans and soil.

Carbon source

A carbon source emits more carbon than it absorbs. Trees can flip from sink to source, absorbing carbon as they grow but releasing it after they die when they decompose or burn. Canada's forests have been a net carbon source since 2001.

Global Warming Potential (GWP)

Some GHGs cause a lot more warming for each ton of gas over a given period of time than others.

All greenhouse gases are compared to CO₂, which has a global warming potential of 1. The GWP measures how much energy the emissions of 1 ton of a gas will absorb over a given period of time relative to the emissions of carbon dioxide. This tells us a substance's ability to trap heat in the atmosphere as well as its lifespan; or how long it stays in the atmosphere. See "Methane" above.

Mitigation

On the prevention side, mitigation strategies reduce some negative effects of climate change and lessen their impact. Adaptation (see below) helps us deal with irreversible damage.

Adaptation

Adaptation refers to adjustments in response to actual or expected changes in order to moderate/reduce harm. In the case of the climate emergency, adaptation cannot take the place of mitigation (see above). We must phase out fossil fuels to avoid exceeding a 1.5 degree increase in the planet's average temperature.

Federal Governmental Policies and Programs

Carbon tax

Also known as carbon pricing, it has federal government requirements but is administered by provincial governments. The tax is on greenhouse gas emissions from fossil fuel sources: coal, oil, "natural" gas or gasoline. It is not clear if the tax works. It is based on models with assumptions that may not accurately predict outcomes.

The carbon tax rebate

The Climate Action Incentive Payment (CAIP) is a quarterly payment to eligible Canadians to help with costs related to the carbon tax.

Carbon offsets

Companies sell “credits” that people or other companies can buy to “offset” or cancel emissions they generate. Offsets also do not reduce global emissions: they only “cancel out” emissions that have already happened.

Emissions/carbon cap

The government has the authority under existing law to directly regulate GHG emissions by instituting a hard cap on emissions at today’s levels. Then every year the cap would adjust in line with Canada’s pledge to reduce emissions by 40 to 45% by 2030.

Clean electricity regulations

Not finalized, and not to take effect before 2035, these regulations are intended to impose a stringent limit on GHG emissions from carbon emitting sources of electric power. However, they contain a loophole for plants commissioned prior to 2025. These plants can operate for period of 20 years.

Carbon capture and storage (CCS)

This technology is heavily subsidized by the federal government.

Carbon Capture and Storage facilities capture the GHG emissions arising during production and store them in underground reservoirs.

However, CCS technology is unproven, inefficient, extremely expensive, and installed at nowhere near the scale required to meet Canada’s or the world’s emissions reductions goals.

Greener Homes Program

The Canada Greener Homes Initiative is intended to “help homeowners save money, create new jobs across Canada for energy advisors and fight climate change.”

There are grants from \$125 to \$5,000 to get back a portion of costs for eligible home retrofits and up to \$600 as a maximum contribution toward the total costs of pre- and post-retrofit EnerGuide evaluations.

Energy Technologies

Coal-fired plants

A coal-fired power station or coal power plant is a thermal power station that burns coal to generate electricity.

Air pollution particles from coal-fired power plants are more harmful to human health than many experts realized. They are more than twice as likely to contribute to premature deaths as air pollution particles from other sources.

Gas-fired plants

A gas-fired power plant is a type of fossil fuel power station where chemical energy, stored in fossil gas, mainly methane, is converted into thermal energy, mechanical energy and, finally, electrical energy.

Gas plants are often the top emitters of nitrogen oxides in communities.

Nitrogen oxides include nitric oxide, which is a colourless, odourless gas, and nitrogen dioxide, which is a reddish-brown gas. Nitric oxide reacts with oxygen or ozone in the air to form nitrogen dioxide. Nitrogen dioxide has an odour and is an acidic and highly corrosive gas. It can affect our health and environment. Nitrogen oxides are critical components of photochemical smog.

The Ontario government is heavily pushing gas plants, both refurbishing old ones and building new ones.

Nuclear plants

Nuclear energy originates from the splitting of uranium atoms – fission. This generates heat to produce steam, which is used by a turbine generator to generate electricity.

This technology is very expensive.

Refurbishing aging CANDU reactors and investing in unproven nuclear technology will waste money that could be otherwise be invested in renewable energy solutions. Globally, the cost of renewable electricity is now significantly below not only nuclear power, but also gas.

There is the ongoing, unsolved problem of disposing of nuclear waste.

The federal government is strongly promoting nuclear energy as a clean alternative to fossil fuels.

Small nuclear reactors (SMRs)

Some climate activists see SMRs as an alternative to fossil fuels. However, they are costly, unproven, and potentially risky and create dangerous radioactive waste.

Hydrogen

We cannot use the term hydrogen powered energy without breaking it down into sources that have very different effects on emissions.

When it is consumed in a fuel cell, hydrogen produces no carbon emissions — just energy and water. Naturally occurring pure hydrogen is rare. It has to be produced from other sources.

Grey hydrogen is chemically extracted from fossil fuels, typically methane from natural gas. In the process, CO₂ is left behind, so the process generates greenhouse gas emissions.

Blue hydrogen is made the same way as grey hydrogen, except that the CO₂ is captured.

Green hydrogen is made by splitting water into hydrogen and oxygen using electricity: electrolysis. To be called “green” the electricity needs to come from renewable energy, such as wind or solar.

Pink hydrogen is similar to green hydrogen, except the electricity comes from nuclear power rather than renewable energy.

White hydrogen is found naturally in underground deposits, which have only recently been discovered.

Alternative Energy Sources and Technologies

Renewable energy comes from natural sources. The energy is replaced at a higher rate than it is consumed. Examples are sunlight and wind.

Fossil fuels are non-renewable resources that take hundreds of millions of years to form.

Renewable energy sources are increasing in capacity and decreasing in cost.

Wind

Wind energy harnesses the energy of moving air by using large wind turbines. They construct turbines on land or in sea - or freshwater. Onshore and offshore wind energy technologies have evolved over the last few years to maximize the electricity produced.

The world’s technical potential for wind energy is greater than global electricity production. There is potential for wind power in most regions of the world.

Solar

Solar energy is the most abundant of all energy resources and can be harnessed in cloudy weather.

Solar technologies convert sunlight into electrical energy, either through photovoltaic panels or through mirrors that concentrate solar radiation.

The cost of manufacturing solar panels makes them often the cheapest form of electricity.

Geothermal

Geothermal energy utilizes the accessible thermal energy from the Earth's interior. The technology extracts heat from geothermal reservoirs using wells or other means.

Once at the surface, fluids of various temperatures can be used to generate electricity. The technology for electricity generation from hydrothermal reservoirs is mature and reliable. It has been operating for more than 100 years.

Hydropower

Hydropower harnesses the energy of water moving from higher to lower elevations. It can be generated from reservoirs and rivers. Reservoir hydropower plants rely on stored water in a reservoir, while run-of-river hydropower plants harness energy from the flow of a river.

Hydropower currently is the largest source of renewable energy in the electricity sector.

However, the infrastructure needed to create hydropower can also have an impact on ecosystems in adverse ways. Many consider small-scale hydro a more environmentally friendly option, and especially suitable for communities in remote locations.

Heat pumps

They work like a "fridge in reverse". They use a mixture of evaporation and condensation to transfer heat from outside to inside a building.

Additional Terms in Use

Greenwashing

Big Tobacco spent millions to hide the dangers of cigarettes. Big Oil uses the same tactics, spending millions to discourage people from phasing out fossil fuels.

Pathways Alliance, for example, not only pollutes heavily, but also runs misleading ads to influence government regulations and sway public opinion in favor of oil sands development. Their fear campaign essentially says renewable energy will not provide people with their energy needs.

Pathways Alliance bought television ads during the FIFA World Cup, the Australian Open and the 2023 Super Bowl. They have been one of the biggest advertisers on Facebook and Instagram.

Decarbonization

This term means removal or reduction of carbon dioxide output into the atmosphere. Decarbonization involves switching to using low carbon energy sources.

Anthropocene

The Anthropocene Epoch is an unofficial unit of geologic time, used to describe the most recent period in Earth's history. This is the period when human activity started to have a significant impact on the planet's climate and ecosystems.

The Great Acceleration

The Great Acceleration explains the Anthropocene transition. The description weaves together human social, political and economic changes. These changes created diverse environmental consequences.

Planetary Boundaries

Scientists note nine planetary boundaries beyond which we cannot push Earth systems without putting our societies at risk:

- climate change
- biodiversity loss
- ocean acidification
- ozone depletion
- atmospheric aerosol pollution
- freshwater use
- biogeochemical flows of nitrogen and phosphorus
- system change, and release of novel chemicals

One planetary boundaries framework update finds that six of the nine boundaries have already been crossed. Earth is now well outside the safe operating space for humanity.

De-Growth

De-growth means primarily the abolition of economic growth as a social objective. The de-growth objective is to have societies use fewer natural resources to organize and live differently from today.

Ecological economists define degrowth this way: an equitable downscaling of production and consumption in order to reduce societies' use of energy and raw materials. This implies reduced consumption.