Tenders – an option for developing countries to support renewable energies under the CDM

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Abstract

Renewable energies are generally considered as an important tool on the way towards sustainable development. However, in case developing countries want to actively promote these energies they may face the problem that corresponding legislation conflicts with the CDM-rules, especially with the additionality concept. Thus, CDM projects may become impossible to be implemented. The following article presents an approach to overcome these potential difficulties. The solution lies in offering a tender specifically for RE-CDM-projects.

Introduction

Regarding the choice of technologies to be applied for the supply of energy, different approaches exist. The options range from a command-and-control set-up on the one side to a pure market approach, where the choice is made through competition on the market, on the other side. The latter approach is quite attractive, however, it is only effective if a level playing field for the various technologies exists (Reddy 2002, p. 130). Renewable energies (RE) offer a number of advantages compared to conventional technologies. However, they are generally not competitive under pure market conditions today as their advantages are not considered in the costs faced by the manufactures and operators. A level playing field does not exist. This is why they have increasingly been promoted by governments and international organisations through the implementation of additional legislation in the past.

The perception of the specific advantages in a certain country depends inter alia on its economic development. For example, the potential to reduce greenhouse gas emissions or to contribute to energy security is of special interest in Annex-I countries. Satisfying the need for electrification, fighting against poverty or reducing local pollutants as for example NO_x / SO_2 are core aspects in non Annex I countries.

The support required to increase their market share may be provided in the very beginning of the product lifecycle, i.e. during R&D, for the construction of pilot plants or for the market introduction and deployment.[1] Though all steps within the lifecycle are of interest, the last one is especially important if a broad market penetration is desired. A wide basket of different options exists to foster this penetration, starting with a command-and-control set-up on the one side and a market approach on the other side. A general overview on these options is provided by Turkenburg (2002, pp. 159-162). Again, instruments applied differ from country to country. Schemes which provide a direct financial incentive seem to be more common in Annex-I than in non-Annex-I countries. Table 1 provides an overview on instruments involving financial incentives, which are in general considered to be extremely effective.[2] Table 2 in the appendix summarises the actions for non-Annex countries recently announced on the Renewables Conference 2004 in Bonn.

[1] Dismantling of RE devices does not seem to be as problematic as in the case of nuclear power plants where the very end of the lifecycle must also be considered if proper evaluations are desired.
[2] Often cited as a successful example is the feed-in tariff in Germany.

Tab. 1: Overview on important instruments to promote renewable energies (based on Meyer 2003)

Name	Feature	Example
Feed-in tariff	Long-term minimum price is guaranteed for electricity or heat from renewable sources	Germany
RE-Quota	Certain market participants (e.g. supplier, consumer) are required to supply or consume a minimum quantity of electricity or heat from renewable sources*)	Italy, The Netherlands
RE-Tender	A national authority puts a certain quantity of electricity or heat from renewable sources to tender. Winners of the tender get a fixed price for the length of the contract	United Kingdom
Direct subsidies	(Parts of) capital costs are born by a national authority	Germany (1991-1992), India (1997-1999)

*) *Note that a green certificate trading scheme allows meeting these targets cost-efficiently. Trading itself does not promote RE*

The four instruments may be applied to RE in total or they may be technology specific. For example, different quotas could be set for RE originating from wind, biomass or photovoltaic. In case a technology specific distinction is desired by the regulator, the different instruments can also be combined. To give another example, it would be possible to set a quota for wind energy for electricity generators and to put to tender the production of a certain quantity of MWh electricity from biomass.

The instruments have different advantages and disadvantages. Their success in praxis depends, however, also strongly on the design chosen (Ibenholdt 2002). Developing countries which want to actively promote RE may thus use one of these (financial) instruments. Yet, analysing policies, strategies and lessons from the GEF in DCs, Martinot (2002, p. 12) finds that "…regulatory frameworks must address the questions of how the additional costs of wind

power […] can be covered." Indeed, some of the major countries started with the implementation of financial support schemes:

India: Different feed-in tariffs on the federal level. (For an overview see Babu et al. 2003, p. 18-19)

Brazil: Launch of a renewable energy incentive programme "PROINFA" (For details see MME, 2004)

China: Commitment to formulate a RE law and Deployment Strategy and Plan (For details see ICRE, 2004, p. 42-43)

In addition to the implementation of one of the instruments mentioned above, governments in non-Annex-I countries can also make use of the Clean Development Mechanism (CDM) to promote the diffusion of RE. In this case, however, there might be some conflicts regarding the additionality requirement for CDM projects.[3]

The CDM and the additionality concept

The CDM is a project-based mechanism under the Kyoto-Protocol according to which certified emission reductions (CER) can be generated through projects in non-Annex-I countries (UNFCCC 1997). These CERs can be bought and used by Annex-B countries to meet their absolute emission targets as specified in the Protocol. An important rationale behind this concept is the fact the GHG emission reductions are generally less costly in developing countries than in industrialised countries.

As the Annex-B countries' overall budget of emission rights can be increased by the purchase of CERs, it is of crucial importance that these reductions be real reductions. Art 12.5 (c) of the Kyoto Protocol states that "reductions in emissions (must be) additional to any that would occur in the absence of the project". Otherwise the Annex-B countries' budget would be inflated at the expense of environmental integrity.

[3] This issue is not a pure academic issue. It has already entered the political discussions (see Bode 2004).

The aspect mentioned above is dealt with under the term of "additionality". Generally, the four different concepts can be distinguished as follows (see Baumert 1999, Bode et al. 2003, Carter 1997, Dutschke et al. 2003, Greiner et al. 2003, Sugiyama et al. 2001):

1. environmental additionality
2. technological additionality
3. financial additionality
4. legal additionality
5. investment additionality

The first additionality concept stipulates that only projects which result in real, measurable emission reductions can earn CERs. The technological concept defines that only projects applying state-of-the art technologies should be eligible as CDM projects.[4] The third concepts states that CDM projects should be financed outside ODA. These three concepts are not discussed any further as there are judged to be unproblematic in respect of RE and in case a CDM host country implements one of the instruments discussed in the previous section.[5]

The concept of legal additionality prescribes that a project which is implemented to meet whatever legal requirement, cannot generate CERs as it would have taken place anyway. Last but not least the investment additionality approach stipulates that projects which are economically viable and attractive cannot earn CER either as investors are likely to realise it anyway. Implications of these two concepts are discussed below.

Regarding the transformation of Art. 12.5 into implementation regulation, the CDM Executive Board is the most important body. Currently, it interprets additionality rather strictly, what in turn resulted in an outcry of project developers (PointCarbon 2003). A consolidated additionality test has been introduced in Oct. 2004 (EB 20004a)[6].

Promotion of renewable energies in developing countries

[4] This is why nuclear power plants are generally not considered eligible under the CDM.
[5] If, however, the money for the implementation of the instruments comes from an industrialised country, this may change.
[6] Note that the rule for considering national policies, as for example feed-in tariffs, within the determination of the baseline (see EB 2004b) does not say anything about dealing with such policies during the additionality test (GTZ 2004).

Assume that the regulator in a developing country thinks about introducing (or did already introduce) a RE promotion instrument. What would be the effect on potential RE-CDM-projects?

Feed-in tariff

A feed in tariff is only effective in terms of a visible increase of RE if the minimum price is high enough to render the project economically attractive. In this case, however, these projects could not qualify as CDM projects anymore as they violate the investment additionality criterion.

RE-Quota

Until the quota is met, RE-projects are, by definition, not additional with respect to the legal additionality criterion as they would take place anyway (as long as non-compliance with the quota is penalised). Thus, there would be an incentive to define a relatively small quota in case RE-CDM-projects are still to be implemented. A small quota, however, would not be in line with the idea of promoting RE in order to take the path towards sustainable development.

RE-Tender

The most important aspect in this case is the price paid. As for the tariff it must be high enough to make the projects attractive which in turn conflicts with the investment additionality concept.

Direct subsidies

Direct subsidies are only effective if the RE project becomes economically attractive due to the reduced capital costs. Again, these projects could not qualify as CDM projects anymore as they violate the investment additionality criterion.

Summing up, the national regulator in a developing country faces a dilemma. He either actively supports RE through the introduction of a new instrument and renounces additional financial revenues from the sale of CERs or he tries to attract CDM projects.[7]

[7] In this case he does not explicitly know if, when and how RE projects will be implemented.

A way out of this dilemma might be a fine-tuning of the financial incentive. Babu et al. (2003, p. 25) who study the removal of barriers for renewable energy CDM projects in India propose the following:

" MERC [Maharashtra Electricity Regulatory Commission] should continue to develop favourable tariff policies for all the renewable energy based power generation sectors which should be carefully tuned to avoid "over-subsidisation" which would in turn endanger project additionality"

I doubt that this is a desirable way of policy making.

Deus ex machina: RE-CDM-Tenders?

An option to resolve this dilemma could be the introduction of a RE-CDM-tender. The regulator would have to put a certain quantity of electricity or heat from renewable sources to tender. This tender would be open either for

- only those projects which are already registered as CDM project. In this case the CDM investor would bear the risk that he does not win the tender and that his revenues would thus be smaller than expected or for
- all projects. However, only those which are later registered as CDM projects would receive the price bid in the auction.

In this context the following two questions emerge:

- What happens to RE-projects which are not registered as CDM projects?
  As the tender could co-exist with each of the other instruments[8] mentioned above, these projects could benefit for example from a feed-in tariff. This tariff may be slightly higher than the corresponding financial support (without the CER revenue) of the winning projects in order to make the former more attractive than it would be without any RE-promotion. However, it would have to be lower than the total additional financial revenue (from the tender and the CERs) in order to provide incentives to get projects registered under the CDM.

[8] The instruments themselves may co-exist, but *a project* should not be allowed to qualify for more than one of the instruments.

- What happens with a CDM-project which has been found to be additional and been registered and which receives additional financial support *after* its registrations? So far, monitoring of financial aspects has not been considered for CDM-projects, at least not until a baseline revision after 7 years. This aspect would have to be clarified.

It goes without saying that several technology specific tenders could be established, too.

Conclusion

A pure introduction of text-book concepts to promote renewable energies in developing countries is likely to result in a conflict with the additionality concept of the CDM. Thus, a regulator may forego additional revenues from the sale of CERs in case he introduces such an instrument. The other option would be to "sit and wait" whether investors are willing to implement RE-CDM-projects in his country.

A solution of the conflict could be the introduction of a RE-CDM-tender. Under this concept the regulator would put a certain quantity of energy from renewable sources to tender. However, only projects that are later registered as CDM projects would finally receive the price bid in the auction. Non-winning projects could still benefit from a traditional instrument.

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Appendix

Tab. 2: Actions announced by non-Annex I countries on the Renewables Conference 2004

Leading Actor(s)	Title of Action or Commitment	Objective
Arab Republic of Egypt	Meeting 14% of Egyptian Electricity Demand with Renewables in 2020	
Argentina	Promotion of Renewable Energies in Argentina with the Aim of Achieving 8% of Power Consumption Renewable Energies	
Benin	Improving Living Conditions for Rural Communities by Means of Electrification	Electrification project for 40 rural communities
Benin	Project for the Provision of Energy Services	Streamline and modernise the biomass energy sector; promote efficient alternatives to substitute lignite fuels (1,200,000 tonnes oil equivalent by 2015)
Botswana	Promotion of Renewable Energy and Energy Efficiency in the Building Sector	Solar electrification programme targeting 88 villages over 5 years
Brazil	Alternative Sources of Energy Incentive Programme PROINFA	Implementation of wind, small hydro and biomass projects with a total power of 3,300 MW, equally shared with 1,100 MW for each alternative source
Brazil	Light for All Programme – “Luz para Todos”	Electrification (2,5 million new connections)
Brazil	Green Fuel Production (Ethanol and Biodiesel)	Authorising 2% of biodiesel in mineral diesel in November 2004 and increase the mixture gradually up to 5% or more to 2010
China	Formulating a Renewable Energy Law for China	
China	Formulating National Renewable Energy Development Strategy and Plan	2010: renewable energy about 60 GW or 10% of total; 2020: 121 GW or 12%
Republic of Congo	Support Project for the Formulation of a National Strategy for Rural Electrification	
Dominican Republic	Renewable Energy for Sustainable Development in the Dominican Republic	2015: 500 MW wind energy; 2010: 10% ethanol blend in gasoline
Eritrea	Dissemination of Improved Traditional Stove	Installing 5000 stoves per year (so far around 20,000 stoves have been installed).
Ethiopia	Renewable Energy Development Programme	
The Gambia	Renewable Energy Action Plan and Implementation	
Guatemala	Integral Water-Basin Resource Management for Greater Renewable Energy Use	
Iran	Developing National Renewable Energy Masterplan	By 2010, total installed capacity of renewable energy will reach 500 MW.
Jordan	Accelerating the Development of Renewable Energy in Jordan	By 2015 5 % of the total energy mix in Jordan comes from renewable energy resources.

Mexico	Mexico Renewable Energy Initiative	2014: renewable energy capacity 40% (4,000 MW)
Nigeria	Hydronet - Sustainable Water Resources Management in Nigeria	
Pakistan	Pakistan Renewable Energy Initiatives	2015: renewable energy capacity 10% (2,500 MW) and more than 50,000 villages electrified
Peru	Promotion of Renewable Energy Development in Peru	2008: renewable energy capacity 100 MW
Senegal	National Strategy for Renewable Energy Development for Poverty Alleviation	2025: renewable energy capacity 15% (now 1%) and raising the rural electrification rate from presently 8% to 60%
Sierra Leone	Government of Sierra Leone - UNDP Initiative	Set up solar home systems in 100 villages
South Africa	The White Paper the Energy Efficiency and the Appliance Labelling Programme	2014: renewable energy capacity 1,667 MW (10,000 GWh over 10 years)
South Africa	1) Regulatory Framework for Renewable Energy 2) Research and Development on Renewable Energy	Regulatory instruments and funding to ensure the target beyond the government's cumulative target of 10 000 GWh
South Africa	South African Wind Energy Programme	A funding plan for 50 MW wind energy by 2013 and if viable, 50 MW wind farms operating by 2013.
Tunisia	Incentives to the Private Sector to Invest in Developing Countries: Wind Energy	Implementation of a concession-based wind energy programme in Tunisia targeting 300 MW by 2011 and 100 MW during the initial phase
Uganda	Supporting the Development of Institutional Capacity to Manage Rural Electrification in Africa	
Uganda	Support of Renewable Energy Development in Uganda	2010: renewable energy capacity 90 MW
Vietnam	Developing Renewable Energy Policies and promoting Electricity Supply to remote Off-grid Areas	Electricity provided to 35.000 – 90.000 households that cannot connect to the national grid up to 2010.
Yemen	Promotion and Expansion of Renewable Energies in Yemen	20 pilot projects; 10% increase of the energy efficiency especially for the use of fuel wood and fossil fuels