

What on Earth is Cap-and-Trade?

Tom Markowitz

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<http://www.enerhope.com/What%20on%20Earth%20is%20Cap.pdf>

After years of hesitating, the Government of Ontario is about to start a Cap-and-Trade system for Greenhouse Gas emissions in Ontario.

Ontario emitted 165 megatonnes (“Mt”) (million tonnes) of carbon dioxide equivalent (“CO_{2e}”) (the standard unit of measure of Greenhouse Gas (“GHG”) emissions) into the atmosphere in 2014. The provincial government has pledged to reduce Ontario’s total emissions to 150 Mt CO_{2e} per year by 2020, to 112 by 2030, and to 33 by 2050.

Ontario’s Liberal Government has been talking about an Ontario GHG Cap-and-Trade program since June, 2008, when Ontario and Québec signed a Memorandum of Understanding for a joint GHG Cap-and-Trade system.

In July, 2008, Ontario joined the Western Climate Initiative (“WCI”), a greenhouse gas initiative of 7 US states and 4 Canadian provinces, led by California, promoting a joint GHG Cap-and-Trade system, covering all member states.

In 2009, the Ministry of the Environment posted a “Carbon Pricing” discussion paper and proposal on Ontario’s Environmental Bill of Rights (“EBR”) Registry, but the Ministry did not make a final decision on setting a price on carbon.

During the 2011 Ontario Provincial Election, Premier McGuinty said that Ontario was not ready for Cap-and-Trade. "We're not going to get into a Cap-and Trade system unless we get the right kind of Cap-and-Trade ... one that's going to benefit Ontarians."

The WCI Cap-and-Trade system started on January 1st, 2012, still waiting for Ontario to participate.

Finally, on April 13th, 2015 Premier Wynne announced that Ontario would go ahead with a Cap-and-Trade system for GHGs, linking the Ontario system with Québec and California, under the WCI.

The Government posted a document, Cap and Trade Program Design Options, on the Environmental Bill of Rights Registry, and invited comments from the public. The document, which describes Ontario’s proposed Cap-and-Trade system, is strongly based on the California Cap-and-Trade system, promoted through the WCI.

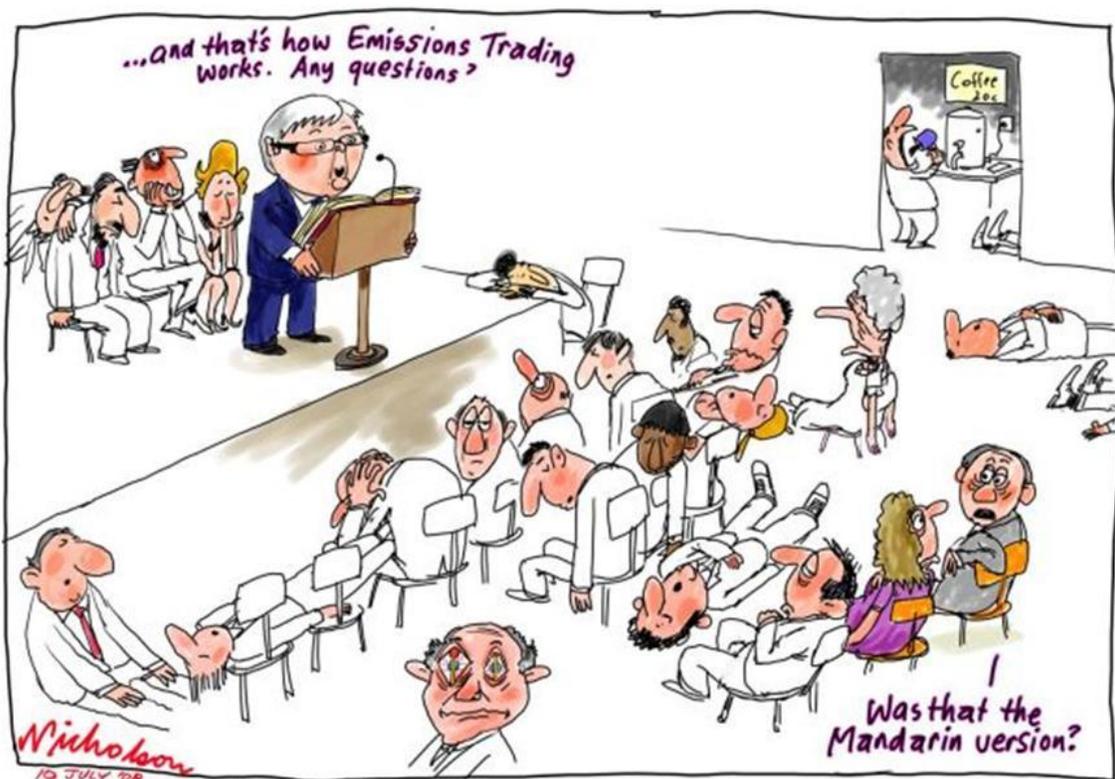
The Government also posted on the EBR Registry a description of Cap-and-Trade, which, unfortunately, leaves out some important concepts.

In 2016, Ontario is now marching resolutely toward a cap-and-trade system for greenhouse gases, based on the California-led WCI system. The Ontario start-up date will be January 1st, 2017.

On May 18th, 2016 the Ontario government passed Bill 172, the Climate Change Mitigation and Low-carbon Economy Act, 2016. This Act establishes the foundation for Ontario's cap and trade regime. On May 19th, the Ontario Ministry of Environment and Climate Change (MOECC) published Ontario Regulation 144/16, which outlines the mechanics of the proposed regime.

What is Cap-and-Trade? Can someone explain how it works?

A historical note: In 2008, the Prime Minister of Australia, Kevin Rudd, tried to persuade Aussies to adopt a national Cap-and-Trade system. This excellent cartoon by Nicholson, in The Australian, commemorates the confusion and mind-numbing boredom generated by Rudd's efforts:



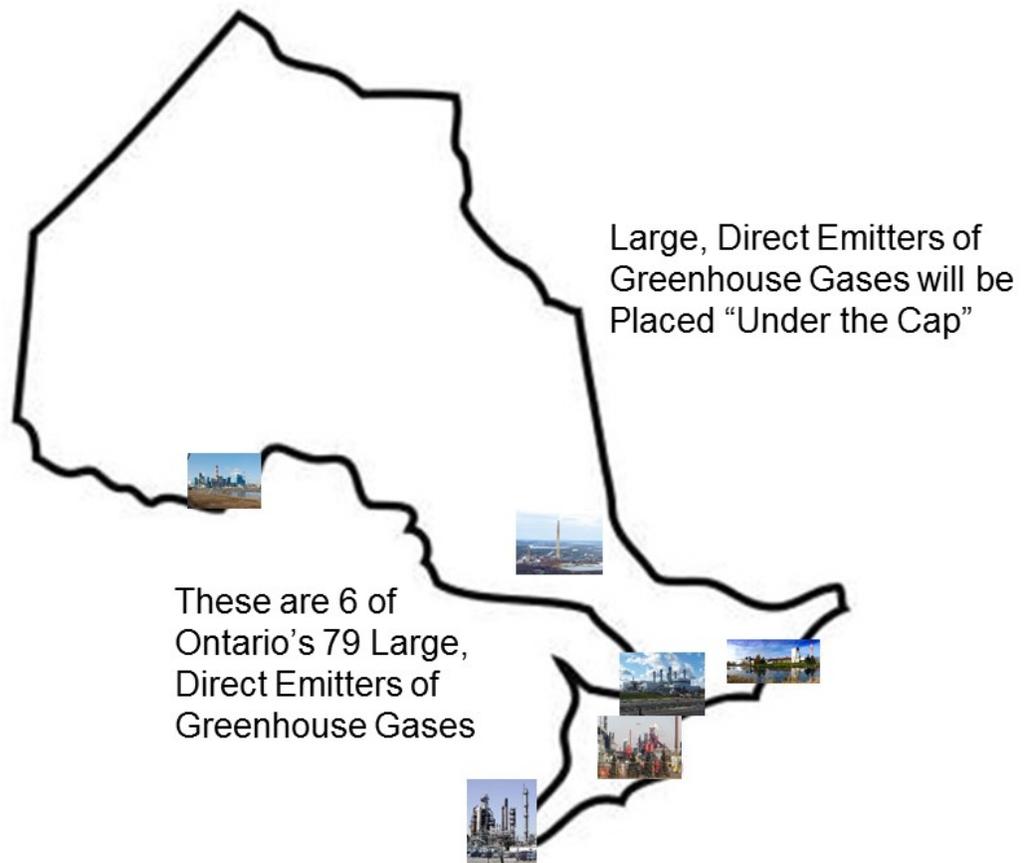
Cartoon by Nicholson from The Australian

www.nicholsoncartoons.com.au

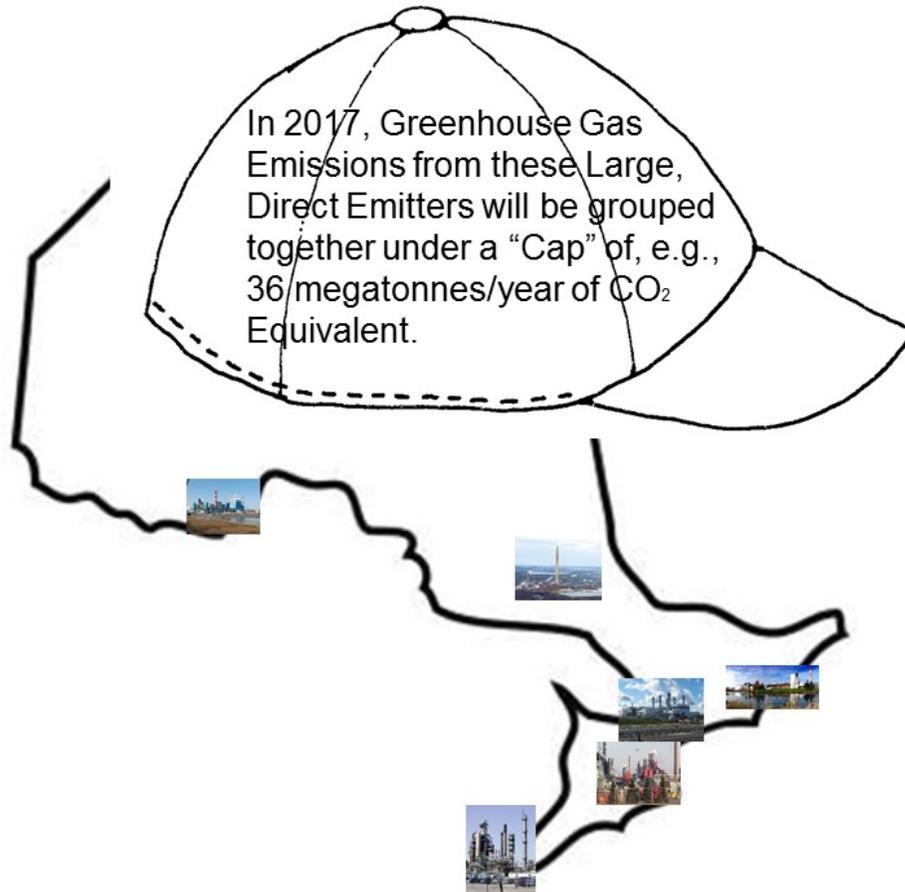
Here is Enerhope's Description of a Proposed GHG Cap-and-Trade System for Ontario, with 11 easy-to follow graphics:

The following process is Enerhope's recommendation for the Ontario GHG Cap-and-Trade System.

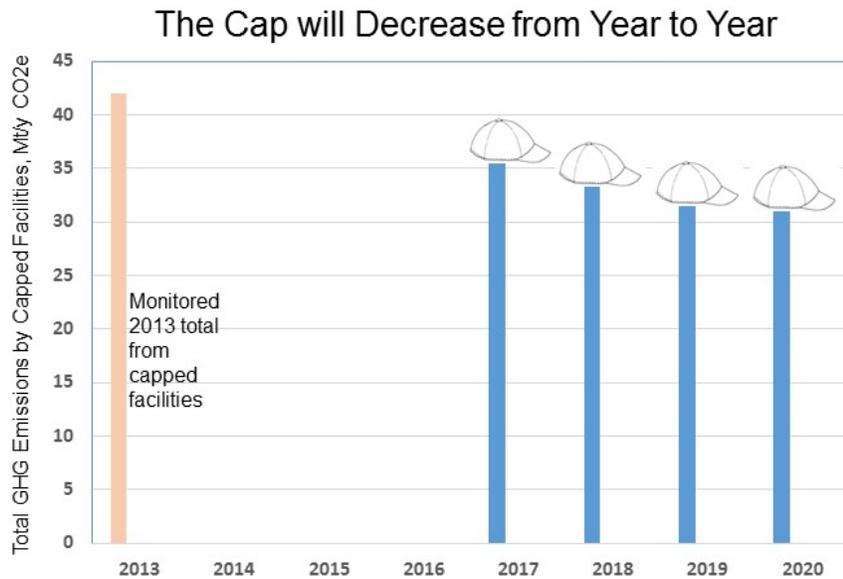
On May 19th, 2016 the **Ontario Ministry of Environment and Climate Change ("MOECC")** published a new **Regulation**, committing Ontario to a **Greenhouse Gas ("GHG") Cap-and-Trade System**.



The new Regulation should list Ontario's **Large, Direct Emitters ("LDEs")** of GHGs into the Atmosphere. These LDEs are large, heavy industries (e.g. petroleum refineries, cement kilns) and large fossil-fuel electricity generators. The Facility Greenhouse Gas Reporting site of Environment Canada lists 79 LDEs in Ontario. Each one of the 79 sites emits over 100,000 tonnes of **carbon dioxide equivalent ("CO_{2e}")** per year, directly into the atmosphere, from its own chimneys. Each LDE will be placed "**under the Cap**" of Ontario's Cap-and-Trade system, although there may be some exemptions.



LDEs placed **"under the Cap"** must participate in Ontario's Cap-and-Trade program. Their total GHG emissions for 2017 will be grouped together "under the Cap," which must not exceed a specified limit, e.g. 36 megatonnes/y of CO₂e in 2017.



(These totals are suggested by the author.)

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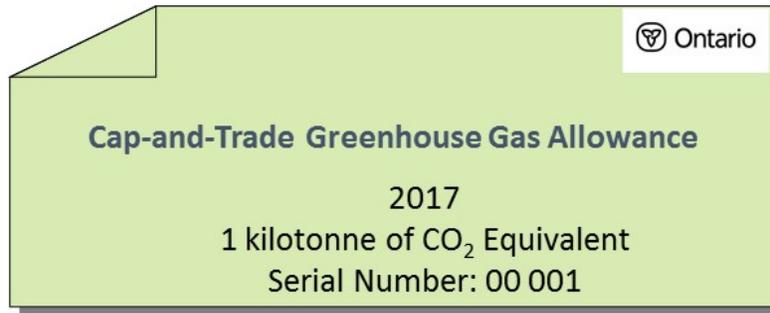
The Cap for 2017 should be lower than the monitored 2013 total from the Capped facilities.

The Cap will decrease gradually, from year to year.

The decreasing Cap will motivate the Capped Facilities to reduce their emissions, over the years.

Allowance:

a permit, which allows its owner to emit a specified amount of a specified pollutant into the environment.



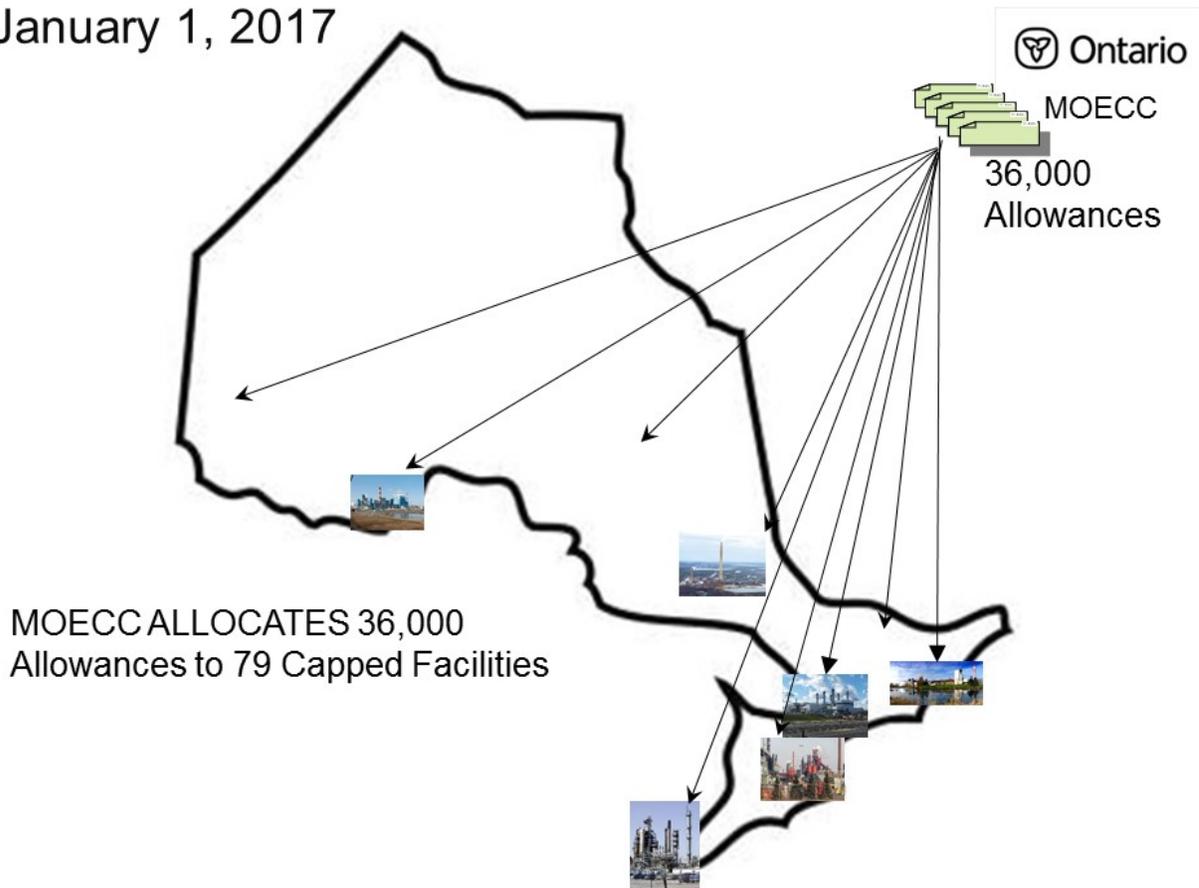
MOECC prints 36,000 Allowances on January 1st, 2017.

How will the Capped Facilities pay for their emissions? ...by returning “**Allowances**” to MOECC.

MOECC will print and give (“**Allocate**”) a **limited** number of permits (“**Allowances**”) to the Capped Facilities. An **Allowance** is a permit, which allows its owner to emit one kilotonne of CO₂e into the atmosphere. Each Allowance is marked with the year of origin, the province of origin (Ontario) and a unique serial number.

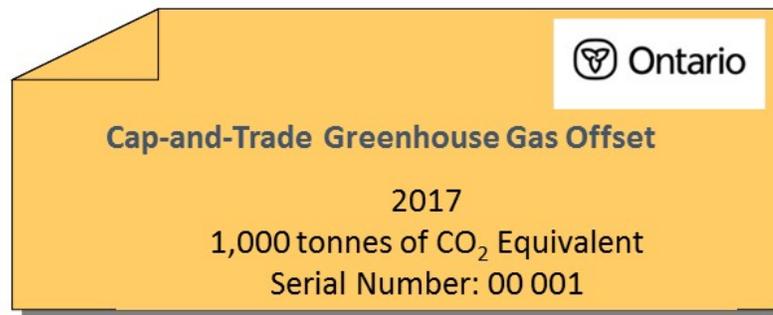
The total number of Allowances for 2017 will equal the specified Cap for 2017, e.g. if the Cap is 36 megatonnes of CO₂e, the total number of Allowances will be 36,000. This total is much lower than the 2013 total emissions from the Capped Facilities. The scarcity of Allowances will motivate the Capped Facilities to reduce their emissions, especially in the later years.

January 1, 2017



On January 1st, 2017 (or shortly thereafter), MOECC will “**Allocate**” (give) all 36,000 Allowances for 2017 to the Capped Facilities, under some fair distribution scheme. During the year, the Capped facilities must reduce their emissions, so that the total emissions from the Capped sector is less than or equal to the total Allowances.

Offset – a reward for emission reductions outside the Capped Sector



Offsets can supplement Allowances in Cap-and-Trade

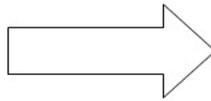
What if there are not enough Allowances? The Capped facilities will try to reduce their emissions, but there may not be enough Allowances to cover all their emissions. To supplement the scarce number of Allowances, MOECC can create **Offsets**, to reward emission reduction projects **outside the Capped Sector**. An organization which is **not a Capped Facility** can complete a **voluntary** emission reduction project and apply to MOECC for creation of Offsets, to reward the emission reductions. If MOECC agrees that the emission reductions were real and satisfy program requirements, MOECC will create a specific number of Offsets from the Project, and place these Offsets in the applicant's Account in the Registry. The applicant may choose to sell these Offsets to a Capped Facility, with the transfer recorded in the Registry.

Eligible for GHG Emission Reduction Offsets?

Bus Line – NOT a Capped Facility



Diesel Buses:
High-GHG



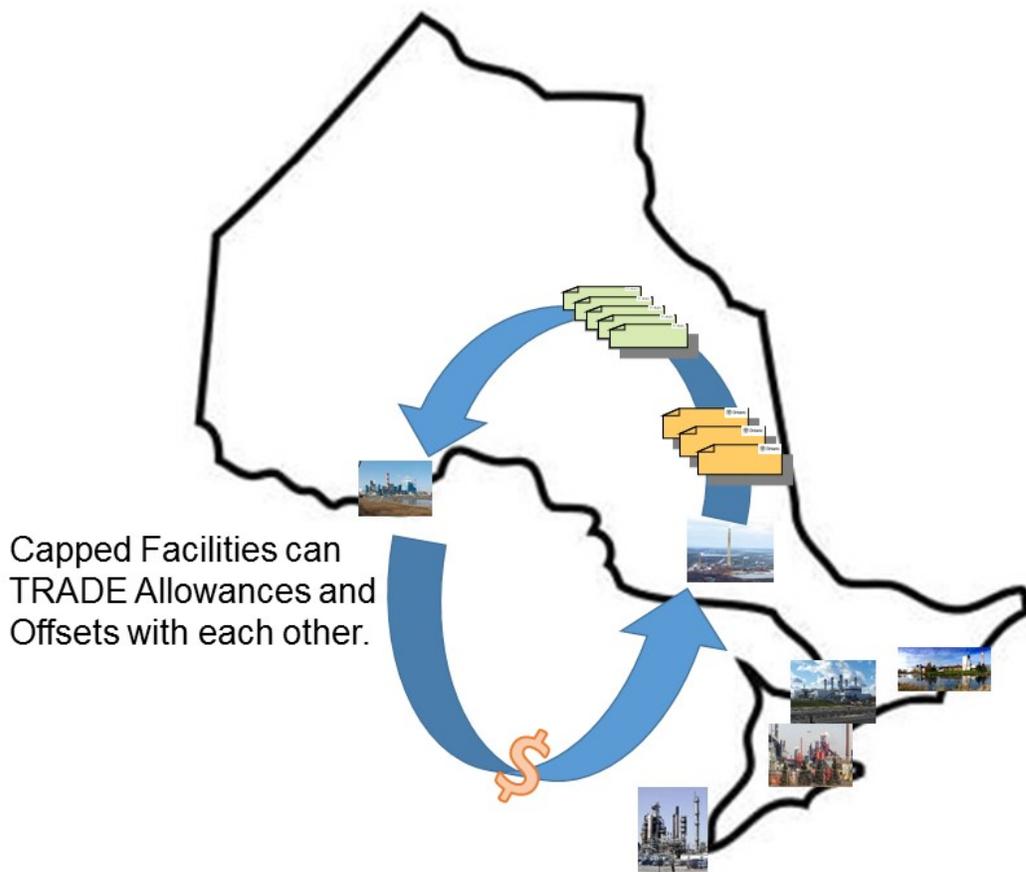
Natural Gas Buses:
Low-GHG

Here is a hypothetical example of an **emission reduction project**, outside the Capped Sector. A bus line converts all of its buses from diesel fuel (high GHG emissions) to natural gas fuel (low GHG emissions). The bus line's annual emissions of GHG decrease significantly. The bus line applies to MOECC for creation of Offsets. If the project and its emission reductions meet program requirements, MOECC will create a specific number of new Offsets and place them in the bus line's Account in the Registry. The bus line could then sell the Offsets to a Capped Facility, with the sale recorded in the Registry.

During 2017, each Capped Facility must monitor its Greenhouse Gas Emissions



Each Capped Facility must **monitor** its direct GHG emissions during the year, completely and accurately. At the end of the year, each Capped Facility must **report** to MOECC its total direct GHG emissions for the year.



Any organization with an Account on the Registry may **Trade** Allowances and Offsets with any other Account holder. A Capped Facility emitting too much GHG may choose to reduce its emissions, or to buy Allowances and Offsets from another Account holder. A Capped Facility which has reduced its emissions may have more Allowances than it needs to comply with the Regulation, and can sell its surplus Allowances.

Exception: No-one may remove Allowances and Offsets from The Retirement Account.

In the example above, the owners of the pulp-and-paper mill in Thunder Bay have decided not to reduce the GHG emissions from their mill. However, the mill does not have enough Allowances and/or Offsets in its Account on the Registry to equal this year's emissions.

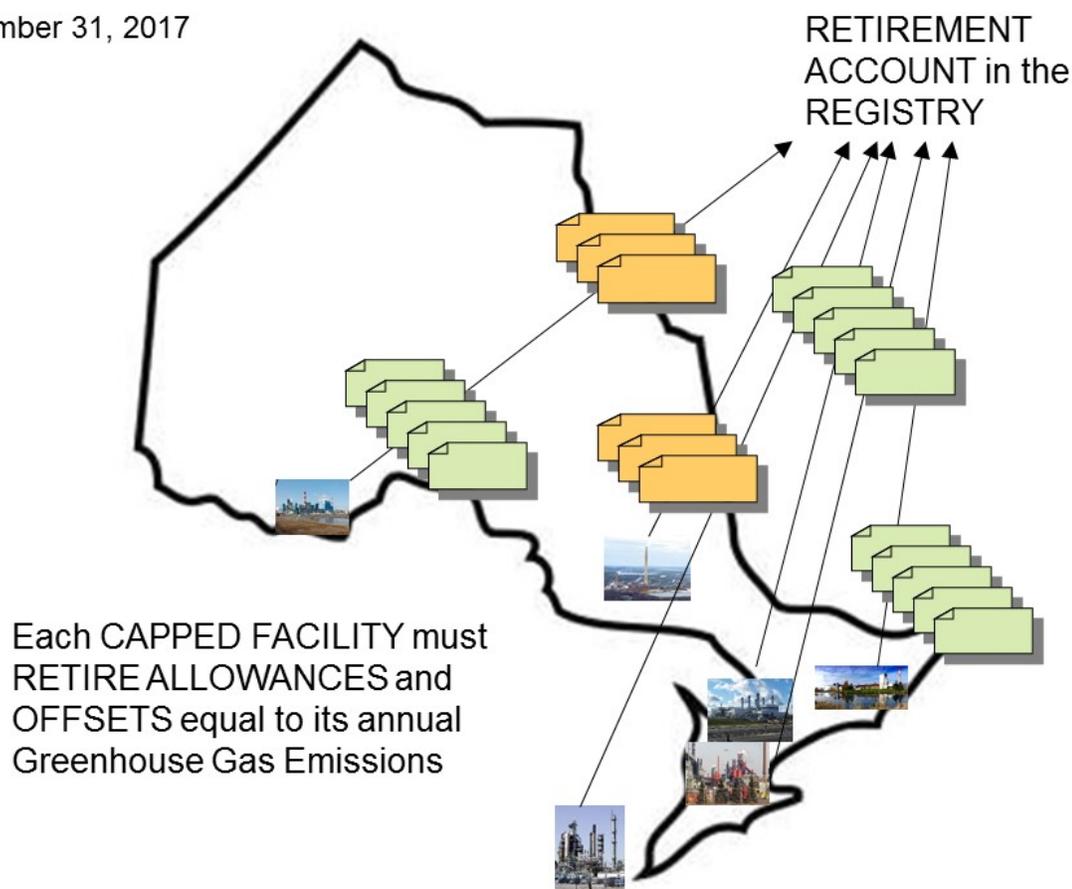
At the same time, the smelter in Sudbury has reduced its emissions this year, through energy conservation and process improvements. The Sudbury smelter has more than enough Allowances and Offsets in its Account on the Registry to cover this year's emissions.

The smelter sells 5 Allowances and 3 Offsets to the pulp-and-paper mill, for an undisclosed sum of money. The transfer is recorded in the two Accounts in the Registry, with the Serial Numbers of the Allowances and Offsets Traded.

Trading in a lively market for Allowances and Offsets, the Capped Facilities quickly find and reward the lowest cost emission reduction technologies and actions, without government intervention. Consumers are not seriously burdened, because the cost of Allowances and Offsets is low.

The limited number of Allowances in circulation motivates the Capped Facilities as a group to reduce GHG emissions, using the most economically beneficial technologies and actions.

December 31, 2017



At the end of the year, each Capped Facility must “Retire” (transfer to the **Retirement Account** in the Registry) Allowances and/or Offsets to equal its monitored total of GHG emissions during the year.

The Retired Allowances and Offsets are laid to rest in the Retirement Account, whence they never depart. The Serial Numbers of the Retired Allowances and Offsets are the “tombstones” in the Retirement Account’s “graveyard.”

A Capped Facility which does not Retire enough Allowances and/or Offsets to equal its annual GHG emissions is out of compliance with the Act.

An Early History of Cap-and-Trade, with Some Initial Successes

It's all Ontario's fault ! Cap-and-Trade was invented in Ontario. John H. Dales, a Professor of Economics at the University of Toronto, first mentioned "markets in pollution rights" in Pollution, Property & Prices, in 1968.

Another amazing historical fact! Cap-and-Trade flourished under Republican US President George H.W. Bush. Three Cap-and-Trade systems were highly successful in reducing smog gases from US fossil-fuel electricity generators. The Ozone Transport Commission NOx Budget Program (1990-2001) and the NOx State Implementation Plan (2002-present) reduced emissions of nitrogen oxides from fossil-fuel generation of electricity in the northeastern states by 70% by 2009. The Acid Rain Program reduced sulfur dioxide emissions from fossil fuel generating stations by 5.5 million tonnes per year between 1990 and 2005, a 35% reduction.

Cap-and-Trade reduced smog emissions from US electricity generators by creating an efficient commercial market for emission reductions. This market quickly found and rewarded the lowest cost emission reduction technologies and activities, with minimal government intervention.

In 2002, Ontario Regulation 397/01 created a Cap-and-Trade system for smog gases from fossil fuel electricity generators. The Cap-and-Trade system operated successfully for several years. It brought down smog emissions from Ontario's electricity sector, below the specified Caps. It demonstrated the mechanics of trading without any major problems. Unfortunately, 397/01 became obsolete when Ontario's new Liberal Government in 2003 announced that all coal-fired electricity generators would close. As the coal-fired units went off-line, one-by-one, smog emissions from electricity in Ontario went far below the Caps specified in 397/01, which became unnecessary.

After its early successes, Cap-and-Trade became a popular concept. As recently as 2008, the Republican Party in the USA promoted Cap-and-Trade for GHGs during the US Presidential Election (before attacking it in the 2012 election).

...and Now, Some Bad News

Unfortunately, Cap-and-Trade as a concept became burdened by politics and bureaucracy.

The much anticipated European Union Cap-and-Trade system continues to suffer from the creation of too many Allowances and Offsets. The price of EU Allowances is so low that Capped facilities can meet their regulatory obligations easily by buying and retiring cheap Allowances, instead of reducing their emissions.

The USA Cap-and-Trade system, promoted by President Obama, was never passed by the US Congress.

The RGGI Cap-and-Trade system in the North Eastern US states started with too many Allowances. Unfortunately, the total Cap and state-by-state Allocation were specified in legislation in 11 state assemblies, and could not be changed without a Herculean legislative effort.

Ontario has joined the Western Climate Initiative (“WCI”) Cap-and-Trade System

Ontario appears to be racing towards full adoption of the WCI Cap-and-Trade system, with complete union of Ontario Cap-and-Trade with California and Québec.

The WCI Cap-and-Trade system is different from what is described above.

Here’s what we can expect in Ontario:

1. (Almost) Everybody under the Cap:

A WCI-based, “California style” Cap-and-Trade system will place 82% of Ontario’s emissions under the Cap, including small and medium industries, commercial buildings, colleges, hospitals, residences, and motorists. The Cap will include direct emissions and indirect emissions.

Cap-and-Trade succeeds in reducing the emissions of Large, Direct Emitters (e.g. petroleum refineries, cement kilns). Each of these major industrial facilities emits over 100,000 tonnes per year of CO_{2e} directly into their atmosphere from the chimneys on its own premises. It has professional staff who understand the science and engineering of emission reductions and the mechanics of Cap-and-Trade.

In contrast, small and medium sized enterprises have no knowledge of emissions reporting, trading or reductions. Under the “California-style” Cap-and-Trade system, these small and medium-size enterprises will be required to monitor their emissions and Trade and retire Allowances.

The California-style Cap-and-Trade system will also Cap indirect allowances by residences and motorists. Gasoline distribution terminals will be required to monitor the emissions by their customers and retire Allowances at the end of the year to equal these emissions.

Capping fuel distributors for their indirect emissions, i.e. for emissions by their customers, would be a serious mistake. Motorists who buy and consume gasoline from service stations would not be under any regulatory obligation to reduce their greenhouse gas emissions. Instead, the motorists would see a price increase of about 4¢ per litre in the price of gasoline, varying with the week-by-week price of Allowances. The motorists would resent this price increase but would not reduce their emissions.

The history of carbon taxes on gasoline in British Columbia is an indication of the effect of a trivial increase in the price of gasoline on the behaviour of motorists, who have not

reduced their consumption of gasoline through 6 years of carbon taxes. Ontario's performance will be similar.

In Ontario's "California style" Cap-and-Trade system, the gasoline distributors, representing Ontario's largest emitting sector (Transportation), will need to purchase Allowances in California, to meet their regulatory obligations, because their customers probably will not reduce emissions. This purchase of California Allowances is already forecast for Québec, which will purchase between \$500 million and \$800 million in California Allowances over the next 8 years.

Many other programs and policies can reduce GHG emissions by small industries, commercial businesses, agriculture, buildings and motorists, much more effectively than trying to stuff 82% of Ontario under the Cap.

2. Very Few Offsets

With 82% of emissions placed under the Cap, Ontario's "California style" Cap-and-Trade system will have very few opportunities to create Offsets. Massive, necessary, voluntary, commercial opportunities for emission reductions in transportation, commercial buildings, small industry, agriculture and renewable energy will not be encouraged. Sufficient Offsets will not be able to supplement Allowances in a tight Allowance market.

3. Auction of Allowances

In a break from past behaviour, Ontario intends to sell most of its Allowances by auction. Capped facilities will need to buy Allowances at auction or from other Allowance holders. The auction revenues will be used to fund emission reduction activities and new technologies.

Auction of Allowances will create a long, circuitous path for the Allowances to be traded by their original owners, through various Traders, to the Capped facilities. This long, circuitous path will add cost, complexity, and the risk of price speculation to the purchase of Allowances by Capped facilities.

Auctioning of allowances adds to the price of electricity and consumer products, and is perceived as an unfair tax by opponents of Cap-and-Trade. The consumers of products of Capped facilities must pay not only the price of the products, but also the price of emission reductions, the auction price, and the price of speculation by investors.

The mechanics of auction create the need for secrecy, which contradicts the need for transparency in the Cap-and-Trade system.

Proponents of allowance auctions reply that Ontario's revenue from Cap-and-Trade will be used to finance emission reduction projects; however, in at least one Cap-and-Trade state, some of these revenues have been used to pay down the state deficit, instead of financing emission reductions.

The alternative to auctioning of Allowances is Free Allocation of Allowances to Capped facilities, according to a fair scheme, under a hard Cap, with a lively Offsets system. The successful Cap-and-Trade programs which reduced smog gases from USA and Ontario electricity generators featured Free Allocation.

Free Allocation to Capped facilities has the following advantages:

- Minimum cost to customers of the Capped facilities: The only cost is the cost of emission reductions. The market for Allowances and Offsets quickly purchases the lowest cost emission reductions.
- The Capped facilities hold most of the Allowances in their own Accounts until Retirement. A few Allowances are traded before Retirement.
- Wealthy Capped facilities (e.g. petroleum refineries) cannot easily buy their way out of their regulatory obligations.
- Economically-stressed Capped facilities (e.g. pulp-and-paper mills) do not need to buy all their Allowances.
- No taxes, no fees, no subsidies, no government financial transactions
- No auction-rigging, no hoarding, no scalping
- Free Allocations are visible to the public: “Transparency”
- By controlling the free allocation of Allowances to Capped facilities, the Government can discourage “leakage” of emission activities outside the Capped facilities.
- By controlling the free allocation of Allowances to Capped facilities, the Government can reward efficient sites and penalize inefficient sites.

In the end, the argument between Free Allocation and Auctioning is an argument between a commercial market and a tax-and-spend program for emission reductions. Which program would be more effective and more efficient at reducing emissions, a true Cap-and-Trade program, establishing an efficient, effective commercial market for prompt emission reductions, or a tax-and-spend program, distorted by politics and bureaucracy? The original, successful Cap-and-Trade programs of the 1990’s were not established to tax-and-spend.

4. Registry in California

When Ontario unifies its Cap-and-Trade system with California and Québec, the Registry for recording and displaying the history of each Ontario Allowance and Offset will be located in a private company, WCI Inc., in Sacramento, California. Millions of tonnes of Ontario GHG Allowances, a public asset of the people of Ontario, will be handed over to WCI Inc., to be auctioned to persons unknown. The auction revenues will be paid to the Province of Ontario. The WCI Registry, known as CITSS, will be the ultimate authority on the validity of Offsets from Ontario emission reduction projects outside the Capped sector.

5. Secret Registry

The WCI Registry, CITSS, is not visible to the general public. This secrecy violates one of the fundamental principles of Cap-and-Trade: **transparency**. The public will not know of the existence or ownership of any Ontario Allowances or Offsets.

This secrecy is a clear departure from the open, accessible Registry which followed the Allowances and Offsets in Ontario's earlier Cap-and-Trade system for electricity smog gases. Ontario Regulation 397/01, which created the earlier Cap-and-Trade system states, "The operator of the Registry shall ensure that all information contained in the Registry is made available, without charge or on payment of a reasonable fee, to any person who requests it."

A secret Registry goes against the transparency and public access recommended by the US Environmental Protection Agency's Tools of the Trade, a Guide to Designing and Operating a Cap and Trade Program for Pollution Control.

So, Where are we?

Ontario has many opportunities to reduce its GHG emissions. Cap-and-Trade for Large, Direct Emitters is one of these opportunities.

A Cap-and-Trade program for Large, Direct Emitters, featuring Free Allocation of Allowances to Capped facilities, according to a fair scheme, under a rigorous Cap, with a lively Offsets system, and an open, transparent Registry, could reduce Ontario's GHG emissions by tens of megatonnes per year. Other programs and policies are necessary to reduce emissions from other sectors.

However, trying to push 82% of Ontario's emissions into a Cap-and-Trade system, administered by a secret office in California, would be a mistake.

Tom Markowitz, P.Eng., was a Senior Policy Advisor in the Ontario Ministries of Environment and Energy, until he retired in 2009.