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## ***Lessons from the Montreal Protocol for Climate Policy***

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The 1987 Montreal Protocol has been highly effective at reducing the production and consumption of ozone-depleting substances. It offers several lessons for climate policy:

- Policy should be viewed as insurance against risk.
- Ex post costs of regulation are usually lower than the ex ante estimates.
- U.S. leadership is essential.
- It is possible to negotiate regulatory regimes with different responsibilities for developed and developing countries.
- Domestic political unity makes success more likely.
- Science should not be politicized.
- Partnerships between corporations, NGOs, and the government can help spread information and create the incentives for innovation.
- Ozone layer and climate protection efforts should be coordinated.

It is both remarkable and disheartening that the example of the Montreal Protocol on Substances that Deplete the Ozone Layer has not played a more prominent role in the climate policy debate. The Montreal Protocol has been extremely successful in eliminating almost all production and consumption of ozone-depleting substances (ODSs); it has achieved very close to universal participation by the nations of the world; and it has demonstrated the possibility of cooperation in funding and technology transfer between the rich and poor nations to achieve a global environmental objective. The Montreal Protocol was negotiated and implemented as a precautionary measure, before depletion of the ozone layer had reached crisis proportions. What lessons does Montreal offer for climate policy?

1. Large-scale economic models are not necessary to “predict” the costs and benefits of alternative regulatory strategies (including business as usual). In the run-up to Montreal, there were no economy-wide models in which the “ODS sector” was a key element, and estimates of the macroeconomic costs of regulation were not prominently featured in the discussion. Cost-benefit analysis did play a part, primarily in pointing out the very large economic losses associated with premature deaths and illnesses that would be caused by

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<sup>1</sup> Economics for Equity and the Environment Network (E3) is a nationwide network of economists developing arguments for environmental protection with a social equity focus. For more information, please contact Kristen Sheeran, Director, at [ksheeran@e3network.org](mailto:ksheeran@e3network.org). E3 is a program of Ecotrust.



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ozone layer depletion. However, the Montreal Protocol was viewed largely as the purchase of insurance against risks. The surprising discovery of the unexplained (at that time) Antarctic ozone hole was a key factor in bringing the initial negotiations to a successful resolution in 1987.

2. *Ex ante* estimates of the costs of regulation tend to be higher than *ex post* realizations because of unexpected and unpredictable technological progress, learning-by-doing, and economies of scale. This pattern has been seen in other cases of environmental regulation (e.g., the SO<sub>2</sub> reductions under the amended Clean Air Act). In the case of Montreal, ODS replacement tended to stimulate productive R&D, led to the redesign of some products and industrial processes, and generally gave rise to improved product quality (such as higher energy efficiency in many of the replacement technologies). The conventional “tradeoff” model of economics, in which environmental gains can only be obtained at an economic cost, did not predict the path of ODS replacement.

3. Leadership by the United States is essential. This is both a geopolitical and economic reality. Leadership has wider diplomatic benefits for the U.S. as well as being necessary for achievement of the underlying environmental objective. In the case of Montreal, the size of the U.S. market and the capacity of the United States to support innovation were important (although a great deal of the technological progress took place in other countries as well).

4. It is possible to negotiate regulatory regimes with “differentiated responsibilities” as to the timing of emissions reductions, assignment of emissions rights, funding of technology transfer, and structuring of decision-making procedures that can be agreed to by both developed and developing countries. In the case of Montreal, these took the form of the 10-year grace period and the establishment of the Multilateral Fund to cover “agreed incremental costs” of replacing ozone-depleting technologies in developing countries. Thus, the dual requirements of full global participation and avoiding hindrance to the economic development of the poorer countries were satisfied. Efforts in this direction have been made in the Kyoto Protocol (e.g., through provision for Clean Development Mechanism credits), but these have been hindered by design flaws and the non-participation of the United States.

5. Success is more likely if the regulation is not politically divisive domestically. In the case of Montreal, the initial negotiations were led by the administration of a conservative U.S. President, and implementation was carried through under both Republican and Democratic administrations (and during periods when first the Democrats and then the Republicans controlled Congress). The Montreal Protocol was never an issue in Presidential or Congressional politics. Success entailed buy-in from and cooperation among ODS producers, industrial users, and environmental NGOs.



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6. It is important that the science not be politicized. Although a few scientists were ozone “skeptics,” the reality of the ozone depletion threat never became a media issue. There was no special-interest funding of advertising about the uncertainties of the science (as has happened in the climate case). It is not clear whether there is any role for policy here; avoiding politicized science is more a matter of responsible journalism and scholarship.

7. Social and professional networks connecting corporate, NGO, and government personnel played a major role in the spread of information, the diffusion of innovations, and creation of incentives for ODS replacement. The process was not entirely (or even primarily) market-driven. Due to the firm regulatory commitment made by the Parties to the Protocol, being a leader within one’s organization for ODS elimination came to be seen as a positive career move. Personal and social objectives were mutually reinforcing; responsibility to future generations was asserted; and the non-economic dimensions of business activity and human life were affirmed.

8. Coordination between the ozone layer and climate protection efforts is essential. This is not only because the ODSs are themselves powerful greenhouse gases<sup>2</sup>, but because provisions in one Protocol can inadvertently undermine the other if there is no coordination. An example is the way it is currently profitable for developing countries to expand production of the ozone-depleting chemical HCFC-22 (which they are allowed to do under Montreal’s grace period) in order to get Clean Development Mechanism funds for destroying the greenhouse gas HFC-23 (which is a byproduct of HCFC-22 production). A unified approach would eliminate such perverse incentives.

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<sup>2</sup> It is estimated that the Montreal Protocol has removed “5 Kyotos’ worth” of global warming potential from the atmosphere.