



Decarbonizing Industry in Canada and the G7

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 CLEAN ENERGY CANADA

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White Paper: Decarbonizing industry in Canada and the G7

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Introduction

Heavy industry is directly responsible for around a quarter of global energy system emissions.¹ When indirect emissions (from electricity use and imported heat) are included, the total rises to 45%.

The steel, cement, and chemicals sectors account for 70% of these emissions (Canadian heavy industry emissions were 72 megatonnes in 2020).² Net zero cannot be attained without dramatic emissions reductions from heavy industries.¹

But there are unique challenges in the decarbonization of heavy industry (which is separate from Canada's oil and gas sector) that market forces will struggle to overcome on their own. Reducing emissions from steel, cement, and chemicals is challenging for both economic and technological reasons, and the sector is still at an early stage in its trajectory. Unlike the oil and gas sector, demand for these products is likely to grow in a clean economy, with steel, cement, and chemicals each having roles in the manufacturing and construction of products like wind farms, transmission lines, and batteries.¹

This is a space in which public sector involvement will be required for success. Ambitious and well-designed policy is going to be key.

Accordingly, when G7 members (Canada, France, Germany, Italy, Japan, the United Kingdom, the United States, and the European Union) met in 2021, they put a clear focus on building their joint understanding of and commitment to addressing industrial decarbonization.³ In May 2022, they jointly agreed to 10 key recommendations that would transform the sector, categorized into five themes that frame the research and findings of this paper.¹ Given the economic power of the G7 group of countries and their disproportionate contribution to global emissions, reducing G7 heavy industry emissions would be a game changer in the global race to net zero.

On the eve of the 2023 G7 meeting, this white paper assesses if Canada has met these recommendations, how it stacks up to other G7 countries, and if there are ideas from other jurisdictions that Canada should consider adopting. It also identifies recommendations for Canada to move smarter and faster on this important issue.

RECOMMENDATIONS

By the end of 2023

- Take a more comprehensive industrial policy approach to industrial decarbonization, improving dialogue, setting priorities, and tracking progress between government, industry, and civil society stakeholders
- Deliver on key missing policies and programs, specifically funding for near-zero industrial demonstration projects and the implementation of demand-side policies such as Buy Clean

By 2024

- Ensure that support is provided to enable workers to transition to low-carbon industries, including a comprehensive national skills assessment and inventory
- Publish clear material definitions, such as “green” and “near-zero,” along with guidance to enable private sector investment in net-zero-aligned transition projects

By 2025

- Engage with industry to co-develop sectoral net-zero transition plans with clear emissions reductions goals and milestones for all heavy industry sectors
- Explore the potential for additional policies to mandate industrial decarbonization, such as near-zero emissions product requirements or mechanisms to phase out high-emission production



Taking an International Perspective

Born out of the oil crisis of the 1970s, the G7 group has an outsized role to play in addressing the climate crisis.⁴

Its members account for approximately:

40%

of global GDP

13%

of the world's population

30%

of global energy demand

25%

of the world's energy-related CO₂ emissions¹

As like-minded nations with advanced economies, liberal democracies, deep trade links, and a shared vision for a net-zero 2050, the G7 represents a critical forum for learning and collaboration when looking to tackle the significant challenges presented by industrial decarbonization.

G7 Commitments to Industrial Decarbonization

In 2021, the G7 Industrial Decarbonisation Agenda was established, initially focused on defining near-zero cement and steel. The Agenda also commissioned two workshops conducted by the International Energy Agency (IEA), with the findings summarized in the report *Achieving Net Zero Heavy Industry Sectors in G7 Members*.¹

To determine whether Canada is seizing the opportunity presented by industrial decarbonization, we reviewed policies in Canada against five broad objectives recommended by the IEA report (which were subsequently adopted by the G7).³

We assessed whether Canada is:

1 Providing clear policy direction on the industrial net-zero transition

G7 commitment: “By no later than the mid-2020s, develop or update national industry sector roadmaps and plans in collaboration with industry stakeholders, providing a robust signal on the direction and pace of travel by developing clear targets and milestones.”

2 Developing and demonstrating near-zero industrial technologies

G7 commitment: “Within the next one to two years, take decisions on funding for innovation and mitigating investment risks of demonstrating critical technologies, collectively.”

3 Phasing out high-emission technologies and shifting to deploy near-zero technologies

G7 commitment: “Over the next three years, formulate finance strategies to contribute to phase out finance for high-emission technologies, and to shift to the deployment of near-zero-emission technologies at new and existing domestic industrial plants, as well as for supporting infrastructure.”

4 Creating markets and demand for near-zero materials

G7 commitment: “Develop policies, ideally within the next three to four years and taking into account the timeline for technological innovation, that create demand for near-zero-emission materials production.”

5 Increasing international ambition and collaboration

G7 commitment: “Pursue avenues to strengthen ambition on the industry transition globally and move towards an increasingly level playing field.”



The Heavy Industry Imperative

Industrial decarbonization is an imperative, but not one that the world is yet prepared to meet. According to the IEA and many other analysts, globally, heavy industry is not on track to reach net-zero emissions by mid-century.¹

At the same time, demand for industrial products is expected to increase, especially in fast-growing developing countries.¹

This does create some opportunities. Buyers—whether government or private sector—are increasingly demanding low- or zero-emissions products to meet their own supply chain or “scope 3” climate commitments. By 2030, the market for near-zero emissions steel and cement is expected to reach 100 million tonnes and 250 million tonnes, respectively.¹ Countries and companies that move quickly to meet this demand may benefit from a first-mover advantage, commanding higher premiums or increased eligibility for government programs or subsidies.

As we pointed out in our 2021 report, *The Next Frontier*, as more countries pledge to reduce emissions, Canada’s low-emitting electricity grid makes it well-positioned to provide the materials to build a net-zero world.⁵ But decarbonizing these emissions-intensive sectors is as much an imperative as it is an opportunity, as we outlined in our 2023 white paper on the chemicals and fertilizer sector.⁶ Developing and deploying zero-emissions production methods is essential to meeting increasing demand without exacerbating the climate crisis.

But it won't be easy. Due to the long lifetimes and slow turnover of industrial plants (around 40 years for steel and cement, with major refurbishments after 20 to 25 years), there is only one investment cycle between now and 2050. Many of the technologies needed for net-zero industry are still at prototype or demonstration stage.

Targeted government support and policies are needed to develop and demonstrate technologies at large scale, so they will be ready for widespread deployment in the early 2030s.

Examples of net-zero technologies for heavy industries

	PRODUCT	TECHNOLOGY	READINESS LEVEL *
	STEEL	Hydrogen-direct reduced iron-electric arc furnace	5-6
		Direct reduced iron-carbon capture, utilization and storage	5-10
		Electrolysis	<5
	CEMENT	Carbon capture, utilization and storage (CCUS)	5-8
	CHEMICALS	Electrolytic hydrogen	7-11
		Carbon capture, utilization and storage (CCUS)	5-11
	ALUMINUM	Carbon-free anodes	<5

***Technology Readiness Levels from the IEA:**⁷ 1-3: concept stages 4-6: prototypes at increasing scales 7-8: pre-commercial and commercial demonstration projects 9-10: technologies at early and growing adoption levels 11: a mature technology with predictable growth within the market

The IEA identifies four unique challenges for decarbonizing the industrial sector:

- 1. Low technology readiness.** Key technologies are still at prototype or demonstration stage (e.g. zero-emissions steel and cement production methods are several years away from commercial scale). The IEA assumes that efficiency gains could reduce emissions by about 25%, but technologies not yet available on the market at the scale required would need to make up the remainder of the reductions.
- 2. Higher costs of production.** New production processes for cleaner products with lower emissions will—at least initially—have higher costs.
- 3. Slim margins.** These products generally have globally competitive markets meaning margins are too slim for producers to encourage the capital investments and higher production costs of zero-emission technologies.
- 4. Slow asset turnover.** New or refurbished plants are likely to last for decades, so if decarbonization efforts are not made today, this could lock in higher-emitting technologies long into the future.

The global trade in products like steel and aluminum is an added challenge for producers in Canada, which have to compete with imports from countries with lower production costs and weaker environmental regulation. This is why, in the short term, creating a domestic market for cleaner construction materials is so important. In our 2022 report, *Money Talks*, we outline how Canadian governments can accelerate the shift to cleaner construction materials while supporting Canadian industries and workers by using their own purchasing power to “Buy Clean.”⁸

In the medium term, countries must move from developing and demonstrating near-zero technologies to supporting their deployment in commercial-scale plants. This must be done by the early 2030s at the latest to ensure 2050 net-zero targets are met. G7 countries have committed to developing financing strategies to deploy near-zero production in both new and existing plants, as well as developing the supporting infrastructure required (clean electricity, hydrogen, and carbon capture, utilization, and storage), the costs of which are often shared between sectors or companies.



Decarbonization Activity in the G7

Over the past year, the world has entered a clean energy arms race. Passed in August 2022, the U.S.'s Inflation Reduction Act (IRA) is set to provide US\$370 billion in investments in clean energy and industrial transformation, with some observers anticipating the final investment to be as high as US\$1 trillion.^{9,10}

Much of this spending is to stimulate domestic industries to develop and deploy zero-emissions technologies, using a mix of supply and demand incentives. Countries globally have been racing to enact their own measures to keep pace with this scale of investment. The EU moved to develop its Green Deal Industrial Plan, including a Net-Zero Industry Act.^{11,12} Canada, through its Fall Economic Statement 2022 and Budget 2023, outlined \$80 billion in spending and tax credits.¹³

Amidst this flurry of activity, G7 members have retained a focus on commitments to decarbonize heavy industry (although investment has not necessarily kept pace). In December 2022, members announced the

formation of a “climate club,” with a particular focus on decarbonizing hard-to-abate sectors and accelerating the market readiness of climate-friendly commodities.^{3,14} In their April 2023 Climate, Energy and Environment Ministers’ Communiqué, the G7 countries reiterated their commitment to industrial decarbonization, focusing on accelerating R&D, creating markets for low-carbon materials, standardizing measurements of lifecycle emissions, increasing deployment and scaling of technologies, and calling for greater collaboration beyond the G7.¹⁵ Individual member states have undertaken varying levels of investment and policy focus to further decarbonization as outlined on the following page.

Highlights from other G7 Members



U.S.

- **Public spending supports supply- and demand-side measures:** The IRA includes more than US\$50 billion for clean manufacturing, including US\$5.8 billion for industrial facilities to install net-zero emissions technologies; US\$10 billion for manufacturing tax credits, expanded production tax credits for hydrogen and industrial carbon capture; US\$5 billion for low-embodied carbon material purchasing; and US\$350 million for industrial emissions reporting and labeling.¹⁶
- **Strategic alignment of policy and funding:** The Federal Buy Clean Initiative prioritizes procurement of low-carbon steel, concrete, asphalt, and glass.¹⁷ The Department of Energy Industrial Decarbonization Roadmap outlines net-zero pathways and Research, Development & Demonstration (RD&D) requirements for key sectors including steel, cement, and chemicals.¹⁸
- **Ambitious hydrogen production targets:** The U.S. has set a draft target for 10 million tonnes of low-carbon hydrogen by 2030, equivalent to between 70 and 90 gigawatts of electrolyzer capacity.^{19*} The U.S. government plans to spend more than US\$30 billion to support hydrogen production through hydrogen hubs (US\$8 billion),²⁰ production tax credits (US\$13 billion estimated budgetary impact),²¹ and R&D (US\$10 billion for Advanced Energy Project investment tax credits).²²



Germany

- **Industrial roadmap, sector emissions targets, and legislation:** 49% to 51% reduction in industry emissions by 2030 (versus 1990).²³
- **Innovation and demonstration funding:** Germany leads in the number of near-zero steel and cement demonstration projects.^{24,25}
- **Public funding:** Large funding commitments to decarbonize heavy industry and support renewable hydrogen production (~US\$22 billion in total).²⁶
- **Target of 10 gigawatts of green hydrogen production by 2030:**²⁷ Hydrogen strategy prioritizes use in heavy industries like steelmaking.²⁸
- **Carbon contracts for difference** (proposed).²⁹



France

- **Sector-specific roadmaps and greenhouse gas targets for steel, cement, and chemicals.**³⁰⁻³²
- **Ambitious funding and targets for hydrogen production:** ~US\$7.8 billion in public funding and commitments from industry to build four electrolyzer gigafactories.^{33,34}
- **Mandatory embodied carbon requirements under RE2020 national building code.**³⁵



Japan

- **Demonstration funding for industry,** e.g. COURSE 50 (steel).³⁶
- **Sector-specific transition roadmaps for steel and cement.**^{37,38}
- **Public funding for industrial R&D.** US\$15.5 billion through the Green Innovation Fund.³⁹



U.K.

- **Industrial decarbonization and net-zero strategies** including sector roadmaps, and target emissions reductions ranging from 43-53% by 2030 for heavy industries.^{40,41}
- **Clear milestones and targets for CCUS and hydrogen production.**^{41,42}
- **A strategic focus on industrial clusters with shared infrastructure.**
- **Developing contracts for difference** to support business cases for industrial hydrogen (Low Carbon Hydrogen Agreements) and CCUS (through the amended energy Contracts for Difference framework).^{43,44}



Italy

- **National hydrogen strategy.**⁴⁵
- **Investing in pilots for low-carbon cement production.**⁴⁶
- **Strategic framework for the circular economy.**⁴⁷

*Assuming conversion rate of 0.11 - 0.15 Mt of H2 per 1GW capacity

Industry initiatives

Beyond the G7, the last two years have seen a proliferation of industry-focused initiatives and alliances including:

- **Low-carbon R&D**, e.g. the Net-Zero Industries Mission, a forum for international collaboration between countries and industry to accelerate the development of decarbonization technologies;⁴⁸
- **Accelerating deployment**, e.g. Breakthrough Agenda, a coalition of nations and decarbonization initiatives aimed at making clean technologies affordable and accessible by 2030;⁴⁹
- **Creating low-carbon markets**, e.g. the Industrial Deep Decarbonization Initiative,⁵⁰ First Movers Coalition, collaborations between multinational companies and jurisdictions to commit to purchasing low-carbon industrial materials and products;⁵¹
- **Prospective trade agreements**, e.g. U.S.-EU discussions on an arrangement on sustainable steel and aluminum;⁴¹
- **A growing number of private sector net zero by 2050 commitments** (including global heavy industry actors such as BASF chemicals,⁵² ArcelorMittal Steel,⁵³ and LafargeHolcim Cement).⁵⁴





Canada's Progress Towards Industrial Decarbonization

Canada has legislated a target of net-zero emissions by 2050, with an interim goal of a 40% to 45% reduction by 2030 relative to 2005.⁵⁵ To meet these targets, Canada's heavy industry sector—which is responsible for 11% of national emissions—must play a role.²

Canada's heavy industry sector is small relative to other G7 members, notably the U.S., Japan, and Germany (not to mention China and India, the industrial giants of the 21st century). However, the sector is still a key part of Canada's economy, contributing billions of dollars in GDP and over \$130 billion in annual exports.⁵⁶⁻⁵⁸

Canada could be well-positioned to take advantage of the economic opportunities associated with industrial decarbonization, home to many of the right ingredients to be a global leader: it has a relatively clean electricity grid, a highly educated workforce, access to feedstocks and raw materials (like iron ore), a manufacturing base close to key markets, and a stable regulatory environment.⁸

However, Canada faces headwinds and stiff competition from the U.S., EU, Japan, and other jurisdictions that are investing heavily in their domestic industries, particularly the U.S.'s Inflation Reduction Act and the EU's Green Deal Industrial Plan.^{9,59}

What Canada has been doing

Canada has invested in funding programs to decarbonize industry and support enabling infrastructure in recent years, including the \$8 billion Net Zero Accelerator, the \$1.5 billion Clean Fuels Fund, the \$15 billion Canada Growth Fund, and investment tax credits for CCUS, clean hydrogen, and clean technology manufacturing valued at more than \$13 billion over the next five years.

Spending is planned to grow significantly over the next five years, utilizing a mixture of direct investment programs such as the Net-Zero Accelerator and more hands-off tools like tax credits that aim to stimulate market investments.

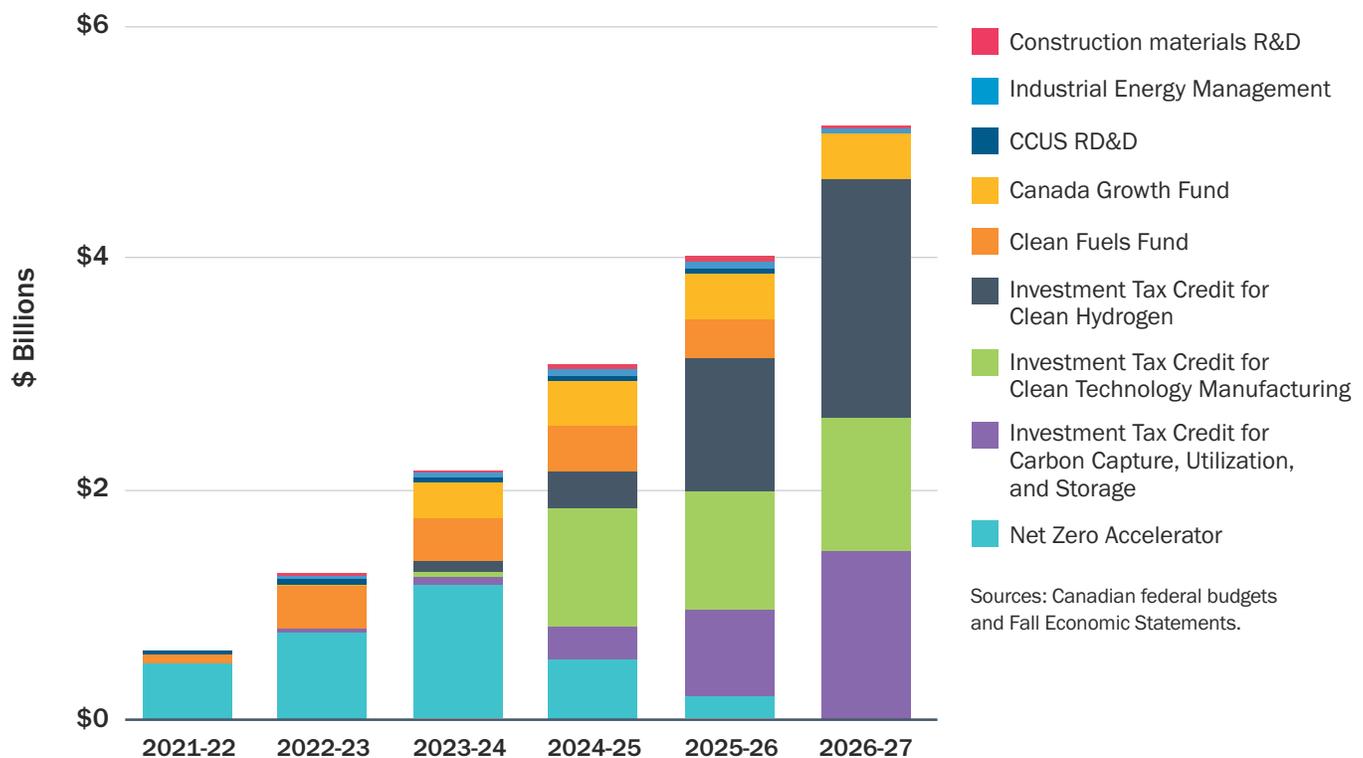
Canada has been active in providing regulatory certainty and long-term policy direction through industrial carbon pricing. Canada's excess emissions charge under the federal Output-Based Pricing System is expected to increase from \$65 per tonne in 2023 to \$170 per tonne in 2030. Several provinces (including Ontario, Alberta, Quebec, and B.C.) have their own industrial pricing systems, which creates a challenge for harmonizing policies and price signals across the country. Uncertainty around future price increases also creates a barrier to private investment in low-carbon production. Alberta recently agreed to raise

its Technology, Innovation and Emissions Reduction Regulation price to \$170 by 2030 and apply it to a greater share of emissions.⁶⁰ Canada's carbon price sits alongside wide-reaching policy frameworks including the 2030 Emissions Reduction Plan and a net zero by 2050 target enshrined in legislation, including legal requirements to set interim targets for 2035, 2040, and 2045, and report on progress.⁶¹

In addition to these activities, Canada has also begun to address some of the key infrastructure requirements for industrial decarbonization, including publishing a national hydrogen strategy and announcing the development of a national Clean Electricity Regulation to phase out high-emission energy production and increase clean energy availability.^{62,63}

To support the development of markets for low-carbon products, the federal government is exploring new tools for financing and creating investment certainty such as a commitment to deliver a number of bespoke Carbon Contracts for Difference for high-risk projects.⁶⁴ Canada has also participated in international initiatives to develop common definitions and standards (Industrial Deep Decarbonization Initiative) and support R&D (Mission Innovation) as part of efforts to facilitate trade and international collaboration.^{50,65}

Figure 1: Planned federal spending on industrial decarbonization



Work That Lies Ahead

While carbon pricing does provide some investment certainty, Canada does not have an overarching clean industrial strategy or sector-specific roadmaps for achieving net zero (with the exception of cement).⁶⁶ This approach, being taken by the U.K., U.S., France, and Japan, helps address the significant coordination, infrastructure provision, human resources, and capital mobilization challenges of industrial decarbonization.

Also, despite the investment commitments made in recent years, Canada is still lagging behind other G7 nations when it comes to developing and demonstrating near-zero emissions technologies. Canada currently trails Germany, France, and the U.S. in investments in near-zero steel and cement as of late 2022.

Part of the reason for this gap is that Canada still lags far behind its peers when it comes to industrial R&D spending, an issue that has existed for a number of years and presents a particular challenge to industrial decarbonization. As noted by the IEA and others, many of the technologies needed for the net-zero industrial transformation are still at prototype or demonstration stage. They require significant ongoing R&D investments to get them to scale, maturity, and profitability.

Figure 2: Announced near-zero steel and cement demonstration projects

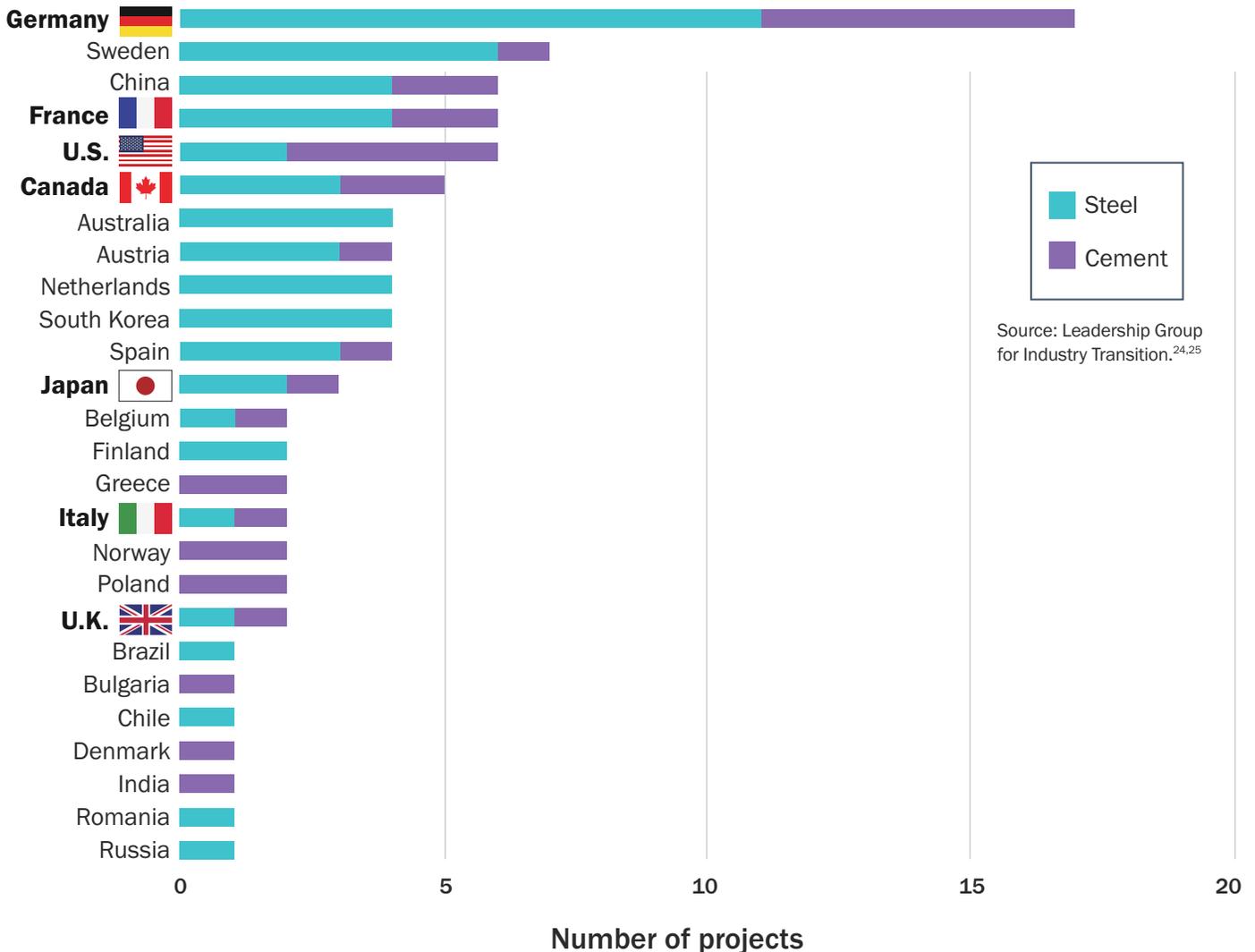
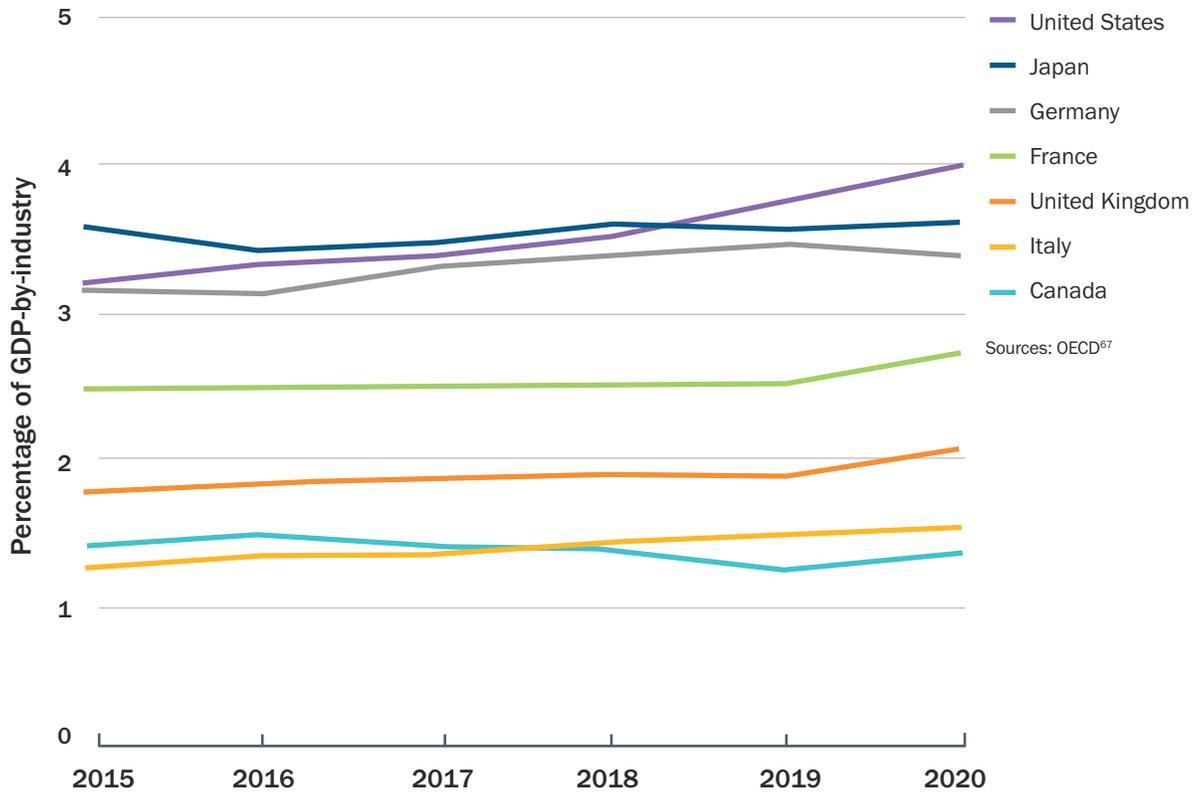


Figure 3: Industrial R&D spending by G7 country as a percentage of industry-generated GDP, 2015-2020



Like most G7 nations, Canada has not begun to develop policies that specifically phase out high-carbon technologies in industry. In both developing new technologies and phasing out dirtier legacy production, Canada has untapped potential. As the smallest market in the G7, Canada will need to look outward, seeking partnerships and alignment with other G7 nations. While this work is being undertaken, Canada will need to lean into international forums and conversations to ensure a growing market for low-carbon products and secure export opportunities.



Tracking Canada's Progress

To determine whether Canada is seizing the opportunity presented by industrial decarbonization, we reviewed Canadian policies against the IEA's five recommended objectives that were adopted by the G7 in the May 2022 communiqué on industrial decarbonization.

Based on activities undertaken by other jurisdictions and the content and suggested timelines of the recommendations, we assessed Canada's performance to provide guidance, improve progress, and identify international best practices that we believe are worth further exploration.

OBJECTIVE

1

Clear policy direction on industrial transition

TIMELINE | 2025

CURRENT LANDSCAPE

- Industrial carbon pricing in place to 2030
- Legislated net-zero economy-wide target and 2030 Emissions Reduction Plan
- No industrial decarbonization targets or strategy
- Only one sector covered by a roadmap
- Just Transition legislation delayed
- Lack of permanent stakeholder forum for collaboration

G7 ASSESSMENT

BEHIND

Canada is behind its G7 partners in planning for a net-zero industry transition, with no dedicated strategy or targets and only one sectoral roadmap (for cement and concrete).

To meet the mid-2020s target, the government needs to accelerate planning, building on lessons from the cement and concrete roadmap as well as other jurisdictions.

INTERNATIONAL BEST PRACTICE

- ✓ **U.K.:** Published Industrial Decarbonization Strategy (2021),^{40,41} which provides high-level direction and industry-specific emissions reduction targets of 63-76% by 2030 from 2019 levels. The U.K. also has production targets for industrial fuel switching to low-carbon hydrogen and electricity (50 TWh by 2035) and industrial CCUS (6 Mt per year by 2030).
- ✓ **France:** Published sector roadmaps and emissions targets for cement and steel (31% by 2030) and chemicals sector.³⁰⁻³²
- ✓ **EU:** A Just Transition Mechanism is part of the EU's Green Deal.⁶⁸ It aims to mobilize €55 billion (with more than €30 billion in public funding) to address social and economic costs from the transition to net zero, focused on regions most affected due to high reliance on industry or fossil fuels.

OBJECTIVE

2

Develop and demonstrate near-zero technologies

TIMELINE | 2023-24

CURRENT LANDSCAPE

- Large funding commitments but delivery should be accelerated
- No overarching RD&D strategy for industry or climate change
- Industrial RD&D funding is lower than G7 and OECD average
- Strong international participation through Mission Innovation and bilateral frameworks

G7 ASSESSMENT

COMPARABLE

Timelines set by the G7 for development and demonstration of near-zero technologies are very ambitious. To be in a better position to succeed, Canada needs to adapt its R&D model to the 21st century.⁶⁹ Research should be directed at solving practical problems (i.e., net-zero industry) with breakthrough technologies along with greater coordination between firms and researchers, and the use of public procurement to create market demand and scale SMEs.

INTERNATIONAL BEST PRACTICE



EU: Funding programs include €95 billion Horizon Europe Fund,⁷⁰ which covers R&D, including a focus on low-carbon industry and breakthrough technologies, and the €20 billion Innovation Fund⁷¹ (commercial demonstration of low-carbon technologies, funded by Emissions Trading Scheme revenues). The EU is contributing €700 million⁷² to low-carbon steel RD&D under the Clean Steel Partnership.⁷³



Germany: Leading the way in large-scale demonstration projects for near-zero emissions steel and cement,^{24,25} with 17 announced (see figure 2 on page 11), followed by Sweden (7), China, France, the U.S. (6), and Canada (5).

OBJECTIVE

3

Phasing out high-emission technologies and shifting to deploy near-zero technologies

TIMELINE | 2025

CURRENT LANDSCAPE

- Several large-scale funding programs targeting industrial emissions and enabling infrastructure (clean electricity, hydrogen, and CCUS) and recent suite of investment tax credits should incentivize deployment
- Announcements about carbon contracts for difference and other innovative financing tools for the Canada Growth Fund are welcomed, but more clarity is needed about rollout
- No plans or targets to phase out emissions-intensive production methods
- Guidance for private sector “transition finance” in development

G7 ASSESSMENT

LEADERSHIP POTENTIAL

Canada has committed funding to industrial decarbonization, and the recent announcement of further tax credits to incentivize deployment is welcomed. However, it does not have specific timelines and targets for phasing out emissions-intensive production methods.

Timelines for developing and refining new low- and zero-carbon technologies are short. A huge amount of research, development, and deployment is required over the next decade. This starts with a strong investment in R&D, an area where Canada still lags behind.

Overall though, with some heavy lifting to do in the next two years, Canada has the opportunity to punch above its weight in deploying existing near-zero technologies and make a big bet on the future with more ambitious R&D spending, building on our existing advantages.

INTERNATIONAL BEST PRACTICE



EU: The REPowerEU plan⁷⁴ targets 20 Mt of renewable hydrogen and 980 GW of wind and solar by 2030 and will accelerate deployment of hydrogen and renewable electricity in industrial sectors. The EU expects 30% of steel production will be decarbonized with hydrogen by 2030.



U.K.: Currently the only G7 member with a national CCUS strategy. It also has targets to develop four industrial CCUS clusters by 2030, set to capture a total of 3 Mt of CO₂ a year by 2030.

OBJECTIVE

4

Creating markets for near-zero materials

TIMELINE | 2025-26

CURRENT LANDSCAPE

- Several demand-side policies in development
- Buy Clean strategy committed to, but not yet released. Expected to be published in 2023
- Potential for Canada Growth Fund to provide funding to guarantee long-term market
- Active in International Deep Decarbonization Initiative and initiatives to set common international standards
- Encourage the use of low-emissions materials in the broader market including through building codes and standards

G7 ASSESSMENT

BEHIND

Canada needs to speed up the release of its federal Buy Clean strategy and work with provinces to ensure their adoption. Canada needs to update codes and standards to ensure uptake in the broader market. We think this commitment is currently at risk.

INTERNATIONAL BEST PRACTICE

- ✓ **U.S.:** The Federal Buy Clean Initiative applies to 98% of federally purchased materials, including steel and concrete. The IRA commits more than US\$4 billion to increase federal low-carbon material procurement, and US\$100 million to develop definitions and standards.
- ✓ **EU:** Developing EU-wide CCFD scheme to support industrial electrification and hydrogen uptake, as part of REPowerEU.⁷⁴
- ✓ **U.K.:** Developing a CCFD business model to fund industrial hydrogen and CCUS in initial sites.^{40,41}

OBJECTIVE

5

Increase international ambition and collaboration

TIMELINE | No date

CURRENT LANDSCAPE

- Active participant in several international initiatives and alliances, including Industrial Deep Decarbonization Initiative and G7
- Not included to date in U.S.-EU negotiations on carbon-based trade agreement
- Leadership on climate finance transparency, but contributions remain insufficient

G7 ASSESSMENT

LEADERSHIP POTENTIAL

Canada has been making significant steps shaping the conversation on low-carbon product standards and definitions (e.g., work with the Industrial Deep Decarbonisation Initiative). There has also been a public consultation on a Carbon Border Adjustment Mechanism, although no policies have been announced.⁷⁵ However, as the smallest member of the G7 by both GDP and population,⁷⁶ Canada is at risk of being outside the conversation when it comes to low-carbon trade agreements. Given that the country has less economic and political capital, it must ensure it leans in and prioritizes participation and engagement in international forums such as the Industrial Deep Decarbonization Initiative, and First Movers Coalition.⁵¹

INTERNATIONAL BEST PRACTICE

- ✓ **EU:** Adopted a Carbon Border Adjustment Mechanism in April 2023, with the initial reporting phase beginning in October 2023. This will apply a carbon levy to imports of certain emissions-intensive materials that do not face similar carbon pricing domestically. The U.S. has proposed an alternative approach that would penalize producers of high-carbon steel and aluminum, without requiring domestic producers to meet the same standards.⁷⁷
- ✓ **U.S.:** Signed agreements with the EU, U.K., and Japan aimed at using tariffs to promote trade in low-emissions steel and aluminum. In December 2022, more details emerged about the U.S.-EU agreement, which would include other producers in a “green steel club” and set emissions standards for imports and exports.⁷⁸



Conclusion

Industrial decarbonization is necessary if Canada is going to meet net zero, requiring policymakers to explore every tool in the toolbox. The G7 will be a critical forum to tackle this challenge with the combination of the right skills, capital, innovation, and political willpower to achieve success.

Canada is at a strategic juncture where the right policies and investments could drive growth and prosperity for industry in a net-zero future. However, our analysis shows that Canada is not moving at the pace required relative to many of our G7 partners. As the net-zero transition begins in earnest, a technological gold rush sits before us—one where savvy countries that make the right strategic investments and think holistically about the transition of their industry base will reap the rewards. Industry support, investments in R&D, and market building could position Canada as a hub for clean technologies that will be critical in the coming decades.

Industrial products—steel, cement, plastics, aluminum—will be the building blocks of our net-zero future, with over 140 net-zero aligned jurisdictions lining up alongside private sector buying clubs like the First Movers Coalition to become customers of low-carbon construction materials.

G7 countries are increasingly recognizing the range of actions that are critical to successful decarbonization. It's time Canada took the lead.

Recommendations

Success for Canada in meeting its G7 commitments will include:

By the end of 2023

- Canada should take a more comprehensive industrial policy approach, improving dialogue, priority setting, and progress tracking between government, industry, and civil society stakeholders. The approach taken by the U.K. and U.S. can provide guidance in this process.⁷⁹
- Canada should have delivered on key missing policies and programs, specifically, funding for near-zero industrial demonstration projects and the implementation of demand-side policies such as Buy Clean (as seen in Germany and the U.S.).

By 2024

- Canada must ensure that support is provided to enable workers to transition to low-carbon industries, including a comprehensive national skills assessment and inventory for emerging roles and ensuring funding delivered as part of the Sustainable Jobs Plan includes changes in heavy industry. Canada should look to the EU's Just Transition Mechanism as an example.⁸⁰
- Canada should publish clear material definitions, such as “green” and “near-zero” along with guidance to enable private sector investment in net-zero-aligned transition projects in collaboration with G7 partners through the IDDI and other forums. These standards must then be adopted into government procurement and decision making.

By 2025

- Canada should have engaged with industry to co-develop sectoral net-zero transition plans with clear emissions reductions goals and milestones for all heavy industry sectors using the framework from the *Roadmap to Net-Zero Carbon Concrete by 2050* for the cement and concrete sector—taking an approach similar to the U.K.⁶⁶
- Canada should have explored the potential for additional policies to accelerate industrial decarbonization, such as near-zero emissions product mandates or mechanisms to phase out high-emission production (e.g. sunset clauses, retrofit-ready requirements).

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