Lessons from the United States on "Buying Clean" and recommendations for Canada

CLEAN ENERGY CANADA



MORRIS J. WOSK Centre for dialogue

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CONTENTS

- **2** Executive Summary
- 4 The process
- **5** A Buy Clean Primer
- 7 Six Buy Clean Lessons for Canada
- 8 Lesson 1: Start simple and increase ambition over time
- 10 Lesson 2: Engage stakeholders in policy design
- 12 Lesson 3: Collect enough data to make informed decisions
- 15 Lesson 4: Use a mix of policy "carrots" and "sticks"
- **17** Lesson 5: Ensure there is a policy champion
- 19 Lesson 6: Include Buy Clean as part of a broader industrial strategy
- **20** Final Thoughts and Recommendations
- 21 Appendix: Buy Clean in the United States: A Snapshot
- **23** References

EXECUTIVE SUMMARY

Governments around the world are increasingly using public procurement—the systems governments use to make purchasing decisions—as a tool to tackle climate change and support low-carbon jobs.

From Canada to the U.S. to the EU, governments are using "Buy Clean" policies to incentivize the use of lowercarbon construction materials in infrastructure projects like roads, bridges, and buildings.

The policy's growing popularity is well-deserved. Buy Clean has significant emissions reduction potential. With government procurement responsible for 15% of global carbon emissions,¹ mobilizing this purchasing power could cut annual emissions by hundreds of millions of tonnes, even if restricted to a handful of carbonintensive materials such as steel and concrete.²

Beyond reducing pollution, a Buy Clean strategy can also improve domestic manufacturing competitiveness—and the jobs and economic benefits that go with it. Canadian industries typically produce lower-carbon goods compared to international competitors, in large part thanks to an electricity grid that is 83% emission-free. Canadian steel and aluminum, for example, are among the world's cleanest—and could be even lower-emission with the right policies and investments in place.^{3,4}

Buy Clean may also be a pathway to exempt Canadian products from "Buy American" rules by demonstrating that Canada is aligned with the U.S. approach on climate and procurement policy.

The government of Canada has expressed its intent to develop a Buy Clean strategy, realizing a 2021 election campaign promise and including it in the December 2021 mandate letters for three federal ministers.⁵ It's now time for Canada to make this commitment a reality.

Adopting such a strategy is key to helping Canada meet its climate targets while rewarding Canadian businesses

for investments to reduce emissions. All levels of government in Canada hold substantial purchasing power, buying about \$4 billion worth of steel, cement, and concrete annually—27% of the national market for these two materials.⁶ Mandating lower-carbon requirements to such a large proportion of the market improves the value proposition of cleaner goods. That, in turn, incentivizes investment in cleaner technologies and, over time, helps lower production costs, making low-carbon products increasingly competitive and available to wider markets.

Given the upsides, unsurprisingly, the Buy Clean concept has broad support. Several Canadian industry associations—covering cement, steel, aluminum, and forestry—have partnered with groups representing labour and the environment to form a Buy Clean Industry Alliance to advocate for a Canadian Buy Clean strategy to be in place by 2023.

What's more, the Canadian public are on board. Recent polling found that three-quarters of Canadians support low-carbon purchasing requirements for public infrastructure projects, even if this leads to slightly higher costs.⁷

But not all Buy Clean policies are created equal, and there are steps that should be taken to ensure their success. Fortunately, there is a wealth of experience from jurisdictions south of the border that Canada can learn from.

Led by California starting in 2017, at least 18 U.S. states and local governments have developed policies or legislation to address the embodied carbon emissions of materials, creating a unique policy laboratory.^{8,9} The U.S. federal government has also begun to mobilize its significant spending power in support of Buy Clean goals.^{10,11}

With this in mind, Clean Energy Canada interviewed numerous American authorities on Buy Clean to understand the key lessons learned, highlight best practices, and inform the development of a Canadian strategy.

We distilled the interview findings down to six key takeaways:

- **1. Start simple and increase ambition over time:** focus on a few high-impact materials, such as steel and concrete, and put in place policies that can be improved on and expanded over time.
- **2. Engage stakeholders in policy decisions:** consult early and widely to create buy-in and tap into expertise within industry and government.

- **3. Collect enough data to make informed decisions:** greater transparency of the carbon footprint of materials is important, but don't wait for perfect data before taking action.
- **4. Use a mix of policy "carrots" and "sticks":** governments have several tools—such as setting embodied carbon caps and using bid incentives to reduce emissions and encourage low-carbon innovation.
- **5. Ensure there is a policy champion:** Buy Clean requires coordination across multiple federal departments and levels of government. Policy champions help make it happen.
- 6. Include Buy Clean as part of a broader industrial strategy: Governments must design a joined-up approach that includes investments to decarbonize industry and changes to trade rules, while growing demand for cleaner products.

Although Canada's Buy Clean strategy will be a multi-year process, there are several steps the federal government must take in 2022-2023 to get the process moving.

First, properly resource existing efforts to support Buy Clean, in particular the National Research Council's vital, but under-resourced, LCA² Initiative.¹² Budget 2022 took an important first step, allocating \$183 million for low-carbon construction materials research, and \$150 million to update building codes and promote lowercarbon construction materials as part of the Canada Green Buildings Strategy.¹³

Second, partner with provinces, municipalities, and the private sector to fund demonstration projects across the country that showcase low-carbon materials, build comfort and expertise in using them, and share lessons learned.

Finally, Buy Clean needs a federal policy champion to inject urgency and leadership into the process. The government should immediately create a federal Buy Clean Task Force with the authority to coordinate policy among the numerous departments, agencies, and stakeholders with a role to play.

Put simply, it's time for Canada to shift Buy Clean into action. For the sake of Canadian jobs—and for the sake of the climate.

THE PROCESS

We interviewed 15 policy architects and experts from U.S. jurisdictions with proposed or implemented Buy Clean programs.¹

All of our interviews were conducted confidentially, and interviewees were assured that specific comments would not be attributed to them by name. However, all participants opted to put some or all of their comments "on the record."

Our interviews focused on the following questions to dig into the politics and process of adopting Buy Clean policy:

- What were the motivations and driving forces behind Buy Clean?
- What key policy design decisions were made and why?
- How were various stakeholders engaged during policy development? Which supported, which opposed, and what was done to win over skeptics?
- What were the main barriers and how were these overcome?
- What lessons or advice do you have for other jurisdictions, such as Canada?

Participants

Policy makers and government officials

Brian Reyes, Sustainability Planner, Marin County, California

Chris Hansen, State Senator, Colorado

Frank Hornstein, State Representative, Minnesota

Jordan Palmeri, Oregon Department of Environmental Quality

Stacey Foreman, Sustainable Procurement Program Manager, City of Portland, Oregon

Tracey Bernett, State Representative, Colorado

Buy Clean experts and advocates

Bree Halverson, Midwest Field Director, BlueGreen Alliance

Charlie Martin, Policy Advisor, BlueGreen Alliance

Chris Markuson, Western States Director, BlueGreen Alliance

Chris Neidl, OpenAir Collective, New York

Jessica Koski, Washington State Policy Coordinator, BlueGreen Alliance

Meghan Lewis, Senior Researcher, Carbon Leadership Forum

Mike Williams, Senior Fellow, Center for American Progress

Ranfis Villatoro, Oregon State Coordinator, BlueGreen Alliance

Sasha Stashwick, Senior Advocate, Climate & Clean Energy Program, NRDC

We would also like to thank Ryan Zizzo from Mantle Developments and Sarah Petrevan from the Cement Association of Canada for generously providing their time and expert feedback in reviewing the draft report.

¹ For more information about the U.S. Buy Clean policy landscape see the Appendix.

A BUY CLEAN PRIMER

What is Buy Clean?

Buy Clean is a set of policies that use government purchasing power to reduce the emissions associated with construction materials. These policies usually establish requirements for suppliers to report their "embodied carbon" emissions for specific products or materials, and for procurement agencies to preferentially choose low-carbon products. California passed the first Buy Clean legislation in 2017.¹⁴

Why should governments Buy Clean?

Government procurement is responsible for about 15% of global GHG emissions.¹ It's also a significant economic driver, accounting for 12% to 30% of national GDP in most countries.¹⁵ Governments—including Canada's—are among the largest buyers of construction materials. In the U.S., 46% of cement and 18% of steel consumption is purchased for public projects, emitting 57 Mt of CO₂e in 2018.¹⁶ In Canada, governments purchase about \$200 billion of goods and products every year. That includes about \$4-billion worth of cement and steel, or 29% and 25% of the market, respectively.

How does it work?

Most Buy Clean policies have two main components. First, suppliers are required to measure and disclose embodied carbon (usually through a tool called an "Environmental Product Declaration" or EPD, see page 14) for selected construction materials. Second, the materials used in infrastructure projects must fall below a certain embodied carbon cap. Some policies include incentives to support innovation and compliance.

Does it make construction more expensive?

Governments can use market-ready, lower-carbon materials without significantly increasing construction costs. A recent study found that embodied carbon in buildings can be reduced by between 24% and 46% at cost premiums of below 1%.¹⁷ Pilot projects using low-carbon concrete also find improvements in performance (e.g. durability) and no significant impacts to ease of pour or workability.^{18,19,20}



CANADA'S GREENING GOVERNMENT STRATEGY AND BUY CLEAN

The Government of Canada has set emissions targets for its direct procurement activities under the Greening Government Strategy.²¹ This includes measuring embodied carbon and, from 2025, reducing these emissions for major federal construction projects. At COP26 in November 2021, the government joined several other countries when it pledged to buy low-carbon steel and concrete.²²

Federal procurement makes up a small share of total Canadian public purchasing of construction materials. As such, in 2021 the government committed to expand this work beyond the federal government by developing a Buy Clean strategy that covers all infrastructure projects.^{5,23}

ABOUT EMBODIED CARBON

Embodied carbon refers to the full life cycle of emissions from construction materials. It covers emissions from raw material extraction, transport and manufacturing, through construction, maintenance and repair, to deconstruction and end of life.

Over a building's lifetime, most emissions are released upfront in the material production and construction stages. Embodied carbon is calculated through life cycle assessment and quantified as global warming potential (GWP) in kilograms of carbon dioxide equivalent (CO₂e).

Emissions associated with production of construction materials have grown in recent decades, accounting for at least 11% of global carbon emissions.⁸ As buildings become more energy efficient and switch to lower-emissions sources of energy, the role of embodied carbon in materials becomes increasingly important for emissions reductions to continue.

Life Cycle Stages of a Building





SIX BUY CLEAN LESSONS for Canada

Start simple and increase ambition over time

KEY TAKEAWAYS

- Focus on a subset of materials
- Reduce policy complexity and potential for opposition
- Take an iterative approach to ratchet up ambition

Many interviewees told us it was important to begin with a focused policy scope and design—to get policies or regulations implemented—and then use that to build on and expand the scope later on.

For many jurisdictions beginning their forays into Buy Clean, it was important that staff resources were well-utilized and not spread too thin, giving adequate time to consult and work with stakeholders, and allowing industry and governments to learn and adapt as the policy developed.

The necessity of starting with a subset of high-impact construction materials (like steel and cement, which have high emissions and high government purchasing shares) was a frequent theme.

For example, several jurisdictions, including the states of New York and New Jersey, the City of Portland, and Marin County, have focused on concrete, given its widespread use in public infrastructure projects.

This approach means that staff resources can be used more efficiently as the number of stakeholders that need to be consulted and brought onside is focused.

There are other ways to keep the initial scope of Buy Clean manageable. Buy Clean requirements can be applied only to projects over a value or size threshold before being expanded in the future. Or, requirements can be phased in over time to give government and industry time to adapt (Figure 1).

"It's important to be flexible with the construct of Buy Clean. Get something down in law, even if it's only requirements for transparency, and build off that."

Mike Williams, Senior Fellow, Center for American Progress

Figure 1: Example timeline for phasing in Buy Clean standards over several years.

Source: Carbon Leadership Forum²⁴



"It's better to focus on a few materials. This is a new policy that is cutting edge, and being focused will help get the most out of it. It's also easier when you have fewer lobbyists against you."

Representative Frank Hornstein, Minnesota

"Buildings were easy—architects already understand embodied carbon. Transport infrastructure was much harder and required education and flexibility. If you want an easy win, go after buildings first. If you want a bigger impact, go after transportation infrastructure."

Representative Tracey Bernett, Colorado

CASE STUDY

WASHINGTON STATE

Washington State legislators and advocates started with a far-reaching Buy Clean bill that included a broad list of materials, a wide project scope (covering buildings and transportation infrastructure), and requirements to set carbon caps for materials. However, after industry and agency feedback highlighted potential challenges (i.e. a lack of readily available lifecycle data for some materials) the bill's scope was reduced to only include buildings and structural materials. A further change removed certain wood products from the list to focus on structural wood products that directly compete with steel and concrete in buildings. Advocates in Washington State hope to pass this streamlined bill and to revisit it at a future date to expand the scope.



Engage stakeholders in policy design

KEY TAKEAWAYS

- Provide insights into potential challenges or constraints
- Design more effective policy with stronger outcomes
- Identify supportive coalitions to act as policy champions

Most interviewees told us that early and consistent stakeholder engagement was critical. And the first step is understanding who the key stakeholders are and how they will be affected.

The list of stakeholders will depend on the materials and projects covered, but generally includes: construction material producers, construction and infrastructure companies, engineers and architects, labour unions, government officials, environmental groups, and experts from academia and think tanks.

In Canada, a number of stakeholders are already represented in the **Buy Clean Industry Alliance**, including major industry associations, think tanks, and groups representing labour and the environment. Canada also has the "Low-carbon assets through life cycle assessment" (LCA²) initiative, which has engaged public and private sector stakeholders to develop life-cycle emissions datasets and benchmarks for construction materials (see Lesson 3).¹²

Internal government staff are another key stakeholder. Buy Clean represents a change from standard procurement practices, which are often driven by keeping upfront costs low. Strong leadership is required to address concerns and keep policy development moving forward.

Certain departments can be tougher than others. Colorado State Representative Tracey Bernett focused her efforts on educating the state Department of Transportation:

"Agency resistance was tough. We recognized that this was a new concept for the transportation sector, and that they needed time to conduct pilot programs to test the durability and cost of lower-embodied carbon materials. In the end, we gave them another year to develop a program to reduce emissions; that made all the difference in the world. They were thankful that we listened to them and gave them more time."

Another example of effective stakeholder engagement can be found in the state of Oregon, which worked with concrete producers to support greater transparency by generating EPDs (see Lesson 3). This effort helped build trust and support among industry, and paved the way for the City of Portland's Low-Carbon Concrete Initiative, and the March 2022 passage of the Buy Clean Oregon Act. ^{25,26}



Non-governmental groups have been instrumental in many of the Buy Clean policies we explored.

The BlueGreen Alliance works in a number of states and in Washington, D.C., to advance climate policy, and includes national unions and environmental organizations. By building diverse coalitions that include industry and political champions, the Alliance has been able to help pass Buy Clean legislation in California, Colorado, and Oregon, and is working in several other states to achieve the same result. Minnesota Representative Frank Hornstein told us he was motivated to champion Buy Clean in his state by seeing the Sierra Club and unions working together as part of the BlueGreen Alliance: "This is one area where jobs are not pitted against the environment."

CASE STUDY

CALIFORNIA

California is illustrative of the risks of not adequately consulting industry. In 2017, the state developed and passed the country's first Buy Clean legislation in just six months. Although a landmark piece of legislation, the final act did not include concrete—a key construction material and one of the largest emitters in the state—due to strong industry opposition. However, this created perceptions of unfairness among direct competitors like steel.

Mike Williams, who worked on the campaign and coined the term "Buy Clean," told us that industry viewed Buy Clean as another set of regulations, rather than an opportunity to improve competitiveness. "In hindsight we would have worked to understand the impact on industry—and the interplay with competitiveness—much more quickly."

Marin County, near San Francisco, took these lessons to heart when creating its Low-Carbon Concrete Code. The County spent two years doing extensive stakeholder engagement and was able to develop a policy with broad support. One of the keys to success was flexibility. Some industry representatives found the initial proposal—based on meeting embodied carbon limits by submitting EPDs—to be overly complex, particularly for smaller concrete suppliers. As a result, the County negotiated an additional compliance pathway based on limiting cement content.



Ranfis Villatoro, Oregon State Policy Manager, BlueGreen Alliance

"In Washington's 'Buy Clean Buy Fair' bill, we took a unique approach by including a labour component on an equal footing with embodied carbon. This brought in unions that are not normally part of the conversation. It also made it harder for opponents to drive a wedge between environment and labour groups, creating a much stronger coalition."

Jessica Koski, Washington State Policy Manager, BlueGreen Alliance

"Engineers already deal with lots of specifications; carbon is just another specification. Getting project engineers, inside and outside government, excited about embodied carbon was really helpful to gaining internal support."

Jordan Palmeri, Policy Advisor, Oregon Department of Environmental Quality

"Implementation of embodied carbon requirements is complex there are a lot of stakeholders and standards attached to building materials. It's important to understand the human side as well as the technical side."

Stacey Foreman, Sustainable Procurement Program Manager, City of Portland

Collect enough data to make informed decisions

KEY TAKEAWAYS

- Lifecycle impact data is needed to choose lowcarbon materials
- More transparency can result in lower emissions
- Data must be linked to policy and decision-making

Good quality data on the embodied carbon of building materials is the foundation of Buy Clean. Once data is more widely available, governments can make policy decisions like setting benchmarks, selecting low-carbon products, and focusing investments in highemitting facilities (see Lessons 4 and 6).

Governments can start by asking suppliers to disclose embodied carbon data (in the form of EPDs) for certain construction materials. This provides a signal to industry to start developing EPDs while allowing smaller firms time to build capacity. This voluntary disclosure period should be followed by mandatory requirements, with clear timelines provided in advance.

During this disclosure period, governments can gather data from other sources, such as past procurement bids and public databases. This will help inform the process of developing baselines and carbon caps. They can also increase the availability of EPDs by providing financial incentives (grants or tax credits) for material suppliers (see Oregon case study on page 13). The proposed U.S. Build Back Better bill earmarks US\$250 million in grants for manufacturers to develop EPDs.²⁸

Although improving embodied carbon disclosure is just step one towards setting eventual caps, it can have measurable impacts on its own. Companies in states with EPD requirements took steps to reduce emissions and compete based on carbon intensity. In Washington State, this led to a 20% reduction in average embodied carbon in concrete.²⁸

Pilot or demonstration programs are another way to collect data. The U.S. Department of Transportation is launching a federal infrastructure pilot program,¹¹ and several jurisdictions (e.g. Washington, Oregon, and the City of Portland) used pilot projects to gather valuable data on the real-world performance of low-carbon materials. These generally find that significant carbon savings can be had without impacting performance, workability, or cost.¹⁸

An important refrain from our interviews was to "not let the perfect be the enemy of the good." Many low-carbon products exist on the market already and are being used outside government, often adding little or nothing to project costs.¹⁷



CANADA'S "LOW-CARBON ASSETS THROUGH LIFE CYCLE ASSESSMENT" (LCA²) INITIATIVE

The LCA² Initiative is led by the National Research Council of Canada (NRC), in collaboration with other federal departments and industry, non-governmental groups, and academia. Its goal is to support low-carbon procurement by developing datasets, benchmarks, and tools to allow governments to compare materials on a life-cycle emissions and cost basis. LCA² has been successful in engaging key government and industry stakeholders in gathering data and developing embodied carbon benchmarks. While LCA² is viewed as a leading example of stakeholder engagement, it has lacked resources and political support to accelerate and link its outputs to policy and decisions-presenting an obstacle to Canada's "Buy Clean" strategy. The 2022 federal budget allocated \$183 million over seven years for the NRC to conduct research and develop standards to encourage the use of low-carbon construction materials.27



CASE STUDY

OREGON

Oregon used a push-pull approach to increase the availability of EPDs. The state partnered with the Oregon Concrete and Aggregates Producer Association to provide US\$50,000 in grants between 2017 and 2020 to producers wanting to develop EPDs, resulting in more than 1,500 concrete EPDs across 20 plants.^{24,30} Many large suppliers took advantage of the program, increasing transparency for the market overall.

On the demand-side, in addition to supporting Buy Clean policy development, Oregon staff also worked with private construction companies and designers to incorporate LEED green building requirements and request EPDs as part of those projects. As Jordan Palmeri from the Oregon Department of Environmental Quality told us, this approach allowed them to act quickly:



"Time is the problem—we don't have 10 years to build a publicly available life-cycle inventory database. For many materials, we don't need (and might never have) perfect data, just data that is good enough for decision-making. There's a lot of EPD data available right now that meets that requirement."



ABOUT ENVIRONMENTAL PRODUCT DECLARATIONS

The industry standard for measuring embodied carbon impacts is called an Environmental Product Declaration or EPD. EPDs are developed by manufacturers and consultants to communicate a product's life-cycle impacts, including greenhouse gas emissions (typically referred to as "global warming potential" or GWP), and are governed by international standards. Type III EPDs are third-party verified and are therefore preferred for Buy Clean policy as they allow for more accurate comparisons between similar products. There are two main categories of EPDs with different functions:

- **Industry-wide** EPDs represent multiple manufacturers and provide an average across industry in a particular jurisdiction, like Canada or North America. They are used to set regional or national benchmarks against which to compare individual products.
- **Product- or facility-specific EPDs** represent products produced by a single manufacturer, or a product produced at a specific facility. These types of EPDs are used to compare between products with the same function.

The availability of EPDs varies by industry and geographic region, but the total number has accelerated over the past five years, driven by policy requirements (like Buy Clean) and the creation of public databases such as the Embodied Carbon in Construction Calculator (EC3) tool (Figure 2).²⁹

Figure 2. The number of EPDs has grown over time, driven by Buy Clean policy requirements and wider availability of data.

Source: Building Transparency, cited in Center for Sustainable Building Research and Carbon Leadership Forum, 2022



Use a mix of policy "carrots" and "sticks"

KEY TAKEAWAYS

- Screen out the worst performers
- Incentivize low-carbon innovation
- Ratchet up ambition over time

As lesson three shows, data collection is an important first step, but governments should not lose sight of the Buy Clean end goal: using public infrastructure investment to reduce embodied carbon in building materials.

Some U.S. Buy Clean policies achieve this through a combination of embodied carbon caps (the "stick") and financial incentives to encourage innovation (the "carrot").

Embodied carbon caps are usually set at an industry's average level, screening out the 50% of highest-emitting products on the market. The caps should be informed by data from initial disclosure requirements as well as publicly available data. Over time, the cap should be ratcheted down in line with climate targets and as industry performance improves.

As is emphasized in lesson two, stakeholder engagement in the development of caps is key to success. In some cases, jurisdictions created technical advisory committees to provide feedback and inform the cap-setting process.²⁴

The cap approach has several benefits: it is relatively simple to administer, excludes the worst performing materials, and supports deployment of current best practices. However, as any product that meets the cap is eligible, it does not create incentives for further low-carbon innovation. Some U.S. groups have proposed a two-tier cap approach to remedy this (see below).^{24,31}

Incentives address this by encouraging low-carbon innovation and continuous improvement.³¹ Procurement incentives can play an important role in encouraging technological innovation, and are a key tool in scaling up zero-emission technologies for heavy industry.^{32,33}



"In New Jersey, we faced opposition from contractors, road builders and ready-mix producers when we tried to introduce the Low-Embodied Carbon Concrete Leadership Act (LECCLA). By switching to a performance bonus incentive, we got support from all those groups, including the aggregate association—that was huge."

Chris Neidl, Co-Founder, OpenAir Collective

Buy Clean incentives could come in several forms:

- A performance bonus if the contractor meets embodied carbon reduction goals, awarded upon project completion. New York state is proposing a lowcarbon concrete performance bonus in a 2022 bill.³⁴
- Bid incentives weigh bids according to the level of embodied carbon reductions. This could be achieved by awarding extra points in scoring-based systems, applying an internal carbon price, or awarding a 5% or 10% bid discount for the lowest-carbon option. As Figure 3 shows, applying a discount at the bid stage can make the lowest-carbon option more costcompetitive in the bidding process.

Figure 3. How bids are compared under a combined cap and discount-based incentive policy.

Source: NRDC and Columbia University, A Design Guide to State and Local Low-Carbon Procurement, 2022



 Products that meet a lower cap can be eligible for funding under a "high achievers market" like the Climate Star program under the proposed U.S. CLEAN Future Act. This approach allocates a share of public procurement budget to purchase products with the lowest 10% or 20% embodied carbon, creating an added incentive for bidders to choose high-performing materials.³¹

In Canada, a properly designed Buy Clean strategy could do double-duty, excluding higher-carbon imported products from infrastructure projects while supporting domestic cleantech innovation in low-carbon building materials (see below).



"Governments must join the carrots and sticks together. Drawing a line is important to exclude the worst performers, and lowering that ceiling over time helps make the case for industry investments to reduce emissions. But we also need to incentivize continuous innovation and greater emissions reductions above and beyond that minimum performance level to avoid locking in only incremental improvements."

Sasha Stashwick, Senior Advocate, NRDC



CANADIAN CLEAN MATERIALS INNOVATION

Several Canadian companies are developing and scaling up innovative ways to cut the carbon footprint of construction materials. B.C.-based Svante has partnered with Lafarge Holcim and Total SE to build a plant in Richmond, B.C., where captured CO_2 will be re-injected and stored in concrete. Nova Scotia's CarbonCure is injecting CO_2 into wet concrete, strengthening the concrete while reducing the amount of cement needed, and therefore its embodied carbon. Several other promising companies, including Carbon Upcycling Technologies, Carboclave, and Pond Technologies, are developing technologies to capture, store, and utilize cement emissions. Other examples include the Elysis joint venture to manufacture zero-emissions aluminum in Quebec, Canada's burgeoning mass timber sector, and efforts to produce iron and steel using zero-emission hydrogen.^{35,36}

Ensure there is a policy champion

KEY TAKEAWAYS

- Buy Clean is complex and cross-cutting, requiring coordination across multiple departments and agencies
- The federal government has a unique role in setting consistent standards
- Provinces, territories and municipalities may lack resources to go alone

A hallmark of successful Buy Clean policy in the U.S. is the presence of strong champions—both political and within government departments.

As we heard from state representatives Tracey Bernett in Colorado and Frank Hornstein in Minnesota, Buy Clean is complex and relatively novel. As such, leadership is necessary to bring key stakeholders to the table and manage challenges as they arise. The same goes for internal government leadership, which was cited as critical by several public servants we interviewed.

The federal government has a unique and critical role to play in developing and implementing a consistent set of reporting standards and carbon benchmarks across the country. Referring to the "bottom-up" approach seen to date in the U.S., NRDC's Sasha Stashwick said, "This is one area where we don't want to see 1,000 flowers bloom." In response to these concerns, in February 2022 the Biden administration announced the creation of a White Houseled "Buy Clean Task Force" to develop federal policies and demonstration projects.¹¹ The U.S. General Services Administration has also issued new low-carbon standards for concrete and asphalt used in federal construction projects, aiming for a 20% reduction in embodied carbon.³⁷

Similar leadership and coordination will be important for Canada. One challenge is that Canadian procurement spending is the most decentralized of any developed country, with nearly 90% under provincial, territorial, or local control (Figure 4).¹ The federal government will need to use various mechanisms—including infrastructure transfer agreements and the Canada Infrastructure Bank—to adopt a Buy Clean approach beyond its direct procurement.



"You have to have leadership inside government—but you also need an outside movement of labour, environment and industry pushing at the same time."

Representative Frank Hornstein, Minnesota

Fortunately, Canada already has key pieces in place: industry and public support, an existing stakeholder process, and high-level political commitments. The federal government could build on this by:

- Working with provinces, municipalities, and industry to fund demonstration projects and research into low-carbon materials, building evidence and comfort with innovative low-carbon materials.
- Developing national and regional embodied carbon benchmarks, building on the work by the LCA² Initiative and linking it to policy decisions.

- Creating a Buy Clean Task Force with a clear mandate, roles, and responsibilities, to champion the Buy Clean Strategy and engage stakeholders in its development.
- Providing financial and technical support to smaller local governments that may lack the capacity or expertise to implement Buy Clean.



Figure 4. Federal vs. sub-federal procurement spending, 2019.

"

"The federal government could set up a sustainable concrete testing lab to test new materials and create comfort for procurement agencies. This would help state agencies update their approved material lists more frequently, reducing a barrier to adoption."

Chris Neidl, Co-Founder, OpenAir Collective

Include Buy Clean as part of a broader industrial strategy

KEY TAKEAWAYS

- Supply and demand signals are needed to decarbonize industry
- Accelerate greenhouse gas reductions in line with 1.5C trajectory
- Create a market for lowcarbon Canadian materials

Buy Clean should be seen in the context of a broader strategy to decarbonize industry. As Sasha Stashwick from NRDC described it, "Buy Clean is part of a three-legged stool" that includes embodied carbon disclosure, low-carbon procurement standards, and targeted investments to accelerate lowcarbon technology uptake in industry.

These policies work together to grow demand for lowcarbon products and incentivize manufacturers to invest in technologies that cut emissions. This will have indirect benefits for the wider market as the private sector purchases and uses low-carbon materials.¹⁶ Estimates from the U.S. suggest this indirect greenhouse gas emissions impact could be twice as large as that from government infrastructure spending.²⁸ Several states, including California and Colorado, have implemented industrial programs that use both supply-side and demand-side policies to support net-zero goals.^{38,39}

We also heard how important it is to integrate Buy Clean with foreign and trade policy. Canada produces lowercarbon steel and aluminum, on average, than many trade partners.^{3,4} However, this clean advantage is not recognized in trade policies, with the result that lower cost imports often from countries with less stringent climate policy and more carbon-intensive production—are able to outcompete domestic manufacturing. Aligning Canada's Buy Clean approach with the U.S. is the first step to addressing this. Beyond that, Canada must work with allies in Europe and beyond to develop low-carbon procurement and trade policies that limit imports from high-carbon producers.^{40,41}

FINAL THOUGHTS AND RECOMMENDATIONS

The government should take immediate action in 2022-2023 to put the pieces in place for a broader strategy around Buy Clean by:



Funding Buy Clean demonstration projects across the country to showcase low-carbon materials in roads, highways, community centres, and other infrastructure. This will require working in collaboration with stakeholders, including provincial, territorial and municipal governments, to test novel materials and approaches to procurement. It is also an opportunity to collect data on the cost and performance of low-carbon construction materials.



Properly resourcing key internal departments working on Buy Clean policy—in particular the National Research Council's LCA² Initiative and the Centre for Greening Government at Treasury Board Secretariat—to accelerate the development and implementation of a Buy Clean strategy by 2023.

Done right, a Canadian Buy Clean Strategy will help tackle a crucial source of emissions while also giving a much-needed boost to low-carbon Canadian companies and their workers. Clean and competitive will increasingly be found on the same page, and Buy Clean will literally make that the case.



We asked our interviewees for any final thoughts or advice for Canada. Here is a sample of what they told us:

"Reducing embodied carbon really helps to make progress towards climate goals. With 10% to 15% of greenhouse gas emissions coming from construction, this is a material policy, not a sideshow."

Senator Chris Hansen, Colorado "For Canada, with its clean steel production and electricity, Buy Clean is a way to support domestic industry and contrast it with carbonintensive imports from China, India and Russia."

Mike Williams, Senior Fellow, Center for American Progress "Canada has some leading companies on carbon capture, utilization and storage, particularly in the cement and concrete sector. A federal Buy Clean policy could be designed to incentivize greater uptake of these technologies in the building material supply chain."

Chris Neidl, Co-Founder, OpenAir Collective

Appendix Buy Clean in the United States: A Snapshot

Jurisdiction	Program	Materials covered	Summary of policies and programs
United States Government	<u>Federal</u> <u>Sustainability</u> <u>Executive Order</u> (2021)	Not yet defined	Directs the federal government to develop a Buy Clean program to support net-zero emissions by 2050 from federal procurement. Creates a Buy Clean Task Force to develop policy recommendations, and pilot projects under Department of Transportation (highways) and General Services Administration (ports of entry).
	<u>GSA Low-</u> <u>Carbon</u> <u>Standards</u> (2022)	Concrete and asphalt	General Services Administration project contractors must provide EPDs, meet 20% lower embodied carbon limits for concrete, and use "environmentally preferable techniques" for asphalt.
	Build Back Better Act (proposed)	Not yet defined	The bill would create an EPD grant program, develop pilot projects, and provide funding to identify and use low-carbon materials for transport projects.
	<u>CLEAN Future</u> <u>Act (proposed)</u>	Aluminum, iron, steel, concrete, cement	The bill would establish Buy Clean standards, create a national EPD database, and develop a "climate star" label for low-carbon products.
California	<u>Buy Clean</u> <u>California Act</u> (2017)	Steel (rebar, structural), flat glass, mineral wool insulation	Requires embodied carbon disclosure via EPDs for all state infrastructure projects. GWP limits published January 2022 and enforced from July 2022.
	Buy Clean amendments (proposed)	Concrete, gypsum board, insulation, carpet	Proposed amendments in 2021 to introduce concrete and finish materials and update EPD requirements did not pass.
	<u>Caltrans low-</u> <u>carbon cement</u> (2022)	Cement and concrete	Caltrans approved the use of Portland limestone cement in road construction and maintenance projects. The agency also collects EPDs for materials.
Colorado	<u>Buy Clean</u> <u>Colorado Act</u> (2021)	Asphalt, cement, concrete, glass, steel (rebar, structural, post- tension) and structural wood	Applies to public buildings, roads, highways, and bridges. Requires state agencies to establish GWP disclosure requirements and limits for public buildings (from 2024) and roads, highways, and bridges (from 2025).

Jurisdiction	Program	Materials covered	Summary of policies and programs
Washington	Buy Clean <u>pilot projects</u> and <u>database</u> (2021)	Not yet defined	2021 state budget funded a reporting database for EPDs and labour information; and provides funding for 2-10 pilot projects and case studies.
	<u>Buy Clean Buy</u> Fair (proposed)	Concrete, steel (rebar, structural), engineered wood products	Requires EPDs and information about labour standards for public construction and building renovation projects.
Oregon	<u>Buy Clean</u> Oregon Act (2022)	Concrete, steel (rebar, structural), engineered wood products	Requires EPDs and information about labour standards for public construction and building renovation projects.
	<u>Oregon</u> <u>Concrete EPD</u> program	Concrete, steel, asphalt	Establish EPD program for transportation projects covering steel, concrete and asphalt. By 2026 the state must establish a program to reduce emissions from these materials.
Minnesota	Buy Clean Buy Fair <u>study</u> and <u>pilot program</u> (2021)	Not yet defined	Buy Clean study and pilot projects to assess adding EPD requirements to materials for public building projects.
New York	Low Embodied Carbon Concrete Leadership Act (2021)	Concrete	Establishes guidelines for low-carbon concrete procurement for state projects.
New Jersey	Low Carbon Concrete Act (2021)	Concrete	Establishes purchasing preferences and tax incentives to encourage use of low-carbon concrete products and technologies.
City of Portland (Oregon)	Low-Carbon Concrete Initiative	Concrete	Requires EPDs for all concrete used in City projects. GWP limits published by April 2022. Pilot projects to test performance of low-carbon concrete mixes in public projects.
County of Marin (California)	Low Carbon Concrete Code (2019)	Concrete	Requires public projects to meet one of two compliance pathways: 1) Concrete GWP limits (via submission of EPD); or 2) Cement quantity limit.

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