Building Canada's future: Maximizing clean-energy infrastructure to reach net-zero emissions by 2050

Deloitte.

Canada is at a critical turning point. Our greenhouse gas (GHG) emissions—already above the G20 average per capita—are on the rise, and the deadline to meet our net-zero objective by 2050 is drawing closer.[1,2] In fact, according to the International Energy Association (IEA), advanced economies need to achieve net-zero targets by 2045 in order to limit the long-term rise in average global temperatures to 1.5°C above pre-industrial levels.[3]

Canada is also facing a substantial infrastructure gap. In *A vision for a thriving Canada in 2030*, Deloitte found that Canada will need to invest up to $22 trillion to meet infrastructure needs over the next 50 years and to increase GDP growth beyond our recent historical average of 2.2% per year.[4]

Governments of countries around the world, including Canada, are rightly focusing on how to use infrastructure investments to help achieve the twin goals of enabling urgent decarbonization objectives and supporting thriving communities. For Canada, the most important infrastructure that we need to prioritize to reach net-zero levels is the energy system—both a major source of GHG emissions and the lifeblood of individual communities. According to the IEA, energy systems need to be completely transformed in order to achieve a net-zero target by 2050.[5] Maximizing the use of infrastructure will be crucial to decarbonizing our energy system and transitioning to a low-carbon future.

We laid out a relatively ambitious imminent goal for national prosperity in our first Catalyst report, *A vision for a thriving Canada in 2030*, but infrastructure requires a longer timeline. The investments we make today can help us create a net-zero future several decades from now. Our vision is that, by 2050, Canada will have achieved net-zero emissions and be a global leader in sustainable, resilient, and inclusive infrastructure.

The complexity of this challenge requires us to think and act differently. If we hope to achieve our 2050 vision, we'll need to work across government levels and departments, and bring together key industries such as energy, resources, transportation, manufacturing, and financial services. In other words, policymakers must aim to adopt a wider, systems-thinking approach that breaks down silos to unite key infrastructure players. The approach should also be grounded in the user-centricity of every policy decision. No single stakeholder group will feel the impact of net-zero transformation as keenly as the individual Canadian—from the urban dweller to the energy worker to the rural environmentalist. Combined, systems thinking and user-centricity should enable policymakers to take an across-the-board view of Canada's infrastructure and to effect transformative change by influencing the relationships within it.

Canada must use this once-in-a-generation moment as a catalyst to be bold and creative. With our time rapidly diminishing, the path to a cleaner energy system will not be without its challenges. Regardless, transformation is possible. We can reach the net-zero target and build a better Canada by taking coordinated action now, grounded in a long-term collaborative vision for a clean-energy ecosystem.

Canada and GHG emissions

- *Canada is among the world's top per capita GHG emitters—our levels are more than double those of the G20 average.*[6]
- *While we account for 0.5% of the world's population, we contribute 2% of worldwide GHG emissions.*[7]
- *Canada's climate is warming twice as quickly as the global average, leading to more frequent and severe extreme-weather events.*[8]

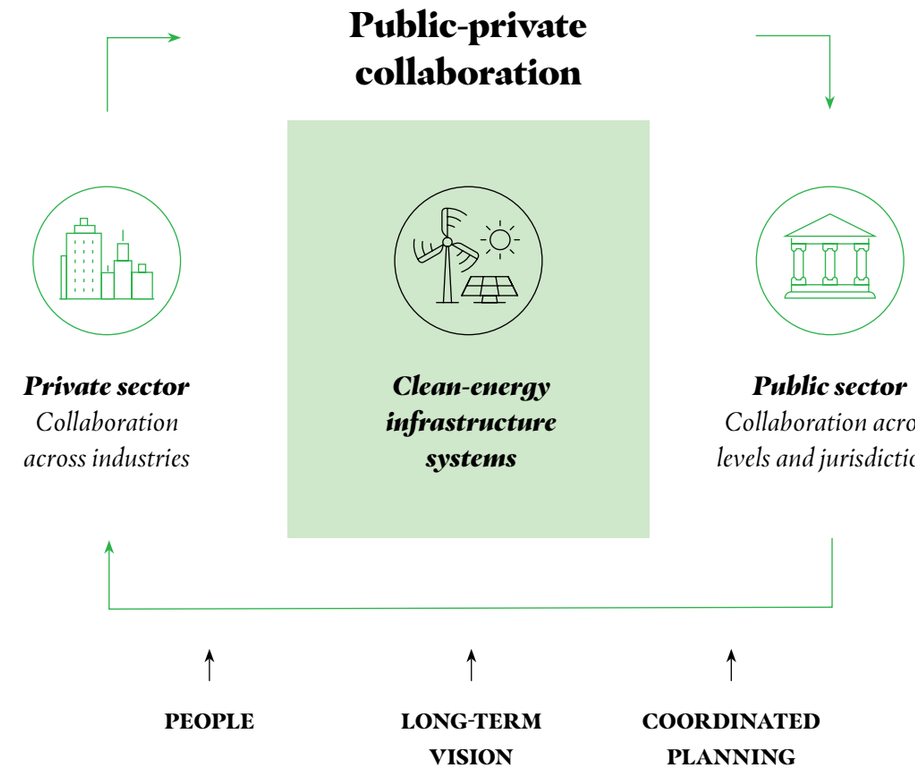
1.
THE CASE FOR A SYSTEMS-THINKING AND USER-CENTRIC APPROACH

Achieving decarbonized energy systems in the years to come will rely on making coordinated choices today. The existing energy infrastructure will need to be transformed into a series of complex, interconnected, emissions-free systems, as described in the Deloitte article *Leading in a low-carbon future*.[9] To reach net-zero levels by 2050, Canadian policymakers must adopt a systems-thinking approach, which takes a holistic view of Canada's infrastructure ecosystem, focusing on how its components—from policy to funding to partnerships—interact with and reinforce each other.

The federal government should act as a convenor to enable coalitions across the public and private sectors, with a view to making transformative energy-infrastructure investments over the long term. This means creating a road map divorced from short-term political cycles to guide Canada's energy infrastructure in its drive toward resilience, inclusion, and net-zero transformation. It also means coordinating across government levels and departments, as well as collaborating with the private sector and Indigenous governments, in order to help ensure the road map is implemented successfully.

Net-zero transformation must also address user-centricity, which focuses on designing policies and processes based on a deep understanding of end users' needs, goals, and desires. People don't interact with infrastructure in silos—they engage with interconnected *systems*. During a commute, for instance, a person may use a range of infrastructure types, from utility to transportation to telecommunications. No stakeholder group will feel the impact of decarbonization as strongly as individual Canadians—whether through their jobs, mobility options, or access to basic utilities. The journey to net-zero, therefore, must put *people* at the centre of every infrastructure investment.

A systems-thinking approach



A user-centric approach

Throughout this policy brief, we refer to several fictitious people to help illustrate our vision for the country's journey to net-zero emissions. These sample scenarios don't aim to represent the full scope of the diverse peoples and communities in Canada, but rather to encourage readers to consider end-user impacts of infrastructure decisions.

***Lina** is an experienced tradesperson in the fossil-fuel industry, raising a family in the petroleum-producing region where she grew up. She believes deeply in the potential of her community, but the ongoing downturn in the oil industry has left her concerned about the future. She's looking for solutions from government that will support her job, her family, and her neighbourhood.*

***Emmett** lives in rural Canada, where he runs the farm his family has owned for generations. Climate change is altering the way he farms: the growing season is longer, but extreme weather is more frequent. While Emmett seeks to adopt more sustainable agricultural practices, he remains reliant on high-emissions vehicles and machinery for work and local transportation.*

***Levi**, a member of a remote First Nations community, is developing a wind farm with an accompanying battery-energy-storage system in equity partnership with other First Nations communities and the regional utility. He aims to eliminate diesel dependence in his community while ushering in economic empowerment and capacity building, all the while stewarding the land for future generations.*

***Sameera** is a young tech professional in a major metropolitan centre who has a passion for sustainability. Cost-conscious, Sameera opted against car ownership in favour of public transit and ride-sharing services. Intentionally lowering her carbon footprint is important to her, and she frequently assesses transportation options based on their environmental impact.*

Our research approach

This policy brief was supported and verified through the following:

- ***Literature review*** *of academic and policy research, including analysis of international best practices, to determine which policies Canada could implement to become a leader in clean-energy infrastructure.*

- ***Specialist consultations*** *with Deloitte leaders who have deep experience in—and understanding of—infrastructure and sustainability.*

2.
APPLYING A SYSTEMS-THINKING AND USER-CENTRIC APPROACH

The Canadian government is rightly focused on decarbonization. However, recent findings by the Office of the Parliamentary Budget Officer suggest that more needs to be done to achieve our climate objectives.[10] Reaching net-zero targets requires changing the way we think about and build clean-energy infrastructure. Based on the approaches described in the previous section, we propose that the federal government take the following targeted actions in order to drive this transformation:

→ *Act as a convenor of the proposed clean-energy ecosystem to enable systems thinking.*

→ *Unlock the power of carbon capture, utilization, and storage using industrial hubs.*

→ *Aim for net-zero emissions from transportation.*

→ *Transform power grids across Canada to maximize the benefit of clean-energy infrastructure.*

→ *Scale up hydrogen-fuel production by bringing together the full hydrogen-energy ecosystem.*

Act as a convenor of the proposed clean-energy ecosystem to enable systems thinking

The journey to net-zero emissions requires transformation across all levels of government, industries, and regions—that is, no one sector or jurisdiction can meaningfully reach the target on its own. However, Canada currently lacks a comprehensive long-term infrastructure plan. Without one, it's difficult to anticipate how much funding is needed and when it would be required, as well as how to mobilize the private sector to help generate the desired amount. The federal government has a role in promoting visibility for long-term planning, coordinating the interaction between public and private players, and instituting international best practices.

This role can take several forms. One option is for the Canada Infrastructure Bank (CIB) to get involved by extending efforts within its mandate. These presently can include investing in infrastructure such as clean energy,[11] acting as a centre of expertise for private-sector infrastructure investors, and providing relevant advice to all levels of government.[12] Using the full scope of its mandate, the CIB could play a more ambitious role in applying systems thinking to Canada's infrastructure pipeline, bringing together ecosystem stakeholders and identifying policy levers that would help incentivize private-sector investments.

In fulfilling this convenor role, whether through the CIB or another avenue, the federal government could take inspiration from emerging international best practices. Additionally, tapping into the level of government and industry commitment that helped usher in popular nationwide infrastructure projects such as the Trans-Canada Highway, the government could steward the investment in infrastructure required to reach net-zero objectives across the clean-energy ecosystem.

Case study: Managing the infrastructure ecosystem in Australia

Infrastructure Australia was established in 2008 by the Australian government as a statutory advisory body to provide independent research and advice to government, industry, and community stakeholders on the investments and policies required to meet the country's infrastructure needs. In 2016, Infrastructure Australia conducted an audit of existing infrastructure and future needs. From those findings, the organization worked with state and territorial governments, as well as with industry leaders and other stakeholders, to produce a priority list of recommended infrastructure investments.[13] Since then, it has created an annual Infrastructure Priority List that identifies nationally significant investment opportunities and provides decision-makers with advice and guidance.[14] In April 2021, the advisory body defined explicit sustainability principles to support this annual assessment program and ensure that infrastructure investments promote the country's sustainability goals.[15]

The majority of Australia's infrastructure is divided into jurisdictions at the subnational level, similar to Canada. However, the federal government, informed by this annual priority list, plays a key role in funding infrastructure investments.[16] The Infrastructure and Project Financing Authority, an independent federal body, is responsible for allocating national funding to key infrastructure projects based on the advice of Infrastructure Australia.[17]

Unlock the power of carbon capture, utilization, and storage (CCUS) using industrial hubs

CCUS is the process of capturing carbon dioxide (CO_2) emissions from sources such as energy-production and manufacturing plants, and then either reusing or storing them so that the CO_2 won't re-enter the atmosphere.[18] It's a promising technology that has a major role to play in helping Canada achieve its net-zero goal: in collaboration with Navius Research, Deloitte found that CCUS could account for up to 13% of the GHG reductions needed to reach net-zero carbon emissions by 2050.[19] CCUS is particularly useful as a retrofit for existing power and industrial plants, which might otherwise emit eight billion tonnes of CO_2 by 2050, and is vital to the production of low-carbon hydrogen.[20]

CCUS is also an important component of a decarbonization strategy for some of Canada's heaviest-emitting sectors, where technology options are often otherwise limited. According to the Intergovernmental Panel on Climate Change, using CCUS in these sectors—such as cement, where process emissions account for more than 4% of all energy-sector GHGs[21]—is crucial to achieving the global 1.5°C goal.[22]

Canada is well-positioned to be a global leader in CCUS, as it's home to some of the world's most advanced facilities and companies for this technology. Canada also has the technical expertise, knowledge, and geological suitability for CO_2 storage. However, CCUS is very expensive—it requires significant upfront capital and clearer paths to commercialization in order to be implemented at scale.

One approach to solving these challenges could be for the government—for example, through the CIB—to work with private-sector companies and provincial governments to create CCUS industrial hubs that share CO_2 infrastructure; this would be particularly relevant in Western Canada, where there's a concentration of energy plants. The federal government has already partnered with Alberta and major energy producers in their shared goal to reach net-zero oil-sands emissions by 2050, chiefly through the use of CCUS.[23] Canada should continue to build on this partnership and further act as a convenor in facilitating energy ecosystems, for example by:

- ***Partnering with the private sector***
  Several approaches are available for government to reduce risk and catalyze private-sector investments; these may include co-investing in CCUS pilot projects featuring next-generation technologies, participating in financing industrial hubs, and underwriting the price of carbon in long-term contracts to help boost companies' confidence to invest and banks' confidence to lend.

- ***Partnering with global peers***
  The government could build on the new US-Canada High Level Ministerial Dialogue on Climate Ambition to partner with the United States in creating bilateral industrial hubs that can jointly capture and receive CO_2. This can help promote CCUS while both spreading costs and commercial risk across multiple stakeholders and achieving economies of scale.

Unlock the power of carbon capture, utilization, and storage (CCUS) using industrial hubs *cont'd*

Building industrial hubs should provide clear employment benefits by creating jobs in markets that are most at risk of displacement due to the net-zero transition. For example, according to the IEA, each new large-scale CCUS hub creates at least 1,200 direct construction jobs. Additionally, hubs can help minimize social and economic disruptions that may be linked to the move to carbon-free systems by allowing power and industrial facilities to continue to operate while they capture their CO_2 emissions. They can also help in this capacity by providing job opportunities to workers in the oil and gas sector who may otherwise be displaced, since their skills and experience would essentially be a good fit.[24]

Case study: Norway's Longship project

Canada can draw inspiration from Norway, which committed US$1.8 billion to the Longship industrial hub, built in cooperation with a consortium of oil and gas companies. Longship was set up with the intent to capture CO_2 from both a cement and a waste-to-energy plant, and then to store it in a large facility in the North Sea. It's also expected to receive CO_2 captured in neighbouring European countries to help the European Union achieve its ambitious climate goals.[25]

Imagine if...

CCUS fuelled a just labour transition

Lina had been concerned for many years that she'd lose her job—and along with it, her ability to support her family—due to Canada's decarbonization efforts. Her employer partnered with a consortium of oil and gas companies, her provincial government, and the federal government to build a large industrial hub with shared CCUS facilities. The coalition benefited from Lina's skills while providing her with on-the-job training through support from the provincial and federal governments.

Workers like Lina, who are close to but not yet ready for retirement, often fall through the cracks of reskilling-program initiatives. But by working in a consortium that includes public- and private-sector actors, Lina could take advantage of the combination of her employer-led, government-funded reskilling program and the targeted government support offered to workers in industries at risk for displacement due to decarbonization—support such as readjustment allowances for training.

Aim for net-zero emissions from transportation

Transportation accounts for one-quarter of Canada's GHG emissions.[26] While several jurisdictions in the country have created policies to enable zero-emissions transport, there's a clear need for collaboration to overcome the current fractured and disjointed system. The future of transportation will be electric-, hydrogen-, and/or synthetic-fuel-powered—from electrified rail and automobile transport to hydrogen-powered flight. But to make this a reality, Canada first needs to adopt a systems approach and make bold bets on infrastructure.

Similar to its role in building the railway system across Canada, the federal government should take the lead: it should work with all levels of government and its various departments, and with utility providers, financial institutions, and automakers across the country to develop a cohesive, national road map for zero-emission vehicles (ZEVs). The aim of this plan should be to identify pathways to reduce the energy intensity of transportation overall. This is critical to building infrastructure that will drive the decarbonization of transportation across the country. Such a road map should include measures such as:

- ***Supporting a clean-fuel standard***
  The federal government has announced that, by 2035, all new cars and light-duty trucks sold in the country must be electric vehicles (EVs).[27] As technology continues to advance, Canada should work with the provinces and territories to require an increasing proportion of all new vehicles, including heavy-duty vehicles, to be zero-carbon emitting. Establishing such a standard would send a strong regulatory signal to auto manufacturers and producers, thus leading to an increase in the production and supply of ZEVs.[28] To match the accelerating demand for ZEVs required by the proposed clean-fuel standard, overall timelines must first be aligned with that of the charging-network rollout across Canada (see the following point for more). The standard must, then, take into account adjustments and/or exemptions for remote communities, where progress on these fronts is expected to be slower.

- ***Installing charging infrastructure across the country for ZEVs***
  EVs are a critical component of a net-zero goal. A pan-Canadian plan for charging infrastructure is already technologically feasible. However, it faces a chicken-and-egg challenge: the required investment becomes more viable as EV uptake rises, but the uptake is itself predicated on a dense charging-infrastructure network. Governments must therefore play a central role in incentivizing these long-term investments as a first step. In order to do so, however, they must establish the required regulatory models and funding partnerships across the infrastructure ecosystem, working with utilities, regulators, manufacturers, and the financial sector.

While electrification of light-duty vehicles has advanced over the last decade, similar progress for heavier vehicle classes has been slow. In 2020, there were roughly 60 models of light-duty EVs in the North American market but only about 30 medium-duty and 21 heavy-duty models.[29] Fuel-cell electric vehicles (FCEVs) will play an important role in bridging this gap in the coming years. The hydrogen-fuelled cells, which can power vehicles for longer journeys, are well-suited for heavy-duty, freight, and industrial transport, such as via trains, ships, planes, and trucks.[30]

FCEVs are not yet technologically viable at scale, but as viability increases, so will the need for hydrogen-fuelling infrastructure, which can then further help incentivize mass-market uptake of these types of vehicles. As with EV charging networks, governments will need to promote and de-risk long-term investments, bringing together funding partners and ecosystem stakeholders. Several provinces, including British Columbia and Quebec, have begun to roll out hydrogen-fuelling infrastructure, but more needs to be done to ensure that FCEV use is supported across the country.[31] A pan-Canadian plan for such a fuelling network would also need to be connected with the production of hydrogen itself (for more, see the subsection beginning "*Scale up hydrogen-fuel production*"). The federal government must therefore act as an ecosystem convenor to establish this long-term vision for hydrogen fuelling and to work with provinces and industry to identify levers for driving private-sector investment.

Imagine if...

We could drive ZEVs everywhere in Canada

Emmett had long wanted to trade in the high-carbon-emitting pickup truck he needs for work for an electric model, but had been unable to do so because of the lack of an EV charging network in his rural community. The federal government collaborated with his provincial authority to install the necessary infrastructure for recharging vehicles across the province, thus providing all residents with this new option. Emmett was finally able to buy an electric pickup truck, as he can now fuel it close to home.

Transform power grids across Canada to maximize the benefit of clean-energy infrastructure

The power and utilities sector underpins every Canadian industry. Transitioning to the usage of clean power—and, importantly, transmitting and distributing it across Canada's vast geography—is imperative. According to the IEA, in order to reach net-zero GHGs by 2050, electricity generation will need to yield net-zero emissions by 2040 and be well on its way to supplying almost half of the world's total energy needs.[32]

In previous sections, we laid out some of the transformational clean-energy investments and reforms designed to set Canada on a path to a net-zero target by 2050. However, this transition cannot happen without a future-ready energy value chain, from generation to transmission to distribution, modernized to handle distributed clean-energy resources and changing demand patterns. The federal government should create the ecosystem conditions required to incentivize this transition and should act as a convenor of key players, particularly provinces, municipalities, Indigenous governments, utilities, and regulators. Modernizing the electricity grid and funding its transformation poses a complicated coordination challenge and thus will require a nuanced, collaborative solution.

One area where such solutions will be required is electricity transmission, which mostly comprises isolated provincial grids. What little Canadian electricity does cross borders normally goes to the United States. As a country, we don't realize the full potential of our renewable-generation capacity. The federal government must therefore bring together stakeholders of utility systems and of provincial, municipal, and Indigenous authorities to improve renewable-electricity sharing across the country. Encouragingly, it has already begun to do so, such as through its support of the Atlantic Loop energy project, which aims to upgrade transmission capacity to increase the flow of hydroelectric power from Labrador and Quebec into Atlantic Canada.[33]

Electricity distribution is another area where nuanced, collaborative approaches will be necessary for grid modernization. Advances in clean-energy technology challenge the fiscal viability of publicly owned utilities (POUs): aging and outdated grid infrastructure drives up costs, while energy-efficiency improvements and the rise of distributed energy generation (e.g., via rooftop solar grids) put downward pressure on revenue. However, existing regulatory rate-setting frameworks for POUs are not designed to incentivize investments in clean-energy systems, particularly at the pace required to achieve our climate goals. Here, too, the federal government can play a convenor role to help utilities, provinces, Indigenous governments, and municipalities explore regulatory models in order to spur grid modernization. Canada should also make use of the knowledge and experience gained by global peers such as the United Kingdom, whose performance-based rate-setting framework rewards utilities for desired outcomes, including reliability and environmental benefits.[34]

Imagine if...

We flipped the power paradigm for Indigenous communities

Levi's remote community, along with those of other First Nations in the region, has long been subjected to a colonial chain of control over its energy needs. Through an Indigenous-led partnership to build wind-generation and battery-storage capacity on their territories, these communities are able to reclaim the energy sovereignty inherent in their ancestral rights to the land, eliminating energy poverty and creating gainful jobs. The coalition is able to access government support not only in terms of funding, but also in navigating the regulatory process of taking ownership of local power distribution within each nation.

The partnership has been working with the federal and provincial governments to connect the wind farm to the broader electrical grid in order to provide renewable energy to other parts of the province. Levi's community has thus done more than achieve energy self-sufficiency: it's now a contributor to the energy system, powering non-Indigenous districts across the region.

Scale up hydrogen-fuel production by bringing together the full hydrogen-energy ecosystem

What are the different types of hydrogen?

- *Grey: Generated through a process called steam-methane reforming, which is fuelled by natural gas and emits CO_2 during production*
- *Blue: Also created through steam-methane reforming, but here, the CO_2 formed during production is captured and stored using CCUS technology*
- *Green: Made through water electrolysis, which cleaves water molecules and then captures the free hydrogen as a fuel; this process is powered by renewable electricity, such as that from wind, solar, and hydro energy*[35]

Hydrogen is a crucial component of a net-zero strategy. According to the IEA, electrification of the economy will be the single largest contributor to reaching net-zero emissions—and hydrogen extends electricity's reach. It can act as a bridge between the power sector and industries/instances for which the direct use of electricity would be challenging, such as in fuelling large ships.[36]

Canada is already one of the 10 largest producers of hydrogen globally and is home to the world's largest green hydrogen plant, the Air Liquide facility in Bécancour, Que., which accesses renewable energy from Hydro-Québec and is close to the major industrial markets in Canada and the United States.[37] Similarly, British Columbia boasts Canada's first public hydrogen-fuelling station and its largest hydrogen-fuelling network.[38] And in Alberta, the provincial and federal governments signed a memorandum of understanding to build a $1.3-billion hydrogen-production plant.[39] Other countries are also betting on hydrogen to achieve their net-zero goals, with 85% of announced large-scale hydrogen-producing projects located in Europe, Asia, and Australia. If all of these initiatives come to fruition, total investments in hydrogen energy will reach more than US$300 billion by 2030.[40]

Scale up hydrogen-fuel production by bringing together the full hydrogen-energy ecosystem *cont'd*

Canada's current hydrogen-production strategy focuses on blue hydrogen, which is less expensive to make than green hydrogen (see call-out box for definitions), but there are added costs for capturing and storing the CO_2 emitted in this process. While Canada's goal by 2050 is to produce only the green variety, blue hydrogen can currently act as a bridge while the government invests in the necessary technology and infrastructure to support green alone.

Hydrogen energy nevertheless faces several challenges, including overall costly production and a lack of pipelines to transport it. The recent announcement from Suncor and ATCO regarding a potential clean-hydrogen pilot project in Alberta explicitly cites that the provincial and federal messages of support on emissions-reduction infrastructure were key factors in the companies' decision to pursue this joint project.[41] This clearly shows that collaboration across the hydrogen ecosystem is essential to the development of green hydrogen.

The federal $1.5-billion Clean Fuels Fund is a step in the right direction.[42] To further build on the initiative, the government should adopt a systems-thinking approach to scaling hydrogen, as the energy ecosystem is composed of multiple industries, sectors, levels of government, and departments within governments, all of which have a role to play. To promote the production and deployment of hydrogen as a competitive and viable energy source, the federal government should bring together these ecosystem players to support research and development, incentivize technology investments, and identify funding tools that can catalyze private-sector investments. Some possible pathways include:

- ***Working with provinces to create a harmonized regulatory framework***
  Currently, Canada lacks a cohesive regulatory framework and common vision that otherwise would send a clear signal about the importance of hydrogen energy.[43] This poses a challenge, as investment returns on long-lived projects depend in large part on having appropriate, stable regulatory structures in place. To further support the development of hydrogen-fuel projects across the hydrogen-energy ecosystem, the federal government should therefore work with the provinces and territories to create harmonized regulatory standards that promote investment in hydrogen projects—initiatives such as progressively increasing levels of clean-gas blending and prioritizing fully enacting low-carbon-fuel regulations.

- ***Retrofitting existing pipelines***
  Canada's current gas network can transport an average of only 5% blending of hydrogen and natural gas, with some sections able to reach 25%. To achieve net-zero emissions, however, it's necessary to go far beyond this level of blending. Reaching Canada's GHG goals will require key modifications to the country's pipelines and distribution networks.[44]

  To ensure the commercial rollout of hydrogen energy, the federal government should create incentives to retrofit existing pipelines across the country to allow for the distribution of hydrogen. This approach may be more appropriate than building fit-for-purpose hydrogen-pipeline infrastructure, which would be highly time-consuming and costly.[45] The retrofitting should begin as smaller pilot projects to assess broader viability, akin to the recent undertakings in California and New York.[46]

Imagine if...

We could fly with net-zero emissions

Sameera is an avid traveller but wants to avoid flying due to the environmental impact of planes. However, many in her family live overseas, so air transport is her only viable travel option. She's thrilled that with advances in hydrogen-fuelling infrastructure, she can fly in a plane partially fuelled by hydrogen, sharply reducing her trip's GHG emissions.

3.
SYSTEMS-THINKING AND USER-CENTRIC TRANSFORMATION MUST START TODAY

The need for infrastructure investments to support Canada's decarbonization plan is abundantly clear. Equally unambiguous is the need to start making these investments today. It's imperative that the federal government take both a systems-thinking and user-centric approach to transform and decarbonize our energy system. It's also essential that all levels of government understand that any long-term solution will be a location-dependent combination of different technologies, infrastructure types, and fuels based on cost and decarbonization effectiveness.

However, no one government or sector alone can meaningfully make the necessary investments. To reach net-zero emissions, we'll need collaboration and integrated planning across industries, departments, and jurisdictions. To this end, the federal government should play a key role in establishing a vision for the future and bringing the right players together. By taking these steps today, Canada can set itself on the path to emitting net-zero GHGs by 2050—and thereby help ensure a prosperous and sustainable future for all in this country.

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It's a follow-up to the Deloitte Future of Canada Centre's first Catalyst report, *A vision for a thriving Canada in 2030*, which charts the country's path from recovery from the COVID-19 pandemic to a prosperous, resilient, and inclusive economy and society in 2030. Read about the Future of Canada Centre on *page 27*.

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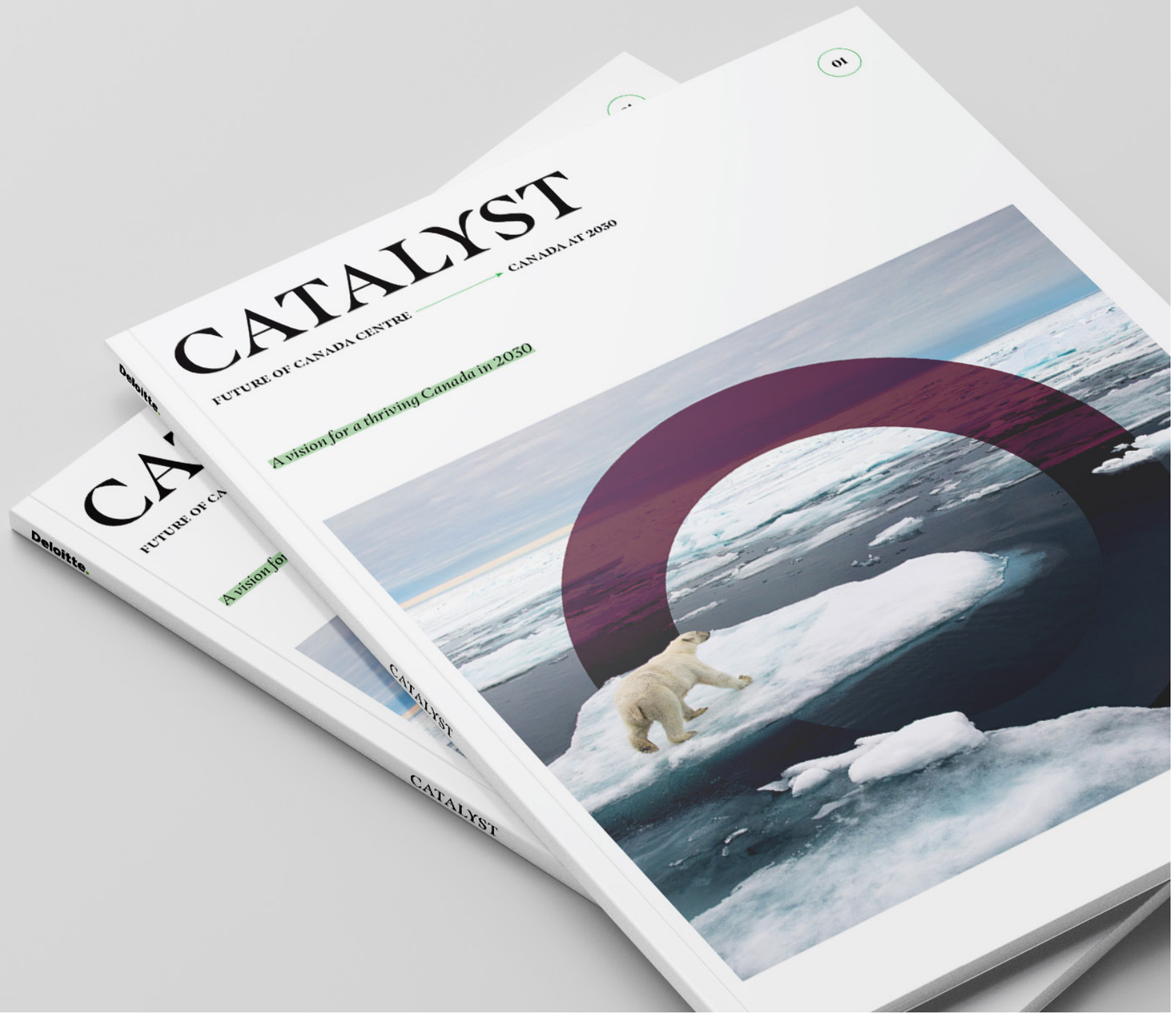

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