
Your guide to net zero
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energy solutions

A boundary we cross at our peril

To understand our planet's carbon-reduction commitments – and the path forward – you need to start with the Paris Agreement of 2015. This is the international treaty that established 1.5 and 2.0 degrees Celsius as global-warming benchmarks.

Global temperatures are believed to already be 1.09 degrees above pre-industrial levels, and we're seeing more frequent extreme weather as a result. Scientists believe that to prevent the worst of the climate crisis, we need to keep within a 1.5 degree boundary – and that we're really in trouble if we approach 2.0 degrees.

Alarmingly, current trajectories risk overshooting those boundaries.

From ambition to action

To bend those trajectories and keep within the boundaries, we need to do more than just reduce our emissions of greenhouse gases – we need to effectively eliminate them, and by no later than 2050. In other words, we need to get to net zero.

The term net zero means, on balance, not contributing greenhouse gases to the atmosphere. This does not mean generating no greenhouse gases. Instead, it means eliminating as many emissions as you feasibly can – in some cases capturing and permanently storing them – while offsetting anything residual.

An offset is a formal arrangement in which an entity supports a specific carbon-reduction project. Under some frameworks, an investment in a project such as solar energy counts as an offset. This is commonly referred to as “avoided” emissions – avoiding the emissions of a fossil fuel project that might have been built instead.

There’s growing momentum, however, towards offsets that actually remove carbon from the atmosphere. This includes creating new forests, which soak up carbon, and using agricultural techniques to capture more carbon in the soil.

Net zero: Who’s on board?

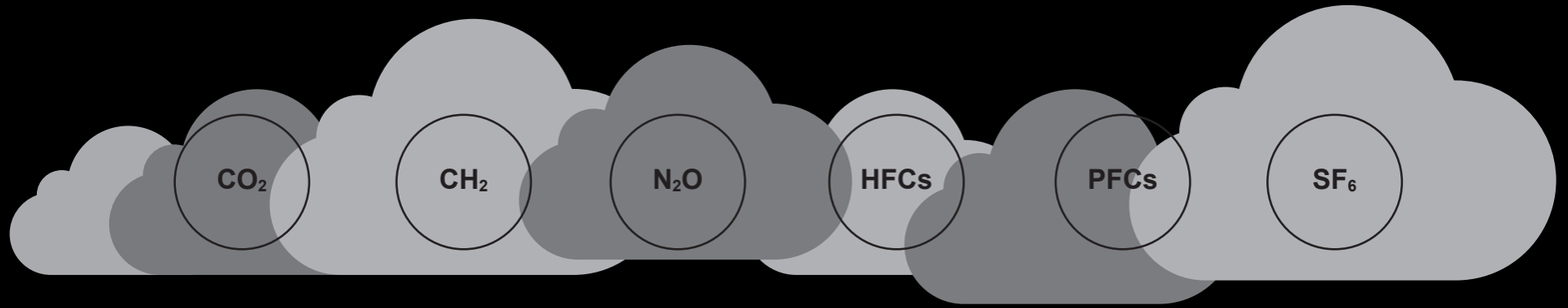
Canada has made a legislated national commitment to achieving net zero by 2050, and so has the City of Ottawa. Each day more and more countries, cities and the world’s largest companies are making net-zero commitments.

Discover the most up-to-date information on countries, major cities and corporations that have made pledges to achieve net-zero emissions:

Check out the live net zero tracker here.

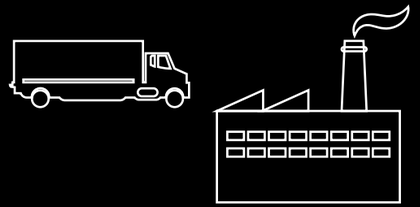
What's the scope of the commitment?

Net-zero commitments are commonly limited to a company's Scope 1 and possibly Scope 2 emissions, which are the easiest ones to measure and control.



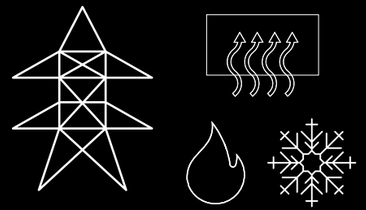
SCOPE 1

Direct greenhouse gas emissions produced by your own operations for example: energy use in your buildings, vehicles, and manufacturing or industrial processes.



SCOPE 2

Indirect greenhouse gas emissions produced when the electricity or other forms of energy that you purchase (including steam, heating and cooling) are generated.



SCOPE 3

Indirect greenhouse gas emissions produced further up and down your supply chain, for example:

Upstream:
- Purchased goods and services
- Capital goods
- Product transportation
- Waste from operations
- Business travel
- Employee commuting

Downstream:
- Processing and use of sold products
- Leased assets
- Franchises
- Investments

A new way of looking at energy use

Net zero requires a shift in focus, from how much energy you consume – while still important – to how much carbon is in that energy itself. This requires different analyses, investments and management approaches. Consider these points:

Moving away from fossil fuels and switching to electric

If your energy is primarily made up of fossil fuels, you'll have to go electric or use clean technologies like heat pumps to get to net zero. And you'll have to re-think your infrastructure decisions, which can't just be about cost and efficiency gains. It's also vital to think about the long-term and not lock yourself into post - 2050 emissions with today's capital spending.

Generating your own electricity may seem compelling, but it's hardly a fast-track to net zero

Solar and other green self-generation options are becoming more widely adopted, and electricity grids are decentralizing with more happening "behind the customer meter". But electricity from Ontario's grid is already remarkably clean - in fact, it's more than 90 per cent emissions-free, with most of the electricity coming from low-emitting resources, like hydro and nuclear.

Remember, the cleanest unit of energy is the one that isn't used

Although it's important to consider what's in the energy you consume, efficiency still plays an important role in keeping emissions and energy costs down.

Making the dollars work

When efficiency was the primary driver of energy projects, the payback was simple and compelling – you use less, you pay less. While it's not as straight-forward with net zero, it's also not as daunting as it seems. Looking holistically and over the long-term, the payback may well be there.

A complete look at costs and savings

It's vital to assess potential fuel switching and other decarbonization projects based on total and long-term cost of ownership, using net present value or other economic analysis. A five-year window with limited parameters won't give you the full picture.

Sure, electrical equipment may cost more to operate than fossil-fuel alternatives, but it's typically simpler in design and cheaper to buy and install. It can be much cheaper to maintain, too. You'll also want to factor in the considerations below, including their escalation over time.

Bottom line benefits of decarbonizing

Less carbon tax liability

The federal carbon price is set to climb to $170/t by 2030, in combination with other measures like the federal Clean Fuel Standard.

Potential new capital sources

Companies pursuing decarbonization are increasingly tapping into new forms of credit and equity through “sustainable finance” mechanisms like green bonds. Various jurisdiction-specific grants or incentives may also be available to support decarbonization projects.

Competitive marketplace positioning

Decarbonization is becoming more important to customers assessing potential suppliers and business partners, and to prospective talent in tight job markets.

The 5 Steps

While the path to net zero is different for every sector and business, you'll likely go through some of these steps as you work towards a 2050 (or earlier) target.

1

Carbon Footprint Assessment

Audit and assess your energy consumption, focusing on high-carbon forms, and identify efficiency and fuel-switching opportunities.

2

Project design and costing

With the best opportunities identified, look at green building and other design services in conjunction with holistic and long-term project costing.

3

Implementation

When the business case is made and the capital allocated, mobilize mechanical, electrical and other engineering services. Specialized expertise in areas such as building automation, electrification of HVAC systems, EV infrastructure and energy storage is key.

4

Ongoing tracking and performance management

Once a project is complete, conduct ongoing, actionable tracking to measure your success and define your offsetting requirements. Smart dashboards with built-in analytics can help.

5

Offset selection

If necessary, include offsets that have received third-party certification. There are a number of standards that are emerging to measure and ensure the validity of your climate-action promise.

Electrification: A key enabler

Demand is set to soar

Put simply, net zero won't happen without electrifying various forms of energy use – from personal transportation to industrial steel furnaces. The good news? Electricity is a mature technology and highly versatile.

Better yet, Canada's electricity supplies are already considered clean, and the federal government is targeting a fully decarbonized electricity grid by 2035.

But there's work ahead of us. As we pursue net zero, we're going to need to generate a lot more electricity than we do today, improve connections between provincial grids, and get better at storing and optimizing electricity use.

Overall, electricity demand is expected to double by 2050 with a potential tripling in the amount of electricity needed from clean sources specifically.

What this means for your net-zero strategy

Any net-zero strategy is going to largely be an electrification strategy – and that has several key implications:

1. **Plan now for the future**
   If you're a large energy user, you'll need to plan now for your future electricity needs. You'll have to understand how to secure grid connections and supply, while at the same time, many others will be looking for the same.

2. **Remember "timing is everything"**
   While Ontario electricity supplies are predominantly green, you'll need to factor timing into your strategy. Lower-carbon electricity, for example, is often more available at off-peak times. As well, Ontario electricity will see a bump up in carbon intensity during any nuclear facility refurbishments.

3. **Forecast for the long-term**
   Provincial supply and demand trends are guided by long-term government planning, so commodity pricing can be forecast. This can provide vital inputs to your capital and business planning.

4. **Work with local experts**
   Since energy markets and energy mixes are province-specific, highly distinct and subject to policy shifts, you'll need to ground your net zero strategy in localized expertise.


Are you implementing a net-zero strategy?
Let’s connect.

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