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:	Industrial biodigesters fed with livestock manure
Date of final assessment:	31 January 2023
Score:	4.17

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. Following the approach of the methodology the following steps are 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.

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 (ΔIRR); and

    c. The equity IRR with carbon credit revenues.

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 ΔIRR, and the sum of IRR and ΔIRR 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 clearly 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 4 May 2022. Downloadable as excel spreadsheet under https://cdm.unfccc.int/Projects/projsearch.html

3 CDM Project Search. Data accessed on 20 June 2022 https://cdm.unfccc.int/Projects/projsearch.html

4 Gold Standard Impact Registry, Data accessed on 20 June 2022 https://registry.goldstandard.org/projects?q=&page=1

5 The Verra Registry – Verified Carbon Standard, Data accessed on 20 June 2022 https://registry.verra.org/

6 World Development Indicators – Lending interest rate (Indicator: FR.INR.LEND), Data accessed on 19 May 2022. https://databank.worldbank.org/source/world-development-indicators

7 World Development Indicators – Real interest rate (Indicator: FR.INR.RINR), Data accessed on 19 May 2022. https://databank.worldbank.org/source/world-development-indicators

8 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/

9 CDM TOOL27 Methodological tool: Investment analysis – Version 11.0 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v11.0.pdf

10   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 4.17

Justification of assessment

In accordance with the methodology, the following steps were conducted for the analysis of the financial attractiveness of the project type:

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:

"Generation of biogas by anaerobic digestion of livestock manure. The biogas is combusted for the generation of power and/or heat, which can be fed into the grid or used on-site. A smaller fraction of the gas may be flared. The project type reduces emissions by (i) avoiding methane emissions from the uncontrolled decomposition of livestock manure and (ii) by displacing more greenhouse gas intensive energy generation based on fossil fuels."

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 industrial biodigesters fed with livestock manure:

- UC Berkeley Voluntary Registry Offsets Database v5 (Source 1), 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.

The degree of information available for each project varies considerably between the programs. ACR and CAR generally do not make public any registration documents with information about the project's additionality – such as the project design document (PDD) and its appendices – and are therefore excluded from the data sample whereas the registration documents disclosed by Gold Standard and VCS generally do not include detailed information on the financial analysis conducted by the project proponent. This is relevant for the ability to use project data for the assessment. What information is directly retrieved from the programs CDM, Gold Standard and VCS is outlined in the following paragraphs.

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 PDD which is often complemented by spreadsheets containing the financial analysis for the project.

In the CDM database, projects of the project type under consideration are listed under the project type "Methane avoidance" with the subtype "Manure". As of 4 May 2022, searching the database for this subtype brings up 42 projects with both an active reference number and an entry for at least one of the abovementioned IRR figures, which is deemed as roughly indicating that the respective project applies an IRR benchmark analysis for demonstrating its additionality. According to their project status as stated in column Q of the database, all of these 42 projects are registered. Consequently, they were transferred into the initial data sample for this assessment.

Since both the Gold Standard Impact Registry (Source 4) and the Verra Registry for the Verified Carbon Standard (Source 5) do not allow filtering their entries by a project subtype relevant for this analysis the UC Berkeley Voluntary Registry Offsets Database v5 was used to identify the respective projects of these two carbon crediting programs. In addition to filtering this database by the type "Manure Methane Digester", it was also filtered for registered projects to have consistency between the CDM and the non-CDM projects. This produced 7 entries of Gold Standard projects and 34 entries of VCS projects. As the database does not provide information about any IRR figures of the projects, it cannot readily be derived whether they applied IRR benchmark analysis at all for demonstrating additionality. Therefore, all the entries were transferred into the initial data sample.

The structure of the CDM database was used for building the 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 and Gold Standard projects was added either by merging excel spreadsheet excerpts or filling in information by hand. The initial data sample from the two programs contains 83 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)

For most CDM projects all three parameters are available as entries in the CDM database. For non-CDM projects and CDM projects where this information was lacking, the PDDs, and key project

information were searched. These documents were also reviewed for the detailed project description to verify that our final data sample only contains projects which match our project type definition as confined in step 1. This resulted in excluding projects because of the following reasons:

- The project envisages to flare the produced biogas;
- Biogas is generated mostly from non-animal waste (e.g., palm oil residues, cassava residues, municipal wastewater);
- There is no biogas generation;
- The project documents do not include any investment analysis;
- The project proponents have chosen investment comparison instead of benchmark analysis as the method for demonstrating financial additionality;
- The registry entry of the project does not provide any project documents at all (this applies for several VCS projects).

This consolidation resulted in 34 projects – 23 of which are registered under the CDM – considered for further analysis. Regarding the spatial distribution, 23 projects are located in Asia. Embracing 14 entries, Eastern Asia is the region with by far the largest representation in the sample.[1] However, 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 between the 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.[2] In the following course of the analysis the sample is referred to as the *original sample*.

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[1] This concentration occurs even more on the country level as all these 14 projects are in China.

[2] Note that as a result the share of both CDM and Chinese projects (i.e., projects in Eastern Asia) in the sub-sample for indicator 1.1.3 is not as dominant as in the sub-samples for the other indicators.

Table 1   **Number of projects used to calculate the three indicators for the *original sample***

	1.1.3.1	1.1.3.2	1.1.3.3
Global	**34**	**23**	**23**
Programs			
CDM	23	19	19
VCS	6	0	0
GS	5	4	4
Regions			
Eastern Asia	14	12	12
Europe	6	1	1
Western Asia	4	2	2
Southern Asia	3	2	2
Central America	3	2	2
South-Eastern Asia	2	2	2
South America	1	1	1
Southern Africa	1	1	1

Source: Own compilation.

The methodology further suggests applying a single carbon price and an adjusted benchmark IRR for all projects in the data sample 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 a project[3] and its IRR type[4] is required to be able to reproduce the financial analysis with different input data 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. As shown in Table 2, such comprehensive information is available for 12 projects. Each of these projects provides a separate spreadsheet file with detailed financial data. In addition to the 12 projects that provide sufficient data for all three parameters, there are an additional 7 projects that provide only information on the IRR type applied in the investment analysis. As this information is sufficient to calculate the value of indicator 1.1.3.1, these projects have been added for this indicator, bringing its respective sample size to 19 projects.

The approach of constructing a sub-sample for each indicator was chosen to ensure the maximum coverage of projects for the respective indicator, especially for indicator 1.1.3.1. The sample-technique applied here ensures that only the respective adjustments affect the final values of the indicators and not the change in the sample composition.

As this sample comprises adjusted carbon prices and adjusted benchmarks, it is henceforth referred to as *sample AP/AB.*

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[3] 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.

[4] 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. This is explained in more detail on page 10.

For enhancing the sample size and thereby the robustness of the results, it was decided to also conduct the analysis with two adjusted samples by making the following adjustments:

- Adjusting for each project the underlying carbon credit price (resulting in *sample AP*) and

- Adjusting the benchmark IRR (resulting in *sample AB*).

Since for these samples only one input factor is changed at the time, there is only project data required on either the project's detailed financials (*sample AP*) or its IRR type (*sample AB*). Consequently, the respective sample size does not diminish as much as when adjusting both – the benchmark IRR and the carbon credit price at the same time (see Table 2). Again, indicator 1.1.3.1 is not affected by adjusting the carbon credit price, which is why in *sample AP* the sub-sample composition for this indicator does not deviate from the *original sample*.

Table 2 shows the number of projects in each sub-sample of the three additional samples. Compared to the *original sample*, the concentration with regard to CDM projects and projects in Eastern Asia is generally higher.[5]

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

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[5] Depending on the indicator and excluding indicator 1.1.3.1 of *Sample AP*, which is identical with the one of the *original sample*, CDM (Eastern Asian) projects represent 84 to 93 percent (68 to 83 percent) of the respective sub-sample, compared to 67 to 82 (41 to 52 percent) in the *original sample*.

Table 2   **Number of projects used to calculate the three indicators for *sample AP/AB*, *sample AP* and *sample AB***

	Sample AP/AB			Sample AP			Sample AB		
Indicator	1.1.3.1	1.1.3.2	1.1.3.3	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	**19**	**12**	**12**	**34**	**15**	**15**	**19**	**16**	**16**
Programs									
CDM	16	11	11	23	14	14	16	14	14
VCS	-	-	-	6	-	-	-	-	-
GS	3	1	1	5	1	1	3	2	2
Regions									
Eastern Asia	13	10	10	14	11	11	13	11	11
Europe	-	-	-	6	-	-	-	-	-
Western Asia	-	-	-	4	-	-	-	-	-
Southern Asia	3	-	-	3	-	-	3	2	2
Central America	1	1	1	3	2	2	1	1	1
South-Eastern Asia	2	1	1	2	1	1	2	2	2
South America	-	-	-	1	-	-	-	-	-
Southern Africa	-	-	-	1	1	1	-	-	-

Source: Own compilation.

Step 6 of the methodology suggests selecting the IRR benchmark from the country-level expected return on equity (ROE) outlined in the CDM methodological tool for investment (CDM TOOL 27; Source 9).[6] This benchmark does, however, only apply to projects that use an equity IRR in their financial analysis. For projects that use a project IRR as the financial indicator, the appropriate benchmark is the weighted average cost of capital (WACC).

There is no publicly accessible data base for WACC across industries and countries. The WACC for an individual firm can be calculated using the following formula:

$$WACC = r_e \times W_e + r_d \times W_d \times (1 - T_c)$$

Where:

r_e	=	Cost of equity
W_a	=	Percentage if financing that is equity
r_d	=	Cost of debt
W_d	=	Percentage of financing that is debt
T_c	=	Corporate tax rate

The most accurate way of calculating a WACC benchmark would be to build a peer group of companies active in a particular country and industry related to the project type and calculate the average WACC that applies among that group. This would require very comprehensive data. The second-best option is to calculate the benchmark by using country specific data for the parameters listed in the formula above. This option was used for the assessment.

The projects of the samples presented above do not uniformly incorporate inflation in their investment analyses.[7] This needs to be considered for calculating the respective adjusted benchmark.

The required data were sourced as follows:

- **Cost of equity:**

   The default values from the table in CDM TOOL 27 version 11.0 were used both as the adjusted benchmark for projects with equity IRRs and as part of the WACC formula above for projects with project IRRs. The host country of the project activity and the category the project type is assigned to determine the respective expected ROE (this is illustrated in step 5 below). Since these values are stated in real terms, they can only be taken as benchmarks for projects which incorporate inflation but need to be adjusted for projects which present their data in nominal terms.

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[6] Since in this source the values of the country-level expected return on equity constitute the cost of equity values, in the context of CDM Tool 27 both terms will be used synonymously in the following course of the assessment.

[7] There is a considerable number of projects which do not even state whether they present their investment analysis in nominal or real terms. After consulting the CDM Secretariat, it was deemed justifiable to assume for CDM projects that these cases exhibit nominal values. For the purpose of consistency, this assumption was extended to projects of other carbon crediting programs as well.

This is done by adding the median of the country-specific annual inflation rates between 1990 and 2020.[8] The inflation data is retrieved from the World Bank series *Inflation, GDP deflator: linked series* (Source 10), which is part of the "World Development Indicators" database. Using this time series both provides consistency with the calculation of the *real interest rate* below and – in contrary to other inflation time series – allows to take into account price changes on the level of the whole economy instead of changes in the consumer prices.

- **Cost of debt:**

  The "World Development Indicators" also include a time series on the *lending interest rate* for meeting "short- and medium-term financing needs of the private sector"[9] (Source 6). Since the interest rates are expressed in nominal terms by this indicator, they were only used for projects with nominal numbers.

  For projects which present their data in real terms, the *real interest rate* time series (Source 7) from the same database was accessed. According to its metadata, this indicator "is the *lending interest rate* adjusted for inflation as measured by the GDP deflator", which ensures consistency with the approach of inflation adjustments for the cost of equity. For either time series, the combination of host country and starting year of the project activity determines the project's respective interest rate considered as benchmark value for the cost of debt. For some country-year combinations data on the respective interest rate are not available. Consequently, some projects were excluded from the analyses related to adjusted benchmarks.[10]

- **Corporate tax rate:**

  The Tax Foundation maintains a time series with the relevant data between 1980 and 2021 (Source 8). Again, the combination of host country and starting year of the project activity determines the applicable rate.

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

The methodology recommends either using the carbon price estimated by the project proponent if it can be considered as plausible or setting a single carbon credit price applicable to all projects. Here, both approaches are implemented and then compared.

For the *original sample* and the *Sample AB* the carbon prices set by the project proponents are not adjusted. The single carbon credit price for the assessment based on *Sample AP/AB* and *Sample*

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[8] Taking the median of long term data, we intend to follow the approach used for calculating the default values in CDM TOOL27, which are "based on long term historical returns".

[9] Basing the country-specific cost of debt numbers on this dataset is in line with the provisions laid out in paragraph 24 of CDM TOOL27 version 11.0.

[10] This is already accounted for in the number of projects of the *Sample AP/AB* and *Sample AB* as presented in Table 2.

AP respectively is set at EUR 10 per ton/CO_2e. This value is chosen with the expectation that carbon credit prices will surge in the future and because the performance of projects at these higher values is of most interest when looking at the financial attractiveness of the project type.

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 (ΔIRR);

   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.

Applying the single carbon credit price of EUR 10 per ton/CO_2e instead of the value set by the project proponents, triggers changes in both b. and c. compared to the calculations of the projects.

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

This step is relevant for uniformly adjusting the benchmark of the projects within *Sample AP/AB* and *Sample AB*.

Industrial biodigesters fed with livestock manure fall within project group 1 of the Methodological Tool for Investment Analysis since this project type is covered by the sectoral scopes 1 (Energy industries) and 13 (Waste handling and disposal), which are assigned to group 1.

Some projects indeed indicate that they fall into sectoral scope 15 (Agriculture), which belongs to project group 3 of CDM TOOL27. Through an expert assessment, we concluded that group 1 would be more appropriate, however.

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 relevant for uniformly adjusting the benchmark of the projects within *Sample AP/AB* and *Sample AB*.

For projects which based their demonstration of additionality on equity IRRs, the country-level expected ROE is used as the appropriate benchmark. For projects which chose project IRR as the

financial indicator however, the WACC is the appropriate benchmark. The respective values are retrieved for each project as outlined in Step 2 above.

For most projects no information is available in the project design document or other key project documentation on the distribution of debt and equity financing of the project. Where this information is lacking, the assumption was made that each source of financing accounts for a share of 50 percent. This assumption is guided by the respective recommendations in paragraph 25 of CDM TOOL 27. Where information on the share of equity and debt is available however, this is considered for calculating the project's WACC by using the formula presented on page 10.

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

For each project the three indicators were derived by putting the respective IRR, ΔIRR and IRR with carbon credit revenues in relation to the respective benchmark.

By basing the calculations on all four samples, different combinations of benchmark values (original or adjusted) and carbon credit price (original and adjusted) were used respectively.

Step 8-12: Calculation of the values for the indicators and the scores

Indicator values were calculated for each project in each sub-sample using the combinations of benchmarks and carbon credit prices outlined in step 2. After this, the values were used to derive the scores for each indicator using the respective scoring formulas outlined in the methodology. Finally, average indicator scores were determined.

As pointed out earlier, indicator 1.1.3.1 is not affected by changes in the carbon credit price, which is why Table 3 below represents only two values for this indicator; one based on the original benchmark (4.25) and another on the adjusted benchmark (4.08). For indicators 1.1.3.2 and 1.1.3.3 values for all four different combinations were calculated.

Table 3 summarizes the results of the analysis. For every indicator and regardless of the sample, the project type has achieved a score greater than 4, which can be considered as a good performance on financial additionality. The overall score for sub-criterion 1.1.3 varies between 4.17 (based on the *original sample*) and 4.31 (based on *Sample AP*). Compared to the *original sample*, scores are higher when applying the single carbon price of EUR 10 per ton/CO_2e, because most projects used lower prices in their investment analyses with an average of EUR 9 from projects which based their calculations on euro numbers.[11]

Since there are not more than a few projects for most geographic region represented in the samples (see Table 1 and Table 2), differentiating the scores between the regions is not deemed robust enough to be considered.

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[11] Projects which calculated with numbers in US dollars used an average price of USD 10.78, which is still well below EUR 10 when considering the long-term EUR/USD exchange rate.

Table 3 **Scoring results for sub-criterion 1.1.3 for the project type** *industrial biodigesters fed with livestock manure*

Sample	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	
Original Sample	34	23	23	4.25	4.54	4.47	**4.17**
Sample AP/AB	19	12	12	4.08	4.87	4.60	**4.28**
Sample AP	34	15	15	4.25	4.70	4.65	**4.31**
Sample AB	19	16	16	4.08	4.78	4.67	**4.26**

Source: Own calculation

Conclusion of the assessment

Considering that the *original sample* is the largest and most diverse sample, with regard to carbon crediting programs and regions, and following the principle of conservativeness (as its overall score is the lowest), the score of the *original sample* is selected for the overall score of the project type industrial biodigesters fed with livestock manure.