

Application of the Oeko-Institut/WWF-US/ EDF 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

Sub-criterion:	1.1.3 Financial attractiveness
Project type:	Recovery of associated gas from oil fields
Date of final assessment:	31 January 2023
Score:	3.67

Contact

info@oeko.de
www.oeko.de

Head Office Freiburg

P. O. Box 17 71
 79017 Freiburg

Street address

Merzhauser Straße 173
 79100 Freiburg
 Phone +49 761 45295-0

Office Berlin

Borkumstraße 2
 13189 Berlin
 Phone +49 30 405085-0

Office Darmstadt

Rheinstraße 95
 64295 Darmstadt
 Phone +49 6151 8191-0

Assessment

Relevant scoring methodology provisions

The methodology assesses the financial attractiveness of the individual project or project type to estimate the likelihood that economic actors would normally not pursue the respective mitigation activity in a given market and policy environment without carbon market revenues. The assessment considers three indicators that are important for determining financial attractiveness: The financial attractiveness without carbon credit revenues, the change in financial attractiveness due to carbon credit revenues, and the financial attractiveness with carbon credit revenues. The following steps should be applied to derive the score:

- Step 1: Decide whether to apply the methodology to an individual project or at the level of a project type. If the methodology is applied at the level of a project type, clearly define the project type and the geographical scope for the assessment (e.g. global, region, country). Project types may be further differentiated into sub-categories, e.g. considering the project size (e.g. classes of wind turbine sizes), the type of project technology (e.g. on-shore or off-shore wind power), or other project features.
- Step 2: Collect the relevant data. Where the methodology is applied to an individual project, data provided by the project may be used, as long as this data can be reasonably verified. Where the methodology is applied at the level of the project type, different data sources could be used, including literature information or a sample of individual projects for which the necessary data is available. To the extent possible, the sample should represent different investment conditions and locations within the geographical scope
- Step 3: Define the carbon credit price used in the calculation of the change in financial attractiveness due to carbon credit revenues. The methodology recommends using the current prices of the relevant markets the project is developed for. Assumptions made by the project proponent on expected carbon prices may be used if they are plausible. In absence of further information, the methodology recommends using a consistent proxy for all projects.
- Step 4: Identify for each project the respective value for:
 - a. The equity IRR without carbon credit revenues (IRR);
 - b. The change in equity IRR due to carbon credit revenues (Δ IRR); and
 - c. The equity IRR with carbon credit revenues, calculated as the sum of equity IRR without carbon credit revenues and the change in equity IRR due to carbon credit revenues (IRR+ Δ IRR).
- Step 5: Identify for the project the relevant project category in the CDM Methodological Tool for Investment Analysis (CDM TOOL 27) according to the following table:

Group	Categories
1	Energy Industries; Energy Distribution; Energy Demand; Waste handling and disposal
2	Manufacturing industries; Chemical Industries; Construction; Transport; Mining/Mineral production; Metal production; Fugitive Emissions from fuels; Fugitive Emissions from production and consumption of halocarbon, and Sulphur hexafluoride; Solvent use; Carbon capture and storage of CO ₂ in geological formations
3	Afforestation and reforestation; Agriculture

- Step 6: Retrieve for each project the country-level expected return on equity (ROE) from the CDM methodological tool for investment analysis for the respective group identified in step 5 (The respective table can be found on page 12 of version 11. 0 of CDM TOOL 27).
- Step 7: Determine for each project the three indicators, by putting the IRR, the Δ IRR, and the sum of IRR and Δ IRR in relation to the expected return on equity (ROE).
- Step 8: If the methodology is applied to a project type, calculate the average values for Indicator 1.1.3.1, Indicator 1.1.3.2, and Indicator 1.1.3.3 for the sample of projects.
- Step 9: Apply the scoring approach in the methodology to determine the score for indicator 1.1.3.1.
- Step 10: Apply the scoring approach in the methodology to determine the score for indicator 1.1.3.2.
- Step 11: Apply the scoring approach in the methodology to determine the score for indicator 1.1.3.3.
- Step 12: Apply the scoring approach in the methodology to determine the overall score for sub-criterion 1.1.3.

If a project or project type does not have revenues or cost savings other than carbon market revenues, an IRR cannot be calculated. As these projects fully rely on carbon market revenues, they are not financially viable without carbon market revenues and are therefore assigned a score of 5.

Information sources considered

- 1 Voluntary Registry Offsets Database v5, Goldman School of Public Policy, University of California Berkeley. <https://gspp.berkeley.edu/faculty-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/offsets-database>
- 2 CDM Database for PAs and PoAs, Data accessed on 04 May 2022. Downloadable as excel spreadsheet under <https://cdm.unfccc.int/Projects/projsearch.html>
- 3 CDM Project Search. Data accessed on 04 May 2022 <https://cdm.unfccc.int/Projects/projsearch.html>
- 4 The Verra Registry – Verified Carbon Standard, Data accessed on 04 May 2022 <https://registry.verra.org/>
- 5 World Development Indicators – Lending interest rate (Indicator: FR.INR.LEND), Data accessed on 19 May 2022. <https://databank.worldbank.org/source/world-development-indicators>
- 6 World Development Indicators – Real interest rate (Indicator: FR.INR.RINR), Data accessed on 19 May 2022. <https://databank.worldbank.org/source/world-development-indicators>

- 7 Tax Foundation – Corporate Tax Rates around the World, 2021. Data accessed on 19 May 2022. <https://taxfoundation.org/publications/corporate-tax-rates-around-the-world/>
- 8 CDM TOOL27 Methodological tool: Investment analysis – Version 11.0 <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v11.0.pdf>
- 9 World Development Indicators – Inflation, GDP deflator: linked series (Indicator: NY.GDP.DEFL.KD.ZG.AD), Data accessed on 19 May 2022. <https://databank.worldbank.org/source/world-development-indicators>

Assessment outcome

The project type is assigned a score of 3.67.

Justification of assessment

Step 1: Decide whether to apply the methodology to an individual project or at the level of a project type

The assessment is applied at the level of the project type. The project type is here defined as follows:

“Recovery and utilization of associated gas from oil fields. This includes the installation of infrastructure to gather and transport the recovered gas to a transmission pipeline or a gas processing plant. Part of the recovered gas may be used to meet on-site energy demands. In the baseline scenario, the associated gas would be vented or flared. The project type reduces emissions by (i) displacing the use of fossil fuels and, where applicable, (ii) reducing venting of methane.”

Step 2: Collect the relevant data

The assessment is conducted at the project type level which requires the construction of a data sample composed of several projects to determine the financial attractiveness of the project type. For this, the following databases were searched for projects related to oil exploration:

- UC Berkeley Voluntary Registry Offsets Database v5 (Source 1; in the following referred to as “UC Berkeley database”), which covers projects registered under the programmes ACR, CAR, Gold Standard and VCS
- CDM Database for PAs and PoAs (Source 2), which covers CDM projects

Basing the assessment only on projects that were submitted to carbon crediting programs might be subject to a selection bias because it is likely that projects that are economically viable without carbon credits do not apply for registration. However, a key purpose is to analyze how much carbon credits contribute to clearing the hurdle rate for the specific project type. Using project samples from carbon crediting programs is therefore still a viable source for conducting the assessment.

Through searching the UC Berkeley database, we could not find any projects of the relevant project type registered under the programmes ACR, CAR and Gold Standard. With regard to the programmes CDM and VCS, the degree of information available for each project varies considerably between the programs. The VCS generally does not make public detailed information on the financial

analysis conducted by the project proponent. This is relevant for the ability to use project data for the assessment.

The CDM database (Source 2) contains comprehensive information for each project, such as its reference number, name, methodology, status, location etc. In addition, key financial information is available in the database. This includes the estimated IRR benchmark, the estimated IRR excluding certified emission reductions (CERs) and the estimated IRR including CERs. Aside from this database, detailed documentation for each project is available when opening individual project entries in the CDM project search (Source 3). This includes the project design document (PDD) which is often complemented by spreadsheets containing the financial analysis for the project. What information is retrieved from each program is outlined in the following paragraphs.

In the CDM database, oil exploration projects are listed under the project type "fugitive" with the subtype "oil field flaring reduction". As of 4 May 2022, the database contains 27 entries with active reference numbers for this subtype. This includes mostly registered projects, but also a few projects that were rejected or withdrawn. All these projects were transferred into the initial data sample for this assessment.

Since the Verra Registry for the Verified Carbon Standard (Source 5) does not allow filtering its entries by a project subtype relevant for this analysis, the search for the VCS was performed through the UC Berkeley database, which does offer this function. Filtering this database by the type "Waste Gas Recovery" produced 8 entries of VCS projects. As this filter also covers projects beyond our project definition as confined in step 1, the project documents of all these entries were diligently reviewed to identify the projects with a scope relevant for this analysis. The documents can be retrieved from the Verra Registry for the VCS. This review resulted in 2 identified oil exploration projects (VCS409 and VCS1166), which are both registered. Although the registry itself does not contain information on the financial analysis of projects, for some projects information is available in the PDD. Therefore, both projects were transferred into the initial data sample.

The structure of the CDM database was used for building the initial data sample, as its header exhibits the most comprehensive row of information categories. For key information categories - such as reference number, status, methodology, country, or country region - information from Verified Carbon Standard projects was added either by merging excel spreadsheet excerpts from the UC Berkeley database or filling in information by hand. The initial data sample from the two programs contains 29 entries.

The methodology uses the following three indicators to assess financial attractiveness:

- 1.1.3.1 The internal rate of return (IRR) without carbon credit revenues, in relation to the relevant IRR benchmark
- 1.1.3.2 The change in IRR due to carbon credit revenues, in relation to the relevant IRR benchmark
- 1.1.3.3 The IRR with carbon credit revenues in relation to the relevant IRR benchmark

The data sample was therefore further consolidated by removing projects for which neither of the following information was available:

- IRR without carbon credits (information required for calculating indicator 1.1.3.1 and 1.1.3.2)
- IRR with carbon credits (information required for calculating indicator 1.1.3.2 and 1.1.3.3)

- IRR benchmark (information required for all three indicators)

Furthermore, we identified both a CDM project which has been withdrawn without further information about its reason and a CDM entry of a project which registered under this program first but has been transferred to the VCS program then, in whose registry it is also listed by now.¹ Both CDM entries were also removed from the sample. This consolidation resulted in 24 projects – 18 of which are located in Asia – considered for further analysis. For most CDM projects, all three above parameters are available as entries in the CDM database. For non-CDM projects and CDM projects where this information was lacking, the project design documents, and key project information were searched. For the only Verified Carbon Standard project remaining, the project design document was reviewed for this information, which was then transferred to the data sample by hand.

Not all projects have information available on each of the three parameters listed above. Therefore, the number of projects that exhibit sufficient data for the calculation of the relevant indicator differs for each of the three indicators as summarized in Table 1 below. This approach of constructing a sub-sample for each indicator was chosen to ensure the maximum coverage of projects, programs, and regions for the respective indicator, especially for indicator 1.1.3.1.

As shown in Table 1, the size of the sub-samples varies, with sub-sample 1 containing 24 projects, sub-sample 2 containing 16 projects and sub-sample 3 containing 16 projects.

Table 1 **Number of projects used to calculate the three indicators for financial attractiveness**

	1.1.3.1	1.1.3.2	1.1.3.3
Global	24	16	16
Programs			
CDM	23	16	16
VCS	1	0	0
Regions			
South-Eastern Asia	6	3	3
Western Asia	5	3	3
Western Africa	4	4	4
Southern Asia	4	2	2
Eastern Asia	3	2	2
South America	1	1	1
Caribbean	1	1	1

Source: Own compilation.

The methodology further suggests applying a single carbon price and an adjusted benchmark IRR for all projects when calculating the indicators. To be able to perform calculations for all projects with both a single carbon price and an adjusted benchmark IRR, detailed information on the financials of

¹ Therefore, integrating also the obsolete CDM entry of this very project in our sample would result in having the same project represented twice.

a project² and its IRR type³ is required to be able to reproduce the financial analysis with input data which differ from those that have been used by the project proponent. For each project in the consolidated data sample, key project documentation was reviewed for the availability of such detailed information. This review showed that only for 7 CDM projects such information is available. Each of these projects provides a separate spreadsheet file with detailed financial data. Due to this relatively small sample size of 7 projects, it was decided to not pursue an analysis based on a single carbon price and an adjusted benchmark IRR. In the following course, the analysis is based on the sample of 24 projects for which high-level financial information is available.

For each indicator the assessment was conducted following the steps in the methodology as described below, using the respective sub-sample.

Step 3: Define the carbon credit price used in the calculation of the change in financial attractiveness due to carbon credit revenues.

As the assessment relies on the estimated carbon price by the project proponent, no further adjustments to the data sample are required.

Step 4: Identify for each project the respective value for:

- a. The IRR without carbon credit revenues (IRR);

The IRR without carbon credits was integrated into the data sample using the process outlined in step 2 above.

- b. The change in IRR due to carbon credit revenues (Δ IRR);

The change in IRR was calculated by subtracting the value for the IRR without carbon credits from the value for the IRR with carbon credits.

- c. The IRR with carbon credit revenues

The IRR with carbon credits was integrated into the data sample using the process outlined in step 2 above.

Step 5: Identify for the project the relevant project category in the CDM Methodological Tool for Investment Analysis (CDM TOOL 27):

This step is not required for the assessment as it relies on the benchmarks by the project proponent.

² In particular, the project documents need to contain information on the impact of a certain carbon credit price on the IRR of the project. Furthermore, it is critical to have the possibility of modifying the financials by hand (e.g., via an excel spreadsheet) in order to apply the single carbon price.

³ The applicable benchmark depends on whether the project proponents based their investment analysis on an equity IRR or project IRR and on whether this is stated in nominal or real terms.

Step 6: Retrieve for each project the country-level expected return on equity (ROE) from the CDM methodological tool for investment analysis for the respective group identified in step 5 (The respective table can be found on page 12 of version 11.0 of CDM TOOL 27).

This step is not required for the assessment as it relies on the benchmarks by the project proponent.

Step 7: Determine for each project the three indicators, by putting the IRR, the Δ IRR, and the sum of IRR and Δ IRR in relation to the benchmark IRR.

The calculations were performed for each indicator according to the methodology.

Steps 8-12: If the methodology is applied to a project type, calculate the average scores for Indicator 1.1.3.1, Indicator 1.1.3.2, and Indicator 1.1.3.3 for the sample of projects.

Average scores were calculated for each of the three indicators using the equations outlined in the methodology.

Conclusion of the assessment

Table 2 summarizes the sample sizes and respective indicator scores for the indicators 1.1.3.1, 1.1.3.2 and 1.1.3.3. Inserting these values into the scoring formula results in a score of 3.67 for the project type. Since there are not more than a few projects for each geographic region represented in the sample (see Table 1), differentiating the scores between the regions is not deemed robust enough to be considered.

Table 2 Results for sub-criterion 1.1.3 for the project type *reduction of methane emissions from oil exploration*

	Sample Size			Indicator Scores			Score 1.1.3
	1.1.3.1	1.1.3.2	1.1.3.3	1.1.3.1	1.1.3.2	1.1.3.3	
Global	24	16	16	3.93	4.29	3.97	3.67

Source: Own calculation

For testing sensitivity, the analysis was reproduced after homogenously adjusting a) the benchmark IRR and b) the underlying carbon credit price.⁴ As not all projects provide the critical information required to apply the respective adjustments (see page 6), the size of the sample diminishes for a) all the three indicators and b) for two indicators. However, since only one input factor is changed at a time for conducting the sensitivity analysis, the respective sample size does not diminish as much

⁴ See the assessment paper “1.1.3 Industrial biodigesters fed with livestock manure” for a detailed description of the approaches for both adjustments.

as adjusting the benchmark IRR and the carbon credit price at the same time (then the sample would contain only seven projects; see page 7).

The sensitivity results are shown in Table 3. Here, the scores are higher than the scores from the original sample (except for the score for the indicator 1.1.3.3 of the second sample). Considering that the original sample is larger and more diverse, in particular with regard to countries, and following the principle of conservativeness, the score of the original sample is selected for the overall score of the project type *reduction of methane emissions from oil exploration*.

Table 3 **Results of sensitivity test**

	Sample Size			Indicator Scores			Score 1.1.3
	1.1.3.1	1.1.3.2	1.1.3.3	1.1.3.1	1.1.3.2	1.1.3.3	
Sample with adjusted benchmarks	17	9	9	4.22	4.72	4.15	4.15
Sample with single carbon price (10 EUR)	24	11	11	3.93	4.55	3.92	3.81

Source: Own calculation