

# Linking the CDM with new and emerging carbon markets

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## Abstract

CDM, JI, the Japanese bilateral offset crediting mechanism, domestic offset systems and offset standards in the voluntary markets have substantial differences in regulation and stringency of offset generation. Generally it can be observed that more recent systems and those not generating compliance credits are more open to standardization, while requiring less independent audit and stakeholder consultation. Thus it is not surprising that different cap and trade schemes have had different approaches to accepting offset credits. Certified emission reductions (CERs) from CDM projects have traditionally served as an indirect link between cap and trade systems around the world. However, since 2010 import restrictions have increased, spearheaded by the EU, which besides quantitative CER import quotas prohibited CERs from certain industrial gas project types. These project type restrictions were quickly also taken up by New Zealand and Australia whose regulators feared to be swamped with industrial gas credits. The EU has also so far prohibited use of CERs from projects not situated in least developed countries (LDCs) and registered after 2012. North American subnational trading schemes so far have been closed to CER imports in practice. Reasons for import limitations include pressure by domestic emissions mitigation industries that want to keep allowance prices high in order to generate demand for their products and services, genuine concerns about the environmental integrity of CERs, concerns about competition in the industries in which reductions take place, as well as the attempt to put pressure on advanced developing countries to accept national emissions commitments under the post-2012 international climate policy regime. Generally, it is surprising that despite ongoing reforms of the CDM and the introduction of relatively lenient domestic offset systems more and more restrictions to CER imports are introduced.

CDM regulators could try to improve access of CERs to cap and trade schemes by improving additionality testing, standardizing baseline and monitoring methodologies and improving stakeholder consultation. However, it should be noted that standardization is no panacea and could lead to a resurfacing of controversies once standardized additionality determination e.g. through benchmarks or positive lists, has been applied for a certain period and found to be problematic. Moreover, a reinterpretation of the E- rule that currently does not take into account domestic mitigation policy incentives in host countries could increase trust in the environmental integrity of CERs. For example after a certain period of policy implementation, the policy could be taken into account in additionality and baseline determination.

If despite such reforms of the CDM blatant protectionism continues, a challenge before the World Trade Organisation (WTO) could be launched on the basis of discrimination of service exports from specific countries.

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# 1. Background

Already since 2008, but accelerating since the weak outcome of the Copenhagen conference, a tendency for international carbon markets to fragment can be observed. As shown by Michaelowa (2011), fragmentation will lead to an increase in mitigation costs, inter alia driven by rising transaction costs. Transparency will decline and the incentives for financial institutions to participate will be reduced due to decreasing liquidity and increasing price volatility and differentiation, which might however partially be offset by revenues from arbitrage between different carbon commodities<sup>1</sup>. In a fragmented market, sellers of credits will need to understand buyer idiosyncrasies for specific types of credit while currently, international competition protects sellers against overly greedy buyers (Michaelowa 2011, p. 15).

The purpose of this study is to compare the conditions applied for generation and use of emission reduction units in the Kyoto Protocol market, with conditions in voluntary markets and in bottom-up markets and bilateral schemes, so as to identify similarities, differences, and potential to allow CERs to be used in non Kyoto Protocol markets.

## 2. Generation of CERs under the CDM

The generation of CERs is subject to a wide array of rules that were introduced to guarantee that emissions reductions credited under the CDM are “real, measurable and long term”, and “additional to any that would occur in the absence of the certified project activity” (para 5, Art. 12 Kyoto Protocol).

### ***2.1. Project eligibility***

Generally, all types of projects that mitigate greenhouse gases are eligible – including carbon capture and storage (CCS) since 2011, with the exception of nuclear power and forest protection. Afforestation and reforestation projects generate two types of CERs – temporary and long-term CERs – whose generation is subject to specific rules regarding the possible destruction of the forest.

Before a project of a specific type can generate CERs, there needs to be an approved baseline and monitoring methodology for that type.

### ***2.2. Country eligibility***

Generally, all developing countries that have ratified the Kyoto Protocol and notified their Designated National Authority (DNA) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat can host CDM projects. Projects need DNA approval before they can be submitted to the UNFCCC Secretariat for registration.

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<sup>1</sup> Actually, recently Gold Standard VERs and local voluntary credits in Chile were recently transacted well above current CER prices.

### **2.3. *Baseline determination***

The volume of CERs is defined by the difference between baseline and project emissions. These two parameters are determined according to a baseline and monitoring methodology that needs approval by the CDM Executive Board.

### **2.4. *Additionality determination***

A CDM project needs to prove its additionality. The concept of additionality has long been contested (Michaelowa 2009), but interpretation converges towards showing that the project is mobilized by the CER revenues. The CDM regulators provide different options to test additionality. The consolidated additionality tool provides the possibility of an investment test where it is checked whether a project is less commercially attractive than a credible alternative, or a benchmark rate of revenue. Alternatively, projects can show that they overcome prohibitive barriers due to the CDM. Small-scale projects just need to show the existence of one or more barriers. Micro-scale projects of specific types are deemed automatically additional (positive list approach). For some project types, such as dissemination of efficient refrigerators or the construction of energy efficient buildings, all projects that beat a performance benchmark are deemed additional.

### **2.5. *Crediting period***

Under the CDM, CERs can be generated for a period of 10 years, or three times 7 years. In the latter case, the baseline needs to be revalidated. Programmes of Activities (PoAs) which allow the bundling of an unlimited number of projects have a lifetime of up to 28 years but each project in the PoA needs to respect the generic crediting periods. Forestry projects have crediting periods of 30 or three times 20 years.

### **2.6. *Stakeholder consultation***

A CDM project can only be registered if local and global stakeholders have had the chance to submit comments. Project Design Documents (PDDs) are open for comments for a four week period. Local stakeholders need to be informed by project developers through a meeting or letters.

### **2.7. *Validation, monitoring and verification***

A third party audit of a project design document (PDD) by a Designated Operational Entity (DOE) accredited by the CDM Executive Board (EB) is a necessary condition for registration. All projects have to follow a monitoring plan, which is specified in the PDD and conforms to an approved monitoring methodology. Once a monitoring report has been published – which can be covering a period of any length – it needs to be verified by a DOE. The CDM EB scrutinizes validation and verification reports and has rejected a significant number of projects and issuances.

## **3. Generation of ERUs under JI**

According to para 1 b), Art 6 of the Kyoto Protocol, emissions reductions credited under JI need to be “additional to any that would otherwise occur”. The two tracks of JI have strongly differing rules regarding ERU generation. The first track, which is essentially administered by host countries that are in full compliance with all Kyoto reporting rules does not specify any external oversight about projects. The second track is very similar to the CDM.

### ***3.1. Project eligibility***

Generally, all types of projects that mitigate greenhouse gases are eligible. Under track 2, a project of a specific type can generate carbon credits (emission reduction units, or ERUs) only if an approved baseline and monitoring methodology exists for that type.

### ***3.2. Country eligibility***

All industrialized countries that have ratified the Kyoto Protocol can host JI projects.

### ***3.3. Baseline determination***

Under Track 1, any baseline methodology deemed appropriate by the host country can be utilized. Under Track 2, CDM baseline methodologies can be used, or a new baseline approach accepted by the accredited independent entity (AIE; same function as DOE in CDM) during determination of the project.

### ***3.4. Additionality determination***

Track 1 additionality testing depends on each host country's regulation. Track 2 additionality testing can be done according to additionality tests accepted by the CDM EB; proof that a comparable project has been determined; or proof that the project is different from the baseline scenario.

### ***3.5. Crediting period***

Crediting periods of JI projects can start 2008 at the earliest, and retroactive crediting is possible. Crediting period length is only formally limited to the lifetime of the underlying project activity, but the extension of a project's crediting period beyond 2012 thus far depends on the willingness of the host country to grant ERUs post-2012.

### ***3.6. Stakeholder consultation***

A JI project does not require specific stakeholder consultation.

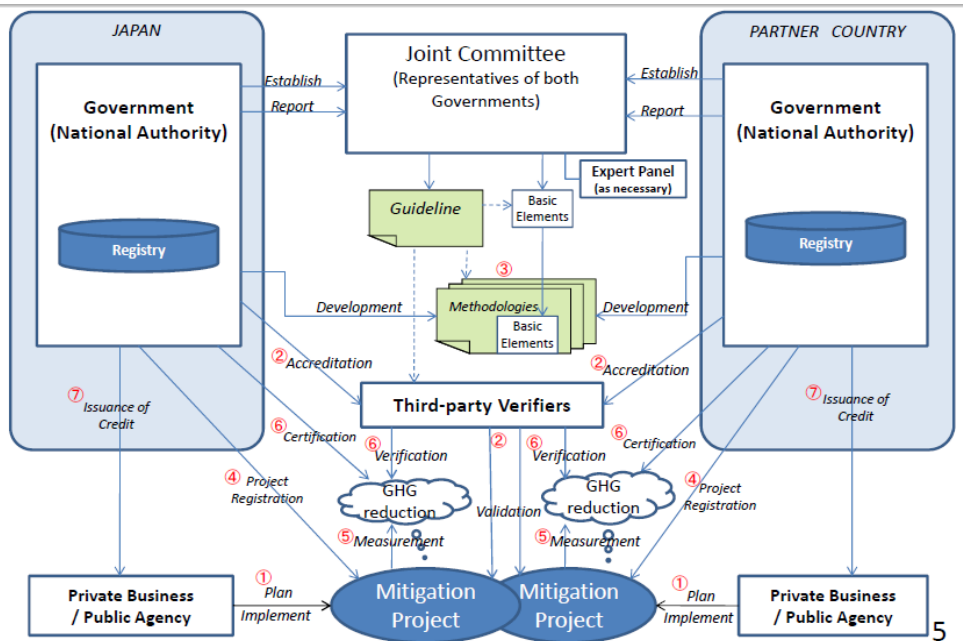
### ***3.7. Monitoring, reporting and verification***

All JI projects need to specify a monitoring plan in their PDD, which is the basis for monitoring reports. An AIE needs to verify the monitoring report before ERUs can be issued.

## **4. Generation of bilateral credits under the Japanese BOCM**

Since 2009, the government of Japan has developed a bilateral offset crediting mechanism (BOCM) due to unhappiness with the restricted eligibility of project types under the CDM, overly strict additionality rules and cumbersome monitoring requirements (Tänzler et al. 2012).

**Figure 1: Principle of the bilateral offset crediting mechanism**



Source: Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment, Japan (2012)

Over hundred feasibility studies for activities under the BOCM have been implemented to date in a large number of countries, covering a wide range of technologies (see for example 29 detailed descriptions in Ministry of Environment, Japan and Global Environment Centre Foundation 2012) . Both the Ministry of Environment and the Ministry of Economy, Trade and Industry have been involved. Nevertheless, the design of the BOCM remains unclear (He and Delbosc 2012). It is planned to finalize the design before March 2013 and start actual BOCM operation then (Mizuno 2012).

#### **4.1. Project eligibility**

The project types are to include all relevant Japanese technologies, including avoided deforestation, peatland restoration, nuclear power and CCS (Ministry of Environment Japan 2010). A Japanese entity needs to be involved in the project for it to be eligible for BOCM credits.

#### **4.2. Country eligibility**

Any developing country will be eligible provided it signs a Memorandum of Understanding with the government of Japan. A joint committee consisting of the Japanese and host country government will be specifying the detailed rules (Mizuno 2012), so there will be may different “shades” of the BOCM.

#### **4.3. Baseline determination**

A “check list” will allow easy determination of applicability of methodologies to the proposed project. Default values and spreadsheets provided by the government of Japan shall facilitate use of the baseline methodologies (Ministry of the Environment, Japan 2012). Benchmarks shall be applied (Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment 2012).



#### **4.4. *Additionality determination***

Positive lists and benchmarking are envisaged (Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment 2012).

#### **4.5. *Crediting period***

There is no information available on the duration of the crediting period.

#### **4.6. *Stakeholder consultation***

No rules regarding stakeholder consultation have been proposed to date.

#### **4.7. *Monitoring, reporting and verification***

There is no validation procedure.

Monitoring shall be facilitated by establishing conservative default values. As far as possible, manufacturer's specifications or external statistics shall be used. Sampling and simulations are to play an important role. Missing data should be estimated (Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment 2012). The government of Japan wants to provide spreadsheets into which project developers just fill their data (Mizuno 2012).

Verification shall be done by DOEs and ISO-accredited certifiers (Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment 2012). During 2012, "MRV model projects" are to apply monitoring methodologies to already operating emissions mitigation projects (Mizuno 2012).

## **5. Generation of ACCUs under the Australian Carbon Farming Initiative**

Australia has introduced a domestic offset system – the Carbon Farming Initiative (CFI) - for the agricultural sector, whose credits are recognized in the Carbon Pricing Mechanism from 2012 onwards, and continuing into the emissions trading system starting from 2015. Entities can cover up to 5% of their carbon price liability with Australian Carbon Credit Units (ACCUs). Detailed rules for the generation of ACCUs have been specified in Australian Government (2011, 2012a). The CFI is unique inasmuch it specifically aims to serve both the compliance market through "Kyoto ACCUs" (and the voluntary market through "Non-Kyoto ACCUs" (Australian Government 2011, section 55).

### **5.1. *Project eligibility***

The CFI is limited to project types in the agricultural sector that are not covered by the rules of the Carbon Pricing Mechanism, i.e. non-CO<sub>2</sub> gas reduction and carbon sequestration by vegetation and soil. Non-Kyoto ACCUs can accrue for wetland restoration, carbon sequestration in vegetation not covered by Kyoto forest definitions and soil sequestration through biochar as well as killing of wild animals that generate methane emissions.

For sequestration projects, 5% of credit volume are put into a buffer to be released in case of reversal of the carbon stock. A detailed negative list of ineligible forestry projects is defined in Australian Government (2012, part 3.36). ACCUs can be cancelled in case of emission of sequestered carbon or discovery that issuance was based on misleading information (Australian Government 2011, section 32-38, 86-91).

Projects can only be implemented by formally “recognized offsets entities” (Australian Government 2011, section 59-67).

## **5.2. *Baseline determination***

Baseline methodologies are to be developed bottom up (Australian Government 2011, section 106-130). They are published for stakeholder comments and assessed by the Domestic Offsets Integrity Committee (DOIC). Final decisions on methodology acceptance are made by the Minister of Climate Change (Department of Climate Change and Energy Efficiency 2011a). Four methodologies have been approved - capture and combustion of landfill gas, destruction of methane generated from manure in piggeries, environmental plantings and savanna burning, while nine other methodologies are currently being assessed.

## **5.3. *Additionality determination***

Additionality is resolved through a positive list approach (Australian Government 2011, part 3.28). The positive list can be expanded by the Minister of Climate Change upon request (Department of Climate Change and Energy Efficiency 2011b), following stakeholder consultation and advice from the DOIC. The project type should go “beyond common practice in the relevant industry or part of an industry, or in the environment in which the activity is to be carried out.”

## **5.4. *Crediting period***

Crediting periods are specified in each methodology. For emission reduction projects, they are set at 7 years and can be renewed. Reforestation projects get 15 years (Australian Government 2012a, part 5.1), and native forest protection projects 20 years. The latter is however not renewable.

## **5.5. *Stakeholder consultation***

Other than in the methodology development process, there is no requirement for stakeholder participation.

## **5.6. *Monitoring, reporting and verification***

Monitoring reports need to be audited by auditors registered under the National Greenhouse and Energy Reporting Act 2007. These auditors need to fulfill eligibility requirements detailed in the National Greenhouse and Energy Reporting Regulations 2008 (Australian Government 2012b) and can be suspended or deregistered by the Clean Energy Regulator.

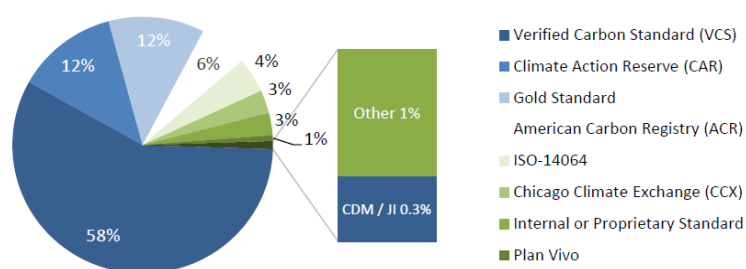
# **6. Generation of VERs on the voluntary markets**

The voluntary market is characterized by an open competition between different systems. It has recently been dominated by three approaches, the Verified Carbon Standard (VCS), the Climate Action Reserve (CAR) and the Gold Standard<sup>2</sup> (see Figure 2), which collectively cover almost three quarters of transactions. The rules of these three leaders will be assessed in detail.

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<sup>2</sup> The Gold Standard can be applied both to CDM/JI projects and projects in the voluntary markets. The discussion below describes the rules for the voluntary market component. However, Gold Standard CERs are also a very sought after commodity in the voluntary market.

**Figure 2: Share of different standards in the voluntary market in 2011 (VERs transacted)**



Source: Ecosystem Marketplace. Note: Based on 946 observations.

Source: Peters-Stanley (2012), p. vii

### **6.1. Project eligibility**

The VCS has the broadest eligibility of any carbon credit mechanism, covering all CDM project types, ozone depleting substance destruction, as well as a wide range of project types in the agricultural and forestry sectors: agricultural land management, improved forest management, avoided deforestation, peatland and wetland conservation and restoration, and avoided conversion of grasslands and shrublands. The VCS accepts submission of projects that have been rejected by other mechanisms (VCS 2012 a, para 3.12.10).

CAR limits project types to those unlikely to be covered by US cap and trade legislation (CAR 2011, para 4.1).

The Gold Standard limits eligible projects to renewable energy, demand-side energy efficiency and waste management; only CO<sub>2</sub>, methane and N<sub>2</sub>O emissions reductions will be considered (Gold Standard 2012a, para III.c and d). Projects are not allowed to generate any emissions, renewable energy or energy efficiency certificates (ibid, para III i 2). Projects with negative sustainable development impacts can be rejected (ibid, para VII a 5).

### **6.2. Country eligibility**

There are no limits to country eligibility in the VCS and for Gold Standard VERs, but Gold Standard JI and CDM projects follow CDM and JI country eligibility criteria. CAR has so far been limited to the US and Mexico. The Gold Standard requires developers in jurisdictions with an emissions cap to retire an amount of allowances equal to the amount of VERs issued (Gold Standard 2012a, para III b 3 and 4).

### **6.3. Baseline determination**

VCS accepts all CDM and CAR methodologies (except the forestry one). Further methodologies can be submitted to the VCS Association after having been checked by two Validation and Verification Bodies (VVBs). One VVB is hired by the methodology developer and the other one by the VCS Association. On the basis of their assessments, the VCS Association decides whether to approve the methodology (VCS 2012b). Currently, 20 methodologies have been approved, of which 11 cover agricultural activities not eligible under the CDM.

Since early 2012, the VCS encourages the use of benchmarks and positive lists (VCS 2012c). Approval of a standardized baseline methodology automatically leads to the withdrawal of the respective project-specific methodology. Aggregation levels of benchmarks need to be defined carefully. Positive lists have to be determined based on the concepts of activity penetration thresholds (ideally using 5% as upper level), financial viability and credit revenue streams options (where threshold should be set at 5% of investment cost).

CAR develops its methodologies (called “protocols”) top down. So far, 12 methodologies have been developed, two of which are specific to Mexico. Stakeholders are invited to suggest project types for new methodology development (CAR 2012); 28 such submissions have been made. Criteria for methodology development are that

- project types are not covered by proposed US cap and trade legislation
- emission reduction potential in the US is significant
- emissions reductions are direct
- projects are likely to be additional
- the methodology can be standardized and data for benchmarks are available
- accurate and cost-effective monitoring equipment is available

Gold Standard allows use of CDM methodologies. Project developers can submit new methodologies; so far 7 methodologies have been approved.

#### **6.4. *Additionality determination***

The VCS allows the use of a project-, performance-or activity-based additionality test (VCS 2012a, para 4.6). The project-based test is similar to the small-scale additionality test of the CDM and assesses whether there are investment, technological or institutional barriers to projects, followed by an assessment whether projects are common practice. The other approaches are based on benchmarks and positive lists.

CAR applies standardized additionality assessment, mainly benchmarks, positive lists based on market penetration and other criteria. These can be combined, for example leading to a “performance standard in terms of a specific type of technology that has an emission rate below a certain threshold and is implemented at an eligible project location” (CAR 2011, para 2.4.1.2).

The Gold Standard applies the CDM additionality tools except for micro projects of less than 10,000 carbon credits annually. These are deemed automatically additional if they fulfill the criteria for CDM micro-scale projects.

#### **6.5. *Crediting period***

For forestry or soil related projects the VCS crediting period can be 20 to 100 years; for all other project types it is three times 10 years (VCS 2012a, para 3.9).

CAR crediting periods are generally twice 10 years while for sequestration projects, they can reach up to 100 years (CAR 2011, para 2.4.4).

Gold Standard crediting periods are equal to those of the CDM (Gold Standard 2012a, para V a 1).

#### **6.6. *Stakeholder consultation***

The VCS requires stakeholder consultation in benchmark setting (VCS 2012a, para 4.1.14) and asks for global stakeholder input to any new methodology. It does not require stakeholder consultation in the context of validation.

CAR sets up a workgroup consisting of industry experts, state and federal agencies, environmental organizations, and other stakeholders that provides input to the development of a new methodology (CAR 2011, para 4.2.1). It does not require stakeholder consultation in the context of validation.

The Gold Standard requires a local stakeholder consultation - a public meeting with a subsequent feedback round (Gold Standard 2012a, para VIII b). In this consultation, an elaborate “no-harm assessment” regarding 14 principles covering human rights, labour standards, environmental

protection and anti-corruption behaviour is to be done (Gold Standard 2012a, para VII b). Throughout the crediting period, a “grievance mechanism” must be operated to allow local stakeholders to submit comments (Gold Standard 2012d).

### **6.7. *Monitoring, reporting and verification***

The VCS requires independent validation of project documentation by an accredited VVB. In their PDD, projects need to specify a monitoring plan consistent with an approved methodology (VCS 2012a, para 3.17). Monitoring reports are to be verified by a VVB, which in contrast to large-scale CDM can validate and verify the same project. VVBs can follow a “risk-based” approach as per ISO 14064 and 14065 standards, with general materiality thresholds of 5%, and 1% for projects generating more than 1 million VCUs per year (VCS 2012a, para 5.3.1) .

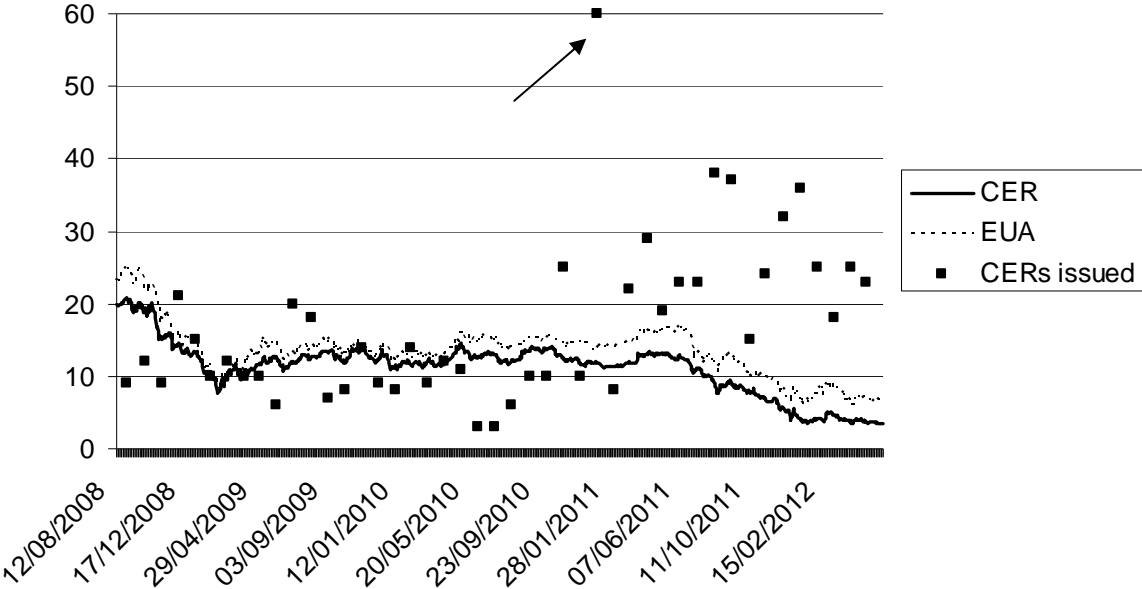
CAR does not ask for validation. It requires a monitoring plan specifying the measurement frequency, the frequency of instrument field check and calibration activities; and the role of individuals performing each specific monitoring activity. Monitoring plans should include QA/QC provisions and a record keeping plan is required (VCS 2011, para 2.7).

GS projects need to be validated by CDM-accredited DOEs, except micro-scale projects, which can use a Gold Standard internal validation procedure (Gold Standard 2012c, para 9.2). Besides monitoring emissions, the Gold Standard requires monitoring of sustainable development indicators (Gold Standard 2012a, para VII a 3) and how comments submitted through the grievance mechanism were dealt with (Gold Standard 2012d). Verification of micro-scale projects can be done through the Gold Standard internal procedure (Gold Standard 2012c, para 10.2). Validation and verification of the sustainable development contribution of micro-scale projects is done through local experts, so-called “Objective Observers” hired by the Gold Standard (ibid, para 11).

## **7. Access of CERs to domestic emissions trading systems**

Access of CERs to domestic cap and trade systems has been increasingly limited. This limitation can be explained by several factors. First, widespread media criticism of the CDM starting in 2007 (see the compilation of negative media reports by Michaelowa and Buen 2012) has led the general public to believe that the CDM is a generally flawed mechanism. Especially in the US, this negative stance has spilled over to policymakers who accept relatively lenient rules for domestic offset credits but oppose any acceptance of CERs. The emergence of CDM Watch and its campaigns against specific project types since 2010 (against HFC-23 projects see CDM Watch 2010a, against N<sub>2</sub>O reductions from adipic acid production see CDM Watch 2010b, against supercritical coal see CDM Watch and Sierra Club 2011) have reinforced the impression that the CDM does not generate credible reduction credits. Second,, the massive rents accruing due to the high differential between CER prices and the costs of industrial gas abatement technologies have been criticized (Wara 2007, EU Commission 2011b). Third, domestic emissions mitigation industries fear that availability of cheap CERs and the resulting pressure on allowance prices undermines demand for their technologies. This situation can be found in the EU (EU Commission 2011b) and Japan. Paradoxically, it is reinforced by the increased effectiveness of the UNFCCC Secretariat in issuing CERs. This has significantly increased CER supply since 2010 and generated price pressure on CERs as is shown by the increased differential between EUAs and CERs in Figure 3.

**Figure 3: EUA and CER price as well as monthly CER issuance**



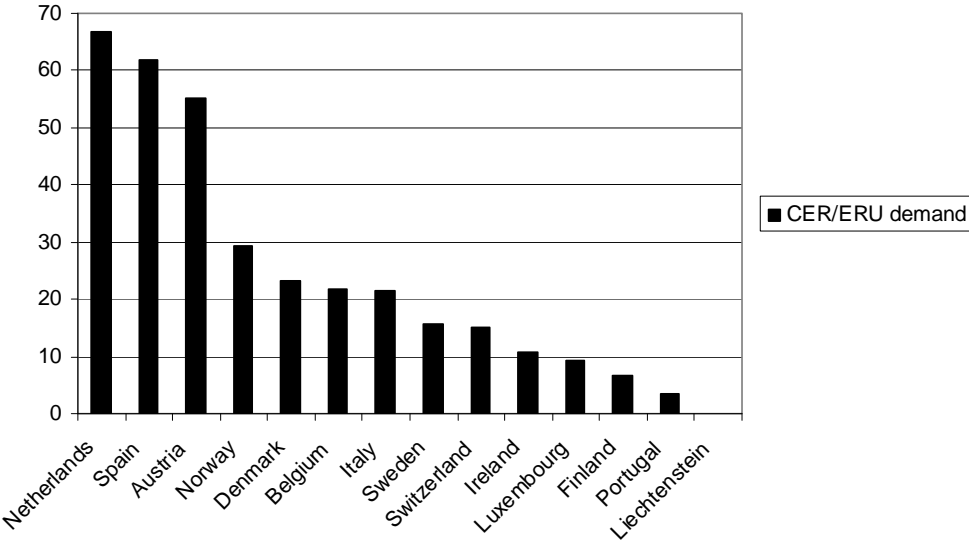
Notes: Prices of secondary CERs and EUAs traded on Bluenext (2012), monthly CER issuances in million. The arrow denotes the peak of issuance due to the clearing of the accumulated backlog by the UNFCCC Secretariat and the significantly higher issuance rates afterwards due to streamlining of the procedures.

Fourth, the increasing recognition that allocation under emission trading schemes has been too lenient – especially given the impact of the persistent economic crisis on emissions – reduces pressure from emitters to get access to cheap CER imports. Fifth, regulators have been convinced by Schneider et al. (2010) that CER revenues from by-products of HCFC-22 production (HFC-23) and adipic acid production (N<sub>2</sub>O) have made it possible for CDM host country HCFC-22 and adipic acid producers to outcompete their rivals from industrialized countries (EU Commission 2011b).

The analysis does not cover the Swiss ETS (which essentially is a weak voluntary agreement and has seen no transactions), nor does it include the very small pilot ETSs in Japan. It should be noted that South Africa envisages the possibility of CERs generating carbon tax credits under its planned carbon tax (South Africa 2012).

Most industrialized countries have – at least until recently – had government purchasing programmes for CERs (see Figure 4 for European countries). These are not necessarily bound by restrictions imposed in the ETSs in such countries.

**Figure 4: CER/ERU purchase program volumes by European governments (million)**



Source: Point Carbon (2012d)

**7.1. EU**

The “Linking Directive” (European Parliament and EU Council 2004) prohibited the use of forestry CERs into the EU ETS and required CDM hydro projects of over 20 MW to conform to the sustainability criteria of the World Commission on Dams. The revision to the emissions trading directive (European Parliament and EU Council 2009) stipulated that among projects registered after 2012 only those located in LDCs can export CER into the EU ETS. In June 2011, the EU Commission (2011a) prohibited the use of CERs from HFC-23 and N<sub>2</sub>O reduction from adipic acid production after April 2013. It has reserved the right to prohibit imports from further project types (EU Commission 2011b). Moreover, the EU Commission (2011b) has made it clear that it might prohibit CER imports from PoAs registered before 2013 if PoAs “increase the supply of CERs from non-LDCs”

European Parliament and EU Council (2009) specifies an overall quantitative threshold for phase 2 and 3 together. If the EU commitment is -20%, the threshold is 1.45 billion CERs for the period 2008-2020; it can be increased if the EU takes up a more stringent commitment.

**7.2. New Zealand**

Until recently, the New Zealand trading scheme was the only system in the world that did not apply any restriction to CER imports. Due to a heavy pressure of industrial gas CERs on prices of New Zealand Units, the government prohibited imports on 23 December 2011. Forward contracts entered into before that date can deliver such CERs into the system until June 2013. New Zealand Government (2012) proposes to introduce a rule that allows the Minister for Climate Change to introduce a quantitative import limit at his discretion, in order to prevent the build up of credits that cannot be used for international compliance.

**7.3. Australia**

In contrast to the EU ETS, the Australian ETS has no specific restriction on CERs from non-LDC projects registered post-2012. It introduces a quota of 50% of allowances for imports of CERs, ERUs, RMU and other, bilaterally accepted units that can start in 2015 and applies all project-type specific restrictions of the EU (Australian Government 2012). Due to the existence of a price floor of 15 A\$,

the government envisages a surrender charge to cover the difference between the CER price paid by the importer and the floor price (Australian Government 2012b). It has asked for comments on four options to calculate the level of the surrender charge. Option 1 would essentially lead to the liable entity always paying the floor price, since the government regulator knows exactly what was paid for CER imports and time value of money is accounted for fully. There is thus no incentive to buy CERs over domestic allowances if these are sold at the price floor level by the government. Under Option 2 CER imports are attractive as long as the liable entity can “beat” the observed market price against which the government indexes the surrender charge by doing a primary CER deal. However, it is not yet clear how the market price index will be developed. So it is also not clear whether there is much room to beat the price especially when secondary CER prices are low. Option 3 will generate transaction costs of buying a financial product from a bank to hedge the surrender charge risk and thus most likely kill the economics of buying CERs, even if you can “beat” the market price. Option 4, where the government would offer the hedge for free would still provide an incentive for CER imports..

#### **7.4. *The Regional Greenhouse Gas Initiative (RGGI)***

The Regional Greenhouse Gas Initiative (RGGI) accepts CERs, ERUs and any subsequent UN-issued offset credits, provided its average allowance price in any given year is above a defined threshold (RGGI 2008, para XX-10.3 b), p 91, and para XX-1.2 bl), p 17). Actual prices for RGGI allowances have remained near the regulatory floor price due to significant over-allocation and thus been far lower than the threshold.

#### **7.5. *California***

Eligible offsets for the Californian ETS can be used to 8% of allowance allocation and generated through four sources, none of which includes CERs (CARB 2012):

- Compliance Offsets Credits approved by the Californian regulators. Currently, only CAR credits are allowed. See Tänzler et a. (2012) for a detailed assessment of offset requirements under the Californian ETS.
- Early Action Offsets Credits, from emission reductions and/or sequestration achieved between January 2005 and December 2014 within the US
- International Sector-Based Offset Credits. Decisions on which sector-based credits are accepted are taken by the California Air Resources Board. So far California has signed memoranda of understanding with the Brazilian state of Acre and the Mexican state of Chiapas regarding acceptance of credits from REDD+. Point Carbon (2012a) expects that about 50 million credits could be generated in Acre between 2012 and 2020.
- Compliance Offset Credits issued by a linked regulatory programme

In contrast to all other offset programmes worldwide, under the Californian rules credits can be invalidated ex post and then need to be replaced by sellers.

#### **7.6. *Quebec***

The offsets regulation for the Quebec ETS are very similar to the Californian ones and do not allow CER use. In June 2012, the three project types methane destruction from livestock manure, landfill gas destruction, and destruction of ozone depleting substances (ODS) found in appliance insulating foam were declared eligible, but the two first types must be located within Quebec, and the third one within Canada or the US (Point Carbon 2012b).



### 7.7. Tokyo

The Tokyo ETS (for a detailed description see Nishida and Hua 2011) does only allow certain kinds of domestic offsets but no CERs.

### 7.8. Emerging Chinese systems

Chinese companies who have applied for CDM status but not yet started the crediting period can generate Chinese CERs that shall be usable in Chinese trading schemes (Point Carbon 2012c). Whether normal CERs will be accepted, remains unclear.

### 7.9. Emerging systems elsewhere

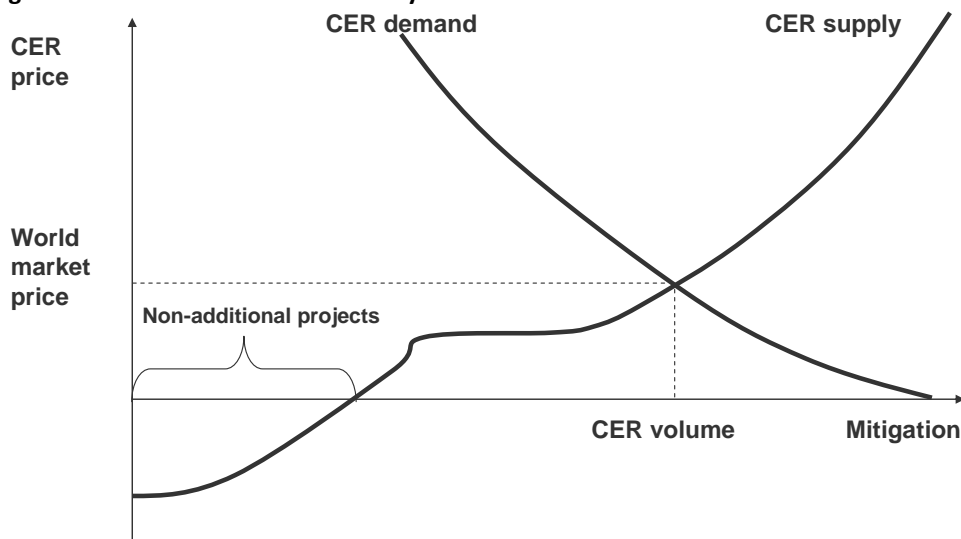
The Korean ETS approved in May 2012 has not yet got implementing regulations, and thus it is not yet clear which types of CERs will be accepted (Norton Rose 2012). Tänzler et al. (2012) assume that Korea might be open towards accepting NAMA credits, but in my view this strongly depends on decisions regarding the design of the new market mechanism.

## 8. Which access limitations are problematic for the functioning of the international carbon market?

The analysis of different baseline and credit and cap and trade systems has shown strong differences in stringency of rules and the degree of acceptance of CERs and other units. This section will discuss the impacts of CER access limitations on the functioning of the CDM and international carbon markets in general. As stressed by Michaelowa (2011) any access limitation will lead to an increase in global mitigation cost. It is also not clear whether access restrictions are consistent with world trade rules, especially if they are applied in a discriminatory manner.

I will assess the impacts of the different types of restrictions using simple economics. I assume that CER supply and demand behave classically, with demand falling as CER price increases, and supply increasing with price (see Figure 5). The supply curve is determined by the marginal abatement costs of the different CDM project types.

Figure 5: The CDM market without any limits



Some mitigation that generates CERs would happen even at zero CER price; this would be the non-additional CDM projects. The flat part of the curve is generated by the industrial gas projects which generate large volumes of CERs at very low cost.

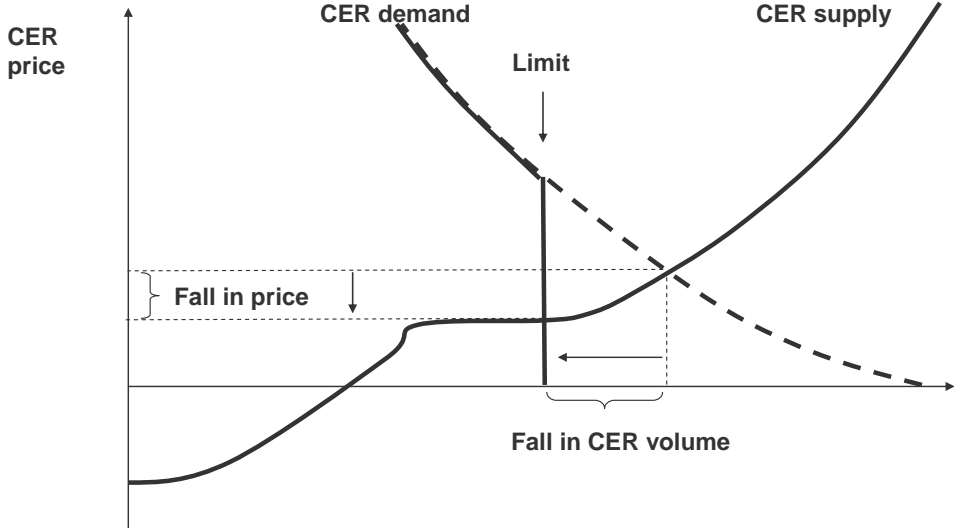
In a situation with low CER prices and the possibility for projects to benefit from support policies that are not factored into the additionality test<sup>3</sup>, CDM might not work like this, but perhaps rather follow the market movements of the underlying output of the projects in question. For example the supply of CDM wind projects in China could be determined by a combination of the price of wind equipment, available financing for wind projects, and developments in feed-in tariffs for wind electricity.

**8.1. Quantitative limits**

Quantitative limits, especially if allocated according to the first come-first serve principle, will lead to a race to generate CERs as quickly as possible, increasing pressure on the regulators and reducing the quality of project documentation. It will also exacerbate price volatility due to uncertainty regarding exactly when the limit will be reached. Compared to a situation without a limit, the price will drop once the limit is coming into sight. Ad hoc changes in quantitative limits will further drive price volatility.

Nevertheless, quantitative limits are preferable to other access restrictions inasmuch they do not principally distort the choice between different project types and thus preserve the incentive to mobilize the lowest cost options first (see Figure 6). Depending on how the rule is designed, projects with a long lead time (e.g. hydro, CCS) could easily end up at a disadvantage. Of course price reductions due to the limit will crowd out the highest cost projects, which are more likely to be additional than low cost projects.

**Figure 6: Quantitative limits**



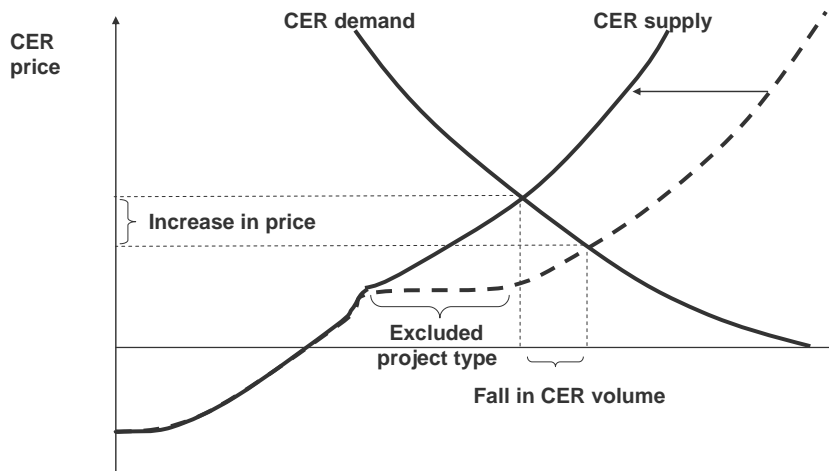
In Figure 6, the limit leads to a crowding out of all projects that are more expensive than industrial gas projects.

<sup>3</sup> The E- rule, agreed by EB 22 in 2005, states that policy instruments supporting greenhouse gas emissions reductions introduced after November 2001 need not be taken into account in baseline and additionality determination. For example a renewable energy feed in tariff is just ignored when calculating the internal rate of return in the investment test for additionality determination.

## 8.2. Exclusion of specific project types

The exclusion of specific project types inevitably leads to a distortion of the market as it will change the shape of the CDM supply curve (see Figure 7). Usually, this will lead to a price increase and volume reduction, but the effect depends on the shape of the supply curve.

Figure 7: Exclusion of specific project types



In the case of Figure 7, industrial gas projects are excluded. Thus the supply curve loses its flat part, which leads to an increase in price and decrease in volume.

Figure 8: Exclusion of project types without price shift

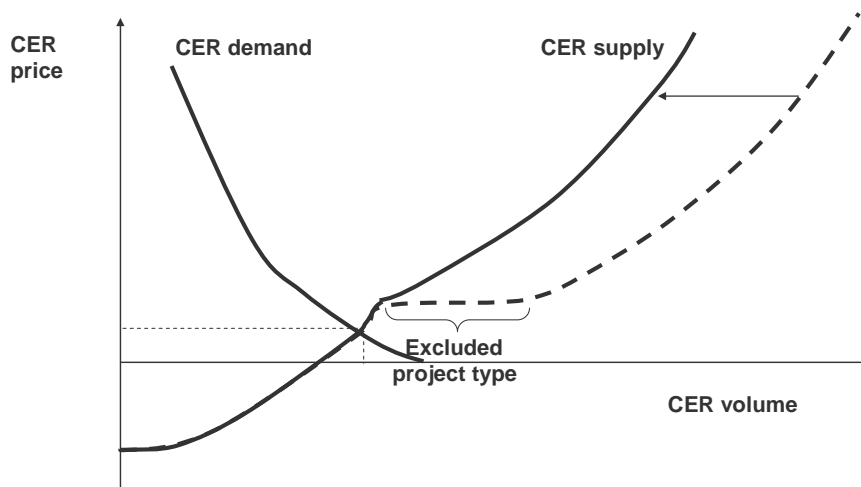
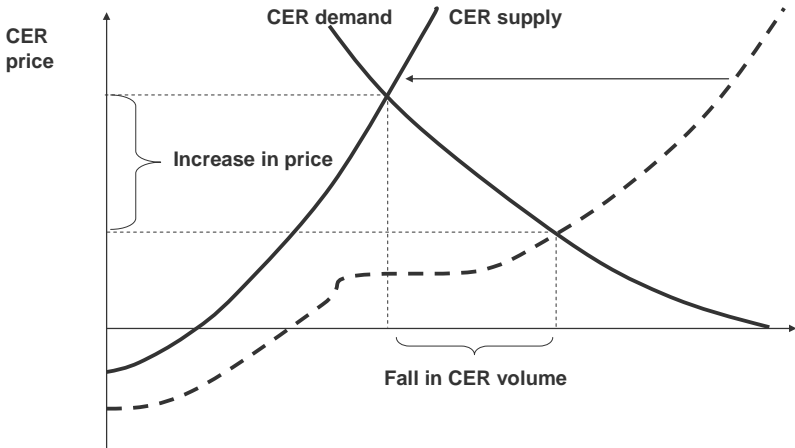


Figure 8 shows that there is no effect of project type exclusion if the marginal abatement costs of the excluded project type are above the CER world market price. This situation could occur in the case of CCS if some buyer countries exclude CERs from CCS projects.

## 8.3. Exclusion of specific host countries

The effect of the exclusion of CERs from specific CDM host countries depends on the type of countries. Generally, the systems that exclude countries aim at advanced developing countries but exclude all countries that do not have the LDC status. The advanced countries have a high share of negative and low-cost mitigation options due to a legacy of obsolete heavy industry installations, and the availability of industrial gas mitigation. Their exclusion would lead to a CER supply curve that has a lower share of negative cost options and is much steeper (see Figure 9). This unequivocally leads to a higher price and fall in CER volumes.

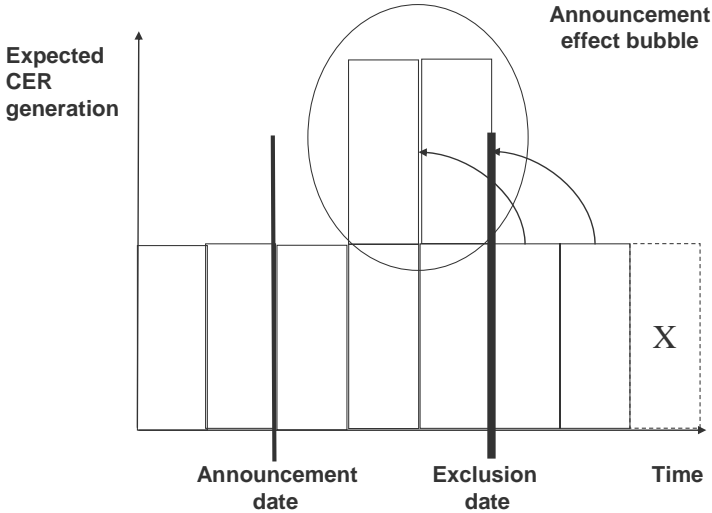
**Figure 9: Exclusion of specific host countries**



**8.4. Exclusion from a certain point in time**

Several systems have announced the exclusion of certain types of CERs from a specific point in time. This will lead to a shift of CDM project inflow over time, especially if the exclusion is linked to a regulatory decision such as registration and not the date of generation of CERs. In the short term, project inflow will increase above the natural rate, while drying up in the long term (see Figure 10).

**Figure 10: Shift in project inflow due to announcement effects of future exclusion**

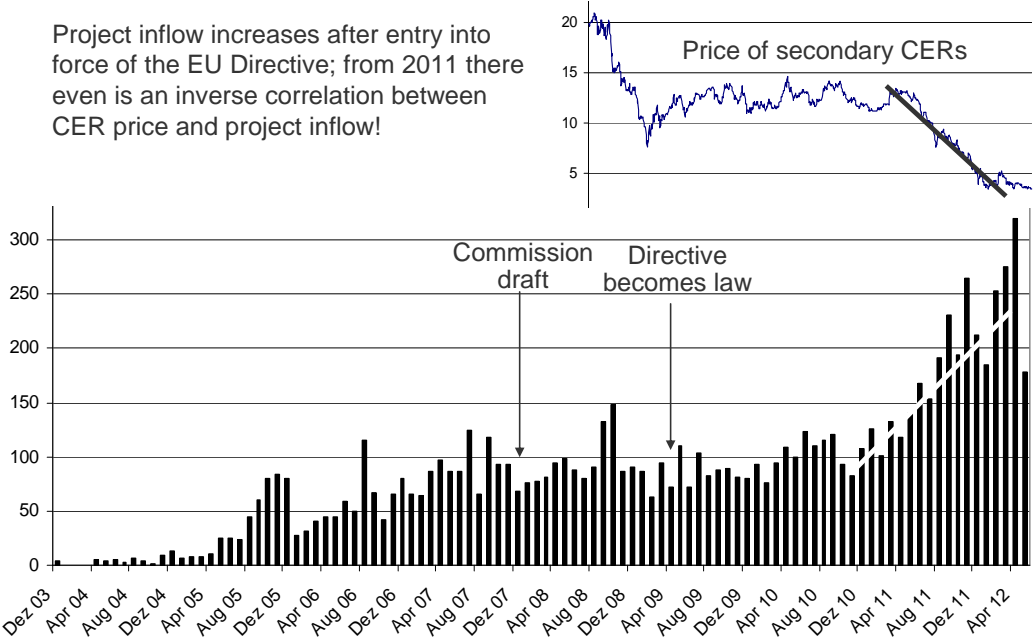


All projects that originally planned registration after the exclusion date will check whether they can accelerate development of their documentation in order to beat the exclusion date. This leads to an “announcement effect bubble”, which strains the resources of everybody involved in the process. Only those projects that have no chance to meet the deadline (last block in Figure 10) will be cancelled.

Actually, there is empirical evidence for this effect having been caused by the end of 2012 exclusion date specified by the EU for CERs from new projects outside of Least Developed Countries. The EU Commission first proposed such an exclusion in January 2008 (EU Commission 2008), and it took legal force in April 2009 (European Parliament and EU Council 2009). Despite the expectations of almost all market participants that CDM project inflow would decline due to the impacts of the financial crisis and the declining time during which projects could generate pre-2013 CERs, project inflow

increased, with a real submission frenzy developing in the first months of 2012 (see Figure 11). Given that a project requires at least 6 months from submission for validation, the massive decline seen in May 2012 seems to herald the end of the announcement effect bubble. Still, some inflow might continue due to the possibility for renewable energy projects made attractive through feed in tariffs to apply the E- rule of the CDM Executive Board. Such projects will continue to apply for CDM as long as the revenue from credits is higher than the CDM transaction costs.

**Figure 11: Empirical evidence for announcement effects**



Sources: Inflow data: UNEP Riso Centre (2012), CER price data: Bluenext (2012)

## 9. How could CDM rules be revised to achieve maximum fungibility of CERs?

For several years, the CDM has functioned as de facto link of emissions trading schemes world-wide. Unfortunately, this link is being weakened by the multiple access restrictions introduced in the last two years (see descriptions in section 7 above), summarized in Table 1.

**Table 1: CER access restrictions in different cap and trade schemes**

System	Quantitative limit	Project types excluded	Host countries excluded	Other restrictions	CERs generally excluded
EU ETS	Yes	Yes	Yes		
New Zealand ETS		Yes			
Australian ETS	Yes	Yes		Yes	
RGGI				Yes	
California					Yes
Tokyo					Yes
Quebec					Yes ?

### **9.1. Project eligibility**

Most cap and trade schemes exclude CERs from HFC-23 and N<sub>2</sub>O reduction from adipic acid production. The CDM could maximize CER fungibility by also excluding these project types. This would however set a bad precedent because the exclusion of these project types – besides genuine fears about environmental integrity – was essentially due to the huge quantity of CERs generated at very low costs, and concerns that CER revenues created a non-level playing field in the markets for the primary products generated by the facilities hosting the CDM projects. This was seen as undermining the price level of the allowances in each system. However, if the CDM regulators generally start excluding project types because they are not “fashionable” with CER buyers, the CDM would suffer. The CDM should not deviate from its approach to decide on project eligibility and CER volumes according to its generic principles. The decision to limit the baseline emission rate of HFC-23 projects to a level that would no longer allow the manipulation of the technology to generate a high baseline emissions rate was a much better approach than just prohibiting the project type.

### **9.2. Country eligibility**

The EU has been the only buyer that has excluded CERs from specific groups of countries, i.e. all non-LDCs. With the emergence of new market mechanisms in the UNFCCC, the CDM will have to compete with these mechanisms. This competition will determine whether the CDM or another market mechanism is the most attractive option to generate emissions credits in a specific country. If one wants to set an incentive for advanced developing countries to take up a national commitment, then of course the exclusion of CDM eligibility for those countries would be a powerful incentive.

### **9.3. Baseline determination**

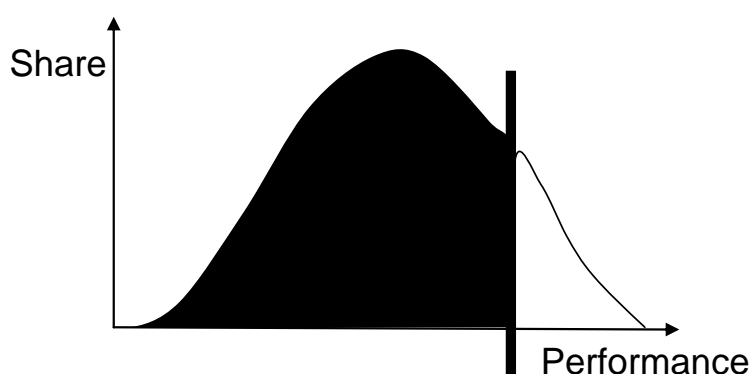
Many domestic offset schemes and voluntary market standards try to apply standardized baseline methodologies (for an assessment of what can be standardized and what repercussions this would have see Hayashi et al. 2010). The CDM regulators have also embarked on a crash programme for standardization. While it is unclear whether standardization is really the panacea it is currently believed to be, it is likely that acceptance of CERs might increase by prospective buyers as long as the standardization is seen as credible from an environmental integrity point of view.

### **9.4. Additionality determination**

As reaction to widespread criticism of CDM project additionality, CDM regulators have substantially tightened additionality determination. However, many regulators of US cap and trade systems still doubt the CDM’s additionality. A further standardization of CDM methodologies might dispel these doubts, as CDM rules would become broadly similar to rules for domestic offset programmes in the US whose credits are accepted in the US cap and trade systems.

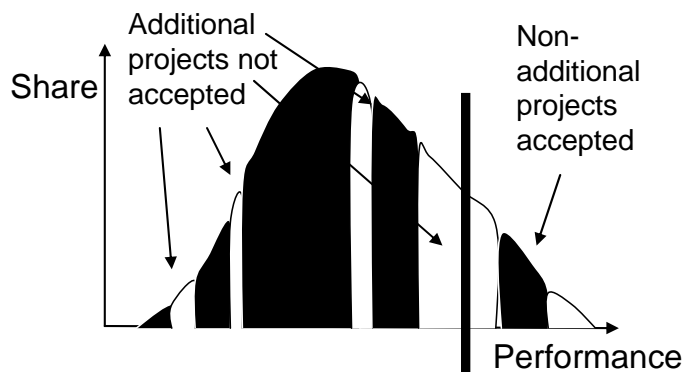
A serious challenge to the use of benchmarks for additionality determination is emerging evidence that for a number of sectors there is no smooth link between performance in terms of emissions intensity of a technology and its additionality. **Figure 12** shows the ideal type of benchmark while **Figure 13** shows a situation where the benchmark cannot capture additionality.

**Figure 12: Ideal choice of benchmark for additionality determination**



The figure shows a performance distribution curve for one sector, with projects with high emissions intensities on the left hand side. The black part of the curve are projects that are not additional, the white one those projects that would not be implemented without the CDM incentive. Here, the benchmark (denoted by the vertical bar) captures exactly the performance level at which projects become additional.

**Figure 13: Benchmark not capturing additionality**



Here, the performance of the technology is not linked to the commercial attractiveness of activities. Some unattractive projects have a low performance, whereas some attractive projects have a high performance. Therefore, the benchmark excludes some additional projects while some non-additional projects slip through.

The use of positive lists should be confined to projects which unequivocally are commercially unattractive. North American offset programmes that have used positive lists have been confined to generally uncontroversial project types. In the Australian CFI, a relatively wide choice of the positive list might lead to controversies in the future. This could also be the case for increases of size thresholds for the use of positive lists under the CDM.

A serious problem that needs to be addressed is that the increasing emergence of domestic incentives for low carbon projects in developing countries are not taken into account in additionality determination due to the E- policy rule of the CDM EB. The EB might want to consider limiting the application of the E- rule to a specific period after project registration, e.g. 10 years.

### **9.5. *Crediting period***

Most offset systems in the voluntary market have a substantially longer crediting period than the CDM. Shortening of the crediting period reduces the revenue from CERs and thus crowds out higher cost projects. On the other hand, many investors say that they do not take into account revenues in the far future. Therefore, a general limitation of the crediting period to one decade might increase the willingness of cap and trade systems to accept CERs.

### **9.6. *Stakeholder consultation***

Substantial criticism of NGOs has been directed towards the rubber-stamping nature of local stakeholder consultation in many host countries. This has clearly contributed to the EU's loss of faith in the CDM. A check by the CDM regulators of the credibility of the local stakeholder consultation would be a simple means to strengthen trust in the validity of CERs.

### **9.7. *Monitoring, reporting and verification***

The low quality of validation in the early phases of the CDM, where DOEs essentially repeated the arguments of project developers without really scrutinizing them, has been a major reason for the critical stance of many industrialized country regulators towards the CDM. The CDM EB has tried to improve DOE work by suspending key DOEs and strengthening the standards for DOE accreditation. However, it has not been fully able to increase the incentive for high quality work of DOEs, e.g. by

introducing liability of DOEs for faulty validation (such liability does exist for verification, as well as for erroneous inclusion of component project activities in PoAs, though). An effort of the CDM regulators to enforce high quality validation and verification could induce cap and trade regulators to accept CERs.

## **10. Conclusions – the potential for harmonizing market requirements for full fungibility of CERs**

CDM, JI and offsets standards on the voluntary market differ substantially (see Table 2).



Table 2: Comparing CDM, JI; BOCM, CFI and selected non-governmental offset standards

Standard	CDM	JI (track 2)	JI (track 1)	BOCM	CFI	CAR	VCS	Gold Standard
Nature of system	Compliance	Compliance	Compliance	Compliance	Compliance and voluntary	Compliance and voluntary	Voluntary	Voluntary
Country eligibility	Developing countries	Industrialized countries	Industrialized countries	Developing countries	Australia	US, Mexico	All countries	All countries (VERs), GS CDM/JI follow CDM /JI eligibility
Non-eligible project types	Nuclear, REDD+, agricultural soils	-	-	-	All types covered by ETS	All types covered by ETS	-	Industrial gas, supply side efficiency
Baseline determination	Project-by project, recently trend towards standardization	Project-by project, recently trend towards standardization	At host country discretion	Pre-determined spreadsheets, default values	Project-by project	Standardized	Strong trend towards standardization	Project-by project, recently trend towards standardization
Additionality determination	Investment or barrier test, rarely through benchmarks, positive list for micro projects	Investment or barrier test, rarely through benchmarks	At host country discretion	Positive lists, benchmarks	Positive list	Benchmarks and positive lists	Through project-based tests, benchmarks or common practice	Investment or barrier test, rarely through benchmarks
Crediting period	10y, 3x7y; 30y, 3x20y for afforestation/ reforestation projects	Host country decides; usually 5y	Host country decides; usually 5y	Unclear	7 y renewable; 15 y renewable for forestry	2x10 y, up to 100 y for forestry/agriculture	3x 10 y, 20 to 100 y for forestry/agriculture	10y, 3x7y; 30y, 3x20y for afforestation/ reforestation projects
Stakeholder consultation	Local and global	None	None	Unclear	None	None	None	Twice local, once global
Monitoring, reporting and verification	Validation and verification by auditors accredited by regulators (DOEs)	Validation and verification by auditors accredited by regulators	At host country discretion	Verification by DOEs and ISO auditors	Verification by auditors accredited by regulators	Verification	Validation and verification by auditors accredited by regulators	Validation and verification by auditors accredited by regulators

The comparison shows that there is a clear tendency towards standardization of baselines as well as additionality determination through positive lists and benchmarks. Except the CDM and Gold Standard, there is no requirement for stakeholder consultation. Most systems have longer crediting period than the CDM. A number of systems do not require validation of project documentation. Generally it can be said that with the exception of the Gold Standard the non-compliance systems have a higher tendency to standardize, while having less requirements for involvement of stakeholders and independent auditors.

Unfortunately, protectionism of cap and trade regulators with respect to CER imports is on the rise. Some of it reflects real concerns about the additionality of CDM projects and their contribution to sustainable development, but it is also driven by wishes of interest groups in industrialized countries who want to prevent the flow of money abroad, safeguard industrial competitiveness and keep the price of allowances sufficiently high to mobilize the penetration of costly mitigation technologies. While there are thus many different reasons for regulators of cap and trade systems to limit CER imports, not all of them can be addressed by CDM regulators.

CDM regulators should continue to improve additionality testing and increase standardization of baseline and monitoring methodologies. This would increase the trust that CERs embody a high level of environmental integrity. However, standardization is no panacea, as shown by Spalding-Fecher and Michaelowa (2012). Wrongly applied standardization can open gaping loopholes for non-additional projects.

In order to improve the contribution of CDM projects to sustainable development which has been frequently been criticized as lacking, CDM regulators should enforce the rules regarding local stakeholder consultation. They might also require project developers to monitor contributions to sustainable development in the manner pioneered by the Gold Standard (2012a).

In case protectionism persists even after these reforms, the UNFCCC Secretariat could theoretically support the opening of a World Trade Organization (WTO) dispute settlement procedure under the General Agreement for Trade in Services (GATS). This should however only be a means of last resort, as so far the international climate policy regime has tried to avoid invoking WTO dispute settlement procedures due to the fear that cornerstones of international climate policy might be jeopardized by the outcomes of such settlements.

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