Application of the CCQI methodology for assessing the quality of carbon credits

This document presents results from the application of version 3.0 of a methodology, developed by Oeko-Institut, World Wildlife Fund (WWF-US) and Environmental Defense Fund (EDF), for assessing the quality of carbon credits. The methodology is applied by Oeko-Institut with support by Carbon Limits, Greenhouse Gas Management Institute (GHGMI), INFRAS, Stockholm Environment Institute, and individual carbon market experts. This document evaluates one specific criterion or sub-criterion with respect to a specific carbon crediting program, project type, quantification methodology and/or host country, as specified in the below table. Please note that the CCQI website Site terms and Privacy Policy apply with respect to any use of the information provided in this document. Further information on the project and the methodology can be found here: www.carboncreditquality.org

Contact
carboncreditqualityinitiative@gmail.com

Criterion:	**1.2: Vulnerability**
Project type:	**Hydropower (dam and run-of-river)**
Date of final assessment:	**12 September 2023**
Score:	**1**

Assessment

Relevant scoring methodology provisions

In market situations where the supply of carbon credits from already registered and implemented projects considerably exceeds the current and expected future demand for carbon credits, the purchase of carbon credits does not necessarily trigger further emission reductions. The methodology therefore evaluates for carbon credits in collapsed markets whether the projects would continue to reduce GHG emissions even without carbon credit revenues, or whether they are at risk of discontinuing GHG abatement without these revenues. In the latter case, they are classified as vulnerable projects. The methodology employs a stepwise approach for assessing the vulnerability of the respective project type or individual project:

Step 1: Evaluate whether the relevant market of the carbon credit can be characterized as collapsed (see methodology for further details). Note that currently, this situation only applies to the CDM.

Step 2: Identify potential continuation and discontinuation scenarios. If applied on the project type level a representative sample of projects can be assessed.

Step 3: Evaluate how applicable legal requirements affect the feasibility of the scenarios identified in step 2. Apply this step to both continuation and discontinuation scenarios. Remove scenarios that could not be pursued due to applicable laws and regulations. This step may be applied at project or project type level in the context of a specific host country or at the level of the carbon crediting program (see methodology for further details).

Step 4: Assess financial benefits and costs and rank the remaining scenarios in order of their financial attractiveness by performing a cost-benefit analysis of each scenario. The financial attractiveness of a project depends on whether its income exceeds the operational expenditure in the absence of carbon credits. Only OPEX and benefits are therefore considered in the analysis. Exclude costs and benefits that occur under all scenarios in a uniform manner.

Step 5: Assess whether any of the scenarios faces non-financial barriers that exclude it from being the course of action. For conducting the barrier assessment, the same approach described in section 1.1.4 is applied using an expert judgement. Remove all scenarios that face non-financial barriers and are scored at 5 or 4 from further consideration.

Step 6: Determine the most likely project scenario. The highest ranked remaining scenario is the likely course of action. If this is a continuation scenario, the project is deemed to have a low vulnerability to discontinue GHG abatement (score of 1). If the scenario is a discontinuation scenario, and it is either the only remaining scenario or any other scenarios are financially significantly less attractive, then the vulnerability is deemed to be high (score of 5). In other instances, e.g. where a continuation and discontinuation scenario may be equally plausible, no clear conclusion can be drawn on vulnerability (score of 3).

Degree of Vulnerability	Score
High Vulnerability	5
Vulnerability not conclusive	3
Low Vulnerability	1

Information sources considered

1 CDM Database for PAs and PoAs, Data accessed on 15 December 2022. Downloadable as excel spreadsheet under https://cdm.unfccc.int/Projects/projsearch.html

2 Warnecke, C., Day, T., Klein, N. (2015): *Analyzing the status quo of CDM projects. Status and Prospects.* https://newclimate.org/sites/default/files/2015/05/cdm_evaluation_mainreport_2015.pdf

3 Warnecke, C.; Day, T.; Schneider, L.; Cames, M.; Healy, S.; Harthan, R.; Tewari, R.; Höhne, N. (2017): *Vulnerability of CDM projects for Discontinuation of Mitigation Activities: Assessment of Project Vulnerability and Options to Support Continued Mitigation*. NewClimate Institute; Oeko-Institut. DEHSt (ed.). Berlin, 2017. Online available at https://www.dehst.de/SharedDocs/downloads/EN/project-mechanisms/vulnerability-of-CDM.pdf?__blob=publicationFile&v=3, last accessed on 15 December 2022.

4 Schneider, L. / Cames, M.: Options for continuing GHG abatement from CDM and JI industrial gas projects. Öko-Institut, Berlin, May 2014. http://www.oeko.de/oekodoc/2030/2014-614-en.pdf

Assessment outcome

The project type is assigned a score of 1.

Justification of assessment

The assessment is applied at the level of the project type. The project type 'hydropower' can be split into the subtypes into 'run-of-river' and 'dam'. These are defined as follows:

Dams:

"Installation of a new hydro power plant by building a new dam or the installation of additional power generation capacity at an existing reservoir. The electricity is fed into a national or regional electricity grid. This project type does not include pumped-storage hydropower. The project type reduces emissions by displacing more greenhouse gas intensive electricity generation."

Run-of-River:

"Installation of a new hydro power plant with no or minimal storage. The plant harvests energy from flowing water, such as rivers or streams. The electricity is fed into a national or regional electricity grid. The project type reduces emissions by displacing more greenhouse gas intensive electricity generation."

Analysis according to the methodology

Step 1: Per the guidance in the scoring methodology, the CDM market is deemed to be collapsed. There are currently more than 2,000 registered hydropower projects under the CDM. All other markets relevant for this assessment (VCM applying GS and VCS standards) are considered functioning.

Step 2: The following continuation or discontinuation scenarios are identified:

- Scenario 1: The mitigation activity continues as originally designed and implemented, and at the same scale.
- Scenario 2: The mitigation activity continues by upgrading the existing power plants ("repowering").
- Scenario 3: The mitigation activity discontinues, i.e. the project owners will dismantle the equipment necessary for the activity.

Step 3: Many countries are encouraging the scaling up of hydropower capacity as part of the decarbonization of the energy sector. However, the operation of hydropower plants, and in particular the continued operation of existing plants, is not commonly required by any laws or regulations.

Step 4: The assessment is conducted on a project type level. For hydropower plants, the OPEX is commonly significantly lower than the revenues from feeding electricity into the grid.

This is supported by relevant information from the literature. A study by NewClimate Institute and Ecofys (Source 2) assesses the status of individual CDM projects, as well as the barriers and means for supporting the continuation of these projects for a sample of 1,310 CDM projects, accounting for 22 host countries and 14 major project types, including existing dams, new dams, and run-of-river within two size ranges: <2MW and 2-20MW. The study indicates high rates of continued operating status for renewable electricity generation projects like wind, hydro and solar. These project types are deemed likely to receive support from alternative sources, often in the form of national-level feed-in tariffs or favourable power purchase agreements. Large hydropower projects (over 20 MW) are even excluded from the analysis, as they represent a large investment and are hence irreversible irrespective of CER prices. For the other hydro projects, non-CER contributions from further revenues or cost savings usually exceed operating expenditures, resulting in high incentives for projects to continue operation even with modest CER price levels or outside of the CDM without alternative support. 81% of the CDM hydropower projects were in regular operation, despite very low CER prices. For hydropower projects, only 2% of the projects named sufficient CER revenues as a reason for continuing the operation.

Another study by NewClimate Institute and Oeko-Institute (Source 3) and an earlier study by Oeko-Institute (Source 4) also both concluded that the vulnerability of hydropower projects is typically low.

Step 5: No significant non-financial barriers could be identified that would prevent any of the considered scenarios.

Step 6: The most likely scenario for the project type is a continuation scenario, as for most of the assessed projects the revenues from power generation exceed operational expenditures. Therefore, the project type is assigned a score of 1under the CDM.