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7th CTI Capacity Building Seminar

**Climate Technology and Energy Efficiency –
The Engine for Economic Growth and Innovation**

Summary

**21-25 October 2006
Hotel Breitenfelder Hof, Leipzig**

1 Introduction

The objectives of the 7th CTI Capacity Building Seminar “Climate Technology and Energy Efficiency” were to exchange information, address problems and design future scenarios with regard to climate change policy. There was a special focus on promoting energy efficiency.

The seminar aimed at

- discussing and developing concrete instruments and projects to reduce greenhouse gas emissions;
- identifying the economic potential of climate change policies;
- promoting understanding of the initial negotiations for a future climate change regime;
- facilitating the sharing of experiences and ideas between experts from the Central and Eastern European (CEE) countries, the former Soviet Union and Mongolia as well as selected OECD countries with regard to the economic potential and benefits of climate change policies;
- inciting the participants to initiate new co-operation projects on climate technologies.

Around 55 persons, particularly from Eastern Europe and Central Asia, took part in the seminar, which was organised and sponsored by the German Federal Environment Ministry and the Federal Environment Agency within the framework of the Climate Technology Initiative (CTI). The following text summarises the discussions held at the seminar. In accordance with the “Chatham House Rule”, no statements are attributed to individual participants.

In some cases, contacts were made which may later lead to the development of projects. In more concrete terms, consultations began following the seminar to develop Joint Implementation projects in Romania (district heating) and the Ukraine (construction of a biodiesel plant; energy efficiency improvement in the communal heat supply sector).

2 Development and Diffusion of Climate-friendly technology as vital part of Climate Protection Policy

2.1 Promotion of Energy Efficiency and Renewable Energies as a means to strengthen Climate Protection

One major focus of the seminar lay on the instruments to promote energy efficiency and renewable energies.

2.1.1 Instruments for the Promotion of Energy Efficiency

As the presentations and the discussions demonstrated, there is a **mix of instruments** with which energy efficiency can be promoted, and a sensible combination of these instruments

can prove to be the best for fostering energy efficiency. Apart from emissions trading, there are command and control measures, educational/information measures, as well as financial incentives and loans. Voluntary agreements can bring about an improvement in energy efficiency as well. However, it has been stressed that in order to control the success of voluntary agreements there has to be a monitoring process. Government can also foster energy efficiency by including energy efficiency aspects in public procurement.

It was recognised that **emissions trading** played a pre-eminent role in the various instrument mixes and provided an economically compatible means to reduce greenhouse gas (GHG) emissions e.g. via conducting energy efficiency measures. A further “natural” incentive to promote energy efficiency is the **high price for energy** on the world market, which render the investment in energy efficiency economically reasonable.

2.1.2 Instruments to promote Renewable Energy

With regard to renewable energies, there are different ways to promote them, namely feed-in tariffs and quota systems.

Feed-in tariffs financially privilege the production of energy based on renewable energy sources (sun, wind, biomass, etc.). These tariffs guarantee a specific price for the energy produced. The operators of electricity grids are, furthermore, obliged to “buy” the renewable energy. These tariffs have led to a boom of renewable energies in some states, but one has to look at the concrete design of the feed-in tariff systems to assess whether their design is sensible to bring about the environmental effect intended and whether they are cost-effective.

In a **quota system**, a certain share of the total electricity consumption is determined for electricity from renewable energy sources and must be met by a group of stakeholders – companies, grid system operators or end users. Usually this system is combined with tradable certificates; every kilowatt hour of electricity from renewable energy sources receives one certificate.

There was no debate as to which instrument, feed-in tariffs or quota systems, is more effective, as the different instruments are difficult to compare given that they perform according to different indicators.

Generally, it was welcomed that different states co-operate in order to promote renewable energies; however, the need for a harmonised policy on the promotion of renewable energies was, however, not seen.

2.1.3 Operational and economic conditions for the promotion of energy efficiency and renewable energies

Apart from financial incentives to be provided by the state, ideal “operational” circumstances have been discussed that might facilitate the investment and spread of renewable energies/energy efficiency projects. First of all, there needs to be the willingness of a company or a municipality to invest in renewable energies/energy saving (motivation and convincing power). Secondly, the adequate investment environment needs to be secured. In order to be financed, the technology needs to be dependable, which should be proven by demonstration projects. In general enough money is available to finance projects, but often

project management skills are lacking to fulfil the conditions demanded by investors to give money. Hence, it is often hard to be granted the necessary funding from investment banks. For the local and economically reasonable promotion of renewable energies, “mega projects” are often not the best solution. Project developers should thus consider simpler actions such as changing burners or fuels of installations or gradual actions such as a part-adaptation of installations first.

For example, **Croatia** mentioned traditional top-down thinking and centralised planning as well as decision making in the Croatian energy sector as barriers to promoting renewable energies. Local communities are usually unaware of the possibilities of adapting energy concepts or are not interested in getting involved.

In order to really spread climate friendly technologies, however **technically feasible** they might be, one should question how **economically** sustained their promotion would be. The question has to be asked whether there are any increased financial risks connected to a technology because there is not much experience with a technology. Another hurdle to the quick spread of technologies is the lengthy process of **market diffusion** of new technologies. This can postpone visible results for climate protection for years. The fact that there is no common energy policy in the European Union, with every state pursuing its own approach, is an additional hurdle for the quick spread of climate-friendly technology.

In order to bring about a widespread breakthrough in energy technology, a rise in research and development (R+D) funding was demanded but considered controversial. An important part of participants rejected the assumption of R+D funding being a central problem. There was the view that a quick implementation programme of energy efficiency and renewable energies based on available techniques should be set up instead of waiting for more R+D funding.

2.2 The case of the transport sector

As a sector not covered by European Emissions Trading, the transport sector was discussed as an exemplary field to achieve GHG emissions reductions.

It was the consensus that transport is a crucial sector for climate protection policy. The basic aim is to achieve sustainable mobility, which combines emission reduction with aspects of health, safety and access to mobility. There is a huge need for transport technology optimised to fulfil these requirements.

The industry’s view was that consumers have to be convinced into buying cars with a more climate-friendly design. There is surely no use in developing expensive 3 litre cars if no one buys them. In some cases it can be considered preferable to achieve decreases in emissions by only procuring minor adaptations to car designs and so achieving a less significant rise car prices.

Given the popular desire for fashionable cars, the issue of energy efficiency and environmentally friendly design should not be the only argument to promote climate-friendly cars. Ideally, sustainable design goes hand in hand with other aesthetic or economic amenities such as attractive features, cost-effective use of resources, etc. It was also stressed that there have to be cost-effective solutions for the car drivers from transition

countries, where people in general have less money to buy extravagant models than in Western Europe. This is especially important because in the transition countries the share of public transport sector is declining due to the perceived benefit of private car use. In this context, the decrease of public subsidies for public transport was criticised.

With regard to fuel substitution, much potential, in general and also for the transition countries, lies in the production and use of biofuels, but the present methods of production and use are not very CO₂-efficient. The “second generation” of biofuels, which is in a test phase, was deemed promising. It was suggested that the use of certain fuels could be supported by financial incentives, which would reconcile economic rationality and environmental soundness (e.g. levels of car-related taxes to be based on CO₂ -emissions). Also, the standard automatic functions of cars should be designed in a way that prevents energy waste, for example no automatic turn-on of the climate conditioning when the car starts.

Apart from this, there is also a need to improve energy efficient driving skills that help save fuels. Also, urban infrastructures can be optimised to reduce emissions from transport (more attractive and time-saving public transport, more parking spaces, etc.).

3 Technology Export: Clean Development Mechanism and Joint Implementation

Generally, the Clean Development Mechanism (CDM) and Joint Implementation (JI) are suited to make a decisive contribution to the reduction of greenhouse gases, the improvement of energy efficiency and in more general terms the employment of qualitative climate-friendly technology. Furthermore, these instruments could help establish an attractive market for investors. However, there is still a variety of challenges to overcome before widely use CDM and JI.

3.1 Barriers and opportunities for the use of CDM and JI

The legal systems of the different countries have, as of recently, not been familiar with the instruments of CDM/JI. As with emissions trading, there have been administrative problems in the implementation of these instruments. An administrative procedure to deal with CDM/JI applications has to be devised. In order to accelerate and simplify these administrative procedures, some further work remains to be done.

The lack of recognised methodologies to assess and approve the various projects has especially been cited as a problem. For certain types of technologies and installations methodologies to calculate the emissions reductions have been developed and proven to be effective. For others, methodologies still need to be developed and tested. Given the fact that the procedures are not harmonised in the different countries, there are significant differences with regard to the scope of assessment by the different Designated National Authorities (DNAs), which make the final outcome of the procedures in some cases rather unpredictable.

Other countries have not established the institutional framework to deal with CDM applications for example, which impedes any investment under the Kyoto mechanisms even if investors would be interested.

The prospects for JI projects in EU Member States have clearly been limited by the EU Emissions Trading System (EU ETS), as double counting needs to be avoided with respect to emission reductions of installations participating in the ETS.

Another problem is the often-witnessed reluctance of private companies, especially small and medium-sized enterprises, to deal with CDM and JI projects. This reluctance might be due to the complicated administrative process that sometimes includes fees, the investment risks in developing countries and more generally the often high transaction costs. Moreover, the “big” profitable projects such as methane or N₂O abatement (large landfills, etc.) have already been covered to a large extent, so the remaining projects are smaller and often less profitable. These projects will most often be linked to raising energy efficiency.

Countries with rich domestic resources of fossil fuels, such as Russia and Azerbaijan, have in principle the greatest potential for JI and CDM projects. However, in order to fully exploit this potential, more awareness is needed to shift the focus away from selling energy to increasing energy efficiency.

In some instances, new technologies applied in CDM projects conflict with traditional patterns of energy use. In Armenia for example, biogas plants are currently not considered appropriate for small- and medium scale farms because the current practice is to dry manure and use it for heating during the winter, which would not be possible if manure was used for biogas production.

Several further **obstacles** to the implementation of JI or CDM projects were mentioned, along with **possibilities to overcome them**:

- While technology transfer is an important benefit expected from the use of JI and CDM, Western technology may still be too expensive. In such cases, it may be preferable to rely more on locally supplied technology, or at least put a greater emphasis on co-operation between Western and regional firms.
- In some countries, it is very difficult to obtain credits from local banks, and interest rates are very high. It may, however, be possible to secure most of the project financing with credits from the home country of the JI/CDM investor. Export credit agencies could provide a big portion of project financing.
- Local authorities are often not aware of the technological potentials of energy efficiency and renewable energy technologies. Instead they rely on the fossil fuel technologies they are familiar with, which may lead to the expensive modernisation of old systems instead of replacing them with more efficient technological solutions. This points to the importance of training and awareness raising for decision makers.
- An already established practice is to combine several small projects into one larger CDM project when one single CDM project is too small; however, organisational difficulties may occur.

3.2 Means of assistance and support for CDM and JI projects

There are **ways for the state to assist private companies** to deal with and realise CDM/JI projects.

- One possible way to help applicants identify projects recognisable under the CDM/JI regime is to design official guidelines or handbooks outlining what can and cannot be regarded as a CDM/JI project.
- Another way is to create project portfolios in which specific possible projects in foreign states are identified and shortly outlined at the state level. This should help investors overcome their doubts to the new instruments of CDM/JI and could foster transboundary co-operation. Also, states can bilaterally simplify the approval procedure for CDM/JI projects by agreeing on framework conditions (“Memorandum of Understanding”, MOU). The conclusion of a MOU is, however, not mandatory for the realisation of CDM/JI projects under the rules of the Kyoto Protocol.

Funding under EU programmes can be an alternative means to fund climate technology projects and can also be used as a complementary instrument to JI or CDM. One example of such complementary funding has been the support for preparing CDM Project Design Documents (PDDs) under the TACIS programme. Unlike the TACIS programme, the Territorial Co-operation Programme (a part of the Cohesion Fund which currently runs under the name of INTERREG) has a bottom-up structure: it relies very much on initiatives within the targeted regions. However, project funding under this programme is largely confined to EU Member States.

4 EU Emissions Trading: Lessons learned

In 2005, the first year with the EU Emissions Trading Scheme ETS in place, only five EU countries had allocated fewer emission allowances than actually needed and/or demanded. This led to the CO₂ “price crash” in April 2006 when 2005 emission data were published. With national allocation plans essentially providing companies with the emission rights they need for pursuing ‘business as usual’ or even more than they need, the EU emissions trading system has so far been more of a ‘funding programme’ than a burden for enterprises at times. While this may be welcomed from the point of view of national industrial policies, a functioning carbon market requires tighter allocation caps.

In **Germany**, the first national allocation plan (NAP I) contained an overly complex system of rules. Some of this complexity was reduced in NAP II. However, some specific rules in NAP I also created burdens on future emission trading periods, including beyond 2012, because of exemptions granted for periods of 12 or 14 years. One aspect of the second national allocation plan (NAP II) that still requires further improvement is the use of fuel-specific benchmarks, as fuel neutral benchmarks would create a greater incentive to switch to low-carbon fuels.

The example of **Latvia** provides a completely different case, in which allocated emissions are far less tightly linked to actual emissions than in Germany. Based on the assumption of strong growth rates of gross domestic product (GDP), the consultation process on NAP II led

to more than doubling the total number of allowances for 2008-2012. It is acknowledged that there is still a high potential to save energy. Following the use of the opt-in clause, 20 companies will participate voluntarily in the EU ETS in 2008-2012 and are expecting to sell surplus allowances following energy saving measures or fuel switch.

The concept of **auctioning** part or all emission allowances was controversially discussed. On the one hand, the view was expressed that auctioning as an allocation method was more closely related to market mechanisms than grandfathering is. Over time governments and the public may become more aware of the opportunities associated with the revenue generated from auctioning, which can be used to lower the overall tax burden. On the other hand, while auctioning appears to be the best allocation method in theory, the recommendation to auction all allowances would build on the assumption of perfect markets and perfect information, which do not exist in reality. Unequal market powers and asymmetry of information need to be taken into account. Therefore, some participants considered it more appropriate to initially distribute only a minor proportion of emission allowances via auctioning. However, to avoid the current unfavourable situation in which industry from countries with auctioning competes with industry from countries without auctioning, it would have been preferable for the EU Emissions Trading Directive to prescribe a minimum rather than a maximum of 10% auctioning.

National allocation plans are expected to not only set emission caps for the industries involved in the ETS, but also to provide indications on mitigation plans for the **residential and transport sectors** as well. However, this has not always been the case. When relatively loose emission targets are established for the industries participating in the ETS one has to compensate by creating tighter targets in other sectors. In order to be credible, such targets should be underpinned with concrete policies and measures to achieve them.

The experience with first national allocation plans shows that a stronger **harmonisation of allocation rules** is needed. The existing rules left too much scope of interpretation for Member States, which led to very different national allocation systems. At the extreme, the Commission could draw up a single European allocation plan. It could be advisable to leave the decision on aggregate sectoral caps to the Commission. The situation may lead to a harmonisation 'race' between Member States and the Commission: Either the Member States will take the initiative to organise harmonisation among themselves, or they will lose policy autonomy as the Commission and the European Court of Justice will impose their decisions on them.

5 The future of carbon trading – options and challenges

Financial institutions are waiting for opportunities to finance projects, a voluntary emissions market is slowly evolving among banks and insurers. The major **requirements for increasing investments** are the following:

- A harmonised international framework is needed to ensure a liquid and efficient global carbon market. Criteria for the approval of projects need to be streamlined;
- Long-term and clear reduction targets for greenhouse gas emissions must be set to provide reliable investment conditions;

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- In addition, targets for renewable energy and energy efficiency would be helpful to support climate change mitigation objectives.

Currently, JI only offers a five-year window with **stable investment conditions**. In contrast, power plants have an investment horizon of 20-40 years. For the CDM, there is a guarantee to generate credits for at least 21 years, which may pose a problem for planning horizons differently: If a CDM host country was to take on GHG limitation commitments in the meantime, the conditions for generating credits would change, which would conflict with the security guaranteed towards investors.

The existence of “**hot air**”, excess emission rights that the Kyoto Protocol assigned to countries with economies in transition, poses a threat to the functioning of the carbon market. If eastern European countries sold all their surplus Assigned Amount Units (AAUs) immediately, market participants would lose confidence in the market. According to a study by ICF Consulting, countries such as Russia and Ukraine should only sell 20 to 30 % of their surplus AAUs in order to maximise their revenues.¹ Another argument for banking surplus AAUs is that this would allow countries with economies in transition, notably the EU Members among them, for more flexibility with regard to likely future commitments. This may also provide some argument for these countries against making too much use of JI. In the future, they might need the reductions achieved by such projects in order to fulfil their own commitments.

Green Investment Schemes (GIS) are not discussed enough yet. With the possibilities of JI becoming limited (at least for the new EU Member States), GIS may gain importance, but they need to be properly designed in order to translate into real improvements for the environment. The concept still needs to be elaborated.

It was remarked that the discussion on post-2012 climate policy may not properly **take into account the dynamics of change**. Notably, the EU enlargement, the creation of a common market for energy products and services, and the European Neighbourhood Policy make it likely that carbon markets will become more tightly connected both within and outside the EU. In theory, EU ETS will continue even without a post-2012 international framework; but in practice internationally defined targets are necessary. On the other hand, the dynamics of EU ETS and its linkage with other regional emission trading schemes may provide a driving force for the continuation of the Kyoto system.

6 Prospects for post-2012 commitments

The seminar included participants from both Annex I countries – those countries with commitments to limit or reduce greenhouse gas emissions under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol – and non-Annex I countries, which do not have such commitments. For most non-Annex I countries represented, little prospects are seen to take on emission reduction commitments after 2012. Economic growth and improving the standard of living are overriding priorities. The ongoing need for financial and technical assistance from Annex I countries was emphasised, as well

¹ See Natalia Gorina: “Cooling down hot air” in: Global Carbon 2006, May 2006 Environmental Finance publications supplement, available at http://www.icfi.com/Markets/Energy/doc_files/surplus-aau.pdf

as the important role of the CDM. Simplifying the CDM approval process was mentioned as one important factor. Development banks could also take on an important role. However, the importance of adequate domestic legislation, for instance the establishment of guaranteed feed-in tariffs for renewable energies, to facilitate progress on climate technologies was also emphasised.

The need for a truly **global framework** with the participation of all big emitters was stressed. Several participants expressed the view that while the current system – developing countries being involved in CDM projects but without their own limitation targets – has been useful to capture some “low-hanging fruits”, the continuation of the carbon market depends on adequate participation and commitments of all parties. If the future climate change regime does not prove adept at embracing all big emitters, or at least their large majority, it will not be effective. Apparently, the current “black-white” scheme of either Annex I or non-Annex I country is not appropriate when discussing future commitments. More differentiated criteria and forms of commitment are needed (“staged approach”). Business opportunities may indeed provide a “**common denominator**” for a new global climate policy framework. In industrialising countries, severe local air pollution may provide an additional motivation to take action on the sources of climate change. The rising global energy demand and the concerns about security of supply provide another argument for emissions trading, which may also be valid for those countries which currently do not participate in the carbon market. However, a common understanding of the climate change problem appears necessary in order to achieve a common understanding on targets.

With respect to **economies in transition within the EU**, it is anticipated that certain post-2012 commitments will need to be made and some form of “burden sharing” will have to be found, which will be mainly the result of negotiations between old and new Member States. The ongoing need for space for economic development in new Member States must be recognised. When CO₂ intensity per GDP is adjusted to purchase power parity (ppp), the carbon efficiency gap between old and new Member States appears considerably smaller than without such adjustment. CO₂ emissions per capita could be another measurement category on which future burden sharing could be based.

Nuclear energy continues to be a contentious issue. A business representative suggested that nuclear power should be reconsidered at the EU level: There should be a lead study examining the trade-offs between nuclear power substitution and CO₂ reduction. A political decision might then be made on which risk is greater. Regarding nuclear energy, on the other hand, the point was made that the increased threat of terrorist attacks had added a new dimension of risk.

Reporting requirements under the UNFCCC may provide a good starting point for reflection about possible national scenarios of energy supply, energy consumption and greenhouse gas emissions. Two scenarios need to be provided: a “business as usual” scenario and a scenario “with additional measures”. In the case of Germany, it has proven useful to investigate longer time horizons than 2020, 2030 or even 2050. The German Federal Environment Agency has elaborated a scenario where a greenhouse gas reduction of 80% by 2050 appears possible. Half of these cuts would be achieved by increases in energy efficiency and the other half by the growth in energy supply from renewable sources. This shows again the great GHG reduction potential that **energy efficiency** still has not only in economies in transition but also in “mature” industrialised economies.

7 Appraisal of the seminar and recommendations for future CTI activities

At the end of the seminar, the participants were asked about their views on CTI activities.

CTI seminars have been very successful in providing first-hand information. In most of the home countries of the participants, it is very difficult to obtain such information. Information found in publications is quickly outdated and does not fully explain underlying policy motives. The balance of different elements in the seminar – such as presentations, discussion, informal meetings and the excursion – was found to be a success as well. The concept to get participants actively involved was felt to be useful. Networking of people from different countries is an important element which may show its full benefits some time after the seminar.

As a point of criticism, some participants regarded it as a problem that participants had very different levels of knowledge, and some of the presentations only addressed part of them (in particular, the programme items dealing with the EU ETS and NAPs). Another view held was that it would be good to have controversial presentations and expert views on specific topics in order to discuss controversial issues in more detail.

For **future seminars**, a focus on Green Investment Schemes (GIS) was recommended, as this is a subject of great importance for the coming years and there is little awareness and knowledge. Capacity building on the post-2012 negotiations also continues to be important.

Many participants were also interested in learning more about the EU's and intergovernmental organisations' programmes to finance climate change and sustainable energy activities. The **CTI as a whole** might organise more concrete, regional workshops for the transfer of technology and best practice. It might also edit some sort of practitioners' guide to international, as well as regional and national, financial institutions with regard to funding for climate and energy projects.

There would be a need for seminars with a **narrower regional focus**, as there are huge discrepancies between the countries involved. Balkan countries are lagging behind other eastern European countries. It would make sense to organise a regional workshop for Southeast Europe, with best practice examples from neighbouring countries (e.g. Hungary, Czech Republic, and Slovakia). The Caucasian and Central Asian countries are another group for which a separate workshop may be appropriate. In addition, for countries such as Serbia and Montenegro, it was suggested to organise an exchange process, which would include both visits of foreign experts these countries and visits of young professionals to Western countries in order to build basic capacity for implementing energy and environmental programmes at local levels.

It was recommended to show more **best-practice examples** from Western countries in the seminar. Furthermore, it would be useful to specifically involve those Western European countries who are the main purchasers of certificates from JI and CDM (e.g. Netherlands, Denmark). On the other hand, governments tend to attribute more relevance to best practice examples from neighbouring countries with economies in transition than from the old EU Member States. The CTI could set up a **best practice website** with examples from both Western and Eastern countries.

The next seminar could still focus more on **initiating concrete projects** and, importantly, **involving NGOs**, who are often more active than governments in the target regions but lack basic funding. It would also be useful not to limit the scope of technological aspects, but to extend the view to **social and educational programmes and awareness raising** among local authorities and the whole population.

It could be useful to establish **CTI focal points** in each country that receive and distribute information. However, this idea was received with some caution. Care needs to be taken to ensure transparency and to ensure that focal points really act as multipliers and not as ending points of information flows.