

Seminar of Governmental Experts (16-17 May 2005)
**Supporting material* for the presentation by Germany on behalf of the
European Community and its Member States**

The Innovation challenge – risks, urgency and opportunities

1. The need for technological change – research and development

Combating climate change requires substantial changes in how the world produces and uses energy and should address both hard and soft technologies, including management practices. As world-wide demand for energy and transport services will continue to grow, the reduction of greenhouse gas emissions will need to be realised through technologies based on much lower carbon intensity per unit of service than current technologies. Innovation is also required in other important sources of greenhouse gas emissions such as land use change and direct emissions from sectors.

2. Bringing technologies to the markets

It is important to both use existing technologies and to bring advanced technologies to the market. Bringing technologies to the market will bring down the cost. Technological change in all economic sectors will be required. Many technologies to reduce greenhouse gas emissions, e.g. combined heat and power production or renewable energy technologies, either exist already or are at an advanced stage of development. However many promising technologies face very limited market up-take.

Technological innovation needs to be linked with investment cycles and tackling climate change needs to be integrated in ongoing investments. Long lasting effects of today's investment decisions could cause lock-in effects into high-emission pathways. What are cost efficient options to avoid this? How can be ensured that these technologies are taken-up by mainstream markets?

3. Pulling technological change : how can we ensure the right incentives?

Establishing a market value for greenhouse gas reductions through market based mechanisms (e.g. trading or taxation) is key. Also, broadening financial incentives will increase the demand for low-carbon technologies, and encourage further technological development.

Complementing market-based instruments with smart and cost-effective policies (including standards and regulations) will encourage the adoption of new technologies. Quotas and feed-in tariffs for renewable energies are examples of policies which have been proven successful in several EU member states. A related

* this paper does not reflect a formal EU position but is intended as a contribution to the debate

issue is how can we help to overcome barriers to the introduction and facilitating demonstration of technologies? However, obstacles related to standards and regulations that prevent technologies from general application must be overcome.

Gradual transformation and investments in markets with long business cycles, such as energy and transport, require a predictable and stable long term policy framework and political commitment. Many investment decisions have to be taken very soon. Given the need for the renewal and expansion of the global capital stock in the electricity industry in the coming three decades, such a framework needs to be established as early as possible. How can we ensure optimal cost effective 'pull' policies by taking advantage of normal capital replacement cycles?

4. Pushing technological change or facilitating technological breakthroughs

Additional technologies need to be developed for widespread use, beyond the many existing technologies. Further development can push technologies that are not yet near competitiveness but perhaps only a few years from the market. More international coordination of science, research and product development is needed to speed up technology innovation.

How can we enhance international co-operation to develop breakthrough technologies? How best to involve public-private partnerships? Budgets for climate, energy, transport and production and consumption research need to be increased significantly.

5. Technology development and innovation requires human resources

The sustainable technologies that will be needed globally require a local base of human resources for successful adoption. This requires research and education, labs and post docs and increased international cooperation in the relevant fields. How can this be achieved at a level that matches the challenge through a deeper international collaboration?

6. Faster deployment of clean and efficient technologies is possible!

The latest IEA alternative policy scenario indicates that, provided the right policy incentives are put in place, faster deployment of clean and efficient technologies is possible.

- How can the UN climate change process: drive technological policy opportunities; facilitate and enhance international synergies; facilitate the implementation of the cost-effective two complementary policy approaches - technology push and market pull - side by side?
- How can we secure a stable long-term policy framework?
- What role does a broader participatory framework play with regard to technological change?