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THE WAY FORWARD FOR ONTARIO

Design Principles for Ontario's New Cap-and-Trade System

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EXECUTIVE SUMMARY

Over the next year, Ontario will design and implement a cap-and-trade system for reducing greenhouse gas emissions. Much public discussion has focused on the effectiveness of cap-and-trade as an overall approach to pricing carbon. While it is possible to debate the inherent advantages and challenges of cap-and-trade compared with other carbon-pricing approaches, the fact is, these differences are small. Effective cap-and-trade systems can, and do, exist. But various problems also exist. In Ontario, as in any other jurisdiction, the success of the cap-and-trade system will hinge on the design details.

Drawing on the Ecofiscal Commission's April 2015 report, *The Way Forward*, this brief outlines four fundamental principles of good cap-and-trade design. It offers a practical roadmap and specific recommendations to Ontario as the province moves toward developing its policy. The same principles could be used as a guide by any province considering the introduction of a cap-and-trade system.

A common theme runs through these principles and recommendations: transparency. It is not enough to design a policy that is effective, cost-effective, and fair. It must also be clear, predictable, and immune to political interference. The confidence of Ontarians—everyday consumers and big emitters alike—is critical to the success of the province's new policy. While the principles outlined in this brief do not address every detail of policy the government will need to consider, they offer the basis for a well-designed cap-and-trade system for Ontario.

Principles and Recommendations

1. Stringency of policy should rise gradually and predictably over time in order to drive meaningful emissions reductions.

Ontario should

- introduce a "cap" on emissions that results in meaningful reductions. That cap should steadily and predictably decline over time;
- manage price volatility to ensure long-term incentives for innovation and deep reductions;
- enforce strong non-compliance penalties.

2. Coverage of policy should be as broad as practically possible.

Ontario should

- use a combination of upstream and downstream points of regulation;
- avoid exemptions or exclusions to ensure cost-effective, fair, and transparent policy;
- carefully handle the use of offsets, if used, which can further broaden coverage, but only if they are credible and represent real and verifiable emissions reductions.

3. Aim to auction all allowances. The scope for free allocations should be narrow, rules-based, and transitional.

Ontario should

- auction allowances as a rule to enable more cost-effective, simple, and transparent policy;
- allocate free allowances only as an exception to reduce adverse competitiveness impacts, but provide this support based on clear, transparent rules and for a limited period;
- avoid free allowances in sectors in which emitters can pass on costs.

4. Seek out opportunities for linkage.

Ontario should

- link with Quebec and California, as planned, to improve cost-effectiveness reinforcing an existing template for inter-jurisdictional carbon-pricing;
- encourage other provinces and jurisdictions to join the linked system, broadening the scope of the cap-and-trade system
- design its system for harmonization on elements such as price floors/ceilings, reporting, and monitoring, verification, and enforcement.

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Over the next year, Ontario will design and implement a cap-and-trade system for reducing greenhouse gas emissions. The details of cap-and-trade design are critically important, perhaps even more so than for a carbon tax. A well-designed system can equitably achieve emissions reductions at least cost. A poorly designed system risks being not only ineffective but also unfair and less cost-effective. This brief builds on the Ecofiscal Commission's first report on carbon pricing, *The Way Forward*, to identify principles for a well-designed cap-and-trade system in Ontario.

We consider four main principles of design. Several other details are also important, but this paper focuses on the fundamentals. Overall, the theme of governance emerges, spanning all four design principles as a means of ensuring transparency and predictability. We describe these issues in turn: stringency, coverage, permit allocation, linkage, and governance.

Principle #1: Stringency should rise gradually and predictably over time to drive meaningful emissions reductions

A cap-and-trade system imposes a *quantity constraint* (the "cap"), limiting the total allowable levels of greenhouse gas (GHG) emissions in a given compliance period. The cap reflects the total number of tradable emissions allowances (also known as "permits") created by the policy. To comply with policy, emitters require a permit for each tonne of emissions. Critically, the cap declines over time, with deeper reductions required in subsequent compliance periods.

A lower cap represents a more stringent policy because it requires more action by emitters overall. Yet because the allowances are tradable, different emitters will generally reduce their emissions by different amounts. A carbon price emerges from the market created by these trades and the scarcity created by the cap. Not surprisingly, a lower cap generally leads to a higher carbon price.

The two key metrics to compare the stringency of different cap-and-trade systems—(1) the strictness of the quantity constraint and (2) the carbon price—are really just two sides of the same coin. To these two metrics, one can add a third measure of stringency: penalties for non-compliance. We discuss each in turn.

A "cap" on emissions

The cap on GHG emissions depends on the target the authorities want to reach at the end of the compliance period (as part of the Western Climate Initiative, for example, regulated emitters in California and Quebec must demonstrate their compliance at the end of three-year periods). The more ambitious the target, compared with the baseline, the more important will be the reduction of allowances each year.

For Ontario's cap-and-trade system to be effective, the total quantity of permits allocated must be equal to the provincial cap. This is not always simple, and errors can undermine the confidence in the system. In the European Union's Emissions Trading System (EU ETS), for example, too many permits were allocated during the pilot phase (2005-2007), partly due to limitations in emissions data. Initially, there was no overall limit to the number of allowances; the total supply was simply the result of the 25 separate decisions concerning the number of allowances that each member state chose to distribute within its jurisdiction. The issue of over-allocation came to light when it was discovered, in April 2006, that there were more allowances than actual emissions, which led to a collapse in the price.[1] In the

[1] For more details, see Ellerman and Joskow (2008).

third phase of the system (2013-2020), efforts have been made to overcome these difficulties. In particular, a single EU-wide cap on emissions has replaced the previous uncoordinated system of national caps. The EU also took steps to manage price volatility, as discussed below.

The dynamics of the emissions cap are also important. The sooner governments implement policies, the more time emitters have to make changes gradually, rather than abruptly. An economic environment with a predictable decline in the cap, which would generally lead to a similarly predictable increase in price, is essential to long-range planning, especially for capital-intensive businesses. Steadily increasing the stringency by tightening the cap over time will avoid unnecessary shocks to the economy, but will nonetheless encourage households and businesses to change their behaviour as the price of carbon rises.

Mechanisms to manage price volatility

The *carbon price* reflects each emitter's marginal incentive for reducing GHG emissions. Carbon prices make carbon-intensive activities more costly relative to less intensive activities and can actually make carbon-reducing activities profitable. In a cap-and-trade regime, a carbon price emerges from the trading of allowances whose scarcity value derives from the existence of the cap.

This carbon price is not fixed. Like all market-determined prices, the price of carbon can fluctuate, though, as we discuss below, policy design can moderate these swings. Changes in technologies, and the ebb and flow of the business cycle can be especially important in driving price volatility. In the EU ETS, for example, the global financial crisis of 2008-10 and the very low growth in subsequent years led to lower than expected GHG emissions. As a result, the demand for allowances fell and the market-determined price of carbon plummeted. Yet the market responded exactly as should be expected: the emissions cap was easier to achieve, given the reduced economic activity, and a lower carbon price was the inevitable result.

Price volatility can nonetheless be problematic. A persistently low carbon price provides inadequate incentives for innovation and long-term investments in low-carbon technologies (Knopf et al., 2013; Sijm et al., 2013). In contrast, large and sudden spikes in the price could threaten business competitiveness and be detrimental to the economy.

Design mechanisms can manage this price volatility. Three main approaches are available:

- A *price floor* establishes a minimum carbon price, guaranteeing incentives for innovation and long-term emissions reductions. In California and Quebec under the WCI, for example, no bids for allowances are accepted below the "auction reserve price." This minimum price is currently around $15 per tonne and is scheduled to increase by 5% (plus inflation) each year (California Air Resources Board [CARB], 2015). Both the Regional Greenhouse Gas Initiative (RGGI) and New Zealand's cap-and-trade system also have forms of price floors.

- A *price ceiling* places an upper limit on the market price of allowances, guarding against costly price spikes. It does so by selling additional permits at a fixed price. The now-repealed Australian carbon-pricing policy, for example, planned for two phases. From 2012 to 2014, the policy was more like a carbon tax, with no true cap on emissions, and unlimited numbers of allowances were available for sale at a fixed price. During the second planned phase of the policy (which was never realized), a price ceiling at AUS$20 above expected international prices would have ensured prices would never be too far out of line with those in other jurisdictions (Center for Climate and Energy Solutions [C2ES], 2011).

- Alternatively, a *market stability* reserve manages prices via adjustments to the permit supply. The Quebec-California system, for example, sets aside a small portion of the total allowances and makes them available for sale at a fixed price. This approach ensures that the emissions cap is never exceeded, while still providing the government with a mechanism to reduce price variability. Similarly, the EU ETS chose to delay the auction of 900 million tonnes' worth of emissions allowances in the early part of its third phase to reduce the supply in the short term. In the longer term, it will use a stability reserve that can add or deduct allowances to the reserve set-aside from future compliance periods to manage price fluctuations (Knopf & Edenhofer, 2014).

Penalties for non-compliance

Incentives under a cap-and-trade system only hold if regulated entities have no motivation to cheat. At the end of the compliance period, each affected emissions source is required to hold at least one allowance for each unit of emissions during the compliance period. Cap-and-trade programs must include provisions authorizing the regulating authority to reconcile the emissions of

each source with the number of allowances they hold to determine compliance. The regulating authority must have the power to impose and enforce sufficient penalties on emissions sources that do not comply with the program rules (US EPA, 2003).

The EU ETS, for example, has a non-compliance penalty of €100 per tonne, an amount far higher than the current market price of allowances. As illustrated in the table below, in many regimes, including the California-Quebec system, the fine is expressed as a multiplier of the carbon price, ensuring that the wedge between the penalty and the marginal incentive to reduce emissions remains constant in relative terms.

Table 1 compares the stringencies of cap-and-trade systems in other jurisdictions, highlighting caps, measures to manage price volatility, and penalties for non-compliance.

Summary: Increasingly stringent policy

- Ontario's "cap" on emissions should require meaningful emissions reductions and should steadily and predictably decline over time.
- Ontario should manage price volatility to ensure incentives for long-term innovation and deep emissions reductions.
- Ontario should enforce strong non-compliance penalties to ensure the policy creates incentives for emissions reductions.

Table 1: Comparison of Stringency of Cap-and-Trade Systems

Area and System	Stringency of Cap	Price Volatility Management	Penalty for Non-Compliance
Quebec-California System (Western Climate Initiative)	For Quebec, 3.2% annual reduction (from 2015 level)	Auction floor of $15 (2015), rising 5% annually + inflation; soft price ceiling through a strategic reserve	Entities must surrender four allowances or offsets for each missing allowance
European Union Emissions Trading System	1.74% annual reduction (from 2008-12 average level)	Market stability reserve automatically adjusts the annual supply of allowances based on the surplus in the market (starting in 2019)	Fine of €100/tCO_2
Regional Greenhouse Gas Initiative	2.5% annual reduction until 2020	Floor price of $2.05 in 2015, increasing annually by 2.5%	Fine equal to three times the allowance price for each missing allowance
South Korea Emissions Trading System	1.9% annual reduction (from 2015 level)	The government may intervene directly in the market if there is a need to stabilize prices	Fine shall not exceed three times the average permit price over a given compliance year
New Zealand Emissions Trading System	Unlimited intensity-based allocations means no hard cap on emissions	Fixed price option at NZ$25	Fine of NZ$30-60/$tCO_2$

Source: Carbon Market Watch, 2015

Principle #2:
Make coverage of policy as broad as practically possible while maintaining the integrity of the system

The coverage of Ontario's new cap-and-trade system (i.e., those emissions subject to the cap) will be a key determinant of its success or failure. Coverage defines the emissions subject to the cap and thus to the carbon price. Broad coverage creates incentives for emissions reductions throughout the economy. Coverage also matters for minimizing the costs of any given level of emissions reduction. The more emitters (and emissions) covered by the policy, the more incentives exist to realize all available low-cost reductions. But what does broad coverage mean in practical terms?

Point of regulation

The *point of regulation*—which defines who must comply with the emissions cap—is a key determinant of coverage. This design decision mainly concerns balancing the cost-effectiveness of broad coverage against the higher administrative costs that occur with having more capped emitters. There is a credible argument that a cap-and-trade system should be applied to a smaller number of emitters in order to keep administrative costs to a minimum. RGGI, for example, covers only power producers, thus targeting a major source of GHG emissions while limiting the number of participants and the complexity of the system.

A *downstream* cap—applied at the end of lifecycle for fuels—limits the emissions actually produced by regulated emitters. Yet to manage complexity and administrative costs for both government and emitters, a downstream cap typically only applies to large emitters (those with emissions above a given threshold). Imposing and enforcing a cap on many small emitters is impractical; including more "point sources" in the policy adds administrative costs, but also poses measurement and enforcement problems for non-point sources, such as vehicles. In the Quebec cap-and-trade system, for example, only emitters that exceed 25,000 tonnes of CO_2e per year (including both process and combustion emissions) have their emissions directly capped (International Carbon Action Partnership, 2014).

An alternative approach is to apply a cap-and-trade system *upstream* on fuel distributors, based on the carbon content of the fuel they sell.[2] Fuel distributors pass the carbon costs on to their consumers, including vehicles, buildings, and other small emitters. Emissions from the many such small entities would be challenging to include directly under a downstream cap. An upstream cap has lower administrative costs and less complexity both for the emitters themselves and the enforcement apparatus required by government. On the other hand, it only covers GHG emissions associated with the combustion of fossil fuels.

The Quebec and California systems actually use a combination of upstream and downstream approaches. Fuel use for small emitters is covered via an upstream cap on fuel distributors, while large emitters have their emissions capped directly. The result is an approach with broad coverage—around 85% of provincial emissions in Quebec—but relatively modest administrative fees. One estimate suggests that administrative costs for Quebec's cap-and-trade system in 2014 were only about $2.5 million (Chalifour & Papy, 2015). To put this cost in context, Quebec's system is expected to generate revenues of approximately $425 million in 2015. This model is a useful one for Ontario to emulate.

Emitters may be more aware of the carbon price in a downstream system in which they directly "experience" the policy, and as a consequence of this greater awareness, they may respond with greater behavourial changes. This could be one advantage of a downstream system. However, an upstream system could achieve a similar impact if retailers were required to make the carbon costs embedded in prices explicit to consumers, in the same way that HST is currently explicit on all final sales receipts.

Exemptions and exclusions

There will always be arguments for excluding a firm, industry, or region from a cap-and-trade system. Such exemptions are rarely justified. They reduce cost-effectiveness, undermine the system's credibility, and create divisiveness among emitters.

Excluding emitters from a cap-and-trade system can significantly reduce the cost-effectiveness of the policy. Achieving the same level of emissions reduction under a system with narrower coverage means that costs of compliance will be borne by a smaller number of emitters. Some will face no incentives, while others will face stronger ones. If the exempted entities have low abatement costs, then the overall costs of the policy are necessarily increased, as low-cost emissions reductions opportunities are missed.

Exemptions also undermine the credibility of a system by reducing fairness. Without all emitters facing the same price, political rivalries, jealousies, and competition will undermine political support for the regime. Further, once one exemption is granted, denying others becomes more challenging for government to justify. Drawing the line is very difficult in both

[2] Applying the cap even further upstream (to fossil-fuel producers) is impractical, given the large number of entities involved in production.

economic and political terms. Exemptions invite all participants to engage in rent-seeking behaviour in an effort to receive special status. Such rent-seeking activities, though potentially very rewarding for the specific firm involved, represent a net loss to society. A similar argument applies to allocating emissions permits, as discussed below.

In cases where specific emitters might legitimately need transitional support—for example, those that are especially *emissions-intensive* and *trade-exposed*—policymakers should consider alternative approaches. See the discussion below relating to the allocation of permits.

Pros and cons of offsets

Offsets broaden the coverage of a cap-and-trade system to include emissions reductions that are hard to incorporate directly under the cap, such as changes in agricultural practices, forestry or land use. Broadening coverage can improve the cost-effectiveness of the overall policy, but only if these emissions reductions are a genuine result of the policy. If emissions reductions would have happened anyway, even in the absence of the offset payment, then the effectiveness of the policy is undermined. British Columbia's Auditor General (2013) identifies this problem in B.C.'s offset program, used to help government facilities achieve carbon neutrality. Strong and transparent governance of offsets can help address these concerns. Offsets in Alberta's Specified Gas Emitters Regulation, for example, are verified by independent third parties; offset protocols pass through technical, stakeholder, and public reviews. Members of the Western Climate Initiative can each certify and issue offsets and set limits on compliance using offsets. (Sawyer, et al., 2011).

Summary: Broad coverage, practical design

- Ontario should use a combination of upstream and downstream points of regulation to design a cap-and-trade system with broad coverage.
- Ontario should avoid exemptions or exclusions to ensure more cost-effective, fair, and transparent policy.
- Ontario should be careful with the use of offsets, which can further broaden coverage but only if they are credible and represent real and verifiable emissions reductions.

Principle #3: Aim to auction all allowances; the scope for free allocations should be narrow, rules-based, and transitional

A cap-and-trade system creates a market for emissions allowances, and thereby creates a price for those same permits. As a result, emissions allowances have economic value. Authorities must decide whether to give that value to firms in regulated industries, through free allocation of permits, or to sell permits through transparent and competitive auctions. It is also possible to combine these two options by auctioning a fraction of the permits and giving the remaining permits for free.

Existing cap-and–trade systems highlight the range of choice for permit allocation. In the U.S. Acid Rain program, SO_2 allowances were freely allocated to regulated entities. All CO_2 allowances were auctioned under RGGI, while approximately 25% of the CO_2 allowances were initially provided for free in the Quebec and California systems, the rest being auctioned (Ecofiscal Commission, 2015).

It is worth noting that the method by which permits are allocated has no impact on the effectiveness of the cap-and-trade system in achieving targeted emissions reductions (Kopp, 2007). Whether allowances are distributed for free or auctioned, the total number of allowances—and thus the cap—is not affected. As a result, the same emissions reductions are achieved in either case, as long the total number of allowances is the same.

The nature of permit allocation does, however, have implications for both the cost-effectiveness and the fairness of the policy. If allowances are auctioned, revenues can be significant. Beugin and Thivierge (2015) provide a rough estimate of carbon revenue for Ontario (assuming that 70% of allowances are auctioned) at $1.5 billion in 2016 and rising to $3 billion in 2020. How these revenues are recycled has important implications for the net cost of the program to individual stakeholders and to the province as a whole.

The rationale for free allowances: Managing the transition

Arguments for free allowances are usually rooted in competitiveness concerns. The cost of purchasing allowances could leave emissions-intensive and trade-exposed firms competitively disadvantaged in international markets. Providing free allowances to these firms can reduce the average cost of policy to emitters while maintaining their marginal incentives to reduce emissions, thus addressing these competitiveness

concerns. Providing free allowances based on output or emissions-intensity ("output-based allocations") can reduce the incentives for emitters to reduce their production or motivate relocation to jurisdictions with weaker policy.

Market structures play an important role. If emitters can pass through costs of carbon in the form of higher prices, then free allowances can lead to windfall profits for those emitters. Electricity generators in the EU ETS, for example, passed on some costs to electricity consumers under the EU ETS, even though they received free allowances (Ellerman & Joskow, 2008). Windfall profits reduce the fairness and the cost-effectiveness of a cap-and-trade system.

The challenges of free allowances and the case for auctioning

A number of concerns are raised with the free allocation of allowances.[3]

As with exemptions, free allocations can be divisive, because they provide economic value to specific emitters. The value of allowances can thus lead to rent-seeking: Decisions about how free permits should be allocated may be subject to intense lobbying, which could undermine confidence in the effectiveness of the cap-and-trade system. Similarly, depending on design, they can provide an advantage to firms existing at the time the system is first implemented; if new entrants are not afforded the same benefits as incumbents, they will suffer undue prejudice.

As a result, transparent allocation of free permits requires clear criteria to determine how many allowances should be given, and to whom. Allowances could be distributed on the basis of historical emissions ("grandfathering") or on the basis of output. Grandfathering requires that good historical emissions data exist for all players in the system. The measurement, reporting, and verification of such metrics may be considered an administrative burden of the free allocation process. Furthermore, giving allowances on the basis of historical emissions is a questionable approach in the long run, depending on how the allocation rule is updated over time, since large emitters receive more valuable allowances. Similarly, providing free allowances based on output effectively subsidizes production and potentially making the cap harder to achieve (National Round Table on the Environment and the Economy, 2009).

Perhaps the biggest problem is that providing allowances for free forgoes the opportunity to achieve important economic benefits by using the auction revenue to reduce existing growth-retarding taxes, provide critical infrastructure, invest in environmental R&D, or several other options. For instance, in *The Way Forward*, the Ecofiscal Commission (2015) uses a simulation exercise to show that, for a given level of emissions reduction, revenue recycling through reduced personal income taxes can improve the cost-effectiveness of a carbon-pricing policy by 0.9 % of GDP relative to an inflexible regulatory approach. Revenue also creates opportunities to provide targeted support to those households and sectors disproportionately affected by the carbon price, thus addressing legitimate concerns of fairness.

Given the concerns related to the free allocation of permits, any such provision should meet three criteria:

- It should be *narrow* in that it should apply only to the most emissions-intensive and trade-exposed sectors. Reducing leakage and competitiveness impacts is a legitimate goal, but only a small share of the economy is likely vulnerable.
- It should be *rules-based* in that data, not discretion, should be used to identify vulnerable sectors, thus increasing transparency.
- It should be *transitional* in that it is phased out over time, thus providing additional incentives for emissions-intensive and trade-exposed firms to develop new technologies to allow them to compete internationally under carbon constraints.

Summary: Auctioning as the rule; free allowances as a transitional exception

- Ontario should auction most allowances to enable more cost-effective but also simpler and more transparent policy.
- Free allowances may have a role to play in addressing competitiveness and leakage concerns. However, Ontario should only narrowly provide this support, based on clear and transparent rules, and for a limited period.
- Ontario should avoid providing free allowances to sectors in which emitters can pass on costs.

[3] As a result, systems are trending toward increased auctioning over time. See the Carbon Market Watch report from May 2015.

Principle #4: Seek out opportunities for linkage

Linkage means that emitters can trade emissions allowances between different cap-and-trade systems, creating a common market with a consistent price. It is a mechanism for harmonizing carbon prices and can increase both the overall effectiveness and cost-effectiveness of the policy.

Ontario's cap-and-trade system should be designed from the outset to facilitate straightforward linkage with other cap-and-trade systems. In fact, it is on track to do exactly this with a stated intent to cooperate with Quebec and California.

The benefits of linkage

Linkage with other cap-and-trade systems offers several benefits.

Most importantly, it increases the overall cost-effectiveness of the policy by broadening the coverage of the cap across multiple jurisdictions, allowing for more low-cost emissions reductions. Economic modelling of the permit trade between California and Quebec, for example, suggests that Quebec will have fewer low-cost emissions reductions available than California, given that the province's electricity system is already decarbonized. Linkage therefore allows Quebec emitters to avoid high-cost emissions reductions, while California emitters achieve more low-cost reductions. The result is savings to Quebec in the form of avoided costly emissions reductions and net revenue flows to California, both on the order of several hundred million dollars. Both jurisdictions gain from linked trade (Purdon et al., 2014; CARB, 2012).

Linkage also increases market liquidity by establishing a larger permit-trading space, allowing larger and more frequent trades to take place within a common system. It also improves the durability of policy by increasing stakeholder acceptance across multiple cap-and-trade jurisdictions, making it harder for arbitrary changes to any one system without consultation with partners. In the long term, linkage with other carbon-pricing policies—such as a carbon tax—are also possible, though the mechanism for doing so is less straightforward.

In the longer term, linkage also begins to establish a common framework for carbon pricing across more jurisdictions and more emissions. As more jurisdictions join the system, more global emissions reductions can be achieved in a cost-effective manner. A larger network of linked carbon markets also reduces competitiveness and leakage concerns, since linkage harmonizes the carbon price.

Challenges of linkage

At the same time, however, linkage can create perceived political problems. On the one hand, jurisdictions that are net buyers of allowances can face challenges over the perceptions associated with using cash payments to avoid emissions reductions at home. On the other hand, net sellers of allowances will see a higher carbon price—and so higher final energy costs—as a result of linkage. Despite these perceptions, the reality is that both jurisdictions gain economically from linkage, and total emissions within the system are reduced in a cost-effective manner. When Ontario joins Quebec and California, it is unknown whether it will be a net seller or net buyer of allowances, since the flow of allowances across jurisdictions depends on the level of the cap and the costs of abatement within the province, relative to those in Quebec and California. As a result, governments need to spend time educating businesses and the public on the advantages of establishing system linkages, while also ensuring that the linked systems are aspiring to high common standards.

Linkage also constrains design choices, requiring alignment of policy on several key dimensions. For example, for allowances to be equivalent between systems, a consistent definition of emissions is required. Similarly, administrative functions such as measurement, reporting, and verification regimes must be harmonized. Price floors and ceilings must also be aligned. And joint auctions—such as those held by Quebec and California—are likely necessary to ensure that permit revenue is shared equitably.

A significant commitment will be essential if Ontario is to ensure that these linkage issues are effectively addressed. That said, experience in California and Quebec shows clearly that cap-and-trade systems can be successfully linked. Since mid-2014, Quebec-based industries have been able to purchase allowances from California to meet provincial targets for emissions reductions, and California's industries can tap into Quebec's carbon market.

Summary: Planning for linkage

- Ontario should link with Quebec and California, improving cost-effectiveness overall by increasing flexibility between jurisdictions and establishing a template for broader, harmonized inter-jurisdictional carbon pricing.
- Ontario should also encourage other provinces and jurisdictions to join the linked system, broadening the scope of the cap-and-trade system.
- Ontario should design its system with linkage in mind, thus harmonizing on design elements such as price floors/ceilings and monitoring, verification, and enforcement.

Conclusion:
Governance for transparency and predictability

This brief lays out four central principles for effective and cost-effective cap-and-trade design. It provides a practical road map for Ontario as the province develops its policy. These principles are quite general and can thus also provide guidance to other provinces considering implementing a cap-and-trade system.

The four principles, and the associated recommendations for Ontario, are as follows:

1. **Stringency should rise gradually and predictably over time to drive meaningful emissions reductions.**

- Ontario's "cap" on emissions should require meaningful emissions reductions and should steadily and predictably decline over time.
- Ontario should manage price volatility to ensure incentives for long-term innovation and deep emissions reductions.
- Ontario should enforce strong non-compliance penalties to ensure the policy creates incentives for emissions reductions.

2. **Make coverage of policy as broad as practically possible while maintaining the integrity of the system.**

- Ontario should use a combination of upstream and downstream points of regulation to design a cap-and-trade system with broad coverage.
- Ontario should avoid exemptions or exclusions to ensure more cost-effective, fair, and transparent policy.
- Ontario should be careful with the use of offsets, which can further broaden coverage, but only if they are credible and represent real and verifiable emissions reductions.

3. **Aim to auction all allowances; the scope for free allocations should be narrow, rules-based, and transitional.**

- Ontario should auction most allowances to enable more cost-effective but also simpler and more transparent policy.
- Free allowances may have a role to play in addressing competitiveness and leakage concerns. However, Ontario should only narrowly provide this support, based on clear and transparent rules, and for a limited period.
- Ontario should avoid free allowances in sectors in which emitters can pass on costs.

4. **Seek out opportunities for linkage.**

- Ontario should link with Quebec and California, improving cost-effectiveness overall by increasing flexibility between jurisdictions and reinforcing an existing template for broader, harmonized inter-jurisdictional carbon pricing.
- Ontario should also encourage other provinces and jurisdictions to join the linked system, broadening the scope of the cap-and-trade system.
- Ontario should design its system with linkage in mind, thus harmonizing on design elements such as price floors/ceilings and monitoring, verification, and enforcement.

A market for emissions allowances generated through a cap-and-trade system can provide clear incentives for emissions reductions. But for Ontario's system to perform well over time, the institutions around it must be credible in the eyes of the general public as well as Ontario's emitters. Given the complexity of cap-and-trade systems and the importance of design details, an approach to governance that includes sufficient transparency and operational predictability would go a long way toward building strong public support.

Transparency, predictability, and good governance underpin all the principles described above. Stringency is fundamentally about a clear, predictable, long-term price signal; emitters must be confident that the cap will decline and the price will increase predictably without political interference. Broad coverage is about treating emitters as equally as possible based on clear rules, rather than succumbing to the pressures of non-transparent lobbying for exemptions. Auctioning allowances is similarly about avoiding subtle transfers of value through the allocation of free permits. And without credibility and transparency, linkage is impossible.

While the case for policy transparency is likely an absolute,

predictability must nonetheless be balanced with adaptability. Predictability does not refer to static policy that never changes, but rather to adjusting policy over time along a clear and planned policy trajectory. Policy design will naturally evolve, based on new information and learning about what works best. Yet given the importance of long-term certainty about the durability of the policy and the carbon price, decisions around the management of the cap-and-trade system should be as predictable as possible. To create a stable business-operating environment, rules-based approaches that provide a high degree of clarity and certainty in advance are significantly better than discretionary ones. Adjustments to policy should be based on the best available evidence. Above all, the system must be perceived as being free of political interference.

Overall, designing cap-and-trade according to these principles can help ensure a policy is effective, cost-effective, and fair. Still, while the principles described here lay out the fundamentals, we acknowledge that other design details also matter. Allowing emitters to bank and borrow allowances between compliance periods, for example, can increase flexibility, though may also introduce complications. Mechanisms may be required to account for new entrants into the market, particularly if some allowances are provided for free. And the question of how revenue should be recycled back to the economy so as to drive the maximum possible economic benefits for Ontario remains an outstanding question. A wide range of credible recycling options is clearly available, and these choices can strongly affect performance of cap-and-trade system, particularly in terms of fairness. Future work from the Commission will explore the question of revenue recycling directly.

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