BUILDING A BRIGHTER TOMORROW

Our Climate Change Plan

ONTARIO POWER GENERATION

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1 INTRODUCTION

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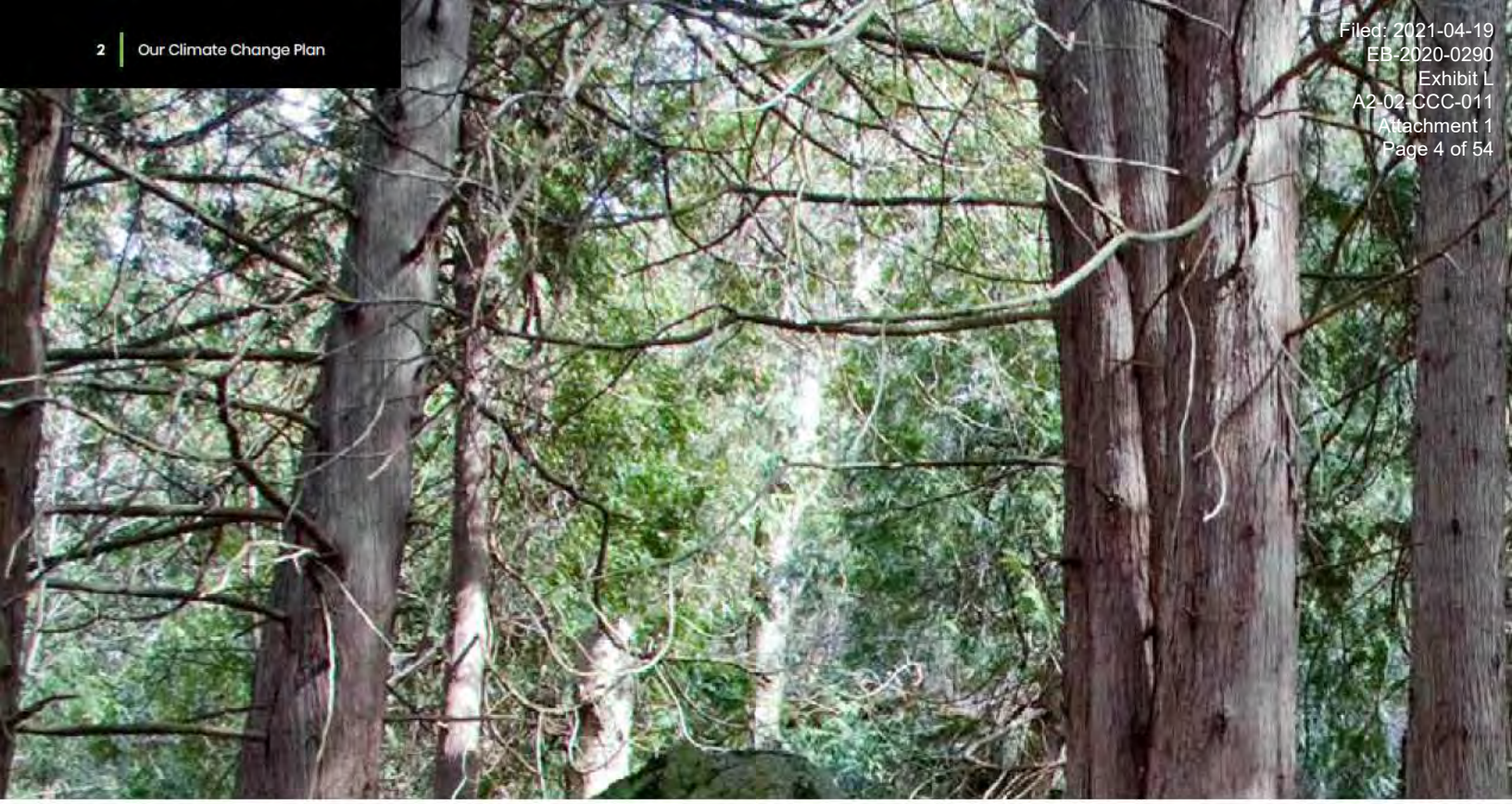

a message from our president and CEO

Ontario Power Generation believes climate change is not the future, it's the present, and its environmental and economic consequences are already affecting the lives of Ontarians.

So the steps we take to address climate change today must improve the lives of everyone and make communities stronger and more resilient. We will create new jobs and nurture new industries to make life better, not just for future generations but for current generations as well.

OPG is proud to have delivered the world's single largest climate change action to date when we stopped burning coal. But there's so much more we can do.

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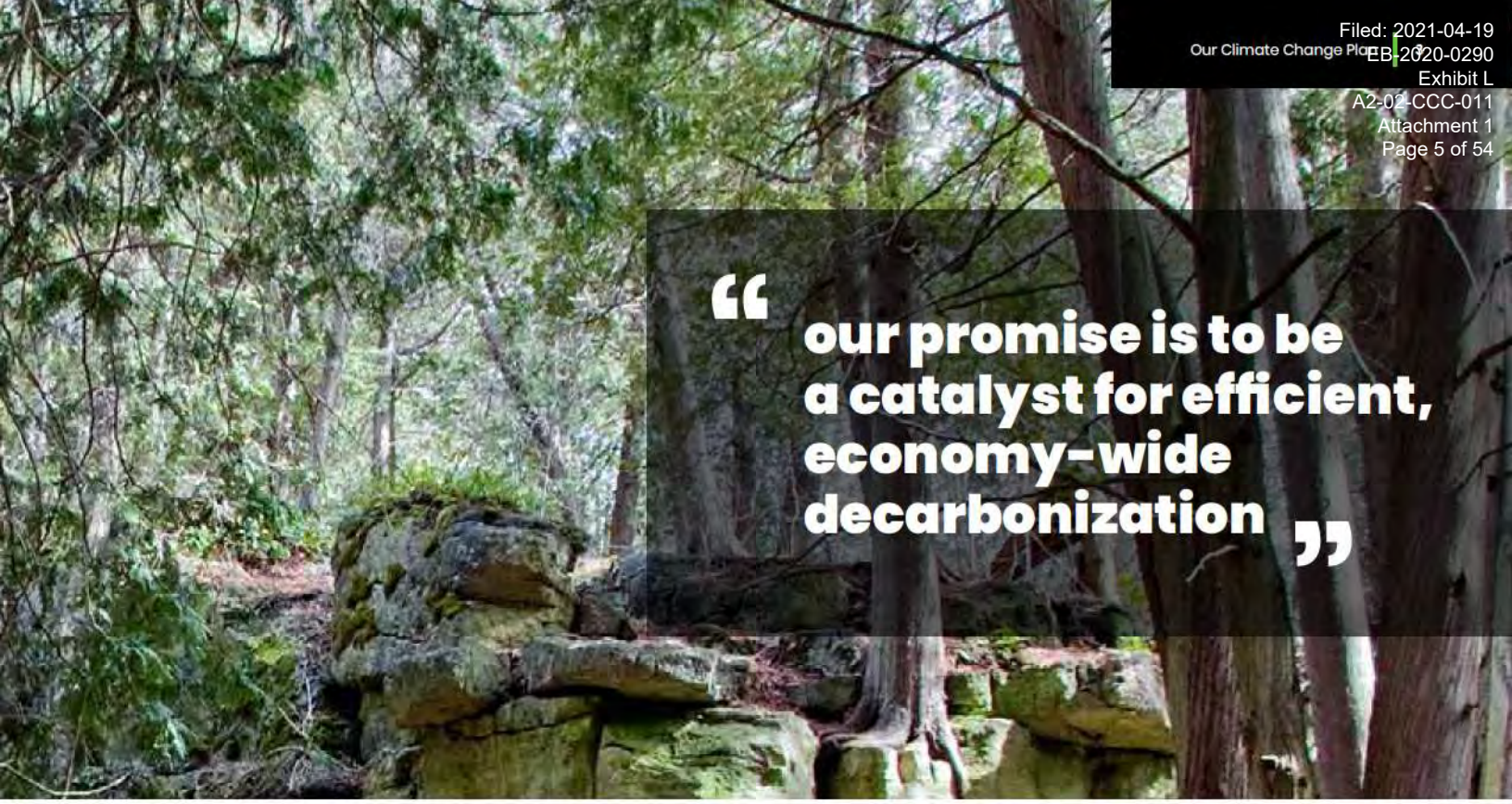

> **“our promise is to be a catalyst for efficient, economy-wide decarbonization”**

That's why I'm pleased to introduce our new climate change plan. It's the product of work by teams from across our company. As part of our plan, we're setting ambitious goals that will guide our promise to be a catalyst for efficient, economy-wide decarbonization, mobilizing our expertise, suppliers, and industry partners to create a cleaner environment and more prosperous, resilient communities in Ontario and beyond.

Our goals won't be easy to achieve. The way forward won't always be clear. But we won't let that lack of perfect clarity stop us from taking action now. And while this is the first time you're hearing about our new climate plan, it will not be the last. You can expect regular updates on our progress.

Today's biggest energy questions will be answered right here. We hope to make our province proud as we bring our Made-in-Ontario experience, our ingenuity, and our commitment, to the world. Together, we will create a brighter tomorrow.

Ken Hartwick

President and CEO,
Ontario Power Generation

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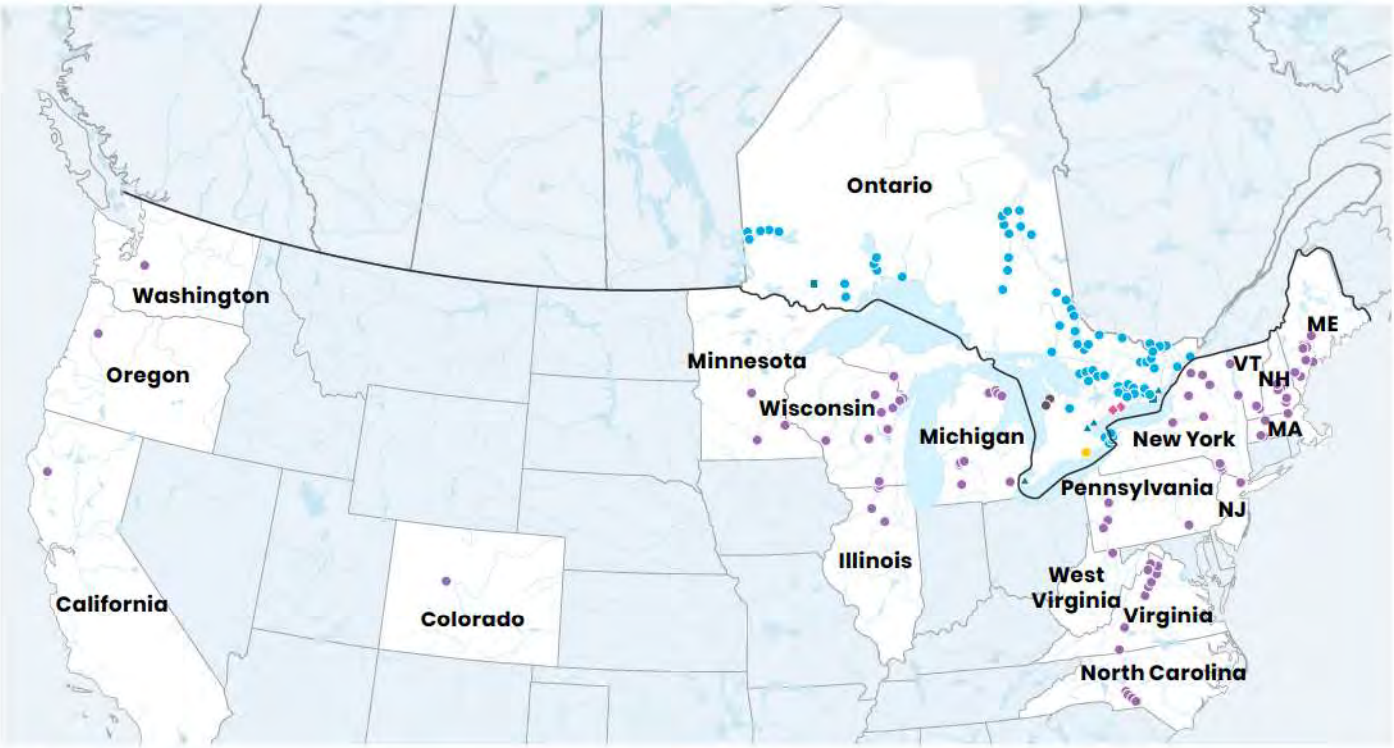
about OPG

Ontario Power Generation (OPG) is the province's largest clean power generator and a climate change leader with one of the most diverse generating portfolios in North America.

In Ontario, we own and operate 66 hydroelectric, two nuclear and two thermal generating stations, and one solar facility. We also operate four gas-fired generating stations. In addition, OPG owns two nuclear generating stations which are leased on a long-term basis to Bruce Power L.P., and we own and operate 85 hydroelectric stations in the United States. OPG has an in-service generating capacity of 18,876 megawatts (MW).



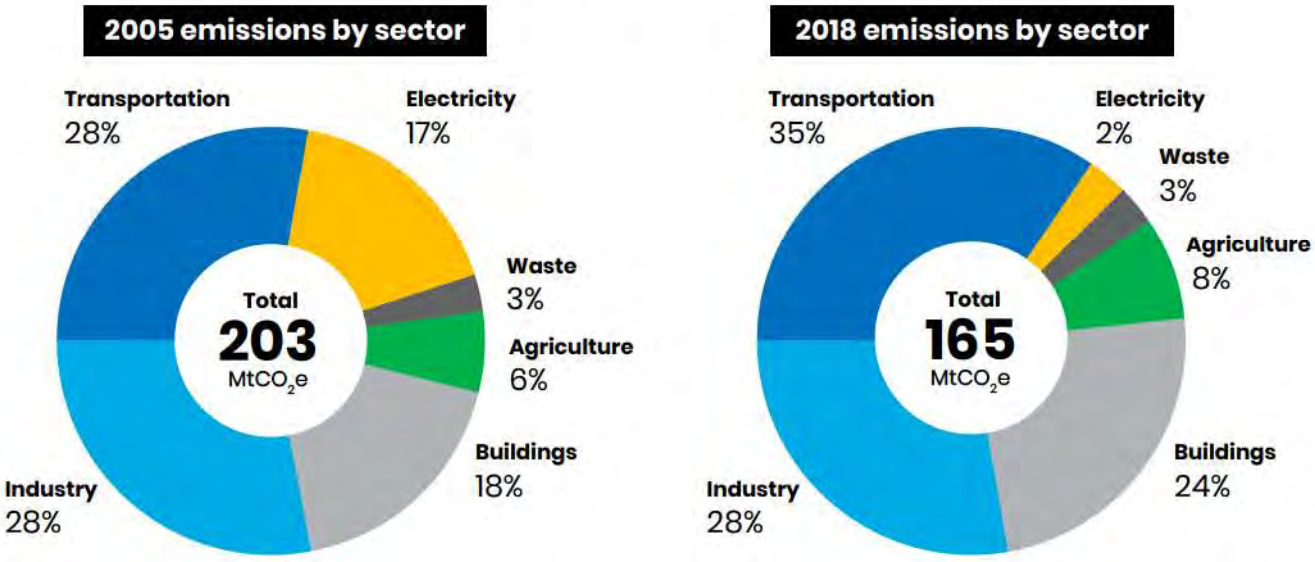
2	2	2	1	66	85	4
Nuclear Stations	Leased **Nuclear** Stations	**Thermal** Stations	**Solar** Facility	**Canada Hydroelectric** Stations	**US Hydroelectric** Stations	**Atura Power Gas-Fired** Stations

positioned to lead

Ontario's electricity system and its generating technology is constantly evolving. In 2005, before we closed our coal fleet, the electricity sector accounted for 17% of Ontario's carbon emissions. Fast forward to 2016, two years after the phasing out of coal, the electricity sector accounted for only 2% of Ontario's total emissions. In fact, compared to other progressive global jurisdictions from a carbon intensity perspective, Ontario ranks among the best.

The transportation sector is now the province's largest source of carbon emissions at more than 30%. Powering cars, trucks, trains, boats and buses with clean electricity, rather than gas or diesel, will make a significant impact to reducing carbon emissions in Ontario. The more of the economy we can get running on electricity, the lower our carbon emissions will be overall. As Ontario's largest power generator and clean technology innovator, OPG is well positioned to lead the drive for decarbonization while balancing economic and environmental benefits, and Ontario's electricity needs.

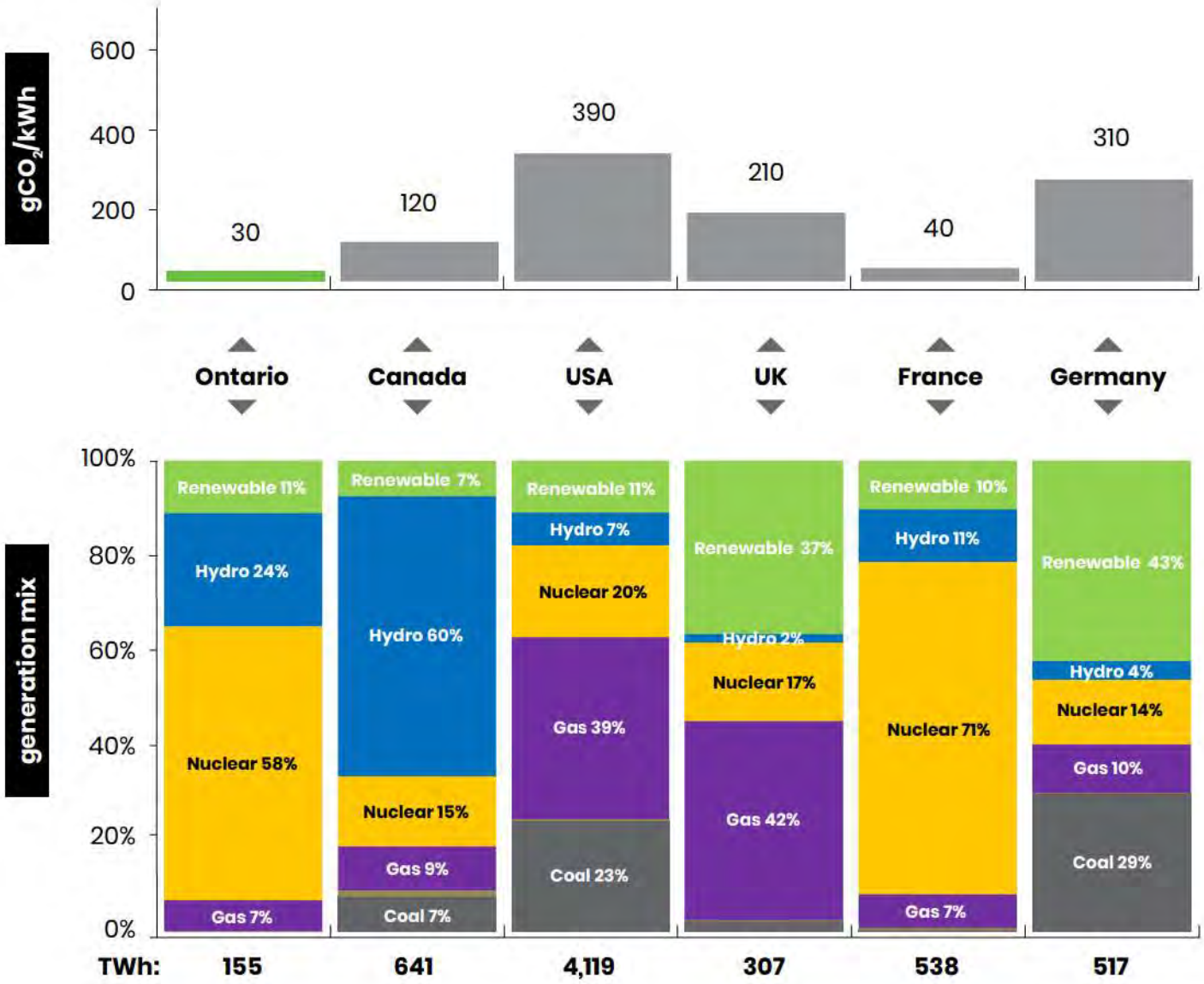
Ontario CO_2 emissions by sector



Sources:

- Greenhouse Gas Progress Report of the Environmental Commissioner of Ontario
- 2018 Canada's Official Greenhouse Gas Inventory

CO_2 emissions intensity – Ontario vs. world



Notes:

- Based on actual 2019 generation for Ontario, USA, UK, France & Germany, and 2018 generation for Canada.
- CO_2 emissions intensity estimates are for in-region generation only; CO_2 from imports and life-cycle emissions are not included.
- Renewable excludes hydro and includes wind, solar, biofuels and geothermal; small brown portion is oil.
- CO_2 emissions intensity estimates calculated assuming emissions of 450 gCO_2e/kWh for gas, 800 gCO_2/kWh for oil and 900 g/KWh for coal .

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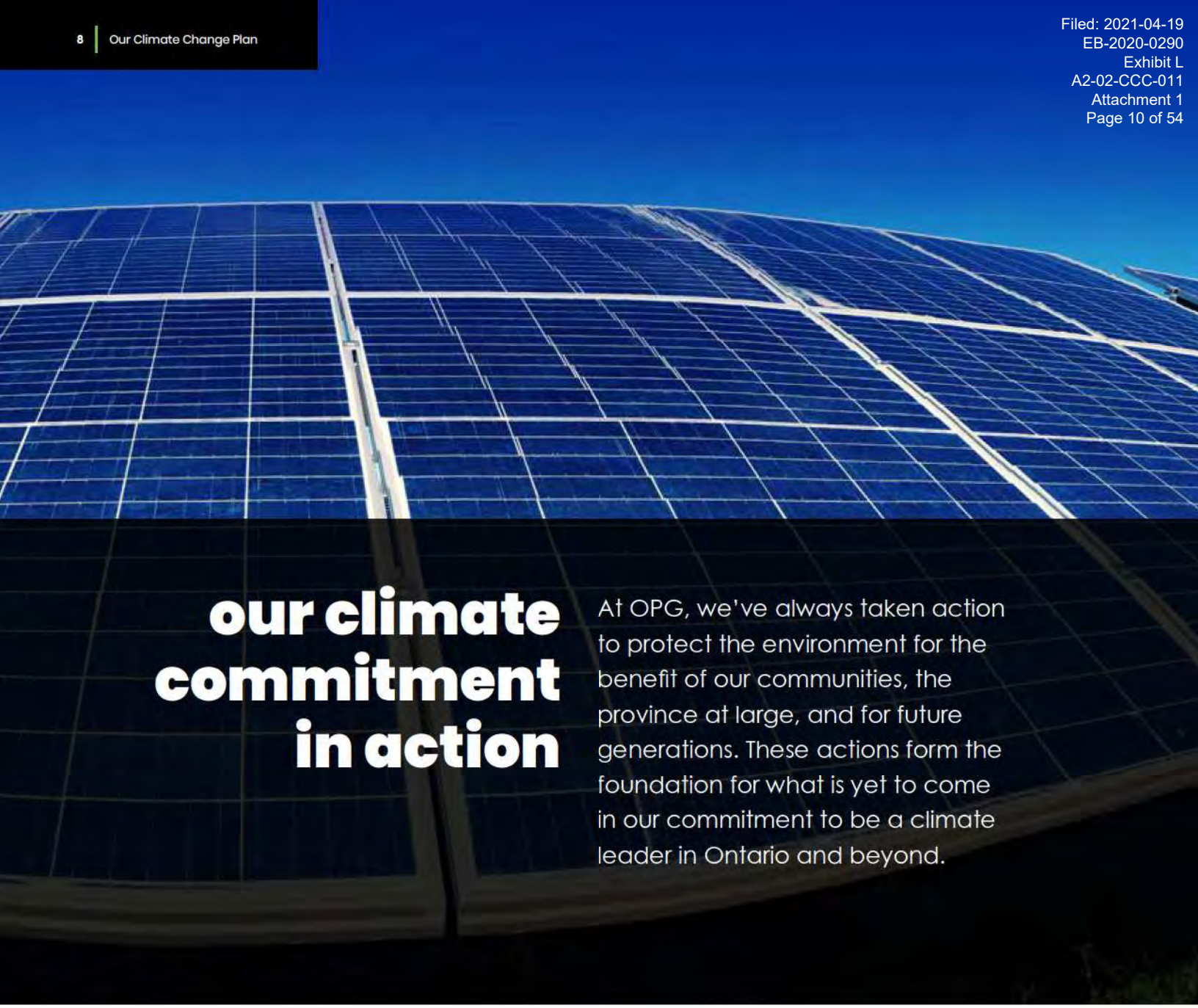

our climate commitment in action

At OPG, we've always taken action to protect the environment for the benefit of our communities, the province at large, and for future generations. These actions form the foundation for what is yet to come in our commitment to be a climate leader in Ontario and beyond.

- Decades before other jurisdictions say they'll be able to do it, we've already **stopped burning coal entirely**.
- We've partnered with Indigenous communities to build **new renewable hydro and solar generation**.
- We're leading the way on advanced technologies that can make a meaningful and immediate impact on climate change, such as **small modular nuclear reactors**.
- We're helping decarbonize the Ontario economy by **electrifying our province's transportation sector**.

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- We're leading the energy sector in using nature-based solutions to help tackle climate change and increase resiliency; planting more than **7 million native trees and shrubs, creating over 120 acres of wetland, 210 acres of grassland and releasing more than 5 million Atlantic salmon** into Lake Ontario and its tributaries, and we're planning to do even more.

- We're **strengthening our resilience and adapting our operations** to ensure the ongoing reliability of our generating facilities. These upgrades will help reduce the impacts of a changing climate on our host communities while helping to decarbonize the economy.

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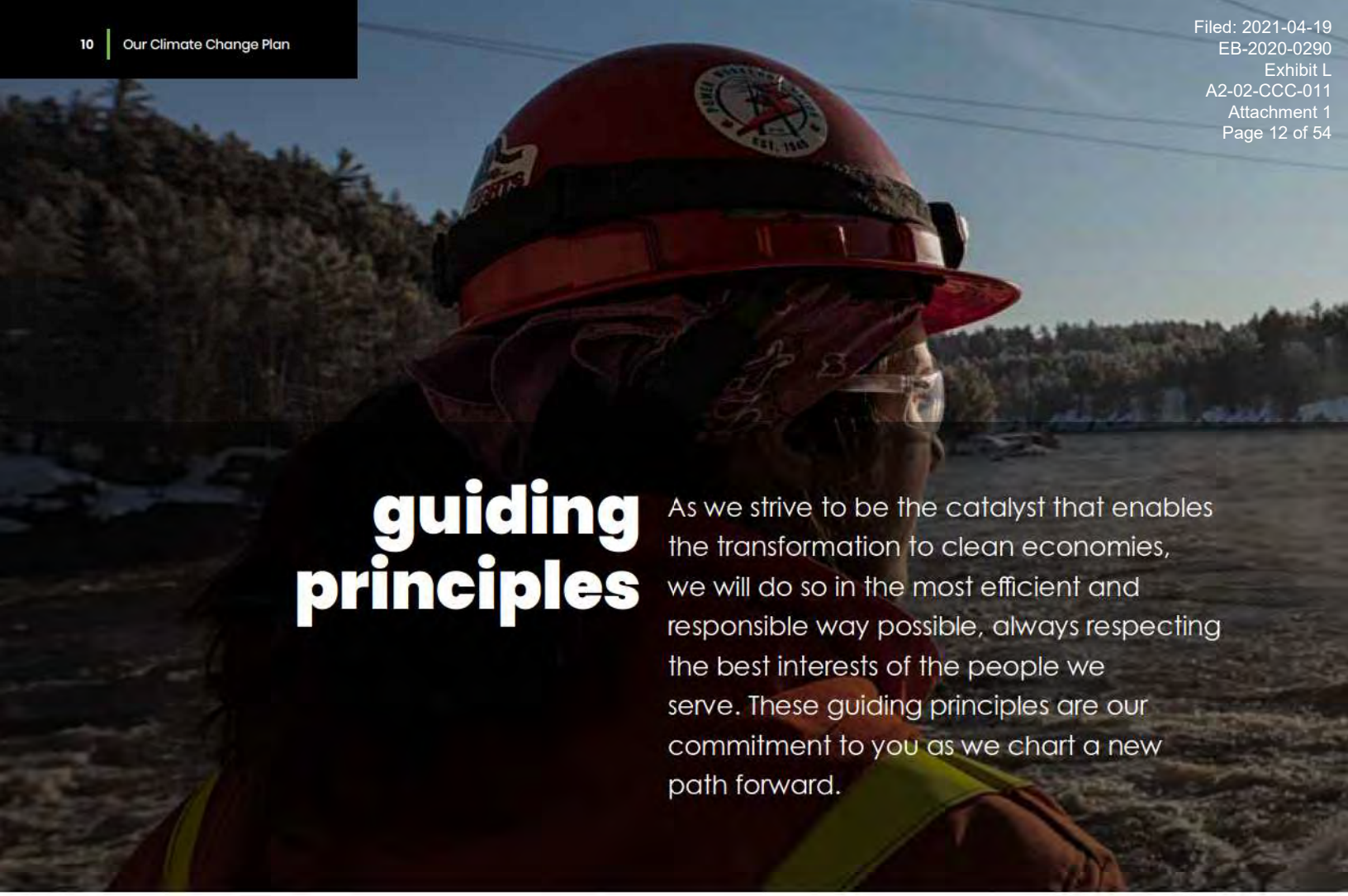


guiding principles

As we strive to be the catalyst that enables the transformation to clean economies, we will do so in the most efficient and responsible way possible, always respecting the best interests of the people we serve. These guiding principles are our commitment to you as we chart a new path forward.

We will **evolve.**

While our goals are firm, the way we reach them will evolve over time. Our plan is designed to adapt to new technologies and changing policies.

We will be **transparent.**

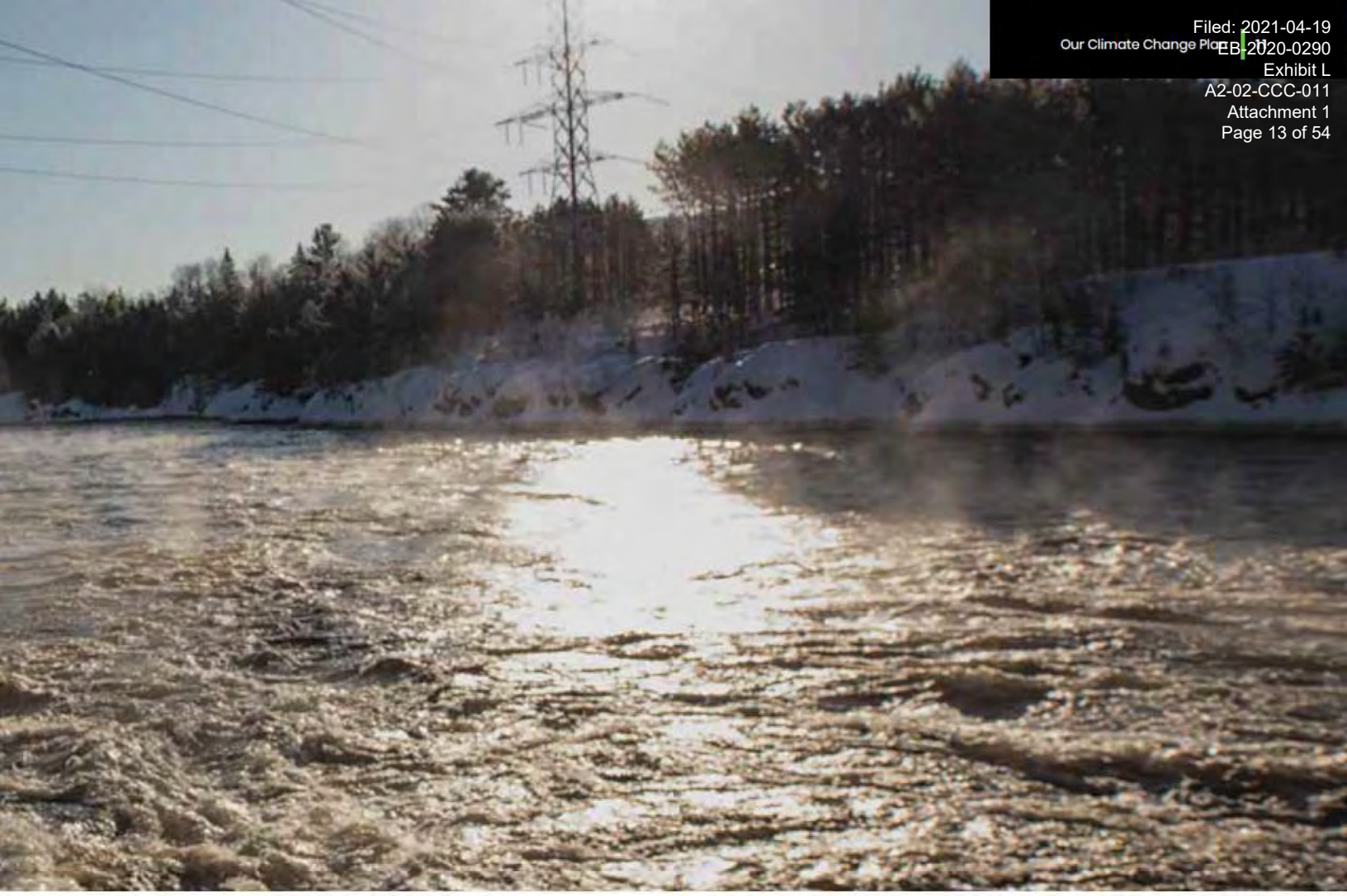
We have tried throughout this document to avoid technical jargon to give you plain facts. We will update you on our progress regularly in the years ahead.

We will follow the **evidence.**

We are guided by the scientific consensus on climate change. Our decisions will be based on the best available evidence on impacts, solutions, and measurement.

We will **respect customers' interests.**

We strive to be a low-cost generator and we will ensure customers' interests are top-of-mind as we work to achieve our goals.



We will **engage Indigenous communities.**

Preserving openness, transparency and trust will underscore our ongoing commitment to growing long-term, mutually beneficial working relationships with Indigenous communities near our current and future operations.

We will be **accountable.**

These days, companies are being held to account by investors, governments, and the public for their progress in addressing climate change. We welcome the scrutiny.

We will be **bold.**

As one of North America's leading clean generators, there is so much we can do to make an impact. We have an obligation to contribute to the full extent of our capacities.

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2 GOALS

goals

Our climate change plan started with a simple question: what can we do to make tomorrow better? The answer, it turns out, is quite a lot. Along with setting an ambitious goal for our company, we're looking beyond our walls to help markets where we operate achieve their goals.

For decades, OPG's world-class workforce has quietly led the charge, devising a blue print for a carbon-free future. With coal closures, conversion of the Atikokan Generating Station to renewable biomass, the Darlington Nuclear Refurbishment, the expansion of our hydro generating assets, and through clean power partnerships like the Gull Bay micro grid and the Nanticoke Solar facility, we are already one of the most diverse, experienced generators in the world but we're ready to do more.

Tackling climate change will take a combination of electricity generating technologies and innovative solutions. Most importantly, it will take the full commitment of societies around the globe. We're determined to do our part.

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our climate goals

A net-zero carbon company by 2040

Having delivered the world's single largest climate action to date by closing our coal stations, OPG will continue to be a climate leader by investing in and implementing CO_2 reductions and offsets to achieve net-zero carbon emissions by 2040.

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A net-zero carbon economy by 2050

OPG will be a leading energy innovation company, advancing clean technologies and solutions to help the markets where we operate achieve net-zero carbon economies by 2050.

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defining net-zero

How net-zero is defined can vary widely across industries and jurisdictions. OPG expects that these definitions will continue to evolve and standardize over time. In the meantime, to keep us motivated on taking the right short-term actions necessary to achieve our goals, we have adopted the following definition.

'Net-zero' refers to achieving an overall balance between direct carbon emissions produced and carbon emissions taken out of the atmosphere.

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Carbon emissions (direct + indirect)

- From OPG-owned or controlled generating stations
- From OPG's purchased energy (i.e. electricity, heat, and cooling) for our corporate operations and offices

−

Carbon removal

- OPG's climate solutions and activities that remove CO_2 from the atmosphere

+

Offset credits

- Invest in offsets, including offset credits purchased from third parties

= 0

Net-zero carbon emissions

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3 SOLUTIONS

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driving innovations and technologies

Our destination is clear: we will be a net-zero carbon company by 2040 and we will help the economies where we operate achieve net-zero by 2050. These goals are not flexible. But the ways we reach them are. After all, a lot can change in 20 to 30 years.

We have many tools in our toolbox including small modular reactors, hydro upgrades, electrification, nuclear refurbishment and nature-based solutions. Here are some of the ways we can adapt our plan to stay on track even when circumstances change.

small modular reactors

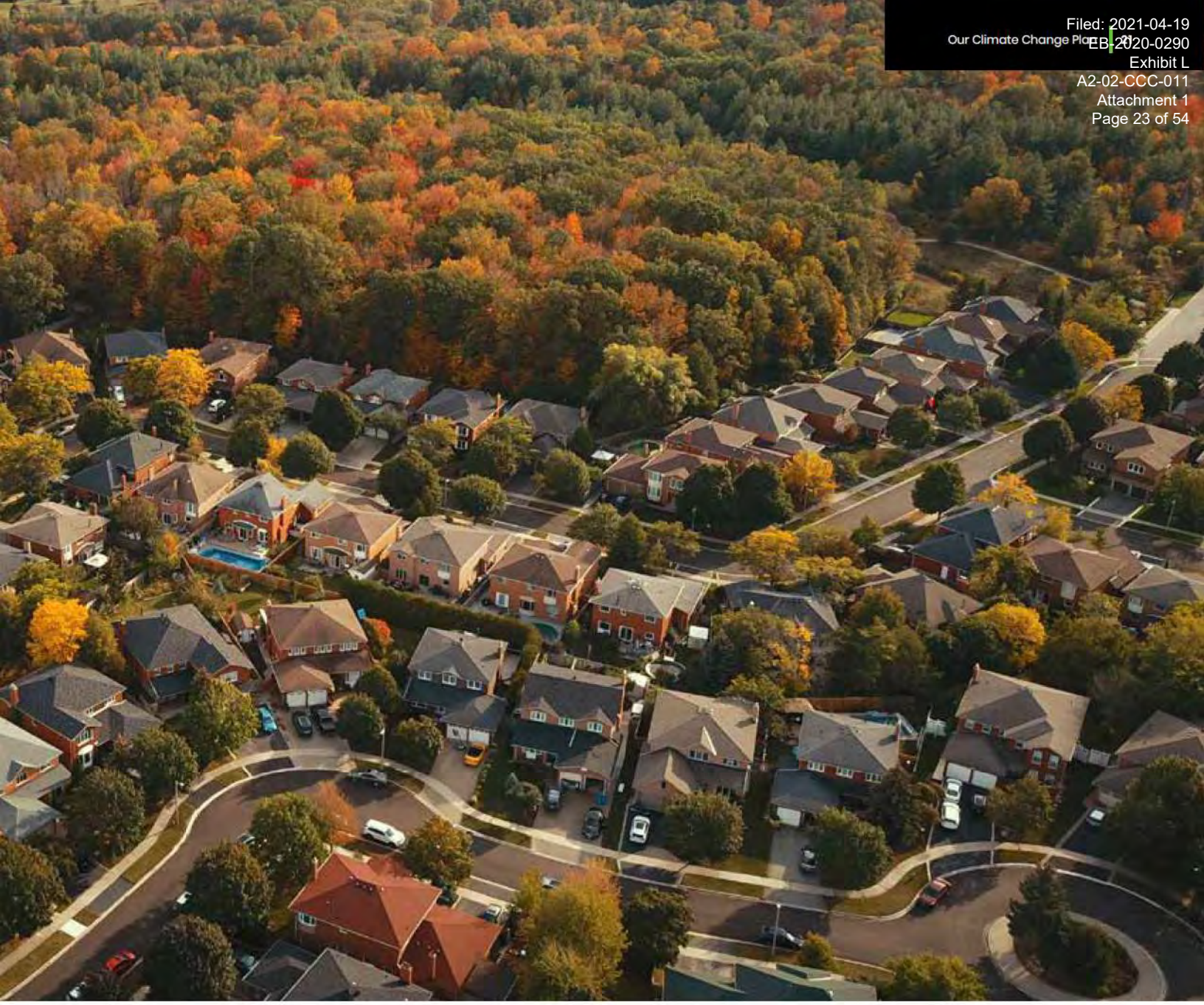
Small Modular Reactors (SMRs) are the next generation in nuclear technology. There are many possible designs under consideration around the world, and many are based on astonishing breakthroughs and new ideas.

SMRs will offer the benefits of traditional nuclear reactors: they'll be able to generate electricity and heat with zero carbon emissions, and they operate around the clock under all weather conditions.

Unlike traditional reactors, they are easier to build and operate and they're smaller — typically with a generating capacity under 300 MW (megawatts). For instance, a 20 MW reactor can power a mining operation or a 5 MW reactor could power a town of 5,000 people. This means they can help power industrial operations, cities, or even remote communities that currently run on diesel generators.

In 2019, the governments of Ontario, Saskatchewan, and New Brunswick signed a Memorandum of Understanding to advance the development of SMRs — a major commitment to collaborate on this new carbon-free energy option.

And in 2020, OPG became the first utility in the world to take an ownership stake in a Micro Modular Reactor™ at Chalk River Laboratories through a joint venture with Global First Power and Ultra Safe Nuclear Corporation.



OPG is also working with three grid-scale SMR technology developers – GE Hitachi, Terrestrial Energy, and X-energy – to advance engineering and design work as part of efforts to identify options for future deployment. And, most recently, we announced the resumption of planning activities for a new nuclear build at the Darlington site with the goal of hosting a grid-size SMR by as early as 2028, pending regulatory approvals and licensing.

SMRs will be an important part of the energy sector's efforts to reduce carbon. OPG's leadership role is critical to advancing and securing acceptance of SMRs, which we see as key to achieving Canada's goal of net-zero by 2050.

nuclear refurbishment and continued operations

Nuclear power remains one of our most effective tools in the fight against climate change because of its ability to produce clean, low-cost, carbon-free baseload power 24/7, 365 days a year. About 60% of Ontario's power is nuclear, which is a big reason why we are among the lowest carbon-intensive jurisdictions in the world.

Darlington Nuclear Refurbishment project

Refurbishing the Darlington Nuclear Generating Station, one of Canada's largest clean energy infrastructure projects, is critical to our climate plan. The four-unit station generates over 20% of Ontario's electricity, or enough energy to power two million homes.

An independent report, prepared by Intrinsik Environmental Sciences, noted the continued operation of a refurbished Darlington Nuclear to 2055 will equal removing two million cars per year from Ontario's roads by avoiding significant carbon emissions.

And a Conference Board of Canada report estimates the Darlington Refurbishment Project, and the added 30 plus years of operation, would generate a total of $89.9 billion in economic benefits for Ontario, create and maintain 14,200 jobs, and boost personal income by an average of $1.6 billion on an annual basis. Customers will also benefit from the station's reliable supply of low-cost power.

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The overall refurbishment project remains on track for completion by 2026.

Pickering optimization

The Pickering Nuclear Generating Station currently provides about 14% of Ontario's electricity. In August 2020, the Ontario government announced its support for OPG's plan to safely optimize the life of Pickering Nuclear, which would see units 1 and 4 operate until the end of 2024 and, if approved by the Canadian Nuclear Safety Commission (CNSC), units 5 to 8 would operate until the end of 2025. This would allow for the safe, sequential shutdown of all units while maximizing the station's environmental and economic benefits. The updated schedule will provide electricity consumers with low-cost energy, allow 4,500 high-quality jobs to remain in Durham region longer, and would avoid approximately 17 million tonnes of carbon emissions. Pickering also supplies about 20% of the world's Cobalt-60 medical isotope.

electrification

Electrification refers to the process of switching parts of our economy that currently use fossil fuels (such as heating or transportation) to use electricity instead.

Because Ontario generates most of its electricity from nuclear and hydro, the carbon intensity of its electricity sector is very low — about 30 grams per kilowatt hour in 2018 and 2019. By comparison, California's carbon intensity is more than seven times this amount and Germany is 12 times greater. The more of the economy we can get running on electricity, the lower our carbon emissions will be and the smaller our contribution to climate change.

More than 30% of Ontario's carbon emissions come from transportation. Powering cars, trucks, trains, buses, and even boats with electricity, rather than gas or diesel, will make a significant impact.

OPG has taken a major step toward advancing transportation electrification through the Ivy Charging Network, an OPG-Hydro One Partnership. Ivy will soon be the largest, most connected electric vehicle (EV) fast-charger network in Ontario with 70+ sites by the end of 2021.

We are also partnering with the Ontario Ministry of Transportation to electrify the province's Amherst and Wolfe Island ferries.

Another partnership with the Toronto Transit Commission will provide charging infrastructure to electrify their bus fleet and help deliver North America's largest transit electrification project.

hydroelectric generation

While hydro has always been a major source of Ontario's energy supply, several of our hydro facilities are over 100 years old and approaching end-of-life. OPG is committed to reinvesting in our hydro fleet to sustain and, where possible, increase generation from this clean, renewable power source in the years and decades ahead.

In addition to investing in Ontario's hydro generation facilities, OPG owns 85 hydro facilities in the United States. We will continue to look for opportunities to grow this portfolio and increase generation at our U.S. facilities. By supporting the United States' transition to a cleaner energy mix, OPG can make a further contribution toward carbon reductions.

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non-hydro renewables and storage

Advancements in renewable technologies, such as wind and solar, have made these sources more cost effective. However, their intermittent nature creates inherent reliability challenges for the system, where the supply of energy and demand must be continually balanced.

These challenges can be partially overcome by pairing renewable sources with energy storage technologies to increase reliability, especially during periods of peak demand. For example, distributed solar and wind generation may be backed up by local storage facilities to increase local reliability and/or to save on transmission and distribution investment. We see this as an important part of meeting future system needs, particularly once Pickering Nuclear Generating Station is no longer operating.

OPG has considerable expertise in solar and storage development, having recently converted the coal-fired Nanticoke Generating Station site into a 44 MW solar facility in partnership with Six Nations of the Grand River and the Mississaugas of the Credit First Nation. We also helped develop an off-grid solar and storage micro grid for the Gull Bay First Nation community, and two other energy storage facilities that manage industrial companies' peak energy consumption.

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OPG will continue to explore opportunities to contribute to a cleaner grid through the development of renewables and energy storage.

negative emissions technologies

Negative emissions technologies, or those technologies that remove and sequester carbon from the environment, will form an important part of the world's overall climate solution. One such technology is Carbon Capture and Storage (CCS) – which captures carbon emissions at the source — such as a natural gas generating station — and stores them underground in suitable geological formations. CCS can dramatically reduce the carbon that is released into the atmosphere by burning fossil fuels.

OPG's ongoing partnership and collaboration with the MaRS Discovery District provides us access to emerging clean technology companies for ongoing collaboration. In the future, we may apply CCS at our gas generating stations when it becomes technically and economically viable.

nature-based solutions

Climate change and biodiversity are interconnected. We protect the environment throughout the course of our operations and continue to invest in biodiversity by retaining, restoring and enhancing natural habitats at our sites and in communities where biodiversity is under threat. This means more than giving plants and animals a place to live. As plants grow, they pull carbon out of the atmosphere, offsetting the release of climate change-causing greenhouse gases.

We've planted more than 7 million native trees and shrubs, and we'll plant millions more before 2040. We're also working to restore wetlands and grasslands. These nature-based solutions to climate change are an important part of our plan.

natural gas

Although it may sound counterintuitive, natural gas generation will play an important role in transitioning off of fossil fuels.

Renewable sources like solar and wind are intermittent by nature so they require a backup source that can be dispatched to meet ever-changing electricity demands. Future breakthroughs in energy storage may make it technically feasible and economical on a mass scale to rely more on renewables; but for now, natural gas remains their enabler and an important part of our climate change plan.

Having flexible natural gas to back up renewables provides the system stability and reliability needed to continue to evolve. OPG operates one dual-fired oil/gas generating station and, through our subsidiary Atura Power, four combined-cycle natural gas generating stations. We will look for opportunities to reduce emissions at these stations, including exploring innovative measures like carbon capture.

adaptation

Adaptation starts with strengthening our assets and operations against climate change related impacts. These efforts also reduce the impacts on our host communities. We are also looking at using nature-based protection measures like building wetlands to mitigate against extreme events like flooding and wildfires.

Beyond updating traditional technologies and processes, we will also continue to integrate climate science and modelling into our investment decision and engineering processes, when considering future design and asset upgrades. Getting ahead of Ontario's climate risks will strengthen the electricity grid's resiliency, which in turn will help decarbonize the broader economy.

Our commitment to you is to ensure our operations are resilient to the impacts of a changing climate, and to do our part to ensure the ongoing safety of our host communities.

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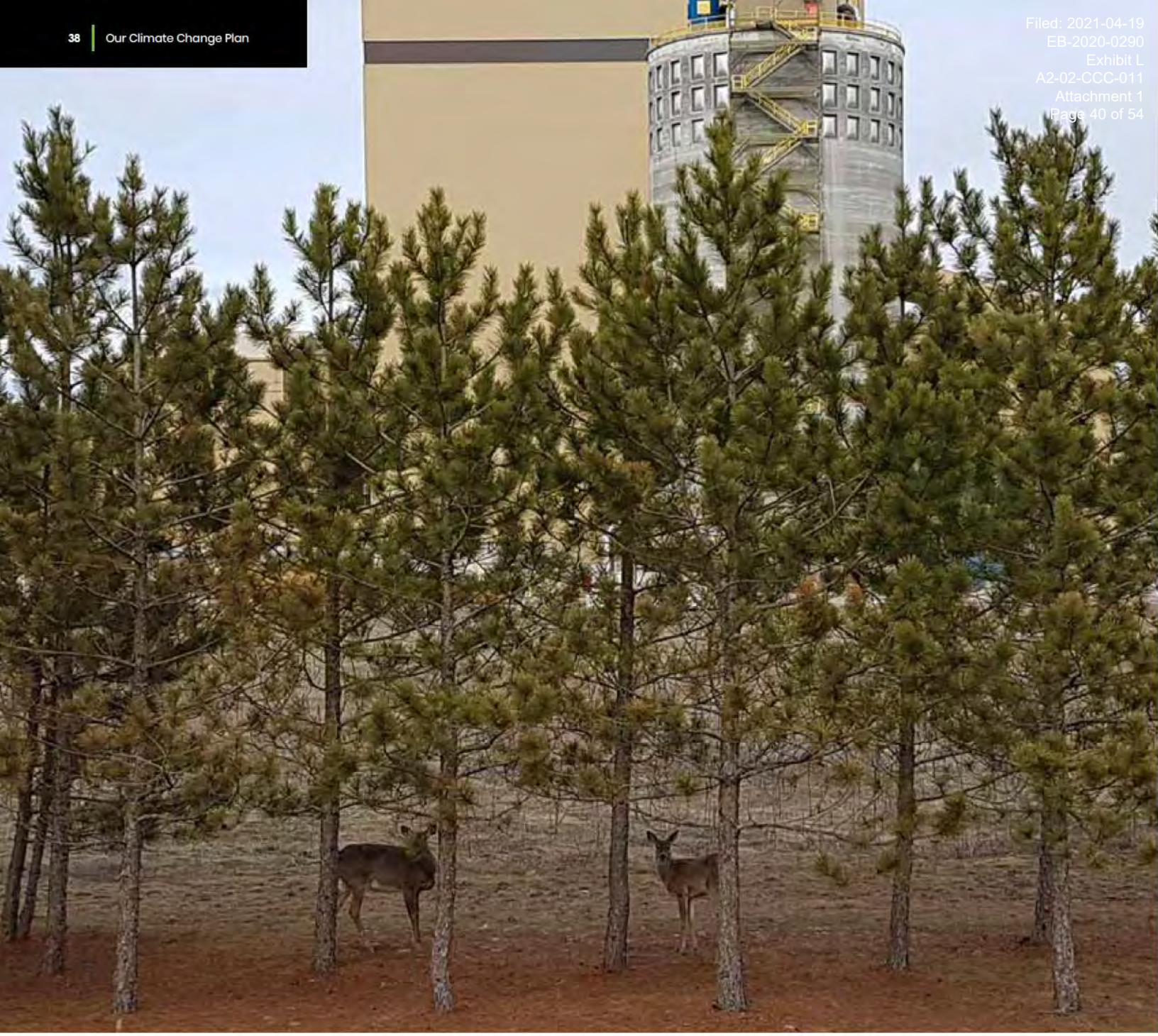

our underlying assumptions

OPG has worked to reduce our carbon footprint for decades. The biggest change was realized in 2014 when we closed the last of our coal stations. We went from emitting 30.2 Mt of CO_2 in 2005 to an average of about 0.5 Mt per year between 2014 and 2019.

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Once the Pickering Nuclear Generating Station winds down in 2025 (pending regulatory approval), Ontario's electricity system may have to rely more on natural gas as other replacement sources, such as Small Modular Reactors (SMRs) are being built. As a result, OPG could see an increase in emissions to approximately 5 Mt of CO_2 per year during this period. This is why we've set the ambitious goal of achieving net-zero carbon by 2040. We believe a diverse mix of energy sources, technologies and offset measures can get us there.

We also believe that as the world advances and adapts to the realities of a changing climate, so too will solutions and policies. To achieve our goals we assume the following:

- **Policies and legislation will be developed** to support the decarbonization of the economy by 2050.
  - Policy changes are important drivers of decarbonization developments across all sectors, including energy, transportation and building standards — both from an economic and technological advancement perspective.
- **Increased electrification will result in additional demand for electricity,** which will require deployment of new clean generation such as additional hydro power and SMRs.
- **Substantial advancements will be made in the area of negative emissions technologies**. Carbon Capture and Storage (CCS) technology will be commercially available by 2040.
- **An offset credit market will be available in 2040** to meet the balance of OPG's carbon commitments not met by direct actions.

In addition, OPG will collaborate with municipalities preparing or implementing a Provincially-funded Municipal Energy Plan to explore opportunities to work together on clean energy generation, electrification, energy storage, energy efficiency, or greenhouse gas emissions reduction projects.

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charting our path forward

There are a number of ways we can achieve our goals. As demand, technologies and policy changes advance, so too will our plan. Our commitment to you is that we will continue to explore and evaluate all available options in our ever-growing toolkit to help reach our goals in the most sustainable and economic way possible. Here is an illustration of some of the possible technologies and ways forward.

The potential range of annual carbon reduction achievable to reach our goals using today's available measures (Mt, million tonnes)

Solutions to meet our targets

For each carbon reduction measure identified below, there is a range of potential applications, which will be balanced to achieve our goal

Small modular reactors	1 SMR in Ontario	1 SMR in Ontario 1 SMR in another jurisdiction		1 SMR in Ontario 2 SMRs in other jurisdictions
Electrification	Support 0.5 million cars in Ontario	Support 1 million cars in Ontario	Support 1 million cars and 1 transit electrification project	Support >1 million cars in Ontario
Hydroelectric generation investment	Up to 100 MW	100 – 200 MW	200 – 300 MW	> 300 MW
Non-hydro renewables and storage	≤100 MW	100 MW – 400 MW	400 MW – 800 MW	> 800 MW
Negative emissions technologies	Assume this is not economic		Applied at one generating station	
Natural gas asset management	Natural gas stations decommissioned at end of service life		Blend or switch to a clean fuel source at one or more of our natural gas stations (i.e. hydrogen or renewable natural gas)	
Purchase offset credits	Yes, applied for target balancing		Not required for balancing	

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4 ACTION PLAN

Goals are not enough. We need action. These are some of the actions we are currently exploring over the next five, twenty, and thirty years as we begin our journey to net-zero.

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mitigate

We will reduce carbon emissions from our operations, and help the markets where we operate do the same.

adapt

We will ensure our operations are resilient to the impacts of a changing climate and our host communities are safe.

innovate

We will develop and deploy new technologies to speed up Ontario's energy transformation.

lead

We will work with others to lead the decarbonization of Ontario's economy, and share our province's lessons with the world.

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mitigate

We will reduce carbon emissions from our operations, and help the markets where we operate do the same.

By 2025

- Through the Ivy Charging Network, install over 100 on-the-go fast-charger sites for electric vehicles (EVs) throughout Ontario to help enable the mass adoption of EVs, with 70+ sites scheduled for completion by the end of 2021.
- Add 10 new MW of clean hydro capacity at Ranney Falls and new internal sluice capacity to respond to water management issues.
- Complete the Sir Adam Beck G1 & G2 conversion, adding an additional 125 MW of clean hydropower.
- Complete the refurbishment of Darlington's Unit 3 (2024), Unit 1(2025) and Unit 4 (2026), to solidify Ontario's low-cost, carbon-free, baseload power generation for 30+ years.
- Reduce our environmental footprint and support green warehousing by consolidating warehouses and using industrial vending machines. Look to use vertical/horizontal carousels, and implement electrification of material handling equipment.

By 2040

OPG is net-zero carbon

- As part of the EV100 initiative, convert our fleet of corporate vehicles, where technically feasible, to electric (approximately 400 vehicles) by 2030, and install over 40 level 2 EV charging units across our offices and sites for staff and fleet vehicles.
- Continue to advance and promote the adoption of EVs through investments in charging infrastructure, helping bring one million EVs to Ontario's roads.
- Pair energy storage with hydroelectric facilities to allow water to be used more efficiently and enhance the ability to provide grid services.
- Deploy Ontario's first on-grid Small Modular Reactor at the Darlington site, pending regulatory approvals and licensing.
- Apply OPG's SMR technology to build and deploy in other Canadian jurisdictions reliant on coal and fossil-fuel power to reduce national carbon emissions.

By 2050

The economy is net-zero carbon

- Continue to advance and promote the adoption of EVs through investments in charging infrastructure, helping bring two million EVs to Ontario's roads.
- Continue investing in nature-based mitigation efforts by planting 35 million trees by 2050, while also creating 3,000 acres of wetlands and 3,000 acres of grasslands.

Complete the Calabogie GS redevelopment, adding ~11 MW of clean hydropower.

Complete the Coniston GS redevelopment, adding 4 MW of incremental capacity of hydropower.

Deploy a systematic approach for extending the life of existing hydroelectric assets and redevelop at least 2 additional hydroelectric generating stations (2025).

Reclaim portions of Nanticoke & Thunder Bay GS industrial sites with naturalized green space.

Work with 3rd Party Logistics (3PL) providers on delivery route optimization, consolidation of orders, bulk purchasing, etc. Also implement widespread use of reusable/recyclable packaging.

Build a state of the art Corporate Headquarters Campus that is designed, built and operated with low carbon and sustainable principles (2025).

Continue to invest in nature based solutions to mitigate the impact of a changing climate by planting 10 million trees (including those planted since 2000), and creating/restoring 500 acres of grasslands (including projects completed since 2014). Also aim to create/restore 250 acres of wetlands.

Carbon pricing assumptions will be built into established business processes from the beginning to enhance project decision-making.

Safely optimize the life of Pickering Nuclear GS to sequentially bring units 1 and 4 down in 2024, and pending regulatory approval by the Canadian Nuclear Safety Commission, bring units 5-8 down in 2025. Pickering optimization would avoid approximately 17 million tonnes of carbon emissions.

Continued support of Ontario's forestry & biomass sectors through the efficient operation of the Atikokan Generating Station on renewable biomass.

Test clean hydrogen, renewable natural gas or carbon capture/utilization and storage at one gas-fired asset in Ontario, to evaluate emission reduction options.

Complete hydro turbine generator overhauls across the fleet to maintain reliability of these renewable assets.

Implement online flow and enhanced performance testing and monitoring to improve the efficiency of hydro power plants.

Increase energy market flexibility by enhancing pump storage capability in Ontario.

Redevelop additional 3-8 hydroelectric generating stations to continue to provide clean, renewable power.

Create, leverage and deploy innovative new technologies and processes to help sustainably manage the decommissioning of the Pickering Nuclear station, responsibly reducing the environmental footprint of the project (from carbon emissions to byproduct volume and waste).

Continue investing in nature-based mitigation efforts by planting 17.5 million trees by 2040 (including those planted since 2000), while also striving to create/restore 1,250 acres of grasslands (including projects completed since 2014), and 1,000 acres of wetlands.

Continued operation of Darlington Nuclear to 2055 will take the equivalent of two million cars off Ontario's roads per year, while helping to support the continued electrification of the economy with clean, carbon-free power.

Implement clean hydrogen, renewable natural gas or carbon capture/utilization and storage at gas-fired assets in Ontario to reduce emissions.

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adapt

We will ensure our operations are resilient to the impacts of a changing climate and our host communities are safe.

By 2025

- Climate change considerations will be embedded into established business process to ensure resilience is a priority in the maintenance of our generating fleet and the operations of our business.
- Complete upgrades on the Little Long Generating Station's Adam's Creek spillway improving discharge capacity on the Mattagami River.
- Continue to invest in nuclear asset resiliency through upgrades that support operations such as lake algae bloom mitigation (Advanced Algae Warning System, bubble curtains, etc.).

By 2040

OPG is net-zero carbon

- Evaluate full-scale, nature-based solutions to reduce the effects of climate change, where appropriate.

By 2050

The economy is net-zero carbon

- Address all generating asset-based climate vulnerabilities to ensure the continued production of clean, reliable power.

Deploy a new hydro prediction and modelling system to improve water management due to adverse weather events caused by a changing climate.

Add new internal sluice at Ranney Falls to respond to water management issues.

Continue to engage in government and inter-sector adaptation teams to increase the resilience of all infrastructure.

Explore the feasibility of nature-based climate adaptation solutions that use nature to help protect our assets and operations, such as building wetlands to help regulate water flow upstream of hydro dams.

Implement optimization decisions and support systems to aid in responding to changing climatic conditions.

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innovate

We will develop and deploy new technologies to speed up Ontario's energy transformation.

By 2025

- By the end of 2021, identify the SMR technology we wish to deploy in Ontario, which will be the first of its kind for SMR pan-Canadian deployment.
- Aim to have the Ontario SMR project construction at the Darlington site well-underway (given all required licences and approvals are granted), leveraging our world-class workforce and innovative project management and construction processes and technologies to deliver the project on time and on budget.
- Establish the Centre for Canadian Nuclear Sustainabilty, and innovation hub focused on developing and using innovative technologies and processes for the sustainable decommissioning of nuclear facilities (2020).
- Aggregate thousands of EVs and chargers into a resource pool which provides 10 MW demand response and operating reserve for Ontario to meet changing electricity demand.

By 2040

OPG is net-zero carbon

- Deploy new renewable generation to meet future energy needs.
- Increase our aggregate resource pool (DERs, EVs and chargers) to provide 100 MW of demand response and operating reserve.

By 2050

The economy is net-zero carbon

- Increase our aggregate resource pool (DERs, EVs and chargers) to provide 1,000 MW of demand response and operating reserve.

Develop and deploy nature-based solutions that can reduce the environmental footprint of our office buildings.

Begin feasibility assessments of nature-based solutions as an innovative means for increasing hydro generation.

Deploy equipment monitoring, reliability and software tools to report on and understand condition of assets to reduce maintenance and better predict remaining life of assets.

Continue to support the issuance of innovative financial instruments in line with climate change goals, such as Green Bonds.

Continue to support innovative projects that reimagine the applications of transportation electrification, such as vehicle-to-grid initiatives using EVs and electric school buses.

Continue to build a portfolio of energy storage facilities at customer sites to reduce the grid need for gas-fired generation at peak times.

Deploy energy storage to meet future grid capacity and reliability needs.

Optimize maintenance through the transition to condition-based maintenance, helping to reduce our carbon footprint by minimizing work.

Use artificial intelligence to operate a fleet of distributed energy resources (e.g. electric vehicles, solar, energy storage, flexible load), creating a Virtual Power Plant.

Develop and deploy a 100 MW clean hydrogen facility.

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lead

We will work with others to lead the decarbonization of Ontario's economy, and share our province's lessons with the world.

By 2025

- Continue to be a global leader in SMR development and continue to lead the CEO SMR Forum and the CANDU Owners Group (COG) SMR Technology Forum.
- Lead the implementation of SMR deployment feasibility work coming out of the Premiers' MOU on SMR Collaboration to bring this climate change fighting technology to market.
- Be the first to deploy a very small modular reactor at the Chalk River site as part of Canadian Nuclear Labs' SMR siting program, as a commercial demonstration to support off-grid energy needs (remote communities, mines) reducing dependency on fossil fuels.
- Enhance our leadership position in sustainable nuclear decommissioning by developing the Centre for Canadian Nuclear Sustainability, which will be a world-class centre of excellence that will help manage the full nuclear lifecycle.

By 2040

OPG is net-zero carbon

- Help Saskatchewan and other jurisdictions with SMR deployment.
- Promote world-wide deployment of SMR technology to help global jurisdictions decarbonize their electricity sectors.

By 2050

The economy is net-zero carbon

- Share our expertise to help decarbonize local and global economies using SMR and hydro development, electrification infrastructure, and sustainably-focused operational/project excellence.

Continue to be a leader in fleet electrification by providing our world-class electrification expertise to help enable the transition of municipal and large corporate fleet vehicles.

Continue to be a leader in mass transit transportation electrification, by executing projects in the marine transportation sector, as well as eBus transit spaces.

By 2025, lead the electrification of the trucking sector by developing and deploying critical charging infrastructure.

Continue to participate in industry leading climate change adaptation research with Ouranos to better inform our business decisions and processes (since 2007).

Continue to lead energy storage industry development through leadership positions in organizations such as Energy Storage Canada.

As Canada's largest corporate Green Bond issuer after our 2020 issuance, continue to expand the issuance of Green Bonds to raise awareness and profile of clean energy projects.

Lead the completion of taxonomy to define the technologies that can advance the transition to a net-zero carbon economy.

Incorporate environmentally friendly policies, processes and metrics in existing sourcing and procurement practices, partnering with Tier 1 suppliers to develop a mandate of "Carbon Neutral" sub-supplier selection process.

Be a global leader in economy-scale electrification, bringing our expertise in consumer transport, trucking, fleet and mass transit electrification to other national and global markets.

Be a market leader with fully established practices and robust processes to select, partner and sustain environmentally conscious supplier relationships.

Be a leader in nature-based climate solutions in the utility space, using the power of nature to build resilience of our assets and to help mitigate the effects of climate change.

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