ISCC CORSIA

GUIDANCE FOR LOW LUC RISK CERTIFICATION

Document Title: ISCC CORSIA – Guidance for Low LUC Risk Certification

Version 1.1

Content

1 Introduction

Low LUC risk feedstock

ISCC CORSIA 205 document[1], chapter 6, lays out the requirements for cultivating feedstocks with a low risk for land use change (LUC) for the production of CORSIA eligible fuels (CEF). The intention of this guidance document is to provide additional guidance on eligible low LUC risk practices, their verification as well as on the general low LUC risk certification process under ISCC CORSIA.

Induced land use change

According to the "CORSIA Supporting Document, CORSIA Eligible Fuels – Life Cycle Assessment Methodology"[2], promoting crop-based SAF may encourage cropland expansion and cause GHG emissions from land use change. As a result of land competition between croplands and natural lands, interactions among markets, and trade among regions, land use change and related emissions may become a global phenomenon that goes beyond the regions expanding biofuels production. This is called biofuels induced land use change (ILUC) emissions. ILUC emissions could occur where the new feedstock production for CEF is taking place (direct land use change) but also in other locations due to the displacement of crops (or animals) for which the land was previously used (indirect land use change).[3]

Default ILUC values

Under CORSIA, a default life cycle assessment (LCA) value is defined for ILUC in the ICAO document "CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels"[4]. This value has to be accounted for in addition to the core LCA value (see also ISCC CORSIA 205, chapter 3.3). As stated in ISCC CORSIA document 205, chapter 6, using certain types of land and land management practices (LMP) could be considered as a contribution to low risk for LUC and therefore receive a value of zero for ILUC instead of the default value. The implementation of these low LUC risk practices for a project shall avoid market mediated responses that lead to changes in land use, and lead to additional CEF feedstock available relative to a baseline, without increasing land requirements.

2 Scope and Normative References

Global application

This document provides additional guidance on the certification of low LUC risk feedstock for CEF. The provisions laid down in this document apply on a global basis.

Scope of application

As a basic principle, all ISCC CORSIA documents published on the ISCC website in their latest applicable version are valid and shall be considered for the scope of application. The following documents are applicable for the certification under "ISCC CORSIA low LUC risk" as well:

[1] ISCC CORSIA 205 "Life Cycle Emissions", p. 12-15
[2] ICAO document "CORSIA Supporting Document, CORSIA Eligible Fuels – Life Cycle Assessment Methodology", p. 78
[3] ICAO website "Life Cycle Emissions of Sustainable Aviation Fuels"; https://www.icao.int/einvironmental-protection/pages/SAF_LifeCycle.aspx
[4] ICAO document "CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels"

> ISCC CORSIA 102 Governance
> ISCC CORSIA 103 Requirements for Certification Bodies and Auditors
> ISCC CORSIA 201 System Basics
> ISCC CORSIA 202 Sustainability Requirements
> ISCC CORSIA 203 Traceability and Chain of Custody
> ISCC CORSIA 204 Audit Requirements and Risk Management
> ISCC CORSIA 205 Life Cycle Emissions
> ISCC CORSIA 206 Group Certification

References

The guidance for the certification of low LUC risk feedstock provided in this document is applicable under both ISCC CORSIA and ISCC CORSIA PLUS. Therefore, as a basic principle, all references made to ISCC CORSIA in this document apply to ISCC CORSIA PLUS as well. Whenever differences between the two systems apply, this is explicitly stated.

3 General Requirements

Two approaches

There are two approaches for low LUC risk feedstock production for CEF:

a) Yield Increase Approach

b) Unused Land Approach

Examples

The yield increase approach applies to any situation where feedstock producers are able to increase the amount of available feedstock out of a fixed area of land. This can include for instance the implementation of an improved fertilizer management, better mechanisation or training courses for farmers to improve agricultural practices. The unused land approach covers all approaches in which previously unused land is used to cultivate sustainable feedstocks for CEF production. This can include for instance cultivating CEF feedstocks on marginal lands or degraded pasturelands.

Verification

The practices will be verified in an audit by the certification body as a net enhancement in CEF feedstock available per unit of land. The feedstock producer needs to provide credible and verifiable evidence of the nature of the new land management practice, timing of its implementation and level of additional feedstock production.

Report and documentation

Any economic operator who would like to claim low LUC risk practices as described in this chapter is required to document them in a written report. This report is called “low LUC risk report”. The report shall, in sufficient detail, describe the low LUC risk measure(s) implemented. Chapter 4 provides further information on the content of the low LUC risk report. ISCC provides a template for the report that include fields for required information, such as crop type, the approach used, the practice used or a description of the area where

the measures were carried out. The truthfulness of the report and its compliance with the ISCC CORSIA low LUC risk requirements will be verified by the auditor.

Verification of compliance

The auditor will forward the low LUC risk report to ISCC along with the summary audit report and all other relevant certification documents. The certificates of any System User in the downstream supply chain who owns and/or handles the certified low LUC risk feedstock/material will include information about the low LUC risk practice applied.

Traceability and chain of custody

To ensure that low LUC risk claims are correctly tracked through the chain of custody and that no double-claiming of low LUC risk certified feedstocks for CEF occurs, System Users handling low LUC risk certified feedstock need to comply with the traceability and chain of custody requirements laid down in ISCC CORSIA System Document 203.[5]

Limitations

Low LUC risk practices implemented on or after January 1, 2016, could be eligible. Exceptionally, practices implemented between January 1, 2013, to December 31, 2015, may be accepted where it can be demonstrated that low LUC risk practices were implemented primarily as a result of demand for biofuels. This would have to be demonstrated on a project-specific basis.

Feedstock designation

Feedstocks designated under the low LUC risk practices approach are designated as such until 2030 and will be subject to periodic audits to ensure ongoing compliance with the original requirements when the feedstocks were certified.

4 Management Requirements

Low LUC Risk Report

Prior to an ISCC CORSIA low LUC risk certification, the System User shall prepare the low LUC risk report. The report shall contain all relevant information specified in this chapter, as applicable. Annex I specifies the relevant data that shall be available at the beginning of each audit to substantiate the content of the low LUC risk report.

4.1 Description of Selected Land

Baseline for comparison

In order to allow for the identification of the selected land for the low LUC risk certification, the characteristics of that land shall be indicated in the low LUC risk report. This will allow for a comparison between the standard (baseline) crop system and the crop system where the yield increase approach or the unused land approach respectively is applied.

Description of selected site

The selected land shall be described using the following parameters (if applicable):

- Farmer name, farm address
- Scope of the farm
- Overall size and managed area of the farm
- Ownership/ Status of lease;

[5] ISCC CORSIA 203 “Traceability and Chain of Custody”

> Certification approach: individually certified, part of a first gathering point/country elevator, member of a group of farms/ plantations
> Size of selected land, geographical data/polygones
> Description of history of selected land – at minimum 5 years before the implementation of the yield increase measure

4.2 Description of Yield Increase Approaches

Additional feedstock

Additional feedstock can only be claimed and calculated after the implementation of a measure that can be considered as a yield increase approach. Measures that could be considered eligible are laid out in chapter 5 of this document.

Information requirements

If the yield increase approach is applied, the System User therefore has to provide the following information in the report:

> A qualitative description of the situation of the farm before the yield increase approach was taken (description of current practices, specifically relevant to the envisaged yield increase measure).

> A description of the yield increase measure, the timeline over which it was or will be applied and whether it will be combined with other yield increase measures.

> An explanation of the expected future yield growth.

4.3 Historic Crop Yield

Historic crop yield data

The yield increase approach requires the determination of a baseline crop yield. In order to calculate this baseline, data on historic crop yields are needed. The historic data shall be crop-specific and for the given selected land. The data set shall include historical crop yields for the preceding five years before the implementation of the yield increase measure.

4.4 Calculation of Yield Baseline

Annual and perennial crops

The baseline shall be calculated by the System User and is to be included in the low LUC risk report. The purpose of the yield baseline is the determination of the additional amount of biomass being produced. The calculation has to be done crop-specific and has to be calculated for each selected land. Further, it can be determined either for each type of yield increase measure or for a combination of measures applied. There are different approaches for annual crops and perennial crops respectively. For annual crops, the historic crop yield is used to determine the yield baseline, whereas for perennial crops the yield development curve over the lifetime of the crop shall also be taken into account. Please see chapter 5 for further information on the calculation of the yield baseline.

Yield baseline unused land

If the unused land approach is used, the yield baseline is set to zero.

4.5 Demonstrating Land Status

Description and verification

The land status has to be demonstrated by the System User using appropriate evidence. This is necessary in order to define and verify the applicable approach for low LUC risk feedstock production. The land status will be verified by the auditor at the beginning of the certification process.

4.6 Sustainability of Low LUC Risk Practices

Sustainability requirements

The certification under “ISCC CORSIA low LUC risk” is only possible if the System User complies with the applicable sustainability requirements provided under ISCC CORSIA. This is to account for, amongst other examples, situations where the low LUC risk practices may otherwise have a negative impact on environmental and social services of the land and resources used, or negatively affect the uses or productivity of resources in other places.

4.7 Estimation of Increased Biomass Yield

Estimating increased yield

An estimation of the effectiveness of a yield increase measure shall be provided by the System User. Comparing the yields that are expected to be achieved after the yield increase measure has been implemented via the yield baseline, helps to estimate how much additional yield will be achieved by the respective measure. This estimation shall be documented in the low LUC risk report. The report shall set reasonable expectations for the additional yield in relation to the applied measure. Therefore, it shall refer to scientific literature, experience from field trials, information from agronomy companies and experts, seed/ fertilizer producers, etc.

Variance of volumes

The actual volume of the biomass certified as “low LUC risk” will vary each year and will depend on actual yields achieved after the implementation of the yield increase measure.

5 Yield Increase Approach

Eligible measures

The yield increase approach applies to any situation where feedstock producers are able to increase the amount of available feedstock out of a fixed area of land (i.e. without expanding the surface of the land). An increase in the harvested feedstock may be the result of the following options (non-exhaustive) and shall be documented and described in the low LUC risk report:

a) An improvement in agricultural practices (practices that increase yields through means such as increased organic matter content, reduced soil compaction/erosion, decreased pests, etc.);

b) Intercropping (i.e. the combination of two or more crops that grow simultaneously, for example as hedges or through an agroforestry system);

c) Sequential cropping (i.e. the combination of two or more crops that grow at different periods of the year);

d) Improvements in post-harvest losses (i.e. losses that occur at cultivation and transport up to but not including the first conversion unit in the supply chain), including also:

e) Mechanical improvements (e.g. using machinery that reduces inputs to enhance output or reduce losses, includes also sowing, precision farming, the introduction of a new harvest machine or new/ faster truck ensuring lower post-harvest losses)

f) Non-mechanical inputs (e.g. the introduction of new seed technologies that save chemical and non-chemical inputs or improve crop resistance against climate change and drought)

Claiming additional yield

A verifiable yield increase measure needs to be applied to be able to claim that additional feedstock has been produced on a selected land. Only additional yield above the yield baseline can be claimed as "ISCC CORSIA low LUC risk". If two or more operational yield increase measures are applied together in the same year on the same selected land, the additional feedstock produced is evaluated against the same yield baseline.

Calculating additional feedstock

The amount of additional feedstock available and considered eligible for low LUC risk feedstock is calculated as follows:

1) Determination of the yield baseline
2) Determination of the actual feedstock/ biomass being produced
3) The additional feedstock represents the difference between the actual feedstock minus the determined yield baseline

Growing of second crop

Where a second crop is grown (sequential cropping) on a selected land after the primary crop has been harvested, the entire feedstock production is considered as additional.

Decrease of feedstock

If there is a decrease of the available feedstock for the food or feed market at the project level resulting from the LMP (e.g., reduced yield from the main crop) this shall be accounted for by calculating the reduction in an appropriate unit of measurement.

Reduced main crop yield

An approach to take a reduced yield of the main crop into account should be based on the energetic value. The volume of low LUC risk feedstock (e.g. camelina) would be reduced by a volume equivalent to the energy value loss of the main crop (e.g. peas) in the following year.

Annual fluctuations

Further, annual fluctuations in yields in agriculture should be taken into account. Average yields of the main crops based on historic yields should be used to countervail those deviations. A five year period should be used as reference.

5.1 Calculating Yield Increase for Annual Crops

Data for yield baseline

The yield baseline for annual crops is the average yield of the respective crop (for which the yield increase measure is being applied) calculated over a five-year period immediately preceding the year of the application of the measure. The yield baseline shall be determined based on data from the same or similar

producers within the same region. Similar producers can be defined as producers growing the same (or equivalent) crops and using a similar management model (e.g., small- or large-scale plantation).). For producers to be considered in the same region, it shall be determined that the relevant location and site factors (e.g. soil, water and climate factors) are comparable and sufficiently representative.

Starting point yield baseline

Figure 1 illustrates the approach. The starting point of the yield baseline is in year zero. In this year, the yield increase measure is implemented. The yield baseline in year zero is the average of the annual crop yields of the respective crop, that has grown on the same selected land over the five most recent years before the yield increase measure was implemented.

Data availability

At least five data points shall be available to calculate an average that can be used as the starting point for the yield baseline. The most recent data shall be used and ideally no data that is older than ten years.

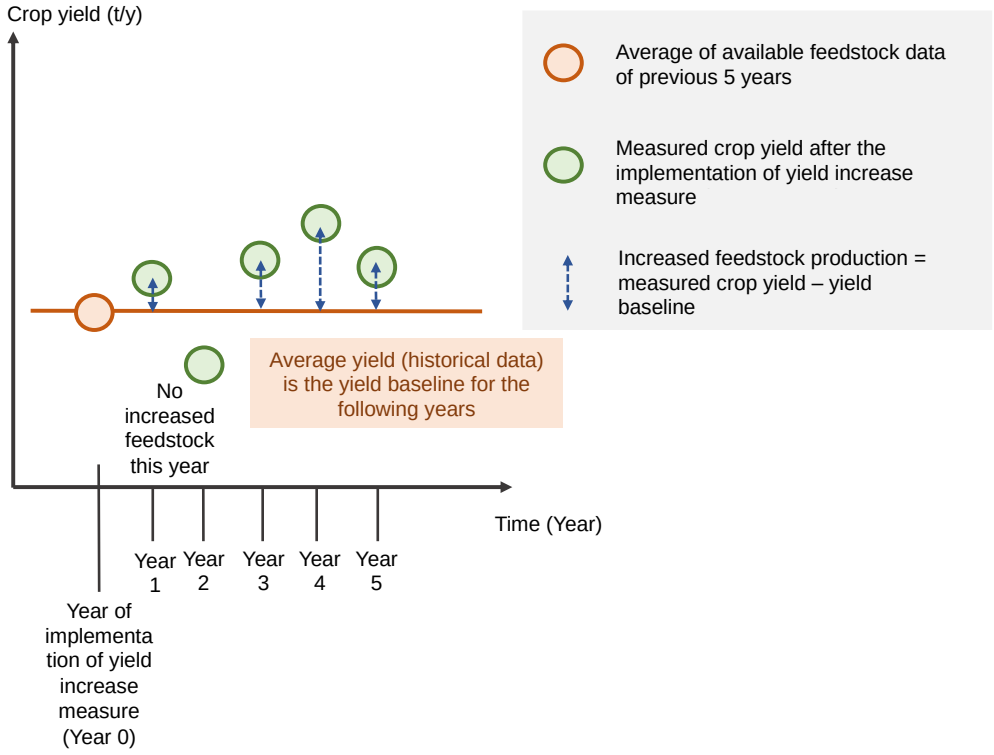

Figure 1: Yield baseline for annual crops

5.2 Calculating Yield Increase for Perennial Crops

Data for yield baseline

The yield baseline for perennial crops is the standard growth curve (metric tons/unit of land) over its lifetime. The standard growth curve shall be determined based on operational (historic) data from the respective farm/ plantation. In case this historic data is not available, data from similar producers within the same region, as found in FAO and/or peer-reviewed data sources, can be used. Similar producers can be defined as producers growing the same (or equivalent) crops and using a similar management model (e.g. small or large scale plantation.

Calculation of additional yields

Crop yields for perennial crops follow a curve over the lifetime of the crop, which mainly depends on the crop species and variety. After a yield increase measure is applied, higher yields are expected. In order to calculate the additional amount of yield, the observed yields are compared to a yield baseline, as is the case for annual crops. The difference in comparison with annual crops relates to the lifetime yield curve of the perennial crop that has to be considered when determining the yield baseline (please see figure 2). Therefore, the calculation is based on the age of the cultivated (perennial) crops.

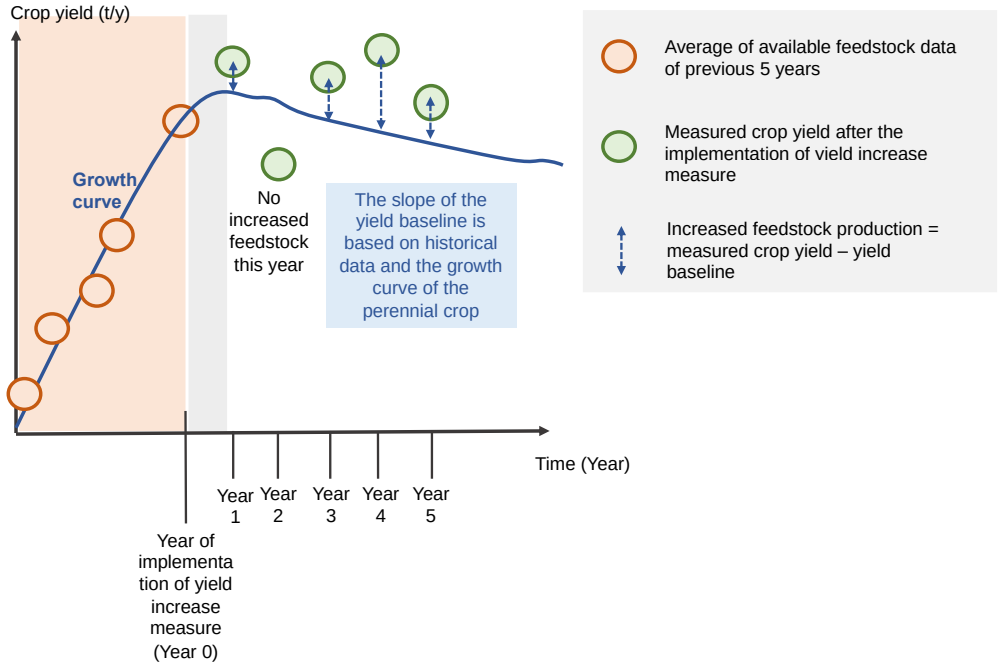

Figure 2: Yield baseline for perennial crops

6 Unused Land Approach

Scope of unused land approach

The unused land approach covers all approaches in which previously unused land is used to cultivate sustainable feedstocks for CEF production.

Low LUC risk feedstock

Under the unused land approach, the amount of feedstock considered as low LUC risk is equal to the amount of feedstock harvested for CEF production from the eligible land.

6.1 Eligible Lands

Eligible lands

Eligible lands for the unused land approach could include, among others, marginal lands, underused lands, unused lands, degraded pasture lands, and lands in need of remediation. For a land to be eligible for the unused land approach, it needs to meet one of the following criteria, while simultaneously complying with the ISCC CORSIA sustainability requirements (see ISCC CORSIA Document 202):

a) The land was not considered to be arable land or used for crop production during the five years preceding the reference date.

b) The land is identified as severely degraded land or undergoing a severe degradation process for at least three years.

Definition of degraded land

Land degradation in the context of ISCC CORSIA and based on the definition of the United Nations Convention to Combat Desertification (UNCCD) is a reduction or loss "of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical and biological or economic properties of soil; and (iii) long-term loss of natural vegetation".[6]

Displacement of services

For a land to be eligible for the unused land approach, it also needs to have little risk for displacement of provisioning services from that land onto different and equivalent amounts of land elsewhere. Provisioning services refer to products obtained from ecosystems such as food, animal feed, or bioenergy feedstocks. It can be assumed that the risk for displacement of provisioning services is little if the land was not used for provisioning of services in the three preceding years prior to the start of the measure.

6.2 Verification Guidance

Verification of land status

The land status of the selected land shall be described by the System User and will be verified by the auditor at the beginning of the certification process. Remote sensing data (e.g. as illustrated in figure 3) and other detective measures combined with auditing techniques such as interviews with local stakeholders may be needed to provide reliable results in the determination of land history and land status to verify "unused land" status.

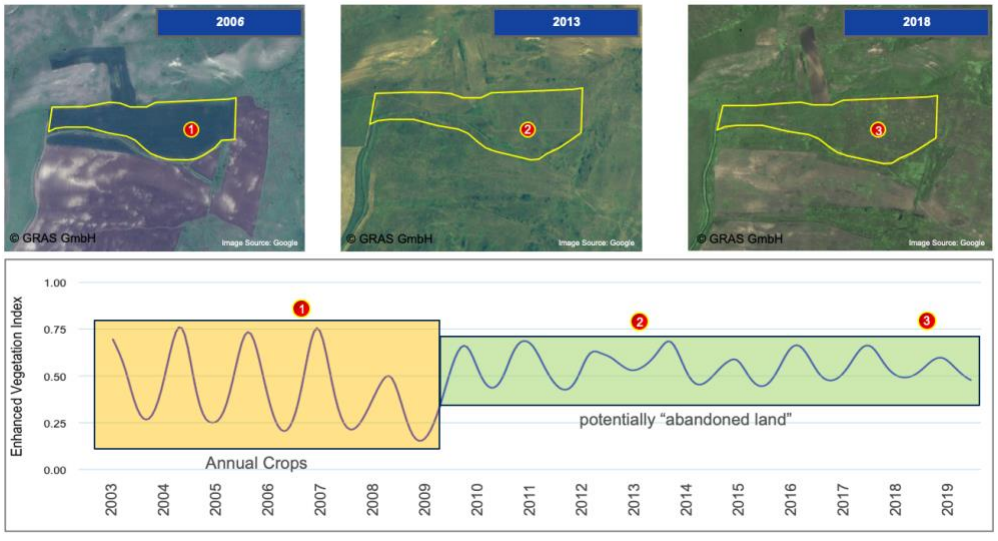

Figure 3: Remote sensing methods should be used to identify unused land and land use history (figure provided by GRAS[7])

[6] UNCCD Article 1(f).
[7] https://www.gras-system.org

Figure 4 provides an overview over the criteria for low LUC risk eligibility of lands under the unused land approach, gives examples of potentially eligible land categories as well as lists potential evidence for proving the respective land status.

Evidence for land status

	Option A	Option B
Criteria for low LUC risk eligibility	Land was not considered to be arable land or used for crop production during the five years preceding the reference date	Land is identified as severely degraded land or undergoing a severe degradation process for at least three years
	• Evidence of little risk for displacement of provisioning services	• Evidence of little risk for displacement of provisioning services • Land characteristics are in line with UNCCD definition
Land categories (non-exhaustive)	• Marginal lands • Underused lands • Unused lands	• Degraded pasturelands • Lands in need of remediation
Potential evidence	• Photographs and satellite imagery showing a period of at least five years during which no signature characteristic of agricultural production was evident • Evidence that the land was in non-agricultural management for at least five years • Evidence from local stakeholders	• Photographs and satellite imagery in which crops can be identified and where the photograph is dated to at least three years preceding the reference date • Proof (physical on-site inspection) of degradation of land: soil erosion caused by wind and/or water, deterioration of the physical, chemical and biological or economic properties of soil and long-term loss of natural vegetation → evidence from soil test

Figure 4: Overview of criteria, land categories and potential evidence

7 Audit Process

7.1 Registration and Certification Process

Add-on

The ISCC CORSIA low LUC risk certification is used as an add-on to an existing ISCC CORSIA certification. An economic operator certified under the low LUC risk approach will therefore have to have the standard ISCC CORSIA certification in place, to ensure compliance with all relevant ISCC CORSIA requirements. The initial audit for the ISCC CORSIA low LUC risk certification can, in principle, be conducted at the same time as an initial certification audit for ISCC CORSIA.

Synergies in certification

Some of the aspects required for ISCC CORSIA low LUC risk certification may already be checked in the context of the existing ISCC certification, such as System User identification, land tenure etc. This data shall still be documented in the low LUC risk report but does not need to be verified again. Similarly, general administrative elements can be adopted from the main certification under ISCC CORSIA.

Certification process

The certification process shall be conducted in line with the requirements laid out in ISCC CORSIA System Document 204.

Annual audits

Audits for ISCC CORSIA low LUC risk certification take place annually, analogously to the audits conducted for complying with ISCC CORSIA requirements.

System users eligible to apply

Based on the registration with ISCC CORSIA, the CB identifies the activities undertaken by the System User that are relevant for ISCC CORSIA low LUC risk certification, and which represent the relevant requirements to be verified

during the audit. Parties (System Users) who can apply for ISCC CORSIA low LUC risk certification are farms or plantations and groups of farms and/or first gathering points (FGPs) acting on behalf of the farms.

Additional information

When applying for certification under ISCC CORSIA, the following additional information for ISCC CORSIA low LUC risk certification shall be included:

- Information if the unit is already certified under ISCC CORSIA (fulfilling mandatory sustainability requirements in the framework of CORSIA)
- Name and contact details of the applicant, including where relevant the name, contact and location of members of a group for the purposes of group certification;
- Information on which low LUC risk approach is or will be applied;
- A description of the low LUC risk measure, including:
    - Details on the selected land where the yield increase measure is or will be implemented including current land use, management practices (e.g. use of a crop rotation system), access to current land yield data, and a statement on whether the land is unused or severely degraded if applicable;
- An estimation of the additional biomass that will be produced following the implemented approach (either through LMP or production on unused or severely degraded land).

Retrospective application

Ideally, the certification application should be made before implementation of the respective measure(s). Low LUC risk certification can however also be applied for low LUC risk practices implemented on or after 01 January 2016 (and exceptionally for practices implemented between 01 January 2013 and December 2015, please see chapter 3), if appropriate data and evidence are available to allow for certification. This would include that the mandatory information for registration as well as data needed for the low LUC risk report is documented and can be verified.

Certification process

Figure 5 shows the general registration and certification process for low LUC risk certification under ISCC CORSIA.

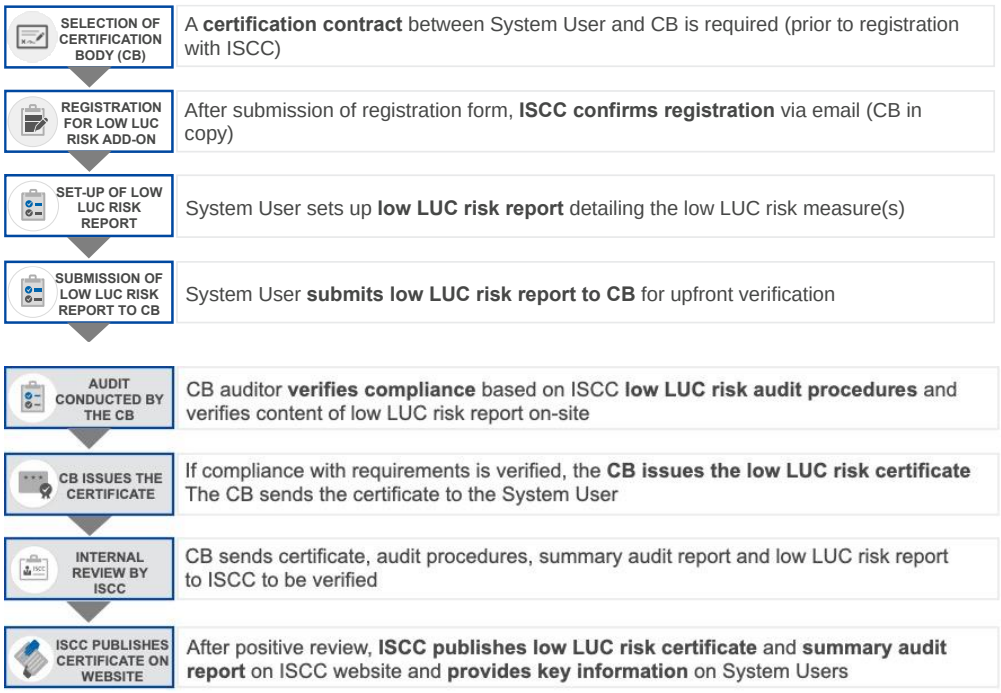

Figure 5: Registration and certification process for low LUC risk add-on

Setting up the low LUC risk report

Once the contract between CB and the System User is signed, the System User has to set up the low LUC risk report. The report shall allow for the comparison between the use of the selected land before and after the implementation of the respective measure. It shall be sent to the CB prior to the audit. After the audit has been conducted, the complete low LUC risk report shall be sent to ISCC by the CB.

On-site audit

The CB conducts an (initial) on-site audit to verify the report as well as the calculation and documentation of the yield baseline. Once the initial audit has been conducted successfully, the CB issues the respective certificate that shows the compliance of the System User with the low LUC risk certification requirements, which will later be published separately on the ISCC website.

Transparency

For transparency purposes, the respective information published on the ISCC website will include:

> Feedstock certified

> Date of issue and period of validity of the certificate

> Certification body used

> The low LUC risk approach used (yield increase or unused land)

> Description of the main features of the applied approach (including a short description of measures applied, e.g. sequential cropping; information on previous and current use of selected land)

Summary audit report

In addition, the CB will send a summary audit report to ISCC, detailing relevant audit results (see also ISCC CORSIA 204, chapter 3.2). This audit report will be published alongside the certificate on the ISCC website.

Low LUC risk audit procedures

ISCC provides low LUC risk audit procedures to ensure that all low LUC risk audits are conducted on the basis of the ISCC CORSIA low LUC risk requirements. The audit procedures support the work of the CBs and facilitate a consistent and comparable verification of requirements during low LUC risk certification audits. CBs are obliged to use the audit procedures provided when conducting ISCC CORSIA low LUC risk audits. System Users can use the audit procedures to conduct internal assessments, for internal training or to prepare for an audit.

Submission of audit procedures

The ISCC CORSIA low LUC risk audit procedures used during the audit shall be submitted to ISCC. This also applies if the external audit showed that the System User did not meet the ISCC CORSIA low LUC risk certification requirements and failed the audit.

7.2 Requirements for Audits

Audit requirements

As a basic principle, the requirements regarding the audit for an ISCC CORSIA low LUC risk certification are the same as described in the ISCC CORSIA documents 103 and 204. System Users are obliged to provide correct and complete data about the amounts handled as “ISCC CORSIA low LUC risk” to the CB. However, some specifics exist that are relevant for the verification of low LUC risk feedstocks.

Internal assessment

The add-on “ISCC CORSIA low LUC risk” shall be part of the internal assessment (self-assessment) of compliance with the ISCC CORSIA requirements at least once a year (see ISCC CORSIA 204). This internal assessment should focus on the ISCC CORSIA low LUC risk requirements applicable at the respective type of operation and on relevant risks (also see ISCC CORSIA 204, chapter 4.1.3). The results of the internal assessment shall be documented, reviewed and signed by the management of the System User. The results of the internal assessment shall be made accessible to the CB during the certification audit.

Specific auditor skills

In addition to the requirements for auditors laid out in ISCC CORSIA 103, the auditor shall have the appropriate skills necessary to conduct the audit. This includes knowledge and professional experience in the following fields:

> Agriculture, land management or a related field

> Land use characteristics and land categories

> Assessment of yield increase measures

7.3 Timeline for Low LUC Risk Audits and Reference Values

Timeline and reference values

Figures 6 and 7 illustrate the application and certification of the two low LUC risk approaches under ISCC CORSIA. Once a company has a certification contract with their CB in place and is registered as ISCC System User, it is required to set up the low LUC risk report, giving detailed information about e.g. the selected land and the measure(s) applied (please refer to chapter 4 for more details). The content of the report is verified during the initial as well as subsequent audits. The System User can then claim low LUC risk certified feedstock under ISCC CORSIA until 2030.

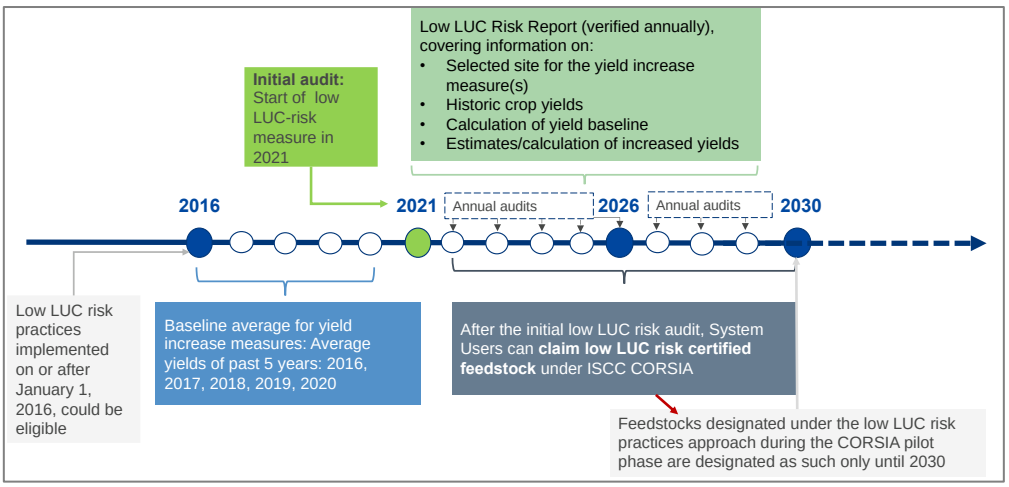

Figure 6: Timeline low LUC risk certification – Yield increase approach

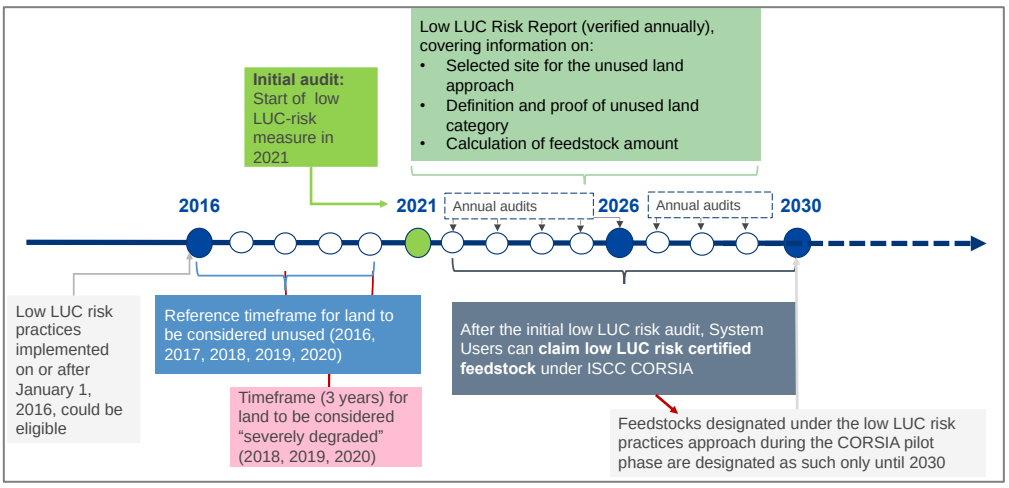

Figure 7: Timeline low LUC risk certification – Unused land approach

Annex I: Relevant Data for Audit Process

Information to be provided

The following information shall be available at the beginning of each audit to substantiate the content of the low LUC risk report.

Information from farm/plantation

Specific information related to the farm/plantation that is covered by the low LUC risk certification:

> Signature and confirmation of the producer that the farm complies with all requirements relevant for the certification of low LUC risk materials

> Depicted as polygons in geographic coordinates:

- Total area of the agricultural operation (total area of the agricultural unit, total size of the land area cultivated)
- Total area of agricultural operation where low LUC risk measure(s) were applied (delineated area) in ha

> Low LUC risk yield increase measure applied and date of initial (or planned) application

> Name and type of crops (annual/ perennial) relevant for low LUC risk certification including date of sowing and harvesting

> Total amount harvested (in metric tons) for the relevant crop (historical data to be used for initial audit, actual data for following audits)

> Average yields of the past five years (metric tons/ unit of land) for the relevant crops

> Calculation of the crop specific yield baseline

> Total amount of additional feedstock produced (estimate and rationale if initial audit, actual in following audits)

> Documentation of the actual crop yield achieved each year on the selected land, based on the yield baseline as a reference

> Demonstration of land status (if measures include planting on unused land)

> Demonstration of sustainability requirements in accordance with ISCC CORSIA

Information from first gathering point

Specific information to be provided by the first gathering point include:

> Number of farms/ plantations participating in the certification of “ISCC CORSIA low LUC risk”

> Total agricultural area of all “ISCC CORSIA low LUC risk” compliant individual farms/ plantations and total area of the agricultural operation where yield increase measure(s) were applied (selected land)

> Biomass received as “ISCC CORSIA low LUC risk” compliant from farms/ plantations during previous certification period

> Data for each farmer on starting date of yield increase measures, total biomass supplied per crop, total size of farm, total size per crop, yield per crop (t/ unit of land), average yield for the past five years, reference value (based on yield baseline), total amount of additional yield

Annex II: Practical Examples for Low LUC Risk Practices under ISCC CORSIA

Examples from pilot audits

This Annex provides practical examples for the application of low LUC risk practices in the context of ISCC CORSIA. The examples are taken from pilot audits that ISCC conducted in 2021 on the basis of the ICAO requirements for low LUC risk certification under CORSIA. The learnings from these pilot audits have also been incorporated into this guidance document.

Yield Increase Approach

Example 1: Cultivation of Camelina as Sequential Crop in France

Potential of camelina

Camelina is an oil crop, with an 40% oil content and 60% meal share. The meal contains a high level of proteins and is therefore a valuable raw material for the feed for livestock industry. The oil is currently mainly used for biofuels and cosmetics, but can also be used to produce SAF (HEFA). Camelina yields can amount to 1.5 – 2 tonnes per hectare. Industry sources estimate the global potential for camelina grown as a catch crop/cash cover crop/double crop at around 30 million hectares, mainly in the Americas and Europe.

Camelina as sequential crop

The farms in France apply a typical, multi-year crop rotation system. The yield increase measure used is the implementation of sequential cropping in the crop rotation with camelina as additional crop. The main crop after which camelina would be introduced as a sequential crop can be barley, which is harvested by the end of June or beginning of July. Afterwards, land is left fallow until the following winter crop or until a cover crop is planted, in order to reduce the risk of nitrogen leaching. A common oil cover crop used is mustard. Introducing camelina to replace mustard provides the opportunity for growing an additional “cash crop”, as camelina grows faster and can provide an additional yield, while other oil crops do not grow fast enough reach maturity. Normally, mustard can solely be used as “green” fertilizer. Using camelina provides the option to produce feed (meal) as well as oil for SAF production, while cover crops like mustard are usually not commercially used at all. Further advantages of using camelina as a cover crop is that it also mitigates nitrogen leaking and avoids erosion while providing services for pollinators at a critical moment.

Verification

During the pilot, the yield increase measure could be verified on the basis of documentation provided by the farmers. In cases where an additional cover crop was inserted into the crop rotation (as opposed to leaving the land idle during that period), remote sensing proved to be a valulable tool for verification.

Example 2: Improvement in Agricultural Practices for Palm in Colombia

Water needs of oil palm

Oil palm requires close to 150 mm of water per month to meet its monthly evaporation/ transpiration needs. If there is a deficit of close to 200- 300 mm, on a yearly basis, then the decrease in productivity could be close to 20%. Improved irrigation can thus be an effective measure to reduce the soil water deficit and thereby increase yields.

Set-up of irrigation system

The low LUC risk pilot was conducted on a palm plantation located in Northern Colombia. The pilot partner, a company active in the vegetable oil industry, produces and markets crude palm oil, palm kernel oil and palm kernel cake. The yield increase measure used is the implementation of an irrigation system across the plantation area (see figure 9), expected to increase the palm yield considerably.

Verification and data basis

Using the calculation approach as described in chapter 5.2 of this document provides for an accurate yield baseline for perennial crops. A robust yield baseline mainly rests on a solid data basis. In the pilot, data from both the individual producer as well as yield statistics from national associations were drawn from.

Unused Land Approach

Example 1: Cultivating on Marginal Lands in Spain

Degraded land in Spain

Large regions in Spain (up to 3 million hectares) fall in the category of marginal, fallow and/or degraded land, as there is only little annual precipitation. Barley grown mainly as monoculture is cultivated on these lands, however, due to the dry conditions, yields are low (between 1-3 tonnes per hectare). In southern Spain in particular, there is strong evidence of irreversible desertification effects and long-term loss of agricultural land, e.g. due to loss of organic carbon in the soil. About 20% of the territory in Spain is degraded and an additional 1% is actively degrading. Biomass produced on restored degraded land could be claimed as low LUC risk under the CORSIA framework and would support farmers to restore marginal land.

Camelina on marginal land

Farms in Spain cultivate camelina on marginal land as a main crop. With erosion and an organic matter content of the soil of below 1%, camelina is an appropriate alternative to be introduced as a rotation crop. Since 2010, the pilot partner cultivated approx. 40,000 hectares of camelina, including about 4,000 to 5,000 hectares of camelina cultivated in 2021.

Remote sensing verification

In the framework of the pilot audits in Spain, remote sensing tools (such as GRAS, see figure 8) in particular were used. The so-called “Enhanced

Vegetation Index" (EVI) provided information on the amount of "green vegetation" of the area in question, which could then be used to determine and verify the land use status in accordance with the low LUC risk requirements under CORSIA.

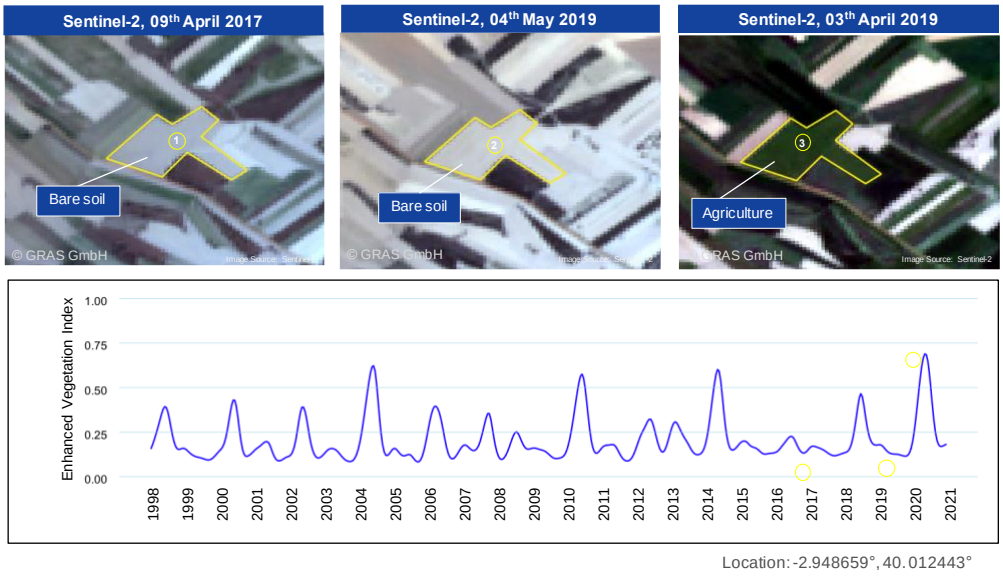

Figure 8: Assessment of land use history via remote sensing (figure provided by GRAS)

Example 2: Unused Land Verification with Remote Sensing in the USA

Former coal mining areas

Land reclaiming of former coal mining areas is very relevant in the USA, as since 1978 over 400,000 ha of land have been reclaimed and transformed into agricultural soil. The focus of the low LUC risk pilot was on farmers who started production of biomass on land that is reclaimed surface area from coal mining. Geographically, the pilot was centered on the Illinois coal basin with more than 200,000 ha of reclaimed surface mine land that have never been in agricultural production between 2011-2019, thus offering great potential for future biomass production. In parallel, remote sensing data was used to verify land categorization and land vegetation.

Remote sensing and interviews

Primarily, remote sensing data was used to map the respective lands (see also figure 9), verify land history and status as well as the eligibility of claiming feedstock from the that land as low LUC risk under CORSIA. The results from remote sensing were then further substantiated by conducting focused interviews with local farmers.

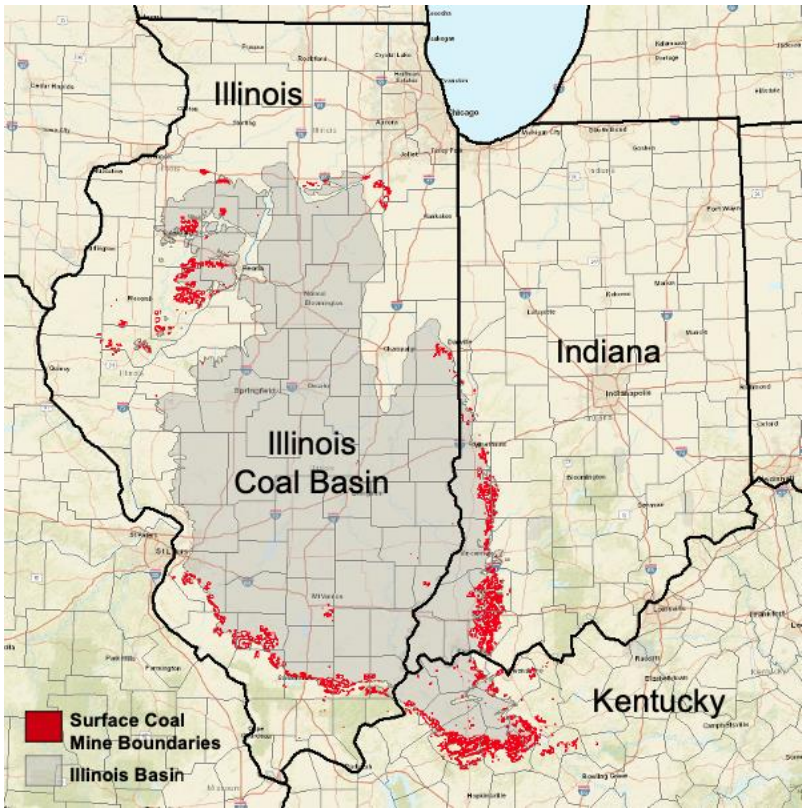

Figure 9: Mapping analysis of the Illinois Coal Basin to identify eligible areas (figure provided by GRAS)