

Svante

# CCUS FUNDING PLAYBOOK

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A Guide to Carbon Tax  
Incentives in North America



# About Svante

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Svante is a purpose-driven, leading carbon capture and removal solutions provider.

Based in Burnaby, British Columbia, our goal of creating world-changing solutions that address climate change and accelerate the global transition to carbon neutrality serves as a major pillar in the fight against the climate crisis.

Our unique, and eco-friendly approach to the carbon capture stems from our patented solid-sorbent technology that allows for easy manageable, modular, and flexible carbon capture project across several different industries.

**Read more** about our technology and carbon capture process.





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# Overview

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## How do Tax Credits Work in the US & Canada?

Even though the world needs carbon capture, utilization, and storage (CCUS) to be deployed quickly and at mass or “gigatonne” scale — along with other technologies such as renewables, hydrogen, and more — the monetization of CCUS has been a notable barrier to adoption.

Before this year’s [Inflation Reduction Act](#) was signed in the US, and before Canada’s investment tax credit for CCUS was introduced in [Budget 2022](#), monetization of CO<sub>2</sub> in these countries wasn’t feasible, as the tax incentives weren’t strong enough to cover the cost of ownership, but that has changed. In this guide, we explain how these new legislative enhancements have created an economically viable way to monetize CO<sub>2</sub> and positioned Canada and the US to become leaders in the CCUS industry.







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# **Carbon Tax Credits in Canada**





# The New Tax Credit

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[Budget 2022](#) proposes a refundable investment tax credit (ITC) for businesses that make eligible expenditures in CCUS. The investment tax credit could be granted to CCUS projects that permanently store the CO<sub>2</sub> captured by an eligible use.

Eligible uses of CO<sub>2</sub> include storage in reserved geological formations and storage of CO<sub>2</sub> in concrete. Enhanced oil recovery (EOR) is not considered an eligible use.

## **What is a refundable investment tax credit (ITC) ?**

A refundable ITC is a credit paid by the federal or provincial government to entities that have made eligible investments in certain industries in the form of buildings, machinery, equipment, or operations — In this case; CCUS.



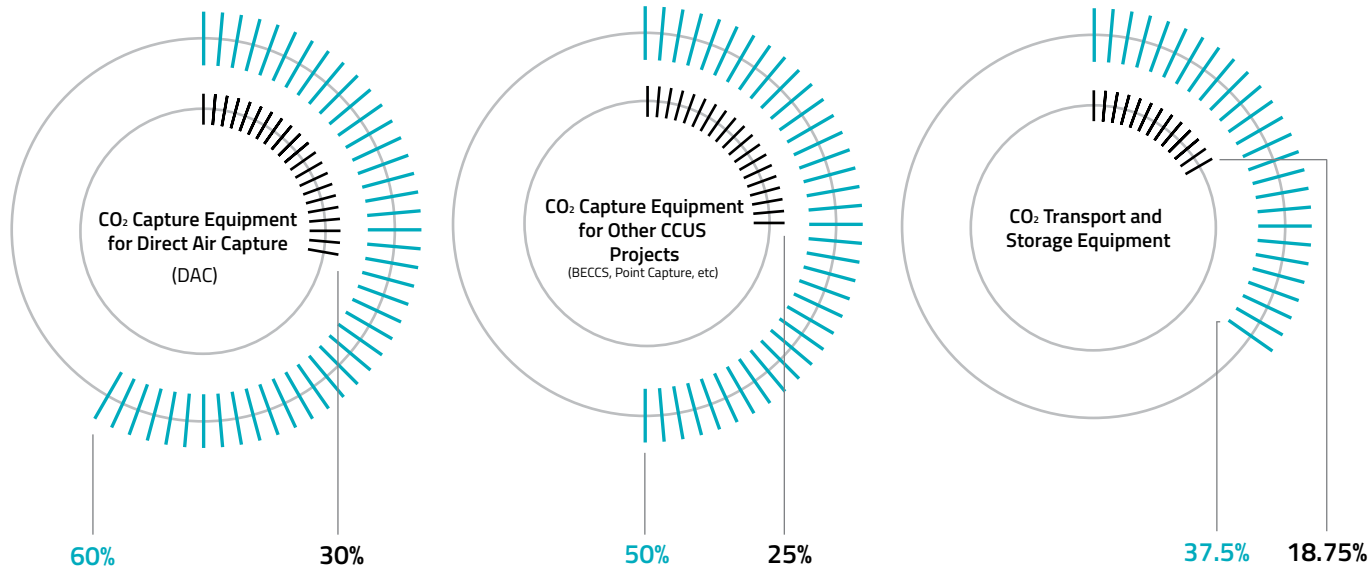


# Investment Credit Rates

**Figure 1: Investment credit rates according to different CCUS projects & time periods**

||| 2022 to 2030

||| 2031 to 2040



Source: Budget 2022

For qualified CCUS expenditures incurred after 2021 and before 2031, credit rates are 60% for qualified carbon capture expenditures used to capture carbon directly from ambient air, 50% for other qualified carbon capture expenditures and 37.5% for qualified carbon transportation, storage or use expenditures (figure 1).

To encourage the industry to move quickly to lower emissions, these rates will be reduced by 50% for the period from 2031 through 2040.





## Tax Credit Budget

The proposed refundable tax credit is expected to cost **\$2.6 billion over five years**, starting in 2022 to 2023, and its annual cost is expected to be approximately **\$1.5 billion from 2026 to 2027**. Going forward, the price of the measure is expected to remain at approximately **\$1.5 billion per year, until 2030**. The government will initiate discussions with the provinces concerned, aiming to further strengthen financial incentives to accelerate the adoption of CCUS technologies.

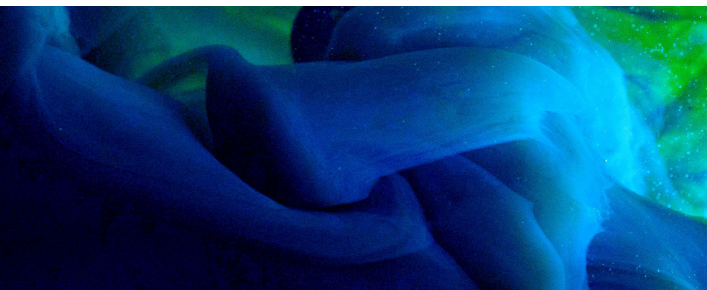
## Eligible Equipment

Investors in CCUS technologies would be able to claim the CCUS Tax Credit on eligible expenses in respect of the tax year in which the expenses are incurred, regardless of when the equipment becomes available for use. The CCUS Tax Credit would not be available for equipment for which a previous owner has received the CCUS Tax Credit.

CCUS equipment would be included in two new capital cost allowance classes: 8% capital cost allowance rate on a declining balance basis for capture equipment (equipment that solely captures CO<sub>2</sub> not including dual purpose equipment), transportation (pipelines or dedicated vehicles for transporting CO<sub>2</sub>), and storage

equipment (sequestration and storage equipment), and 20% capital cost allowance rate on a declining balance basis for use equipment (i.e. equipment required for the utilization for the captured CO<sub>2</sub>.)

These classes also extend to the cost of converting existing equipment for use in a CCUS project, equipment for monitoring and tracking CO<sub>2</sub>, and buildings or other structures that solely support a CCUS project.





## Capital cost allowance rate & declining balance basis explained:

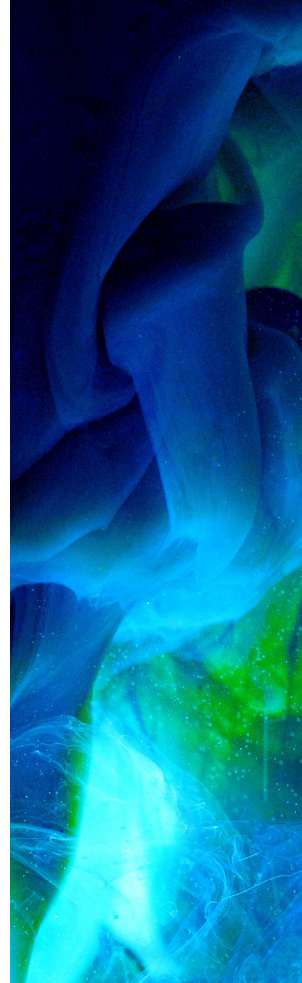
Owners of the carbon credit assets depreciate year over year, as such, the capital cost allowance accounts for asset depreciation over time, meaning payment for these assets will be reduced

## Eligible CO<sub>2</sub> Uses

The CCUS Tax Credit is available for eligible equipment, depending on the end use of the captured CO<sub>2</sub>. Initial eligible uses include dedicated geological storage and storage in concrete, whereas enhanced oil recovery (EOR) would not be eligible.

## Recovery of CCUS Credits

Once projects begin to capture CO<sub>2</sub>, they would be assessed at five-year intervals, up to a maximum of 20 years, to determine if a recovery of the CCUS Tax Credit is warranted. Assessments would be based on the total amount of CO<sub>2</sub> going to an ineligible use over the five-year period being assessed. A recovery would be calculated if the portion of CO<sub>2</sub> going to an ineligible use is more than five percentage points higher than set out in the initial project plans (i.e., the basis on which the CCUS Tax Credit was paid).





## Storage Requirements

### Underground Storage & Geological Sequestration

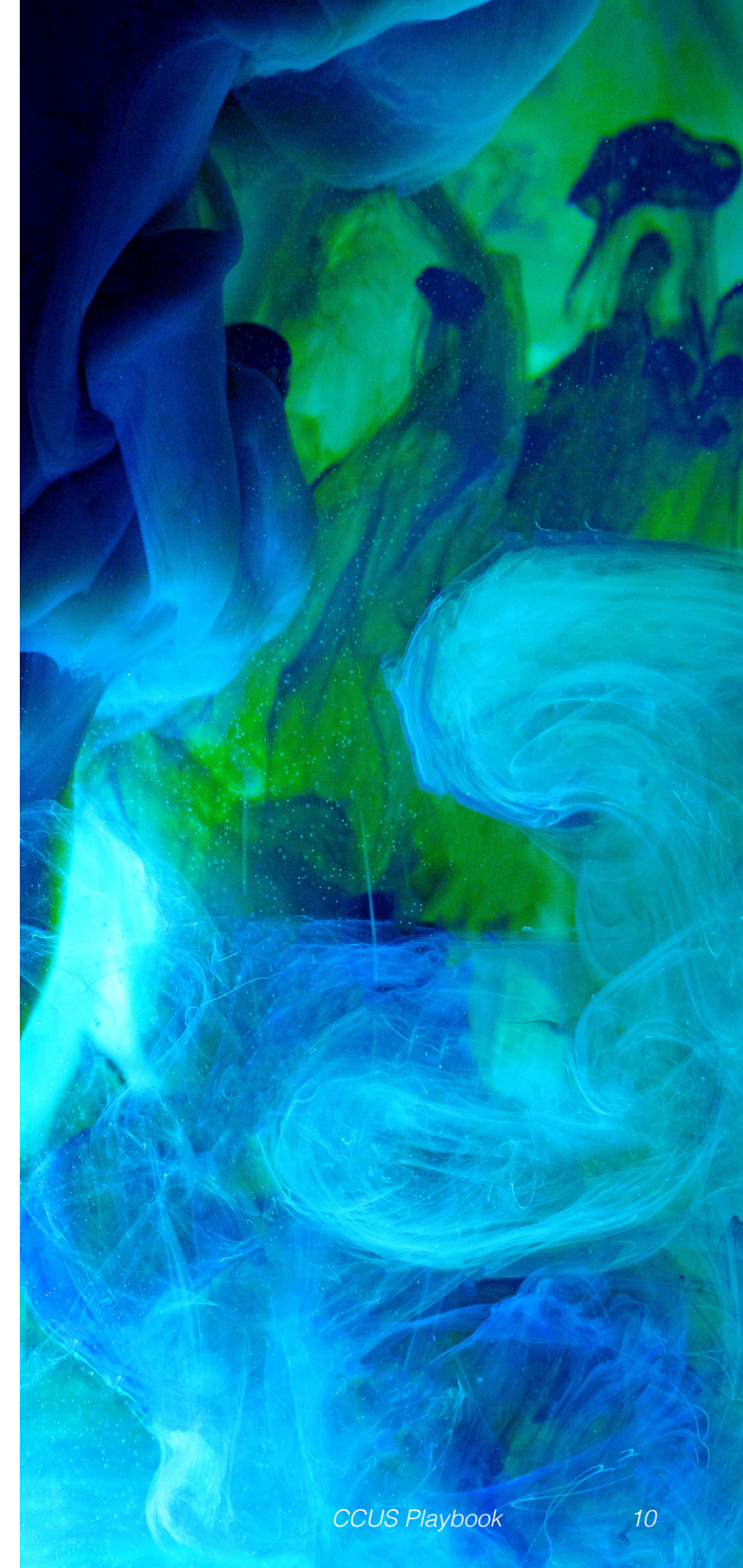
In the case of qualifying dedicated geological storage, the CCUS Tax Credit will only be available to projects in jurisdictions where there are sufficient regulations to ensure that CO<sub>2</sub> is permanently stored as determined by Environment and Climate Change Canada. Initially, the CCUS Tax Credit will only be available to CCUS projects that store the CO<sub>2</sub> in [Saskatchewan or Alberta](#).

All projects will be subject to relevant federal, provincial, and territorial regulations.

### Storage in Concrete

For storage in concrete to be considered an eligible use, the process for using and storing CO<sub>2</sub> in concrete must be approved by Environment and Climate Change Canada and demonstrate that [at least 60 per cent](#) of the CO<sub>2</sub> that is injected into the concrete is mineralized and locked into the concrete produced.

The CCUS Tax Credit would be available in all jurisdictions so long as the process for storing CO<sub>2</sub> in this manner is approved.







## Canadian Carbon Tax

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Since 2019, every jurisdiction in Canada has had a price on carbon pollution. Currently, all provinces and territories are subject to a carbon pricing mechanism, either by an in-province program or by one of two federal programs.

Canada's approach is flexible: any province or territory can design its own pricing system tailored to local needs or can choose the federal pricing system. The federal government sets minimum national stringency standards that all systems must meet to ensure they are comparable and contribute their fair share to reducing greenhouse gas emissions.

As of April 2022, the federal [minimum tax is set at CA\\$50 per tonne of CO<sub>2</sub> equivalent](#), set to increase to CA\$170 in 2030.

### Output-Based Pricing System (OBPS)

The federal OBPS sets a performance standard for each sector under the system. Facilities that are less efficient than the standard have to pay. Those that perform better than the standard will earn credits that they can sell or save for future use. The amount each facility pays depends on the volume of carbon emissions to produce one unit of product.

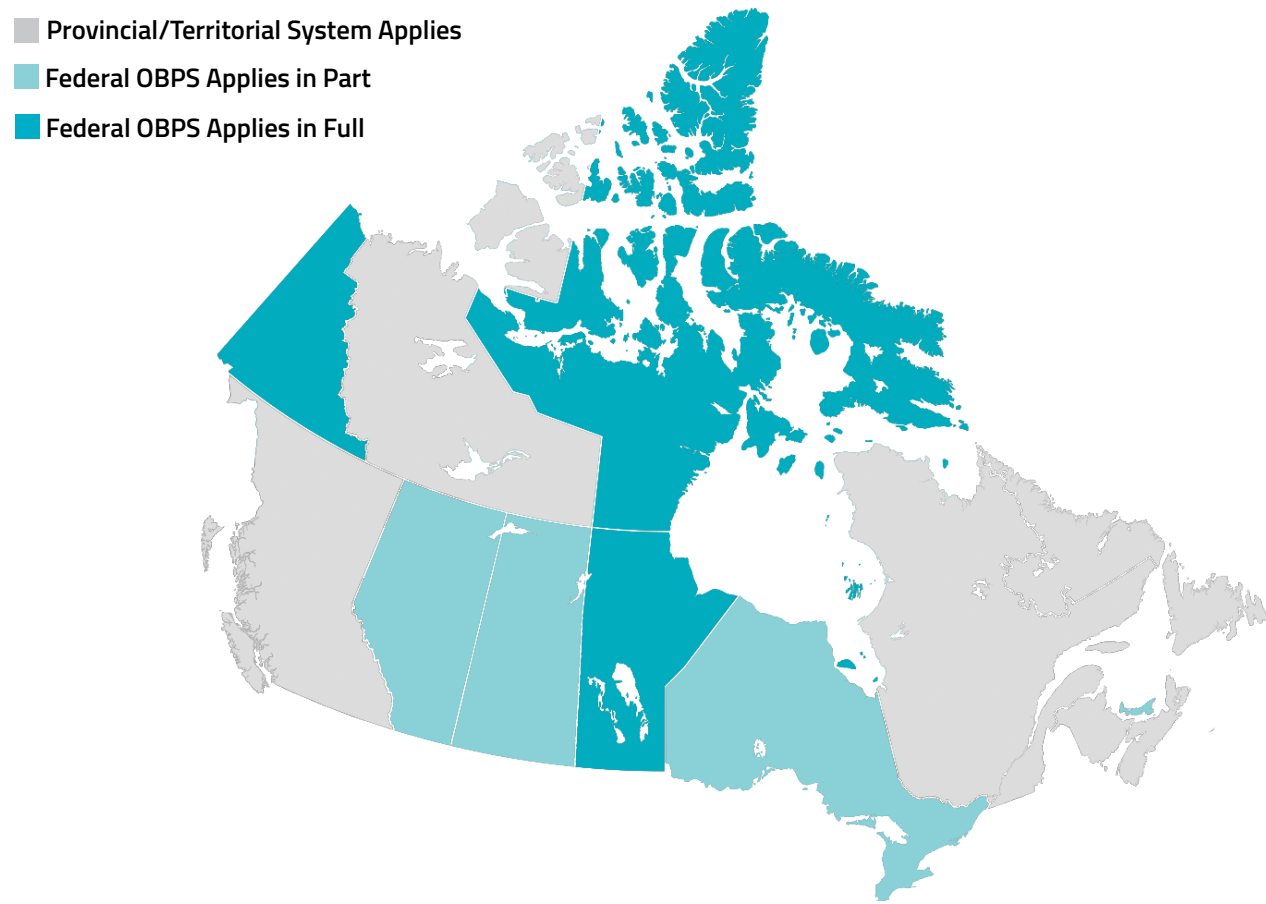
If a facility emits less per unit, it will save money or earn credits. This creates a financial incentive for the continuous reduction of emissions, thus encouraging less efficient facilities to reduce emissions per unit of output, and for strong performers to continue to improve. Although only large emitters are required to join the OBPS, some additional facilities can opt in to take advantage of the benefits from the system.

The federal OBPS has the intent to return all proceeds generated to the province or territory in which they were collected to help further reduce greenhouse gas emissions.



## Carbon Tax Credits by Province

**Figure 2: Carbon pricing systems across different Canadian provinces & territories**



Source: Budget 2022

For qualified CCUS expenditures incurred after 2021 and before 2031, credit rates are 60% for qualified carbon capture expenditures used to capture carbon directly from ambient air, 50% for other qualified carbon capture expenditures and 37.5% for qualified carbon transportation, storage or use expenditures (figure 1).

To encourage the industry to move quickly to lower emissions, these rates will be reduced by 50% for the period from 2031 through 2040.





## Alberta: Provincial OBPS & Federal Carbon Tax

The Technology Innovation and Emissions Reduction Regulation (TIER) applies to facilities in Alberta that emits 100,000 metric tonnes or more of CO<sub>2</sub>e emissions annually. TIER imposes an output based (OPB) emissions benchmark on these facilities, specific to the facility itself or the industry in which it operates.

A TIER-regulated facility has four options for complying with the TIER's requirements:

- 1) improving its facility operating efficiency
- 2) submitting emission performance credits
- 3) submitting emission offsets
- 4) paying for fund credits

## British Columbia: Provincial Carbon Tax

The BC government launched the CleanBC Program for Industry in 2019. The CleanBC Program for Industry directs an amount equal to the incremental carbon tax paid by industry above \$30/tonne into incentives for cleaner operations. The Program is designed for regulated large industrial operations, such as pulp and paper mills, natural gas operations and refineries, and large mines.

The program includes:

- 1) CleanBC Industrial Incentive (CIIP) that reduces carbon-tax costs for operations meeting world leading emissions benchmarks.
- 2) CleanBC Industry Fund that invests some industrial carbon

tax revenue directly into emission reduction projects.

## Quebec: Cap-and-Trade

Quebec's GHG market has been integrated with California through the Western Climate Initiative.

The carbon market is intended for the following emitters:

- 1) Industrial establishments that emit 25,000 metric tonnes or more of CO<sub>2</sub>e annually.
- 2) Electricity producers and importers that emit 25,000 metric tonnes or more of CO<sub>2</sub>e annually.
- 3) Distributors of fossil fuels used in Quebec.

The minimum price per metric tonne of CO<sub>2</sub>e increases annually by 5%. As of 2021, the minimum price is set at \$17.36 (USD \$12.94) for Quebec.



## Saskatchewan: Provincial OBPS

The Saskatchewan OBPS Program meets the requirement for the 2023-2030 federal carbon pricing benchmark, including the addition of the electricity generation and natural gas transmission pipeline sectors.

The new federal benchmark requires provincial and territorial carbon pricing programs to follow a schedule that, at a minimum, matches the federal carbon pricing schedule, which will increase by \$15 per year from \$65 per tonne CO<sub>2</sub>e in 2023 to \$170 per tonne CO<sub>2</sub>e in 2030.

Saskatchewan's OBPS program currently awards performance

credits to regulated facilities that have reduced emissions by at least 10, 15, or 20 per cent (depending on the sector) below their permitted emissions in a given year.

## Nova Scotia: Cap-and-Trade

Nova Scotia's cap-and-trade program took effect on January 1, 2019.

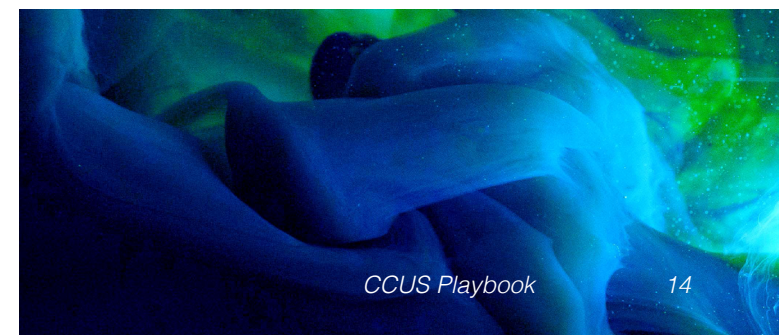
The following are mandatory participants and must participate in Nova Scotia's cap-and-trade program:

- 1) facilities generating 50,000 tonnes or more per year of GHG emissions from sources that are covered by the QRV regulations.
- 2) petroleum product suppliers that first place 200 litres of fuel or more per year on the Nova Scotia market for consumption in the

province. Petroleum products include automotive gasoline, diesels, light fuel oils (No. 1, 2), heavy fuel oils (No. 3, 4, 5, 6), and propane.

- 3) natural gas distributors that deliver natural gas for consumption in Nova Scotia that, when combusted, produces 10,000 tonnes of GHG emissions or more per year.

- 4) electricity importers that import electricity into the province for consumption in the province and whose greenhouse gas emission from the generation of the electricity imported is greater than 10,000 tonnes of GHG per year.





## Ontario: Provincial OBPS

Ontario's Emissions Performance Standards (EPS) program was fully implemented at the beginning of 2022, replacing the more costly federal Output-Based Pricing System that was in place in Ontario from 2019 to 2021.

Facilities emitting 10,000 tCO<sub>2</sub>e or more are eligible for the EPS program.

## New Brunswick: Provincial OBPS

The New Brunswick output-based pricing system (the "NB OBPS") is used to regulate GHG emissions from large emitters, which includes New Brunswick's industrial and electricity generation sectors. Facilities emitting 50,000 tonnes

or more of carbon dioxide equivalent (CO<sub>2</sub>e) emissions annually in the province became subject to the NB OBPS.

Facilities emitting between 10,000 tonnes and 50,000 tonnes of CO<sub>2</sub>e or more have the option to participate in the NB OBPS by "opting-in".

New Brunswick is exploring the following compliance flexibility mechanisms:

1) Climate Change Fund Credits: Purchasing Climate Change Fund credits from New Brunswick's Climate Change Fund. These credits would be priced at the federal level of \$20 per tonne in 2019 increasing by \$10 annually to a maximum of \$50 per tonne in 2022.

2) Performance Credits: Performance credits are awarded to a facility which exceeds its performance

standard. New Brunswick is still exploring the various options under which performance credits could be awarded. It is anticipated that these credits would be bankable by a facility and tradeable across facilities. Similar to other trading systems, the value of the performance credit would be determined by the New Brunswick market.

3) Offset Credits: Offset credits are verified projects administered by people, businesses or organizations not directly subject to the OBPS program. These projects reduce or remove GHG emissions from the atmosphere; building on the premise that GHG emissions should be reduced wherever that can be achieved at the lowest cost. Similar to the performance credit, the value of the offset credit would be determined by the market.



## **Newfoundland and Labrador: Provincial carbon tax & OBPS**

Newfoundland and Labrador's carbon pricing program was approved by the federal government on October 23, 2018. The provincial government's "hybrid" carbon pricing program came into effect on January 1, 2019, and has two key elements:

- 1) a carbon tax applied to combusted fossil fuels across the economy under the Revenue Administration Act, except where exemptions are provided, at the price of \$30/tonne of CO<sub>2</sub> equivalent as of October 1, 2020.
- 2) a performance standard system under the Act for both onshore and offshore large industrial facilities and large-scale electricity generation that emit more than

25,000 tonnes of GHG emissions annually. Existing large industrial facilities and large-scale electricity generation will be required to reduce their GHG emissions by 10% in 2021, and 12% in 2022.

## **Manitoba, Nunavut, Prince Edward Island and Yukon: Federal Backstop**

The federal carbon pricing backstop applies in jurisdiction that do not have a carbon pricing system in place. The backstop will also supplement systems that do not fully meet the benchmark.

- The federal carbon pricing backstop is composed of two key elements:
- 1) A carbon levy applied to fossil fuels
  - 2) An OBPS for industrial facilities that emit above a certain threshold,

with an opt-in capability for smaller facilities with emissions below the threshold.

Both the carbon levy and the output-based pricing system will price carbon on a CO<sub>2</sub>e basis. As of 2022, the minimum benchmark price for CO<sub>2</sub>e is \$50 per tonne.



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# **Carbon Tax Credits in the US**





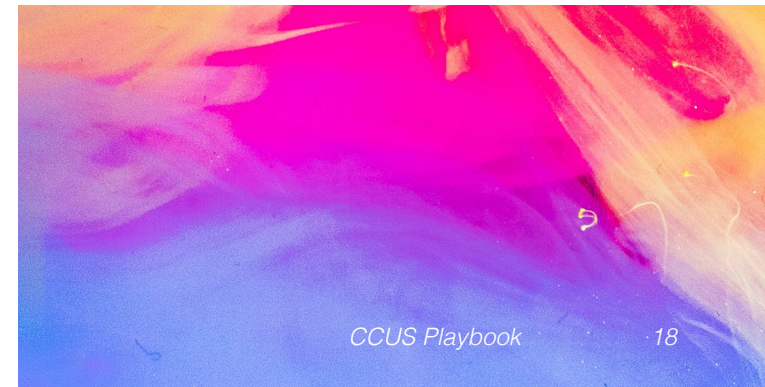
# The Inflation Reduction Act of 2022

The [Inflation Reduction Act \(IRA\) of 2022](#), which was passed on August 12th, 2022, marks a monumental leap forward for the viability of wide scale deployment of industrial carbon capture, utilization, and storage (CCUS) technologies in the United States. With the enhancements made to the [45Q tax credit](#) via the IRA in conjunction with the Net Zero (NET Zero) Act of 2021, entities in the energy and industrial sectors now have stronger incentives in place to adopt CCUS technologies due to the lower barrier to entry achieved by the new legislative framework.

With the 45Q tax credit brought up at [\\$85/tonne](#), projects can be viable with a [fence-line cost of capture around \\$50](#) (O&M plus a capital recovery factor for 11% returns). This leaves enough to cover project contingencies, transportation, and storage (transportation and storage is currently \$20-\$30/tonne, but at scale it should be approximately \$10-\$15/tonne).

The 45Q tax credit is computed per metric ton of qualified carbon oxide captured and sequestered. For the purposes of the tax credit, qualified carbon oxide is a carbon oxide that

would have been released into the atmosphere if not for the qualifying equipment.

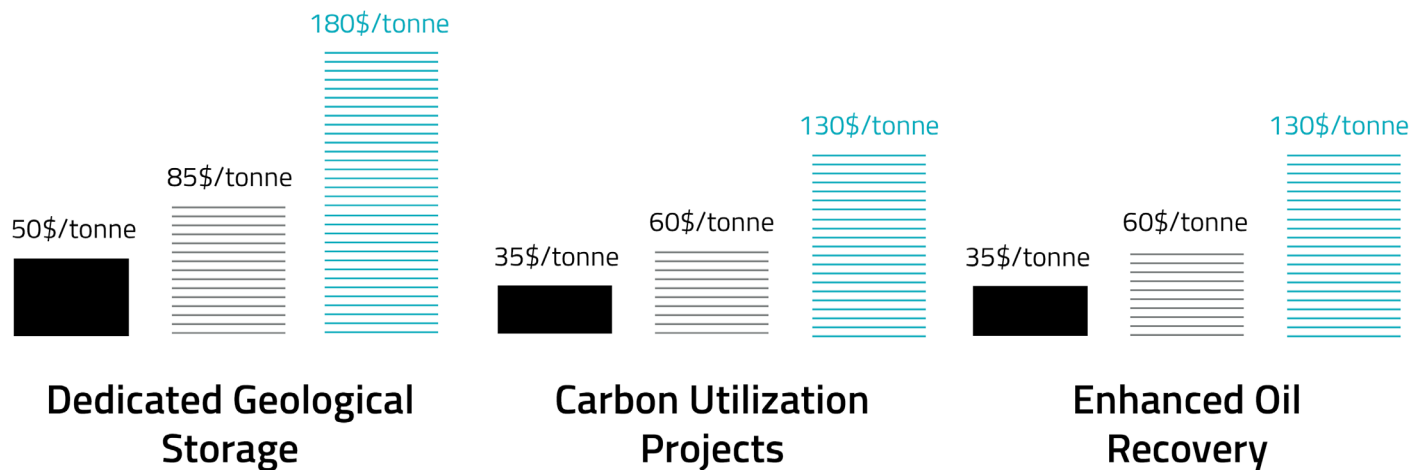




# Credit Value Increases

**Figure 3: 45Q Tax Credit changes under the Inflation Reduction Act (IRA)**

- 45Q Tax Credit Value in 2018 Future Act
- ≡ New 45Q Tax Credit in IRA: Industry & Power
- ≡ New 45Q Tax Credit in IRA: Direct Air Capture



Previous iterations of the 45Q tax credit lacked the necessary value to effectively jumpstart the deployment of CCUS in heavy industry, posing a significant investment and commercial risk.

The most recent enhancements to 45Q through the signing in of the IRA has created a favorable environment for businesses, investors and industries to monetize CO<sub>2</sub> and achieve net zero objectives.

Source: Carbon Capture Coalition



## Extension of the Commence Construction Window

The eligibility requirements for the 45Q tax credit have been made more accessible via the IRA, with the most significant enhancement being the extension of the commence construction window, which has been shifted to [January 1st, 2033 – a seven-year extension](#) from the previous January 1st, 2026 deadline.

CCUS projects that commenced construction prior to the 2033 deadline qualify for 45Q, significantly reducing investor risk through the expansion of the investment horizon, as it provides adequate time for the CCUS market and related technologies to develop.

## Direct Pay Option

With the IRA, entities are given the choice to utilize a direct pay option for the full value of the tax 45Q tax credits, allowing project developers to potentially secure greater private capital investments in CCUS projects.

The direct pay option is divided into categories, depending on the nature of the entity.

### [For-Profit Entities:](#)

Project developers can access direct pay for the full value of the tax credit for the first five years after the carbon capture equipment has been placed in service. The remaining seven years of the credit must be financed through alternative means.

### [Tax-Exempt Entities:](#)

These enhancements are even more expansive for tax-exempt organizations, i.e., non-profit projects, cooperatives, and municipal utilities, which have the option to access direct pay for the entire twelve years of the credit.

## Expanded Transferability

The alternative to direct pay is that entities can now transfer 45Q tax credits to other taxpaying entities, with the benefit of receiving a cash payment for the transfer.

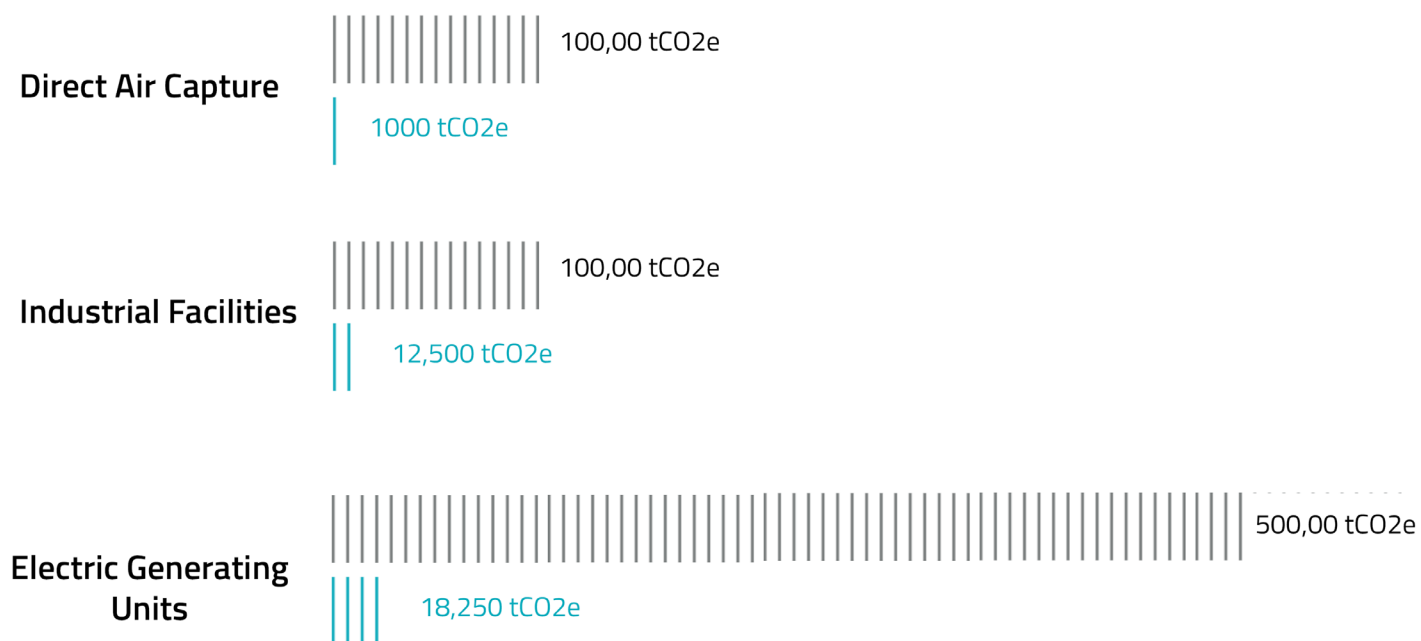
This allows for greater flexibility for CCUS investors to transfer their tax credits to taxpayers with tax liability, resulting in the creation of a market for monetizing 45Q tax credits.



# Lower Capture Thresholds

**Figure 4: Changes to Capture Thresholds in the Inflation Reduction Act (IRA)**

||| 45Q Capture Threshold in 2018's POWER Act (in metric tonnes of CO<sub>2</sub>e per year)  
||| New 45Q Capture Threshold in IRA (in metric tonnes of CO<sub>2</sub>e per year)



The IRA drastically lowers the barrier of entry for new projects to qualify for the 45Q tax credits by drastically lowering the carbon capture thresholds required to claim the tax credit, incentivizing more entities to reach these attainable thresholds.

Along with the lower capture thresholds, carbon utilization projects are now subject to individual project thresholds in the updated 45Q introduced in the IRA.

Source: Carbon Capture Coalition



The background is a vibrant, abstract composition of swirling colors. It features a mix of deep reds, purples, and blues, with wispy, smoke-like patterns in shades of green and white. The overall effect is dynamic and ethereal, with a dark, almost black, background that makes the colors stand out.

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**ITC & 45Q  
Comparison**





## CO<sub>2</sub> Capture Plant Economics Illustration

**Figure 5: Tax credit illustration of a carbon capture plant in Canada & the US**

	Canada	US
Average CO <sub>2</sub> Production (tonnes/day)	3,000	3,000
Total Plant Capex (USD millions)	\$220.6	\$220.6
Project Development Period (years)	1	1
Project Construction Period (years)	2	2
Tax Credit Mechanism	Refundable Federal ITC (50% Capex)	45Q Production Tax Credit (\$85/Tonne)
Project Leverage	27% Project Debt (50% of Total Cost After ITC)	50% Project Debt
Marketed Emissions Credits (USD\$/tonne)	\$0.00	\$0.00
Levered Return on Equity	8.6%	22.5%

To the left is an illustrative model\* of a 220.6 million US Dollar carbon capture plant, capturing 3000 metric tonnes of CO<sub>2</sub> per day, for 12 years.

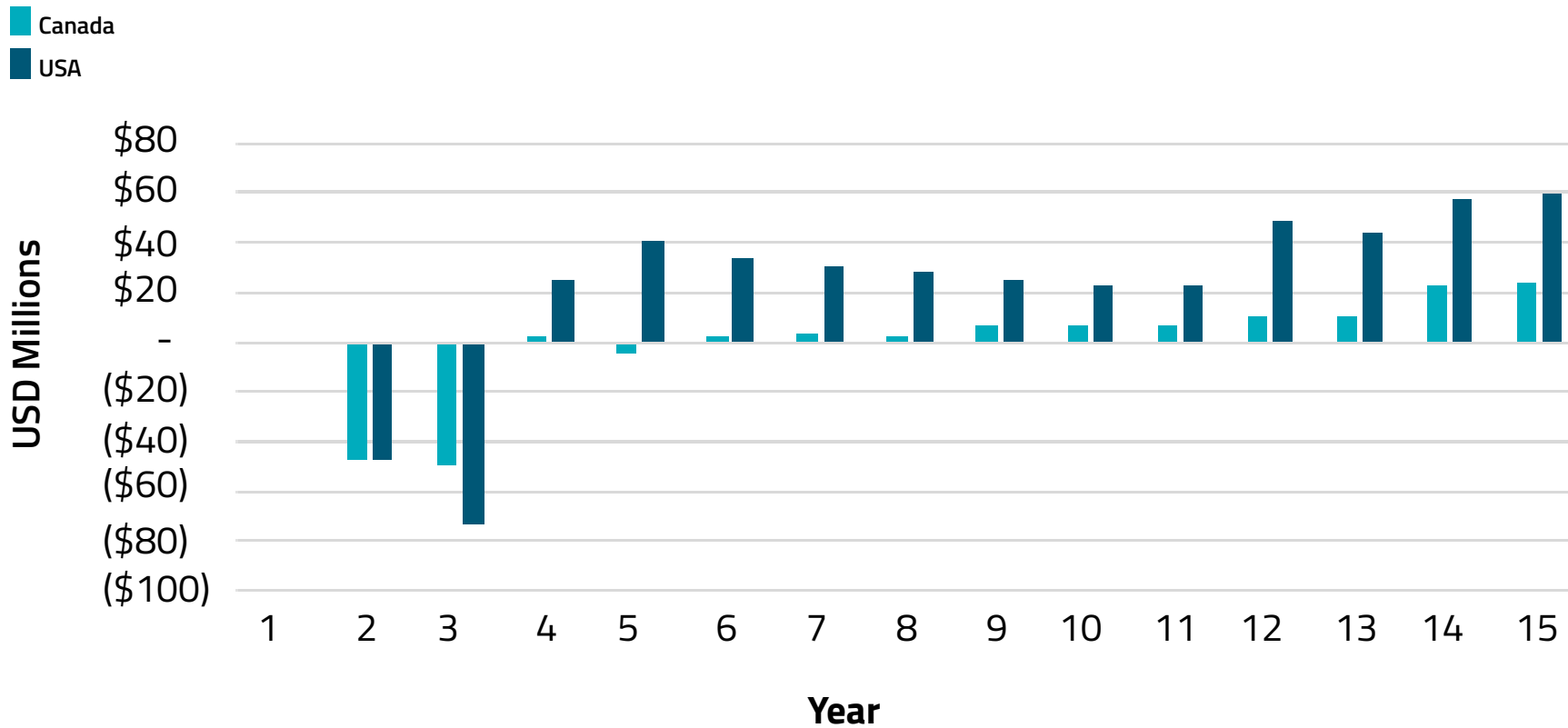
The purpose of the table is to demonstrate and compare the levered return on equity via the different tax mechanisms in Canada and the US, respectively.

*\*Based on Svante management's economic model.  
Figures may vary due to future changes in economic models and legislation.*



# Illustrative Free cash Flow to Project Owners

Figure 6: Free cash flow illustrative model across a project's lifetime



\*Based on Svante management's economic model.  
Figures may vary due to future changes in economic models and legislation.

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Conclusion &  
Next Steps







# Conclusion

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With these government tax incentives put in place in Canada & the US, marking the most progressive push towards carbon capture, CCUS technologies now have the necessary support to roll out wide-scale projects due to the attributed risk and barrier to entry being significantly reduced—if not entirely removed.

Canada's own Carbon Investment Tax Credits provide businesses with long-term tax incentives that significantly reduce the cost of rolling out CCUS facilities, equipment, and operations; going so far as to provide a basis in which to monetize the captured CO<sub>2</sub> as well as the tax credit itself.

The USA'S Inflation Reduction Act (IRA) of 2022 has largely bolstered the viability, appeal, and value of the 45Q tax credit, transforming it into an instrumental tool for the large-scale deployment of CCUS projects in the U.S.

With the new legislation and tax incentives in both countries working in conjunction with one another, CCUS' economic viability has essentially been achieved; spurring North America into becoming a leader in CCUS.

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**Still have questions?**

Reach us at [svanteinc.com/contact](http://svanteinc.com/contact) for inquiries