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Federal Department of the Environment, Transport, Energy and Communications

Federal Office for the Environment FOEN
Swiss Federal Office of Energie SFOE

Process description for authorisation and specific requirements for monitoring, reporting and verifying mitigation activities under Article 6 of the Paris Agreement

Version 4.3, March 2026

1. Introduction

The Federal Office for the Environment (FOEN) is the Swiss regulator for emission reduction projects in the Swiss compliance market. It runs the Compensation Office (CO) together with the Federal Office of Energy (SFOE). Mitigation activities under Article 6.2 of the Paris Agreement must be authorised by FOEN and the partner country of the emission reduction activity.

This document describes the CO's processes from submission of applications for authorisation to issuance of international attestations, as they are called in the domestic regulation, also known as International Transferred Mitigation Outcomes (ITMOs), the term used in the Paris Agreement.

It also outlines additional, project-specific requirements that complement those of the CO_2 Ordinance, particularly regarding the definition of parameters and monitoring concepts. Based on initial experience with authorised projects, existing methodologies and external evaluations, the FOEN establishes specific criteria to ensure compliance with the CO_2 Ordinance and to promote high-integrity emission reductions.

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2. Process description for authorisation

General remarks

Mitigation Activity Design Documents (MADDs), including methodologies, volume of ITMOs and other regulations are defined by the partner country. The FOEN does not issue international attestations without the consent of the partner country.

However, the Compensation Office does always specifically evaluate the mitigation activity to assure compliance with the Paris Agreement, related bilateral agreements and Swiss legislation (see CO_2 Ordinance under Chapter 6). It may formulate additional restrictions, require methodologies to be adapted or even refuse to authorise a mitigation activity or issue international attestations. This has various implications that differ from processes during the (formerly applied) Clean Development Mechanism: 1) Methodologies are not accepted/registered per se but should be used as a starting point for project-specific adaptations. 2) The version of the MADD that has been submitted for validation may differ from the MADD that is finally authorised. A feedback process to the validation and verification bodies (VVBs) allows them to keep up to date with the requirements.

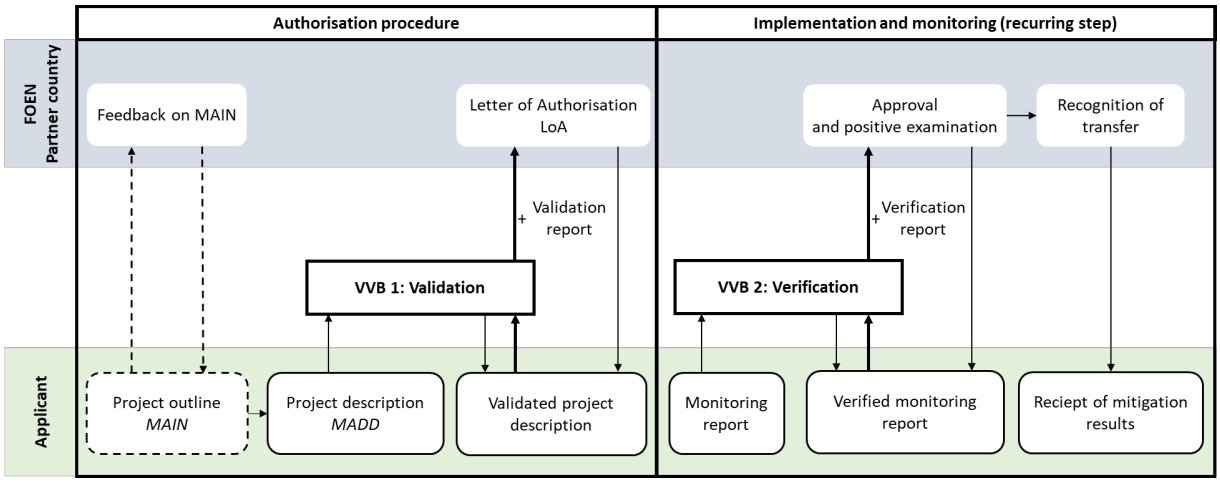

Figure 1 Diagram of the procedure for authorising applications and issuing attestations for projects abroad. While they do not appear in Swiss legislation, the following terms are used for activities abroad: LoI (Letter of Intent), MAIN (Mitigation Activity Idea Note) = Project outline, MADD (Mitigation Activity Description Document) = Project description, LoA (Letter of Authorisation).

Mitigation Activity Idea Note, MAIN (see 3.2 in FOEN Notice)

Before applying for project authorisation, applicants may ask the CO to make a preliminary assessment of a Mitigation Activity Idea Note (MAIN) or draft MADD, to give feedback on it and assess the general eligibility of the mitigation outcome (formerly called a Letter of Intent (LoI)). The better the quality of the MAIN (or draft MADD), the better the response of the CO can be. At this stage the CO contacts the other federal offices concerned and incorporates their feedback into its response to the applicant.

Only projects implemented in partner countries with an existing bilateral agreement or where negotiations about a bilateral agreement are at an advanced stage can be deemed eligible.

The feedback does not impact the subsequent assessment of the mitigation activity.

Authorisation (see 3.4 in FOEN Notice)

The MADD must be validated by a validation body approved both in the partner country and in Switzerland. It must contain the Mitigation Activity Summary MAS (template can be downloaded

from the FOEN website, see link in Chapter 3). Both the MADD and the validation report must be signed electronically and submitted to the CO via the CORE information and documentation system. Partner countries which have difficulty or do not have access to the Qualified Electronic Signature (QES) system are not required to provide a QES. The submission date confirmed in CORE applies. Mitigation activities may not be launched more than three months before this date. NB: For activities in Switzerland, the date on which the applicant makes a significant financial commitment to a third party or itself takes organisational measures relevant to the project or programme is already deemed the start of implementation of the activity (Art. 7 in conjunction with Art. 5 para. 1 let. d CO_2 Ordinance).

Once the CO has received the validated MADD and associated validation report, it checks that the documentation is complete and correctly submitted. It then assesses the documentation on a technical level. It may issue clarification requests (CRs) and/or corrective action requests (CARs), and the project proponent may be asked to adapt the MADD to ensure compliance with Swiss legislation. The final authorised MADD may therefore differ from the validated version initially submitted. (For the first projects authorised, this process took between four and six months; it is expected that it can be accelerated over the longer term.) Once the CO has assessed the documentation, it consults the other Swiss federal offices concerned for their agreement and inputs (so-called HF6 consultation), a process which takes about a week. Once all offices have reached agreement, final approval is sought at the strategic level (so-called POL), which on average takes another week. Switzerland is then ready to issue the authorisation statement, including an updated initial report, but can only do so once the CO has received the partner country's authorisation statement. Informal exchanges between Switzerland and the partner country should take place before the authorisations are formally issued in order to clarify findings and possible issues in advance and to coordinate the process.

NB: The CO assesses not just that the MADD is correctly submitted but that the mitigation activity meets general eligibility requirements. It may even decide to reject the mitigation activity. The use of established methodologies (CDM, GoldStandard, etc.) does not guarantee that a project will be authorised. The CO might ask for additional requirements if these are necessary to comply with Swiss legislation.

The application for project authorisation should include the following documents:

- project or programme description, duly validated and signed
- Excel spreadsheet for calculating emission reductions
- signed validation report
- where applicable, redacted versions of the above-mentioned documents for publication on the FOEN website
- where applicable, all related annexes (MAS, receipts, supporting documents, etc.)
- for projects abroad: project or programme authorisation granted by the partner country, duly signed

Monitoring, reporting and verification (see 3.7 in FOEN Notice)

The monitoring report (MR) must be verified by a verification body that is approved both in the partner country and in Switzerland. Both the MR and verification report must be signed electronically and submitted to the CO via the CORE information and documentation system; the submission date confirmed in CORE applies. Partner countries which have difficulty or do not have access to the QES system are not required to provide a QES. The MR may cover a monitoring period of up to three years and must be sent to the CO within one year of the end of the monitoring period. The verification body must not be the same as the initial validation body.

After the verification body has submitted the verification and monitoring reports to the CO, a non-objection period of 90 calendar days applies for both Switzerland and the partner country until the approval of the reports takes automatic effect. The approval may take effect sooner if Switzerland and the partner country confirm the reports in writing ahead of the 90-day non-objection period. Within the same 90-day period, the partner country also examines the mitigation outcomes covered by the submitted monitoring report against the requirements in Article 7.5 of the bilateral agreement (no double claiming, no discrepancy with authorisation statement, no violation of human rights or national legislation) and publicly issues a positive examination statement. This automatically entails the approval of the underlying monitoring report.

Once the CO has received the verified MR from the verifier, it checks that the documentation is complete and correctly submitted. It then assesses the documentation on a technical level. It may issue clarification requests (CRs) and/or corrective action requests (CARs) and the project proponent may be required to adapt the MR to ensure compliance with Swiss legislation. The final accepted MR may therefore vary from the verified version. This process can take three months or longer, depending on the mitigation activity. Once the CO has assessed the documentation, it consults the other Swiss federal offices concerned for their agreement and inputs, a process that takes about a week. Once all offices have reached agreement, and the partner country's positive examination statement is publicly available, final approval is obtained at the strategic level. This takes a further week on average.

If the partner country requires confirmation that the monitoring report has been positively assessed before making its own assessment decision, the CO may send this confirmation before final approval is given at the strategic level. If the partner country's positive examination statement has already been received, the CO must confirm within 30 calendar days that the transfer requirements are met and publish this information.

Once positive examination statements have been issued by both Switzerland and the partner country, the mitigation outcomes may be issued in the partner country's registry.

The entity authorised to transfer may request the transfer of mitigation outcomes. The transfer can take place once recognition of transfer is issued by the partner country; this includes the identification of the mitigation outcomes, proof of cancellation of transferred units inside the partner country registry and the commitment to undertake corresponding adjustments in line with the method chosen by the partner country pursuant to Article 10 of the bilateral agreement. Upon receipt of the recognition of transfer from the partner country, Switzerland publishes its own recognition of transfer and subsequently issues the attestations in the Swiss registry within 4 weeks.

Switzerland and the partner country undertake to provide the necessary information in accordance with the reporting guidance in Article 6 paragraph 2 of the Paris Agreement, including any corresponding adjustments.

The following documents must be submitted:

- monitoring report, duly verified and digitally signed
- Excel spreadsheet for calculating emission reductions
- digitally signed verification report
- where applicable, redacted versions of the above-mentioned documents for publication on the FOEN website
- where applicable, all related annexes (MAS, receipts, supporting documents, etc.)
- for projects abroad: project or programme authorisation granted by the partner country, duly signed

Plus (as part of the MR):

- Details of the project proponent
- Number of ITMOs and vintage year
- Reference to the underlying authorisation

The CO then accepts the MR as a transfer request, provided it contains all of the aforementioned information.

3. Fraction of non-renewable biomass fNRB

Mitigation activities that reduce the use of non-renewable biomass (i.e. cookstoves or biogas) need to establish robust methodologies for determining the fraction of non-renewable biomass (fNRB) – that part of the biomass used that will not regrow within reasonable time scales. Emissions from burning non-renewable biomass are considered to stay in the atmosphere for a long time, while carbon emissions from renewable biomass are removed from the atmosphere by the regrowing biomass. The fNRB parameter plays a crucial role in quantifying the effects of such activities and ensuring that emission reduction claims are justified.

To achieve this goal, Switzerland proposes a conservative approach that draws on international studies and tries to incorporate the lessons learned from projects registered under other standards. By utilising existing research and methodologies, the aim is to enhance transparency, accuracy and comparability across projects and regions.

Switzerland authorises mitigation activities using a default fNRB value of max. 30%. Mitigation activities can either use this value as a fixed parameter for the crediting period or define it as a dynamic parameter. Switzerland and the partner country may, however, define and apply to mitigation activities country-specific alternative fNRB values based on regional circumstances. These alternative values must be reflected in the mitigation activities methodology and must be based on a study jointly agreed on by Switzerland and the partner country.

There are three main aspects which Switzerland considers key for establishing such a study:

fNRB-values to reflect regional conditions

It is known that fNRB can vary greatly within a country. By adopting a regional approach, variations in biomass composition, availability and demand across different geographical areas can be accounted for. Local conditions can be taken into account and the methodology adapted to reflect regional realities as closely as possible.

Participation of a multilateral party or bilateral parties

Clear criteria for the sources and quality of data and methodologies used in determining fNRB should be established.. In order to maintain credibility and avoid potential conflicts of interest, studies conducted by project developers are not considered; instead, Switzerland prioritises independent, peer-reviewed research and studies. Studies may be conducted by UNFCCC, or the partner country and Switzerland may be involved in the development of the study.

MoFuSS[1] model to be considered in the study

[1] MoFuSS is an open-source freeware, which primarily models degradation rather than deforestation. Degradation occurs under the forest canopy or in open non-forest areas with low tree density. Monitoring these changes is more difficult than monitoring deforestation, which can be assessed by looking at changes in the canopy cover.

In the model, each year's wood harvest is simulated by considering the fuelwood and/or charcoal consumption from every populated pixel on a map and the accessibility of woody biomass to those pixels. Accessibility to both rural fuelwood (transported on foot) and urban fuelwood and charcoal (transported in vehicles) is determined by distance and terrain including factors such as elevation, land cover and road networks, while also accounting for borders and protected areas. Urban fNRB appears to be low because the model assesses fNRB harvest location. Demand in urban areas is met by other regions.

The logistic growth function (which in our view is more representative than the assumption of constant growth in CDM Tool 30) also makes MoFuSS dependent on the assumptions about the current biomass stock in relation to the maximum stock.

Expert knowledge and experience, including historical data to determine fNRB values, are only available from partner countries. Switzerland therefore considers fNRB values established by a partner country, provided they are compared with values from MoFuSS. As there is no way to objectively measure fNRB, modelling remains the best way to proceed, even though no model is perfect. Switzerland refers in large part to UNFCCC-funded studies, based on MoFuSS, as this model was published after scientific peer-review and is being further developed by UNFCCC. Furthermore, Switzerland adopts the MoFuSS approach with regard to i) its logistic growth function, ii) the aggregation of many years instead of a snapshot and ii) future projections to represent the state of the art. If a study bases fNRB values on a model other than MoFuSS, deviations from MoFuSS must be explained, input data must be traceable and the study must be reviewed by an independent third party.

The following table gives an overview of the different ways to determine fNRB values and the consequences for authorisation by Switzerland.

Table 1: Ways to determine fNRB and authorisation requirements.

fNRB value derivation	Authorisation by Switzerland possible?	Regional resolution necessary?	Comment
30% or lower	yes	no	Default value in line with previous decision of the Compensation Office and CDM Tool 33. If a national fNRB value is lower than 30%, but no regional values are defined, 30% may be applied but only as a dynamic parameter.
Higher value derived from MoFuSS-model including international review	yes	yes	International review may be conducted by UNFCCC, or Switzerland and the partner country may be involved in the development of the study. Project proponents may be allowed to challenge the model's input parameters and partner countries may request updates to the input data of the MoFuSS model. If up-to-date, reliable and demonstrably conservative data are available, they may be considered in an updated calculation with MoFuSS and will be assessed on a case-by-case basis.
Higher value derived from different models, but differences to MoFuSS can be explained and input data is traceable and reviewed by an independent third party.	yes	yes	A cross-check of data has to be part of the study.
Higher value derived from MoFuSS based on input data from the project developer only, i.e. without independent third-party review.	no	n.a.	
Higher value derived from other models only.	no	n.a.	
Higher value derived from CDM Tool 30 only.	no	n.a.	

4. Plausibility check for cookstove-related activities

This section sets out the CO's minimum requirements for monitoring plans for cookstove-related activities. The main goal is to accurately quantify emission reductions and to avoid the risk of over-crediting, pursuant to Article 5 paragraph 1 letter c No 4 of the Swiss CO_2 Ordinance. The quantification of emission reductions achieved by mitigation activities that reduce fuel consumption

is directly linked to household fuel consumption, usage rate, and the number of stoves installed. It is therefore essential that the monitoring plan, sample design and sample size are set out in a way that reliably and accurately reflects these factors. It is important to note that the following conditions apply in addition to the general requirements for offsetting projects and programmes found in the CO_2 Ordinance.[2]

Monitoring design overview

Description of the target population: In order to account for project-specific circumstances in the monitoring plan, a description of the target household and the livelihoods of the occupants must be provided. This should include insights into their activities and practices, as well as the social and environmental factors that influence them, such as geographical location, seasonality, occupations, income and household structure. The objective is to evaluate the diverse behaviours of the target households in relation to fuel consumption, cooking practices and the primary influencing factors. The results of this evaluation should be incorporated into the sampling design, for example by stratifying factors such as urban versus rural households and different stove technologies. Some influencing factors may not be relevant as they may already be included in the definition of the target population.

Each cookstove/household is considered an individual project within a programme. Inclusion criteria must therefore be clearly defined, and each cookstove/household must fulfil these criteria to be eligible for inclusion.

The inclusion criteria must be explicitly defined and designed to ensure that each project included in the programme meets the requirements of Article 5a paragraph 1 letter c of the CO_2 Ordinance. The inclusion criteria are exhaustive and must be applied to all projects in a programme. If a project fails to meet the inclusion criteria, it cannot be part of the programme.

The inclusion criteria should be presented in a structured format (e.g. table), clearly specifying:

1. Eligibility criteria
2. Criteria application
3. Criteria verification

[2] The requirements may be updated whenever relevant changes occur in international stove monitoring requirements (e.g. Clean Cooking Alliance, CCA guidance).

Example of inclusion criteria:

No	Eligibility criteria	Criteria application	Criteria verification
1	Geographical area	Describe where stoves will be installed. Differentiate between urban and rural settings.	• Total Sales Record/ programme database including name, address, phone number of the beneficiary, date etc. • Cross-check the urban or rural characterisation of the household with local statistical data
2	Baseline fuel profile	Explain which baseline fuels are eligible and which are excluded, if any. Difference between urban and rural taken into account.	• Total Sales Record/ programme database including name, address, phone number of the beneficiary, etc. • Pictures of kitchen areas and baseline stoves before installation, giving GPS coordinates and date. • Cross-check with local statistical data on % of fuel consumption (differentiate urban v. rural)
3	Avoidance of double counting: Emission reductions achieved by the cookstoves in the activity cannot be claimed elsewhere	The beneficiary must sign an acknowledgement and acceptance of a carbon waiver for each cookstove sold under the activity.	• Sales records • Carbon waiver
4	The distribution of the cookstove under the programme is additional	The device payback period is monitored in subsequent surveys and compared with the original values.	• Details can be verified by means of the monitored parameters – fuel price (P_{fuel}) and device payback period ($P_{payback}$).
5	The parameters necessary to calculate emissions reductions achieved by the programme can be measured and checked for plausibility	All parameters described in the MADD for calculation of the emissions reductions are determined ex-ante or monitored during the implementation of the activity.	• (specific references to the MADD)
…			•

Please note that these are just examples and may not fully apply to your specific project context. For other examples, please see already registered Projects abroad.

Real time data collection from the field

Emission reductions are only recognised if they are 'verifiable and quantifiable'. Realtime data from the field are the basis for a recognisable quantification of the emission reduction (Art. 5 para. 1 let. c No 1 CO_2 Ordinance). Data should be collected using:

1. **KPT:** The Kitchen Performance Test (KPT) is the principal field-based procedure to measure household fuel consumption in the baseline as well as in the project scenario (specific fuel savings – SFS). The KPT may be based on the latest methodologies such as the Gold Standard Reduced Emissions from Cooking and Heating: Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC),[3] or the Comprehensive Lowered Emission Assessment and Reporting 2 (CLEAR) Methodology for Cooking Energy Transitions.[4] The FOEN may have additional requirements beyond those of established methodologies. The KPT is used to record actual consumption and any reductions in solid fuel use in the baseline and project scenarios *in addition* to the metered data on electric stoves.

2. **Stove use monitors (SUMs)** (usage rate): The plausibility of the usage rate must be verified using continuous sensor-based measurements of stove usage (temperature, electricity usage).

3. **Surveys** (qualitative): Qualitative data acquisition to gauge how people feel about the cook stoves, identify problems quickly, check plausibility of the inclusion criteria of the projects in the programme, establish usage rate (SUM) and fuel consumption (KPT) and finally, to verify whether the SDGs defined in the programme are met.

4. **Appropriate sample design**: Requirements to minimise the risk of over-crediting are set out below for each of the data collection approaches 1–4.

4.1. Kitchen Performance Test (KPT)

4.1.1 General requirements

- The households participating in KPTs must be randomly selected. Details are to be provided in the MADD.

- KPTs should be performed in at least two groups of households, one using the old stove (reference households = baseline) and one using the new stove (project households). The reference household should be representative of the participants targeted by the project activity. Details are to be provided in the MADD.

- Baseline and project KPTs must be performed simultaneously throughout the year, e.g. quarterly, to capture possible seasonality effects. If stratification is defined in the MADD, e.g. i) urban and rural households, ii) different project cookstove types, the KPT should further differentiate this stratification and the sample size should be calculated accordingly for each stratum (see section 4.4. Sampling design).

- The MADD should explain how people will be motivated to participate, especially the reference households, which do not receive an improved stove.

4.1.2 Length of test period

[3] https://globalgoals.goldstandard.org/407-ee-ics-technologies-and-practices-to-displace-decentrilized-thermal-energy-tpddtec-consumption/

[4] https://unfccc.int/sites/default/files/resource/A6.4_PNM004_appendices_methdology_clear.pdf

An appropriate KPT test period should be selected and an explanation given as to how the period captures the representative cooking pattern. The reason for the number of KPT test days (min 3 days) and why this is appropriate should also be given.

4.1.3 Frequency of data collection

Frequent monitoring is required to account for variation in climate (geographical and seasonal) and other external factors (e.g. traditions or other occupations which could influence cooking habits) influencing fuel consumption throughout the year. It must be clearly explained how the chosen frequency and measurement duration reflect the possible seasonal variations in consumption. Any external factors that might influence consumption fluctuations should be discussed. Ongoing coverage during the monitoring period is considered best practice and any deviation from this must be explained.

4.1.4 Sample size

If data cannot be collected for all programme participants, a representative sampling approach may be applied. The number of KPTs involved should be determined in the sampling design (See Sampling design, section 4.4).

4.2. SUMs (stove use monitors = sensors), usage rate

The plausibility of usage rate must be established by means of continuous sensor-based measurements of stove usage (temperature, electricity consumption).

4.2.1 General requirements

Ideally, cookstoves in all active projects should be fitted with a sensor. Where this is not the case, reasons should be given.

4.2.2 Test period

If possible, measurements should be recorded continuously over a period of at least one year. Where this is not possible, reasons should be given.

4.2.3 Frequency of data collection

If digital data reception is not possible, data should be collected frequently to ensure no data loss.

4.2.4 Sample size

A sampling approach may be adopted if it is not possible to obtain digital data following the requirements in section 4.4.

4.3. Surveys

Project-specific surveys should be conducted at different stages of the project. The complete survey/questionnaire forms part of the MADD. The suitability of the survey questions should be assessed during monitoring/verification and adapted as required.

The method of data collection and storage should be described and details of the person(s) responsible given. Information regarding sample design and sample size should also be provided.

- **Initial survey before start of project:** This survey should be carried out before stoves are sold or distributed. It may also include households that do not adopt the stove. The goal is to estimate how people feel about the stove, to identify differences among the households such basic social, economic and cooking information of the community families, to identify eligibility of household participation and to check the plausibility of inclusion criteria. The results of the initial survey will also influence sample design.

- **A follow-up survey (following installation):** This may be conducted after the stove has been in use for a while to identify both strengths and weaknesses in the stove's performance and to promptly correct any problems.

- **Monitoring survey:** The goal is to acquire qualitative data about performance and use of the stove. The data collected should be in line with the parameters used to calculate the emission reduction, plausibilisation of inclusion criteria and KPT/SUM data. Finally, parameters to monitor and verify SDG alignment should also be collected.

4.4. Sampling design

If the entire target population cannot be measured, a sampling approach can be applied. The sampling must be unbiased and involve reliable estimates of the parameters used to calculate greenhouse gas emission reductions. Minimum requirements for sampling design are described below.

Sampling must be random and is in principle conducted by the FOEN, possibly in coordination with the partner country, based on the information provided and at the request of the project owner. Suitability and representativeness of the target population (e.g. different technologies, difference between urban and rural areas, household compositions, climate etc.) should be described and explained. If a randomly selected household cannot be properly accessed, the consequences should be described in the monitoring plan.

The following must be considered:

- The latest version of the sample size calculator from CDM (sampling and surveys for CDM project activities should be applied).[5]

- In case of a stratified sampling approach: Sample size should be defined for each stratum independently.

- Realistic drop-out rate, so that the minimum calculated sample size can actually be reached.

- Sample design is to be adapted regularly on the basis of real data (mean and standard deviation). The sample size should be recalculated after each monitoring period using to the CDM tool. As a result, the sample size may increase or decrease depending on variation variation in the monitoring data.

- Expected mean/SD must be comprehensible and data-backed.

- A high level of confidence/precision should be applied 95/5. The imprecision of 5% must be discounted from the calculated emission reductions to avoid over-crediting (Art. 5 para. 1 let. c No 4 CO_2 Ordinance). If the imprecision exceeds 5% in the actual measurements during monitoring, this higher imprecision must be discounted from the calculated emission reductions.

[5] Sample size calculator version in 2025 in Annex 6 of: https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_%28ver04.0%29.pdf

Example:

$ER_y = BE_y – PE_y - LE_y$ – imprecision adjustment factor

Where:
ER_y Emission reductions in year y (tCO_2e/yr)
BE_y Baseline emissions in year y (tCO_2e/yr)
PE_y Project emissions in year y (tCO_2e/yr)
LE_y Leakage emissions in year y (tCO_2e/yr)

- The percentage of emission reductions covered by the sample must be stated (transparency measure).

- The MADD should contain details of how the random sampling is to be conducted. The FOEN selects projects randomly, possibly in coordination with the partner country, from the full list of active and planned new projects submitted by applicants before the start of monitoring.

5. Requirements for Methane Emission Reduction Projects in Rice Cultivation

Summary

Mitigation activities that reduce methane emissions through adjusted water management in rice cultivation (e.g. Alternate Wetting and Drying, AWD) require robust methodological guardrails.
These guidelines outline the requirements for methane emission reduction projects in rice cultivation and are intended to aid regulators and validators in assessing such projects. The list of criteria is not exhaustive and should be applied alongside the general guidelines for all carbon offsetting activities. Meeting these criteria does not constitute an automatic methodological approval, as the criteria may be adjusted depending on project-specific circumstances and evolving requirements.

The basic emission reduction mechanism of AWD-type projects is the reduced release of methane from soil during rice cultivation through a change in water management. Historically, continuous flooding of fields is applied. Given the prolonged period of anaerobic conditions on the rice fields, substantial amounts of methane (approx. 3-6 tCO_{2eq} / ha / season) are released. Adjusted water management (e.g. via AWD) reduces methane emissions by periodically draining rice fields. This introduces oxygen into the soil and methane release is reduced (approx. 1-3 t CO_{2eq} / ha / season). Greenhouse gas emission processes are complex, and soil is a complex biological system. The nature of the soil and its interaction with the atmosphere depend on temperature, soil treatment, fertilisers, etc. and can vary even over the surface of one field. Because of these multi-factorial influences, robust empirical monitoring is particularly important.

<u>Common practice analysis</u> (Additionality (Art. 5.1.b.1 CO_2 Ordinance))

- A thorough common practice analysis should be carried out using independent data (e.g. from agricultural census data, peer-reviewed scientific literature or similar) to assess whether activities of the same project type are registered under other carbon market standards (Verra, Gold Standard etc.).
- Inclusion criteria should include an assessment of common practice as well as define a historical lookback period, ideally including satellite imagery evidence of water practice during previous growing seasons.
- Common practice should be assessed according to appropriate geographical stratification. *For example: Country XY has a rate of AWD application of 2% of total rice fields, but in the region*

xy, where the activity is to take place, the rate is 25%. In other words, the activity is already common practice in the given region.

<u>Financial analysis and benefit sharing mechanism</u> (Additionality (Art. 5.1.b.1, CO_2 Ordinance))

- An investment and barrier analysis should be provided. This can be based on the explanations in Chapter 6 of the FOEN notice.
- Importantly, the financial analysis should be carried out for each individual farm(er).
- Depending on the stratification approach taken, the size of the farms included should be discussed. The size of the farm may impact the financial additionality analysis (economies of scale effects, especially if water pumping is involved).
- If relevant, savings resulting from a reduced use of diesel water pumps for irrigation or any other savings due to the reduction in water use should be included in the additionality analysis for each farm.
- The carbon revenue impact for farm(er)s should be clearly stated and the benefit sharing mechanism defined in the MADD. The monitoring concept should include verifiable proof of the described sharing mechanism.
- The effect of the AWD intervention on rice yields should be considered in the additionality analysis.

<u>Inclusion criteria</u> (Programmes, Art. 5a.1.c CO_2 Ordinance)

- In the case of programmes, concrete inclusion criteria should be defined along with the exact data acquisition mechanism and plausibility checks.
- Specifically, the mechanism for acquiring the exact coordinates of participating rice field areas should be described.
- Details should be given of utility and workability of digital media for continuous monitoring. If digital platforms are used, data transmission should be described (how good is the internet connection? What kind of information is recorded and how? What happens if no mobile connection is possible?).
- If relevant, exclusion criteria should be defined in the case of non-compliance with inclusion criteria or if the participant wishes to withdraw from the programme. The inclusion criteria are generally assessed once at the start of the programme for any given participant. This may include the willingness and availability to provide data on the digital MRV platform. Details should be given of how non-compliance will be handled, and wherever possible, of how the plausibility of the inclusion criteria is to be verified (e.g. via satellite imagery).

<u>Emission reductions calculation</u> (Art. 5.1.b.3 and Art. 5.1.c.1 CO_2 Ordinance)

The following should be addressed:

- The impact of N_2O emissions and of CO_2 emissions (via soil organic carbon) on the total GHG emissions balance; fertiliser application – which may lead to substantial N_2O emissions in both baseline and project scenarios – and specifically its use in the MRV approach and its impact on the emission reductions calculation; soil organic carbon, which may be significantly altered by applying AWD.
- Uncertainties related to the quantification of the relevant greenhouse gases (CH_4, N_2O, CO_2) and their effect on the emission reduction calculation.
- Potential leakage from limited water availability under the project specific circumstances.
- Seasonality and its effect on the calculation of emission reductions.

Baseline setting (Art. 6.2.d CO_2 Ordinance)

If relevant, details of a stratification approach should be given in the MADD including, *inter alia*:

- sater regime
- soil type
- organic matter management
- fertiliser application
- climate zones

Monitoring (Art. 5.1.c.1 CO_2 Ordinance)

Measurements of both project field as well as baseline control sites must be clearly and comprehensively described in the MADD. These may include, but are not limited to:

- water level sensors
- satellite imagery and remote sensing, especially to monitor water levels for each field participating in the programme
- closed-chamber GHG measurements (CH_4, N_2O), including an explanation of frequency, duration and location of measurements to be rolled out to deliver statistically viable proof
- SOC content
- Modelling of soil methanogenesis and nitrous oxide fluxes
- PVC tubing (including a pre-defined density of the number of PVC tubes per ha or per farm)

6. Guidelines for Photovoltaic Projects

1. Types of photovoltaic (PV) projects

PV offsetting projects can take several forms:

1.1 PV plants for self-consumption: These systems are typically installed on rooftops or other structures such as parking areas or garages. Their main purpose is to replace electricity from the grid or that generated by fossil-fuel generators (genset) or both (reference). Where local regulations permit, any electricity surplus not consumed on site can be injected into the grid (see also below). Such projects are often grouped into a programme.

1.2 PV plants for grid injection: These are ground-mounted solar farms that inject renewable electricity into the grid. Their purpose is to replace electricity produced from fossil fuels in the reference scenario, thereby reducing the national grid emission factor.

1.3 PV plants with Battery Energy Storage System (BESS): In some cases, PV plants are combined with a BESS. These systems store surplus electricity that cannot be consumed on site and/or injected into the grid. For example, electricity may be stored during company shutdowns or maintenance periods (no or low consumption) or when the grid cannot absorb the electricity produced. Stored electricity can be stored to be sold at a later date at a better price. BESS is covered in detail in Chapter 7 of this document.

1.4 PV-plants for e-mobility charging: These systems are coupled with e-mobility projects/programmes and are not covered by these guidelines.

This document provides guidance specific to photovoltaic technology. General requirements (e.g. pursuant to Arts 5-6 of the CO_2 Ordinance) must still be included in the MADD and discussed in the validation report.

2. Grid emission factor

Grid emission factors must be taken from official government publications. If official data are not available, the applicant should use the values provided on request by the Compensation Office.
The grid emission factor must be updated regularly and must not be older than two years at the start of the monitoring period.

3. Reference and project scenario

3.1 PV for self-consumption

The reference scenario is the amount of electricity from the grid or from fossil generators that is to be replaced by solar electricity generated by the project. Emission reductions are calculated by multiplying the electricity consumption (kWh) in the reference scenario by the grid emission factor of the partner country (see also above). The following key aspects must be considered:

3.1.1 Project duration:

The standard project duration is 25 years and this must be reflected in the financial analysis. Any deviation from this value must be justified (e.g. region- and technology-specific studies).

3.1.2 Reference consumption

- The reference is typically grid or fossil generator electricity consumption. A combination of both is also possible. For simplification, a conservative approach which takes into account the lower-emission power source only (usually grid) may be taken.
- The annual adoption rate or legal targets for photovoltaics disregarding the offsetting project should be included with a conservative **reference factor** where applicable.
- If the area is regularly affected by **power cuts/outages** and PV can reduce these interruptions:
    - Where (hybrid) inverters or BESS[6] allow PV production/consumption during a power outage, a correction factor that reflects such production must be integrated in the reference scenario, as no electricity would have been consumed during these periods without the project.
    - Where inverters do not allow PV production without grid power and no BESS is installed, no correction must be applied. The applicant must explain why no hybrid inverter is installed.
    - Where a generator already existed before the project, no correction is required, as the generator would have overcome the outage.

3.1.3 Grid injection

- If grid injection is permitted in the partner country and/or region where the project is implemented, emission reductions for grid injection may be claimed. Details must be given by the applicant in the MADD.
- If grid injection is not possible technically or is not permitted under local regulations, the applicant must clearly describe how the electricity surplus is to be managed (e.g. stored or restricted by a limitation system preventing grid injection).

3.1.4 Measurement

- The amount of fossil electricity displaced by the PV installation can be estimated by recording the amount of power generated by the installation.

[6] When a conventional inverter detects a grid failure or other anomalies, it disconnects from the grid and the PV system stops producing solar power. Hybrid inverters allow continuous operation even without a grid connection. In some cases, PV production remains possible without a battery/BESS (but at a limited power output). The combination of a hybrid inverter and a battery allows full use of the solar installation in the event of a grid failure. See also: Électricité solaire en cas de panne de réseau.

Installing a battery with a conventional inverter compensates for a power outage but does not allow the PV system to continue producing energy.

- PV production is measured on inverters that are coupled with data loggers. Loss between production and consumption/grid injection is negligible. PV production can therefore be used as the parameter for electricity consumption/the amount injected into the grid.
- Unlike smart meters with remote reading, manual readings require photographic evidence.
- A plausibility check or sampling method must verify data accuracy for electricity consumption. When only part of the data is verified, the applicant should draw up a sampling concept to verify the plausibility of the electricity consumption assessment. The sample should be based on representative projects and must be verified by the verification body. This could be done based on Chapter 4.
- Systems should not be oversized to artificially increase ITMOs. To this end, PV installation must be dimensioned to cover electricity/capacity need, especially when storage or grid injection are not possible.
- Missing data must be conservatively estimated or set to zero if it cannot be shown that the installation was in operation.

3.1.5 **Project emissions** must be taken into account but are typically negligible. In rare cases, PV may indirectly cause emissions (e.g. increased genset use). This may occur when electricity consumers stop relying on the grid and instead use PV combined with a genset.

3.1.6 **Leakage** can occur when the project indirectly enables new grid connections or when PV replaces generators that are then resold elsewhere. In this case no emission reduction can be taken into account.

3.2 PV-plant for grid injection

The reference is the amount of grid electricity produced in the partner country that will be replaced by solar electricity generated through the project. Emission reductions are calculated by multiplying the electricity injected into the grid (kWh) by the grid emission factor of the partner country (see also above). The following key aspects must be considered:

3.2.1 **Project duration:** The standard project duration is 30 years and must be reflected in the financial analysis. Reasons must be given for any deviation from this value (e.g. region and technology-specific studies).

3.2.2 **Reference and measurement**

- The reference is typically the national grid generation replaced by the PV-plant.
- Legal targets of photovoltaics in the absence of the offsetting project should be included with a conservative **reference factor** where applicable.
- Only electricity injected into the grid (i.e. not losses or self-consumption) counts towards emission reductions.
- Production must be measured by calibrated meters and crossed-checked for plausibility (see also section 7.2 of the FOEN notice ‘Offsetting CO_2 emissions: projects and programmes’).

3.2.3 **Project emissions** produced by the project must be taken into account. If fossil-fuel back-up generation is used, emissions must be counted unless they are below 1% of the total emission reductions of the project (see section 4.6 of the FOEN notice 'Offsetting CO_2 emissions: validation and verification'). Even if project emissions can be disregarded, it must still be demonstrated in every monitoring report that they represent a negligible share (< 1%) of the emission reductions.

3.2.4 **Leakage** may occur when the project indirectly creates new grid connections. In this case no emission reduction can be accounted for.

4. Additionality and financial analysis

Offsetting projects must demonstrate additionality, meaning that without ITMO financing they would not otherwise take place. This is particularly true for PV projects, as this technology is well established in some countries and can be profitable under certain circumstances. The following key aspects must be considered:

- The **reference scenario must be reflected** in the financial analysis, covering the entire project duration or integrating a residual value of the main investment. The technical and regulatory possibility of injecting into the grid should also be considered.
- Where projects are grouped into a programme, a financial analysis can either be conducted for each project or can be based on a representative demonstration of the economic unfeasibility of all the projects in the programme. In this case, the analysis must be carried out for the most economically feasible activity, taking conservative values (see section 6.1, Box 'Specific information for programmes' of the FOEN Notice 'Offsetting CO_2 emissions: projects and programmes').
- PV installations usually do not replace an existing system but are a complementary source of electricity. Financial analysis of PV projects typically involves comparing the project's IRR (Internal Rate of Return) to a benchmark. The applicant must calculate a project IRR but can also provide an equity IRR to reinforce the analysis. Other methodologies may be used in accordance with section 6.3 of the FOEN notice "'Offsetting CO_2 emissions: projects and programmes'.
- **All parameters** must be supported by independent sources or internal and legally recognised documentation.
- **Revenue** is determined either by electricity saved from the grid or from fossil generators (self-consumption) or power sold (grid injection). To calculate this revenue, the production potential (MWh/MWp) as well as its price must be established:
    - A conservative revenue estimate assumes that all production potential is either self-consumed or injected into the grid at the highest price listed below.
    - Production potential may be determined using real measurements or tools from reliable sources such as Global Solar Atlas.
    - Correction factors may be applied if justified: e.g. the correction is not already considered in the estimated production potential, and it can be shown that this potential cannot be reached. This might be the case when electricity surplus can neither be injected into the grid nor stored, or when local conditions (high temperatures in summer), existing building design (shading) or maintenance periods reduce this potential.
    - For PV-plants, the electricity is sold at prices concluded in a Power Purchase Agreement (PPA, long-term contract between an electricity producer and a buyer, defining the price, quantity and duration of the electricity purchase), contracts or at spot prices (the current market price at which a commodity or electricity can be bought or sold for immediate delivery). Applicants must clearly state which of these applies to their project.

    - For self-consumption projects, the price of electricity saved (market-based) may differ from the price of electricity injected into the grid (set by contract with electricity purchaser or grid operator).
    - Any subsidies or external financial support must be disclosed and considered in the financial analysis.
- **Project costs** are mainly composed of capital expenditure (CapEx) and operating expenditure (OpEx).
    - CapEx includes the cost of equipment (PV-modules, inverter, cable, meters…) and its installation, as well as the costs of designing and setting up the plant. If justified, other costs may be considered.
    - OpEx includes use and maintenance costs, insurance, land lease (PV-plant for grid injection). OpEx can be determined as a percentage of CapEx. Values of OpEx components must be justified.
- **Benchmark** may reflect the company's internal benchmark (such as Weighted Average Cost of Capital, WACC), the current national bank interest or a specific return on investment such as benchmarks from the CDM Tool 24. Default values in Table 1 of the CDM Tool 24 are benchmarks to be compared with equity IRR and not with project IRR. Project IRR is generally compared with WACC. The parameter used to calculate WACC (share equity/debt, capital and debt cost and tax rate) must also be documented and justified. Capital costs may be taken from the CDM Tool 24.
- **Sensitivity analysis** varies the main parameters (CapEx, OpEx, prices) by 10%. If the project becomes profitable under a particular scenario, the applicant must thoroughly justify why such variations are unlikely (e.g. contractually defined fixed prices).
- **Periodical review/updates** of the financial analysis must be regularly conducted for programmes as both parameters and influencing factors are very dependent on market fluctuations.

5. Remarks

CDM methodologies may help to determine emission reductions and financial analysis of a project but cannot be used for calculating the grid emission factor. Calculation of emission reductions and additionality should be conservative and must comply with both the Swiss and partner-country regulations.

7. Guidelines Battery Energy Storage Systems (BESS)

1. Summary

Battery Energy Storage System (BESS) is an electrical energy storage technology that uses batteries to store electricity for later use. Large-scale BESS can be connected to the electrical grid. They are classified either as **integrated BESS**, meaning they are technically linked to and directly charged by an integrated renewable energy generation park, or as **stand-alone BESS**, meaning they charge from and discharge to the electrical grid. They generally serve two purposes, which can be implemented either independently or simultaneously: they can inject predominantly renewable energy at strategic grid nodes to limit curtailment, and they can provide capacity and ancillary services to the electrical grid, such as frequency regulation, spinning reserve, grid forming and black-start capabilities.

Emission reductions achieved by using batteries result primarily from decarbonising the electrical grid by storing renewable energy that would otherwise be curtailed, and discharging it into the grid, thereby replacing fossil-based sources. Typically, this means the BESS charges during the day when

renewable solar energy is abundant and discharges it at night when the electrical grid tends to be more carbon intensive. In addition, the intermittent nature of renewable energy sources increases the demand for grid services, which can be effectively provided by BESS. Electricity system operators typically generate high-frequency operational and market data to ensure the efficient functioning of electricity markets. The robust data environment makes BESS well suited for carbon offsetting projects, although the availability and granularity of data may vary across countries.

These guidelines set out the requirements for BESS projects and are intended to facilitate understanding of the FOEN's requirements for this specific type of mitigation activity. Please note that these methodological requirements are subject to periodic updates; applicants should therefore consult the most recent version before submitting the Mitigation Activity Design Document (MADD) to FOEN. Three months after publication, thelatest version of this documentbecomes mandatory for project applicants. The information presented here is not exhaustive and should be applied in conjunction with the general guidelines for carbon offsetting projects.

2. General description of the mitigation activity

In describing the mitigation activity, it should be clearly stated whether the project or programme involves a stand-alone BESS or an integrated BESS. If the programme includes both stand-alone and an integrated BESS, and the carbon accounting methodologies differ between these two configurations, the programme must be split accordingly, and two separate MADDs must be submitted – one for each methodology.

Details of the following should be given:

- electricity market in the country where the mitigation activity takes place
- degree of market regulation, distinguishing between vertically integrated, regulated markets and liberalised or deregulated markets

For regulated markets:

- dispatch protocols (where available) especially with respect to renewable energy generation, grid injection, and curtailment practices

For liberalised markets:

- applicable merit-order mechanism, including whether the price of the marginal unit is determined through bidding or based on generation costs.

3. Methodology

The FOEN does not prescribe a specific methodology for BESS projects. The applicability of a given methodology depends on the characteristics of the country's electricity market and on whether the BESS is deployed as a stand-alone or an integrated system. Accordingly, the selected methodology must be appropriately tailored and must convincingly account for both configurations.

To ensure that the calculated emission reductions remain conservative, it is essential to measure or estimate a marginal grid emission factor for both the charging and discharging phases of the BESS. For stand-alone BESS mitigation activities, the grid emission factor during charging must not be assumed to be zero but instead be derived during monitoring. To assess the risk of leakage resulting from energy displaced by the battery being exported beyond the system boundaries, it must be specified whether the electricity grid in the country of the mitigation activity operates as a closed system or is interconnected with other electricity markets.

4. Monitoring

As electricity grid data is usually very comprehensive, a clear 'how-to' guide for completing and using the monitoring file should be provided. There should also be remarks on data accuracy and the advantages of a statistical software package over an Excel-based system, particularly when working with

large datasets. If a statistical package is used, both the VVBs and the FOEN must be able to perform plausibility checks and spot checks.

5. Additionality

To conduct the common practice analysis, the following indicator must be calculated for target market penetration and must remain below the common practice threshold percentage jointly defined by the partner country and the FOEN:

$$PTM(m) = \frac{Inj_{12m,BESS}(m)}{Inj_{12mfossil}(m)} \times 100\ \%$$

Whereby:

$Inj_{12m,BESS}$ (m): Injection of BESS energy in MWh over the last 12 months
$Inj_{12m,fossil}$ (m): Injection of fossil fuelled electricity generation in MWh over the last 12 months

Because large-scale BESS require substantial capital investments, ITMO revenues represent a relatively small portion of the total project costs. Accordingly, the common practice analysis serves to complement the investment analysis in assessing financial additionality. For programmes, the financial additionality must be demonstrated at the time of inclusion by means of an investment analysis, as battery prices are expected to decline substantially over time.

8. Guidelines for electric mobility programmes

This chapter provides guidance for activities introducing new electric vehicles (EVs) to displace the use of fossil-fuel vehicles in passenger and freight transport.

1. Programme scope (Arts 5, 5a and 6 CO_2 Ordinance)

1.1 Programmes may not cover more than one vehicle category (e.g. motorcycles, buses, trucks).

1.2 Vehicles of the vehicle category included in the programme must be intended for the same type of service (e.g. city bus, intercity coach, taxi services).

1.3 Hybrid and plug-in hybrid vehicles are not eligible.

1.4 The charging strategy for project vehicles must be specified.

2. Programme structure (Art. 5a.1.c and Art 5.1.g CO2 Ordinance)

2.1 Each vehicle is a project; inclusion criteria should therefore be defined at the vehicle level.

2.2 Vehicle ownership and ownership of emission rights must be clearly specified.

3. Reference emissions (Art 5.1.c.4 CO2 Ordinance)

Reference emission calculation is generally based on the assumption that diesel-, gasoline- or natural-gas-powered vehicles are operated in the baseline.

3.1 An adjusted baseline with a correction factor based on the share of EV sales must be applied where data is available (e.g. the average EV sales share in 2027 is 30% -> emission reductions for vehicles included in 2027 are multiplied by the factor 0.7). If data is not available, an alternative approach for conservative calculation of reference emissions accounting for future baseline developments must be presented.

3.2 A biofuel correction factor should be included if relevant (e.g. if the biofuel share of petrol is 5% -> emission reductions are multiplied by a factor of 0.95).

3.3 Assumptions for specific fuel consumption of reference vehicles must be conservative.

4. Project emissions (Art 5.1.c.1 and Art 5.1.f CO2 Ordinance)

Project emissions result from electricity consumption of project vehicles.

4.1 If grid electricity is used to charge the project vehicles, grid emission factors must be taken from official government publications. If official data is not available, the applicant must apply the values provided on request by the Compensation Office. The emission factor must be updated regularly and must not be older than two years at start of the monitoring period.

4.2 If the project vehicles are charged with renewable energy, zero emissions can only be counted if it can be proven that the renewable energy was additionally produced as part of the offsetting project (e.g. the offsetting project is decisive for the construction or operation of the energy generation plant that supplies the charging stations).

5. Additionality and financial analysis (Art. 5.1.b.1 and Art. 5.1.b.3 CO2 Ordinance)

5.1 Additionality must be shown by means of a financial analysis (either project-specific or representative) at the vehicle level.

5.2 All financial incentives by national, regional or local governments must be incorporated into the financial analysis.

5.3 If a representative financial analysis is chosen, the chosen parameters and assumptions must be conservative for all vehicles eligible in the programme (e.g. lowest electric vehicle CapEx in the programme).

5.4 The representative financial analysis must be repeated on a yearly basis with an update of the influencing factors (vehicle prices, energy prices, etc.) for as long as new vehicles are allowed to be included in the programme.

5.5 If available, market penetration rates should be analysed to show that EVs are not common practice (limits of < 8% market share of EVs in the total vehicle stock and < 50% of market share of sales are recommended).

6. Monitoring (Art. 5.1.c.1 and Art. 9.3 CO2 Ordinance)

6.1 A verifiable list of each vehicle in the programme must be provided with appropriate evidence (e.g. registration and purchase date).

6.2 Distance driven must be measured and recorded for each project vehicle and over the entire credit period.

6.3 Measured electricity consumption of project vehicles must be part of monitoring.

7. Leakage (Art. 5.1.f CO2 Ordinance)

7.1 The MADD must include a discussion of the potential risk that the higher demand for electricity may be met by additional fossil fuel-based electricity generation (especially at times of peak demand).

7.2 Lifecycle emissions should be quantified and discussed.

Links

- FOEN notice for projects and programmes: Climate: Enforcement aids
- FOEN notice for validation and verification bodies: Climate: Enforcement aids
- Mitigation Activity Summary template: Applicants
- Bilateral climate agreements
- CO_2 Ordinance (requirements for offseting projects Arts 5–12)
- Emissions Trading Registry of Switzerland

9. Amendments

This document contains the amendments made to version 4.21 of February 2026:

- Updating of wording and improved document readability
- Section 7: New: Guidelines for Battery Energy Storage Systems (BESS)
- Section 8: Guidelines for electric mobility programmes