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Treatment of CDM and JI in the National Accounts and Environmental Accounts

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1. Introduction

Joint Implementation (JI) and Clean Development Mechanism (CDM) are mechanisms under the Kyoto Protocol. JI and CDM may help industrialised countries to achieve part of their emission reduction objectives in industrialised or developing countries. This enables countries and companies to achieve Kyoto targets at lower costs. This paper will address a number of related questions such as:

- What is JI and CDM?
- What kind of emission rights can be obtained from JI and CDM?
- How should JI and CDM related emission permits be recorded in economic and environmental accounting in addition to 'regular ETS' permits?

2. Kyoto flexibility mechanisms

The Kyoto Protocol demands that signed countries cut back their greenhouse gas emissions. These countries are expected to meet their reduction targets primarily through national policy measures. However, as an additional means the Kyoto Protocol introduced three market-based mechanisms leading to the creation of a "carbon market." This carbon market is believed to be crucial in the cost-effective reduction of greenhouse gas emissions worldwide. The three Kyoto mechanisms are:

1. Emission trading;

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2. The Clean Development Mechanism (CDM);
3. Joint Implementation (JI).

These mechanisms are supposed to stimulate sustainable development through technology transfer and investment and may help to meet targets by reducing emissions, or alternatively removing carbon from the atmosphere, in other countries in a cost-effective way. This may encourage developing countries to contribute as well to worldwide greenhouse gas emission reductions.

To be allowed to participate in the three mentioned mechanisms so-called Annex I Parties have to meet a number of eligibility requirements. Among others, they must have:

1. Ratified the Kyoto Protocol;
2. Calculated their assigned amount in terms of tonnes of CO_2-equivalent emissions;
3. Set up a national system for estimating emissions and removals of greenhouse gases within their territory. Moreover they must have in place a national registry to record and track the creation and movement of Assigned Amount Units (AAUs), Emission Reduction Units (ERUs) and Certified Emission Reductions (CERs) (to be explained later on) and must annually report such information to the secretariat and;
4. Annually report information on emissions and removals to the secretariat.

3. What are JI and CDM?

JI and CDM are two project based mechanisms that support establishing a carbon market within the Kyoto framework. JI enables industrialized countries to carry out joint projects while CDM involves investment in sustainable development projects that reduce emissions in developing countries. In their national communications under the Protocol, Annex I Parties must provide information to demonstrate that their use of the different mechanisms is “supplemental to domestic action” to achieve their targets. This information is assessed by the facilitative branch of the Compliance Committee of the Kyoto Protocol.

As an example, the Netherlands intends to achieve half of its emission reduction obligation for Kyoto by participating in CDM and JI projects.

3.1 Joint Implementation (JI)

As defined in Article 6 of the Kyoto Protocol, Joint implementation allows Annex I countries with restrictive emission targets to invest in greenhouse gas (GHG) emission reduction or carbon removal projects in other Annex I countries. Each tonne of CO_2 equivalent reduction brought about by a project grants the foreign investor an Emission Reduction Unit (ERU) which can be counted towards meeting the Kyoto Protocol targets. ERUs are tradable permits and can be sold after being obtained from a JI project.

Joint implementation offers countries a flexible and cost-effective way to fulfil at least part of their Kyoto commitments while the host country and connected parties may benefit from

foreign investments and technology transfer. Governments of Annex I countries have the freedom not to opt as host country for JI projects.

JI projects must generate emission reductions that are additional to what otherwise would have occurred. This ‘otherwise’ situation is described as the so-called ‘baseline’. Projects must be approved by the host country while participants have to be authorized by so-called Designated National Authorities (DNA).

The process of receiving emission credits for JI projects is somewhat complex. The ERUs are subtracted from the host country's pool of assigned emissions credits, known as Assigned Amount Units, or AAUs. Each Annex I party has been granted a predetermined amount of AAUs, calculated on the basis of its 1990 greenhouse gas emission levels. By requiring JI credits to come from a host country's pool of AAUs, the Kyoto Protocol ensures that the total amount of emissions credits among Annex I countries (with legally binding GHG-emission reduction targets) does not change for the duration of the Kyoto Protocol's first commitment period. In other words, JI leads to a reallocation of emission allowances and not to the creation of additional ones. This means in practice that AAUs are converted into ERUs. Subsequently, these ERUs are transferred to the donor country, either as a return to direct investment or as an additional transaction. Throughout the service life of the joint implementation project, the annual transfer of emission credits may continue. By mid 2008 between one and two hundred JI projects were established and another 150 projects were announced.

3.2 Clean Development Mechanism (CDM)

Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol (Article 12) allowing industrialized countries with a greenhouse gas reduction commitment (Annex 1 countries) to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. This mechanism allows emission reduction (or emission removal) projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO_2. These CERs can be traded and sold, and used by industrialized countries to meet part of their emission reduction targets as adopted under the Kyoto Protocol. CDM is the first truly global environmental investment and emission credit scheme of its kind.

CDM is supposed to stimulate sustainable development worldwide. At the same time it provides industrialized countries flexibility in meeting their emission reduction targets. Examples of CDM are projects related to renewable energy, energy efficiency (cleaner transport), methane capture from landfills and forestry (afforestation and reforestation).

CDM projects must qualify through a quite rigorous and public registration and issuance process designed to ensure real, measurable and verifiable emission reductions that are additional to what would have occurred without the project. The mechanism is overseen by the CDM Executive Board. In order to be considered for registration, a project has first to be approved by the Designated National Authorities (DNA), usually the ministry of environmental affairs, foreign affairs or the environmental protection agency. Operational CDM projects generate CERs on an annual basis. Since early 2006 more than one thousand

projects have been registered worldwide. These projects are supposed to produce CERs representing over 2.7 billion tonnes of CO2 equivalents in the first commitment period of the Kyoto Protocol, 2008–2012 (UNFCCC, 2009).

3.3 JI and CDM arrangements

JI and CDM project can be carried out in various forms by private or public companies and may be financed by government or private investors. A government may decide to participate in a JI or CDM project in order to meet national targets. In this respect it is important to acknowledge that usually only part of the economy is covered by an ETS cap and trade system. If governments do not find the possibilities to cut back emissions in other sectors of the economy (e.g. households or services sector), it may decide to participate in JI or CDM projects itself and obtain the required emission allowances (CERs and ERUs) on behalf of society to meet Kyoto targets. Governments can participate in JI or CDM projects as direct investors. Alternatively governments (or private parties) could simply settle an agreement with an investor to buy certain amounts of emission allowance during the service life of the project. Investors could provide loans at below market rates in return for CERs or receive interest payments in CERs.

Foreign parties can obtain full or partial ownership of CDM or JI projects. This means that CER/ERU ownership becomes annex to a financing agreement. Investors may participate in CDM or JI with the purpose of simply selling emission allowances or using them for their own obligations.

3.4 Characteristics of AAUs, CERs and ERUs

The emission caps of Annex I countries are expressed in levels of allowed emissions, or ‘assigned amounts’ (AAUs) denominated in tonnes of CO_2-equivalent emissions. The Kyoto System allows countries to exchange allowances through ETS or JI or to extend to some level their allowances through CDM. This complex reality requires a registry system that is able to track down the ‘location’ of ownership of all allowances at any point in time. For this purpose national as well as international registries have been installed to record ownership and exchanges of credits. The UNFCCC CDM Executive Board is responsible for issuing CDM credits to the national registries.

Obviously these registers may also be very useful for statistical purposes.

In the national registers the registration of CERs and ERUs do not differ from AAUs. In physical terms they are similar. Each type of allowance accounts for one ton of carbon dioxide equivalent (CO_2-equivalent). However conditions may differ which may lead to differences in market prices between AAUs, ERUs, or CERs. These conditions may vary from country to country. The following differences can be observed:

- In National registers a distinction is made between AAUs, CERs and ERUs;
- AAUs and ERUs are usually issued by the national authorities. However, CERs are issued by the international UNFCCC CDM Executive Board;

- Conditions regarding ownership, surrender and transfer may differ**.** Under the European ETS the maximum amount of CERs and ERUs companies are allowed to surrender over the period 2008-2012 must not exceed 10 % of their allocation for that five year period. Within this period companies are allowed to be more flexible on a year-to-year basis;
- Under the European ETS the maximum amount of CERs or ERUs companies (operators) are allowed to carry-over beyond 2012 must not exceed 2.5% of their allocation in the first period (2008-2012). For individual holders CERs and ERUs will not be valid after 2012;
- In the Netherlands CERs and ERUs granted for land use change and forestry (LULUCF) projects cannot be surrendered to meet national emission targets;
- The Dutch national emission authority has blocked the possibility to transfer temporary reductions from CDM forestry projects, so-called tCERs and lCERs to the Operator Holding Accounts in the national register. tCERs and lCERs face complex conditions and limitations and therefore businesses cannot use them to settle emissions.

These differences in conditions may influence the prices of AAUs, ERUs and CERs. The more restrictive validity in Europe of ERUs and CERs compared to AAUs would imply that their prices are below AAU prices. However ERUs and CERs are internationally transferable while in Europe AAUs cannot be exchanged outside EU countries.

4. The recording of CERs and ERUs in the national accounts and the SEEA

One may conclude that the treatment of emission permits in the national accounts and SEEA should not exclusively focus on ETS but needs to address also emission allowances derived from Kyoto mechanisms such as JI and CDM. CERs and ERUs are emission permits that are largely interchangeable with allowances made available via cap and trade schemes. This means that the recording in the national accounts of emission permits derived from JI and CDM strongly depends on any decision that is taken for ETS permits. At this stage one may draw the following conclusions.

AAUs, CERs and ERUs are all tradable permits with, to large extent, similar properties. CERs and ERUs can be surrendered to governments in the same way as ETS permits and are equally exchangeable. From this point of view one may argue that in (environmental-) economic accounting AAUs, CERs and ERUs should preferably fall under the same category of assets.

According to the 2008 SNA, tradable emission permits issued under cap and trade schemes should be recorded as taxes. It is not obvious that permits issued under JI and CDM should be treated similarly. CERs and ERUs are not issued by governments and are obtained without any direct payments to governments. On the other hand so far most allowances under the EU ETS have been grandfathered. Under this scheme emission permits were equally issued

without payments to government. In this context it is important to underline that JI leads to redistribution only while CDM generates supplementary allowances. As a result ERUs are more familiar to AAUs than CERs are. In fact ERUs are nothing more than converted AAUs.

The financial asset option is tied to the idea that permits represent a tax settlement instrument. One important advantage of this solution, from a tax payment context is that the issuing of permits does not create wealth effects at macro level. This corresponds properly with the idea that taxes are unrequited. However, for permits derived from CDM it is not clear in which government balance sheet this tax settlement instrument should appear as a liability. This makes it rather difficult to consider CERs as financial assets.

At least in the Netherlands, the national government is one of the most active participants in CDM and JI projects. CERs and ERUs are obtained to meet national emission targets. Various economic sectors (households, transport, trade, services) are excluded from the cap and trade system. In sectors without cap environmental policy is obviously less powerful in cutting back greenhouse gas emissions. The Dutch government aims to surrender 50 to 60 Mton CO_2 equivalents of contracted ERUs and CERs in the 2008-2012 Kyoto commitment period. It is difficult to conceive the surrender of these permits as a tax payment by a government to itself. An international organisation like the UN could be identified as the tax recipient. Alternatively one may conclude that this example confirms that the tax treatment is not very well applicable to permits derived from JI and CDM.

Then again there are good reasons why SEEA should not follow the SNA treatment of pollution permits as a tax. From a SEEA viewpoint emission permits are used as a global policy instrument to safeguard the sustainable use of a natural resource, being the atmosphere. This would simplify the recording of pollution permits derived from JI and CDM substantially since, unlike the levying of taxes, access to natural resources can be granted by any (supranational) body like the UNFCCC that is entitled to claim ownership of the atmosphere on behalf of the global society. Also the surrendering of permits by governments on behalf of society does not seem to create any substantial difficulties, as appears to be the case in the SNA tax treatment situation.

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Annex: Example of CDM project in Brazil[†]

Project: Brazil, Tremembé Landfill gas recovery

The project concerns a landfill site in São Paulo State, Brazil. The site consists of an existing and a new landfill for municipal waste. The Dutch government participates in this project by guaranteeing a fixed price for CERs generated during the lifetime of the project.

The proposed project consists of:

- Extending the existing partial landfill gas recovery network to cover the whole landfill;
- Gradual construction of a landfill gas recovery network for the new landfill;
- Increasing flaring capacity;
- Carrying out a feasibility study on electricity supply to the grid.

The project is supposed to have several positive effects on the environment. Next to reduction of the greenhouse gas emissions (represented by the CERs), the project will also benefit the local community by reducing risks of explosion and fire, unpleasant odour and nuisances and damage to vegetation by asphyxia. The landfill complies with stringent EU legislation.

The landfill gas recovery equipment will have a total capacity of 2,400 m3/h. The new landfill will be filled until 2012.

Justification

The Brazilian economy is expected to continue to grow considerably and as a result the increase in waste volume will be large. The project is justified by the fact that no other controlled municipal waste landfills within a reasonable distance exist to compete for the waste being produced. Together with tightening regulations, the landfill is expected to benefit from the growing waste market.

Project partners

Donor country: Annex I country that purchases CERs: The Netherlands

Host country: Non-Annex I country where the CDM project will be located : Brazil

Project developer: is responsible for carrying out the CDM project and benefits from the sale of CERs. In this case the project developer is also the supplier (the contractor) of the infrastructure or collection system and additions. This company is based in France and it's core business is to provide services in all aspects of waste management: collection, recycling, incineration, treatment and disposal. This company has a subsidiary in Brazil (São Paulo) operating the landfill and supporting the project.

Executive Board (EB): Governing independent CDM Board established to supervise CDM implementation

[†] This is a real example. Also the emissions reductions and number of generated CER's are real figures. All monetary data however is fictitious.

Intermediary: Organisation contracted by the government (i.e. Ministry of the Environment) to select projects and purchase CERs on its behalf. The sponsor or donor of the project is SenterNovem, an intermediary of the Dutch government (Annex-I). They purchase the emission reductions (CERs) generated by the project. The CER's will be booked in the Dutch national emissions registry on the account of the government

Emission reductions

After implementation of the project and construction of the infrastructure, the greenhouse gas emission reductions ('CO_2-equivalents') come from methane to be flared and converted into CO_2 with far less global warming potential (GWP). Current regulations do not require flaring and regulations are not expected soon in Brazil. As a result the project is supposed to comply with the 'additionality requirement'. The project is not 'business as usual' (BAU). As a 'baseline situation' it has been selected not to flare the landfill gas both at the existing and the new landfill. This was the situation of the landfill in January 2000.

The expected greenhouse gas emission reductions are calculated using predictions for the amount of dumped waste, its organic content and the content of methane of the landfill gas. It is expected that the project realises a reduction of 700,625 ton CO_2-equivalent in the period 2003-2012. The biggest part (70 percent) of this amount has been contracted by the Dutch government. All captured methane will be converted into CO_2. Emission reductions as result of electricity generation are not part of the project and have consequently been left out of the baseline study. The actual emission reductions will be monitored by measuring the landfill gas volume captured and the methane content of the landfill gas.

1. Project design and formulation: 2001

Project participants (Dutch Government and project developer) design a CDM project design document.

2. National approval by host country: 2001

Designed national authority of the Netherlands screens project and gives approval

3. Validation and registration: 2001

Project is validated and registered by the CDM executive board (EB)

4. Project appraisal and negotiations: 2001

Emission reduction purchase agreement between project participants: Dutch government contracts 490 000 CERs over a fixed price over a time period of 10 years (2003-2012) for a fixed price of 9 euro per ton CO_2.

5. Project financing: 2001

Project developer gets a loan from a bank to start the project

6. Implementation and monitoring: 2001-2002

Project in implemented: the existing landfill gas recovery network is extended and a new one is developed. The process is monitored by all participants.

7. Verification and certification: 2003

The project becomes operational: the emission reductions for the first year are verified (70,000 ton CO_2-equivalents) and these reductions are certified as CER's

8. Issuance of CERs: beginning of 2004

CERs are issued by the EB and registered in the CDM registry (70 000 CER's)

9. Cross-border transfer of CERs: beginning of 2004

49,000 CERs (the contracted amount for 2003) are transferred from the CDM registry tot the national registry of the Netherlands. SenterNovem (intermediary) pays 441 000 euro to the project developer.