Report of the Auditor General of Québec
to the National Assembly for 2016-2017

Report of the Sustainable Development Commissioner
Spring 2016

CHAPTER

4

Carbon Market: Description and Issues

Highlights

Work Objectives

The Québec cap-and-trade system for greenhouse gas (GHG) emission allowances, generally referred to as the "carbon market", was implemented in 2013 and is part of Québec's program to fight climate change. This market will generate approximately $3 billion from 2013 to 2020, which will be deposited into the Green Fund.

This chapter aims to:

- explain the fundamentals and concepts of the carbon market and how it operates;
- provide a better understanding of this market's issues.

The Report is available at www.vgq.qc.ca.

Work Results

The following are the key elements and issues related to the carbon market.

Various instruments to fight climate change available to legislators. These instruments may take the form of carbon pricing, particularly through carbon taxes and cap-and-trade systems for GHG emission allowances. These two pricing methods provide incentive to reduce GHG emissions because there is a cost associated with them. They each have advantages and disadvantages.

The cap-and-trade system: a complex and not widely known operating instrument. The cap-and-trade system requires emitters to obtain allowances for their annual GHG emissions. This system aims to limit allowances to compel emitters to reduce their emissions or compensate for them. The cap-and-trade system involves several steps, and its cycle extends over more than a year. Regulations identify emitters that are required to participate, categories of emission allowances as well as terms for issuing and using these allowances. A number of provisions apply depending on the situation.

Issues that require particular attention. Although control measures are planned, the implementation of a carbon market in Québec raises a certain number of issues.

Government interventions on the carbon market have an impact on the number of allowances available and, consequently, on their cost and on the desired change in behaviour of emitters and consumers. In addition, implementing a common market with other governments has some advantages, but there is also a risk that reductions in GHG emissions will take place outside Québec. Benefits, like improved air quality, may be lessened if these reductions do not materialize in Québec.

Carbon market regulations are complex and have been amended several times over the years. This could lead to challenges in enforcing regulations and make voluntary participants reluctant to take part in the market.

A lack of information on the market, the results arising from its implementation or the use of funds collected could adversely affect its social acceptance. Finally, a lack of coordinated, complementary and comprehensive monitoring and auditing could undermine participants' confidence, which is necessary for the market's efficiency.

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Courtesy Translation

The original version, published in French on the Website, takes precedence.

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1 Context

1 The term "carbon market" is generally used to refer to everything that revolves around a cap-and-trade system for **greenhouse gas** (GHG) emission allowances. In Québec, this system has been in place since January 2013. It involves many different stakeholders, and those who do not have to participate in it know little about its complex operation. In this context, the Sustainable Development Commissioner decided to prepare a description of the carbon market to explain its fundamentals and concepts and how it operates. Some of the specialized or technical terms not explained in a side note are defined or explained in Appendix 1. The objective of this description is to provide a better understanding of the issues associated with the carbon market in Québec.

Certain gases present in the Earth's atmosphere cause heat to be trapped near its surface. They are called greenhouse gases (GHGs). The increase in their concentration is one of the factors that give rise to global warming.

2 The description provided by the Commissioner follows the audits that he published on the following topics:

- the *2006-2012 Climate Change Action Plan* (spring 2012);
- the Green Fund (spring 2014 and winter 2016).

Interventions Against Climate Change

3 The means of intervention available to legislators can take the form, for instance, of government policies or research and innovation programs. They can also include tax credits for investments in so-called clean technologies, loan guarantees or **green bonds**. Compliance measures can also be applied, such as the requirement to meet established conditions before obtaining subsidies from standard-based programs.

A green bond is a way to raise capital in order to invest it in projects, particularly those related to climate change.

4 The means of intervention can also take the form of carbon pricing, which is applied through duties, carbon taxes or cap-and-trade systems for emission allowances.

5 A carbon tax is applied on an element that is easily measurable, such as the consumption of gasoline and fossil fuels. It increases the price of products and services whose production requires the use of gasoline and fossil fuels. As a result, this favours products and services that use less gasoline and fossil fuels and therefore generate less GHG emissions.

6 The primary objective of a regulated cap-and-trade system is to include the cost of GHG emissions in business decision making. This type of system therefore does not directly require businesses to reduce their emissions, contrary to traditional environmental regulations. Rather, it provides incentive for the targeted businesses to reduce their emissions by limiting emission allowances to make them scarce, imposing a higher cost to obtain them and encouraging the implementation of clean technologies.

7 Québec implemented this type of cap-and-trade system for GHG **emission allowances**. The Minister of Sustainable Development, Environment and the Fight Against Climate Change is responsible for this system.

In Québec, an emission allowance is an authorization to emit one metric ton of carbon dioxide equivalent (t CO_2 eq.). It is issued exclusively by the government.

8 A carbon tax and a cap-and-trade system for emission allowances are not mutually exclusive. In fact, they are increasingly used together and in a complementary manner by various governments. Each of these mechanisms has its own specific advantages and disadvantages.

Mechanisms	Advantages	Disadvantages
Cap-and-trade system for GHG emission allowances[1]	• Ability to coordinate with other governments to create a wider market that offers more opportunities to participants • Certainty, for both the government and participants, about the maximum quantity of emission allowances offered by the government	• Increase in the price of gasoline and fossil fuels not very noticeable for consumers • More extensive regulations to put in place • Complex administration and monitoring • Uncertainty about the cost for participants (market-based fluctuation)
Carbon tax	• Certainty about the cost for participants (cost determined by the government) • Less extensive regulations to put in place • Easier administration and monitoring	• Uncertainty about the quantity of GHG emission reductions • Direct and visible impact that could lead to opposition from the population and businesses

1. The advantages and disadvantages presented are similar to those of a system like Québec's.

Source: Adaptation of box 5 *Trade-offs in Instrument choice* from Canada's Ecofiscal Commission, *The Way Forward* report.

9 Note that these advantages and disadvantages are not automatic, but are instead strongly linked to the way the mechanisms are implemented. It should also be noted that the advantages and disadvantages of a duty, such as the one on gasoline and fossil fuels that was collected in Québec from 2007 to 2014, are similar to those of a carbon tax.

2 Description of the Carbon Market

2.1 Context and History

International and Canadian Scene

10 The Paris Agreement, which was signed at the December 2015 conference on climate change, was recently added to other agreements made over the years by the international community to try to stabilize the world's climate. These agreements include the United Nations Framework Convention on Climate Change (adopted in 1992 and effective since 1994) and the Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted in 1997 and effective since 2005).

11 Among other things, the Kyoto Protocol provides for the use of emission allowance trading systems as a way to fight against climate change. Canada withdrew from the protocol in 2012, although it remained a party to the Framework Convention. As for the Paris Agreement, it provides for the use of carbon pricing in the fight against climate change.

12 In the past decade, the global fight against climate change and the way it is funded have been significantly transformed. Today, this fight is complex and fragmented in nature. A large number of state and private actors are involved, and various means of intervention are being implemented. As a result, the proportion of global GHG emissions covered by a pricing method has tripled over the past decade, and the number of means of intervention that have been put in place has nearly doubled since January 2012. Together, these means now cover more than 10% of global GHG emissions.

13 The relative importance that carbon markets and the other means have in this fight varies in terms of global emission coverage and financial impacts for the participating governments, among other things (see Appendix 2). There are differences between the regulated markets, for instance in the prices set and in the number of regulated participants (see Appendix 3). Québec's cap-and-trade system for GHG emission allowances particularly stands out for the prices associated with emission allowances, which are among the highest; its scope, which includes the sectors that emit the most GHGs; and the limited number of targeted **establishments**.

An establishment is a place where GHG-generating activities are conducted, which may make the emitter subject to the carbon market.

14 In Canada, the diversity observed in the economies and population figures of provinces means that the sectoral distribution of GHG emissions is very different from one province to the next and that per-capita emission rates also vary widely. Moreover, the federal and provincial governments each have their own areas of jurisdiction in this regard. This explains in part the diversity in carbon pricing methods put in place (see Appendix 4).

History of Québec's Approach

15 Québec adhered to the principles of the Framework Agreement and the resulting Kyoto Protocol, and it declared itself bound by these principles in its jurisdiction. Over the past 20 years, Québec's approach has led to the successive adoption of several GHG emission reduction targets. The target set in 2012 was a 6% reduction in emissions compared to 1990 levels. According to data from the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC), an 8.6% reduction compared to 1990 levels was reportedly achieved. Here are Québec's most recent emission reduction targets:

- by 2020, a 20% reduction in emissions compared to 1990 levels;
- by 2030, a 37.5% reduction in emissions compared to 1990 levels.

16 To promote the achievement of those targets, the government has developed two climate change action plans since 2006. The government's actions under the first plan (2006-2012) were funded mostly through a duty on gasoline and fossil fuels that was deposited in the Green Fund. This duty represented $1.4 billion from 2007 to the end of 2014.

17 In its subsequent action plan for the 2013-2020 period, the government indicated that the carbon market is the means that it chose to use to encourage the actors of several economic sectors to reduce their GHG emissions and to fund, in large part, the measures included in the plan. According to the MDDELCC, the cap-and-trade system for GHG emission allowances covers nearly 85% of GHG **emissions from Québec** that are **quantified**, including those from the distribution of gasoline and fossil fuels.

18 The revenues generated by this market replace those that were generated by the duty on gasoline and fossil fuels, which ended in December 2014. From December 2013 to February 2016, the carbon market generated approximately $1.2 billion for the Government of Québec. According to the MDDELCC, approximately $3 billion in revenues from this market will be deposited into the Green Fund from 2013 to 2020.

The Québec inventory of GHG emissions is generated based on estimates, calculations and data compilations. According to the most recent Québec inventory published by the MDDELCC in 2016, emissions totalled 81.16 MT CO_2 eq. in 2013.

The emissions that are quantified are those that are recorded and that come directly from Québec, including those related to the production of exported goods. However, they do not include indirect emissions related to the consumption of goods and services produced outside Québec. The 2016 Québec inventory indicates that this approach is consistent with the technical guidelines of the international organization that oversees national GHG inventories, namely, the Intergovernmental Panel on Climate Change (IPCC), which comes under the United Nations.

19 Québec's approach for the implementation of a carbon market actually dates back to 2008, i.e., the year the province became a member of a **forum** called the Western Climate Initiative. The goal of this collaborative forum, which was made up of several partners and observers from Canadian provincial governments as well as US and Mexican state governments, was to implement cap-and-trade systems for emission allowances on a regional scale. The intent was to implement these systems while respecting the interests and needs of members and then link them together to establish a common market.

The forum, which was in place until 2011, once included seven US states (Arizona, California, New Mexico, Oregon, Washington State, Utah and Montana) and four Canadian provinces (British Columbia, Manitoba, Ontario and Québec), as well as observers from other Canadian provinces and from US and Mexican states.

20 In 2011, a non-profit organization called Western Climate Initiative, Inc. (WCI, Inc.) was created in the United States. Its purpose is to provide administrative and technical services to support the implementation of emission allowance trading programs created by states and provinces. Representatives from the governments of California, British Columbia, Ontario and Québec sit on its board of directors. In 2012, Québec and California enacted their respective regulations for their cap-and-trade systems; the two systems were linked together starting in January 2014. Appendix 5 presents the history of the **Québec-California carbon market**.

Based on 2013 emissions, the Québec-California carbon market reportedly covered nearly 1% of global GHG emissions in 2015.

21 Québec and California entered into **agreements** with WCI, Inc. so that WCI, Inc. would provide administrative and technical services for certain activities related to their common market, such as tracking emission allowances, administering auction sales and monitoring the market. Pooling these services together makes it possible to share operating costs and facilitates market monitoring.

The value of the agreements made by Québec with WCI, Inc. from 2012 to 2015 totalled approximately US$3.5 million. The agreement made for the 2016-2017 period is worth $1.9 million.

22 As for British Columbia, it chose to implement a tax. The governments of Ontario and Manitoba announced their intent to implement a carbon market and then join the common market managed by WCI, Inc. They signed an agreement in this regard in 2015. In May 2016, Ontario adopted a statute on its cap-and-trade system for emission allowances that is set to become effective in 2017. It also entered into an agreement with WCI, Inc.

2.2 Description of the Carbon Market in Québec

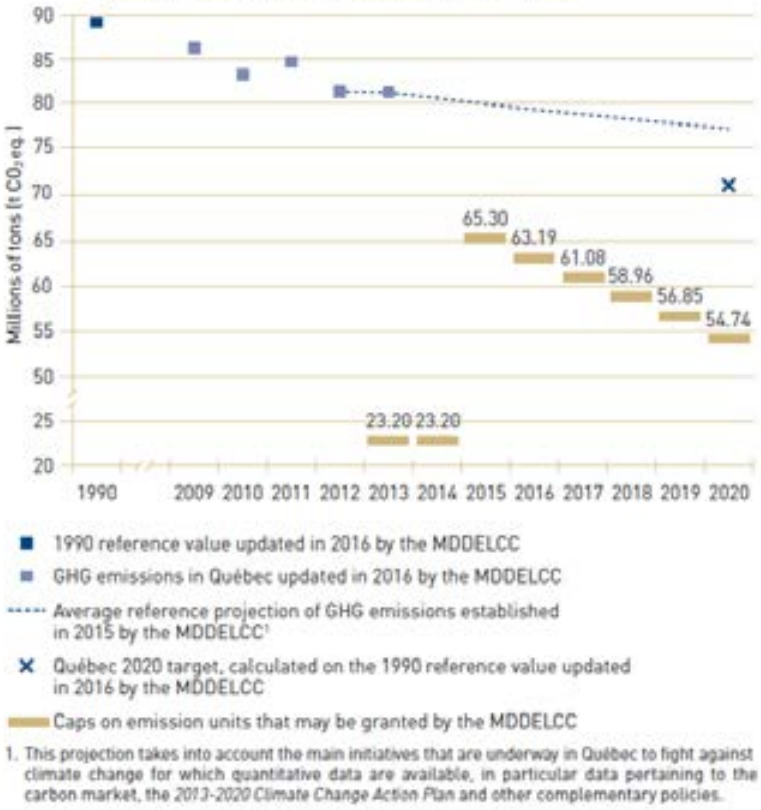
Fundamentals

23 In accordance with the *Environment Quality Act*, the cap-and-trade system for GHG emissions is governed by the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*, which determines, among other things:

- the emitters that are required to participate;
- the categories of emission allowances;
- the terms for issuing, transacting and using these allowances.

24 As its name indicates, the cap-and-trade system for emission allowances involves the establishment of a "cap." It should be noted that the cap does not represent the quantity of GHG emissions allowed in Québec, but rather the annual maximum number of emission units (see the section entitled "Categories of Emission Allowances") that the designated minister may grant to participants (Figure 1). Each unit is a one-time right to emit one metric ton of GHG measured in carbon dioxide equivalent (t CO_2 eq.). Emission unit caps are established by government order.

Figure 1 Projection of greenhouse gas emissions in Québec and emission unit caps determined by order in council



1. This projection takes into account the main initiatives that are underway in Québec to fight against climate change for which quantitative data are available, in particular data pertaining to the carbon market, the *2013-2020 Climate Change Action Plan* and other complementary policies.

25 Québec and each of its partner governments in the cap-and-trade system for GHG emission allowances establish their own caps according to the directives issued by the Western Climate Initiative forum. By progressively decreasing the annual caps, the emission allowances that can be acquired become scarcer. Since the number of allowances in circulation will be limited, emitters will be compelled to reduce their emissions or compensate for them. The MDDELCC indicated that this will contribute to achieving the government's GHG emission reduction targets.

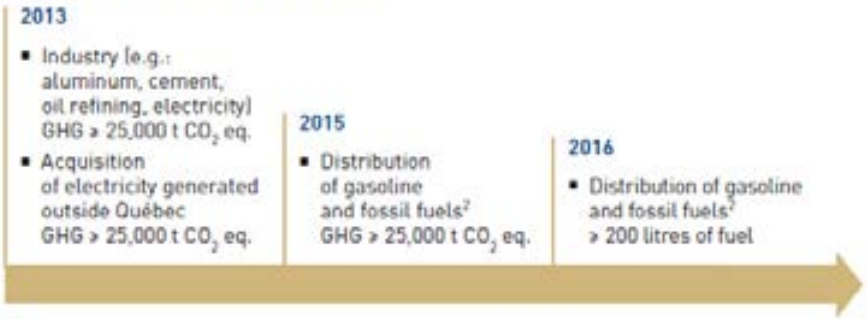
Participants

26 The regulation distinguishes two categories of participants: those who are required to participate in the system (regulated emitters) and those who participate on a voluntary basis.

Regulated Emitters

27 Three types of GHG emitters, which represent 85% of Québec's quantified GHG emissions, have become subject to the cap-and-trade system for GHG emissions at different times since it was implemented. The determination of emitters that are subject to the system is based either on their annual GHG emissions expressed in metric tons (t CO_2 eq.) or on the quantity of gasoline and fossil fuels that they distribute (Figure 2).

Figure 2 Emitters targeted[1] by the cap-and-trade system for GHG emission allowances



1. In this figure, the classification of emitters is based on the one used in the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*.
2. The distribution of gasoline and fossil fuels includes, in particular, emissions from road, air and maritime transportation, which excludes international transportation for the purposes of the inventory. According to the MDDELCC, transportation activities emitted 43% of quantified GHG emissions in Québec in 2013.

28 Regulated emitters, which are legal or natural persons and municipalities operating enterprises in the targeted sectors, must make sure they hold an emission allowance for each metric ton of carbon dioxide equivalent they emit into the atmosphere. This requirement is called the "coverage obligation."

29 According to the MDDELCC, 55 industrial emitters or emitters that acquired electricity generated outside Québec were subject to the carbon market in 2013, 2014 or both of those years. This number increased in 2015 with the addition of nearly 20 distributors of gasoline and fossil fuels (see Appendix 6).

Voluntary Participants

30 In Québec, the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* makes it possible to voluntarily register to the system. Voluntary participants include legal or natural persons or municipalities that intend to purchase, hold, sell or transfer emission allowances, particularly for investment or speculation purposes. They also include participants that wish to carry out offset credit projects (see the section Categories of Emission Allowances). The objective of having such diversity of participants is to increase the opportunities for regulated emitters to obtain emission allowances at a lower cost.

31 According to MDDELCC data, 15 voluntary participants were registered to the system in October 2015.

Categories of Emission Allowances

32 Each GHG emission allowance is worth 1 t CO_2 eq. and is associated with a given year, called a "vintage". Regulated emitters must have enough emission allowances to cover all their verified emissions for each **compliance period**. The allowances used must be associated with the years included in the compliance period or previous years. Even though allowances for future years may be purchased in advance, they can be used only for the corresponding compliance period or the subsequent one.

At the end of a compliance period, the duration of which is established by regulation, a regulated emitter must hand in to the government a number of emission allowances equivalent to the total verified GHG emissions that they reported for that period. The regulation provides that the first compliance period has a two-year duration and the subsequent ones have a three-year duration:

- from January 1, 2013, to December 31, 2014: only industrial emitters or emitters that acquire electricity generated outside Québec are targeted;
- from January 1, 2015, to December 31, 2017: gasoline and fossil fuel distributors are added to existing regulated emitters;
- from January 1, 2018, to December 31, 2020: the three types of emitters continue to be regulated.

33 Emitters regulated under the cap-and-trade system for GHG emissions can use different categories of emission allowances to cover their emissions. These allowances are currently issued by Québec or California. Allowances will also be issued in the future by other partner governments that will enter into agreements in this regard, such as Ontario. The categories of allowances are shown below.

Categories of emission allowances	Description
Emission unit	Basic emission allowance in the Québec system ▪ Emission units can be sold at auction or by mutual agreement or allocated without charge by the designated minister. ▪ The total number of emission units that may be granted by Québec or a partner government for a given year corresponds to the annual cap established by each one.
Early reduction credit	Emission allowance that the designated minister could issue to a regulated industrial emitter that reduced its emissions from 2008 to 2011 in establishments covered by the cap-and-trade system, i.e., before the system was put in place ▪ The credits were granted if the reduction was real, permanent, irreversible, additional and verifiable. ▪ The credits were issued one time only in January 2014. No other credits of this type will be issued in Québec.

Categories of emission allowances	Description
Offset credit	Emission allowance granted by the designated minister to any emitter or voluntary participant in Québec that carries out a **project** to reduce, capture, store or eliminate emissions not covered by the cap-and-trade system ▪ Credits are granted if the reduction is real, additional, permanent, irreversible and verifiable and is carried out in accordance with the **protocols** included in the regulation. ▪ The designated minister keeps 3% of offset credits to be granted to each promoter in a reserve to be able to use it to replace credits in case of subsequent invalidation. ▪ The project promoter can sell the credits obtained to other participants. ▪ The credits enable sectors not covered by the cap-and-trade system to contribute to the effort to reduce GHG emissions, which fosters the emergence of emission allowances. ▪ The first offset credits in Québec were issued in 2015. ▪ For a regulated emitter, the use of offset credits is limited to 8% of the total number of emission allowances they must hand in at the end of a compliance period.
Allowance issued by a partner	Certain emission allowances that are issued by governments with which Québec has signed agreements for the implementation of the carbon market and that are eligible in Québec ▪ California is currently Québec's only partner. - It issues units (allowances) that are equivalent to Québec's emission units and early reduction credits which can be used to fulfill coverage obligations. - It grants several types of offset credits that are equivalent to Québec's offset credits. - It has not granted any early reduction credits.

As at April 30, 2016, four promoters had registered a total of eight offset credit projects in Québec. To date, these projects have led to the issuance of 177,661 offset credits.

The protocols provided for by regulation specify, among other things, the calculation to be used to determine the GHG emission reduction generated by a project eligible for the issuance of offset credits.

In Québec, offset credits are granted under five protocols:

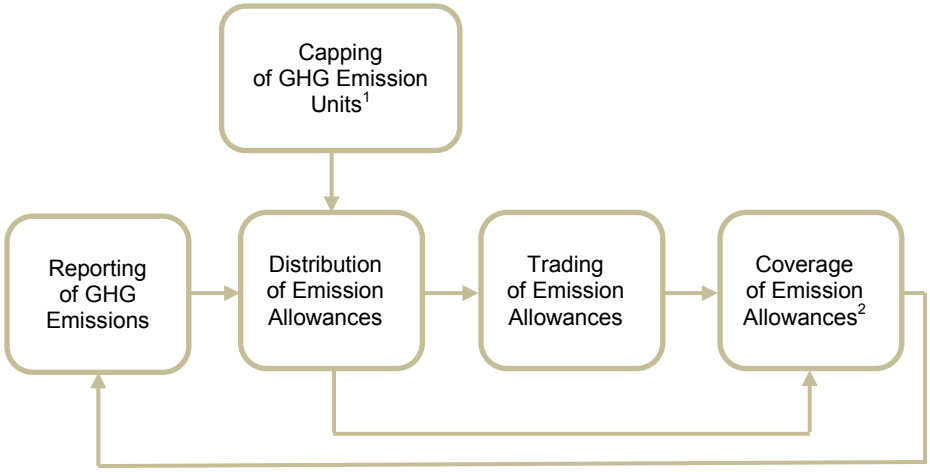
- covered manure storage facilities;
- landfill sites;
- destruction of ozone depleting substances;
- coal mines: drainage;
- coal mines: ventilation.

2.3 Carbon Market Cycle

34 The carbon market follows a cycle that involves several steps for a regulated emitter (Figure 3).

35 The steps related to the reporting of emissions and the distribution and trading of allowances are repeated more than once in each cycle, which extends over more than one year. For example, for the compliance period from January 1, 2015, to December 31, 2017, a regulated emitter must report its verified emissions no later than June 1, 2016, 2017 and 2018, for the years 2015, 2016 and 2017, respectively. The emitter then has until November 1, 2018, to hand in its emission allowances to the designated minister for the entire 2015-2017 period.

Figure 3 Carbon market cycle



1. The annual cap on GHG emission units is pre-determined by order in council. It was set in 2012 for each of the years from 2013 to 2020.
2. Emission allowances are handed in after the end of each compliance period.

Reporting of Emissions

36 The *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere* governs the reporting of GHG emissions. This obligation has been in effect since 2010, before the cap-and-trade system for GHG emission allowances was even put in place. Whether or not an emitter is regulated under the cap-and-trade system is based on this reporting to the designated minister. Therefore, every person or municipality operating an enterprise must, not later than June 1 of each year, report their emissions for the previous year to the Minister if:

- their emissions are equal to or greater than 10,000 t CO_2 eq.;
- they distribute more than 200 litres of gasoline or fossil fuels annually.

37 Furthermore, those that emit more than 25,000 t CO_2 eq. as well as those that distribute 200 litres or more of gasoline or fossil fuels (starting in 2017 in the latter case) have the additional obligation of having their report verified by an accredited organization before submitting it to the designated minister.

Capping of Emission Units

38 Caps on annual GHG emission units are determined by government order in council. The designated minister may grant emission units until these caps are reached. In 2012, the government established its annual caps for the years 2013 to 2020.

39 According to the MDDELCC, the annual caps were based on the most recent data available on Québec GHG emissions and on the government's economic development outlook. In Québec, the first two caps, for 2013 and 2014, were maintained at the same level (see Figure 1); they covered only

industrial emissions and emissions related to the acquisition of electricity generated outside Québec. In 2015, the cap increased because gasoline and fossil fuel distributors became subject to the carbon market. The cap will then decrease until 2020, when it will reach its lowest level.

Distribution of Emission Allowances

40 The designated minister is the one who introduces emission allowances into the carbon market through a distribution. This distribution, which represents the primary market, involves four different processes: auction sale, sale by mutual agreement, allocation without charge, as well the issuance of early reduction credits and offset credits.

Auction Sale

41 Auction sales have a central role to play in how the cap-and-trade system for GHG emission allowances operates. They are held up to four times a year. At least 60 days before a sale, the Minister must publish a notice detailing its **conditions**. Emission units are sold in lots of 1,000 units, except for the last lot of units, which may consist of a lesser quantity. WCI, Inc. provides the administrative and technical services for auction sales, whether they are carried out exclusively for Québec or in conjunction with California.

The conditions include the date and place of the auction sale, the terms and conditions for registering, the procedure for submitting a bid, the number and vintage of the units to be auctioned, as well as the minimum settlement price.

42 The *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* imposes a minimum auction sale price under which units cannot be sold. It also provides for an annual 5% increase and indexation based on the consumer price index. The minimum price established for emission units as part of a joint sale corresponds to Québec's minimum price or California's, whichever is highest. When the sale is carried out in conjunction with California, participants from Québec can choose to use Canadian or US currency. A participant in an auction sale can make more than one bid, at different prices, for units of the same vintage.

43 The regulation also provides that the Minister must award the units first to the participant that made the highest price bid and then to the other participants by descending value of bids. However, the final sale price is not the one offered by the participants that are awarded units. Instead, the final sale price for all the emission units put up for sale corresponds to the lowest bid for which the Minister awards the last units. Table 1 illustrates this operating mode.

Table 1 Theoretical example of the distribution of 100,000 emission units of the same vintage according to the bids accepted in an auction

Participants[1] (according to bid price)	Accepted offers[2]		Awarded by Minister		
	Bid price[3] /unit ($)	Number of requested units	Number of awarded units	Number of units still for sale	Final sale price[4]
Participant G	65.00	2,000	2,000	98,000	13.00
Participant B	58.00	8,000	8,000	90,000	13.00
Participant E	49.00	18,000	18,000	72,000	13.00
Participant A	33.00	10,000	10,000	62,000	13.00
Participant G	24.00	20,000	20,000	42,000	13.00
Participant H	16.00	20,000	20,000	22,000	13.00
Participant C	14.00	20,000	20,000	2,000	13.00
Participant B	13.00	10,000	2,000	–	13.00
Participant A	12.50	15,000	–	–	N/A
Participant J	12.00	20,000	–	–	N/A
Total	**N/A**	**143,000**	**100,000**	**–**	**N/A**

1. A participant in an auction sale can make more than one bid, at different prices, for units of the same vintage. However, participants in the cap-and-trade system are not required to submit bids for each auction sale.
2. An accepted bid is a bid that does not violate the purchase limit, the possession limit or the bidder's financial guarantee.
3. For this example, the minimum price was set at C$12.00.
4. The final sale price is the price offered by the last participant to whom the Minister awarded emission units.

44 At the time of printing this report (May 2016), the last auction sale for which the results were available had been held in February 2016. For that sale, the Government of Québec had set a minimum price of C$12.82 per unit, and California had set a minimum price of C$17.64 (according to the conversion rate in effect). As provided for in the regulation, the minimum price used on the day of the sale was the highest of the prices set by Québec and California, i.e., $17.64. Bids of up to C$65.90 per unit were received for certain vintages. Nevertheless, the final sale price was established at C$17.64, i.e., the equivalent of the minimum price, for all the units sold.

45 The 10 auction sales carried out between December 2013 and February 2016, i.e. 4 sales exclusive to Québec and 6 joint sales (see Appendix 7), contributed $1.2 billion to the Green Fund. The regulation requires the designated minister to publish a **summary** after each sale, which he did. According to the summaries published for the sales held up until February 2016, a total of 48 participants from Québec, including 43 regulated emitters, registered for the auction sales. Three regulated emitters participated in all of the sales.

A summary including the names of the persons registered as bidders for the sale, the settlement price of emission units as well as the total quantity and distribution of the units sold, in non-nominative form, must be published within 45 days following the sale.

Sale by Mutual Agreement

46 The designated minister may sell emission units by mutual agreement to regulated emitters in Québec that do not have a sufficient number of allowances to meet their coverage obligation in relation to their GHG emissions.

47 The designated minister may proceed with a sale by mutual agreement no more than four times a year. At least 60 days before the sale, the Minister must publish a notice detailing the conditions of the sale. Unlike auction sales, sales by mutual agreement are not carried out jointly with California and are therefore always in Canadian currency. The performance of administrative and support tasks for these sales has also been delegated to WCI, Inc. Similarly to auction sales, the designated minister must publish a summary, and the sums collected are deposited in the Green Fund.

48 In the regulation, the starting prices for units sold by mutual agreement were set at $40, $45 or $50, depending on the defined categories. Starting in 2014, these prices were increased and indexed on the same bases as the price of units sold at auction. In the event that the submitted bids exceed the quantity of units available, the regulation specifies the distribution method to be used. At the time of printing this report, no sale by mutual agreement had taken place. A sale had been announced in the fall of 2015, but it was cancelled because no one registered for it.

Allocation Without Charge

49 According to MDDELCC documents, units may be allocated without charge to minimize the impact of the purchase of emission allowances on enterprises subjected to strong national and international competition. These enterprises belong in particular to the aluminum, cement, petrochemical, mining, pulp and paper, and oil refining sectors, and, in some situations specified by regulation, the electricity production sector (see Appendix 8). Distributors of gasoline and fossil fuels are not eligible for allocations without charge.

50 Several factors are taken into consideration to calculate the number of units that may be allocated without charge to an eligible emitter, including the type of emissions (**fixed process emissions**, combustion emissions and other emissions), the activity sector (aluminum, cement, etc.) and the intensity of emissions in previous years. Several equations contained in the regulation can therefore be applied simultaneously to determine the number of units that an emitter is entitled to receive without charge.

Fixed process emissions are those resulting from a carbon-emitting chemical reaction or raw-material transformation process.

51 Fixed process emissions all give rise to allocations without charge for the three compliance periods determined until 2020. All eligible regulated emitters receive allocations without charge for these fixed emissions.

52 Units were allocated without charge for combustion and other emissions in the first compliance period. For the second period, the allocations granted without charge for those emissions are progressively reduced.

53 The units allocated without charge for a given year are handed out in two successive instalments. The first one is established in a prospective manner by the designated minister based on the total quantity of **reference units** used or produced (production level) two years before the allocation year. The second instalment consists of an adjustment based on the verified emissions reported by the emitter, which includes production data (measured in reference units) and the fuels, raw materials, equipment and processes used. When this adjustment is made, a regulated emitter may have to return excess emission units that it received. As provided for in the regulation governing the cap-and-trade system for GHG emission allowances, the Minister publishes, no later than December 1st of each year, the list of emitters that benefited from allocations without charge and the total number of emission units allocated without charge.

A reference unit is a standardized measurement unit related to a raw material used to conduct an activity or the product resulting from an activity.

Issuance of Credits

54 Early reduction credits and offset credits enter the market when they are issued by the designated minister. No compensation is paid to the Minister for the issuance of these credits.

Summary of Allowances Issued on the Primary Market

55 According to data published by the MDDELCC, for the first compliance period (2013 and 2014), the designated minister allocated 37.6 million emission units without charge to Québec emitters (see the dark blue sections of the bars in Figure 4). For the same period, the coverage obligations of regulated emitters represented 36.7 million allowances (see the black lines in Figure 4).

56 Still for 2013 and 2014, the designated minister also sold at auction 6.8 million units to market participants (see the light blue sections of the bars in Figure 4). The total number of units allocated without charge or sold, i.e., 44.4 million units, is slightly lower than the 46.4 million units that could have been allocated according to the caps determined by order (see the beige lines in Figure 4). As for the units allocated without charge, they represent nearly 85% of units allocated during the first compliance period.

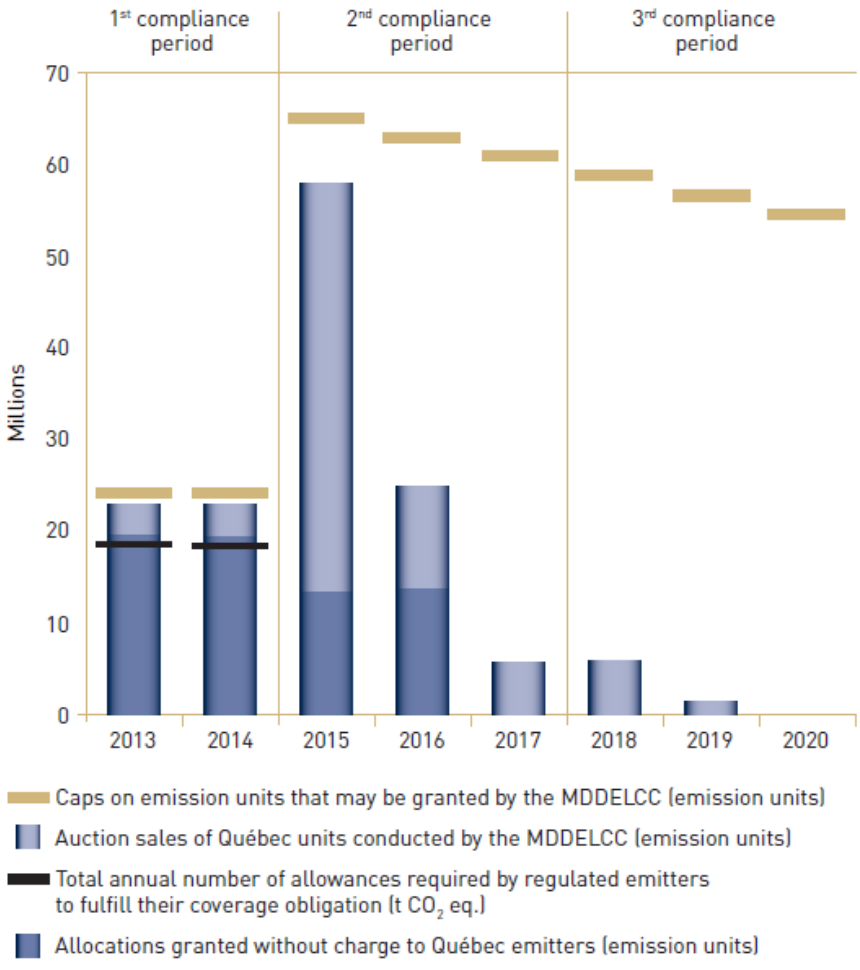
57 For the second compliance period, the cap determined by order was 65.3 million emission units for 2015 to take into consideration the fact that gasoline and fossil fuel distributors became subject to the carbon market, then it decreases to 63.19 and 61.08 million units respectively for 2016 and 2017. Emission units for 2017 are already in circulation. The proportion of units

distributed in auction sales should be higher than it was during the previous period since gasoline and fossil fuel distributors, which are now subject to the carbon market, are not entitled to receive allocations without charge.

58 Finally, for the third compliance period, the cap set by order in council will be at its lowest level in 2020, i.e., 54.74 million emission units. Units are already circulating on the market for 2018 and 2019.

59 Figure 4 gives an overview of the emission units sold or allocated without charge since the implementation of the cap-and-trade system for GHG emission allowances, based on the annual caps determined by order in council.

Figure 4 Emission unit caps and units sold and allocated without charge by Québec as at March 24, 2016



Trading of Emission Allowances

60 On the carbon market, emission allowance transactions can be made between carbon market participants either directly or through third parties. This is what we call the secondary market. Unlike the primary market, the secondary market does not generate any revenue for the government.

61 Transactions are made at prices determined freely by the parties. This increases opportunities for regulated emitters to acquire emission allowances at a lower cost or to resell the allowances they will not need to fulfill their obligations.

62 Since Québec's system is linked to California's, participants in the cap-and-trade system for GHG emission allowances can also trade emission rights with participants in California.

63 Products derived from those allowances can also be traded. This is the case, for example, for futures contracts that allow a participant to purchase from another participant a certain quantity of emission allowances that are delivered on a given date and sold at a pre-determined price. Derivative products can also be used to cover risks related to the variation of emission allowance prices. Like the secondary market, the derivatives market does not generate any revenue for the government.

64 Trading on the secondary market and the derivatives market can be carried out by mutual agreement or through a carbon exchange. The development of the secondary market is supported by the Environmental Markets Trading Platform launched by the Quebec Business Council on the Environment in 2013. It enables participants to post offers to purchase or sell emission allowances. As for the derivatives market, its development is supported by carbon exchanges such as the Intercontinental Exchange, which offer derivative products related to emission allowances in Québec and California.

65 As they are now allowed to participate in the cap-and-trade system for GHG emission allowances, **clearing houses** can facilitate transactions between purchasers and sellers on the carbon market.

66 The designated minister must publish at least once a year a summary of the **transactions** completed over the previous year on the secondary market based on the information found in the emission allowance tracking system developed and hosted by WCI, Inc., called the Compliance Instrument Tracking System Service (CITSS). Since the emission units of Québec and California are **fungible**, the summary presents the results in a consolidated manner for the Québec-California market, which means it does not distinguish the Québec units in circulation. Offset credits are, however, distinguishable. They are presented separately in the summary based on their origin and the type of project they are associated with.

Clearing houses are legal or natural persons whose role is to guarantee that the asset purchased on an exchange will be delivered to the purchaser and that payment will be made to the seller. They therefore assume the risk that one of the parties may fail to meet their obligations by acting as a substitute for such party, if needed. In doing so, they enhance the security of transactions on the carbon market. Since January 1, 2016, they can register for the cap-and-trade system as voluntary participants on the primary and secondary markets as well as the derivatives market.

Transactions include the allowances traded on the secondary market and the derivatives market. They do not include the allowances issued on the primary market by the Minister. According to the latest summary available, 1,271 transactions were carried out in 2014 involving 113.7 million emission allowances.

Allowances are considered fungible when they are perfectly equivalent following a trade or contract.

Coverage of Emission Allowances

67 On November 1st following the end of a compliance period, regulated emitters must have a number of allowances at least equivalent to the verified emissions that they reported so they may hand them in to the designated minister and therefore meet their coverage obligations.

68 All categories of allowances may be used to meet these obligations. It should be noted that emission units must belong to the vintages of the compliance period in question or to previous vintages. Note also that the proportion of offset credits cannot exceed 8% of the quantity of allowances that a regulated emitter uses to meet its coverage obligation.

A monetary administrative sanction may be imposed on regulated emitters that contravene the regulation. Sanctions vary from $500 to $2,500 for a natural person and from $2,500 to $10,000 in other cases.

Regulated emitters that do not comply with the regulation are liable to a penal sanction, depending on the offence. For a natural person, the regulation provides for fines of $3,000 to $500,000 or up to 18 months of imprisonment. In other cases, the fines vary from $10,000 to $3 million.

69 Sanctions may be imposed on an emitter that does not meet its obligation. Certain sanctions are applied automatically. Thus, for each emission allowance that it lacks to cover its emissions, a regulated emitter must hand in three emission units or three early reduction credits. Moreover, the account of any emitter that does not have enough allowances at the end of the compliance period is suspended, which notably prevents it from participating in the secondary market. There are also **monetary administrative sanctions** that may be applied at the discretion of the designated minister. Finally, an emitter that contravenes the regulation is liable to **penal sanctions**.

70 The MDDELCC reported that all regulated emitters had met their coverage obligation for the first compliance period that ended on December 31, 2014.

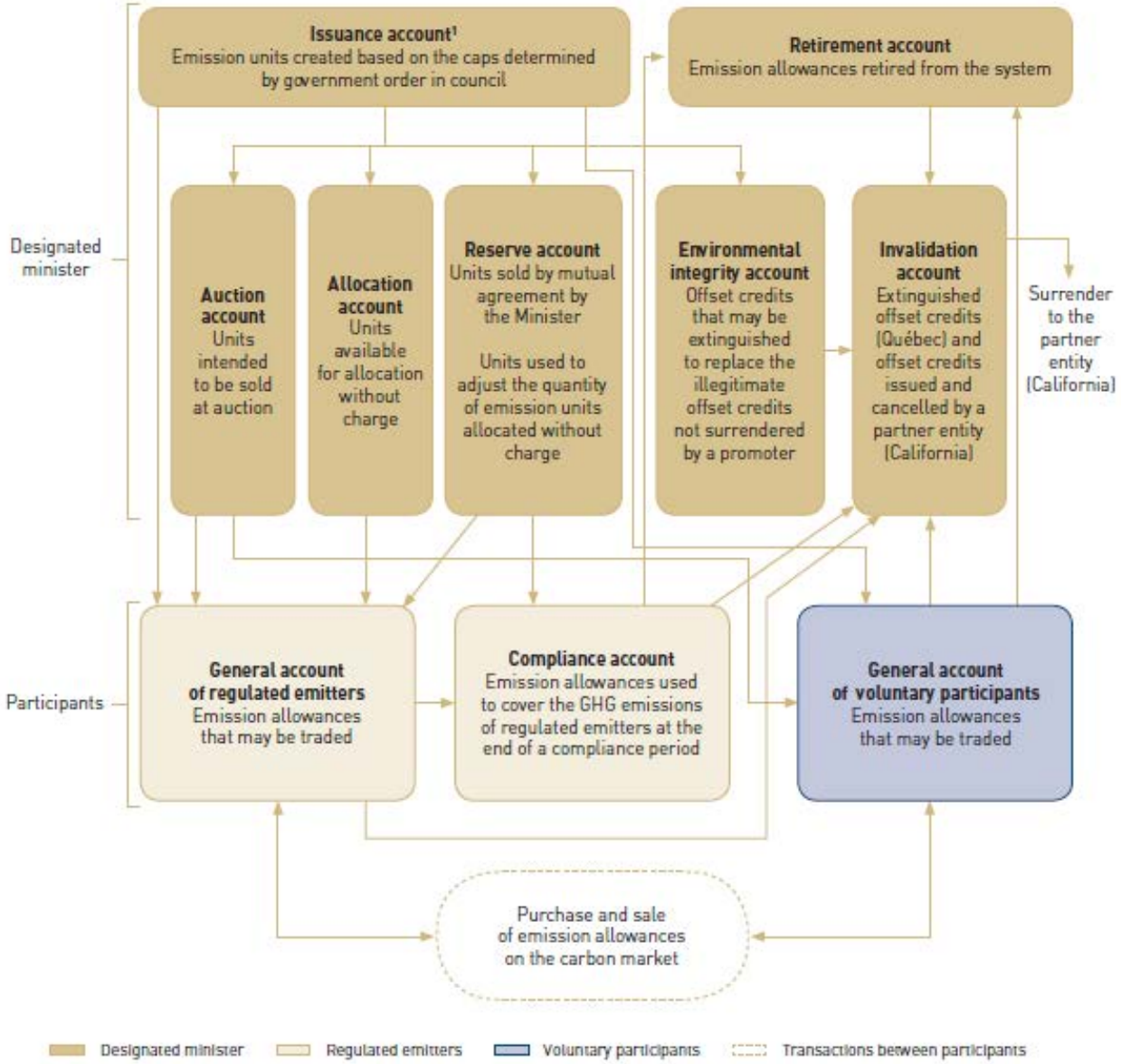
2.4 Accounts for Emission Allowances

71 The designated minister, regulated emitters and voluntary participants have accounts in which their GHG emission allowances are recorded. There are several types of accounts, and certain rules apply to how these allowances must be registered or transacted (Figure 5).

72 On the one hand, the designated minister holds a main account in which all emission units are initially created. Units from this account are credited to three different accounts based on their method of issuance. The *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* does not indicate how offset credits are created. In practice, emission allowances are created only in the issuance account. When the Minister determines that projects meet the conditions attached to the protocols, offset credits are created and immediately transferred to participants. A reserve (3%) of offset credits is registered in the environmental integrity account, while invalidated credits are registered in an account created for that purpose. On the other hand, each type of participant (regulated or voluntary) has a separate general account in which its emission allowances are deposited, regardless of category. Regulated emitters also have a supplementary account in which they deposit the allowances they will use to meet their emission coverage obligation. Finally, the designated minister retires from the system any unused allowances and records them in his retirement account.

73 This account system makes it possible to apply controls and gives participants a certain amount of flexibility in managing their compliance and investment strategy. For example, the emission units purchased as part of a sale by mutual agreement with the designated minister are recorded directly in the compliance account of the regulated emitter. Therefore, they cannot be used to conduct transactions on the market. However, allocations received without charge from the Minister are recorded in the general account of eligible regulated emitters. This creates a number of business opportunities for these emitters, since they can speculate on the market using the emission units they received without charge.

Figure 5 Accounts for emission allowances



1. Offset credits are deposited directly into the general accounts of participants who carried out a project in accordance with the regulation. A reserve is recorded in the environmental integrity account.

Source: Figure inspired by the Suivi administratif du SPEDE published in the economic impact study of the draft regulation amending the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* (May 23, 2012).

2.5 Responsibilities

74 Appendix 9 provides details about the responsibilities of various stakeholders in Québec and of WCI, Inc. As mentioned, the performance of certain administrative and technical tasks related to sales on the primary market has been delegated to WCI, Inc., which hired private firms by **contract** to process financial guarantees, conduct auction sales or sales by mutual agreement, as well as collect and remit sums due to the Government of Québec.

Under WCI, Inc.'s procurement policy, public calls for tenders are the privileged method for awarding contracts to private firms. From 2012 to the end of 2015, the five main contracts that WCI, Inc. had signed were with firms operating in the United States. The contracts totalled around US$8 million.

2.6 Control Measures

75 In Europe, the carbon market has experienced some major operational failures. In addition to a problem with excess emission allowances being granted, these operational failures resulted from fraud related to offset credits, tax fraud as part of transborder sales and allowance theft in the national registers.

76 Since Québec's carbon market was created after the European market, the government was able to draw lessons from the problems encountered in Europe. Québec's regulations include several control measures to mitigate risks.

Information Collected Upon Market Registration

77 The carbon market registration process is similar to the practices used by the banking sector to fight against money laundering and includes know-your-client procedures. Thus, all regulated emitters and voluntary participants that wish to register in the cap-and-trade system for GHG emission allowances must provide certain information and satisfy **registration conditions**.

As part of registration conditions, the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* requires that natural persons be domiciled in Canada or that municipalities or persons other than natural persons have an “establishment” in Canada. Natural persons not domiciled in Québec must designate, among their representatives, at least one natural person domiciled in the province.

78 The application for registration is processed in two steps. The first step consists of checking the identity of the natural persons that will act on their own behalf or as representatives for a participant, checking their criminal and judicial records, and obtaining their authorization to transmit their information to WCI, Inc. or one of its subcontractors, as applicable.

79 The second step focuses more on collecting information on business relationships between market participants in order to later detect potential non-compliant behaviours.

Emission Allowance Tracking Register

80 Québec and California have implemented a single, centralized registration system (the CITSS) for all their emission allowances. As a result, all allowances issued and all transactions made on the secondary market must be registered in this system, which makes it possible to limit fraud or market manipulation attempts. One of the cases of fraud that occurred on the European market was facilitated in particular by the existence of multiple registers that were managed in a decentralized manner by the different member countries participating in that market.

Purchase and Possession Limits

81 Purchase limits apply when emission units are sold at auction in order to reduce the risk of market manipulation. As a result, a regulated emitter may acquire a maximum of 25% of emission units put up for auction during a sale (4% for voluntary participants). When bidders are **related entities**, this purchase limit applies to all the entities.

An entity is related when it maintains, under certain conditions established by regulation, a direct or indirect business relationship with other regulated emitters or voluntary participants.

82 Limits also apply to the possession of emission units when an auction sale is held or when transactions are carried out on the secondary market or the derivatives market. They represent the maximum number of units that a regulated emitter or voluntary participant may hold in its general account or that a regulated emitter may hold in its compliance account (except for the portion of emission units necessary to meet its coverage obligation). The possession limit is calculated based on the parameters included in the regulation. It applies to related entities as a whole, the same as for the purchase limit. If participants exceed the possession limit, the designated minister has the power to confiscate excess units.

Minimum Price Imposed

83 A minimum price is imposed for units sold at auction to prevent the collapse of prices on the market in the event of a surplus of emission allowances like the one that occurred on the European market. Moreover, it gives a certain degree of predictability to the price of units, which partly provides the market with one of the advantages of a tax.

84 Furthermore, the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* provides for a specific mechanism in case there is no buyer for emission units in an auction sale. Under this mechanism, unsold units may be put up for sale again as soon as the final sale price of emission units has been above the minimum price for two auction sales. In addition, the quantity of emission units put up for another auction sale cannot exceed 25% of the quantity of units initially planned for the auction.

Restriction on the Disclosure of Sensitive Information

85 In order to prevent collusion during auction sales and insider trading in the context of emission allowance transactions, the regulation indicates that a bidder must not disclose information about its participation in these sales or transactions, or any confidential information on its bidding strategy or its bid. Moreover, if a bidder mandates an advisor to develop its bidding strategy, the advisor must comply with a non-disclosure obligation, and their identity must be provided to the designated minister.

86 Furthermore, any person that has privileged information on an emission allowance may not carry out any transaction relating to that allowance and may not disclose this information to any other person.

Regulation of Offset Credits

87 The regulation provides for measures to monitor emission reduction projects leading to offset credits, as well as measures to compensate for offset credits deemed to be **illegitimate**.

An illegitimate offset credit is a credit that is not associated with a real, additional, permanent, irreversible and verifiable reduction in emissions.

88 Monitoring measures are conducted from the launch of a project until the issuance of offset credits. Therefore, an emission reduction project must:

- be based on one of the protocols provided for in the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*;
- meet the 13 conditions that make it possible, in particular, to demonstrate that the reductions are real, additional, permanent, irreversible and verifiable;
- be the subject of detailed periodic reports, which must be verified by an accredited organization.

89 To ensure greater information transparency, the designated minister maintains a public register of offset credit projects that includes detailed information about the promoter and the project, including the different verification reports. The MDDELCC also publishes information on the issuance of these credits. According to the Department, these rules were established in accordance with the recommendations made by the Western Climate Initiative forum and were harmonized with California's regulation.

90 Furthermore, the cap-and-trade system for GHG emission allowances protects purchasers of Québec offset credits. These purchasers do not incur any risk as to the validity of the credits, because the promoter is responsible for replacing illegitimate offset credits. In the case of offset credits from California, this risk is borne by the purchaser for a period of up to eight years for certain types of projects and in certain situations.

Information on Transactions

91 In order to monitor emission allowance transactions, the regulation requires participants to disclose to the designated minister certain information about their transactions on the secondary market. This information includes the identity of the parties as well as the accounts and emission allowances involved in the transaction. It also includes the details of the transaction **price** and the method used for its determination, except when the transaction is between related entities.

According to the MDDELCC, a price of zero can be associated with transactions when they are part of a sale between related entities or when the price may not be representative of the value of the allowances if it includes considerations other than the cost of traded emission allowances. These transactions are labelled "no price" in the summary published by the Minister.

Monitoring by the Minister, Analyses and Reports

92 Certain technical and administrative aspects related to auction sales, sales by mutual agreement and emission allowance transactions have been delegated to WCI, Inc. Note, however, that the Minister remains responsible for monitoring and for imposing sanctions in all areas of application of the regulation governing the cap-and-trade system and that only the performance of tasks has been delegated. As for WCI, Inc., following a public call for tenders, it retained the services of a private firm to assist the governments with monitoring activities on the primary and secondary markets for emission allowances (see Appendix 9). This firm submits the findings of its analyses to the designated minister of Québec and to the authorities of California.

93 Finally, all contracts made between private firms and WCI, Inc. provide that WCI, Inc. or one of its member governments are entitled to conduct a financial audit of each firm or a compliance audit of their activities.

3 Issues Related to the Carbon Market in Québec

94 The implementation of a carbon market in Québec raises a certain number of issues. Although control measures are planned, these issues require special attention to ensure that Québec reaps the anticipated benefits of this market in the next few years.

3.1 Reduction of Emissions in Québec

Government Intervention Affecting the Scarcity of Emission Allowances

95 One of the intended effects of the carbon market is a change in behaviour. This effect will materialize if emission allowances become scarce and, consequently, if a price likely to result in this change in behaviour is achieved, particularly among consumers of gasoline and fossil fuels and among industrial emitters.

96 The scarcity of emission allowances depends in particular on government interventions on the market. Decisions on the issuance of units, including the establishment of caps and the number of units put up for sale, as well as the number of offset credits on the market require solid preliminary analyses and rigorous monitoring.

97 As shown in Figure 4 (see the subsection Summary of Allowances Issued on the Primary Market), the caps determined by order in 2012 for the 2013 and 2014 vintages (first compliance period) were higher than the coverage obligations related to the emissions that were reported by emitters subject to the cap-and-trade system for GHG emission allowances for those years. In addition, the quantity of emission units allocated without charge for the first compliance period (37.6 million units) exceeded alone the coverage obligations of regulated emitters (36.7 million units). Some emitters also received early reduction credits (2.04 million units) that they could have used. If we add emission units that could have been acquired in auction sales reserved for Québec participants over this period (6.1 million units), regulated emitters were able to acquire a lot more emission allowances for the first compliance period (more than 45 million units) than their total needs (36.7 million units).

98 If this situation continues over the next compliance periods, the scarcity of emission allowances that is needed for the market to produce its effects may not be achieved.

Reduction of Emissions Taking Place Outside Québec

99 Implementing a common market with other governments has some advantages, but there is also a risk for lower emission reductions in Québec.

100 The way the Québec-California market operates makes it possible for regulated emitters to avoid reducing their GHG emissions if they manage to acquire enough allowances on the market. For a regulated emitter in Québec, these allowances can also come from California, which has a higher proportion of market allowances than Québec. Even though California emitters are not precluded from acquiring allowances in Québec to meet their obligations, there is still a risk that emission reductions will take place in California and not in Québec in the event that a significant portion of emitters from Québec decide to acquire allowances from California to cover their emissions. Therefore, emitters from Québec may indirectly support innovation and productivity among the emitters of partner governments rather than those of Québec.

101 California approved a larger number of offset credit protocols than Québec. This fosters the emergence of greater diversity in projects that can contribute to reducing GHG emissions and lead to offset credits. As a result, the environmental and socioeconomic benefits could be more significant for California than for Québec. To date, California has issued a significantly higher number of credits than Québec (more than 34 million credits issued in California, including 20 million still in circulation, compared to 0.2 million credits issued in Québec). As mentioned, these credits are not recorded in the annual emission unit caps determined by order in council.

102 Incidentally, the *2013-2020 Climate Change Action Plan* specifies that "since the carbon market extends beyond our borders, it does not guarantee that all of the emission reductions will be achieved within our territory. The challenge is, therefore, to ensure that the reductions are achieved in Québec, bearing in mind the significant benefits stemming from them." The benefits that Quebecers would be deprived of if the reductions do not take place in Québec include improved air quality and a decrease in certain costs related to public health measures.

Limited Incentive Resulting from the Price of Emission Allowances

103 Regulated emitters' interest in reducing their GHG emissions and innovating in the area of clean technology depends on various factors, including the price of emission allowances compared to the cost of this technology. Therefore, the incentive created by the carbon market can be strengthened only if the price of emission allowances increases above a certain threshold, i.e., the remediation costs. If the price remains relatively low because there are still opportunities to acquire emission allowances at a low cost on the market, the incentive to reduce emissions in Québec through technological innovation may not be felt strongly enough.

104 At first glance, the price of carbon seems to be progressing toward this threshold because it increased by 29% for participants that purchased units in Canadian dollars between the first joint auction held in November 2014 and the most recent one held in February 2016. However, it should be noted that a large portion of the increase in the price of emission allowances observed over that period, i.e. 22% out of 29%, is due to the exchange rate. Since this rate varies constantly, the assessment of the actual impact of the market on reaching the desired threshold can be distorted. In addition, there is still a risk that the situation will revert over the next few years. A higher Canadian dollar compared to the US dollar could lead to a relative decrease in the price of allowances, which the government has no control over, without however dropping below the minimum price set.

External Factors Impacting Emissions

Price of Gasoline and Fuels

105 The transportation sector, which has experienced sustained growth since 1990, is responsible for the majority of the 2013 quantified GHG emissions in Québec (43%). However, various factors may thwart the efforts made on the market to encourage emission reductions in that sector.

106 The carbon market leads to an increase in the price of gasoline and fuels which, according to economic theory, should induce a change in the habits of consumers when the price exceeds their tolerance threshold. However, the decrease in the price of gasoline since 2013 has compensated for the impact of the increase caused up until now by the carbon market. If the price of oil were to stabilize at a relatively low level for an extended period of time, increased consumption of gasoline and fossil fuels could even be observed, which would increase emissions in the transportation sector.

Level of Economic Activity

107 Some of the decreases in emissions observed before the carbon market was put in place are due in large part to periods of economic crisis; this was particularly the case in 2009 as a result of the global financial crisis. The carbon market is part of an evolving global context that we must consider when we measure the impact of this market on the reduction of GHG emissions.

3.2 Regulation Development and Implementation

Regulatory Changes

108 The supervision of a system like the cap-and-trade system for emission allowances requires complex regulations. The successive amendments made to these regulations can impact market dynamics.

109 The *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* has been amended six times since it was enacted in 2011, and this included two major amendments (link created between the systems in Québec and California, and lowering of the threshold at which distributors of gasoline and fossil fuels become subject to the carbon market). As for the *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere,* it has been amended nine times since 2007. Although the merits of the amendments are not put into question and some of them are more technical in nature, the fact remains that this number of amendments may have an impact on emitters' ability to comply with the regulations, particularly on their ability to appropriately report their GHG emissions. Moreover, for all participants, these amendments can interfere with the development of their medium- and long-term carbon market strategies, and for regulated emitters, with the fulfillment of their emission coverage obligations.

110 Regulatory amendments might still be made in the next few years due to changes announced for carbon pricing policies in Canada and the United States, which could have an impact on the carbon market in Québec.

Enforcement of Regulations

111 Considering the length of the carbon market cycle in Québec (the first compliance period being two years long and the current and subsequent periods being three years long), difficulties in enforcing regulatory control measures might arise.

112 The entire process followed to ensure that regulated emitters meet their coverage obligations can unfold over several years after the GHG emissions were produced by these emitters. As a result, if disputes were to develop with emitters, current penal provisions may be applied only years after potential offences. This could be problematic, especially if the legal persons at fault are no longer in operation.

Legal Clarifications on Emission Allowances

113 The regulations governing the carbon market in Québec define what an emission allowance is for the purpose of its use on the market, but they do not legally characterize that allowance.

114 Even though emission allowances have been recognized up until now as "inventory," particularly for the calculation of taxes, the lack of legal characterization can lead to uncertainty as to the range of uses and the obligations that can be attached to emission allowances in matters of bankruptcy or **security** and in the context of monitoring transborder transactions. Furthermore, this lack of characterization could force the concerned governments to have recourse to the courts, which requires time and money. Other carbon markets have experienced similar difficulties in this regard.

A security is a guarantee provided by a person to ensure the payment of debts or the fulfillment of an obligation.

3.3 Social Acceptance and Overlap in Means of Intervention

115 Like for any major project, the carbon market will gain social acceptance through a better understanding of the nature of the market, the use of the funds collected and the results achieved. So it is important that complete and up-to-date information on those elements be available, particularly so that parliamentarians and citizens alike may assess the reduction of GHG emissions in Québec and understand how the market contributes to this.

116 Furthermore, the Green Fund provides funding for several financial assistance programs related to the climate change action plan. Among other things, these programs are intended to support businesses in their efforts to reduce their GHG emissions in order to contribute to achieving government targets. This assistance is also available to regulated emitters, which could interfere with the operation of the carbon market. Regulated emitters that cannot or do not want to acquire all the allowances needed to meet their obligations under the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* may be forced to invest to reduce their GHG emissions. By subsidizing these investments, the Green Fund could signal to regulated emitters that they can choose not to acquire emission allowances and instead rely on government assistance to meet the conditions of the cap-and-trade system for GHG emission allowances. Questions might also be raised among the population on the relevance of this financial assistance if it does not rely on a clear and comprehensive demonstration of its coherence with the carbon market’s fundamentals.

3.4 Monitoring and Auditing of the Market

117 The confidence that actors have in the proper operation of the carbon market is based largely on the assurance that each of the parties will meet its obligations. If there is a lack of confidence, there is a risk that voluntary participants will withdraw from the market or that regulated emitters will not participate in the secondary market, which could undermine the efficiency of the carbon market.

118 Although regulations provide for control measures, ongoing vigilance is needed, as the experience of other countries shows that irregularities can occur in this type of market. It is important to ensure the coordination, complementarity and comprehensiveness of monitoring and auditing, both between governments and with the firms hired to perform certain tasks. Providing participants with coherent, validated, precise and clear information on the entire system is also essential.

119 Finally, it should be noted that the performance of certain activities outside Québec and the use of subcontractors could complicate the intervention of both the MDDELCC and the Auditor General with regard to certain processes of the carbon market in Québec.

Appendices and Abbreviations

Abbreviations

CITSS	Compliance Instrument Tracking System Service
GES	GHG Greenhouse gas
MDDELCC	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
WCI	Western Climate Initiative, Inc.

Appendix 1 Definitions or Explanations

Paris Agreement	In addition to the long-term goal of keeping the increase in global average temperature to below 2°C, the Paris Agreement provides for a review mechanism to enhance national contributions to the reduction or mitigation of GHG emissions every five years starting in 2023. It also sets out commitments in terms of funding for developing countries and adaptation to climate change, as well as a framework for information transparency and a control mechanism related to the implementation of the Agreement's provisions. The Agreement will come into force in 2020 after it is ratified by a minimum of 55 countries representing at least 55% of global emissions.
Climate change	Climate change which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Green Fund	According to the *Act respecting the Ministère du Développement durable, de l'Environnement et des Parcs*, the Green Fund "is intended, among other purposes, to support measures promoting sustainable development, especially in its environmental aspects." The Green Fund collects revenue from six activity sectors. These sums are used to carry out programs in the sector from which they were collected. The revenue related to the carbon market is therefore used to fund actions in the climate change sector, in particular through GHG reduction or mitigation programs and climate change adaptation programs.
Privileged information	This is information that is not yet publicly known and that can impact the decision of a reasonable investor.
Regulated carbon market	Businesses that participate in a regulated carbon market must meet their coverage obligation for their GHG emissions, are monitored by the government and can incur sanctions in the event of default. However, in a voluntary market, participating businesses are engaged in a voluntary social and environmental responsibility effort. For example, they can set the objective of being carbon neutral.
Accredited organization	For the purposes of the cap-and-trade system, this is a verification organization that has received ISO 14065 accreditation from a member of the International Accreditation Forum, which is the worldwide association of compliance assessment organizations whose main function is to develop a universal and recognized compliance program.
Duty on gasoline and fossil fuels	This duty was created in 2007, and the resulting sums were deposited into the Green Fund and used to fund the implementation of the *2006-2012 Climate Change Action Plan*. The anticipated revenue was $200 million per year and came from gasoline and fossil fuels distribution in Québec. The amount paid by each distributor was equal to its share of the annual $200 million contribution, calculated based on the quantity of carbon dioxide emissions attributed to it Since gasoline and fossil fuels distributors have been subject to the cap-and-trade system since January 1, 2015, the duty ended on December 31, 2014.
Emission allowance tracking system CITSS	This is an account management and emission allowance tracking system that is used as part of the cap-and-trade programs for Québec and California emission allowances. Developed and hosted by WCI, Inc., the CITSS computer system tracks emission allowances (emission units, early reduction credits and offset credits) when they are created by participating governments, when they are traded between participants and retired from the system.
Clean technology	This is a manufacturing method that involves making the most rational use possible of raw materials and energy while reducing the quantity of environment-polluting effluents at an economically acceptable cost.
Per-capita emission rate	This rate does not represent the total contribution of Québec's population to GHG emissions because it does not take into consideration certain indirect emissions related to the consumption of goods and services (for example, international maritime and air transportation). Based on the 2013 Québec inventory of greenhouse gas emissions and their evolution since 1990, the per-capita emission rate is 10.0 t CO_2 eq.
Metric ton of carbon dioxide equivalent (t CO_2 eq.)	This is a metric ton of carbon dioxide or a quantity of another GHG with an equivalent global warming potential, as indicated in Schedule A.1 of the *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere*.

Appendix 2 Means of Intervention to Fight Against Climate Change[1]

	Number of participants in 2014[2]	Value in 2014[2] (billion US$)	Government revenue in 2014[2] (billion US$)	Share of global emissions in 2014[2]
Means of intervention subject to parliamentary control				
Regulated carbon markets[3]	55 governments ▪ 35 national governments ▪ 20 regional governments, including the carbon market in Québec and California, and seven pilot projects in China	More than 32	5	8%
Taxes[3]	16 governments ▪ 15 national governments ▪ 1 regional government (British Columbia)	10	10	4%
Performance standard	1 regional government (Alberta)	N/A	N/A	N/A
Other means of intervention				
Voluntary carbon markets	N/A	0.395	N/A	Approx. 0.2%
Internal businesses carbon price[4]	About 150 businesses	N/A[5]	N/A	N/A
Green bonds	280 organizations having issued more than 1,900 bonds in 21 currencies	503 (25 for Canadian emitters)	N/A	N/A

1. The data come from various sources and have not been verified; they are provided to give an order of magnitude. For carbon markets, they differ in certain respects from the data presented in Appendix 3 due to the time period covered by these sources.
2. The year 2014 was retained for comparison purposes because it is the last year for which all the submitted data were available.
3. Thirteen national governments implemented both a carbon market and a tax.
4. An internal carbon price is established in particular when a private business adopts a policy in this regard. The place where the business is located is a determinant factor for establishing the price. This practice enables a business to, among other things, analyze the current or potential impact of the price of carbon on its activities. Furthermore, internal pricing is used when considering whether or not to invest in green technologies.
5. The internal price of carbon varied from US$6 to US$89 per ton in 2014, depending on the sources.

Appendix 3 Comparison of the Québec System with Other Systems[1]

Government (system)	Year of launch	Number of allowances in 2014[2] (million)	Average price[3] of allowances in 2014[2] (C$ / t CO_2 eq.)	Portion of emissions covered in 2014[2] (%)	Establishments targeted in 2014[2]
Quebec (SPEDE)	2012	▪ Allocations granted without charge: 18.7 ▪ Auction sale: 9.4 ▪ Secondary market: 113.6[4]	▪ N/A ▪ 11.97 ▪ 13.10	Approx. 30% (approx. 85% starting in 2015[5])	78
California (Cap-and-Trade Program)	2012	▪ Allocations granted without charge: 54.4 ▪ Auction sale: 110.0 ▪ Secondary market: 113.7[4]	▪ N/A ▪ 12.84 ▪ 13.10	Approx. 32% (approx. 85% starting in 2015[6])	393
United States (RGGI, Inc.[7])	2009	▪ Auction sale: 77.8 ▪ Secondary market: 211.0	▪ 5.21[8] ▪ 5.25[8]	Approx. 21%	168
European Union (EU ETS)	2005	▪ Allocations granted without charge: 966.7[9] ▪ Auction sale: 537.7 ▪ Secondary market: 6 404.0	▪ N/A ▪ 8.80[8] ▪ 8.58[8]	Approx. 45%	Approx. 12,400
China (seven regional pilot projects)	2013 : 5 projects 2014 : + 2 projects	▪ Allocations granted without charge: N/A[10] ▪ Auction sale: 14.3 (for only one of the seven projects) ▪ Secondary market: 22.0 (from june 2013 to april 2015)	▪ N/A ▪ 9.44[8] (for only one of the seven projects) ▪ 6.14[8] (on average from June 2013 to April 2015)	Approx. 35-60% according to regional system	From 114 to 832 (depending on the pilot projects)

1. The data come from various sources and have not been verified; they are provided to give an order of magnitude.
2. The year 2014 was retained for comparison purposes because it is the last year for which all the submitted data were available.
3. The average price for RGGI, Inc. and the pilot projects in China refers specifically to tons of CO_2 because it is the only GHG covered by these systems.
4. The number was calculated jointly for the Québec-California market in 2014.
5. Distributors of gasoline and fossil fuels have been subject to the Québec cap-and-trade system since 2015. According to the MDDELCC, this increases the percentage of emissions covered in Québec to about 85%.
6. Distributors of gasoline and fossil fuels from California have been subject to the Cap-and-Trade Program since 2015. According to the Air Resources Board of the California Environmental Protection Agency, this increases the percentage of emissions covered in California to about 85%.
7. RGGI, Inc. is a not-for-profit organization that includes nine northeastern US states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont). Its goal is to reduce CO_2 emissions in the electricity production sector and to implement a common carbon market.
8. Since the data were available on an annual basis, they were converted using the Bank of Canada's average annual exchange rate in 2014 (from US dollars for the United States and China, and from euros for the European Union).
9. These are allocations that were granted without charge to establishments and airlines companies, which are eligible for the EU ETS.
10. According to data published in 2016, approximately one billion allocations were granted without charge for the seven pilot projects.

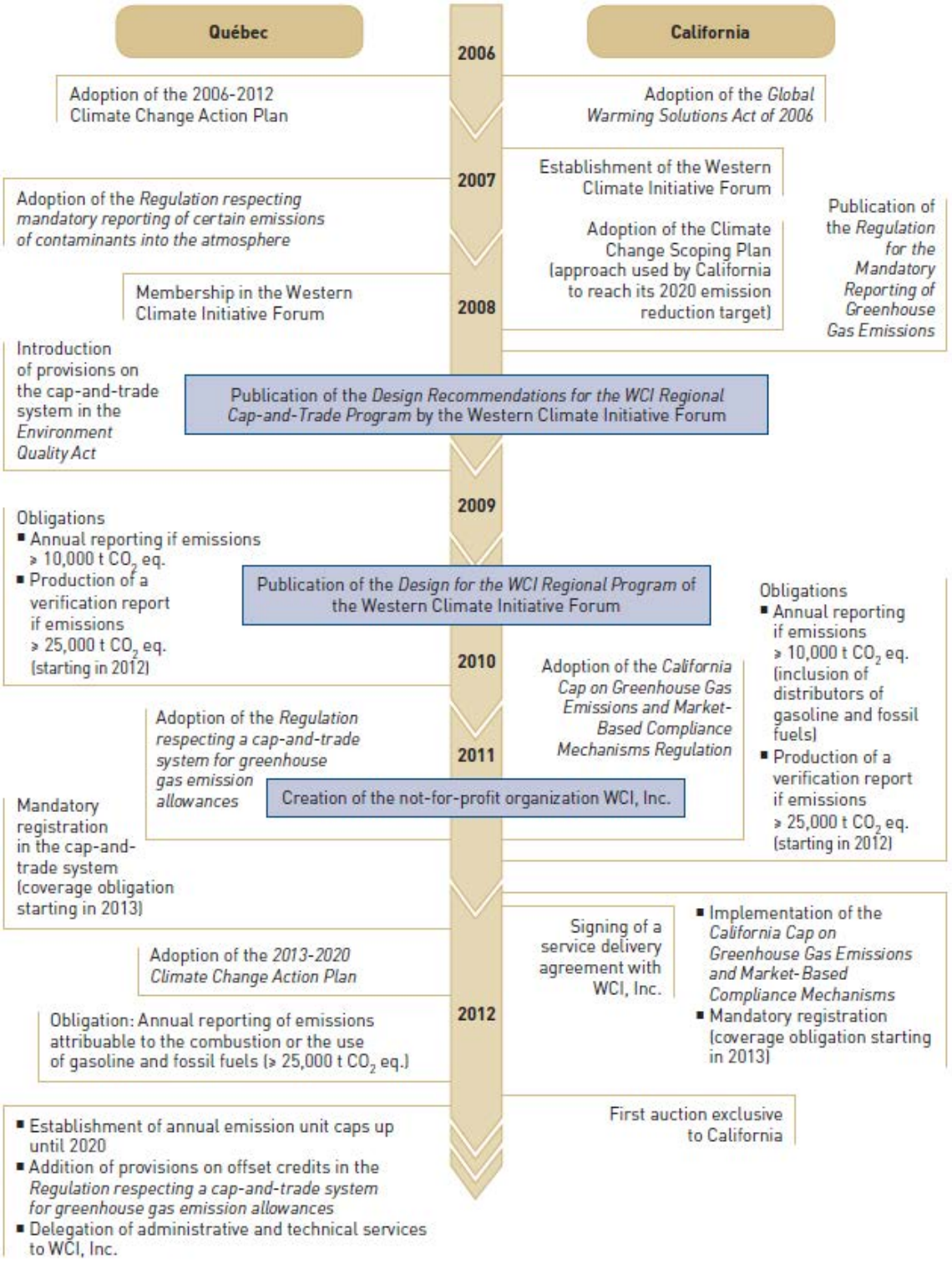
EU ETS European Union Emissions Trading System
RGGI Regional Greenhouse Gas Initiative
SPEDE Système de plafonnement et d'échange de droits d'émission

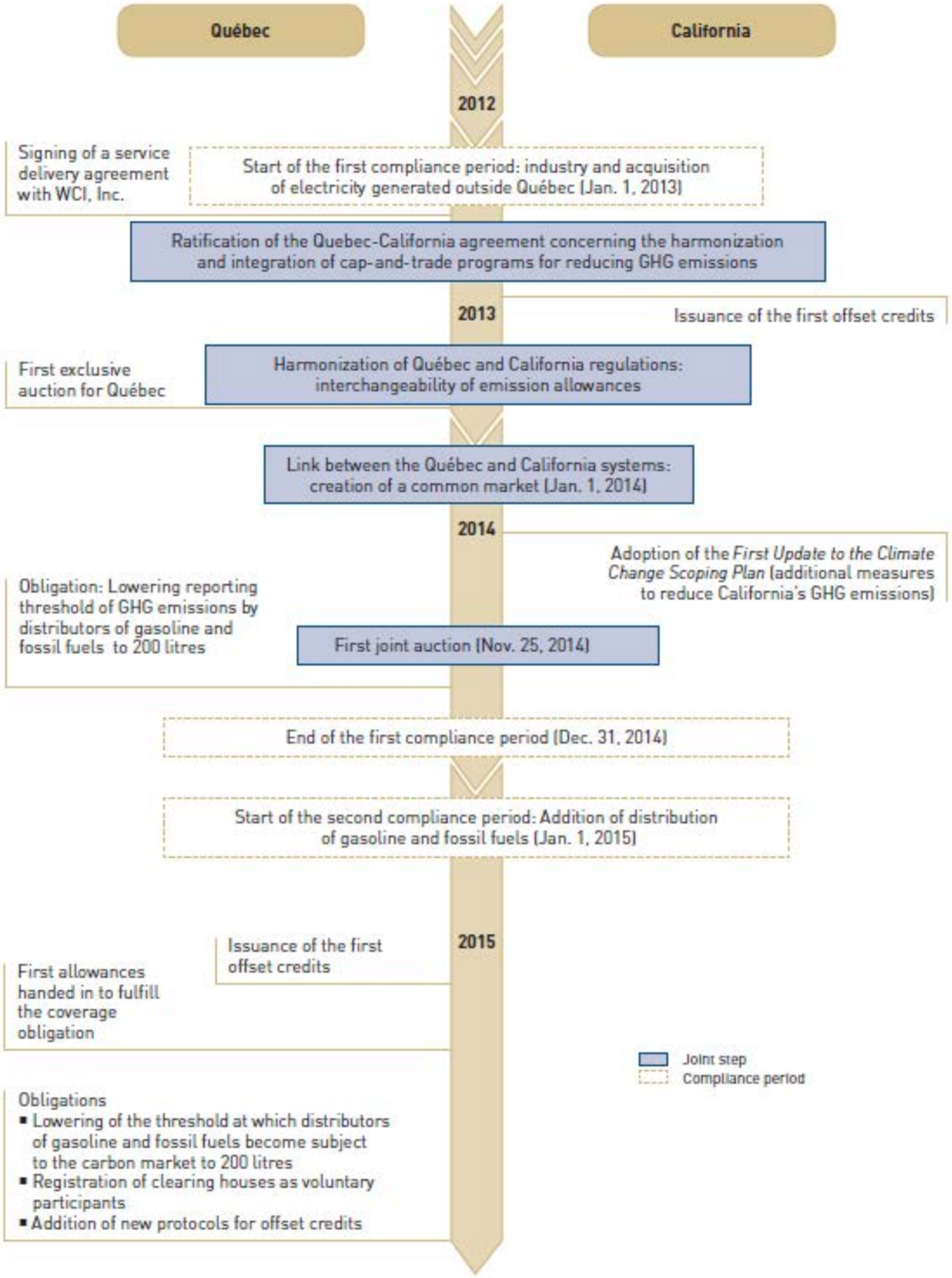
Appendix 4 Carbon Pricing Methods in Canada[1]

Province[2] and year of launch	Means	Volume covered[3] (% / provincial emissions)	Value[3] ($ / t CO2 eq.)	Government revenue[3] ($)
Québec 2012 (mandatory in 2013)	SPEDE	Approx. 30% in 2014 and 85% (starting in 2015)	▪ Allocation without charge ▪ Auction sale: (average price of $11.97 in 2014 and $15.83 in 2015) ▪ Secondary market: $13.10 (average price in 2014)	Nearly 1.2 billion: revenue generated in Québec in 2014 and 2015 following four auction sales exclusive to Québec and six Québec-California joint sales
British Columbia 2008	Carbon tax	Approx. 70% in 2015	$30	1.2 billion in 2013-2014[4]
Alberta[5] 2007	Annual target for reducing the intensity of GHG emissions according to the age of the establishment ▪ From 2 to 12% in 2015 ▪ From 3 to 15% in 2016 ▪ From 3 to 20% in 2017 Four options can be chosen and combined by GHG emitters to comply with the standard ▪ Improvement of facilities to reduce the intensity of emissions ▪ Use of performance emission credits from an entity that exceeded its reduction obligations ▪ Purchase of offset credits issued in the province of Alberta ▪ Contribution to Alberta's Climate Change and Emissions Management Fund	Approx. 43% in 2015	Contribution to Climate Change and Emissions Management Fund ▪ $15 in 2015 ▪ $20 in 2016 ▪ $30 in 2017	578 million from the creation of this fund in 2007 until 2014

1. The data come from various sources and have not been verified; they are provided to give an order of magnitude.
2. Ontario and Manitoba have announced their intent to implement a carbon market and join the common market managed by WCI, Inc.
3. The data presented are those of the most recent years for which they were available.
4. This is a tax that generates fiscally neutral revenue that is entirely returned to taxpayers through a reduction in other fiscal levies.
5. According to the Climate Leadership Plan published in 2015, Alberta plans to implement a mechanism that combines pricing based on a performance standard for the oil sands sector and a carbon tax for other sectors.

Appendix 5 History of the Québec-California Carbon Market




Québec
California
2012
Signing of a service delivery agreement with WCI, Inc.
Start of the first compliance period: industry and acquisition of electricity generated outside Québec (Jan. 1, 2013)
Ratification of the Quebec-California agreement concerning the harmonization and integration of cap-and-trade programs for reducing GHG emissions
2013
Issuance of the first offset credits
First exclusive auction for Québec
Harmonization of Québec and California regulations: interchangeability of emission allowances
Link between the Québec and California systems: creation of a common market (Jan. 1, 2014)
2014
Adoption of the First Update to the Climate Change Scoping Plan (additional measures to reduce California's GHG emissions)
Obligation: Lowering reporting threshold of GHG emissions by distributors of gasoline and fossil fuels to 200 litres
First joint auction (Nov. 25, 2014)
End of the first compliance period (Dec. 31, 2014)
Start of the second compliance period: Addition of distribution of gasoline and fossil fuels (Jan. 1, 2015)
2015
Issuance of the first offset credits
First allowances handed in to fulfill the coverage obligation
Joint step
Compliance period
Obligations
Lowering of the threshold at which distributors of gasoline and fossil fuels become subject to the carbon market to 200 litres
Registration of clearing houses as voluntary participants
Addition of new protocols for offset credits

Appendix 6 Emitters Regulated Under the Québec System[1]

Here is a list of regulated industrial emitters and emitters that acquire electricity generated outside Québec.

N°	Corporate name	Number of establishments targeted in the first compliance period (2013 and 2014)	Total emission coverage obligation for 2013 and 2014 (1,000 t CO_2 eq.)
1	Rio Tinto Alcan inc.	7	6,553.3
2	Énergie Valero inc.	1	2,637.9
3	Produits Suncor Énergie S.E.N.C.	2	2,373.2
4	Aluminerie Alouette inc.	1	2,222.5
5	ArcelorMittal Montréal inc.	3	2,067.8
6	Rio Tinto Fer et Titane inc.	2	2,016.3
7	ArcelorMittal Exploitation minière Canada S.E.N.C.	2	1,929.2
8	Aluminerie de Bécancour inc.	1	1,597.7
9	Graymont (QC) inc.	3	1,590.9
10	Holcim (Canada) inc.	1	1,541.1
11	Alcoa ltée	1	1,229.2
12	Lafarge Canada inc.	1	1,165.9
13	Ciment Québec inc.	1	1,016.0
14	Compagnie de gestion d'Alcoa-Lauralco	1	929.7
15	Glencore Canada Corporation	3	590.0
16	Dow Chemical Canada ULC	1	493.1
17	Chimie ParaChem S.E.C.	1	465.8
18	Compagnie RockTenn du Canada inc.	1	430.9
19	Colacem Canada inc.	1	356.5
20	PF Résolu Canada inc.	6	297.2
21	Kronos Canada inc.	1	277.9
22	Owens Corning Celfortec LP	1	273.5
23	Silicium Québec société en commandite	1	241.6
24	Produits Kruger S.E.C.	2	234.9
25	CEPSA Chimie Montréal inc.	1	231.8
26	TransCanada Energy Ltd.	1	215.0
27	Elkem Metal Canada inc.	1	196.9
28	Fibrek S.E.N.C.	1	194.4
29	Tembec	1	185.8
30	Cascades Canada ULC	3	181.8
31	Mines Wabush	1	170.2
32	Lantic inc.	1	153.4

1. In this appendix. the classification of emitters is based on the one used in the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*.

N°	Corporate name	Number of establishments targeted in the first compliance period (2013 and 2014)	Total emission coverage obligation for 2013 and 2014 (1,000 t CO2 eq.)
33	Fortress Specialty Cellulose inc.	1	143.4
34	Domtar inc.	1	140.2
35	O-I Canada Corp.	1	133.7
36	Ethanol Greenfield Québec inc.	1	120.5
37	Kruger Wayagamack inc.	1	102.5
38	Newalta Corporation	1	101.6
39	Les Forges de Sorel cie	1	97.3
40	CEPSA Chimie Bécancour inc.	1	97.0
41	Hydrogenal II, société en commandite	1	82.9
42	Kruger inc.	1	82.4
43	Société en commandite Revenu Noranda	1	81.9
44	Praxair Canada inc.	1	81.5
45	Trans Canada Pipelines Limited	1	79.1
46	Twin Rivers Technologies Entreprises de transformation de graines oléagineuses du Québec inc.	1	67.2
47	Grace Canada inc.	1	59.9
48	CGC inc.	1	57.6
49	CertainTeed Gypsum Canada inc.	1	53.7
50	La Cie Matériaux de construction BP Canada	1	41.7
51	Teledyne Dalsa Semiconducteur inc.	1	36.2
52	Papiers de publication Kruger inc.	1	30.4
53	Diageo Canada inc.	1	25.9
54	Société en commandite Papier Masson WB	1	11.8
Acquisition of electricity generated outside Québec			
55	Hydro-Québec	1 + entire network	874.9
Total		**78**	**36,664.7**

Source: The MDDELCC, table *Émissions de gaz à effet de serre déclarées et vérifiées des établissements visés par le Règlement concernant le système de plafonnement et d'échange de droits d'émission de gaz à effet de serre (RSPEDE)* (October 5, 2015).

Here is the list of gasoline and fossil fuel distributors that have been subject to the cap-and-trade system for GHG emission allowances since January 1, 2015 (GHG emissions of 25,000 t CO_2 eq. or more). This list could change following the reporting of 2015 emissions, which must be submitted to the Minister no later than June 1, 2016.

N°	Corporate name
Distribution of gasoline and fossil fuels	
1	Bell-Gaz ltée
2	Énergie Valéro inc.
3	Gazifière inc.
4	Gestion Énergie Québec inc.
5	Kildair Service ULC
6	Les Huiles H.L.H. ltée
7	Les Pétroles Irving Commercial S.E.N.C.
8	Les Pétroles Irving Marketing S.E.N.C.
9	Les Produits Pétroliers Norcan S.E.N.C.
10	Morgan Stanley Capital Group inc.
11	Pétrolière Impériale
12	Produits Shell Canada
13	Produits Suncor Énergie S.E.N.C.
14	Propane Québec inc.
15	Sobeys Québec inc.
16	Société en commandite Gaz Métro
17	Suncor Energy Marketing inc.

Source: The MDDELCC, table *Distributeurs de carburants et de combustibles devant couvrir leurs émissions de GES en vertu du Règlement concernant le système de plafonnement et d'échange de droits d'émission de gaz à effet de serre (RSPEDE)* (April 1, 2015).

Appendix 7 Auction Sales of Emission Units

Date	Vintage	Minimum asking price in Québec (C$)	Minimum asking price in California (C$)	Minimum price offered (C$)	Maximum price offered (C$)	Final sale price[1] (C$)	Number of Québec units sold (thousand)	Sales proceeds (million C$)
Sales exclusive to Québec[2]								
December 3, 2013	2013	10.75	N/A	10.75	30.00	10.75	1,025.0	11.0
	2016	10.75	N/A	10.75	11.98	10.75	1,708.0	18.4
March 4, 2014	2014	11.39	N/A	11.39	20.00	11.39	1,035.0	11.8
	2017	11.39	N/A	11.39	20.00	11.39	1,285.0	14.6
May 27, 2014	2014	11.39	N/A	11.39	20.00	11.39	1,049.1	11.9
	2017	11.39	N/A	11.39	20.00	11.39	1,302.0	14.8
August 26, 2014	2014	11.39	N/A	11.39	15.00	11.39	694.0	7.9
	2017	11.39	N/A	11.39	15.00	11.39	1,455.0	16.6
Québec-California joint sales[3]								
November 25, 2014	2014	11.39	12.82	12.82	47.92	13.68	1,049.1	14.4
	2017	11.39	12.82	12.82	49.74	13.41	1,527.0	20.5
February 18, 2015	2015	12.08	15.01	15.01	56.06	15.14	11,171.6	169.1
	2018	12.08	15.01	15.01	24.81	15.01	1,474.0	22.1
May 21, 2015	2013	12.08	14.78	14.78	55.21	15.01	1,946.7	29.2
	2015	12.08	14.78	14.78	55.21	15.01	11,171.6	167.7
	2018	12.08	14.78	14.78	22.70	14.78	1,386.5	20.5
August 18, 2015	2015	12.08	15.84	15.84	59.18	16.39	11,171.6	183.1
	2018	12.08	15.84	15.84	24.31	16.10	1,474.0	23.7
November 17, 2015	2015	12.08	16.16	16.16	60.37	17.00	11,171.6	189.9
	2018	12.08	16.16	16.16	25.76	16.89	1,474.0	24.9

1. As explained in the Auction Sale subsection of this report, the final sale price for all the emission units sold corresponds to the lowest bid for which the Minister awards units, and not the price offered by each of the participants.
2. For auction sales exclusive to Québec, the price of the units sold is only in Canadian dollars.
3. Since November 25, 2014, the date of the first common auction, participants from Québec can choose to use Canadian or US currency. The final sale price of emission units in Canadian dollars increased by 29% (the dollar depreciated by 22%).

Date	Vintage	Minimum asking price in Québec (C$)	Minimum asking price in California (C$)	Minimum price offered (C$)	Maximum price offered (C$)	Final sale price[1] (C$)	Number of Québec units sold (thousand)	Sales proceeds (million C$)
Québec-California joint sales (cont.)[3]								
February 17, 2016	2013	12.82	17.64	17.64	17.64		1,073.3	18.9
	2014	12.82	17.64	17.64	17.64		538.0	9.5
	2016	12.82	17.64	17.64	17.64		9,538.4	168.3
	2019	12.82	17.64	17.64	17.64		1,320.0	23.3
Total								**1,192.2[4]**

1. As explained in the Auction Sale subsection of this report, the final sale price for all the emission units sold corresponds to the lowest bid for which the Minister awards units, and not the price offered by each of the participants.
3. Since November 25, 2014, the date of the first common auction, participants from Québec can choose to use Canadian or US currency. The final sale price of emission units in Canadian dollars increased by 29% (the dollar depreciated by 22%).
4. The revenue deposited in the Green Fund is approximately $0.7 million less than the sales proceeds, which represents 0.06% of revenue. In this regard, the MDDELCC reports that: [Translation] "Joint auction sales require part of the revenue to be converted. The currency conversion and the associated transaction fees are likely to significantly affect the amount deposited into the Green Fund. Therefore, when the number of units sold is multiplied by the sale price, the result might differ slightly from the amount deposited into the Green Fund."

Appendix 8 Activity Sectors Eligible for Allocations Without Charge

Activity sectors	Type of activity
Aluminium	▪ Baked cathode production ▪ Aluminum production ▪ Baked anode production ▪ Aluminum hydroxide production and secondary activities ▪ Calcinated coke production
Others	▪ Beer production ▪ Alcohol production ▪ Graphite electrode manufacturing ▪ Gypsum panel manufacturing ▪ Sugar production ▪ Glass container manufacturing ▪ Industrial steam production (for sale to a third person) ▪ Production of semi-conductors and other electronic components ▪ Carbone dioxide production ▪ Oilseed processing
Lime	▪ Lime production
Chemical	▪ Ethanol production ▪ Tire production ▪ Fabrication of rigid foamed insulation ▪ Production of titanium dioxide ▪ Production of linear alkylbenzene ▪ Production of catalyzer ▪ Production of hydrogen ▪ Production of purified terephtalic acid (PTA) ▪ Production of paraxylene ▪ Production of sodium silicate ▪ Production of sulphur (refinery gas) ▪ Polyethylene terephthalate (PET) production
Cement	▪ Cement production
Electricity	▪ Only for circumstances provided for in the regulation: – Electricity production – Acquisition of electricity produced outside Québec, but in administration when a cap-and-trade system is in place, for the consumption of the enterprise or for sale in Québec ▪ Steam production (except steam produced by cogeneration)

Activity sectors	Type of activity
Metallurgy	■ Steel production (steelworks) ■ Wrought steel production ■ Steel pellet or slab rolling ■ Copper anode production ■ Iron ore concentrate pellet ■ Copper cathode production ■ Ferrosilicon production ■ Lead production ■ Metal powder manufacturing ■ Titanium dioxide (Ti O2) slag manufacturing ■ Silicon metal production ■ Zinc production
Mining and pelletization	■ Pellet production ■ Iron concentrate production ■ Nickel concentrate production ■ Nickel concentrate and copper concentrate production
Pulp and paper	■ Pulp and paper production ■ Production of wood-fibre based products ■ Steam production
Refining	■ Oil refining

Appendix 9 Responsibilities Related to the Québec Cap-and-Trade System for Emission Allowances

Government	▪ Determine emission unit caps by order in council.
Minister[1]	▪ Receive verified annual reports and publish a summary of GHG emissions reported by regulated emitters. ▪ As registrar, receive, analyze, verify and approve applications for registration in the cap-and-trade system. ▪ Allocate emission units without charge to regulated emitters. ▪ Manage the financial guarantees submitted before each auction sale. ▪ Sell emission units at auctions or by mutual agreement. ▪ Receive, analyze, verify and approve (or refuse) applications and, if applicable, grant early reduction credits and offset credits. ▪ Publish each year a summary of emission allowance transactions between participants. ▪ Verify that regulated emitters fulfill their coverage obligation. ▪ Monitor the application of the regulation pertaining to the cap-and-trade system. ▪ Impose sanctions on participants in the cap-and-trade system who contravene the regulation.
Ministère des Finances du Québec	▪ Receive the financial guarantees submitted before each auction sale. (The responsibility of this task was delegated by order in council to WCI, Inc.) ▪ Receive the amounts from auction sales and sales by mutual agreement, and deposit them in the Green Fund.
WCI, Inc.	▪ Put in place a register system to track emission allowances and provide all the services related to the use and operation of the system. WCI, Inc. entered into contracts with private firms that were hired to: - provide first-line telephone and email assistance services; - develop, host and update the emission allowance tracking system (CITSS); - ensure the security and technical support of the system. ▪ Administer auction sales and sales by mutual agreement of emission units. WCI, Inc. entered into contracts with a private firm that was hired to: - develop and host the sales platform; - administer sales in accordance with the requirements set. WCI, Inc. also entered into a bank that was hired to: - receive, verify and administer financial guarantees; - collect the sums due following sales and hand them over to the Ministère des Finances du Québec. ▪ Monitor transactions and operations in the system, in collaboration with Québec authorities. WCI, Inc. entered into a contract with a private firm that was hired to: - monitor auction sales and sales by mutual agreement, as well as emission allowance trades; - report its observations to the Minister.

1. The MDDELCC acts on behalf of the Minister for these responsibilities.