BIKE

BIOFUELS PRODUCTION
AT LOW - ILUC RISK
FOR EUROPEAN SUSTAINABLE
BIOECONOMY

D 1.5

Final Report

Dissemination level:

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1 Introduction to ISCC and ISCC PLUS certification

The International Sustainability and Carbon Certification (ISCC) is a voluntary sustainability certification scheme which can be used by companies along complex supply chains to prove compliance with mandatory and voluntary sustainability requirements in the market. ISCC is independent and was developed via a multi-stakeholder initiative. The ISCC certification system covers all sustainable feedstocks, including biomass from agriculture, forestry and aquaculture; biogenic waste and residues; non-biological renewable materials and recycled carbon-based materials and products derived therefrom. With currently more than 8,000 valid certificates in more than 120 countries, ISCC is among the world's largest certification systems.

As part of the BIKE project, ISCC together with all project partners, pilot partners, auditors, and other stakeholders, developed a certification concept for low ILUC-risk biofuels, bioliquids and biomass fuels and implemented this certification framework as an ISCC add-on for the ISCC PLUS certification scheme. The relevant ISCC PLUS system documents for low ILUC-risk certification were tested via four pilot audits and can be used by companies, certification bodies and auditors to certify ISCC system users under this approach.

ISCC is a sustainability certification system for all markets, e.g., bioenergy, food and feed and industrial applications as well as markets with mandatory and voluntary sustainability requirements. Depending on the market to which companies would like to supply their sustainable materials, a specific certification system must be chosen. ISCC operates different certification schemes:

- ISCC EU is recognized by the European Commission for demonstrating compliance with the sustainability criteria for bioenergy as outlined in the Renewable Energy Directive (RED), and by the United Kingdom under the renewable fuel obligation. It applies to sustainable fuels used in the EU and UK;
- ISCC CORSIA is recognised by the International Civil Aviation Organization (ICAO) for the certification of CORSIA-eligible Sustainable Aviation Fuels (SAF). The scheme can be used to demonstrate compliance with the sustainability and GHG criteria for CORSIA eligible fuels;
- ISCC Japan FIT is a system of incentives to produce renewable electricity in Japan which includes subsidies for the procurement of palm kernel shells and palm trunks;
- ISCC PLUS is a sustainability certification scheme for voluntary markets, e.g., biofuels outside the EU and UK and industrial applications.

The ISCC certification systems are largely harmonised. Along ISCC certified supply chains, each element owning, trading, and processing the sustainable material must be certified. Under ISCC PLUS, the whole supply chain needs to be certified under ISCC. Group certification can be applied only at the beginning of the supply chain, on *farm* level or for *Point of origins* where waste and residue materials are generated. These elements are covered under the scope of the next element in the supply chain that is receiving the sustainable material directly from the farm or the point of origin and are verified on a sample basis. These companies are called *First Gathering Points* for agricultural products or *Collecting Points* for waste and residue feedstocks.

First Gathering Points and Collecting Points subsequently sell the sustainable material to companies that engage in further trading and/or processing of the material, such as its conversion into biofuel. Farmers who are implementing low ILUC-risk measures on-site at farm level and who are producing additional biomass in accordance with the low ILUC-risk criteria do not know, if and where the feedstock produced will end up in the supply chain and in which market (e.g., food, feed, bioenergy, industrial application) it will be used.

Consequently, the farmer must ensure that the biomass produced at the farm level meets the sustainability requirements for a wide range of markets and they must choose a certification scheme that is covering these different markets. This also includes low ILUC-risk certification, which can be carried out in addition to already existing sustainability certification.

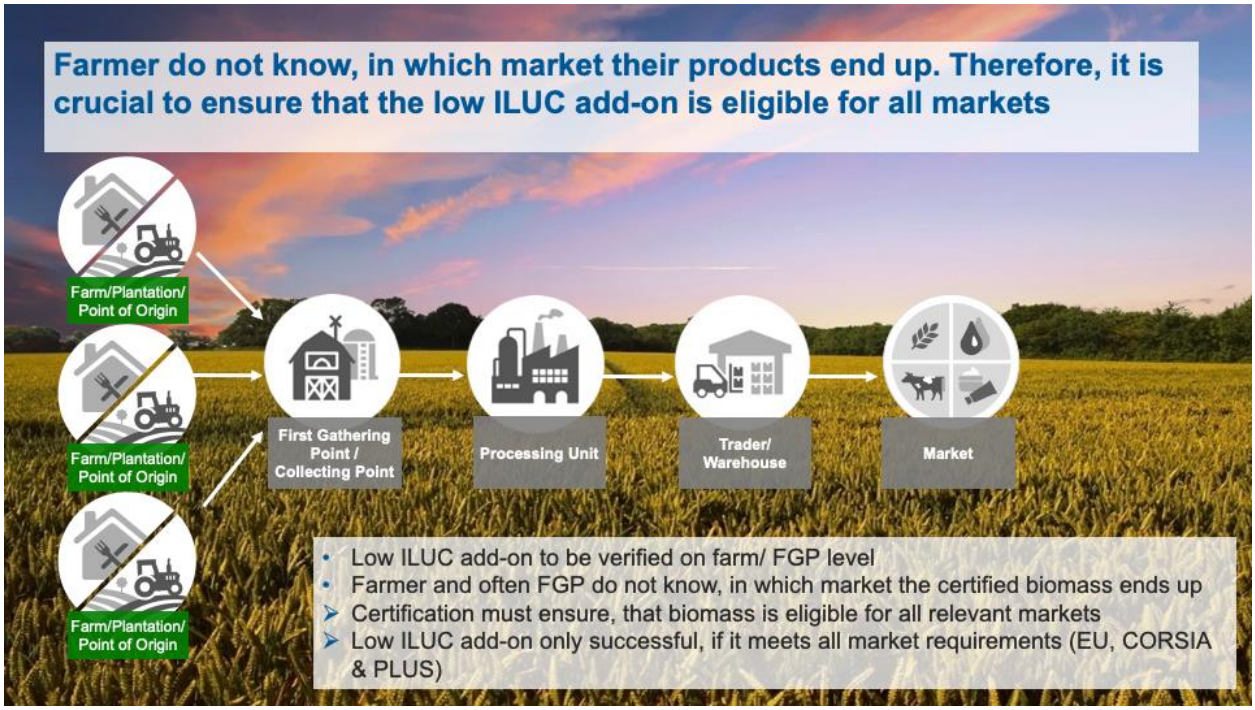


Figure 1: *Simplified supply chain for low ILUC-risk certification*

All kinds of agricultural feedstocks can be certified under ISCC, including annual crops like rapeseed, sunflower or cereals, as well as perennial crops like palm or miscanthus. Furthermore, ISCC certifies different agricultural systems (e.g., sequential cropping, intermediate crops) and ecosystems worldwide. Consequently, the low ILUC-risk certification approach must be applicable for all types of crops and worldwide.

To be qualified as sustainable under ISCC PLUS, agricultural feedstocks must be cultivated in line with the six ISCC Principles for sustainable raw material production. Behind these principles, 90+ sustainability criteria must be fulfilled by farmers, covering different aspects of sustainable feedstock production in agriculture. This “basic” sustainability requirements must met by farms and plantations applying for low ILUC-risk certification. Consequently, solely companies that are already certified under ISCC and thus show that they are fulfilling these basic requirements can implement low ILUC-risk measures and can receive an ISCC low ILUC-risk certificate as an “add-on” to the already existing certificate.

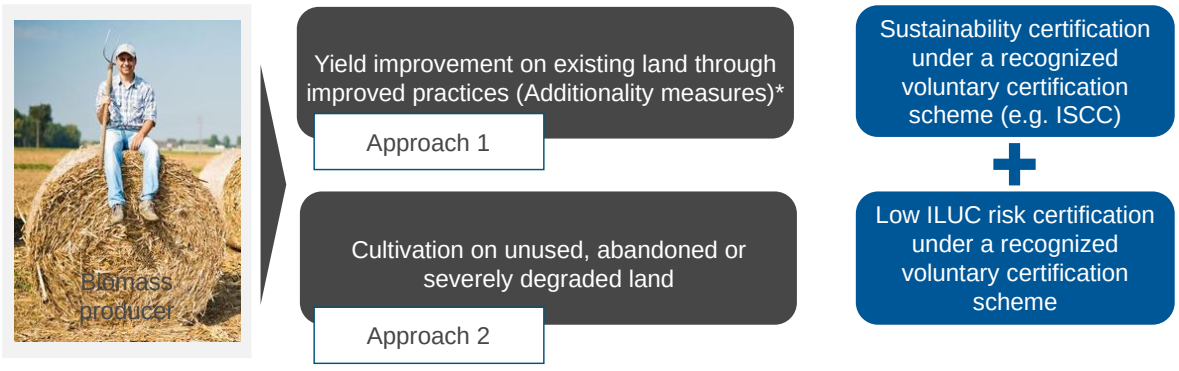
Figure 2: *The six ISCC Principles for sustainable raw material production*

2 Criteria for low ILUC-risk certification

Only feedstock that is produced "in addition" or "on top" of the normal biomass production can be claimed as low ILUC-risk feedstock. Furthermore, companies need to prove that the additional biomass was produced via improved management or cultivation practices, meaning that it is based on the implementation of an additionality measure ensuring an increased or "additional" biomass production on a defined plot of land.

The production of additional biomass can be applied using one of the two eligible approaches:

1. Yield improvement on existing agricultural land through improved practices (additionality measure);
2. Cultivation on unused, abandoned or severely degraded land.



* Additional feedstock can only be claimed as "low ILUC-risk" after the implementation of an additionality measure

Figure 3: *Approaches for low ILUC-risk biomass production*

As part of the IR 2022/996, the EU COM published a non-exhaustive list of additionality measures that can be used for yield increase. This list includes measures that go beyond conventional agricultural practices.[1] In addition to this list, the BIKE project identified further practices that may lead to yield increase and thus can be used to produce additional biomass. The developed list of additionality measures supports auditors and farmers in identifying potential strategies for increasing yields in the context of low ILUC-risk biomass production.

Additionality category	Additionality measure	Example
Replanting (for perennial crops)	Choice of crop varieties	Higher yield or short rotation variety, better adaptation to eco-physiological or climatic conditions.
Mechanisation	Machinery	Adoption of machinery that reduces/ complements existing workforce input to boost output or reduce losses. This could include sowing, precision farming, harvesting machinery or machinery to reduce post-harvest losses.
Multi-cropping	Sequential cropping	Introduction of second crop on same land in the same year.
	Agroforestry	Introduction of productive woody plants onto arable lands
	Intercropping	Introduction of a crop grown amidst the main crop or in-between ist planting rows, intended to be harvested or to be supportive to the harvest of the main crop
Management	Soil management	Mulching instead of plowing, low tillage; ridges; biochar application; crop residue integration
	Fertilisation	Optimisation of fertilisation regime, use of precision agriculture.
	Crop protection	Change in weed, pest and disease control, consistent with the principles of integrated pest management laid out in DIR 2009/128
	Pollination	Improved pollination practices.
	Landscape elements	Contour ploughing on steep slopes, terraces, buffer strips, field margins
	Genotype selection and improvement	Appropriate crop genotype selection and improvement
	Irrigation	Vegetated waterways and drainage, precision irrigation, rainwater harvesting with low-cost practices
	Other	Leaves room for innovation, combinations of measures and unforeseen developments.

Replanting at the end of the crop lifetime is always necessary for a perennial crop. For replanting to count as an additionality measure, the economic operator must prove that their replanting goes beyond 'business as usual'.
Source: BIKE WP 5

Figure 4: *BIKE project: list of additionality measures*

Only the "additional" biomass production can be claimed as "low ILUC-risk". To determine the yield increase annually, farmers must determine a baseline at the initial audit. This baseline will be used in the following years as a basis to determine the additional biomass being produced. "Additional" biomass is the quantity of harvested feedstock "above" this baseline. The baseline is the average of the three previous harvests of the main crop and a "slope" representing the annual increase of the worldwide yields for the relevant crops. In the case of perennial crops, the baseline is established based on an average or standard growth trajectory of the crop throughout its lifespan.

Besides the yield increase on land areas that are already used for agricultural production, the other approach for low ILUC-risk certification includes the cultivation on unused, abandoned and severely degraded land. Land classification is based on the definition of the EU COM for these different land categories:

- **Unused land** means areas which, for a consecutive period of at least 5 years before the start of cultivation of the feedstock used for the production of biofuels, bioliquids and biomass fuels, were not used for the cultivation of food and feed crops, other energy crops, or any substantial amount of fodder for grazing animals (DA 2019/807, Article 2);
- **Abandoned land** means unused land, which was used in the past for the cultivation of food and feed crops but where the cultivation of food and feed crops was stopped due to biophysical or socioeconomic constraints (DA 2019/807, Article 2);

[1] IR 2022/996, Annex VIII, A2

- **Severely degraded land** means land that, for a significant period of time, has either been significantly salinated or presented significantly low organic matter content and has been severely eroded (DIR 2018/2001, Annex V, part c).

Land classification is verified as part of the annual audits. In case farmers are aiming to produce additional biomass on one of the three land areas, the needed documentation to prove the land status must be available during the audit. Regarding low ILUC-risk certification on these land areas, farmers can claim the whole biomass as "additional" and can make a low ILUC-risk claim.

3 Pilot auditing

Based on the document from the EU COM describing the low ILUC-risk certification approach under the RED framework and on scientific literature on low ILUC-risk certification and stakeholder feedback, ISCC developed a draft certification approach for low ILUC-risk feedstocks which can be implemented into the ISCC PLUS framework. A draft guidance document explaining the certification approach and the relevant requirements and criteria for stakeholders, farmers and auditors was developed. In addition, draft certification documents were set up, which can be used during the auditing process. The draft audit procedures – summarizing all criteria that must be verified during the audit as well as a document checklist summarizing all documents and data to be provided by the farmers – were developed.

To test the draft certification framework, the requirements and the system documents, ISCC conducted four pilot audits. The aims of the pilot audits were:

- To test and further improve the draft system documents (procedures, checklist);
- To further improve the certification concept for low ILUC-risk certification (guidance document);
- To test the identified indicators and criteria "on-site".

The findings of the pilot audit as well as the feedback from farmers and auditors were documented and used to further improve the draft documents. A report summarizing the audits and main findings from the audits was submitted (Deliverable 1.3). For all the four pilot audits, ISCC cooperated with external ISCC auditors. The four pilot audits were conducted in different regions of the world, with the objective of assessing the certification requirements for different climatic areas as well as different types of agricultural land management. Consequently, different crops and low ILUC-risk approaches to achieve additional biomass were tested.

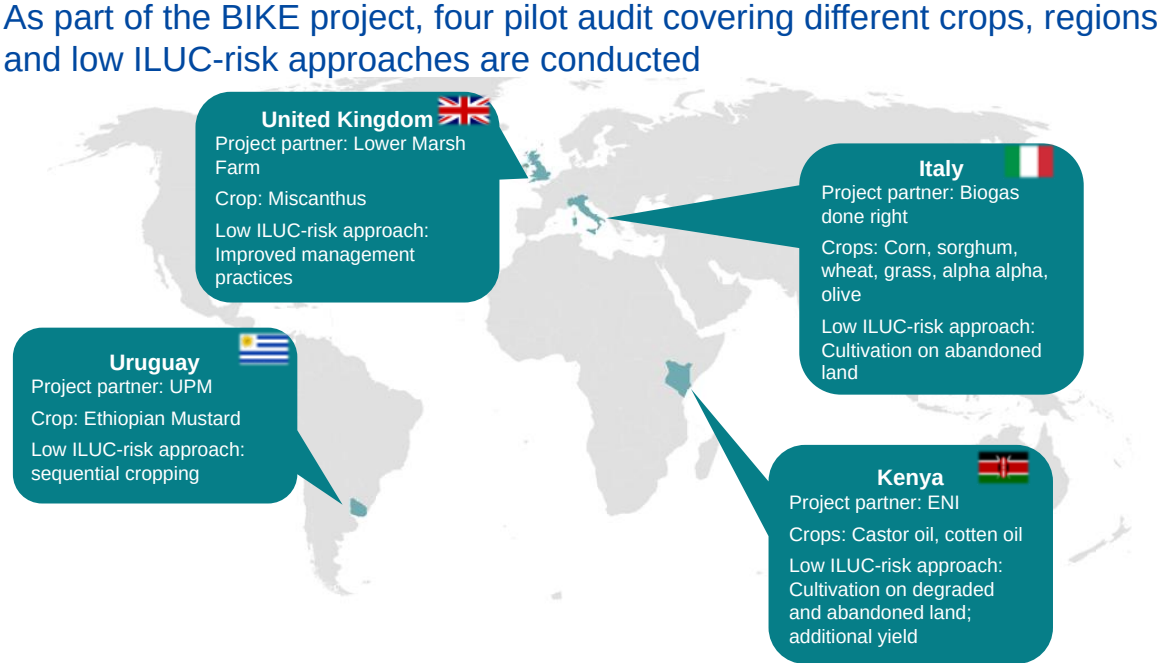


Figure 5: *Overview on the four pilot audits*

3.1 Lower Marsh Farm, UK

The Lower Marsh Farm in Taunton, UK, manages 120 hectares of farmland, with 25 hectares dedicated to grassland and the remaining fields (95 hectares) utilized for cultivating Miscanthus. *Miscanthus giganteus* is a perennial bioenergy crop that grows up to three meters; it is harvested annually and mainly used for renewable fuel production and for animal bedding. The pilot audit was conducted on-site on 6 July 2022. Prior to the audit, an online meeting with all participants was conducted on 9 June 2022. The audit was conducted by certification body AgroVet. The low ILUC-risk measure that was tested is improved management practices to produce additional biomass.

Lower Marsh Farm cultivates miscanthus and grass on 120 ha

Farm:	Lower Marsh Farm
Total area:	120 ha
Crop:	Miscanthus, grass
Area low ILUC-risk:	4.82 ha (Plot Tainfield)
Type of agr. producer:	Individual farmer
Low ILUC-risk approach :	Improved management practices; additional biomass production

Figure 6: *Fact sheet low ILUC-risk pilot at Lower Marsh Farm, UK*

3.2 Uliva Societa Agricola S.S., Italy

Fattoria della Piana is a farm located in the South of Italy. The farm manages 250 hectares dedicated to cultivating corn, sorghum, wheat, grass, alpha alpha and olive. In addition, the farm operates a biogas plant which is digesting different types of biomass from the farm as well as further suppliers. The digestate from the biogas farm is used as a fertilizer on the cropland improving long-term soil structure and fertility. The audit was conducted on-site on 28/29 June 2022. Prior to the audit, an online meeting was conducted on 5 April 2022. The audit was conducted by the certification body RINA. The focus of the audit was on the cultivation of additional biomass on previously unused and abandoned land. About 97 ha of the farmland are used for biomass production on previously degraded land area, that was not used for agricultural production before.

The farm „Fattoria della Piana“ in Italy operates a biogas plant producing bioenergy

Farm:	Uliva di Foggio
Total area:	250 ha
Crops:	Corn, sorghum, wheat, **grass, alpha alpha, olive**
Area low ILUC-risk:	96.47 ha
Type of agr. producer:	Individual farmer
Low ILUC-risk approach:	Cultivation on unused, abandoned or severely degraded land

Figure 7: *Fact sheet low ILUC-risk pilot at Fattoria della Piana, Italy*

3.3 ENI, Kenya

The pilot audits in Kenya covered a First Gathering Point (FGP) receiving sustainable biomass from different farms/small holders. The supply chain is managed by ENI (Italy) using the feedstock for biofuels production under the RED framework. The pilot audit was conducted in parallel to an ISCC EU audit for the whole supply chain. As part of the pilot audit, three farms in different regions of Kenya were audited. The Farm Pamela is a small holder cultivating castor beans on 0.075 ha of previously abandoned land. Jane Maweu owns 5 hectares of cropland on which castor beans are cultivated on previously abandoned land with an intercropping system. The third farm, Cecilia Mutindi Kombo, is cultivating castor beans on 0.27 ha of degraded land. Castor beans are cultivated on previously unused land and thus not affecting traditional food production. The castor beans are further processed to an oil mill managed by ENI. In a following step, the extracted oil is processed in one of ENI’s biorefineries.

Figure 8: *Fact sheet low ILUC-risk pilot in Kenya*

Before the on-site meetings at the farms, a documentation review was conducted at the First Gathering Point (FGP), where the harvested biomass is transported. The audit was conducted by the certification body RINA. An ISCC EU certificate was issued to the FGP afterwards.

The pilot audit was conducted in parallel to an ISCC EU audit for „Toshika Textiles“. After the audit, an ISCC EU certificate was issued by the CB

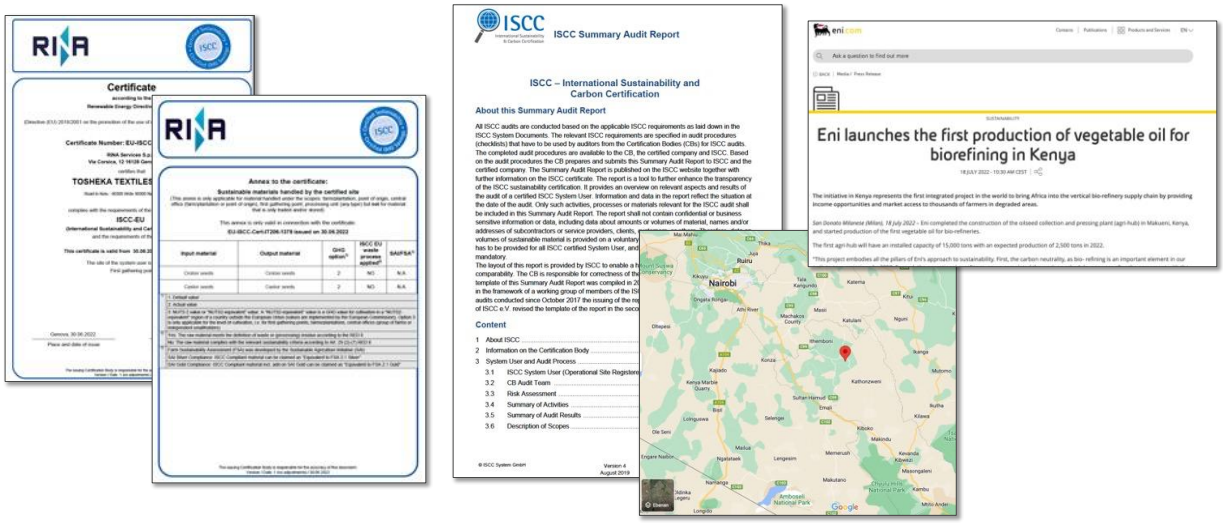


Figure 9: *An ISCC EU certificate was issued to Toshika Textiles (FGP) after the audit*

3.4 Nalmer S.A. farm & UPM, Uruguay

Nalmer S.A. farm is located in Sánchez, Uruguay and is a feedstock supplier for UPM, a biofuel and biomaterial producing company from Finland. UPM is operating a biorefinery in Uruguay, which is processing the feedstock supplied. UPM is currently certified under the Roundtable on Sustainable Biomaterials (RSB) against the requirements of the REDII.

The Nalmer farm in Sánchez is cultivating crops on about 910 ha of land. On one field the farmer is cultivation *Brassica*, which is further processed into biodiesel. This single field of the farm is dedicated to the low ILUC-risk certification. This field is about 110 ha. The on-site audit was conducted on 30 August 2022 by an independent auditor. Prior to the audit and afterwards, the farmer as well as UPM were available for calls and provided the relevant documents for the audit.

Based on the findings of the audit and the feedback provided by auditors and auditees, the draft system documents (procedures, checklist) and the guidance document were updated. In addition, feedback from project partners (e.g., adjustment of the list of additionality measures) were considered.

4 Implementation into ISCC PLUS

International associations, corporations, research institutions and NGOs from around the world have been and are involved in the development of ISCC to meet high demands regarding social and ecological sustainability as well as to ensure high practicality and cost effectiveness. Before implementing new approaches, requirements, and indicators, ISCC publishes newly developed draft system document or fundamental changes in a public consultation. As part of the public consultation, ISCC invites all interested parties (stakeholders) to send their feedback regarding the document. This round of public consultation lasts 60 calendar days from the date of publishing. In this time, stakeholders can provide feedback to the relevant documents. The feedback is analysed by ISCC and considered for updating the document.

The ISCC PLUS guidance document for low ILUC-risk certification was also published for public consultation. The process started 15 February 2023. The feedback received from all stakeholders was further used for (minor) adjustments and finalization of the document. The document is implemented into the ISCC PLUS standard and can be used for the certification of low ILUC-risk feedstocks under ISCC PLUS.

5 Conclusions and outlook

The certification approach for low ILUC-risk certification and the guidance document was developed in a multi-stakeholder approach including ISCC stakeholder, project partners, auditors, and pilot farmers. In addition, several literature sources were used to develop the certification concept and to identify key criteria and indicators. A key source is the document published by the EU COM that sets out the requirements on low ILUC-risk certification. The Delegated Regulation 2019/807 supplementing the RED II is the most relevant document describing several aspects of low ILUC-risk certification for the biofuels market in the EU. However, under the RED II framework, low ILUC-risk certification is not implemented now (August 2023), as further information from the EU COM is missing. This includes e.g. details on the additionality test (financial barrier analysis, non-financial barrier test) and the determination of additional biomass in complex agricultural production systems (e.g. sequential cropping, intermediate crops). Further guidance on these crucial aspects is needed, to define the certification framework. In the pilot

project conducted by a project supporting the EU COM on the further development of the certification approach, feedback from pilot partners showed that especially the concept of proving additionality, either via the financial attractiveness test or via the non-financial barrier analysis, is challenging for company and may be key to receive the certificate[2]. Furthermore, the strict definition for smallholders set out in the Delegated Act, limiting the maximum land area to 2 ha, reduces the number of farmers eligible to be qualified as smallholders and to benefit from the exception made for this group. Only after the EU COM will publish more information, companies will be able to certify low ILUC-risk feedstock under the RED framework.

The inclusion of this missing information into the ISCC PLUS low ILUC-risk certification approach requires deliberation among ISCC stakeholders. It is likely that the ISCC stakeholders will take the further information from the EU COM and integrate it into the certification approach. The main driver for this development is the fact that low ILUC-risk certification needs to be implemented and certified at a farm level and under the certificate of the first gathering point. However, in most cases neither the farmer nor the first gathering point knows in which market the sustainable feedstock is going to be used. The determination of whether a feedstock is utilized in the food and feed market or for the production of biofuels and materials is typically made later in the supply chain. Thus, farms and first gathering points need to ensure that their feedstock is eligible for these different markets, e.g., via existing sustainability certification. This leads to the fact that system users have a strong interest in covering all possible options with one certificate and thus an alignment of the requirements for low ILUC-risk certification for both standards.

Under the RED framework, low ILUC-risk certification can be used to "counter" the phase-out of high ILUC-risk feedstocks to be used for biofuels production. So far, the EU COM solely identified palm as a feedstock fulfilling the criteria for high ILUC-risk crops and thus being linked with significant deforestation. As set out in the RED II, high ILUC-risk feedstocks will be gradually phased-out from the RED market starting in 2023 until 2030. In many EU Member States, this process is accelerated, and palm cannot be used as a feedstock for biofuels (e.g., Germany, France). However, volumes of palm-based biofuels can still be counted against the national quota in case the feedstock is certified under one of the recognized voluntary schemes and in case the feedstock is low ILUC-risk certified. Besides this, low ILUC-risk certification is not integrated into the legal framework, e.g., no sub-quotas for low ILUC-risk certified biofuels exist. It's yet to be determined whether biofuel producers will show interest in this certification approach beyond its use for mitigating the classification of high ILUC-risk.

As part of our project, the certification approach was tested on different crops and in different agricultural systems, explicitly not solely focussing on palm or "potential future" high ILUC-risk crops. With the implemented add-on, companies have the opportunity to certify "additional" and thus low ILUC-risk feedstock and biofuels proving that they go beyond mandatory and voluntary required sustainability requirements. The example of ENI, one of our pilot partners, shows that there is a strong interest from companies to implement the needed, additional measures and to produce "additional", low ILUC-risk feedstocks and biomass for the biofuels market.

[2] See the homepage of the project (https://iluc.guidehouse.com) for further information on the pilot audits conducted