

Nova Scotia's Cap and Trade Program

Regulatory Framework

Nova Scotia Environment



Nova Scotia's cap-and-trade program took effect on January 1, 2019. This document was updated in May 2019 to reflect the launch of the program and is consistent with the Cap-and-Trade Program Regulations, which were published in November 2018.

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Nova Scotia's Cap-and-Trade Program: Regulatory Framework

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Glossary

Account application: The process of applying for an account for a mandatory participant in the online system. This is the second step in the process, completed after a user is registered (user registration).

Allowance auction: An auction held by the province at which mandatory participants can bid for available emission allowances.

Cap: The maximum amount of emission allowances that the province will create each year.

Cap-and-trade program: A market program where there is a limit, or “cap”, on the total amount of greenhouse gas emissions from covered sources allowed in the province. Mandatory participants in the program are required to submit emission allowances for each tonne of greenhouse gas they are responsible for.

CITSS: The Compliance Instrument Tracking System Service (CITSS) is the emission allowance tracking system Nova Scotia uses to administer its cap-and-trade program.

CO₂e: Carbon dioxide equivalent is a metric used to standardize emissions from greenhouse gases.

Compliance account: Each mandatory participant has this account where it must place the emission allowances it wants to use to demonstrate compliance for a given period.

Compliance period: A period of time determined by the province during which mandatory participants must place sufficient emission allowances in their compliance accounts to match their greenhouse gas emissions for that same period.

Emission allowance: An instrument that is equivalent to one tonne of carbon dioxide equivalent (CO₂e). Only emission allowances created by the province can be used for compliance purposes in Nova Scotia’s cap-and-trade program.

General account: An account that each mandatory participant has to receive emission allowances from the province, hold emission allowances prior to sending them to the compliance or limited use holding accounts, or trade emission allowances with another mandatory participant.

Green Fund: A fund that receives all revenue from the sale of emission allowances, collection of applicable fines, and accrued income which will support provincial climate change initiatives.

GHG: Greenhouse gas, meaning carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), nitrogen trifluoride (NF₃), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

Holding limit: The maximum number of emission allowances that a mandatory participant is permitted to have in their accounts.

Limited Use Holding Account: An account that each mandatory participant has to transfer their emission allowances to be sold on consignment at auction.

Mandatory participant: An emitter that is required to register and participate in the cap-and-trade program.

Offset credit: A compliance instrument that represents a reduction, avoidance, or removal of one tonne of CO₂e from an uncovered source. Offset credits are issued to approved projects that are in accordance with government approved protocols.

QRV Regulation: N.S. Reg. 29/2018, Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulations made under the Environment Act.

Secondary market: The market where mandatory participants are able to trade emission allowances amongst one another after distribution from the province.

True up: The process by which all mandatory participants demonstrate compliance with the cap-and-trade regulation. This is done by mandatory participants submitting into their compliance accounts emission allowances equal to their verified GHG emissions in the preceding compliance period.

User registration: The process of obtaining an identifier for individuals to have access to the electronic system, CITSS.

Vintage: The year in which an emission allowance is created for.

Nova Scotia's cap-and-trade regulatory framework

On December 9, 2016, Nova Scotia endorsed the Pan-Canadian Framework on Clean Growth and Climate Change. The framework is a collective commitment from the federal, provincial, and territorial governments to grow our economy while reducing greenhouse gas (GHG) emissions and building resilience to adapt to a changing climate.

Nova Scotia established a cap-and-trade program to support the Pan-Canadian Framework's commitment to price carbon pollution across Canada.

In the spring of 2017, Nova Scotia Environment asked Nova Scotians for their advice on design options for the cap-and-trade program. We published public comments on the program design in the *What We Heard* summary released in August 2017.

In October 2017, Nova Scotia amended the Environment Act to allow the province to implement a cap-and-trade program. Regulations setting out how to quantify, report, and verify GHG emissions followed in February 2018 to support the development of the cap-and-trade program.

The regulatory framework presented here offers specific information about GHG caps (amount of emission allowances in the program), allocation of emission allowances, and how the cap-and-trade program will work.

Cap-and-trade regulations were finalized in the fall of 2018 and the program officially launched on January 1, 2019. By developing a made-in Nova Scotia program, we avoided the imposition of the federal government's backstop carbon pricing program.



Figure 1: Cap-and-trade program milestones

Nova Scotia's greenhouse gas emissions

Nova Scotia is a national leader in reducing GHG emissions. Emissions within the province have been declining over the past decade. In 2007, Nova Scotia set a target in legislation to reduce GHG emissions to at least 10% below 1990 levels by 2020. According to the most recent data, Nova Scotia's GHG emissions were 16.1 million tonnes of carbon dioxide equivalent (Mt CO₂e) in 2016. This means that we are already 18% below 1990 levels and 30% below 2005 levels. We expect to continue our successful record of reducing GHG emissions.

Most of Nova Scotia's GHG emissions, about 44%, come from the electricity sector. These GHGs come from burning fossil fuels such as coal, oil, and natural gas to produce electricity. Transportation (31%) is the second largest contributor followed by heat for residential buildings (8%). This includes home heating systems that burn fossil fuels, like furnace oil, propane, or natural gas. It does not include electricity used for home heating, which is accounted for under the electricity sector (Figure 2).

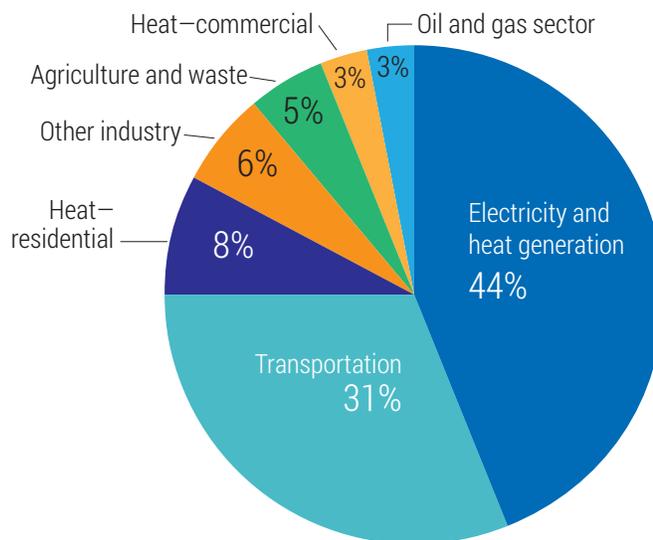


Figure 2: Nova Scotia GHG emissions by sector, 2016 (source: National Inventory Report 2018: Greenhouse Gas Sources and Sinks in Canada; Nova Scotia Power Inc. GHG report, 2017).

Nova Scotia's 2030 GHG target

By 2030, we plan to reduce GHG emissions to 45–50% below 2005 levels (Figure 3). Our target is one of the most ambitious in Canada, and bolder than the federal target of 30% below 2005 levels by 2030. We will achieve this new target through a variety of policies and programs, such as the cap-and-trade program, investments in efficiency, green infrastructure, innovation, and a transition of Nova Scotia's electricity grid to a cleaner energy future.

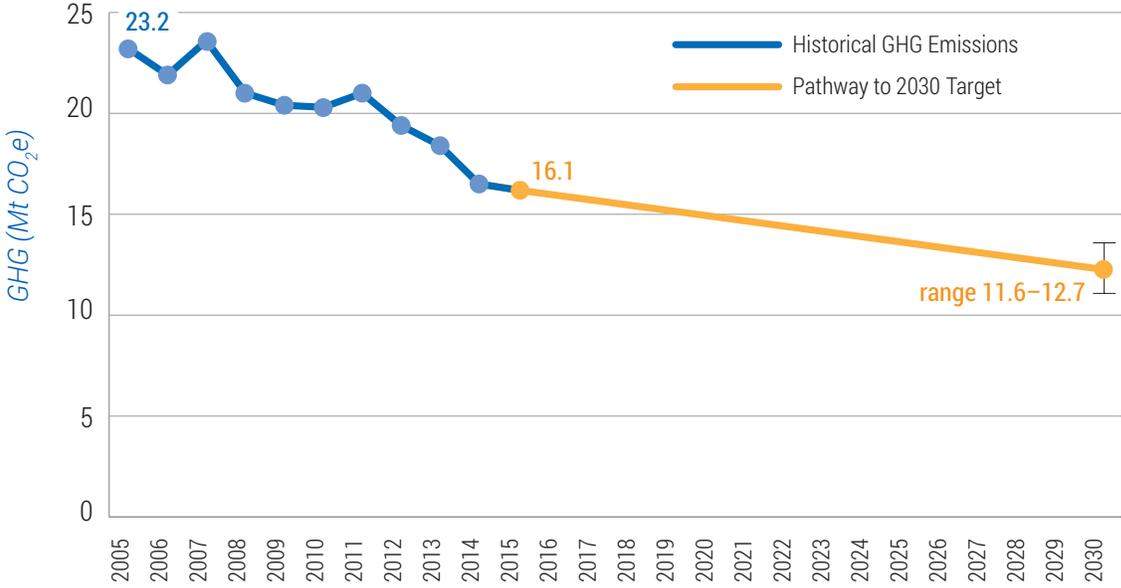


Figure 3: Trajectory to Nova Scotia's new 2030 GHG target

Nova Scotia's cap-and-trade program

Nova Scotia's cap-and-trade program sets yearly limits or "caps" on the total amount of GHG emissions allowed in the province for the years 2019–2022. Each year, the province creates a set number of emission allowances that can be put in circulation equal to that year's cap. The province distributes most of the emission allowances free of charge to mandatory participants, some are sold through auction, and some are set aside for sale through a government-held reserve. Mandatory participants can also buy emission allowances on the secondary market from another participant who has emission allowances for sale.

The compliance period is from 2019–2022. Each year, the cap declines, which means fewer emission allowances are available and there is a greater incentive to find ways to reduce GHG emissions. In December 2023, after verified GHG reports for 2022 are submitted, mandatory participants will need to true up and have in their compliance account one emission allowance for each tonne of GHG emissions that they emitted over the course of the compliance period.

Emission allowance: An instrument that is equivalent to one tonne of carbon dioxide equivalent (CO₂e). Only emission allowances created by the province can be used for compliance purposes in Nova Scotia's cap-and-trade program.

Some companies are required by law to participate in the cap-and-trade program. These are called mandatory participants and are the only companies that directly participate in the program. Mandatory participants are defined according to whether they exceed a set threshold, as defined on page 7. Companies who fall below the thresholds listed on page 7 cannot participate in the program. They are not required to quantify, report, and verify their GHG emissions, and they are not required or eligible to acquire emission allowances. While non-participants have no compliance obligations under the cap-and-trade regulations, the program results in increased costs as mandatory participants pass on the carbon price.

At this time, only emission allowances created by the province are recognized under the Nova Scotia cap-and-trade program. In some cap-and-trade programs, participants can trade their emission allowances with participants in another jurisdiction because their systems are linked. Nova Scotia does not plan to link at this time. Instead, all trading, investment opportunities, and actual GHG emission reductions will happen in Nova Scotia.

Features of the cap-and-trade program

Nova Scotia's cap-and-trade program is outlined below:

1. Program scope
2. Caps
3. Program registration in Compliance Instrument Tracking System Service (CITSS)
4. Distribution of emission allowances free of charge
5. Distribution of emission allowances by auction
6. Trading: Sales of emission allowances between participants
7. Reserve
8. Cost pass-through for fuels with regulated prices
9. Offsets
10. Enforcement and compliance
11. Green Fund

Program scope

This section identifies who is required to participate in the cap-and-trade program and the sources of GHG emissions that are included in the program.

Who must participate in the cap-and-trade program?

Companies in Nova Scotia who are required to verify GHG emissions under the Quantification, Reporting, and Verification (QRV) regulations made under Section 112Q of the Environment Act are regulated mandatory participants under the cap-and-trade regulations.

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

- facilities generating 50,000 tonnes or more per year of GHG emissions from sources that are covered by the QRV regulations
- 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.
- 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
- 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.

What GHG emissions are covered in the cap-and-trade program?

Mandatory participants in the cap-and-trade program are responsible for all GHG emissions for which they are required to provide annual verified reports under the QRV regulation. The cap-and-trade program covers approximately 80% of GHG emissions in Nova Scotia.

Here is a list of specified GHG activities where associated GHG emissions are covered by the regulations:

- cement production
- electricity importation
- electricity generation
- operation of equipment for a transmission system or a distribution system (electricity)
- general stationary fuel combustion
- natural gas distribution

- operation of equipment related to the transmission, storage, and transportation of natural gas
- petroleum and natural gas production and natural gas processing
- supplying petroleum products
- pulp and paper production
- any other specified GHG activities defined in the QRV regulation

The following GHG emissions are not included in Nova Scotia's cap-and-trade program:

- GHG emissions from non-combustion sources in agriculture and waste sectors
- GHG emissions from offshore oil and gas production
- coal mine methane
- GHG emissions from coal storage
- industrial process emissions
- carbon dioxide emissions from combustion of biomass
- fugitive natural gas emissions from the operation of equipment related to the transmission, storage, and transportation of natural gas
- fugitive hydrofluorocarbon (HFC) emissions from the operation of cooling units at electricity generators
- fugitive gas emissions from the operation of geothermal electricity generating facilities
- GHG emissions from industrial wastewater
- GHG emissions from fuels used in aviation and marine applications
- any specified GHG activities not defined in the QRV regulations

Subject to amendments in the QRV regulations, all companies whose verified GHG emissions exceeded the verification threshold in their 2018 GHG Report will become mandatory participants regulated under the cap-and-trade program. The process for including those who exceed the threshold in later years is described in the User Registration section.

What happens when a mandatory participant falls below the threshold, ceases operation, or closes?

Mandatory participants are no longer required or permitted to participate in the cap-and-trade program if their verified emissions fall below the threshold for 3 years in a row. In the event that the mandatory participant ceases engaging in specified GHG activities permanently, all GHG emissions up to that date need to be covered by emission allowances for compliance purposes. All emission allowances received from the province by way of free allocation, that are not used for compliance purposes, will need to be surrendered to the province by December 31 of the year of the final verification report.

Can non-mandatory participants participate voluntarily?

In some cap-and-trade programs, voluntary participation is possible for non-emitters (e.g., individual persons) and emitters that do not meet the threshold to become a mandatory participant (e.g., less than 50,000 tonnes GHG annually). No voluntary participation is allowed in Nova Scotia's cap-and-trade program at this time.

The caps

The cap-and-trade program includes a cap, or emissions limit, that applies to covered GHGs. The process of setting the caps was completed using Environment and Climate Change Canada's (ECCC) federal carbon pricing benchmark guidance. The caps represent incremental reductions from business-as-usual (BAU) projections - the GHG emissions that would likely be released in Nova Scotia in the absence of a carbon price.

Figure 4 compares Nova Scotia's GHG emission projections for all covered emission sources with and without the cap-and-trade program.

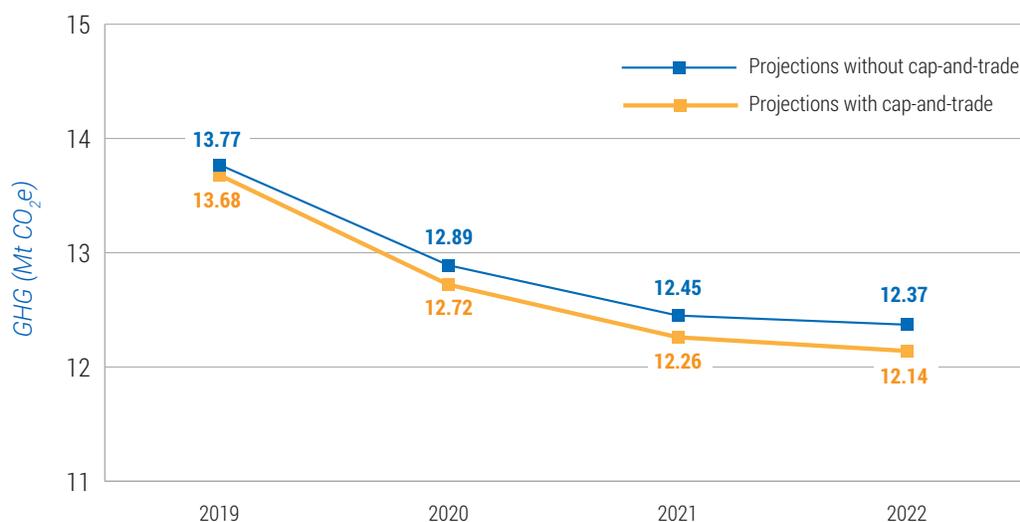


Figure 4: Nova Scotia's projected GHG emissions with and without cap-and-trade for all covered emissions: 2019–2022

Caps are set annually, but there is a 4-year compliance period (2019–2022) to provide year-to-year flexibility for mandatory participants.

The caps, which set the number of emission allowances that can be put in circulation each year, are as follows:

	2019	2020	2021	2022
Emission allowances (caps)	13,683,000	12,725,000	12,258,000	12,148,000

Program registration in Compliance Instrument Tracking System Service (CITSS)

Nova Scotia is using an existing system called the Compliance Instrument Tracking System Service (CITSS) to help us manage the cap-and-trade program. The system is used to

- register cap-and-trade participants
- distribute and track emission allowances
- permit participants to trade and remit emission allowances

CITSS is currently used by jurisdictions in the Western Climate Initiative's (WCI) cap-and-trade system. The province has an agreement to use the online system, but Nova Scotia's cap-and-trade program will remain independent from the linked WCI jurisdictions.

Compliance Instrument Tracking System Service: The Compliance Instrument Tracking System Service (CITSS) was developed specifically for cap-and-trade programs. The Western Climate Initiative, Inc. (WCI Inc.), a non-profit corporation, runs the service. WCI Inc. provides administrative and technical services to support state and provincial GHG emissions trading programs.

CITSS tracks compliance instruments, such as emission allowances, from issuance to final compliance retirement. This includes all transfers of ownership in between.

Nova Scotia joined the WCI Inc. in May 2018. We use CITSS to administer our cap-and-trade program and all mandatory participants must register in the system.

All mandatory participants are required to register in CITSS through a 2-step process: (1) user registration and (2) account application.

User registration

Subject to amendments to the QRV regulations, emitters whose verified 2018 GHG report exceeded the verification threshold must register as a mandatory participant in the cap-and-trade program. In future years, facilities that report that they have exceeded the GHG emissions threshold for participation must submit all registration documents on or before October 1 of the same year in which they submitted their report. Facilities are required to submit allowances starting January 1 of the year directly following their date of registration in the program. Fuel suppliers are required to submit allowances starting January 1 of the year immediately before their date of registration in the program.

For example, if a facility reports in 2020 that their GHG emissions exceeded 50,000 tonnes of CO₂e in the 2019 calendar year, they will have to register in the cap-and-trade program by October 1, 2020 and their compliance obligation starts January 1, 2021. If a fuel supplier reports in 2020 that their GHG emissions exceeded the threshold in the 2019 calendar year, they will have to register in the cap-and-trade program by October 1, 2020 and their compliance obligation starts January 1, 2019.

To apply for registration in CITSS, mandatory participants are required to provide detailed business information and register at least two representatives: a Primary Account Representative (PAR), the main contact, and an additional Alternative Account Representative (AAR). The province provides guidance to mandatory participants on the forms and information required for user registration.

Account application

After mandatory participants have registered as a user, they are required to apply for their accounts in CITSS. The province provides guidance to mandatory participants on the information required for account application. There are 3 types of accounts that mandatory participants use:

- general account – This is the account mandatory participants use to receive, hold, and trade emission allowances.
- compliance account – This is the account mandatory participants use to hold emission allowances before transferring them to the province to meet their compliance obligation. Mandatory participants are not permitted to move emission allowances from the compliance account back into the general account.
- limited use holding account – This is the account mandatory participants use to request emission allowances to be sold on consignment at auction.

The province issues emission allowances for the cap-and-trade program in electronic form through CITSS. Each emission allowance has a unique identifier. The province manages the system using administrative accounts. All those involved in trading emission allowances may do so only through CITSS.

Holding limits and limited exemptions

Each participant in Nova Scotia's cap-and-trade program has a holding limit of 500,000 emission allowances for their accounts. The holding limit is the largest number of emission allowances that a participant can hold at any one time. If 2 or more mandatory participants in the program are related, for example if one is a subsidiary of another, they are considered a single mandatory participant for the purpose of the holding limit. This means they have to share the 500,000 limit and disclose to the province how the limit will be divided among the subsidiaries.

The holding limit may not be large enough for some mandatory participants to acquire enough emission allowances to meet their compliance obligations. To address this, a limited exemption is available to each mandatory participant. The limited exemption applies to each mandatory participant's compliance account and allows for emission allowances equal to the previous year's verified GHG emissions report to be placed into the compliance account and not be counted towards the mandatory participant's holding limit. The limited exemption is adjusted annually by an amount equal to the participant's most recent verified GHG report to ensure that the mandatory participant can acquire enough emission allowances to cover their GHG emissions at the end of the compliance period.

Distribution of emission allowances free of charge

Eligible mandatory participants in Nova Scotia's cap-and-trade program receive free emission allowances in accordance with one of the following methods:

- Method 1: industrial facility allocation based on production intensity benchmark
- Method 2: direct allocation to Nova Scotia Power Inc. based on reduction from business-as-usual projection
- Method 3: fuel supplier allocation based on verified GHG reports

Method 1: Industrial facility allocation based on production intensity benchmark

This method applies to existing industrial facilities whose verified GHG emissions exceeded 50,000 tonnes GHG in 2017, subject to amendments to the QRV regulations. This method also applies to new industrial facilities whose verified GHG emissions exceed 50,000 tonnes GHG in 2018 or any subsequent year.

This method does not apply to facilities that exclusively generate electricity for sale to the grid and are owned or operated by Nova Scotia Power Inc.

The number of emission allowances that are distributed by the government free of charge under this method is determined as follows:

- 1.1 A base number of emission allowances is calculated.
- 1.2 A cap adjustment factor and assistance factor is then applied to the base number.
- 1.3 A production adjustment is calculated following the submission of a verified GHG report for the year in which free emission allowances were distributed.

The benchmark calculation is based on the same emissions scope as industrial facilities' verification requirements in the QRV regulations.

At the beginning of the year, the government deposits 75% of eligible emission allowances into eligible industrial facilities' general accounts. In the following year, after a verified GHG report has been submitted, the government deposits the remaining eligible emission allowances into industrial facilities' general accounts.

Benchmark reference years

The historical facility intensity benchmark uses the average GHG emissions intensity from a fixed historical reference period to determine the average facility production intensity.

- For existing facilities, whose verified GHG emissions exceeded 50,000 tonnes CO₂e in 2017, the reference years includes 2014, 2015, and 2016.
- For new facilities, the benchmark reference years will include the first year of operation where verified GHG emissions exceed 50,000 tonnes CO₂e. The fixed reference period for a new facility will be updated each year to include the previous year until 3 years of data are available, excluding the first year of operations.

1.1 Base number for emission allowance

The estimated base number of emission allowances for a facility for year t before applying the cap adjustment factor and assistance factor, is calculated with Formula 1.1.1:

$$B_{ci_{t-2}} = \sum_i^n (Product_{i,t-2} \times EI_{c,i}) \quad \text{Formula 1.1}$$

Where

$B_{ci_{t-2}}$ = The estimated base number of emission allowances for a facility's GHG emissions for year t

$Product_{i,t-2}$ = the amount for year $t-2$ of

- (a) Quantity of Product i produced if the product is set out in Column 2 of Table 1
- (b) Quantity of Process parameter i if the process parameter is set out in Column 2 of Table 1

$EI_{c,i}$ = Historical facility production intensity benchmark, as calculated by Formula 1.2

$$EI_{c,i} = \frac{\sum_j^n E_{c-ij}}{\sum_j^n Product_{ij}} \quad \text{Formula 1.2}$$

E_{c-ij} = Historical combustion emissions for product i or process parameter i specified in Column 2 of Table 1 for the reference years j specified in Column 5 of Table 1

$Product_{ij}$ of Table 1 is the

- (a) Quantity of product i set out in Column 2 of Table 1 that was produced at the facility for years j specified in Column 5 of Table 1
- (b) Quantity of the process parameter i set out in Column 2 of Table 1 for years j specified in Column 5 of Table 1

Table 1: Historical facility emissions intensity for product produced/process parameter

Column 1 Specified GHG activity or component of a specified GHG activity	Column 2 Product i produced/ process parameter i	Column 3 Product i produced/ process parameter i units	Column 4 Historical combustion emissions intensity	Column 5 Fixed reference period (j)	Column 6 Facility intensity benchmark units	Column 7 Assistance factor AF_t
Cement production	cement: clinker + mineral additives (gypsum and limestone)	tonnes	historical facility combustion emissions intensity	2015, 2016	Emission allowances per tonne of clinker + mineral additives (gypsum and limestone)	1
Pulp and paper	air-dried pulp and paper	tonnes	historical facility combustion emissions intensity	2014, 2015, and 2016	Emission allowances per air dried tonne of pulp	0.9
Natural gas processing	raw natural gas throughput	10 ³ cubic metre	historical facility combustion and flaring emissions intensity	2014, 2015, and 2016	Emission allowances per 10 ³ cubic metre of raw natural gas throughput	0.9

1.2 Cap adjustment and assistance factor

A cap adjustment and assistance factor is applied to the base number using Formula 2.1.

$$A_{t-2} = 0.75 \times AF_t \times C_{at} \times B_{ci_{t-2}} \quad \text{Formula 2.1}$$

Where

A_{t-2} = The number of emission allowances under Method 1 distributed for the year t after applying the cap adjustment factor and assistance factor to the base number of GHG emissions calculated in section 1.1

AF_t = the assistance factor for year t . AF_t is set out in Column 7 of Table 1 for each year in the 2019–2022 compliance period

$B_{ci_{t-2}}$ = the estimated base number of emission allowances for year t as calculated in section 1.1

C_{at} = The cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying Formula 2.2

0.75 = percentage of calculated emission allowances to be initially allocated.

$$C_{at} = 1 - (1 - C_{ct}) \times F_{bt} \quad \text{Formula 2.2}$$

Where

C_{at} = the cap adjustment factor for year t with adjustment based on biomass fuel use

C_{ct} = the cap adjustment factor without adjustment for biomass fuel use set out in Table 2 for year t

F_{bt} = adjustment based on biomass fuel use calculated by applying Formula 2.3

$$F_{bt} = 1 - \frac{EI_{Biomass_{t-2}}}{EI_{AllFuels_{t-2}}} \quad \text{Formula 2.3}$$

Where

F_{bt} = adjustment based on biomass fuel use

$EI_{Biomass_{t-2}}$ = energy input from biomass fuel at the facility in year $t-2$ (in gigajoules)

$EI_{AllFuels_{t-2}}$ = total energy input from all fuel, including biomass fuel, at the facility in year $t-2$ (in gigajoules)

Table 2: Cap adjustment factor without adjustment for biomass fuel use (C_{ct})				
Year	2019	2020	2021	2022
Cap adjustment factor without adjustment for biomass fuel use	1.000	0.930	0.896	0.888

1.3 Production adjustment

After verified emissions reports are submitted each year, an adjustment in accordance with Formula 3.1 and 3.2 is made to determine the remaining portion of free emission allowances to be issued. This production adjustment is determined by subtracting the quantity of estimated emission allowances already issued from the recalculated emission allowance based on actual production in year t .

$$B_{adj} = (AF_t \times C_{at} \times B_{ci-t}) - A_{t-2} \quad \text{Formula 3.1}$$

Where

B_{adj} = Production adjustment

AF_t = The assistance factor for year t defined under Formula 2.1

C_{at} = The cap adjustment factor for year t with adjustment based on biomass fuel use calculated using Formula 2.2

B_{ci-t} = Actual base number of emission allowances calculated based on $product_{i,t}$ and calculated using Formula 3.2

A_{t-2} = The number of emission allowances under Method 1 distributed for the year t after applying the cap adjustment factor and assistance factor to the base number of GHG emissions calculated using Formula 2.1

$$B_{ci-t} = \sum_i^n product_{i,t} \times EI_{c,i} \quad \text{Formula 3.2}$$

Where

$product_{i,t}$ = the amount for year t of

- (a) Quantity of product i set out in Column 2 of Table 1
- (b) Quantity of the process parameter i set out in Column 2 of Table 1

$EI_{c,i}$ = Historical facility production intensity benchmark, as calculated using Formula 1.1.2

1.4 Total emission allowances for distribution

Total number of emission allowances distributed to a facility free of charge is given by:

$$A_{pt} = A_{t-2} + B_{adj} \quad \text{Formula 4.1}$$

Where

A_{pt} = The total number of emission allowances that will be distributed free of charge for the year t to the facility. A_{pt} will be rounded down to the nearest whole number

A_{t-2} = The number of emission allowances under Method 1 distributed for the year t after applying the cap adjustment factor and assistance factor to the base number of GHG emissions calculated using Formula 2.1

B_{adj} = total production adjustment for the facility for year t calculated using Formula 3.1

Method 2: Direct allocation to Nova Scotia Power Inc. based on reduction from business-as-usual projection

The amount of free emission allowances outlined in the table below are allocated to Nova Scotia Power Inc. Nova Scotia Power Inc.'s compliance obligations for GHG emissions include verified GHG emissions from facilities that generate electricity for sale to the grid and exceed 50,000 tonnes of CO₂e, and any verified GHG emissions obligations associated with imported electricity.

	2019	2020	2021	2022
Free emission allowances allocation	6,334,000	5,517,000	5,120,000	5,087,000

At the beginning of the year, the province deposits 100% of the assigned number of free emission allowances into Nova Scotia Power Inc.'s general account. The free emission allowance allocation for Nova Scotia Power Inc. is equivalent to approximately 90% of the business-as-usual projection for GHG emissions from the electricity sector for the 2019–2022 period.

Method 3: Fuel supplier allocation based on verified GHG reports

The method applies to petroleum product suppliers, natural gas distributors, and electricity importers.

To account for the variability in petroleum product and natural gas supply and demand and to minimize costs for consumers, emission allowances are distributed after the submission of verified GHG emissions reports.

2019 GHG reports are due June 1, 2019 and verification statements are due September 1, 2019. In subsequent years, GHG reports and verification statements are due on or before May 1. The province allocates free emission allowances equal to 80% of a fuel supplier's verified GHG emissions each year.

The free emission allowance allocation as determined by the method above is placed into the mandatory participant's general account following the deadline for submission of verified GHG reports.

Distribution of emission allowances by auction

The province will hold an auction of emission allowances 2–4 times in a calendar year. Sixty days before an auction, the province will provide notice with the following information:

- the rules for the auction
- where and when the auction will take place
- the terms and conditions for registering as a bidder
- the form a bid should take and how to submit a bid
- how the auction will proceed
- the number and vintage of the emission allowances to be auctioned and the composition of each lot
- the minimum settlement price for the emission allowances

Registering for the auction

Every mandatory participant registered in the program may take part in an auction of emission allowances. Each auction participant must register as a bidder and submit a financial guarantee to the province before the auction opens.

Participating in the auction

Auctions will be administered through CITSS. Each auction will have a single round of bidding using sealed bids. The emission allowances will be auctioned in lots of 1,000 emission allowances. The minimum price will be \$20 per emission allowance for auctions held in 2020. For each year after 2020, the minimum price will increase by 5% plus inflation.

Bidders will be subject to purchasing limits that restrict how many emission allowances each participant can buy at any one auction. Purchasing limits are intended to mitigate the risk that any one participant can manipulate the market by causing shortages and price spikes. For the 2019–2022 compliance period, the following purchasing limits will apply to all auctions:

- fuel suppliers: purchasing limit of no more than 15% of their prior year's verified GHG report per auction and no more than 25% of their prior year's verified GHG report per calendar year
- facilities emitting greater than 50,000 tonnes of GHG: purchasing limit of no more than 3% of their prior year's verified GHG report per auction and no more than 5% of their prior year's verified GHG report per calendar year
- Nova Scotia Power Inc.: purchasing limit of no more than 5% of the emission allowances available for sale at each auction

During an auction, a bidder may submit more than one bid. Each bid must state the quantity of lots requested and the price offered per emission allowance. The total number of all the bidder's bids must not exceed the amount of the bidder's submitted financial guarantee, purchase limit, or holding limit.

Closing the auction

At the close of the auction, the province will award emission allowances, beginning with the bidders that submitted the highest bids. The final sale price per emission allowance is the lowest price bid for which the province awards emission allowances. The final sale price will apply to all the emission allowances put up for auction so all successful bidders will pay the same price per emission allowance. If the sum of the emission allowances included in bids at the lowest price total more than the number of emission allowances available, the emission allowances will be distributed proportionally based on the share of requested emission allowances for each participant.

Emission allowances that are offered for sale by the province and remain unsold after an auction may be put up for sale in future auctions.

Bidders must pay for their awarded emission allowances within a set period of time after the close of the auction. Once a participant has paid in full, the province will transfer the emission allowances into the participant's general account. All revenue collected through the auction of emission allowances will be deposited into the Green Fund.

The province will publish a summary of auction results after the close of the auction.

Improper disclosure

The cap-and-trade program has rules that limit insider trading, collusion, and market manipulation. For example, auctions are subject to rules limiting disclosure of mandatory participants' intent to participate in the auction, bid amounts, bidding strategies, and other information. Mandatory participants are only permitted to purchase and sell emission allowances based on information that is publicly available or that they have reason to believe is known to the general public. Participants may share privileged or material information with the other party in a transaction during the normal course of business, as long as sharing that information does not violate any other legislation, regulation, or requirement.

Trading: Sales of emission allowances between participants

Over the counter sales

The cap-and-trade program allows mandatory participants to trade emission allowances with one another. To promote a transparent and competitive market, trading among participants is regulated and all transactions are documented.

To trade emission allowances, the seller must submit a transaction request to the intended buyer and the province containing

- the general account numbers for the seller and buyer
- the quantity, type, and vintage of emission allowances
- the settlement price and a description of how the settlement price was reached
- the type of trade agreement, including a list of all other related transactions or products covered under the agreement

Consignment sales of participants' emission allowances

If a mandatory participant has excess emission allowances to sell to other mandatory participants, they have the option to sell them through the government auction on a consignment basis. Consignment sales are intended to minimize transaction costs for all mandatory participants, and ensure a fair market price for all buyers and sellers of emission allowances.

The seller is required to notify the province of the number and vintage of the emission allowances to be sold at auction. The emission allowances will be transferred into the participant's limited use holding account. There is no maximum or minimum limit to how many emission allowances can be offered for sale by a mandatory participant.

Emission allowances sold by consignment will be sold at the auction's closing price. All consignment emission allowances will be sold first, followed by emission allowances offered for sale by the province. Any unsold consignment emission allowances will be kept and put up for sale at the next auction.

Following the close of the auction, the province will provide the consignment seller a summary of the auction results and the monetary amount associated with the sale of the consignment emission allowances.

Reserve

In the first year of the compliance period, the province placed into the reserve 3% of the emission allowances available under the yearly caps. These emission allowances may be used to:

- accommodate new mandatory participants in the cap-and-trade program whose GHG emissions are not currently accounted for in the business-as-usual projections used for setting caps
- adjust to variability in year-to-year commitments to free emission allowances as laid out in the regulation's allocation methods
- offer for sale at set prices to mandatory participants at pre-determined times throughout the year

Reserve sales

Some of the emission allowances in the reserve may be offered for sale as an opportunity for mandatory participants to purchase emission allowances to cover their compliance obligations. To be eligible to purchase emission allowances from the reserve, the mandatory participant must be registered in good standing in CITSS and not hold any emission allowances in their general account.

The price of emission allowances in the reserve will be sold initially at \$50 per tonne in 2020, rising annually by 5% plus inflation. The reserve price is intentionally higher than the auction floor price and predicted market price as the reserve is designed to act as a last resort for mandatory participants, incentivizing them to buy at the auction, trade on the market, or reduce their GHG emissions through more cost-effective mechanisms.

Up to 4 reserve sales can occur in a calendar year. Advance notice of the sale is provided by the province and includes details such as

- the location or web address of the sale
- the date and time of the sale
- the terms and conditions for participating
- the form of and procedure for submitting an offer
- the number of emission allowances available for sale
- the price for the emission allowances

To register for the sale, a participant must submit to the province their contact information and account numbers, the names of their account representatives, any update to their registration information, and a financial guarantee. Any business relationship with other mandatory participants must also be disclosed or updated. An updated notification regarding the holding limit allocation among related entities is also required.

The province will sell emission allowances in lots of 1,000. Participants will submit sealed bids for each set of 1,000 emission allowances they want to buy. When the sale closes, the province will distribute the emission allowances. If the total number of offers is equal to or less than the total number of emission allowances for sale, each participant will get what they requested. If the number of offers totals more than the number of emission allowances available, the emission allowances will be distributed proportionally based on the share of requested emission allowances for each participant.

Participants will have a set number of days to pay for emission allowances in full. Once a participant has paid in full, the province will transfer the emission allowances into the participant's general account.

Upon completion of the sale, a summary will be posted online. The province will hold in reserve any unsold emission allowances for possible sale at a later date. All revenue from the sale will be deposited into the Green Fund.

Cost pass-through for fuels with regulated prices

In Nova Scotia, the price of automotive gasoline and diesel is regulated under the Petroleum Products Pricing Regulations. For these fuels, the province made a regulatory change to allow the Utility and Review Board (UARB) to include the compliance cost of the cap-and-trade program when determining the wholesale selling price for automotive gasoline and diesel.

A new price adder has been included in the calculations for the wholesale selling price. For the period of January 1, 2019 until the first allowance auction, the price adder is determined based on the first auction's floor price and the expectation that fuel suppliers need to acquire, at auction or through trading, 20% of their emission allowances.

At the beginning of each year, the floor price used to calculate the price adder will increase to account for the subsequent annual rise in auction floor prices. After an auction is complete, the price adder will be updated with an adjustment factor that will account for any discrepancy between the settlement price and the floor price of that auction. This will allow fuel suppliers to recover the costs associated with a higher than anticipated settlement price.

The amount of the adder is communicated through the existing UARB process for publicizing the wholesale selling price. The UARB will update the price adder at the beginning of each year and after the province publishes the results of each auction. The cost adder to the wholesale selling price applies equally across all regulated fuel wholesalers.

For other fuels that are not price regulated, the way in which the price of carbon is included is determined by the market.

Offsets

Carbon offset credits are issued for projects that either reduce GHG emissions or sequester GHG emissions over the long-term from GHG sources not covered by the cap.

Nova Scotia's cap-and-trade legislation includes the ability to develop an offset system. However, regulations and protocols related to offset credits and offset projects are not yet available. The province will consult with stakeholders on regulations for the offset system.

The province intends to develop offset project protocols or adapt them from existing protocols in other jurisdictions.

Enforcement and compliance

The province will set administrative penalties for violating the cap-and-trade regulations. The regulations will outline how administrative penalties will be determined.

Specific penalties, including minimum and maximum fines, will be set out in the regulations. Examples of regulatory violations include

- failure to follow rules when trading emission allowances
- coordinating auction bidding with other participants
- committing fraud
- tipping or insider trading
- other regulatory infractions

In addition to fines levied for individual regulatory infractions, mandatory participants who do not remit enough emission allowances at the end of the compliance period to cover their obligation pay to the minister an amount determined by this calculation:

$$A = 3 \times B \times C$$

Where

A = the amount required to be paid

B = the lowest bid price accepted for emission allowances at the most recent auction

C = the amount of outstanding obligations at the time of the determination

Participants may ask to have the Minister of Environment review the decision.

For a given offence, mandatory participants can be subject to either administrative penalties or other enforcement provisions of the Environment Act, but not both at the same time.

Green Fund

All revenue from emission allowance auctions, sales of reserve emission allowances, and administrative penalties will go into the Green Fund. Administration and management of the Fund will be established in 2019.

The Environment Act allows the fund to be used to support a broad range of measures that help reduce GHG emissions, mitigate social and economic impacts, or adapt to the impacts of climate change. The province is engaging on potential uses of the revenue in the Green Fund in 2019.

Impact analysis

GHG emissions

As result of cap and trade, Nova Scotia as a whole will reduce GHG emissions by at least 650,000 tonnes over the first 4 years of the program. That's equivalent to taking almost 141,000 cars off the road. This is in addition to the approximately 1,400,000 tonnes of GHG reductions that are already projected to occur between 2019–2022 through investments in renewable energy and efficiency programs.

Impact on energy prices

The Nova Scotia cap-and-trade program is putting a price on carbon. It is expected to have a small impact on consumer prices for electricity, gasoline, diesel, heating oil, propane, and natural gas.

Electricity	0.15 cents/kWh
Gasoline	1.1 cents/L
Diesel	1.3 cents/L
Heating oil	1.3 cents/L
Propane	0.7 cents/L
Natural gas	0.9 cents/m ³

*All price impacts are estimates, based on modeling results from the gTech Computable General Equilibrium Model. Actual price effects are a consequence of real market behaviour, including the closing price at emission allowances auctions and trading emission allowances between participants.

Total cost to households

The cost of the cap-and-trade program to households will depend on how much electricity and fossil fuels Nova Scotians use each year to drive, heat their homes, and power lights and appliances. These are some ways that Nova Scotians can reduce the costs associated with the cap-and-trade program:

- Improve household energy efficiency and switch to less carbon-intensive sources of energy.
- Choose more fuel-efficient cars.
- Use public transit, walk, or bike.

Table 4: Estimated annual household costs, including driving, home heating, electricity and indirect costs in first four years (2019–2022)

	Single family detached (oil heated)	Single family detached (electric baseboard heated)	Apartment
Electricity	\$6	\$44	\$15
Heating oil	\$39	\$0	\$8
Gasoline	\$18	\$18	\$18
Goods and Services (Indirect costs)	\$7	\$7	\$7
Total	\$69*	\$69	\$48

* Data are presented as rounded figures. However, all calculations have been performed using unrounded data which may lead to minor discrepancies.

The cap-and-trade program may also have some indirect costs to Nova Scotians. For example, companies may pass some of the costs of higher energy prices onto households and other businesses through the goods and services they sell. Model results suggest that total indirect costs to households will be \$7 per year.

Nova Scotia's cap-and-trade program compared to the federal carbon pricing approach

We chose a cap-and-trade approach to carbon pricing as a way to minimize costs to Nova Scotians. Across all energy bills, our cap-and-trade program will cost Nova Scotians less than the federal carbon pricing backstop approach.

In Nova Scotia, the average gasoline price increase between 2019–2022 is expected to be 1.1 cents/litre. In comparison, under the federal carbon price, gasoline prices would go up by 11.5 cents/litre. That's the difference between an extra 50 cents to fill a 50 L tank of gas under the Nova Scotia approach or an extra \$5.75 under the federal carbon price.

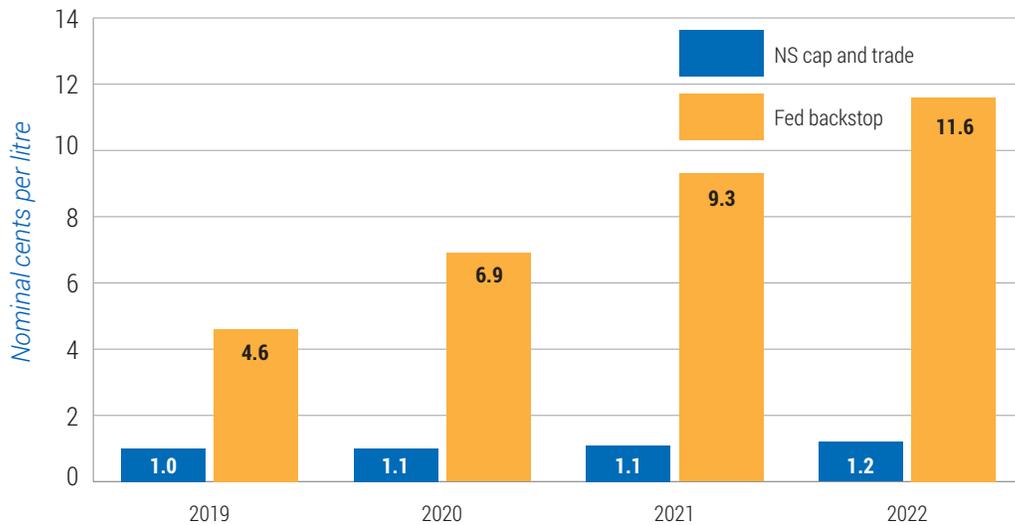


Figure 5: Estimated increases in gasoline prices: Nova Scotia cap-and-trade program vs. federal carbon pricing policy (2019–2022): change in gasoline prices (nominal cents per litre)

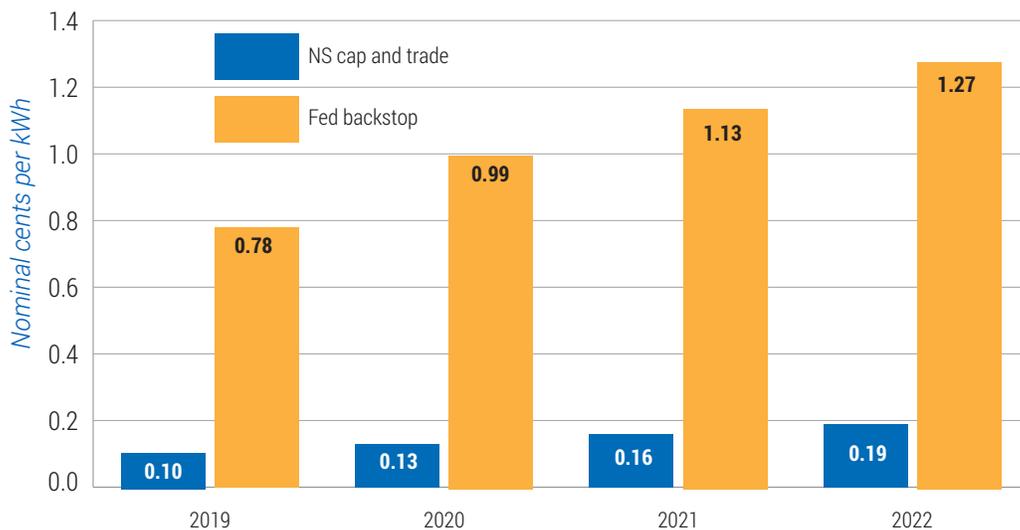


Figure 6: Estimated increases in electricity prices: Nova Scotia cap-and-trade program vs. federal carbon pricing policy (2019–2022): change in electricity price (nominal cents per kWh)

Supporting programs/initiatives

In conjunction with the launch of the cap-and-trade program, we are also continuing our work on other programs and initiatives to reduce GHG emissions and foster a more innovative economy.

Reducing emissions in electricity generation

With a completed Maritime Link, our position as a leader in addressing climate change has taken another leap forward. With the link up and running, we're on track to meet our legislated target of having 40% of our electricity generated by renewable sources pending the timely introduction of the Muskrat Falls hydro electric generation project, and we're well positioned to help Canada address and meet its climate change targets and international commitments. The exchange of electricity between Nova Scotia and Newfoundland and Labrador is not a small achievement. This will change and improve the way energy is transmitted in Atlantic Canada. It will deliver renewable energy, and help us make continued progress towards a cleaner energy future.

Nova Scotia sees solar energy as a growing part of our cleaner energy future. Under our Solar Electricity for Community Buildings program, applicants propose a price per kWh for the electricity they will generate. Successful organizations then enter into a 20-year power purchase agreement with their electric utility. In 2017, we received 67 applications from Mi'kmaq bands, non-profit organizations, municipalities and academic institutions. In total, 18 projects were approved representing 673 kilowatts at an average price of about 25 cents per kilowatt hour.

Nova Scotia recently announced the SolarHomes program, supported by Canada's Low Carbon Economy Fund. This new program will provide rebates to an estimated 2,000 Nova Scotians who choose to install solar on their property. The program will help save Nova Scotians money on their electricity bills, support local jobs, and increase the amount of renewable energy generated while offering more choices and control for Nova Scotians to manage their energy future. It is estimated that the average Nova Scotian home could save \$1,300 each year by installing solar PV system.

Nova Scotia is a leader in tidal energy development, and government is moving this industry forward by fostering innovation. The Fundy Ocean Research Center for Energy (FORCE) has become a world-class demonstration facility. The Offshore Energy Research Association (OERA), continues to receive funding from the province, and is advancing the tidal industry through its research projects. This growing industry has launched new companies, created hundreds of jobs, and attracted hundreds of millions of dollars of investment.

The province is also creating new pathways to test innovative tidal energy technologies. In fall 2017, we amended the Marine Renewable Energy Act to create a new stream of demonstration permits. These permits will make it easier for developers to assess their ideas, and bring new technologies to market faster.

Reducing energy usage

Since its creation in 2009, Nova Scotia's energy efficiency agency, Efficiency One, has helped cut the amount of energy we use by 10%. That's faster than any other Canadian province. Efficiency One and the Clean Foundation also offer low-income homeowners free energy efficiency improvements that can help them feel more comfortable while reducing heating and power bills.

The province has worked with Mi'kmaq communities for many years. We're proud of our relationship, and the success we've enjoyed. The Mi'kmaq are renewable energy leaders. Today, Mi'kmaq communities in Nova Scotia use less electricity than their wind projects produce each year. The province is also working with First Nation communities to grow our energy efficiency and solar programs. In 2017, we started work together to design and create a new home efficiency program. It will perform full efficiency upgrades, and offer training to community members. We want this program to have a lasting impact by creating jobs and helping small businesses expand.

As part of the recently announced Low Carbon Economy Fund, Nova Scotian homeowners who heat with oil and other fuels, are now eligible for funding through Low Carbon Homes programs. With the Home Energy Assessment program, homeowners and small residential building landlords will receive energy assessments and rebates for energy efficient retrofits. With the Green Heat program, rebates will be given for space and water heating systems. Under the Efficient Product Installation program, homeowners and renters will have the costs of energy efficient products and their installation covered, like low-flow showerheads, faucet aerators and insulating pipe wraps, in addition to the current offering of LED lighting and smart power strips. Homeowners could save \$1,000 or more through these programs. Over four years, Nova Scotia can expect 10,000 upgraded homes, and more than 20,000 homes using more efficient products.

Reducing transportation emissions

Nova Scotia Power Inc. has moved ahead to install Nova Scotia's first electric vehicle fast-charging network. In 2018, Nova Scotia Power Inc. installed a network of 12 Level 3 fast chargers from Yarmouth to Sydney, making it a more viable option to drive an electric vehicle in Nova Scotia. These chargers can charge an electric vehicle in 15–30 minutes. The initiative also enables Nova Scotia Power Inc. to study the effects of electric vehicle fast chargers on the power system. This network addresses the lack of high-speed charging stations, which is an inhibitor to Nova Scotians adopting electric vehicles. Further contributing to the solution, the province installed an additional 12 Level 2 chargers at the same locations. These chargers provide a charging solution for plug-in hybrid vehicles that are unable to charge using the Level 3 chargers.

Through the province's Connect2 grant program, the province is supporting its partners to improve active transportation, alternative forms of transportation, and transportation efficiency. Connect2 is based on a vision that all trips under 2 kms to key community destinations could be made using sustainable transportation methods, such as walking or biking. The province has invested \$5.5 million in this program to date, and has leveraged

over \$15 million from other sectors such as municipalities, non-profits, federal government, and other local corporate sponsors. Connect2 has helped build over 118 kilometers of active transportation connectors, and collaborated on 180 sustainable transportation projects across Nova Scotia.

These actions, along with the cap-and-trade program, help us move toward our goals of reducing GHG emissions while growing Nova Scotia's economy.