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

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Sub-criterion:	**6.2: Sustainable development impacts of the project type or project**
Project type:	**Hydropower (run-of-river)**
Date of final assessment:	**12 September 2023**
Score:	**LDCs/SIDS: 2.63** **Other countries: 1.63**

Assessment

Relevant scoring methodology provisions

The methodology assesses the extent to which a specific project or project type contributes to or hinders the achievement of each of the 17 Sustainable Development Goals (SDGs), with the exception of Goal 13 on climate action which is the primary goal of the climate mitigation projects. To assess the impacts of a project type or individual project on each SDG, the methodology draws on a seven-point ordinal scale for each SDG (see further details in the methodology). The following table illustrates the scale from -3 to +3 points to assess the impact or influence of a project type or individual project on each individual SDG goal:

Impact of the project on the SDG goal	Points
Indivisible: The successful implementation of the project automatically delivers progress on this SDG goal.	+3
Reinforcing: The successful implementation of the project directly makes it easier to make progress on this SDG goal.	+2
Enabling: The successful implementation of the project indirectly creates conditions that enable progress on this SDG goal.	+1
Consistent: There is no significant link between the project and this SDG goal.	±0
Constraining: The successful implementation of the project constrains the options for how to deliver on this SDG goal.	−1
Counteracting: The successful implementation of the project makes it more difficult to make progress on this SDG goal.	−2
Cancelling: The successful implementation of the project automatically leads to a negative impact on this SDG goal.	−3

As an additional step of the evaluation, it is assessed whether the project is implemented in Least Developed Countries or Small Island Developing States, which are recognized to face special circumstances that require additional support. Projects implemented in these countries receive an upgrade of one score point (e.g. from 3 to 4) in the overall evaluation of criterion 6.2. Note that the overall score cannot exceed 5.

Information sources considered

1 SDG Climate Action Nexus Tool (SCAN-tool), sector “electricity and heat”, category “ reduce emissions intensity”, mitigation action “renewable energy: small hydro”

2 Kuriqi et al. (2021) - Ecological impacts of run-of-river hydropower plants—Current status and future prospects on the brink of energy transition: https://www.sciencedirect.com/science/article/abs/pii/S1364032121001271?via%3Dihub

3 Anderson et al. (2014) - The impacts of ‘run-of-river’ hydropower on the physical and ecological condition of rivers: https://onlinelibrary.wiley.com/doi/10.1111/wej.12101

4 Kelly-Richards et al. (2017) - Governing the transition to renewable energy: A review of impacts and policy issues in the small hydropower boom: https://www.sciencedirect.com/science/article/abs/pii/S0301421516306401

5 Watershed Watch (2007) – Run-of-river hydropower in BC: https://watershedwatch.ca/wp-content/uploads/2011/02/RoR-CitizensGuide.pdf

6 Ullah et al. (2023) - Hydrological and ecological impacts of run off river scheme; a case study of Ghazi Barotha hydropower project on Indus River, Pakistan: https://www.sciencedirect.com/science/article/pii/S2405844022039470

7 Review of descriptions of different individual carbon credit projects

Assessment

The criterion is here assessed at the level of the project type, noting that the actual impacts may differ substantially between individual projects. The assessment thus aims to provide a picture of the typical impacts of the relevant project type. The project type is characterized as follows:

“Installation of a new hydropower plant with no or minimal storage. The electricity is fed into a national or regional electricity grid. The project type reduces emissions by displacing more greenhouse gas intensive electricity generation."

The assessment results are summarized in the below table.

SDG	Points	Justification
Goal 1: No Poverty	0	No interaction.
Goal 2: Zero Hunger	-1	Depending on the design, location, size and cumulative effect of the project type, there might be a loss of agriculture due to surface and groundwater depletion and a decreased productivity of fisheries downstream (target 2.3).
Goal 3: Good Health and Well-being	1	Reduced air, soil, and water pollution compared to a baseline of fossil fuel power generation (especially coal) reduces risk for related illnesses (target 3.9). However, the impact of run-of-river projects compared to the pollution of fossil fuels is not considered to be substantial.
Goal 4: Quality Education	0	No interaction.
Goal 5: Gender Equality	0	No interaction.
Goal 6: Clean Water and Sanitation	1	Fossil fuel power generation plants require freshwater for cooling and pollute adjacent water bodies through their waste-water (temperature change, harmful particles from combustion or alike). The use of hydropower (run-of-river) reduces these impacts (target 6.1, 6.3. 6.4) and has only a small impact on water access and water quality.
Goal 7: Affordable and Clean Energy	3	Relevant international agencies (e.g. the IEA) define hydropower as a source of renewable energy. Projects therefore make a positive contribution towards efforts to substantially increase the share of renewables in the electricity mix (target 7.2). Hydropower is more vulnerable to the adverse effects of climate change compared with other sources of renewable energy. Increased frequency and intensity of extreme weather have a high impact on the reliability of hydropower. More frequent droughts and floods will impact availability and flow rate of water and thus the ability of run-of-river projects to provide stable flows of electricity. The contribution of the project type to target 7.1 (universal access to affordable, reliable and modern energy services) is therefore likely limited. The link to target 7.1 is therefore scored 0 not impacting the progress delivered for target 7.2.
Goal 8: Decent Work and Economic Growth	1	The project type helps to decouple economic growth and energy production from environmental degradation (target 8.4), and it creates jobs – but jobs might also be lost in the fossil industry if a fossil power plant is replaced (target 8.5).
Goal 9: Industry, Innovation and Infrastructure	1	Deployment of run-of-river hydropower supports the development of sustainable infrastructure, but projects are rather small, and the reliability and resilience of run-of river projects decrease with more frequent climate-induced

		extreme weather events that impact water availability and increase flood risks (target 9.1). At a smaller scale, the project type supports sustainable industrialisation (target 9.2) as well as the adoption of clean technologies (target 9.4).
Goal 10: Reduced Inequality	0	No interaction.
Goal 11: Sustainable Cities and Communities	0	No interaction.
Goal 12: Responsible Consumption and Production	0	No interaction.
Goal 14: Life Below Water	0	No interaction.
Goal 15: Life on Land	-2	Although the project type uses considerably less water and is less polluting for freshwater ecosystem than the displaced fossil energy sources, run-of-river projects may negatively impact freshwater ecosystems and mountain areas (mainly through in-channel barriers and flow regime change), and can degrade fluvial habitats. If a small reservoir is created, natural areas are inundated to make space. The original route of the river may be changed and diverting larger amounts of water affects water velocity and depth which impacts habitat quality. Changes in species composition and alteration of the species structure are a consequence. Further the project type leads to river fragmentation and can impede fish migration and harm aquatic organisms through the turbines, especially if no fish pass is provided (targets 15.1, 15.4, 15.5). Run-of-river projects are often subject to fewer regulations and cumulative impacts of such small projects are often overlooked, increasing the overall risks of negative impacts. Impacts vary between different forms and sizes of run-of-river projects and are dependent on cumulative effects.
Goal 16: Peace and Justice Strong Institutions	0	No interaction.
Goal 17: Partnerships to achieve the Goal	0	No interaction.
Total points achieved: 4		

The project type receives 4 points in the SDG impact evaluation. Furthermore, none of the goals is assessed with a score of -3. Using the scoring approach in the methodology, this results in a score of 1.63. If the underlying project is implemented in a Least Developed Country or Small Island Developing State, the score is upgraded by one point, resulting in an overall score of 2.63.