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Tradeable quotas for greenhouse gases: An option also in favor of the environment?

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Tradeable quotas for greenhouse gases:

An option also in favor of the environment?*

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One of the main questions now at stake in the final phase of the negotiations on the Berlin Mandate is whether or not the emission quotas specified in a protocol to the Climate Convention should be tradeable. If a protocol allocates emission quotas to the Annex I countries, governments of these countries might also want to consider allocating these quotas further to domestic enterprises as emission permits. If such allocation takes place emission trading is a significant policy option also in the domestic arenas. Hence, in the years to come, new markets for greenhouse gas (GHG) emission quotas and permits might emerge domestically as well as internationally.

The aim of the report is to discuss the potential gains from emission trading and to raise crucial questions. The advantages in the form of reduced abatement costs are a basic feature of emission trading. The numerical example presented shows that the total abatement costs within the Annex I area could be reduced by approximately 70% through emission trading. From the Nordic perspective it is important to note that Denmark, Norway and Sweden are probably among the Annex I countries benefiting most from this trading. Finland will not benefit to the same extent from this trading because of lower estimated abatement costs in this country.

* The following is the executive summary of a report prepared for the Ad hoc group on energy-related climate issues at the Nordic Council of Ministers. The report explores the possible development and implementation of an international trading scheme for greenhouse gas emission quotas. The full report will be available on request.

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The cost-saving potentials are probably significant also with domestic emission trading. Here, however, emission taxes could be implemented and give a correspondingly cost-effective solution. It is also important to recall that an international trading scheme among governments does not set restrictions on national choice of policy instruments.

The report emphasizes that emission trading at the national and international levels must be discussed separately. The Nordic governments, for example, will find several good reasons for supporting emission trading at the international level, although emission trading in greenhouse gases may not be the preferred policy instrument *domestically*. The Nordic countries have already implemented domestic taxes on CO₂-emissions. This tax policy could be sustained while the Nordic governments support and take part in emission trading at the international level.

Even though we realize that emission trading can be in the interests of the Nordic countries, some undesirable side effects cannot be ignored. The report emphasizes that a protocol with low ambitions, could give at least some of the countries in transition to a market economy (the EIT countries) emission limitations above their business-as-usual (BAU) emissions. Free emission trading among Annex I countries would then *reduce* total emission abatement compared to a situation where the quotas are non-tradeable. We will refer to this as the 'hot air' problem in connection to emission trading.

The gains from trade

Figure 1 shows the calculated distribution of costs of a climate protocol.¹ A protocol with 10% flat-rate emission reductions in 2010 relative to the 1990 emissions serves as our starting point. The European Union (EU) has allocated its quota to the member countries in accordance with the internal EU distribution plan agreed upon in March 1997.

Four cases are analyzed in the report. In the first case no emission trading is allowed. In the second case only the Nordic countries are allowed to trade with each other. In the third scenario, the trade region is extended to include all the Annex II countries. Finally, we look at the case where emission trading is free within Annex I. In the last case the total costs of

¹ The numerical examples are produced by simulation of a model developed at CICERO. The model is described in detail in Holtmark (1997).

the Annex I countries are reduced by approximately 70% compared with the case without trade.

Denmark, Norway, Japan, Sweden and the EIT countries will receive significant benefits from emission trading. This is related to especially high or low abatement costs in these countries. Countries with more average abatement cost patterns will not benefit to the same extent from emission trading.

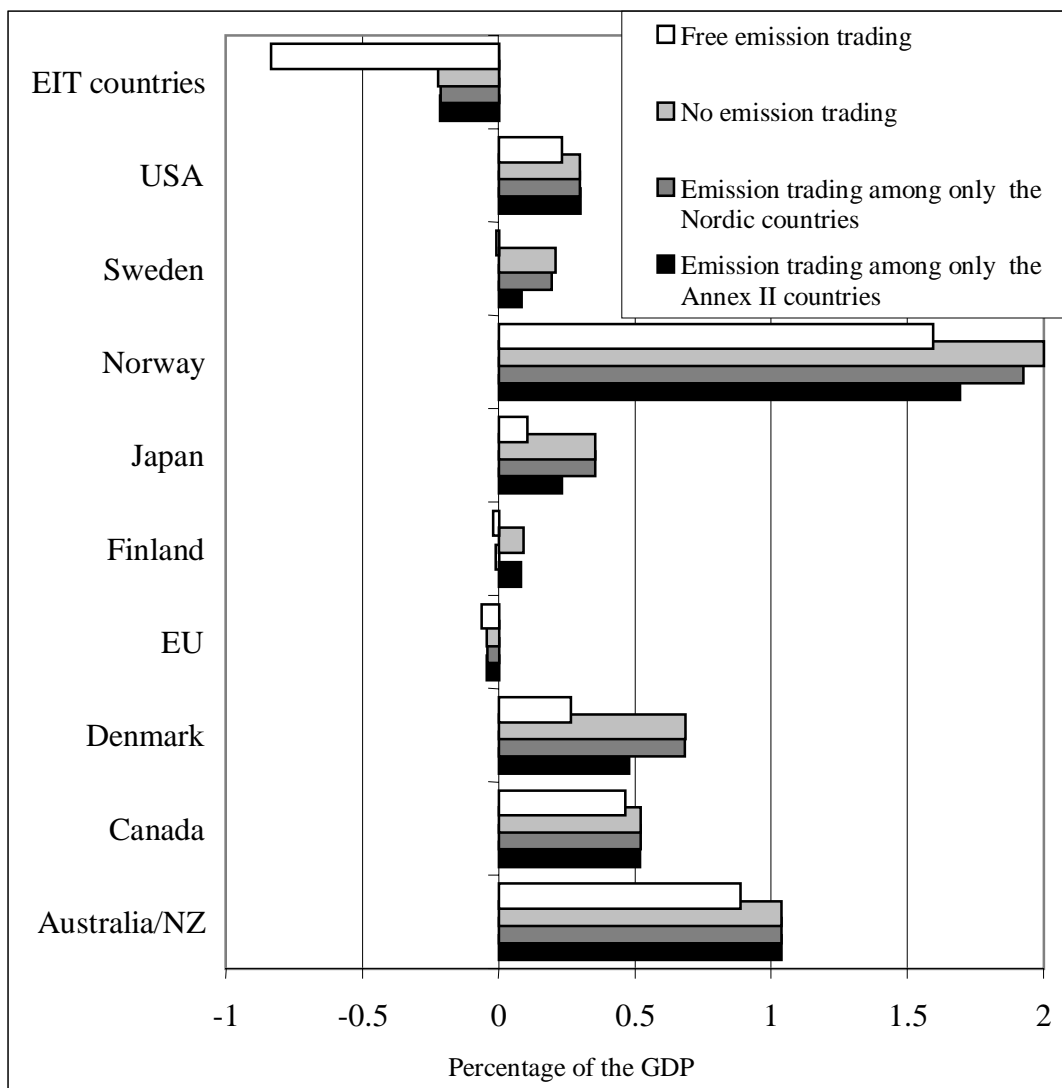


Figure 1 Costs of a climate protocol with 10% flat-rate CO₂ emission reduction commitments in 2010 relative to the 1990 emission levels. Both terms-of-trade changes due to price changes in the energy markets and benefits from revenue recycling are taken into account. The internal EU distribution plan agreed upon in March 1997 is internalized.

A basic result of the presented model simulations is that the EIT countries are large quota sellers, while in general the traditional market economies are buyers of quotas. Hence, if there are no limitations on the trading, an outcome could be reduced abatement efforts in the traditional market economies. Significant ‘no regret’ options for emission reductions in the EIT countries mean that these countries experience net benefits even in a situation of no emission trading.

Long-term impacts of emission trading

It is important to recall that the global emission reductions that could be achieved through a protocol specifying emission limits only in the Annex I countries will be limited. The emissions are likely to continue to grow in the rest of the world as long as new renewable energy production loses in the competition with fossil fuels. Therefore, a crucial question is how a climate agreement should be designed in order to encourage the technological development within new renewable energy production. Emission trading reduces the costs of emission abatement, which again will reduce the demand for non-polluting or emission efficient technologies. Hence, emission trading could reduce the R&D incentives in these areas, and consequently the long term environmental impacts of the agreement.

A stepwise approach to an emission trading scheme

The report recommends a controlled, step-by-step introduction of emission trading. The seriousness of possible undesirable side effects will then probably be detected in time to be corrected. The report distinguishes between three primary phases in the development of a global emission trading scheme.

In the **first phase** a protocol or another legal instrument is established internationally. The protocol quantifies emission limitations for the Annex I countries. In this phase the protocol would allow limited trade in emission quotas between Annex I governments. For example, each government is allowed to sell only a certain share of its quotas to other governments. The rest of the quotas are non-tradeable. In order to avoid that quota trading leads to higher emissions compared to a situation where the quotas are non-tradeable, the size of the tradeable share must be seen in relation to the ambition level. Furthermore, it would be best to allow trade in emission quotas only for GHGs, or sources of GHG emissions, of which emissions

are relatively easy to monitor and verify. An international institution should be designated to approve, register and control the emission trading.

Some governments will design systems for domestic allocation of tradeable emission permits. In the first phase the Nordic countries should consider whether they should continue and expand their carbon-tax policies, or allocate tradeable quotas domestically. There are good arguments for both alternatives. The report recommends, however, that the Nordic countries should choose taxes, at least in the first phase.

At the end of the first phase, the Conference of the Parties (COP) should review experiences from transboundary emission trading between governments of Annex I parties. On the basis of this review the COP should decide whether the restrictions on the emission trading should be relaxed.

If several governments in the first phase introduced emission-trading systems at the national arenas, in the **second phase** they should consider whether these markets could be integrated. Transboundary trade with both government and business could then emerge. The national government, however, should be responsible for the national compliance. At this stage the non-Annex I countries should be invited to accept emission limitations in order to be able to join the quota market.

At the end of the second phase, the COP should evaluate the experiences. If they are promising, a global market involving both governments and business in both Annex I and non-Annex I countries could emerge in **the third phase**. The greatest benefits of the trading regime are expected in in this phase.

References

Holtmark, B. (1997). Climate agreements: Optimal taxation of fossil fuels and the distribution of costs and benefits across countries. Working Paper 1997:5. CICERO.

This is CICERO

CICERO was established by the Norwegian government in April 1990 as a non-profit organization associated with the University of Oslo.

The research concentrates on:

- International negotiations on climate agreements. The themes of the negotiations are distribution of costs and benefits, information and institutions.
- Global climate and regional environment effects in developing and industrialized countries. Integrated assessments include sustainable energy use and production, and optimal environmental and resource management.
- Indirect effects of emissions and feedback mechanisms in the climate system as a result of chemical processes in the atmosphere.

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