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Trading on strength: Canada's clean tech in global carbon markets

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Executive summary

Canada is off track to meet its 2030 emissions target and its nationally determined contribution (NDC), which means more policy ambition will be needed to hit its 2035 target and align with net zero emissions beyond. Despite a decade of carbon policy implementation, emissions progress remains modest given rising economic activity, lagging efficiency gains, and emissions from an ever-expanding oil and gas sector. Canada will need a sustained policy effort to bring down emissions and a full tool box to get it done.

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Internationally transferred mitigation outcomes (ITMOs), enabled under Article 6 of the Paris Agreement, are an important tool, offering a credible, cost-effective, and strategic opportunity to complement domestic action. They allow one country to count emission reductions achieved in another country toward its own NDC, provided both parties agree and apply robust accounting to avoid double counting. ITMOs can be generated through cooperative activities or programs jointly designed and implemented by the participating countries.

Designed well, ITMOs can reduce compliance costs, expand technology exports, and strengthen international partnerships, all while supporting sustainable development outcomes globally.

But Canada risks falling behind. Other countries, notably Japan, have already moved to institutionalize Article 6 co-operation, advancing trade and climate interests through structured bilat-

eral agreements and technology deals. With operational guidance now finalized under Articles 6.2 and 6.4 of the Paris Agreement, uncertainty has decreased in terms of the path forward under the UNFCCC and the window for Canada to act is now open.

The prevailing view in Canada—that LNG exports can be sold with bankable credits flowing to Canada—is increasingly out of step with how Article 6 rules are evolving. Strict requirements around quantifying additionality—namely, that LNG exports actually reduce emissions in importing countries beyond what would have happened without them—along with a growing emphasis on comprehensive decarbonization strategies, are likely to preclude simple LNG-for-credit transactions negotiated with partner countries.

This paper outlines the case for a Canadian ITMO strategy that integrates domestic clean technology, climate finance, and increased trade. It recommends establishing a national co-ordination mechanism, launching bilateral pilot projects, and leveraging existing finance and export services. Embedding ITMOs into Canada's broader climate and economic strategy affords a significant opportunity to align climate ambition with the need for trade diversification globally, all while supporting sustainable development outcomes in the Global South.

ITMOs are timely and important now

With 10 years of concerted effort to reduce emissions, it's clear that bending Canada's emissions trajectory downward toward the 2030 and 2035 targets—and, ultimately, net zero—is no easy task. Despite sustained policy effort by the federal government, provinces, and territories, historical and emissions forecasts both show Canada is struggling to counter the upward pressure on emissions from economic and population growth.

At the Institute, we've been tracking Canada's progress toward its 2030 emissions target, or its Nationally Determined Contribution (NDC), for several years, assessing federal emissions-reduction plans, evaluating feasible 2035 targets, and mapping out net zero pathways. Our conclusion, consistent with the federal government's own modelling, is that Canada is off track for 2030 and even further from the deeper reductions needed to align with net zero by mid-century. Economic growth continues to drive emissions upward, particularly in the ever-expanding oil and gas sector. Given current national pressures to develop more conventional oil and gas projects, this upward pressure on emissions can be expected to continue.

This paper contends that Canada must enhance its portfolio of carbon mitigation options by including the use of internationally transferred mitigation outcomes (ITMOs), or international emissions-reduction credits, to both allow companies the flexibility to source low-cost reductions internationally but, also, to enhance climate ambition across all orders of government.

ITMOs are emission reductions transferred between countries under Article 6 of the Paris Agreement, allowing one country to count reductions achieved in another toward its own NDC through cooperative activities with transparent accounting to prevent double counting.

With changes in Canada's trading relationship with the U.S., there is also a pressing need to diver-

sify trade with more countries. ITMOs, as Japan and other nations are showing, offer an additional channel to sell Canadian decarbonization technology while supporting global climate action. A less self-serving interest is to support the Global South in advancing sustainable development objectives, where well-designed climate finance projects can deliver multiple development benefits alongside much-needed decarbonization funding and technology.

ITMOs build on Canada's commitments

A central tenet of climate policy is to expand the pool of mitigation opportunities to keep costs down. This principle has shaped international climate co-operation under the United Nations Framework Convention on Climate Change (UNFCCC) for decades and has influenced Canada's policy. Under Canada's *Kyoto Protocol Implementation Act*, *2007*, for example, internationally sourced Kyoto compliance units were enabled towards meeting Canada's Kyoto target, with a limited number of units booked for compliance. This commitment continues today, with Canada's 2030 and 2035 NDCs including a commitment to explore the transfer and use of ITMOs and other options that can generate emissions reductions. The proposed federal oil and gas emissions cap and Output-Based Pricing System Regulations both include a commitment to consider ITMOs as a compliance option.

Equally important, globally sourced emission reductions have long been bundled with sustainable development objectives, a priority for Canada. When designed with integrity and thoughtfulness, these transfers can create development co-benefits and emissions reductions. Investing in new cookstoves in Africa is a clear example of these co-benefits. More efficient stoves reduce wood use, freeing up time otherwise spent collecting fuel, reducing deforestation and associated environmental damage, and improving indoor air quality and health. It is no surprise that ITMOs are seen as an important tool to expand climate finance and support the United Nations' Sustainable Development Goals (SDGs).

How Article 6 works

The Paris Agreement, adopted in 2015, introduced Article 6 as a new global framework for co-operative mitigation actions using carbon markets. Article 6 enables country-to-country co-operation in two important ways. First, at the project level, where countries can transfer internationally transferred mitigation outcomes; and second, at the national level, where countries agree on how to credit or debit ITMOs against their respective NDCs. Article 6 enables countries to meet their NDCs through both market and non-market mechanisms, with two market mechanisms defined:[1]

- **Article 6.2** For Canada to participate and gain credit toward its NDCs (or other compliance requirements), it must strike deals with other countries and meet a number of

1 Under Article 6.8, non-market approaches (NMAs) do not involve credit trading. Instead, they focus on enabling conditions to facilitate decarbonization, including climate finance, technology transfer, and capacity building. Both mitigation and adaptation support are explicitly recognized as part of these approaches.

procedural requirements under the UNFCCC that enable voluntary bilateral agreements for cross-border deals to transfer mitigation outcomes, where there is some benefit or value in exchange to both credit buyers and sellers. Under these deals, one country transfers emissions reductions to another, which then counts them toward its NDCs or other international GHG compliance systems not covered by the Paris Agreement, such as the International Civil Aviation Organization's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Any organization, including companies, can negotiate for and use the credits, opening a door for their use by industry for domestic compliance.[2]

- **Article 6.4** Paris Agreement Crediting Mechanism (PACM) establishes a new centralized crediting mechanism overseen by the UNFCCC, where units can be registered and traded. Article 6.4 establishes a project-based mechanism that allows countries to invest in emissions-reduction and -removals projects abroad, and receive credits toward their own NDCs or other internationally recognized GHG compliance schemes.

For Canada to participate and gain credit toward its NDCs (or other compliance requirements) it must strike deals with other countries and meet several procedural requirements under the UNFCCC.

ITMOs cut compliance costs and expand options

ITMOs offer a flexible approach to reducing emissions by enabling countries to pursue lower cost and more economically efficient opportunities globally. Access to these international reductions allows countries to avoid the highest-cost mitigation options, an especially important consideration for Canada, where meeting medium-term targets will likely require expensive mitigation options. This is particularly relevant given the slow pace of transition to date, the high-emitting industrial production that remains in place, and the high cost of retiring or upgrading the capital stock.

A case in point is the cost of carbon capture, utilization, and storage (CCUS). While initial deployment costs for capturing concentrated CO_2 streams in natural gas processing average around $100 per tonne, costs rise significantly when applied to more diffuse emissions sources, such as combustion from oil sands operation, often exceeding $150 per tonne. Given the size of Canada's industrial emissions, which account for roughly 42 per cent of total national emissions, relying solely on domestic mitigation could become prohibitively expensive.

Using existing modelling analysis by Navius Research for the Institute, we can estimate the likely cost savings if Canada uses ITMOs to enhance climate ambition. To do this, we assembled a cost curve based on modelling runs that assessed the trade-offs associated with different levels of ambition for a new 2035 NDC for Canada.

2 A number of federal regulations mention the use of international units as recognized compliance units, notably the proposed oil and gas emissions cap and the federal Output-Based Pricing System Regulations, but none have been enabled.

Achieving an NDC target in the range of 45 per cent below 2005 levels in 2035, which is Canada's official target, would result in average carbon costs around $130 per tonne, requiring reductions on the order of 90 megatonnes in 2035 against the reference case projection. Displacing the most expensive portion of this domestic mitigation with international units would generate significant cost savings. For example, purchasing 10 megatonnes of reductions globally could avoid costs to the domestic economy of approximately $1.7 billion in 2035.

This compares to current ITMO price forecasts ranging between $45 and $100 per tonne by 2030, representing a 20 to 70 per cent cost reduction compared to domestic Canadian abatement options.

Of course, this would represent a loss of economic activity within Canada. Spending on mitigation in countries like Brazil would generate local economic activity there, including job creation and business investment. Given Canada's current focus on diversifying trade and strengthening domestic economic performance, this transfer of economic value needs to be weighed against the benefits gained.

Still, the potential cost savings are substantial. And it is likely that the avoided drag on productivity, investment, and consumption from pursuing only high-cost domestic mitigation would more than compensate for the shift in economic activity abroad. And to the extent technology deals can be struck, where there is some commercial gain for Canada, the benefit-cost ratio improves.

COP29 in Baku opened the door for action

The implementation of ITMOs took a major step forward at COP29 in Baku, where negotiators finalized the operational guidance for Articles 6.2 and 6.4. After several years of negotiations and disagreement, the election of U.S. President Donald Trump and the expectation that the United States would step back from global action catalyzed negotiators to stand up ITMOs with better guidance.

Historically, UNFCCC negotiations seeking to enable Article 6 carbon markets by developing a rule book have been met by some countries with skepticism and mistrust. Key concerns were ensuring the integrity of carbon credits, addressing potential double-counting, ensuring accountability, and preventing the undermining of national climate action commitments. The Article 6 guidelines that emerged from Baku help put some—but not all—of that distrust behind, creating space for the new guidelines to open up the longstanding promise of ITMOs.

Important guidance emerging from Baku included the establishment of robust transparency requirements, including regular reporting and public registries to ensure accountability; standardized emissions quantification guidelines to reduce the risk of double counting; and rules on how emissions reductions are credited and debited between countries.[3] Outcomes from Baku

3 The ITMO authorized by the host country with a corresponding adjustment in the national GHG inventory of the receiving country There are three elements of authorization, including authorization of a co-operative approach, authorization of the ITMOS, and authorization of participating entities.

also helped integrate the Sustainable Development Goals to ensure that ITMO-related projects contribute positively to development objectives in the Global South beyond just carbon reductions. That said, there is agreement that smaller countries with less of a natural resource base will still need help to fully participate in global credit trade.

Operationalizing Article 6.2 depends on countries developing their own participation frameworks. Each national government must set up its own institutional processes to authorize ITMOs, meet UNFCCC and domestic reporting requirements, and align trading strategies with national climate targets. Once in place, each country must decide on contractual terms, including which sectors can trade and what portion of total units generated are to be transferred.

This procedural clarity provides Canada with an opportunity to move forward with ITMO planning and to integrate global credit trading into its broader climate strategy. With rules in place or at least becoming clearer, the market for ITMOs is expected to grow, attracting both public and private sector participation. For Canada, this opens new opportunities to form bilateral agreements by financing high-quality emissions reduction projects under Article 6.2 that align Canadian policy with trade, climate, and development objectives.

With the global framework firming up, Canada can now begin structuring its ITMO participation and embedding it into a broader climate finance and project development strategy. With 98 bilateral ITMO agreements between 60 countries, early preparation will be critical to both influence the evolution of global rules and secure a pipeline of low-cost, high-integrity credits before supply tightens as global demand increases.

Canada should play to its strengths

Early thinking from some of Canada's leading Article 6 watchers strongly suggests that Canada play to its strengths. Notably, Sullivan et al. (2023)[4] identified Canada as having significant clean energy and technology opportunities that can be sold globally with the potential for ITMO offtakes. They noted Canada has made significant, and in some cases, world-leading progress in decarbonizing its energy sector, which could lead to ITMO opportunities. For example:

- On methane, Canada has committed to deep reductions, developed advanced detection and control technologies, and supported international methane mitigation efforts through financing and technical expertise. These actions have fostered a clean-tech ecosystem capable of generating ITMOs globally.
- In the electricity sector, Canada has cut emissions by 60 per cent since 2000, with over 80 per cent of electricity now non-emitting. Its experience phasing out coal, scaling renewables, and maintaining system reliability offers a valuable model for countries still dependent on high-emitting generation.

4 Katie Sullivan, Lisa DeMarco, and Steve MacDonald. (2023). *The Missing Article How to get Canada Back in the Game on Article 6*. Energy Future Forum. https://ppforum.ca/publications/paris-agreement-climate-change-article-6/

- On LNG, bundled approaches that integrate Canadian LNG with clean energy investments and broader energy transition strategies in importing countries could qualify for Article 6 treatment, but have significant potential pitfalls and are far from the "sell gas, bank credits" model[5] many believe to be true.
- As experts from the International Institute for Sustainable Development note, Canadian LNG will be challenged to meet the additionality and leakage criteria required to substantiate Article 6 credits. To be considered under Article 6, most LNG exports would likely need to be embedded in a more comprehensive decarbonization plan—positioning LNG within a broader clean energy industrial transition strategy that helps trading partners phase out coal, or as a transition fuel linked to nationwide strategies to decarbonize electricity systems.
- Canadian clean-tech firms are deploying carbon removal technologies such as direct air capture, ocean alkalinity enhancement, and low-carbon concrete, often supported by federal or provincial funding. Advancing decarbonized manufacturing, including industrial heat pumps, could also show promise.

The authors conclude that a more deliberate Canadian strategy building on bilateral agreements and modelled on mechanisms such as Japan's Joint Crediting Mechanism could secure ITMOs from these efforts. Taking this one step further, the section below explores Japan's model as a potential blueprint for Canada in more detail, followed by specific recommendations on how Canada could adapt Japan's approach to international climate co-operation.

Japan's model offers a blueprint

Japan's success in implementing Article 6 highlights the significant opportunities available to countries that adopt comprehensive, institutionalized approaches to international climate co-operation. Japan has been proactive under Article 6 of the Paris Agreement, developing a structured approach with a dedicated deal facilitation body at its core—the Joint Crediting Mechanism (JCM). To date, Japan has formal arrangements under the JCM with 29 partner countries, and over 257 projects are underway in 18 of them. Around 90 per cent of these projects focus on renewable energy and energy efficiency.

The JCM facilitates bilateral co-operation with developing countries to promote the adoption of Japanese low-carbon technologies. This contributes to emissions reductions and supports sustainable development goals. Emissions reductions achieved through the JCM using standardized quantification methodologies and offtake agreements that share credits between Japan and its partner countries contribute to each partners' NDCs while facilitating technology transfer, trade, and foreign direct investment.

5 Aaron Cosbey. *Credit Check: Should Canada get Climate Credit for its Liquefied Natural Gas Exports?* IISD Policy Brief. https://www.iisd.org/system/files/2024-10/credit-check-lng-exports-canada.pdf

Japan's success hinges on a comprehensive and targeted governance approach:

- **Co-ordinated governance.** To co-ordinate its Article 6 efforts, Japan relies on a co-ordinated institutional framework, drawing on expertise from multiple government ministries, including Environment, Trade, Technology and Energy, and Foreign Affairs. The main government functions delivered include technical co-operation, financing, and delivery of demonstration projects.
- **Bilateral technology-focused co-operation.** The JCM is Japan's primary framework for implementing bilateral agreements to promote co-operative action. It is designed to accelerate the diffusion of Japanese decarbonization technologies, products, services, and infrastructure—primarily through investment by Japanese companies with state support. Standardized approaches are developed and applied to streamline implementation, reduce transaction costs, simplify credit transfers, and help with financing to get deals done.
- **Technical assistance.** An Article 6 Implementation Partnership (A6IP) was launched by Japan's Ministry of the Environment in 2022 with the aim of supporting capacity building in partner countries related to Article 6 implementation. Today, 86 countries and over 200 organizations and companies participate in the partnership, sharing knowledge and receiving technical support towards the implementation of Article 6. This knowledge sharing and technical assistance can facilitate ITMO agreements by addressing capacity deficiencies in the Global South.
- **Leadership through regional clubs.** In 2023, Japan initiated a co-operative forum involving 11 Asian countries to promote decarbonization and the energy transition more broadly. Ministerial meetings were held and MOUs on energy transition projects were signed allocating over a billion dollars to support 14 projects. Bringing multiple partners together to facilitate deals and provide a routine and ongoing basis helps keep momentum going.
- **Embedded private sector involvement to de-risk investment.** Japan supports private sector involvement in the JCM through a structured suite of financial, technical, and institutional tools. These are designed to de-risk investments, lower transaction costs to facilitate deals, and provide incentives for companies to participate in emissions-reduction projects abroad.

Japan's success under Article 6 shows that the window for early-mover advantage is closing as more countries enter the space. For over a decade, Japan has actively used its JCM to secure long-term benefits, leveraging climate co-operation to promote its technologies abroad and deepen trade and diplomatic relationships. Canada would be wise to act now, mobilizing its own Article 6 strategy before it loses ground in key energy transition markets.

Canada's next moves: key recommendations

So far, Canada has mostly talked a good game on ITMOs. Now it's time to move from talk to action. That means defining a clear institutional path forward. Japan's experience with the JCM offers a tested and structured model upon which Canada can build.

Here are the main actions to follow:

- **Establish a national Article 6 co-ordination mechanism,** housed within Environment and Climate Change Canada and supported by Global Affairs and Energy and Natural Resources Canada. This mechanism would lead to bilateral co-operation, set standardized methods, manage project approvals and credit issuance, and co-ordinate with provinces and territories to ensure participation across jurisdictions. It could also draw from Japan's open-source methodologies under the JCM to develop project templates, MRV systems (monitoring, reporting, and verification), and governance protocols. Japan's inter-ministerial co-ordination structure shows how effective centralized oversight can be in advancing Article 6 and climate co-operation more broadly.
- **Focus on technology and energy co-operation.** Rather than treating Article 6 as an NDC compliance mechanism, Canada should see it as an opportunity to support its clean technology and energy sectors. Promoting Canadian clean tech abroad can reinforce Canada's comparative advantages while generating credible international mitigation outcomes. This approach would align climate action with trade and foreign policy goals, just as Japan has done.
- **Launch bilateral pilot projects where strong relationships already exist.** These early efforts would allow Canada to build institutional capacity, test implementation systems, and demonstrate the value of international co-operation. A public-private advisory group would strengthen implementation, providing early-stage policy design and pilot feedback. Like Japan, Canada should prioritize practical progress over perfect system design.
- **Leverage existing finance and deal-facilitation mechanisms.** There is no need to create new institutions from scratch. Canada can work with existing export finance and clean technology support systems, such as Export Development Canada, the Canada Growth Fund, and the Clean Growth Hub. A pragmatic, modular approach will help Canada move quickly while avoiding the delays that come with large scale institutional realignment.
- **Focus on sustainable development and host country priorities**. Crucially, Canada should position Article 6 not only as a tool to deliver mitigation outcomes or sell products, but as a vehicle for mutual benefit. Projects should aim to support partner countries' development priorities while transferring Canadian expertise and technology.

Canada has a narrow window to move from discussion to delivery. Learning from Japan, the path forward is clear.

> As Japan has shown, attention to co-benefits, including capacity building, skills development, and sustainable development outcomes, can increase the credibility and attractiveness of international partnerships.

To operationalize this strategy, Canada should finalize its ITMO framework and begin piloting Paris-aligned co-operation opportunities, following Japan's lead. This framework should be integrated into Canada's overall climate strategy and treated as a complementary channel for technology transfer and emissions reduction. Canada should also immediately begin seeking to develop bilateral agreements with willing partners, using Japan's approach as a model for how to structure, approve, and monitor these deals.

At the same time, Canada should leverage its experience in carbon markets to participate as both a buyer and a seller of emissions reductions and removals. A national ITMO framework should guide federal, provincial, and territorial engagement, enabling international units to be recognized in large-emitter trading systems and under regulations via the *Canadian Environmental Protection Act, 1999*. Standardized guidance should be developed to support provincial adoption, and protocols for validation and bilateral credit transfer should be put in place in line with Article 6.4 requirements.

Canada has a narrow window to move from discussion to delivery. Learning from Japan, the path forward is clear.

Conclusion

As geoeconomic risks grow and emissions reduction costs rise quickly with more ambition, maintaining access to credible international units gives Canada the flexibility to enhance climate action. At the same time, embedding ITMOs within Canada's development assistance and global finance commitments can help promote Canadian technology while advancing global sustainable development goals.

The case for immediate action to establish the institutional framework needed to pursue ITMOs is clear. Here are five key points that underscore the need for the federal government to act now:

1. **Canada is off track to meet its 2030 climate target, and ITMOs offer a credible, cost-effective way to enhance ambition.** With economic and population growth continuing to drive emissions upward, Canada needs flexible, lower cost mitigation options. ITMOs can supplement domestic reductions and help bend Canada's emissions curve down.
2. **ITMOs are more than a compliance tool—they provide a platform for trade, technology deployment, and sustainable development.** Canada can leverage ITMOs to expand clean technology exports, build strategic bilateral partnerships, and support Global South development goals. Well-designed projects deliver both emissions reductions and co-benefits such as improved capacity building and energy security. LNG-for-credit deals are likely to fall outside the scope of Article 6 unless they are packaged within a broader decarbonization strategy supported by Canada and can meet strict additionality requirements.
3. **Japan's Joint Crediting Mechanism provides a successful, scalable model for Canada.** Japan has shown how to institutionalize international co-operation under Article 6, with 257 projects in 29 countries and a robust governance model. Canada should adopt a similar approach, using its own institutions and export support tools to facilitate bilateral deals.
4. **Operational guidance from COP29 in Baku clears the path for Canada to act.** With transparency rules, double-counting protections, and SDG alignment now clarified, the international architecture for ITMOs is ready. Canada should immediately develop its own institutional framework, approve bilateral pilot projects, and integrate ITMOs into its national climate strategy.
5. **The window for early-mover advantage is closing, and Canada must act fast.** As more countries enter the ITMO space, credit supply will tighten, prices will rise and investment opportunities will slow. By moving quickly, Canada can secure high-integrity, low-cost credits and position itself as a global leader in climate finance and clean tech deployment.

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