A DYNAMIC CREDITING REGIME FOR JOINT IMPLEMENTATION
TO FOSTER INNOVATION IN THE LONG TERM

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Abstract. Joint Implementation is a theoretically efficient instrument of climate policy at least in the short run. This need not apply for the long run. Joint Implementation can reduce innovation in the industrialized countries because of reduced incentives for emission reduction. To realize short run efficiency gains and to avoid long run efficiency losses, we need a 'strategic' climate policy. This policy should start with full crediting of Joint Implementation allowing short-run efficiency gains which can foster technology transfer and thus lead to 'leapfrogging' by developing countries. Over time, the crediting ratio should be gradually reduced while domestic carbon taxes are raised. Experiences from the second oil shock have shown that energy-saving innovation is positively correlated to energy prices. Both, the reduced crediting and the raising domestic carbon tax, will therefore lead to long-run innovation.

Key words: crediting, dynamic efficiency, innovation, Joint Implementation, static efficiency.

1. Introduction

International climate policy started vigorously in the late 1980's. This vigour has subsided recently as only a small minority of countries pursues substantial steps toward emission reduction. At the first U.N. Framework Convention on Climate Change Conference of the Parties no protocol on long-term reduction targets could be signed – there was consensus that negotiations on such a protocol should be finalized by late 1997.

The debate on costs of climate policy has shown that the efficiency of emission reduction is raised, if as many countries as possible participate. Thereby, the differences in marginal reduction cost can be exploited. Joint Implementation (JI) is discussed as such a step on the way towards global emission taxes or emission permits (see Jepma, 1995 and Michaelowa, 1995).

In its original form, JI means that a country can reach its emission target not only by reducing emissions at home but also by financing emissions reduction abroad. As greenhouse gases are a global pollutant without local effects, the location of the emissions does not matter. Reduction and its financing are separated with the aim of reaching the reduction at lowest possible cost. JI should encompass all greenhouse gases. In the following, though, we only refer to CO2 emissions as they are almost linearly correlated to fossil fuel consumption. Industrialized countries that have accepted emission targets can finance JI projects in developing countries.
and get a carbon credit towards their target. The first Conference of the Parties in Berlin, though, did not allow crediting for the duration of the JI pilot phase. Besides reaching an emission target at minimum cost, JI has the following goals:

- reaching a broad country participation in emission reduction to counter the leakage problem and raise the potential for efficient climate policy,
- alleviating the burdens of countries and thus enabling them to accept stronger emission reduction targets,
- furthering transfer of technology to developing countries by setting incentives for both sides.
- funding projects in sustainable energy and land use that currently lack funds

2. JI and innovation – dynamic efficiency

The evaluation of JI crucially depends on its effects on technological innovation*— either on a country or global scale. The dynamic efficiency question has so far been discussed controversially:

- JI reduces incentives for innovation as the emission-intensive structures of production and consumption in industrialized countries are not changed and even exported into the developing world (see e.g. Loske/Oberthür, 1994).
- JI leads to an additional technology transfer into the developing world and allows them to ‘leap-frog’ several stages of technology. For a discussion of ‘leapfrogging’ see Brezis et al. (1993) and Barro/Sala-I-Martin (1995).

Traditional (neo-classical) growth theory distinguishes between autonomous and induced innovation. The former is exogenous while the latter needs a new framework as starting point for the induced and finally accelerating innovation.

Induced innovation is generated through planned search processes such as research and development (R&D). Two motives for R&D can be distinguished:

- interests of private enterprise and research institutes
- public investment subsidies

As the latter is not particularly relevant in an age of high public deficits, the analysis focuses on the former.

To show the relation between JI and innovation, a deducing perspective seems appropriate. We begin by analyzing the relation between environmental policy and innovation, focus on climate policy and then on JI.

2.1. Relation between environmental policy and innovation

Environmental policy can accelerate R&D and thereby innovation. The 1990 U.S. Clean Air Act with its introduction of offset concepts led to a number of innovations.

* Innovation obviously is no per-se policy target. It is preferable to the status quo, though, if the discounted cost savings in the future are higher than the costs of innovation today. As it is very difficult to measure discounted cost savings not knowing which effects innovation will have, the general assumption is made that finally these cost savings are higher than the up-front costs.