The "Magic" of the Kyoto Mechanisms: Will It Work for Buildings?

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ABSTRACT

According to their design, the flexible mechanisms of the Kyoto Protocol should deliver a wide spectrum of "magical" outcomes in all sectors of developing countries and transition economies including, among others, technology and know-how transfer, skilled experts, investment capital, and capacity building. Buildings should, in theory, be prime targets of clean development mechanism (CDM) and joint implementation (JI) projects since they house major cost-effective potentials for saving carbon-dioxide (CO2) through the improvement of energy efficiency all around the world. Host countries should welcome activities channeled to buildings, as these mechanisms could help overcome barriers inhibiting the improvement of energy efficiency in homes and businesses.

Will these opportunities be realized? The paper examines the three flexible mechanisms of the Kyoto Protocol from the perspective of their promise to save energy in the buildings sector. First, it highlights the priority of the buildings sector for climate mitigation policies. Then, it reviews on-going JI and CDM projects, and planned activities. It examines the prime barriers to the application of these mechanisms in buildings. Finally, the paper identifies a selection of opportunities for improving the present implementation of these mechanisms to better deliver the "magic" in buildings. It concludes that introduction of such policies as Green Investment Schemes (GIS) and project-based emission trading, methodological improvements for JI and CDM, and capacity building programmes targeted to local audience may help to overcome some of the barriers to implementation of these mechanisms in the buildings sector.

Introduction: the Magic of the Kyoto Mechanisms

In order to allow parties to meet their greenhouse gas (GHG) reduction targets in the most cost-effective way, the Kyoto Protocol introduced the so-called "flexible mechanisms". These include international emission trading (IET) as defined by Article 17, the clean development mechanism (CDM) introduced in Article 12, and joint implementation (JI), described in Article 6. IET provides incentives to foster investment in GHG reduction in the Annex-I Parties of the Protocol when these countries are interested in producing a higher supply of Assigned Amount Units (AAUs) for allowance-based transactions[1]. The project-based mechanisms, i.e. the CDM and JI, were designed to decrease GHG emissions by providing the background for project-based transactions[2].

The flexible mechanisms, especially the project-based mechanisms, were associated with the promise of bringing a broad range of benefits to host countries. Such projects were expected to accelerate the transfer of energy-efficient and other advanced low-GHG technologies, to

[1] Under IET, an Annex-I Party may purchase some emission units under their assigned amount (allowances), AAUs, created and allocated by regulators under cap-and-trade regimes from another Annex-I Party.

[2] Under the project-base mechanisms, an Annex-I Party may purchase emission credits from a project that reduce GHG emissions for the amount different from the emissions taking place without this project. JI allows such transactions from an Annex-I Party and such emission credits are called as Emission Reduction Units (ERUs), while CDM permits transaction of credits referred as Certified Emission Reductions (CERs) from a non-Annex I Party.

stimulate capital investment and capital transfer into developing countries and transition economies, to bring know-how and expertise, and to build the local capacity and institutions necessary for low-GHG development. In the energy field, the project-based mechanisms had the promise of capturing major, cost-effective potentials, through overcoming the high number of financial, institutional and political barriers prevailing in developing countries and economies in transition (EIT) (Grabb, Vrolijk & Brack 2002). In addition to benefits related to the deployment and diffusion of advanced technologies, the project-based mechanisms are both mandated and expected to bring benefits critically important to sustainable development (Woerdman 2000). For instance, projects under their framework will reduce operating costs through improved energy efficiency and thus improved competitiveness in poorer countries, will provide new employment opportunities, may facilitate access to energy services, will contribute to the solution of fuel shortages especially in rural regions, thus, opening a window for locally generated energy-supply systems, and will generate opportunities to productively engage stagnating, low income communities in the globalization process and improve their competitiveness (IEA 1997; Williams 2000).

These new opportunities can be considered especially welcome in sectors supplying the largest and the cheapest energy saving opportunities. In 2004, buildings emitted 32% of world's CO2 emissions (Price et al. forthcoming), at the same time Ürge-Vorsatz & Novikova (forthcoming) estimated that at least 27% of the business-as-usual emissions can be saved cost-effectively in buildings by 2020. It was hoped that implementation of the flexibility mechanisms targeted to homes and businesses could help overcome a large number of barriers inhibiting the improvement of energy (for details, see for instance, Govole & Eto 1996; Shove 1998; Rezessy et al. 2006; Bertoldi & Rezessy 2005).

However, will the "magic" of the Kyoto mechanisms work in buildings, and deliver these benefits? What is the experience with the flexible mechanisms in the buildings sector to date and what are the future prospects and challenges? What can be done to improve the leveraging of these mechanisms to unlock the large financial and emission savings potentials in this sector? This paper examines these questions based on existing literature, analysis of present and planned activities under the flexible mechanisms, and expert interviews. It assesses the three flexible mechanisms from the perspective of their promise to save energy in buildings. As the authors of this paper have not been able to locate any previous research examining the problems with flexible mechanisms in the buildings sector, the present paper attempts to (i) show the importance of these tools in buildings; (ii) review the experience and future prospects of these mechanisms in buildings, (iii) identify the barriers to the utilization of these instruments in the residential and commercial sectors, and (iv) highlight a few opportunities how they could be better leveraged to mobilize the financial and environmental gains through energy-efficiency investments[3] in buildings.

Do the Kyoto Mechanisms Work for the Buildings Sector?

A Look at On-Going and Planned JI Activities in Buildings

Very little information about on-going and planned JI activities is available. However, even from the limited data it is clear that buildings projects are not favored by JI investors. Thus,

[3] In the paper we considered only demand-side energy-efficiency within the buildings sector.

although Novikova & Ürge-Vorsatz (2005) showed that the countries of the Central and Eastern European (CEE) region are the prime targets for JI, according to Ürge-Vorsatz, Novikova & Watt (forthcoming) there has not been a single JI project channeled to demand-side energy-efficiency in the building sector among 74 approved[4] JI projects in ten countries of Eastern and Central Europe[5]. In Russia and Ukraine, not a single JI project has been accepted so far due to the limited institutional capacity of these countries, which are experiencing difficulties with the development of a national framework for the development of JI projects.

Based on the available data from three CEE countries as of February 2006, it seems that the future prospects of JI activities in buildings are very limited if they exist at all. Thus, on the list of 20 submitted JI projects in Hungary additional to the 10 which have already been accepted, there is not a single building-related project (the information from the official website of the Hungarian Ministry of Environment and Water). Of 54 projects submitted under the JI mechanism in the Czech Republic, on top of 31 already accepted, not one project concerns buildings (Pavel Zámyslický – e-mail com.). Nor do any of the 37 JI projects so far submitted in Poland target buildings (Sobolewski, Karaczun & Kassenberg 2005).

The question is whether a major turnaround can be expected in JI projects in the remaining time until the end of the first commitment period. The countries of Eastern Europe including Russia and Ukraine provide the largest potential for this mechanism; they are also the largest potential suppliers of AAUs (Streck 2004). Ürge-Vorsatz, Novikova and Watt (forthcoming) demonstrated that JI activities played so far a negligible role in CEE countries, and this role is only expected to dwindle in the Central European region due to a number of reasons. While the application of Track-1 JI could overcome a large number of the barriers facing JI projects in buildings, the particularly complicated administrative procedures and consequently high transaction costs make the Track-1[6] JI requirements difficult and expensive to comply with. While the 10 post-communist EITs that have will have joined the European Union by 2012 need to comply with requirements under the EU Emission Trading Scheme that also will make them be eligible for Track-1 JI, it is not clear that this will be completed early enough to open a large new window for Track-1 JI projects in these countries. On the other hand, due to its high transaction costs and other shortcomings, Track-2 JI is likely to be substituted or complemented by either project-based emission trading or other, more flexible approaches under the rules of IET, such as the Green Investment Scheme. The conclusion regarding the low capacity for JI is supported by the projections of Michaelowa, Krey and Butzengeiger (2004), who estimated that the share of the world annual demand for emission reductions captured by JI activities in 2008-2012 will be only 3%. This is further exacerbated by the fact that some countries, such as Slovakia, actually prioritize IET over JI on the national policy level (Princova 2005). In summary, it is highly unlikely that either Track-1 or Track-2 JI will deliver a large number of energy efficiency projects in buildings.

[4] According to available information on the date of February 2005.

[5] Bulgaria, Slovakia, Slovenia, Hungary, Romania, Poland, the Czech Republic, Latvia, Lithuania, Estonia.

[6] There are two possible procedures for carrying out a JI project: "Track-1" may be applied when the Annex-I Party hosting the project fully meets all the eligibility requirements to participate in the mechanism. In this situation, the host Party may apply its own national rules and procedures to the selection of JI projects and the estimation of emission reductions from them. "Track-2" must be applied if the host Party does not meet all eligibility requirements. In such cases, the project and the quantity of emission reduction units it generates must be verified under rules and procedures supervised by the Article 6 Supervisory Committee.

The Present and Future Outlook for CDM Projects in the Buildings Sector

The buildings sector has by far the largest potential for GHG emissions mitigation in developing economies. According to Table 1 the share of the CDM potential supplied by buildings and appliance efficiency in 2010 consists of 32% of the total CDM potential that can be tapped at negative costs[7] (net benefit). This share is 20% if accepting mitigation costs up to USD 20/tCO2eq.

Table 1. Estimates of CDM Potential by Project Type in 2010

CDM project type	Additionality at USD 0/tCO2eq		Additionality at USD 20/tCO2eq	
	Mln tCO2eq	Share of total CDM potential, %	Mln tCO2eq	Share of total CDM potential, %
Buildings and appliance efficiency	**26.3**	**31.9%**	**211.4**	**20.0%**
Industrial efficiency measures	20.0	24.2%	101.8	9.6%
Forest Sequestration			117.2	11.1%
Other projects including landfill gas utilization / capture, methane reduction, and others.	36.2	43.9%	624.1	70.4%
Total	**82.5**	**100.0%**	**1,054.5**	**100.0**

Source: Constructed based on Trexler and Associates (2003) in Margaree Consultants (2004)

Despite such low-hanging fruits in the buildings sector, only 4 out of 101 registered CDM projects as of February 2006 (see Table 2) aim to increase the energy efficiency in buildings (UNFCCC[8]). The total amount of CERs from these four projects of about 40,000 tonnes of CO2eq. per year accounts for only 0.12% of the CERs generated by all 101 projects.

Table 2. Registered CDM Projects in Buildings as of February 2006

No.	Registration	Title	Host Country	CERs (tonnes of CO2eq./year)
1	2005-08-27	Kuyasa low-cost urban housing energy upgrade project, Khayelitsha	South Africa	6,580
2	2006-01-20	Moldova Biomass Heating in Rural Communities	Moldova	17,888
3	2006-01-29	Moldova Energy Conservation and GHG Emission Reduction	Moldova	11,567
4	2006-02-26	CDM Solar Cooker Project Aceh 1	Indonesia	3,500

Source: UNFCCC website[9] as of February 26, 2006

None of these projects come from China and India, the largest CER suppliers. This observation is especially surprising for China, which house the largest potentials for emission reductions in the world. According to the Mid- to Long-term Special Plan for Energy Conservation of China promulgated in November 2004 by the National Development and Reform Commission, 3/4 of energy consumption of buildings can be saved if China implements energy efficiency codes that are comparable to those of the developed countries.

[7] The negative net reduction cost of CO2 for energy efficient options means that they are cost-effective as results of measures are greater than their implementation costs, thus resulting in negative cost of conserved CO2.
[8] http://unfccc.int/kyoto_mechanisms/aij/activities_implemented_jointly/items/2094.php
[9] http://cdm.unfccc.int/Projects/registered.html

As regards the planned CDM activities, according to available information on the official UNFCCC website[10], none of the 48 CDM projects seeking validation targets the buildings sector as of February 2006. Although it is early to jump into conclusions about the constitution of the final CDM market at the end of the first commitment period as the market is presently undergoing a major boom, there are no indications that the trend for buildings would reverse.

International Emission Trading

When emission trading works as originally intended, the host country receives carbon financing for GHG mitigation efforts, making more sustainable energy projects financially viable. As already mentioned the largest suppliers of AAUs are EIT of the CEE region. However, the surpluses of AAUs resulted from decline in their economies rather than from targeted GHG abatement activities. According to Michaelowa and Jotzo (2005), the recent estimates of AAUs potentially available only by Russia and Ukraine are about 1 million tonnes of CO2eq over the first commitment period. This is about the same amount as the projected excess in emissions over targets under the baseline scenario in OECD Annex B countries excluding USA and Australia. It is thus unlikely that EIT will directly foster sustainable energy developments in CEE, unless revenues from the selling of AAUs are earmarked for such a purpose (Novikova & Ürge-Vorsatz 2005).

Since the transaction costs of trading AAUs are proportional to the number of transactions rather than to the amount of emission reductions, the marginal costs in IET are likely to be significantly lower than for the CDM and JI projects. In light of this conclusion, the JI projects channeled to buildings are unlikely to compete with IET characterized by lower transaction costs and experiencing less impact from institutional inflexibility than the JI tool.

Barriers to Emission Reductions in Buildings Through the Flexible Mechanisms

The previous section provided evidence that there have been a limited number of projects developed under the framework of the Kyoto flexible mechanisms in buildings, and the prospects until the end of the first commitment period are not more positive. This section lists barriers that contribute to this failure of the flexible mechanisms in buildings in Table 3 and then reviews them in details. Since in its original design it is only the two project-based mechanisms which have been targeting buildings, in this section we discuss the barriers to JI and CDM projects (these two are very similar from our perspective). We offer a few suggestions for IET in the recommendations section.

Small Scale of Building-Related Projects, High Transaction Costs

During a pilot stage of JI and CDM practices (so called Activities Implemented Jointly phase)[11], 18 projects out of 156 listed on the official website of the UNFCCC[12] targeted the buildings sector. Calculations based on the available information for emission reductions in 143

[10] http://cdm.unfccc.int/Projects/Validation

[11] Under AIJ Annex II parties of the United Nations Framework Convention on Climate Change (UNFCCC) could finance projects and activities in the host countries who are non-Annex II parties.

[12] http://unfccc.int/kyoto_mechanisms/aij/activities_implemented_jointly/items/2094.php

AIJ projects showed that an average AIJ project related to the buildings sector among 15 such projects reduced emissions by about 2,000 tonnes of CO2eq. annually, while an average project of the AIJ stage taken as a whole reduced emissions by about 142,000 tonnes of CO2eq. annually. This means that during the AIJ phase the projects related to buildings were by one or even two orders of magnitude smaller than the average. Moreover, this potential for emission reductions is fragmented among the end-uses and widespread among buildings as separate project units.

Table 3. Barriers for Implementation of the Project-Based Kyoto Flexibility Mechanisms in the Buildings Sector

Main barriers	Description of barriers
High transaction costs of small scale of buildings projects	A single project related to buildings often generates a small quantity of emissions reductions in comparison to other sectors like industry. This potential is fragmented among the end-uses and widespread among buildings as separate project units. This is why, transaction costs calculated per unit of emission reductions are very high for buildings-related projects.
Bundling of small scale building projects	To be bundled, projects should be of the same type, within the same geographical area, at the same stage of development and be bundled by one organization. If several building-related projects are bundled, it is difficult to correspond to all these criteria.
Post-Kyoto uncertainty	There is a high risk regarding whether or not the current regime will continue after 2012 because the decision is a matter of international negotiation. This is why mainly large-scale, short-term projects are favored, which are rare in the buildings sector.
Justification of additionality	If emission reductions were initially expected from implementation of JI/CDM projects but it appeared that they can also result from the upcoming law or other instruments such reductions will not be considered as additional and CDM/JI investors cannot pretend to gain from them.
Multiple baseline setting	If the project involves more than one measure for energy efficiency improvement, that is very typical for buildings, the setting of a multiple-type baseline scenario which contains a set of different baseline components becomes problematic.
Other methodological and procedural barriers	There is no widely applicable methodology for projects in the buildings sector. Developing a JI project is associated with additional risks because many details of the JI guidelines have not yet been established.
Project implementation risk	Purchasing project-based credits before they are issued involves more risks than purchasing allowances because issuance of credits depends on such issues as whether the project performs correctly or whether the credits are finally verified by the JI/CDM board.
Lack of awareness and expertise	Due to the risk involved and the post-2012 uncertainty, many skilled people are not willing to choose a full time/permanent position in the carbon market. Most JI/CDM experts work on a national level and are not likely to become JI/CDM consultants who play a crucial role along the whole project cycle

This has implications for deciding whether or not a project should be implemented, especially when transaction costs are taken into account. According to Michaelowa and Jotzo (2005), the Prototype Carbon Fund considers projects with a volume of below 3 mln tCO2eq. unattractive due to the transaction costs. Projects have to obtain national approval and pass through all the other (often costly) processes including validation, registration, implementation and monitoring, verification, and certification before the final issuance of ERUs or CERs. Typical pre-implementation transaction costs for a CDM project were estimated as EUR 391,000 and they could be reduced at maximum to EUR 120,000-250,000 depending on the project type (Michaelowa et al. 2003). Pre-implementation transaction costs associated with track-2 JI are in the range of EUR 17,000 – 70,000 (ECON Analysis 2005). Table 4 illustrates how high the transaction costs of building-related projects are for the investor and how they tend to generate lower emission reductions in comparison with other types of activities.

Table 4. Project Size, Types and Indicative Transaction Costs for CDM Projects

Size	Type	Certified Emission Reduction (t CO2/year)	Transaction costs in Euro/tCO2
Very large	Large hydro, gas power plants, large combined heat-power (CHP) plants, *geothermal*, landfill/pipeline methane capture, cement plant efficiency, large-scale afforestation	>2,000,000	0.1
Large	Wind power, *solar thermal*, energy efficiency in large industry	20,000-200,000	0.3 - 1
Small	Boiler conversion, demand side management, small hydro	2,000-20,000	10
Mini	***Energy efficiency in housing and small and medium enterprises, mini hydro***	**200-2,000**	**100**
Micro	*Photovoltaics*	<200	1000

Notes: In italics – project types that typically have relatively high marginal costs
Source: Michaelowa and Jotzo (2005)

The Challenge of Bundling of Small Scale Building Projects

Emissions reductions have to be calculated on a project-based level. This means that even if a project covers only one building it has to apply separately for approval. However, it is almost impossible for the host country's buildings as a whole to apply as one project and claim emissions reductions all at one time. Bundling of several similar projects under one project can solve the problem of high transaction costs of small-scale projects, allowing them to undergo steps in the project cycle jointly and reducing the costs per unit to an economically feasible level (Evans 2001; Ahonen & Hämekoski 2005). A few "bundled" JI projects have been implemented in the CEE region (Ürge-Vorsatz, Novikova & Watt forthcoming), however none of them is in buildings. To be bundled, projects should be of the same type, at the same stage of development and be bundled by one organization. Thus in reality the bundling of projects would be difficult, moreover, later management and monitoring of projects tied to buildings having among different owners create becomes difficult (Pierre Longlois – pers. com.).

Post-Kyoto Uncertainty

Despite the cost considerations, another influencing factor is that after 2007 it would be too late to run a large scale project mainly due to the uncertainty with respect to the second commitment period. Any project starting after 2007 with more than 6 years' crediting period[13] will go beyond the end of the first commitment period which will end in 2012. For example, a project starting at the beginning of 2007 may sets its crediting period to be 10 years but as of now it can only get CERs for 6 years because the first commitment period ends in 2012. No project participants are willing to take the risk regarding whether or not the current regime will continue after 2012 because the decision is a matter of international negotiation. Logically, since the number of years that a project can generate emission reductions is limited, projects with large amount of CERs will be favored. This is especially true for projects targeting buildings which have small amount of CERs if single projects are not bundled.

[13] The Crediting period is the time duration when a project's emissions reductions can be measured and calculated to claim emission reductions credits. For a CDM project there are two options of crediting period to choose: a maximum of 7 years which can be renewed for two times at most; or a maximum of ten years which can not be renewed.

Justification of Additionality and Baseline Setting

The justification of additionality[14] and the baseline setting is becoming more difficult for building projects to correspond to due to upcoming policy tools aimed at improving energy efficiency in buildings. For example, China has recently set compulsory design standards for energy efficiency in buildings, thus a single CDM project which aim to raise energy efficiency towards the mandatory level is very likely to become non-additional after the promulgation of these standards and resulted GHG emission reductions cannot be traded. At the same time, the introduction of project-based mechanisms might create perverse incentives against such energy efficiency policies as building codes or minimum energy performance standards for equipment and appliances. The Governments who would like to encourage investments in energy efficiency and JI/CDM projects might stop taking other actions directed to improve energy efficiency such as introduction of mandatory demand-side programs to get tradable emission reductions.

Even when the proposed project is justified as additional, it still faces difficulties regarding the setting of a multiple-type baseline scenario[15] which contains a set of different baseline components if the project involves more than one measure for energy efficiency improvement. For example, a proposed project may need to establish a baseline scenario under which the historical and current data regarding heating, air-conditioning, lighting and insulation have to be carefully examined. One likely situation in reality is that those data either do not exist or are not sufficient to establish a baseline. Even when a baseline is set up, difficulties with monitoring could still hinder the process. Therefore, taking into consideration that the development of such a baseline and monitoring methodology on the one hand incurs a considerable amount of transaction costs over a long period of time and on the other hand does not generate a large quantity of CERs or ERUs, investors are very unlikely to implement such projects on a JI or CDM basis.

Other Methodological and Procedural Barriers

There is no widely applicable methodology for projects in the buildings sector. With regard to CDM, up until now, there are 27 approved methodologies, 8 approved consolidated methodologies and 15 approved small-scale methodologies, of which two small-scale methodologies can be applied in this context: one is designed for energy efficiency and fuel switching measures in buildings and another is for demand-side energy efficiency programmes for specific technologies like lamps, ballasts, refrigerators, motors, fans, air conditioners, appliances, etc (official website of UNFCCC/CDM[16]). These methodologies are only applicable for small-scale projects such as regional efficiency upgrading programs. Such initiatives may have to develop a new methodology for approval, this process can take up to two years.

Developing a JI project is associated with additional risks because many details of the JI guidelines have not yet been established. Many of the JI rules will be set on the national level and countries still have to develop national procedures for developing JI guidelines (ECON

[14] Additionality requires that projects have to demonstrate that they are additional to business-as-usual scenarios, namely, the propose project activities to be implemented in selected building are only feasible due to the assistance from JI/CDM activities otherwise the project is considered to be non-additional and not eligible under JI/CDM.

[15] Multiple-type baseline here refers to a baseline scenario where the baseline energy efficiency improvement is consisted of more than one component. Under such circumstances, baselines need to be set up for each of the component.

[16] Official web-site of the UNFCCC: http://www.unfccc.int/ as of February 2006.

Analysis 2005). The Supervisory Committee under the UNFCCC was recently established by the COP11/MOP1 in December 2005, but guidance with regard to the implementation is still under development. According to the new MOP1 decision, JI projects seeking early action may apply the pertinent baseline and monitoring methodologies where appropriate. However, this does not remove the methodological barrier, since JI project proponents are generally unfamiliar with the available CDM methodologies.

Transaction and Project Implementation Risk

The project-based carbon transactions are associated with risks of a different nature. Most project-based transactions so far have been signed before the project-based credits were issued. Purchasing project-based credits before they are issued involves more risks than purchasing allowances because issuance of credits depends on such issues as whether the project performs correctly or whether the credits are finally verified by the JI/CDM board (Lecocq & Capoor 2005). There are other risks related to the implementation of any investment projects that relate to construction, performance, and delivery of ERUs and CERs.

Lack of Awareness and Expertise

For most of the project participants, participation in Kyoto project-based mechanisms is a young concept which was introduced only a few years ago. The general knowledge of the Kyoto Protocol with its target in GHG emissions reduction is widely broadcasted but the details about its flexible mechanisms are seldom publicized. Furthermore, because the target areas of investors have been focused on energy efficiency in large industrial processes and renewable energy power generation, the buildings sector as a whole has been overlooked by them both for JI and CDM. There are also insufficient qualified people working in this field. Tangen & Heggelund (2003) observed that in China real expertise regarding the CDM can only be found in a few ministries and research institutes under the central government. A number of capacity building programs have been launched world-wide during the past couple of years but within a short period it is difficult for project proponents to master a foreign language, JI/CDM rules, business negotiation, etc. Moreover, due to the high risk involved and the post-2012 uncertainty, many skilled people are not willing to choose a full time/permanent position in the carbon market. Most JI/CDM experts work on a national level and are not likely to become JI/CDM consultants who play a crucial role along the whole project cycle (Tangen & Heggelund 2003). Experience has been accumulated mainly among the central government expert groups but local authorities, even though some have established JI/CDM offices, are still learning by doing.

Opportunities for the Improvement of the Kyoto Mechanisms to Reach Buildings

This section highlights a selection of potential remedies that could still be applied to improve chances of these instruments to become more applicable in the buildings sector in the first commitment period. Unfortunately, the detailed assessment does not fit the limits of the paper and we leave this task for the forthcoming detailed research. The short summary of proposed actions is presented in Table 5 below.

Table 5. Opportunities for the Improvement of the Kyoto Flexibility Mechanisms to Reach Energy Efficiency in the Buildings Sector

Opportunities	Description
Promoting project-based emissions trading as opposed to Track-2 JI	If emission trading is tied to concrete projects and revenues from selling AAUs are specially targeted for investing into such projects, emission trading will result in generating real emission reductions. This project-based emissions trading, in essence, is not markedly different from Track-1 JI because rules and procedures for project approval are with the countries, but could be applied in those Annex-I countries which are not eligible for this Track. The greater flexibility offered by this alternative may make project-based emission-trading more attractive than JI, which is facing the large number of barriers described above.
Green Investment Schemes (GIS)	The Green Investment Schemes or, shorter, GIS are the schemes that link the transfer of AAUs and mitigation projects or programs which need investments. Similarly to the definition of ERUs generated by a JI project, AAUs are "greened" if an activity financed through the proceeds of their sale has produced the same emission reductions as AAUs (WB 2004). GIS is not officially recognized as an element of the Kyoto Protocol. Perhaps, the introduction of a framework for "green credits" under GIS will open a new window for the buildings sector.
Advancing the development of simplified methodologies and procedures	To remove the methodological barrier for JI/CDM projects in the buildings sector, it is essential to further develop and simplify widely applicable baseline and monitoring procedures for buildings projects, which provide a set of default values for different components so that project proponents do not need to pass through the time-consuming process for methodology development. It has been suggested that the frequency of verification could be reduced to once in two years to make such projects viable (Bharadwaj et al. 2004). Decisions need to be made to produce clear rules to deal with double-counting problems for multi-faceted programmatic activities.
Establishment of a facility providing project bundling	As shown, bundling of small-scale JI/CDM projects with the purpose of minimizing their transaction costs per unit of emission reductions is difficult to realize on practice due to different characteristics and different owners of bundled buildings. One of the possible solutions for overcoming this organizational barrier might become founding of special facilities providing services of bundling for such small-scale projects (Pierre Longlois – pers. com.).
Programmatic CDM[17]	So far policy and programmes cannot receive CDM credits. A study conducted by Figueres et al. (2005) suggests that policy/programmatic project activities can implement CDM and they have an unique feature of involving many small scale projects in one programme that is registered as a bundled CDM project or a single project. If programmatic projects are accepted under CDM, it may lead to awareness of energy efficiency in buildings among the developing countries and generate a great number of CDM projects in this sector, with major achievable savings. Additionally, perhaps, the idea of a programmatic CDM can considered to be adopted for JI. At the same time, the programmatic CDM may even strengthen the thread of the perverse incentives against up-coming policy tools because a country might prefer to design JI/CDM to receive emission reductions than to introduce building codes and other programmes.
COP/MOP recent developments	A new impetus for JI activities is expected from the Decision made at the first MOP (FCCC/KP/CMP/2005/L.6). The decision requests the JI Supervisory Committee to develop the special provisions for small-scale projects among the other guidelines for JI and allows the transfer of methodologies and experience of designing documents for small-scale CDM projects to JI activities. Concerning the CDM small-scale methodologies, our evaluation is that the recent decision will not make a big difference for small-scale buildings projects since the existing and modified methodologies do not address many of the concerns raised in above sections and procedures for developing a new methodology in the buildings sector have not been simplified.
Information awareness and capacity building	Since to date the major attempts to implement CDM/JI projects were based on the "learning-by-doing" approach limited with an external expertise that slowed expanding of the initiatives on the carbon market, more capacity building programs targeting participants at the local level, ongoing development of reader-friendly texts on national languages will accelerate the involvement of project stakeholders.

[17] A programmatic CDM project is a CDM project where the emission reductions are achieved by multiple actions executed over time as a result of a government measure or a private sector initiative (Figueres et al. 2005).

Conclusion: Summary of Opportunities and Further Research Needs

The paper examines the role of the Kyoto flexibility mechanisms to deliver energy efficiency and emission reductions in the buildings sector. It analyses the declining trend for building-related projects starting from the AIJ phase and ending with the currently planned JI/CDM projects. It suggests that the number of such projects is unlikely to experience a considerable increase unless some effective measures are taken to empower these mechanisms to better work for buildings. The paper identifies the key barriers that stand in the way of the full mobilization of the Kyoto flexible mechanisms in buildings to unlock the large cost-effective energy-efficiency potentials. As regarding to project-based mechanisms, the paper calls to further advancing and simplifying the complicated methodological procedures for project-based mechanisms, establishment of facilities assisting small-scale project bundling, recognition of programmatic CDM, and raising information awareness about financing energy efficiency through JI and CDM mechanisms. The paper also shows that IET is unlikely to contribute to improving energy-efficiency in buildings, unless combined with other innovative schemes such as project-based emission trading; earmarked spending of IET revenues; and, more specifically, Green Investment Schemes.

In conclusion, the authors would like to add that due to many very recent developments in this area, they have not had adequate opportunity to conduct research to verify or assess the real potentials offered by these solutions. There is a need to catalogue and assess much more systematically the options that are available within the first commitment period to improve these instruments for the buildings sector. In addition, since transport has equally been neglected by JI/CDM projects, it would be important to conduct similar research and explore if there are synergies and resulting options through which additional GHG saving projects could be fostered in both sectors by these mechanisms. Finally, it seems highly probable that, be it the Kyoto Protocol or an alternative regime, the flexible mechanisms are here to stay even beyond 2012. Therefore a thorough assessment of how they can be more fundamentally re-engineered to address the two crucial emitting sectors, i.e. buildings and transport, is essential.

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References

Ahonen, H-M., and K., Hämekoski. 2005. Transaction Costs under the Finish CDM/JI Programme. University of Helsinki. Discussion Paper. Helsinki.

Ministry of Power, Government of India: New Delhi. Annual Report 2004-05. http://powermin.nic.in/

Bertoldi, P., and S. Rezessy, 2005. ESCOs in Europe. *Status report 2005*. Ispra: Joint Research Centre/European Commission.

Bharadwaj, N., B. Parthan, H.C. de Coninck, C. Roos, N. H. van der Linden, J. Green, and J. Mariyappan . 2004. Realizing the Potential of Small Scale Projects in India. http://www.cdmpool.com/reports/C04084.pdf.

ECON Analysis. 2005. *BASREC Regional Handbook on Procedures for Joint Implementation in the Baltic Sea Region*. Commissioned by Nordic Council of Ministers. Olso, Norway.

Environmental Valuation & Cost Benefit News, 2005. China's Mid- to Long-term Special Plan for Energy Conservation, issued on Nov.25, 2004.

Evans, M. 2001. Demand-Side Energy Efficiency and the Kyoto Mechanisms: Forging the Link in Countries in Transition. In *Proceedings of the Summer School of the European Council for an Energy Efficient Economy (ECEEE)* 2001: 6.126.

Figueres C., Ecoenergy Internaitonal Corp., Margaree Consultants Inc. 2005. Study on Programmatic CDM Project Activities: Eligibility, Methodological Requirements and Implementation. Prepared for the Carbon Finance Business Unit of the World Bank. http://carbonfinance.org/docs/Programmatic_CDM_Report.pdf.

Golove, W.H., and J.H., Eto. 1996. Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency. Lawrence Berkeley Laboratory, Berkeley, CA.

Grabb, M., C., Vrolijk, and D., Brack. 2002. The Kyoto Protocol. *A Guide and Assessment. 2nd ed*. Moscow: Harvest-Print.

[IEA] International Energy Agency. 1997. *Activities Implemented Jointly*. Partnerships for Climate and Development. OECD/IEA: Paris.

Kuik, O. and M., Mulder. 2004. Emissions Trading and Competitiveness: Pros and Cons of Relative and Absolute Schemes. *Energy Policy* 32 (6): 737-745

Lecocq, F. and K., Capoor. State and Trends of the Carbon Market. 2005. Development Economics Research Group of the World Bank Carbon & Environmental Finance, Africa Region, Environment and Sustainable Development, World Bank: Washington DC.

Margaree Consultants. 2004. Estimating the Market Potential for the Clean Development Mechanism: Review of Models and Lessons Learned. *PCFplus Report 19*. Washington DE.

Michaelowa, A. and F., Jotzo. 2005. Transaction Costs, Institutional Rigidities and the Size of the Clean Development Mechanism. *Energy Policy* 33: 511 – 523.

Michaelowa, A., M., Krey, and S., Butzengeiger. 2004. CDM and JI. New Instruments for Financing Renewable Energy Technologies. *Thematic Background Paper*. Climate Change and Hamburg Institute of International Economics: Bonn. www.renewables2004.de.

Michaelowa, A., M., Stronzik, F., Eckermann, and A., Hunt. 2003. Transaction Costs of the Kyoto Mechanisms. *Climate Policy* 3: 261-278.

Novikova, A. and D., Ürge-Vorsatz, (2005). Kyoto Flexibility Mechanisms in an Enlarged EU: will They Make a Difference? *European Council for an Energy Efficient Economy Summer Study 2005*. Mandelieu la Napoule, France.

Price, L., S. De la Rue du Can, J. Sinton, and E. Worrell, forthcoming: Sectoral Trends in Global Energy Use and GHG Emissions. Lawrence Berkeley National Laboratory, Berkeley, CA.

Princova, H. 2005. Implementation of Status of EU ETS and Linking with CDM and JI in Slovakia. Presentation at the UNIDO Seminar "Linking the Kyoto Project-Based Mechanisms with the EU ETS", Vienna, September 15-16.

Rezessy, S., K. Dimitrov, D. Ürge-Vorsatz, and S. Baruch. 2006. Municipalities and Energy Efficiency in Countries in Transition: Review of Factors that Determine Municipal Involvement in the Markets for Energy Services and Energy Efficient Equipment, or How to Augment the Role of Municipalities as Market Players. *Energy Policy* 34 (2): 223-237.

Shove, E. 1998. Gaps, Barriers and Conceptual Chasms: Theories of Technology Transfer and Energy in Buildings. *Energy Policy 26 (15): 1105-1112.*

Sobolewski, M., Zb., Karaczun, and A., Kassenberg. 2005. Case study: JI Secretariat in Poland. Institute for Sustainable Development. http://europeandcis.undp.org.

Streck, S. 2004. Options for Designing a Green Investment Scheme for Bulgaria. Presentation Made at the CTI Capacity Building Workshop, Leipzig, October.

Tangen, K. and G., Heggelund. 2003. Will the Clean Development Mechanism be Effectively Implemented in China? *Climate Policy* 3 (3): 303-307.

Ürge-Vorsatz, D. and A., Novikova. Forthcoming: Opportunities and Costs of GHG Mitigation in the World's Domestic Sector. In *Proceedings of the International Conference on Energy Efficiency in Domestic Appliances and Lighting(EEDAL) 2006*. London, June 21 - 23 2006.

Ürge-Vorsatz, D., A., Novikova and A., Watt. Forthcoming: Kyoto Flexibility Mechanisms in an Enlarged EU: will They Make a Difference? *Climate Policy*.

Williams, R. 2000. *Briefing Note to Participants*. UNIDO Special Event on the Climate Convention and Kyoto Protocol.

Woerdman, E. 2000. Implementing the Kyoto protocol: Why JI and CDM Show More Promise Than International Emission Trading. *Energy Policy* 28 (1): 29-38.

[WB] World Bank, Carbon Finance Unit, Energy and Infrastructure Department Europe and Central Asia region. 2004. *Options for Designing a Green Investment Scheme for Bulgaria*. Report N 29998. http://carbonfinance.org.