

Has Joint Implementation reduced GHG emissions? Lessons learned for the design of carbon market mechanisms

Introduction

Joint Implementation is one of two offsetting mechanisms under the Kyoto Protocol, along with the Clean Development Mechanism. Both allow for projects that are certified as reducing greenhouse gas (GHG) emissions to issue credits for each tonne of carbon dioxide equivalent (CO₂e) abated, which can then be transferred for use in another country. CDM projects are hosted by developing countries, which do not have emission reduction commitments under the Kyoto Protocol, whereas JI projects are hosted by countries with commitments under the Kyoto Protocol.

As of March 2015, almost 872 million Emission Reduction Units (ERUs) had been issued under JI, about a third of all Kyoto credits. This policy brief summarizes a systematic evaluation of the environmental integrity of JI in the first commitment period of the Kyoto Protocol, 2008–2012.

Impact of JI on global emissions

In principle, offsets are a zero-sum game for the atmosphere. Buyers of offsets can increase their emissions by a corresponding amount above the target level, while emissions are reduced by that amount in the host country, keeping global emissions the same. If offsets come from non-additional or overcredited projects, however, using them will lead to an increase in global emissions relative to a scenario without the use of offsets.

The design of JI should, in theory, avoid that outcome. Under the Kyoto Protocol, each country with an emissions target receives allowances (called Assigned Amount Units, AAUs) equivalent to its total emissions budget for the commitment period. For every ERU it issues, a host country must cancel one AAU. Thus, if a JI project is overcredited or not additional, the host country would have to make up the difference and engage in more mitigation action.

However, in the first commitment period, several countries had emissions targets well above their business-as-usual (BAU)

Key findings

- As of March 2015, almost 872 million Emission Reduction Units (ERUs) had been issued under Joint Implementation (JI). Host countries must cancel one of their emission allowances for every ERU issued, but more than 95% of ERUs were issued by countries with significant surpluses of allowances in the first commitment period of the Kyoto Protocol.
- A detailed analysis of a sample of 60 projects shows that for 73% of the ERUs issued, it was implausible that the projects required carbon revenues to go ahead. In other words, they were unlikely to be additional.
- Of the six largest project types, only one – N₂O abatement from nitric acid production – had overall high environmental integrity; for the rest, additionality seems unlikely or questionable, or unrealistic assumptions were used that significantly overestimate emission reductions. Overall, 80% of ERUs issued came from project types with questionable or low environmental integrity.
- Overall, the use of JI may have enabled global GHG emissions to be about 600 million tCO₂e higher than they would have otherwise been.
- To date, 97% of ERUs were issued under Track 1, which allows JI host countries to largely establish their own rules for approving projects and issuing credits, without international oversight. The share of ERUs issued from project types with plausible environmental integrity was considerably larger under Track 2, which provides for international oversight.
- Auditors – in particular the entity which audited most projects – did not perform their auditing functions appropriately. Under Track 1, they had no incentives to do so, as appropriate oversight was not provided, and any non-performance had no consequences.



A coal mine in Luhansk Oblast, Ukraine.

emissions, resulting in large AAU surpluses. In such cases, host countries can use surplus AAUs to cover their ERUs, and will not have to engage in additional mitigation action. Thus, non-additional or overcredited JI projects in those countries will lead to higher global emissions.

Plausibility of additionality claims

The plausibility of additionality claims of JI projects was assessed through an in-depth review of a random sample of 60 projects, selected to be representative in terms of host countries, project types and project scale. Figure 1 shows that for 43% of the projects and 73% of the ERUs, the additionality claims were not plausible based on the available information. Another 12% of the projects reviewed had questionable additionality claims.

Overall, the use of JI may have enabled global GHG emissions to be about 600 million tCO₂e higher than they would have



Figure 1: Plausibility of the additionality claims of the sample projects

Data source: Random sample of 60 JI projects

otherwise been. The implications for the European Union's Emissions Trading System are particularly serious. As of April 2015, more than 560 million ERUs had been used in the EU ETS. JI may therefore have undermined the EU ETS emission reduction target by about 400 million tCO₂.

Environmental integrity of key project types

The environmental integrity of the six project types with the highest ERU issuance was also examined in detail. These project types represent 84% of the ERUs issued and 53% of registered projects in the first commitment period. Figure 2 and Table 1 summarize the analysis.

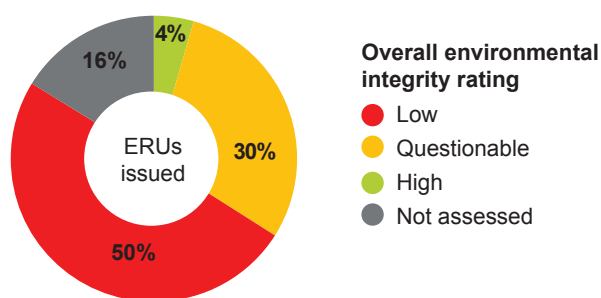


Figure 2: Overall environmental integrity of project types by ERUs issued

Data source: Evaluation of the largest six project types, applied to the portfolio of 642 projects registered as of March 2014.

Track 1 vs. Track 2

Under the current rules, JI projects can be implemented under two tracks. Under Track 1, host countries can largely establish their own rules for approving projects and issuing ERUs, without international oversight. The host country can determine whether it deems emission reductions as additional. Under Track 2, a UN body – the Joint Implementation Supervisory Committee (JISC) – reviews projects and requests for ERU issuance and accredits JI auditors. To date, 97% of ERUs have been issued under Track 1. Figure 3 compares the environmental integrity of the two tracks by the fraction of offsets from different project types (not evaluated types are shown in grey). The share of ERUs issued from project types with plausible environmental integrity was considerably larger under Track 2 than under Track 1.

Accredited Independent Entities

Accredited Independent Entities (AIEs) have the key role of ensuring the compliance of the projects with JI requirements, including those related to environmental integrity. However, our findings call into question the ability of and incentives for the involved AIEs to perform their auditing functions appropriately. AIEs often failed to identify obvious mistakes, inconsistencies, questionable assumptions or claims, or post-registration changes to the project activity or monitoring plan. In many instances, validation and verifica-

Table 1: Environmental integrity of the six largest JI project types

Project types	Registered projects	% of ERUs	Additionality	Over-crediting	Inventory inconsistencies	Overall environmental integrity
Spontaneous ignition of coal waste piles	78	26.1%	Not plausible	Likely to be very significant	Significant	Low
Energy efficiency in industry and power production and distribution	164	23.1%	Questionable	Not known	None found	Questionable
Associated petroleum gas utilization	22	13.9%	Not plausible	Likely to be very significant	Significant	Low
Natural gas transportation and distribution	32	9.8%	Not plausible	Some over-crediting likely	None found	Low
HFC-23 abatement from HCFC-22 and SF ₆ abatement	4	6.4%	Plausible	Likely to be very significant	Significant	Questionable
N ₂ O abatement from nitric acid	41	4.5%	Plausible	Unlikely	Largely consistent	High

Source: Authors' analysis.

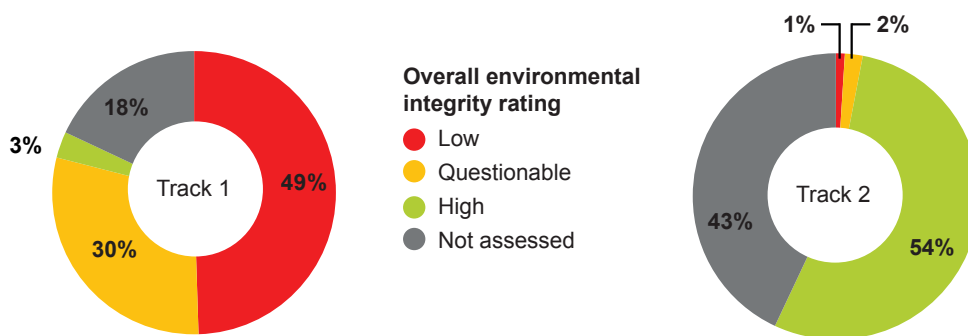


Figure 3: Environmental integrity of project types under Tracks 1 and 2, by ERUs issued

Data source: Evaluation of the largest six project types, applied to the portfolio of 642 projects registered under Track 1 and Track 2 as of March 2014

tion expert statements are very brief and do not specify how key requirements are assessed.

Most host countries rely on AIEs accredited under Track 2 to perform determination and verification functions under Track 1, while their performance is only monitored and assessed by the JISC for functions performed under Track 2. For this reason, AIEs did not have to fear sanctions if they did not perform their functions appropriately under Track 1. Moreover, the fact that JI project participants select and pay their AIE may create an inherent conflict of interest.

One AIE, Bureau Veritas Certification Holding SAS, audited 56% of all projects, which together generated 78% of total ERUs. Overall, Bureau Veritas audited more projects with low environmental integrity than other AIEs. In our sample, 77% of the projects determined by Bureau Veritas made additionality claims that were not plausible, and 17% had questionable claims, while only 12% of projects determined by other AIEs made implausible additionality claims, and 46% made questionable claims.

Differences in host countries

The four countries with the highest ERU issuances – Ukraine, Russia, Poland and Germany – registered 439 projects and issued more than 800 million ERUs, accounting for 94% of ERU issuance. An assessment of the project portfolio in each country indicates significant environmental integrity concerns for over 80% of ERUs from Russia and Ukraine, whereas the environmental integrity was rated as high for 70% of ERUs in Poland and 97% in Germany.

Lessons learned for the design of crediting mechanisms

A key finding of our analysis is that crediting mechanisms need to be very carefully designed to ensure environmental integrity. In particular, our evaluation of the environmental integrity of JI offers the following insights:

- **Crediting mechanisms should adopt project cycle procedures which ensure full transparency and make all documentation publicly available.** Lack of transparency is an important concern in some JI host countries, where key project documentation, such as project design documents, monitoring reports, and determination and verification reports are not available or incomplete for a number of projects. To avoid this problem, crediting mechanisms need rules and enforcement to ensure timely and complete reporting. However, it is important to note that transparency, though crucial for ensuring environmental integrity, is not enough by itself. One

host country, Ukraine, ensured a high degree of transparency but nevertheless issued mostly ERUs of low environmental integrity.

- **Only internationally accepted methodologies should be eligible for use.** Many projects applied their own, JI-specific approaches for additionality demonstration and the calculation of emission reductions. In many cases, these projects used inappropriate approaches or assumptions which lead to overcrediting. Therefore only internationally accepted methodologies that have undergone thorough review by experts and were developed for specific and defined project types should be used.
- **Auditors should be fully accountable for all their activities to the authority regulating the mechanism.** Crediting mechanisms should adopt accreditation systems which continuously monitor the performance of auditors and which apply sanctions in the case of non-performance, including the suspension or withdrawal of accreditation. Merging the two tracks and the JI and CDM accreditation systems could further improve the oversight of the operations of AIEs.
- **Retroactive crediting should not be allowed.** Retroactive crediting of emission reductions has seriously undermined the integrity of JI. Current and future crediting mechanisms should avoid any retroactive crediting and provide for procedures which ensure that projects must be approved or pre-approved (e.g. through a letter of endorsement) prior to the decision to proceeding with their implementation.
- **Investors should have reasonable certainty:** In several JI host countries, project developers faced considerable uncertainty as to whether their projects would ultimately be approved and ERUs issued. This uncertain environment may have favoured projects that did not rely on ERU revenues, thereby also negatively affecting the overall environmental integrity of the project portfolio. A stable and predictable regulatory environment for crediting mechanisms should be established.

The JI Guidelines are currently under review, offering an opportunity to address these issues. However, addressing the serious shortcomings identified in our analysis would require far greater reforms than are now on the table. For example, the current draft JI Guidelines would allow existing projects to register again without having their additionality reassessed, which could potentially enable numerous projects with low environmental integrity to undermine global mitigation efforts during the second commitment period of the Kyoto Protocol.

Policy implications for market mechanisms under a new climate agreement

Countries are negotiating a new agreement under the United Nations Framework Convention on Climate Change (UNFCCC). As part of this process, each country is to submit its “intended nationally determined contribution” (INDC). The Parties have also started to discuss how they might integrate carbon markets into the agreement. Our analysis highlights the urgent need to ensure environmental integrity in any international transfers of units under the new agreement. Based on the JI experience, we identify several key risks that must be addressed:

- **Unclear ambition of INDCs:** The ambition of INDCs submitted so far varies significantly, and even an INDC that is ambitious today could turn out to be easily achievable due to unforeseen developments, such as an economic recession, cheaper-than-expected low-carbon energy options, or technological advances. Thus, it is possible that some countries will have targets that are above actual BAU emissions. If so, they would have no incentive to ensure the environmental integrity of any credits they issue.
- **INDCs not converted into multi-year emission targets:** If countries with single-year targets (e.g. a 20% reduction by 2025) did not convert their target into a multi-year emissions target and were allowed to transfer units issued for years up to the target year, they would have no incentive to ensure the units’ environmental integrity. Accounting of international transfer of units towards commitments should indeed only be possible if countries take on quantifiable, multi-year emission reduction targets.
- **Absence of international accounting rules:** If countries with mitigation commitments do not account for units transferred to other jurisdictions, they could sell credits without having to engage in additional mitigation action if these credits lack environmental integrity. An internationally agreed accounting approach is crucial to ensuring that international transfer of units does not lead to double counting of emission reductions, and that host countries have incentives to ensure the environmental integrity of units.

While international oversight is important, there are limitations. Information asymmetry between project developers and auditors or regulators remains a major challenge that is difficult to address, even with international oversight. Furthermore, international oversight can only be effective if countries do not hamper the strengthening of a crediting mechanism’s integrity. CDM and JI reform efforts under the UNFCCC have shown that often no consensus can be reached to address and rectify environmental integrity shortcomings.

A broader question that remains is what the scope and role of crediting mechanisms can be in the longer term. The experience with JI shows that in countries with ambitious caps, the potential of a crediting mechanism may be quite limited. The EU, for example, had to limit the eligible project types considerably in order to avoid double counting and overlap with the EU ETS and other climate policies. Given the reduced potential of crediting mechanisms in a world where most emissions may soon be covered under other mitigation policies, and given the general challenges of ensuring environmental integrity for crediting mechanisms, the role of crediting mechanisms beyond 2020 may be rather limited.



An Achema AB fertilizer plant in Jonava, Lithuania, the site of a JI project.

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