

**How to Cut Greenhouse Gas Emissions:
A guide for policy-makers in Canada and elsewhere. Part 2: International Action**

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Summary: Controlling global greenhouse-gas emissions requires global coordination of national efforts, but not all nations need act together at the first step. Significant mitigation leadership by a group of major economies, either all industrialized or industrialized and developing, may promise to break the current international deadlock. A group of leaders can enact mitigation measures that create incentives to re-orient private-sector investment and R&D toward climate-safe energy technologies. The risk of competitive disadvantage to the leaders, and resultant leakage of emissions outside the group, can be controlled by designing the initial mitigation measures to limit incentives for investment to move, and to provide incentives for additional nations to join. One element of creating these incentives can be provided by the leaders enacting mitigation-linked trade measures, which equalize the burden of their mitigation policies between producers inside and outside the mitigation zone by imposing an equivalent obligation on imports and crediting it back to exports. Such measures would be essential for trade in carbon-based fuels. Applying them to trade in other goods would pose serious legal, administrative, and political challenges, but these may be surmountable – especially if, as in the international ozone-layer regime, the implied threat of such broad trade measures motivates other nations to join before the measures are enacted. A key challenge facing any leading group will be how to engage the developing countries, either at the first step or subsequently – in particular, how to balance required favorable treatment to them with the eventual need for their full participation in the global mitigation effort.

1. Controlling Global Emissions Requires Global Action – But not all at once.

National mitigation policies alone cannot control global greenhouse-gas emissions. Nor can State, Provincial, or other sub-national policies. Effective control of global emissions requires global action – eventually. But this need for *eventual* global cooperation has been widely misconstrued to mean global cooperation is needed from the outset. This is not necessarily true. There is nothing in the dynamics of the climate system, energy resources, or technology that requires all nations to cut emissions at the same time. And while there may be political or economic advantages to proceeding this way, current experience suggests there are also major obstacles to this approach. Pursuit of broad international emissions cuts has thus far failed, and current efforts are deadlocked.

If controlling global emissions does not require all nations to move together from the start, then many more approaches are possible. In particular, there is room for leadership by a group of nations who take a significant step to cut emissions and break the current

deadlock and move others to follow. The smaller the group of nations taking such a first step, the more manageable their negotiations will be. But a small group of leaders cannot solve the global problem, so it is crucial to think beyond the first step: not just who forms such a group of leaders and what do they do, but also when and how do other nations follow? To limit climate change, there must be a feasible sequence by which the first step leads to the goal of deep sustained emissions cuts by all nations. A proposal for mitigation leadership must include a first step that is timely, non-trivial, and feasible – and a sequence in which each step makes the subsequent steps easier, not harder.

2. A Group of Leaders: Two Approaches

What might such a leading group of nations look like? Two approaches have been proposed, in which the first movers are a group of the largest industrialized and developing nations, or a group of only rich industrialized nations. Each approach holds both clear advantages and difficulties. Any North-South group seeking to move first would have to integrate questions of development, global equity, and international transfers into their initial mitigation negotiations. This would make the negotiations complex and contentious, but have the advantage that an agreement reached here would provide a model of North-South cooperation that could potentially be expanded globally. North-South leadership would also include a larger fraction of global emissions in initial negotiations. In contrast, all-North leadership puts the initial mitigation burden onto rich countries best able to bear the costs. Both historical responsibility and North-South politics favor initial action by industrialized countries, although exploration of this approach has been blocked by US refusal to act without simultaneous commitments from major developing countries. An all-North approach would benefit from a narrower agenda, focusing primarily on adopting and implementing mitigation policies. But while this approach would let industrialized countries provide the clear signal of leadership and willingness to bear costs that has thus far been lacking, in leaving developing countries out of the initial mitigation steps it would also limit their involvement in early negotiations, possibly obstructing subsequent attempts to include them.

Whichever type of group leads, their first step poses two related risks: competitive disadvantage to the leaders, and the resultant emissions leakage that might make their efforts ineffective and raise barriers to subsequent expansion of mitigation. The actual severity of these effects is highly uncertain, however, and will depend on the details of the initial leadership. The stronger the first mitigation step, the greater the competitive and leakage risks. And the larger the set of economies moving together, the smaller are these risks because more trading partners are inside the mitigation zone. Mitigation measures can be designed and phased in to reduce these effects, but they probably still impose limits on leadership so it cannot be sustained forever if others do not follow.

3. Managing the Risks of Mitigation Leadership

The risks of competitive disadvantage and emissions leakage do not mean that leadership is impossible, but only that you must consider what happens next. Environmental agreements are not static, but can expand after their initial adoption by adding new

members. Consequently, leaders must consider both their initial costs and how long they can sustain these while waiting for others to join. Their burdens and the risk of leakage will depend on the relationship between two dynamic processes: the movement of high-emitting investment outside the mitigation zone, and the expansion of the mitigation zone. If other major economies quickly join the leaders, the costs of leadership can be low – lower still, if the leaders pre-commit mitigation policies with enough lead time that others join before they are implemented, or if the expectation of expansion weakens incentives for investment to move. On the other hand, if others follow slowly, weakly, or not at all, leaders' costs may mount to the point that they cannot be politically sustained.

Evidence from other policy areas suggests that the balance between these two processes may be favorable, or can be made to be so. Studies of international taxation suggest that the movement of investment outside the mitigation zone is not likely to be as big or as fast as those concerned with emissions leakage have suggested. And experience with other environmental agreements, in particular the Montreal Protocol on the ozone layer, shows that they can expand rapidly after their initial establishment.

4. After the First Step: Motivating Other Nations to Join

How fast the mitigation zone expands will depend on the incentives of those outside the leading group. If the group is big enough to strongly reorient private activities, some incentives for outsiders to join will come purely from markets, independent of public policies. These will include, e.g., environmental policies of transnational firms, such as procurement policies and environmental standards that transmit incentives across supply chains; and the tendency for new technologies to be superior on multiple dimensions, even if emission reduction has raised their cost relative to unrealized alternatives.

In addition, the leaders can design their mitigation policies to reduce the incentive for investment to leave, and to create incentives for outsiders to join. The key to creating these incentives lies in linking mitigation to trade measures that level the playing field between firms operating inside and outside the mitigation zone. These measures would resemble border tax adjustments, but their details would depend on the specific mitigation policies leaders have enacted. If leaders adopt an upstream emission tax, they would charge the same tax on imports to the mitigation zone and rebate it to exports. Alternatively, under an upstream emissions permit system, imports would have to acquire the required quantity of permits, and exports would generate new permits that could be used elsewhere or sold. These measures would equalize the burden of mitigation policy between producers inside and outside the mitigation zone: selling inside the zone, both would bear the burden; outside, neither would bear it. The burden of mitigation within the leading group is shifted from producers to consumers.

For international trade in carbon-based fuels themselves, applying these mitigation-linked trade measures is straightforward, uncontroversial, and essential. Economy-wide mitigation policies, whether implemented as taxes or tradable permits, would operate like an excise tax on carbon-based fuels, so linked trade measures would be essential for the

policies to be effective. Without such measures, mitigation policies would be ineffective since fuel demand would simply shift to cheaper fuel produced elsewhere.

To eliminate competitive disadvantage to producers in the mitigation zone, however, trade measures must not be applied just to fuels, but also to other goods in proportion to the emissions generated in their production. Otherwise, producers of emissions-intensive goods would face a substantial cost increase relative to competitors outside. Trade measures would seek to level the playing field between producers inside and outside the zone by imposing a burden equivalent to that of the mitigation-policy on imports and crediting it back to exports. Such measures would reduce incentives for investment in emissions-intensive sectors to flee the mitigation zone and create incentives for additional countries to join the zone, at a minimum to avoid the administrative burden.

5. Mitigation-Linked Trade Measures (and threats): Promise and Objections

Although mitigation-linked trade measures are being seriously discussed, particularly in Europe, several legal, administrative, and political objections to them have been raised. Their basic GATT-legality is ambiguous, as they lie in a grey area between so-called "direct" and "indirect" taxes, for which the acceptability of border adjustments has never been resolved. It is quite likely, however, that if implemented in a non-discriminatory manner they would qualify under one of the environmental exceptions to the GATT obligations. Administratively, these measures would face the difficulty of accurately and reliably attributing emissions content to traded goods. The attribution would have to consider both the specific technology by which goods were produced and the energy mix of the exporting country. This would pose a great administrative challenge, although it is plausible that reasonable approximations are within the capability of modern information technology – perhaps by employing slightly unfavorable default rules and allowing exporters to provide documentation to gain more favorable treatment.

The most serious objections to these measures, however, are political. If applied to all traded goods, or even to those from the highest-emitting sectors, they would represent an unprecedented disruption of world trade. Worse, because of the complexity of attributing embedded emissions to goods, such measures could provide a pretext for all manner of opportunistic protectionism. They consequently could provoke a series of escalating retaliations and risk unraveling the present, moderately liberal world trade regime.

There are several responses to this objection. Most broadly, if the risk of climate change is severe enough and trade measures are necessary in the early stages of responding to it, some risk of trade disruption may be judged worthwhile. In addition, the risk could be reduced by designing the measures and processes to oversee them to be as fair and accurate as possible – perhaps by giving the job of calculating attributed emissions to an independent international body, rather than relying on officials of importing countries.

The risk to international trade could also be reduced through careful sequencing of mitigation and trade measures. Precisely because the proposed trade measures would be so disruptive, nations would have strong incentives to avoid them. Consequently, a

credible threat of such measures may motivate others to join, without necessarily requiring the measures to be enacted. For example, leaders could simply announce they were considering broader mitigation-linked trade measures on emissions-intensive goods from countries not making similar mitigation efforts. They could then invite all nations to join the mitigation effort while they study the proposed measures' effectiveness, feasibility, and legality, aiming for a decision in a few years. The combined invitation and implied threat could provide a powerful incentive for others to join.

Although this threat may appear contrived, precisely this approach has been successfully used before in another environmental agreement. The Montreal Protocol on the ozone layer, initially signed in 1987 by only 27 nations, included trade restrictions on the chemicals being controlled, whether in bulk or contained within other products such as refrigerators. But parties also announced they would study the feasibility of broader trade restrictions, on products "made with but not containing" the controlled chemicals. This comprised a vastly larger set of goods, including for example almost everything containing electronic components. Although the parties eventually decided these products could not be identified well enough to enact these broad trade restrictions, the threat of these measures – together with various transfers, differentiated commitments, and other inducements – made a powerful incentive for nations to join the Treaty. Within 3 years, all significant producers and consumers of the chemicals had joined the Treaty.

6. Including Developing Countries: Common but Differentiated Responsibility in Practice

The preceding discussion applies whether the leading mitigation group includes only industrialized nations or a coalition of major developing and industrialized nations. In either case, other nations must be motivated to join the leaders and mitigation-linked trade measures can be a powerful tool to provide this motivation. But the two approaches diverge in how to address the key problem in moving toward global participation – how and when developing countries are brought into the mitigation group, and how their obligations are varied to reflect their development status.

The widely agreed principle for engaging developing countries in a global mitigation effort is the "principle of common but differentiated responsibility," stated in the Framework Convention on Climate Change. This principle states that all nations share the responsibility to respond to climate change, but not in the same way or to the same degree, and in particular that nations' specific obligations depend on their development status. Moving toward global mitigation effort will require putting this principle into practice more concretely than has been done so far.

If the leaders are a North-South group, for example as proposed in the L-14 initiative, then issues of the distribution of responsibilities and its connection to development status must be engaged in the initial negotiations, probably explicitly. There are sharp differences of opinion over how central and prominent issues of global equity should be to discussions of greenhouse-gas mitigation. On the one hand, it would be impractical to put the entire burden of redressing global inequities onto the climate-change issue, since

this would guarantee that no progress could be made on climate change. On the other hand, given the responsibility of the industrialized countries for current climate change and the acute development needs of much of the world, it would appear essential that climate-change measures not only do not worsen existing inequities, but reduce them to some degree. To what degree they do so will be a crucial element of the negotiations.

Any hope of an agreement that includes serious participation from the South must include measures that favor them. These might take several forms. For example, they might include a larger share of future emissions budgets relative to historical emissions; preferential treatment in the structure of coordinated international emissions permit markets or emissions fees; provisions for technology transfer, perhaps through government acquisition and transfer of intellectual-property rights in existing technologies, or arrangements to establish and endow new institutional capabilities for research, development, demonstration, and deployment of climate-safe energy technologies in developing countries; and specific infrastructure investments or other measures to provide secure supplies of climate-safe energy.

In addition, a crucial point of North-South negotiations will be the links between their respective mitigation commitments. The strongest basis for developing countries' refusal to accept mitigation commitments thus far has been the failure of industrialized countries to make serious commitments of their own and meet them. Each group's use of the others' inaction to justify their own is a key driver of the current deadlock. A North-South group of leaders could break this larger-scale deadlock by modeling a mitigation agreement among themselves that resolves the factors underlying the deadlock. The most promising approach to do so would involve simultaneous acceptance by North and South of emissions trajectories or budgets, with two crucial points of asymmetry favoring the South. First, the industrialized countries' obligations would come into effect first, while those of the developing countries would be delayed, for example, by specifying emissions trajectories that begin at or slightly above baseline projections. Second, the developing countries' future obligations would be explicitly conditional on some observable benchmark of prior performance by the industrialized countries: if these are not met, the developing countries' mitigation obligations would be suspended until they are. A deal of this structure could break the current deadlock by meeting the key needs of both sides – developing country commitments made at the same time as industrialized-country commitments, but structured to spare developing countries from commitments that are binding even if industrialized countries fail to meet theirs.

If the leaders are an all-North group, their decisions will also have powerful implications for the global distribution of burdens and benefits, but they are less likely to address these explicitly in initial negotiations. While avoiding these issues will simplify the initial negotiations, it will also pose the risk that the issues are addressed inadequately or with bias, so subsequent attempts to recruit developing countries are obstructed. Under this approach, there are two linked sets of decisions that raise distributive issues most strongly – how mitigation-linked trade measures are applied to different outside countries, and on what terms newcomers are invited to join the group.

The crucial issue will be how these provisions distinguish among nations of different development status. At one extreme, if the terms do not vary at all with development status – so developing countries, exactly like industrialized countries outside the leading group, must mitigate as strictly as the leaders or face the full force of the trade measures – this would represent an extreme violation of the principle of common but differentiated responsibility, and indeed of any notion of global equity. The likelihood of attracting voluntary participation by developing countries on such terms would be slim.

Rather, for a rich group of mitigation leaders to attract subsequent developing-country recruits, they would have to vary both the stringency of trade measures applied to outsiders, and the terms of negotiation to join the group, according to development status. Poorer nations would face weaker trade measures, perhaps including an initial period during which these are not applied at all. In addition, less stringent, or later, mitigation efforts would be required of poorer nations in order to join the mitigation group. The two forms of preferential treatment would have to be jointly designed to ensure that adequate incentives are still created for nations to join. In addition, neither form of preferential treatment would be fixed for all time: rather, both would decrease as national income rises, and perhaps would also decline over time.

The question of preferences to developing countries illustrates the greatest advantages and the greatest risks of starting a mitigation group with only rich countries. This approach would simplify the initial negotiations of mitigation commitments and provide a concrete signal of the participants' willingness to bear costs, so developing countries would no longer be able to reject calls for their own participation by charging hypocrisy, saying that the rich are asking them to do what they are unwilling to do themselves.

But how would the terms for subsequent engagement of developing countries be established? The initial participants might be tempted to set these unilaterally as they are negotiating their own mitigation commitments, but this approach would pose serious risks. It would risk producing badly designed measures that fail to generate the needed incentives, cost too much, or miss opportunities to build mutually advantageous deals. In addition, it would also risk antagonizing those whose voluntary participation is essential for achieving the desired global regime, and letting the architects of the initial mitigation regime bias its details to favor themselves. Avoiding these risks would require some form of consultation with developing countries from the outset, even as the leading group is negotiating mitigation measures that would initially apply only to themselves. These consultations would have some similarity to the initial negotiations required within a group of North-South leaders, with two differences: first, it would be understood that the leading group was willing to adopt their own mitigation measures even without a concluded agreement with developing countries on the terms of their subsequent accession; and second, because these negotiations would be hypothetical, both sides might be unwilling to reveal the extent of concessions they would be willing to make in the context of a real global mitigation deal. These consultations would have to achieve a delicate balance – letting the leaders design the details of their own obligations, while also exploring the fairness and viability of future expansion by considering in advance what terms of such expansion would be mutually acceptable.

While both approaches to mitigation leadership appear plausible, there is no strong basis evident for judging one more promising than the other. The most promising route of all might be preliminary consultations among potentially interested nations that consider both simultaneously, deciding how to proceed on the basis of countries' evident seriousness of interest.

8. Conclusion:

Achieving global cooperation to cut greenhouse-gas emissions enough to stabilize the climate will be an enormous challenge, but there are several grounds for more hope than the current deadlock would suggest.

First, leadership is possible. A leading group of relatively few of the world's major economies, either all industrialized nations or some mix of industrialized and developing, can adopt a common mitigation strategy that deploys incentives strong enough to motivate serious pursuit of climate-safe energy technologies by private actors. They can thereby make a non-trivial initial contribution to deflecting global emissions.

Second, the commitment and adoption of mitigation policies by such a group of leaders can be designed and sequenced to motivate other nations to join them, and thereby to limit the competitive costs borne by the leaders. One component of their strategy can be the implementation, or threat, of mitigation-linked trade measures, which can both limit the incentive for capital to flee, and create incentives for outside nations to join. To the extent that such measures are threatened, they must be coupled with inducements to join and presented to avoid antagonizing those being recruited. For example, measures must be coherently related to the core environmental objectives being pursued, and implemented with adequate lead time and consultation. In addition, in the design of both mitigation and related trade measures, leaders must avoid any hint of bias in their favor: rather, they should visibly ensure that they are taking on burdens at least equal to those they are asking others to accept.

Third, an initial step by such a leading group can be consistent with global equity and the principle of common but differentiated responsibility, by varying terms of participation and accession to the initial group of leaders, and the nature of trade-related measures applied to outsiders, according to development status.

Adequately controlling global emissions will require addressing the issue of distributing emissions budgets among nations of vastly different development status. While this will require an extremely difficult negotiation, one ground for hope lies, paradoxically, in the enormity of the required shift in global energy systems. Since emissions eventually must approach zero in the transition to a climate-safe energy system, there will eventually be nothing to fight over. Rather, the acute negotiation problem is allocating shares of ultimately limited emissions, during a long transition period.