BIKE

BIOFUELS PRODUCTION
AT LOW - ILUC RISK
FOR EUROPEAN SUSTAINABLE
BIOECONOMY

D 1.1

Report on criteria and indicators for low ILUC-risk certification

Dissemination level:

PU

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List of Acronyms

CORSIA: Carbon Offsetting and Reduction Scheme for International Aviation

DA: Delegated Act

DIR: Directive

GHG: Greenhouse Gas

ILUC: Indirect Land Use Change

IR: Implementing Regulation

ISCC: International Sustainability and Carbon Certification

Executive Summary

The aim of this report is to identify criteria and indicators for the certification of low ILUC-risk feedstocks under ISCC PLUS. Based on this report, ISCC developed a handbook for the certification of low indirect land-used change (ILUC)-risk feedstocks in a parallel step (D1.2). The handbook includes all documents needed for the certification process (guidance document, procedure, checklist).

The DA and the draft IR of the EU COM set the main guidelines for the certification of low ILUC-risk feedstocks including a list of eligible additionality measures, a methodology for the determination of additional biomass for different types of crops (annual, perennial crops) as well as management systems (sequential cropping). Yield increase under low ILUC-risk certification must go beyond a "business-as-usual" scenario (common agricultural practices). Economic operators must proof additionality e.g. via a financial attractiveness test or a non-barrier analysis. The CORSIA framework also implemented requirements for low LUC-risk feedstocks. Comparing the CORSIA and RED framework, some differences e.g. in the calculation of additional biomass, land classification and yield increase measure can be identified. Besides these regulative frameworks, several scientific papers and reports cover low ILUC-risk certification. Findings and recommendations of papers published 2019 or earlier were already considered for the development of the DA 2019/807 on high ILUC-risk feedstocks. In a recent paper, Sumfleth et al. provide an overview on latest low ILUC-risk developments.

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Background and Objectives of the Report

Work package 1 "Development of low ILUC-risk feedstock and biofuels certification module" serves as the practical tool for the implementation of the outcomes of the other WP. ISCC's role together with the project partners is to develop the relevant documents for low ILUC-risk certification and to provide guidance for the whole certification process – for auditors as well as for auditees. To address these topics, the objectives of the working package are:

- Development of a certification concept for low ILUC risk biofuels, bioliquids and biomass fuels
- Implementation of an ISCC PLUS add-on for the certification of low ILUC risk feedstocks and biofuels

Working package 1 is structured in four parts:

- Task 1.1 → Identification of criteria and indicators for low ILUC risk biofuels
- Task 1.2 → Creation of an ISCC handbook for low ILUC risk biofuels on-site verification
- Task 1.3 → Conduction and documentation of pilot audits
- Task 1.4 → Implementation into the ISCC scheme

This report summarizes the findings for task 1.1 and identifies criteria and indicators for low ILUC risk biofuels. The findings of this report were used to develop the ISCC handbook for low ILUC risk certification (D1.2). The handbook was developed as part of task 1.2 of the project and will be used and further adjusted during the pilot audits (see task 1.3). Thus, this report is crucial for the further development of work package one and shall address the following aims:

- Identification of criteria and indicators for low ILUC-risk certification under ISCC PLUS
- The identification requires a comprehensive baseline research on available regulations and supporting studies, including:
    - The Delegated Act (DA) on low ILUC risk biofuels (COM 2019/807)
    - RED II (DIR 2018/2001)
- Identification of options to verify crucial criteria and indicators of low ILUC risk feedstock production and to use these findings for the development of draft ISCC PLUS system documents (ISCC PLUS certification *handbook*)

For the activity of Work package 1, existing mandatory guidelines, and documents were of relevance to identify criteria and indicators for low ILUC risk certification. ISCC developed a this deliverable including criteria and indicators identified. This deliverable will be submitted together with deliverable D1.2: the handbook including the checklist, documents list and templates to be used during the auditing activity to be performed from the second year of the BIKE project.

Introduction to ISCC PLUS

ISCC – International Sustainability and Carbon Certification (ISCC) is a certification system that offers solutions for the implementation and certification of sustainable, deforestation-free and traceable supply chains of agricultural, forestry, waste and residue raw materials, non-bio renewables and recycled carbon materials and fuels. Independent third-party certification ensures compliance with high ecological and social sustainability requirements, greenhouse gas emissions savings (on a voluntary basis under ISCC PLUS) and traceability throughout the supply chain. ISCC can be applied globally in all markets including the food, feed, chemical and energy markets.

ISCC applies strict rules for the conservation of valuable landscapes as well as the environmentally friendly and socially responsible production of agricultural and forestry raw materials. ISCC does not accept any form of compensation or remuneration for breaches of system requirements.

Since 2006 ISCC has continued to develop through an open multi-stakeholder process involving representatives from agriculture, processing and refining industries, trade, and NGOs with ecological and social backgrounds. Today, ISCC is one of the world's leading certification systems. The interests of the different stakeholders are represented in the ISCC Association (ISCC e.V.). At regular regional and technical stakeholder committees in Asia, Europe, North- and South America, experiences and improvements of the ISCC system are discussed, and – when possible – lead to continuous improvements of the ISCC system.

ISCC operates different certification systems for different markets. These systems are ISCC EU and ISCC PLUS. ISCC EU is a certification system to demonstrate compliance with the legal sustainability requirements specified in the Renewable Energy Directive (RED) II. ISCC PLUS is a certification system for all markets and sectors not regulated by the RED II, such as the food, feed or energy markets and for diverse industrial applications. Under ISCC PLUS, all types of agricultural and forestry raw materials, waste and residues, non-bio renewables and recycled carbon materials and fuels are covered. ISCC PLUS is used by system users in the food and feed sector and in the market for industrial applications to prove compliance with voluntary sustainability requirements. ISCC certifies all kinds of agricultural and forestry raw materials. These feedstocks must follow ISCC's set of sustainability criteria

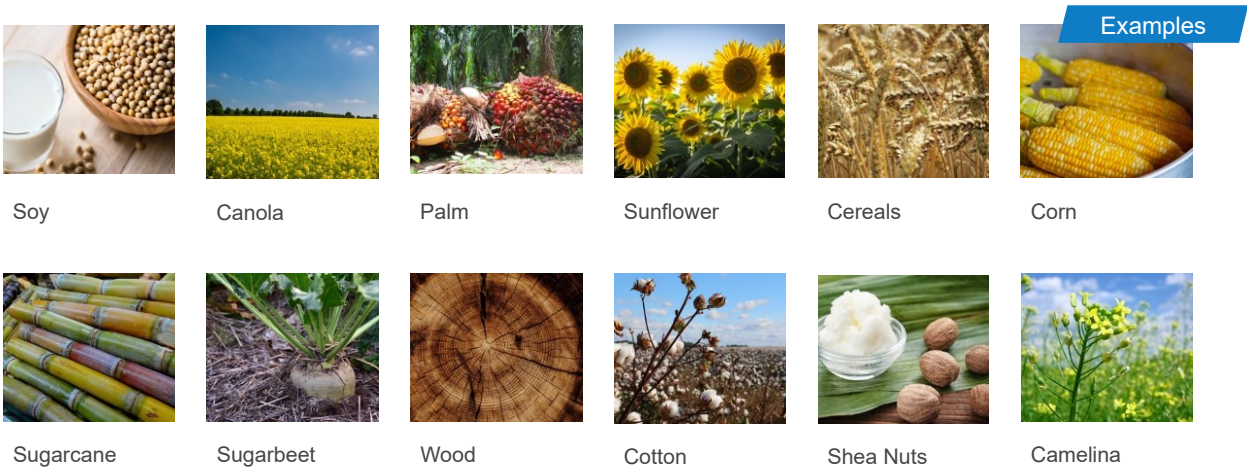

Fig 1: *Examples of feedstocks from agriculture and forestry being certified under ISCC*

The ISCC EU 202-01 and 202-2 document are setting out sustainability requirements for agriculture. Biomass used in food, feed, chemical and energy markets should be produced in a sustainable way. This means that the production of biomass should follow best environmental, social and economic practices. Areas, which are biodiverse or rich in carbon, which serve to protect threatened or vulnerable species, or which are of other ecological or cultural importance, need to be protected and should not be degraded or destroyed for biomass production. The objective of the International Sustainability and Carbon Certification (ISCC) certification system is to contribute to the sustainable cultivation, processing and use of different kinds of biomass and their products. Thereby, ISCC contributes to the reduction of environmental impacts, more efficient resource use and an increasing capacity for climate change adaptation and mitigation and climate resilience. Both documents are setting out ISCC sustainability requirements for sustainable agricultural biomass.

For the certification of agricultural raw materials, the standard developed a balanced set of ecological and social criteria.

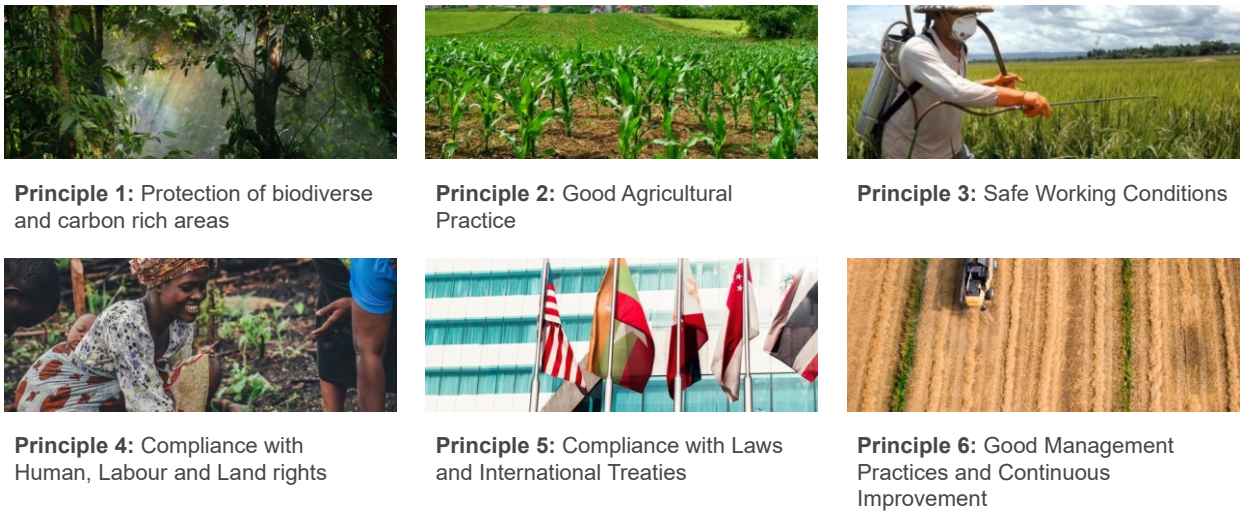

Fig 2: *ISCC principles for sustainable biomass production*

The following table provides an overview on ISCC Sustainability Requirements. In total, The ISCC standard covers six principles and 96 criteria for sustainable biomass from agriculture. ISCC certified farms/ plantations must comply with this set of sustainability criteria. The compliance with the ISCC standard is being verified by auditors and certification bodies (CB) cooperating with ISCC. Only biomass from ISCC EU and ISCC PLUS certified farms/ plantations is eligible to be used in ISCC PLUS certified supply chains.

Tab. 1: *ISCC sustainability requirements*

ISCC 202-1 ISCC Sustainability Requirements	
Main category	**ISCC sustainability requirements**
Principle 1: Protection of Land with High Biodiversity Value or High Carbon Stock	
1.1 Biomass is not produced on land with a high biodiversity value	(1) Primary forests and other wooded land (2) Highly biodiverse forest and other wooded land (3) Areas designated by law or by the relevant competent authority for nature protection purposes (4) Areas for the protection of rare, threatened or endangered ecosystems or species (5) Highly biodiverse grassland spanning more than one hectare
1.2 Biomass is not produced on land with high carbon stock	(1) Wetlands (2) Continuously forested land (3) Forested areas with 10-30% canopy cover
1.3 Biomass is not produced on peatland	
1.4 Monitoring of impacts on soil quality and carbon	

ISCC 202-1 ISCC Sustainability Requirements	
Main category	**ISCC sustainability requirements**
Principle 2: Environmentally Responsible Production to Protect Soil, Water and Air	
2.1 Conservation of natural resources and biodiversity	2.1.1 Environmental impact assessment 2.1.2 Avoidance of damage or deterioration of habitats 2.1.3 Implementation of ecological focus areas for the protection of pollinators and biodiversity 2.1.4 A biodiversity action plan is in place 2.1.5 Natural vegetation areas around springs and natural watercourses are to be maintained or re-established 2.1.6 Cultivation of highly invasive species and genetically modified

	(GM) varieties 2.1.7 Restriction on burning
2.2 Maintain and improve soil fertility	2.2.1 Improvement of soil fertility 2.2.2 Avoidance of soil erosion and compaction 2.2.3 Annual crops follow crop rotation procedures
2.3 Fertiliser application	2.3.1 Fertilisers are used according to nutritional requirements 2.3.2 Soil contamination through fertilisers is minimised by adapted management 2.3.3 Fertiliser application machinery 2.3.4 Restrictions on the use of sewage sludge and other organic material 2.3.5 Use of wastes and agricultural residues 2.3.6 Records of fertiliser application 2.3.7 Soil organic matter balance is compiled
2.4 Restrictions on plant protection products and seeds	2.4.1 Prohibition of chemicals 2.4.2 Applied plant protection products are registered 2.4.3 Local restriction on the use of plant protection products are followed 2.4.4 Seed origin is legitimized 2.4.5 Invoices for registered plant protection products are kept
2.5 Avoiding plant protection products with integrated pest management	2.5.1 Assistance with the implementation of IPM systems has been obtained 2.5.2 Evidence of implementation of IPM activities covering "prevention", "observation and monitoring" and "intervention"
2.6 Plant protection product application	2.6.1 Staff dealing with plant protection products must be skilled 2.6.2 The application of plant protection products is carried out appropriately 2.6.3 All application equipment must be calibrated 2.6.4 Plant protection product applications are recorded
2.7 Handling and disposing of plant protection products, fertilisers and wastes	2.7.1 Appropriate facilities for measuring and mixing plant protection products 2.7.2 Redundant plant protection products must be disposed of via authorised or approved channels 2.7.3 Surplus application mix or tank washings are disposed of in a way that does not contaminate the ground water 2.7.4 Avoidance of re-usage of empty plant protection product containers 2.7.5 Empty plant protection product containers are cleaned prior to disposal 2.7.6 During disposal of empty plant protection product containers exposure to humans and the environment is avoided 2.7.7 The premises must have adequate provision for waste disposal

	2.7.8 Waste management includes reduction, reuse and recycling. It reduces waste and avoids the use of landfills or burning
2.8 Storing of operating resources	2.8.1 Fertilisers are stored in a safe manner 2.8.2 Plant protection products are stored in accordance with local regulations in a secure storage facility 2.8.3 Liquids are not to be stored on shelves above powders 2.8.4 The product inventory must be documented and readily available 2.8.5 Mineral oil products are stored in a safe manner
2.9 Maintaining and improving water quality and quantity	2.9.1 Respect existing water rights and justify irrigation in the context of social and environmental sustainability 2.9.2 Application of good agricultural practices to reduce water usage and to maintain and improve water quality
2.10 Air pollution, GHG emissions and energy management	2.10.1 Reduction of air pollutants and emissions 2.10.2 Efficient energy management

ISCC 202-1 ISCC Sustainability Requirements	
Main category	**ISCC sustainability requirements**
Principle 3: Safe Working Conditions	
3.1 Training and competences	3.1.1 Records are kept for training activities and attendees 3.1.2 Certificates of competence are available for dangerous or complex work 3.1.3 All workers have received adequate health and safety training and have been instructed according to the risk assessment
3.2 Prevention and handling of accidents	3.2.1 The farm/plantation has a written health, safety and hygiene policy and procedures including issues of risk assessment 3.2.2 Work-related accidents are covered by contracts or adequate compensation is received 3.2.3 Workers are equipped with suitable protective clothing 3.2.4 Potential hazards are clearly identified 3.2.5 Restrictions related to hazardous activities are followed 3.2.6 Accident procedures and equipment are available 3.2.7 There are facilities to deal with accidental operator contamination

Principle 4: Compliance with Human and Labour Rights and Responsible Community Relations	
4.1 Rural and social development	4.1.1 A self-declaration on good social practice regarding human rights is available 4.1.2 Negative environmental, social, economic and cultural impacts are avoided 4.1.3 Provision and disclosure of information 4.1.4 Biomass production does not impair food security 4.1.5 Fair and transparent contract farming arrangements are in place 4.1.6 Farm/plantation residents have access to basic services 4.1.7 All children living on the farm/plantation have access to quality primary school education 4.1.8 Other forms of social benefits are offered by the employer to workers and their families and/or community 4.1.9 Workers and affected communities must be able to make a complaint 4.1.10 Mediation is available in case of a social conflict
4.2 Employment conditions	4.2.1 There is no forced labour at the farm/plantation 4.2.2 There is no child labour at the farm/plantation 4.2.3 There is no discrimination at the farm/plantation 4.2.4 Employment conditions comply with equality principles 4.2.5 Respect and ensure gender equity 4.2.6 Regular employment is available wherever possible 4.2.7 Workers are treated with dignity and respect 4.2.8 All workers are to be provided with fair legal contracts 4.2.9 the employment conditions of individual workers comply with legal regulations and/or collective bargaining agreements 4.2.10 A living wage is paid which meets at least legal or industry minimum standards 4.2.11 An elected worker or a workers' council represents the interests of the workers 4.2.12 Labour organisations and collective bargaining are allowed for negotiating working conditions 4.2.13 There is a person responsible for workers' health, safety and good social practice 4.2.14 The management communicates openly with workers 4.2.15 Records on all workers and employees are available 4.2.16 Working times and overtime are documented
Principle 5: Compliance with Land Rights, Laws and International Treaties	
5.1 Legitimacy of land use	
5.2 Compliance with applicable laws and treaties	
5.3 A written anti-bribery and -corruption statement must be in place	

Principle 6: Good Management Practices and Continuous Improvement	
6.1 Economic stability	6.1.1 Basic economic documentations 6.1.2 Business plan 6.1.3 Good relationship with customers
6.2 Management	6.2.1 Establishment of a recording system for each unit of production 6.2.2 Commitment of continuous improvement for each unit of production 6.2.3 Records are kept for the description of the areas in use 6.2.4 Subcontractors must fully comply with the ISCC sustainability requirements

ISCC PLUS certification covers the whole supply chain – from the farm/ plantation cultivating a sustainable feedstock, or starting at the element in the supply chain where a waste and residue feedstock occurs (Point of Origin), to the final market. Each element in the supply chain is individually certified, which provides flexibility for all elements in the supply chain. Group certification applies for farms/ plantations and point of origins. A scheme is reported in the figure below.

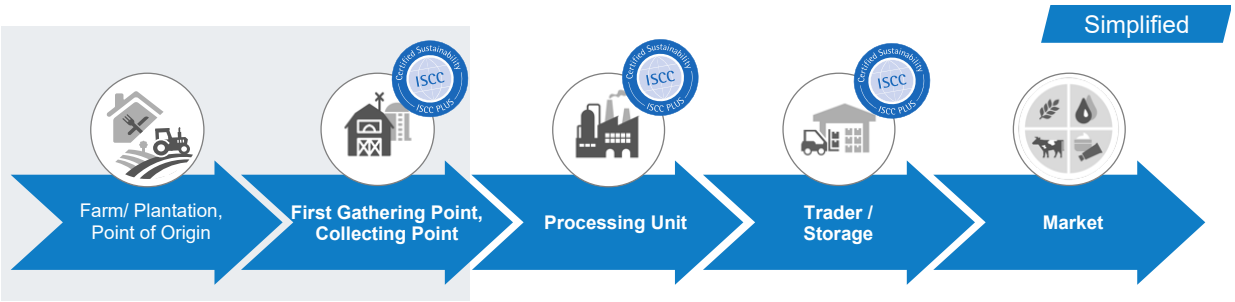

Fig 3: *ISCC certification covers all elements in the supply chain*

For the chain of custody, most ISCC system users use mass balancing. This allows the physical mixing of sustainable and non-sustainable feedstocks and materials along the whole supply chain, but to document the relevant sustainability characteristics on a bookkeeping level. Mass balancing ensures that the relevant sustainability information remains assigned to batches of material. Further, volumes of outgoing sustainable material do not exceed volumes of incoming sustainable material. A physical link between the mass balance and the material is required along the whole supply chain. This means that the sustainable material can only be included in a mass balance if it is physical received at the site of the certified company. The following figure provides an example for mass balancing in complex supply chains in agricultural supply chains.

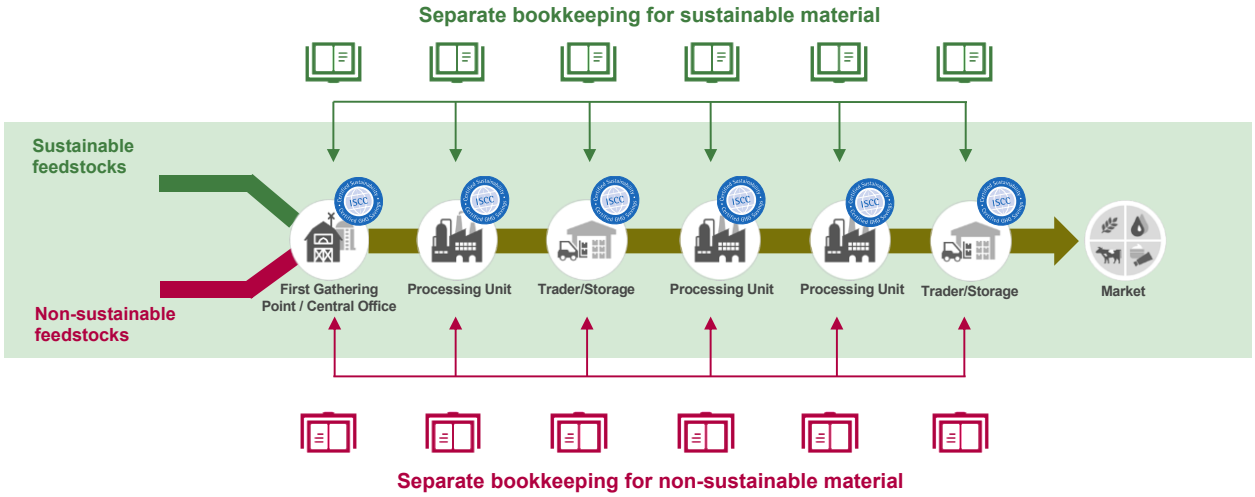

Fig 4: *Simplified example for mass balancing in a supply chain for biofuels*

ISCC conducted low ILUC-risk audits on farm and first gathering point level (oil mill) in Colombia in November 2018. In total, eight farms were audited displaying the diverse management structure (e.g. smallholders, palm farmers, bigger agricultural farms covering different crops) in the country. The audits were conducted by an independent CB. ISCC developed initial audit documents (procedures) as well as a proposal for calculation additional biomass for perennial plants. Findings and recommendations from the pilot were considered for this report.

Summary of ISCC Plus

ISCC PLUS covers the whole supply chain and allows to make respective claims on sustainable products:

- ISCC can be applied globally in all markets including the food, feed, chemical and energy markets.
- ISCC PLUS is used by system users in the food and feed sector and in the market for industrial applications to prove compliance with voluntary sustainability requirements.
- ISCC applies strict rules for the conservation of valuable landscapes as well as the environmentally friendly and socially responsible production of agricultural and forestry raw materials.
- Since 2006 ISCC has continued to develop through an open multi-stakeholder process.
- ISCC certifies all kinds of agricultural and forestry raw materials. Criteria for the certification of sustainable biomass from agriculture are set out in ISCC EU 202-01 and ISCC EU 202-02.
- For the certification of agricultural raw materials, the standard developed a balanced set of ecological and social criteria. In total, ISCC sets out 96 sustainability requirements for sustainable biomass from agriculture.
- ISCC PLUS certification covers the whole supply chain – from the farm/ plantation cultivating a sustainable feedstock to the final market. Each element in the supply chain is individually certified.

- Mass balancing allows to physically mix sustainable and non-sustainable materials along the supply chain and to document the relevant sustainability characteristics of a feedstock/ material separately.
- This allows to make respective claims on sustainable products at the end of an ISCC PLUS certified supply chain.

Identification of Criteria and Indicators

Different sources were used for the identification of criteria and indicators for future low ILUC-risk certification. The following paragraphs analyse these different sources. For each chapter, relevant criteria and indicators were identified and used to develop the certification documents (see task 1.2 of the BIKE project).

Development of low ILUC-risk certification – RED I to RED II

The Renewable Energy Directive (RED) together with the Fuel Quality Directive (FQD, DIR 2009/30/EC) set out the legal framework for the EU biofuels market. In recent years, the further development of the RED (RED I, RED amendment, RED II) was crucial for the development of low ILUC risk certification of biofuels. A timeline on the implementation of the RED II and of the low ILUC-risk certification is reported in the figure below.

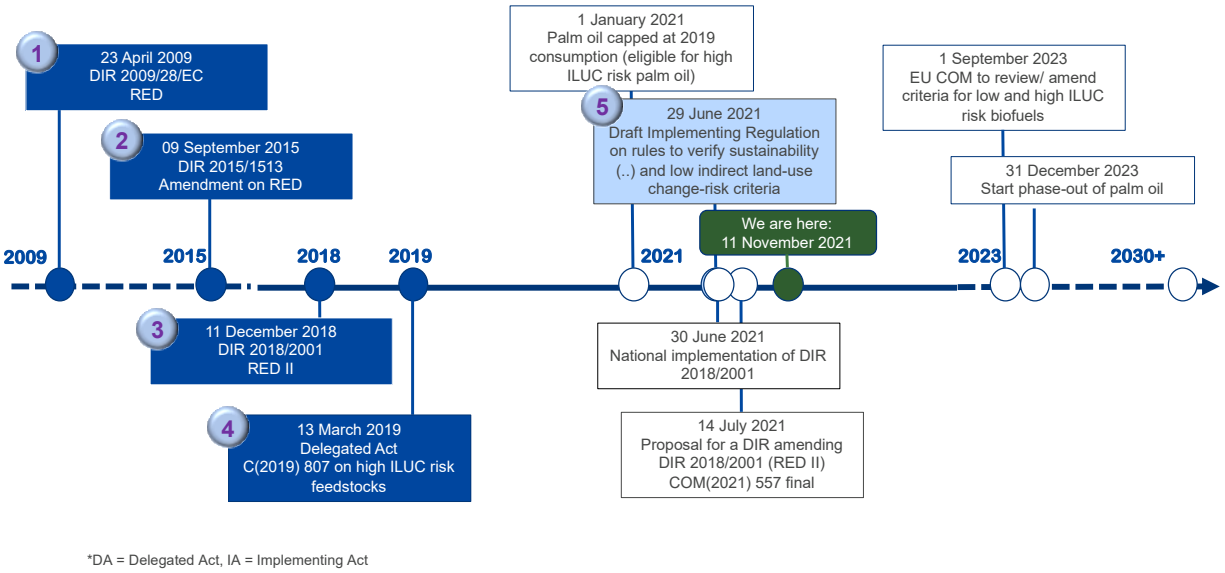

Fig 5: *Timeline for the implementation of the RED II and low ILUC-risk certification*

The RED I (DIR 2009/28/EC) was published in 2009. The directive describes the legal framework for the biofuels market in the EU and sets out targets for renewable energy in the transport sector. For all biofuels to be counted against these targets, mandatory sustainability criteria for sustainable biomass production must be fulfilled. The following key criteria for sustainable biofuels were set out in the RED i:

- Land-based sustainability criteria
- Greenhouse Gas (GHG) emission saving criteria
- Chain-of-custody

Economic operators must use voluntary certification schemes to prove compliance with the mandatory sustainability requirements. Further, the RED I recognized the problem of indirect land use change in biofuel supply chains.

In 2015, a RED I amendment (DIR 2015/1513) was published. The document introduced a definition for low ILUC-risk biofuels and advanced biofuels:

> *„Low indirect land-use change-risk biofuels" means biofuels, the feedstocks of which were produced within schemes which reduce the displacement of production for purposes other than for making biofuels and which were produced in accordance with the sustainability criteria for biofuels* (..)"
>
> *"Advanced biofuels with low indirect land-use change impacts and high overall greenhouse gas emission savings and their promotion are expected to continue to play an important role in the decarbonisation of transport and the development of low-carbon transport technologies beyond 2020"*

Beside the definition of low ILUC-risk biofuels, crop groups were introduced and the aim of a "decarbonization" of the transport sector was defined. Focus was on the reduction of GHG emission via ILUC.

> *"Based on (..), it is likely that greenhouse gas emissions linked to indirect land-use change are significant, and could negate some or all of the greenhouse gas emission savings of individual biofuels. This is because almost the entire biofuel production in 2020 is expected to come from crops grown on land that could be used to satisfy food and feed markets. In order to reduce such emissions, it is appropriate to distinguish between crop groups such as oil crops, sugars and cereals and other starch-rich crops accordingly."*
>
> *"Indirect land-use change risks can occur if dedicated non-food crops, grown primarily for energy purposes, are grown on existing agricultural land which is used for the production of food and feed."*

Options for the mitigation of ILUC were also introduced. The restoration/ cultivation on severely degraded and heavily contaminated land as well as yield increase e.g. via intensified research, technological development and knowledge transfer or cultivation of a second crop are mentioned.

> *"Nonetheless, compared to food and feed crops, such dedicated crops grown primarily for energy purposes can have higher yields and the potential to contribute to the restoration of severely degraded and heavily contaminated land."*
>
> *"Yield increases in agricultural sectors through intensified research, technological development and knowledge transfer beyond levels which would have prevailed in the absence of productivity-promoting schemes for food and feed crop-based biofuels, as well as the cultivation of a second annual crop on areas which were previously not used for growing a second annual crop, can contribute to mitigating indirect land-use change."*

RED II (DIR 2018/2001) was published in 2018. The document provides a definition for high ILUC-risk feedstocks:

> *"While the level of greenhouse gas emissions caused by indirect land-use change cannot be unequivocally determined with the level of precision required to be included in the greenhouse*

gas emission calculation methodology, the highest risks of indirect land-use change have been identified for biofuels, bioliquids and biomass fuels produced from feedstock for which a significant expansion of the production area into land with high-carbon stock is observed. It is therefore appropriate, in general, to limit food and feed crops-based biofuels, bioliquids and biomass fuels promoted under this Directive and, in addition, to require Member States to set a specific and gradually decreasing limit for biofuels, bioliquids and biomass fuels produced from food and feed crops for which a significant expansion of the production area into land with high-carbon stock is observed. Low indirect land-use change-risk biofuels, bioliquids and biomass fuels should be exempt from the specific and gradually decreasing limit."

The document provides further information on options to mitigate ILUC. Yield increase e.g. via improved agricultural practices, better machinery or knowledge transfer and cultivation on land not previously used are low ILUC-risk measures and can mitigate ILUC. However, the yield increase must go beyond the expected increase in agricultural production and annual yield fluctuations must be considered.

"Yield increases in agricultural sectors by means of improved agricultural practices, investments in better machinery and knowledge transfer, beyond levels which would have prevailed in the absence of productivity- promoting schemes for food and feed crop-based biofuels, bioliquids and biomass fuels, as well as the cultivation of crops on land not previously used for the cultivation of crops, can mitigate indirect land-use change. Where there is evidence that such measures have led to an increase of production going beyond the expected increase in productivity, biofuels, bioliquids and biomass fuels produced from such additional feedstock should be considered to be low indirect land-use change-risk biofuels, bioliquids and biomass fuels. Annual yield fluctuations should be taken into account in that context."

High ILUC-risk biofuels will be phased out to 0% in the EU till 2030. EU Member States have some flexibility here and can decide to phase out high ILUC-risk biofuels earlier. For high ILUC-risk biofuels to still be eligible against the *quota*, these biofuels and feedstocks can be certified to be "low ILUC-risk".

"§ 26 Specific rules for biofuels, bioliquids and biomass fuels produced from food and feed crops

(..) 2. For the calculation of a Member State's gross final consumption of energy from renewable sources referred to in Article 7 and the minimum share referred to in the first subparagraph of Article 25(1), the share of high indirect land- use change-risk biofuels, bioliquids or biomass fuels produced from food and feed crops for which a significant expansion of the production area into land with high-carbon stock is observed shall not exceed the level of consumption of such fuels in that Member State in 2019, unless they are certified to be low indirect land-use change- risk biofuels, bioliquids or biomass fuels pursuant to this paragraph. From 31 December 2023 until 31 December 2030 at the latest, that limit shall gradually decrease to 0 %."

Summary

The RED provides information for the certification of low ILUC-risk feedstocks and for the development of a low ILUC-risk certification module. The following key aspects were introduced in the RED I to RED II:

- Definition for low and high ILUC-risk feedstocks and biofuels set out by the RED II
- Low ILUC-risk biofuels with an important role beyond 2020 with respect to the reduction of GHG emissions ("decarbonisation of the transport sector)
- Options to mitigate ILUC:
    - Yield increase e.g. via improved agricultural practices, better machinery or knowledge transfer and
    - Cultivation on land not previously being cultivated (e.g. restoration/ cultivation on severely degraded and heavily contaminated land)
    - To take in account that:
        - Yield increase must go beyond the expected increase
        - Annual yield fluctuations to be considered
- Introduction of crop groups (e.g. oil crops)
- Cap for crop-based biofuels, unless certified as low ILUC-risk
- High ILUC-risk biofuels to be phased out to 0% in 2030

Low ILUC-risk regulation

The Delegated Act (DA; 2019/807) sets out criteria for the certification of low ILUC-risk feedstocks. The following key aspects were used for the development of criteria and indicators for the low ILUC-risk certification module:

- Criteria for certification of low ILUC-risk biofuels, bioliquids and biomass fuels
- Criteria for determination of high ILUC-risk feedstocks
- ILUC risk particularly relevant for oil crops
- Cap for high ILUC-risk fuels set at 2019 consumption level and phasing out by 2030
- Palm oil labelled as high ILUC-risk feedstock

The DA on high ILUC risk feedstocks sets out criteria for the certification of low ILUC-risk feedstocks. Low ILUC-risk feedstocks must be compliant with the mandatory sustainability requirements set out in the RED II (e.g. protection of biodiverse and carbon-rich areas, GHG emission savings, chain-of-custody requirements, monitoring of sustainable soil management). Additional biomass to be eligible as "low ILUC-risk" certified must prove to be "additional" against a "business-as-usual" scenario. A "dynamic yield baseline" must be determined to calculate the amount of additional biomass. Further, criteria for additionality measures are introduced. They must be applied by small holders or biomass must be cultivated on abandoned or severely degraded land or the additionality measure must prove that the measure becomes financially

attractive or face no barrier preventing their implementation only because the biofuels can be counted towards the targets set out in the RED.

The regulation is addressing the issue of ILUC to lay down provisions setting out the criteria for determining the high ILUC-risk feedstock and for certifying low ILUC-risk biofuels. Economic operator must implement "additionality measures" to be proven as "additional" against a business-as-usual scenario to be eligible:

> *"Scientific literature also demonstrates that the impact of ILUC on the potential of biofuels, bioliquids and biomass fuels to achieve greenhouse gas emission savings is particularly pronounced for oil crops."*
>
> *"Biofuels, bioliquids or biomass fuels should be considered low ILUC-risk only if the feedstock used for their production is cultivated as a result of the application of duly verifiable measures to increase productivity beyond the increases which would be already achieved in a business-as-usual scenario. In addition, these measures should ensure sustainability of feedstock in view of all requirements set in Directive 2009/28/EC or Directive (EU) 2018/2001 in relation to renewable energy targets."*

To receive low ILUC-risk certification, general criteria for sustainable land management must be fulfilled by the economic operator implementing the additionality measure:

- Fulfilment of the mandatory sustainability criteria from the RED II
- Must be produced from additional feedstock obtained through additionality measures that meet the criteria for additionality measures
- Documentation of the evidence needed to identify the additional feedstock
    - Information on the additionality measure
    - Information on the delineated area where the measures have been applied
    - Information on the average yield achieved from the land over 3-year period immediately preceding the year when the additionality measure was applied

The additionality measure to be implemented must meet at least one of the following conditions:

- They become financially attractive or face no barrier preventing their implementation only because the biofuels can be counted towards the targets set out in the RED
- They allow for cultivation of food and feed crops on abandoned land or severely degraded land
- They are applied by small holders

The following figure shows a decision tree for demonstrating "additionality" according to the DA.

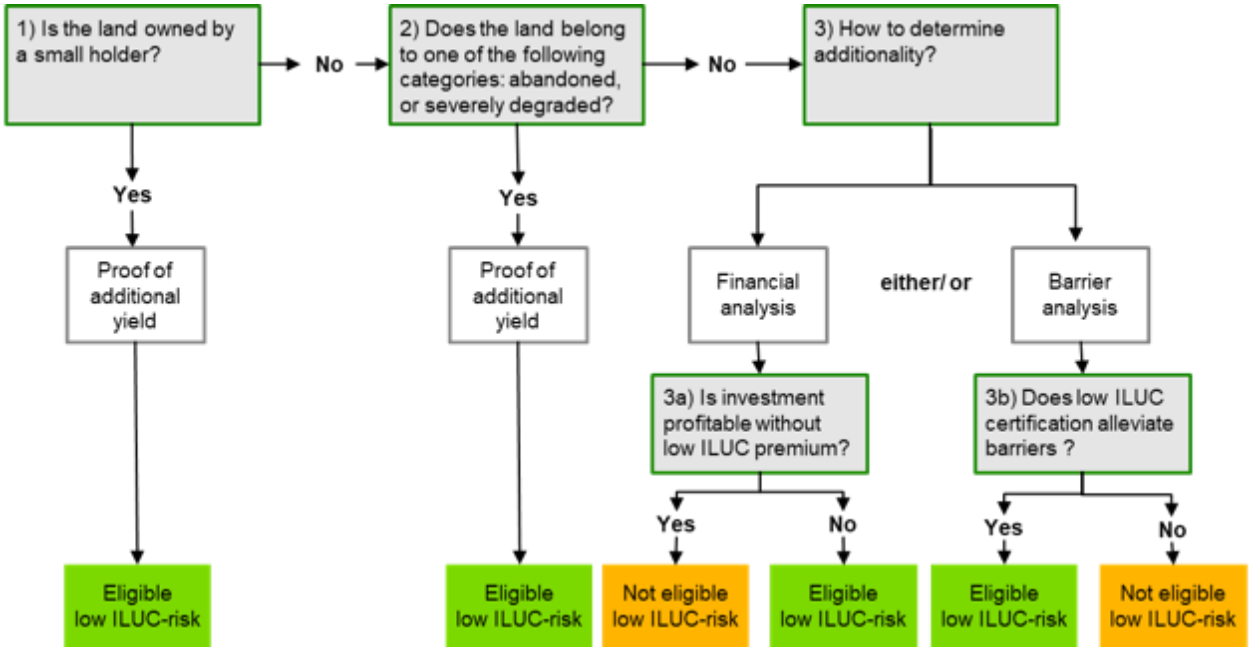

Fig 6: *Decision tree for demonstrating additionality*[1]

The additionality measure is taken no longer than ten years before certification. Further, "*only measures that are financially attractive because they allow to reap the financial premium arising from such certification should be considered, in analogy with the financial additionality criteria applied under the Clean Development Mechanism of the Kyoto Protocol." (DA C(2019/807)).*

The auditing process must be based on reliable information. The following criteria for auditing and verification of low ILUC-risk certified feedstocks are introduced:

- Reliable information substantiating their claims
- Arrange for an adequate standard of independent auditing and an adequate level of transparency reflecting the need for public scrutiny of the auditing approach
- Provide evidence that the audits are conducted

Further, a mass balance system must be used to demonstrate that a consignment is to be considered as low ILUC.

Summary

- The Delegated Act on high ILUC risk feedstocks sets out criteria for the certification of low ILUC-risk feedstocks
- Low ILUC-risk feedstocks must be compliant with the mandatory sustainability requirements set out in the RED II (e.g. protection of biodiverse and carbon-rich areas, GHG emission savings, chain-of-custody requirements, monitoring of sustainable soil management)

[1] Guidehouse, Stakeholder webinar, 19 May 2021, https://iluc.guidehouse.com/images/webinar/Low_ILUC_pilots_stakeholder_webinar_19th_of_May_2021.pdf

- Additional biomass to be eligible as “low ILUC-risk” certified must prove to be “additional” against a “business-as-usual” scenario
- A “dynamic yield baseline” must be determined to calculate the amount of additional biomass
- Criteria for additionality measures are introduced. They must be applied by small holders or biomass must be cultivated on abandoned or severely degraded land or the additionality measure must prove that the measure becomes financially attractive or face no barrier preventing their implementation only because the biofuels can be counted towards the targets set out in the RED

The following criteria and indicators for the certification of low ILUC-risk feedstocks were derived from the DA.

Tab. 2: *Criteria, requirements and verification measure for the certification of low ILUC-risk feedstocks derived from the DA C (2019) 807*

Criteria/ Requirements for the certification of low ILUC-risk feedstocks	
Criteria/ Requirements	**Verification measure**
Economic operators must prove compliance with RED II sustainability requirements	Valid ISCC EU/ ISCC PLUS certificate in place
The additional feedstock must be obtained through the implementation of an additionality measure	Implementation of the additionality measure. Verification, if the implemented measure is sufficient to obtain the respective yield increase
The additionality measure must meet at least one of the following conditions	
1) They become financially attractive or face no barrier preventing their implementation only because the biofuels can be counted towards the targets set out in the RED	Determination via an financial attractiveness test. If the test is positive, alternatively a non-barrier analysis can be conducted
2) They allow for cultivation of food and feed crops on abandoned land or severely degraded land	Determination of the former land status of the abandoned or severely degraded land. Check of documentation on land status, land use. Use of remote sensing data on land management
3) They are applied by small holders	Determination, if the farmers fulfil the requirements for small holders
The additionality measure is taken no longer than 10 years before the certification	Determination, when the additionality measure has been implemented
The additionality measure must lead to "additional" biomass proven as additional against business-as-usual scenario	Additional biomass must be demonstrated against the "dynamic yield baseline"

The economic operator must provide reliable information and evidences on the low ILUC-risk measure. This includes at least information on the additionality measure, the delineated area in which the measure has been applied and the average yield achieved from this land in the previous three years before the additionality measure was applied	Check of available documentation on farm management. GIS data on the delineated land should be available. Information on historic yield data
The economic operator must use a mass balance system to demonstrate that a consignment is to be considered as low ILUC	Documentation of low ILUC-risk certified quantities in the mass balance system of the economic operator. Valid certification by an EU-recognized certification scheme

Draft Implementing Regulation on rules to verify low ILUC-risk criteria

This report was finalized in October / November 2021. At this point in time, only a draft version of the Implementing Regulation (IR; published 29 June 2021) is available. The draft IR aims to set out detailed criteria for the certification of low ILUC-risk biofuels. The publication of the document was part of a public consultation phase (until 27 July 2021) in which stakeholders had the option to provide feedback on the regulation. This report is based on the draft IR reflecting the status. The IR and the respective criteria set out for the certification of low ILUC-risk feedstock may be subject to change depending on the further legislation and the final version of the document. The draft IR sets out guidelines and criteria for the certification of low ILUC-risk feedstocks – for economic operators as well as voluntary certification schemes:

- Specific requirements for economic operators
- Certification process
- Management plan
- List of additionality measures
- Options to proof additionality
- Guidelines and methodology for the determination of additional biomass for different crop types

Process of low ILUC-risk certification

To get certified, economic operators must apply with a certification body. The economic operator must submit a management plan containing relevant information on the low ILUC measure. The certification body shall conduct on-site baseline audits to verify the management plan and to verify the yield increase. The certification body shall report on sustainability issues linked to the implementation of the additionality measure. The validity of the additionality measure is ten years. The implementation of the measure must be at least ten years ago. Only the additional biomass is eligible to be certified.

The economic operator must prove additionality. Additionality is the increase of feedstock being produced beyond a business-as-usual scenario. This additionality must be achieved via the implementation of an additionality measure. An additionality measure must go beyond common

agricultural practices. It shall boost output without compromising sustainability and shall not compromise future growing potential by creating a trade-off between short-term output and mid/long-term deterioration of soil, water and air quality and pollinator populations. If a measure is applied that only aims to improve the sustainability of the plot, without improving yields, it is not deemed an additionality measure. This is not the case with cultivation on abandoned or severely degraded land, in which case the cultivation itself is the additionality measure.

Management plan

The management plan is a mandatory document to be filled out by the economic operator producing the low ILUC-risk biomass. The aim of the document is to provide relevant information on the economic operator and the low ILUC-risk measure to be implemented. The management plan must be provided to the certification body before the first audit. The following information must be included in the management plan:

- A definition of the delineated plot of land
- A description of the additionality measure(s)
- Check on sustainability of the additionality measure against the requirements of DIR 2018/2001
- Demonstration of additionality assessment (if applicable)
- Determination of the dynamic yield baseline
    - Yield increase measure (three years of historical data)
    - Cultivation on unused, abandoned and severely degraded land
    - Proof of land status
- Estimation of additional biomass yield per year on the delineated plot of land

Further, the economic operator will have to demonstrate that the management plan sets reasonable expectations on the yield increase by referring to scientific literature, experience from field trials, information from agronomy companies, seed/fertiliser developers or simple calculations. Satisfactory evidence supporting the expected yield increase of the additionality measure applied is needed for the project to be certified.

Additionality measures

In addition, the draft document introduces low ILUC-risk additionality measure to be eligible for certification.

Tab. 3: *Eligible additionality measures from the draft IR*

Additionality category	Additionality measure	Example
Replanting (for perennial crops)*	Choice of crop varieties	Higher yield 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
Management	Soil management	Mulching instead of ploughing, low tillage
	Fertilisation	Optimisation of fertilisation regime, use of precision agriculture
	Crop protection	Change in weed, pest and disease control
	Pollination	Improved pollination practices
	Other	Leaves room for innovation, combinations of measures and unforeseen developments

Additionality test

Economic operators must also "prove" this additionality. The Proof of additionality must be passed by carrying out a financial attractiveness or barrier analysis assessment. The financial attractiveness test must be negative to be eligible for low ILUC-risk certification. This means, a negative net present value (NPV) of the investment without the inclusion of a market premium must be shown or a non-financial barrier analysis must be shown.

The financial attractiveness analysis shall demonstrate that the investment required for the additionality measure becomes financially attractive only if the resulting additional yield is certified as low ILUC risk. The analysis shall include only those costs and yields that are directly related to the additionality measure investment. The costs and revenues included in the analysis shall be related to the preparation, implementation, maintenance and decommissioning of the additionality measure that would not have been otherwise incurred.

Financial attractiveness arises from a business case in which the net present value ('NPV') of the investment is positive, which means that the investment may be conducted by the economic operator itself. As a result, only measures for which the business case analysis is negative (without the inclusion of a premium) shall pass the financial additionality test and become eligible to be certified as low ILUC risk. Outcomes above zero (a positive NPV) may still be eligible only if they pass the non-financial barrier analysis. The following parameters shall be included in the NPV calculation:

- Estimate of additional biomass volume

- Feedstock sales price
- Discount rate to be used: 3.5% for high income countries and 5.5% for all other countries
- Lifetime of the investment of ten years and respectively 25 years (perennial crops)
- Investment cost related to the additionality measure (CAPEX + OPEX)

The non-financial barrier analysis test shall only cover non-financial project barriers that prevent the implementation of the additionality measures in case of no low ILUC risk certification. Any barrier whose cost can be estimated shall be included in the financial attractiveness analysis rather than in the non-financial barrier analysis. The non-financial barrier test shall therefore be used only in very exceptional cases.

Determination of the dynamic yield baseline

The setting of the dynamic yield baseline and the calculation of the actual volume of low ILUC risk biomass depends on the respective agriculture management and the type of crop (annual crops vs. perennial crops).

Annual crops:

- Option 1: The economic operator calculates an average of the yields for the 3 most recent years that the target crop was grown on the specific delineated plot prior to implementation of the additionality measure. As crops are grown in rotation, this may mean using data that is more than 5 years old.
- Option 2: The economic operator calculates a weighted average of the yields of the 3 most recent years that the target crop was grown on the farm prior to implementation of the additionality measure, even if those yields were obtained from different plots of different sizes on the same farm.
- The slope of the dynamic yield baseline shall be taken as the slope of a straight trend line fitted for yield developments of the target crop over the previous 10 years. It is based on global data and shall be derived from the FAOSTAT World+ data for the relevant crop. This shall be done at the start of the certification period, and the slope shall be valid for the 10-year baseline validity period.
- For any crop in the table, the dynamic yield baseline is determined by taking the starting point (three-year average of historical yields prior to application of the additionality measure) and adding the global trend line (slope) from 1. The following formula shall be used, starting at Y0:

  y=($starting\ point\ DYB$)+($slope$20)x

Perennial crops:

- For palm trees, the following data may be used by economic operators of oil palm plantations when determining their dynamic yield baseline:
  - the cultivars of palm trees on the delineated plot;
  - the planting year of palm trees on the delineated plot of land and/or their age profile;
  - the area of land replanted each year on a plantation, if applicable;
  - the historical crop yields obtained prior to implementation of an additionality measure.
- That data is combined with a growth curve applicable to the cultivars on the plot to determine the dynamic yield baseline. The key characteristic from the growth curve shall be the shape, not the magnitude of the yield.
- The following three options are available for determining the dynamic yield baseline for palm trees. For each of those options, the data required to set the dynamic yield baselines must include:
  (a) average growth curve;
  (b) economic operator provides growth curve;
  (c) annual crop approach

Sequential cropping:

- If multi-cropping practices such as sequential cropping are used to optimise land use and this leads to a situation where overall farm yields are increased but the new (target) crop lowers the yield of the main (primary) crop, this shall be compensated in the calculation of low ILUC risk biomass.
- The dynamic yield baseline shall be based on the 'business as usual' situation for the delineated plot of land. The baseline shall be determined based on data (historical plot yield and global trend line) for the primary crop that has been grown on the land in previous years. After implementation of sequential cropping, the additional biomass shall be calculated as the difference between the total annual yield from the delineated plot of land (that is to say, the yield of the primary crop plus the yield of the target crop) and the primary crop dynamic yield baseline.
- The net additional yield of biomass x is therefore calculated by the sum of the target crop yield xTC and the primary crop yield x1, minus the pre-sequential cropping yield x0.
  $x = (xTC + x1) - x0$

Calculation of the quantity of additional biomass

- Determining additional biomass for yield increase measures
  - Additional biomass = additional amount of feedstock produced in a clearly delineated area compared to a dynamic yield baseline as a direct result of applying an additionality measure

  - Setting of a dynamic yield baseline: starting point, based on historical yield from the delineated plot and a global trend line
  - The actual yield on the delineated plot shall be compared against the baseline. The difference between actual yield and dynamic yield baseline is the additional feedstock eligible for low ILUC-risk certification
- After implementation of the additionality measure, the economic operator must be obliged to record the actual crop yield achieved each year on the delineated plot to be able to determine the actual volume of low ILUC risk biomass that may be claimed. This is done by comparing the crop yield achieved with the dynamic yield baseline.
- If certification is sought for an additionality measure applied in the past, the additional biomass yield may be calculated and recorded in the management plan. While this allows the actual volume of low ILUC risk biomass to be precisely calculated, low ILUC risk biomass may only be claimed after low ILUC risk certification has been awarded.
- If the harvested volume is only measured (weighed) at a first gathering point where products from multiple farms or plots arrive, then the documentation from the first gathering point may be used as proof of the harvested volume (yield) for the farms and plots involved.
- To calculate the additional biomass volume, the crop yield data obtained for a given year shall be compared to the dynamic yield baseline. The additional biomass yield Δx is equal to the difference between the crop yield observed and the yield projected by the dynamic yield baseline for the same year, multiplied by the surface area A (ha) of the delineated plot in question. This additional volume can then be claimed as low ILUC risk biomass.
  $\Delta x = (xx+4 - xx+4\ DYB) \times A$ (in tonne/yr)

Unused land

For abandoned land, severely degraded land or small holders the financial attractiveness test must not be applied. In case of production on unused, abandoned or degraded land, the dynamic yield baseline is zero with no trend line. For the determination of land status and for the identification of unused, abandoned and severely degraded land, the following figure provides further information:

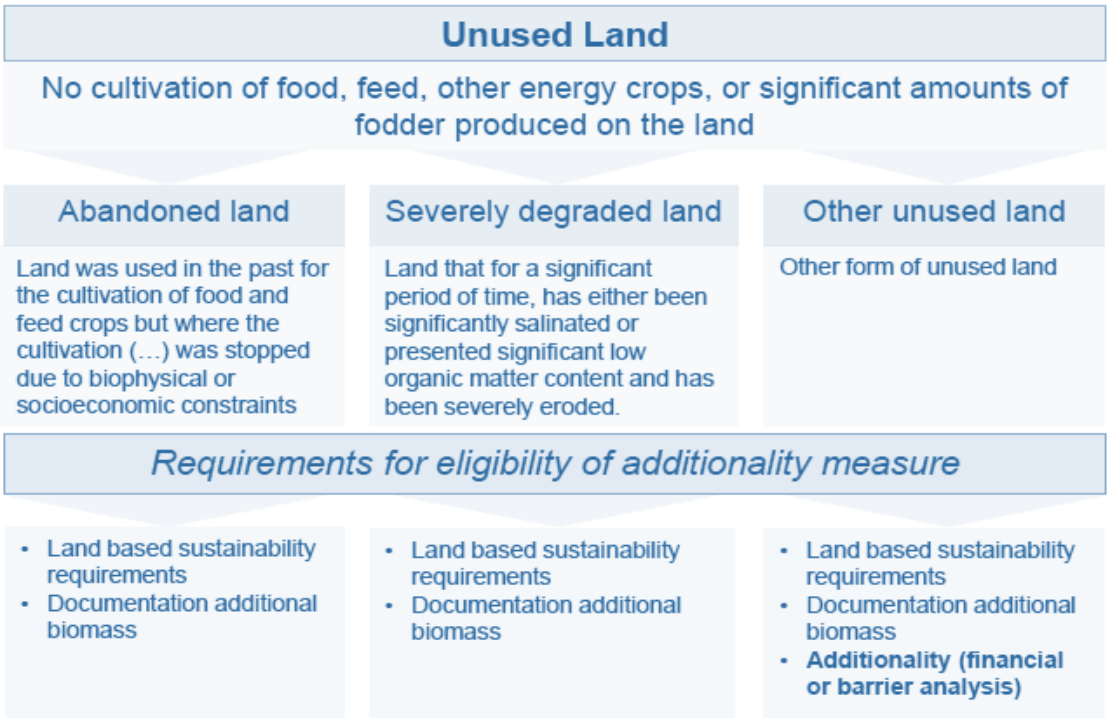

Fig 7: *Overview on unused land classification and consequences for low ILUC-risk certification*[2]

For production on unused or abandoned land, the economic operators shall provide evidence that for a consecutive period of at least five years before the start of cultivation of the feedstock used for the production of biofuels, bioliquids and biomass fuels, the delineated areas were used neither for the cultivation of food and feed crops or other energy crops nor for the cultivation of any substantial amount of fodder for grazing animals. For land to qualify as abandoned land, the economic operator shall provide additional evidence that food or feed crops were once grown on the delineated area before the consecutive period of five years. That evidence shall also prove that the production ceased for biophysical or socioeconomic reasons. For land to qualify as severely degraded land a soil test results shall be used to prove that the land is salinized, has a low soil organic matter, or is eroded. For unused land, an additionality test must be passed.

Summary

The following criteria and indicators for the certification of low ILUC-risk feedstocks were derived from the IR.

Tab. 4: *Criteria, requirements and verification measure for the certification of low ILUC-risk feedstocks derived from the IR*

Criteria/ Requirements for the certification of low ILUC-risk feedstocks	
Criteria/ Requirements	**Verification measure**
The economic operator must submit an application for low ILUC risk certification with a CB providing information on (i)	Determination, if the registration process with a

[2] Guidehouse, Stakeholder webinar, 19 May 2021, https://iluc.guidehouse.com/images/webinar/Low_ILUC_pilots_stakeholder_webinar_19th_of_May_2021.pdf

the applicant, (ii) a description of the low ILUC risk measure, (iii) a description of the delineated plot of land, (iv) a description of the additionality measure applied and (v) an estimation of the additional biomass and (vi) information on existing certification with an EC-recognised voluntary certification scheme	qualified VS took place. On-site verification of low ILUC-risk measures. Check of respective documents (e.g. GIS data on the delineated plot of land)
The economic operator must provide a low ILUC-risk management plan providing information on (i) the delineated plot of land, (ii) a description of the additionality measure(s), (iii) demonstration of financial attractiveness assessment (if applicable), (iv) the determined dynamic yield baseline and (v) an estimation of the additional biomass	Verification, if a filled-out management plan is available. Verification of data provided in the management plan
In case of yield increase and cultivation on unused land, the economic operator must have a financial attractiveness test in place demonstrating that the investment required for the additionality measure becomes financial attractive only if the resulting additional yield is certified as low ILUC risk.	Verification of the calculation of financial attractiveness
In case the financial attractiveness test was positive (meaning that the investment is already attractive without low ILUC-risk certification, a barrier analysis test must be provided describing a non-financial barrier preventing the implementation of the additionality measure).	Verification of the non-financial barrier analysis test
The economic operator must calculate a dynamic yield baseline, according to the requirements set out in the handbook and taken the respective crop (perennial, annual) or management system (sequential cropping) into account. The calculation must be based on historic data from the respective delineated plot. To determine the dynamic yield baseline, the average historic yield is the starting point to which a global trend line (slope) is added, representing the annual yield improvement of the target crop. The trend baseline must be determined based on FAOStat data.	Verification of the dynamic yield baseline calculation according to the methodology set out by the VS. Verification of the historic data and trend baseline
The economic operator must calculate additional biomass volume which is equal to the difference between the crop yield observed and the crop yield projected by the dynamic yield baseline for the same year.	Verification of the calculation of additional biomass
The implemented yield increase measure is from one of the following categories: (i) Replanting (applicable for perennial plants), (ii) mechanisation, (iii) machinery or (iv) improved management including soil management, fertilisation, crop protection, pollination or other category.	Verification, if the implemented measure can be included to one of the categories.

Low LUC risk certification under the CORSIA framework

In 2016, the 39. ICAO (International Civil Aviation Organization) Council adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) by its 116 ICAO members. In 2019, Standards and Recommended Practices (SARPs) including requirements for CORSIA Eligible Fuels for SAFs (Sustainable Aviation Fuels) were implemented. CORSIA members started to monitor and report emissions from international flights. CORSIA only applies to international flights: flights that take-off in a state and land in another state.

One option to reduce an aeroplane operator's offsetting obligations is the use of CORSIA Eligible Fuels (CEF). CEFs include "sustainable aviation fuels" (SAF), which are renewable or waste-derived fuels, as well "lower carbon aviation fuels" (LCAF), which are fossil-based fuels. Renewable fuels must comply with certain sustainability and reporting requirements. End 2020, the first voluntary certification schemes were recognized by ICAO for the certification of sustainable aviation fuels

The CORSIA framework also allows for low Land Use Change (LUC) risk certification. Important to differentiate between ILUC and Low LUC under the CORSIA framework:

- ILUC refers to the induced land use change, including direct and indirect LUC

Unless for the purposes of CORSIA it can be proven that using certain types of land, land management practices (LMP), and the incorporation of innovative agricultural practices contribute to low risk for land use change and therefore receive a value of zero for ILUC.

The implementation of these low LUC risk practices for a project should avoid market mediated responses that lead to changes in land use, and lead to additional SAF feedstock available relative to a baseline, without increasing land requirements. A low LUC risk methodology should consider that, for a specific project to be eligible for recognition as a low LUC risk practice, the practice must be verified as a net enhancement in SAF feedstock available per unit of land.

There are two approaches for low LUC-risk SAF feedstock production:

a) Yield Increase Approach (achieved through so-called land management practices: LMP)
b) Unused Land Approach

The practices will be verified by the certification body (CB) as a net enhancement in sustainable aviation feedstock available per unit of land. Any economic operator who would like to claim low LUC-risk practices is required to document them in a written report. This report is called "Low LUC-Risk Report". For the farmer to proof compliance with the CORSIA low LUC-risk approach, he/she needs to fill in the Low LUC-Risk Report describing:

- the status of the selected land for the measure(s)
- the measure(s) applied
- the estimation/calculation of the additional yield

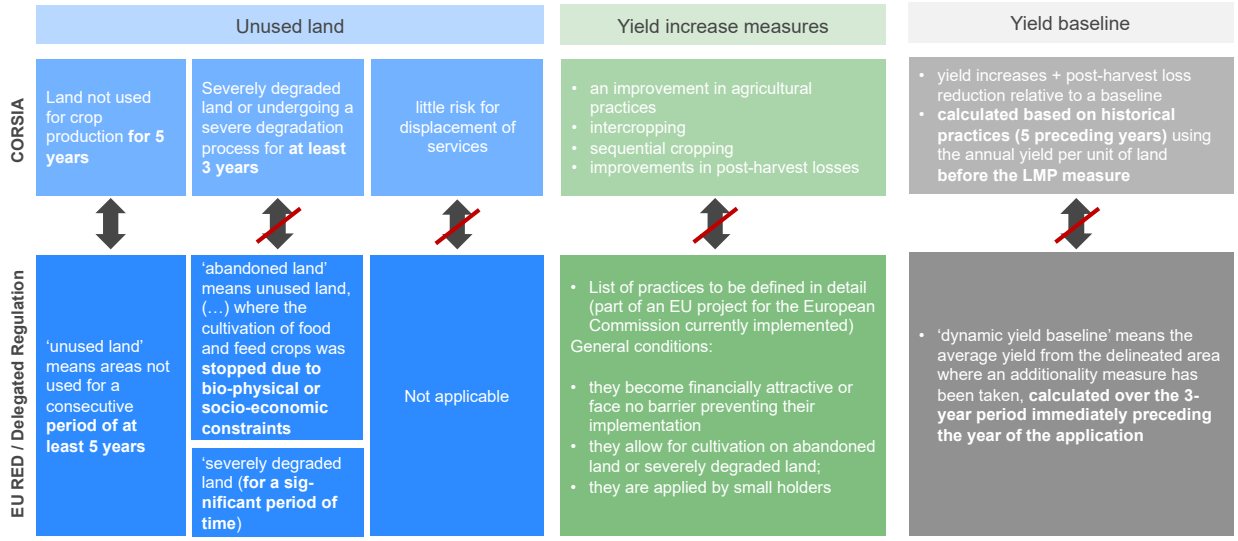

Fig 8: *Overview on criteria that differ in the EU RED and CORSIA framework*

Summary

- CORSIA is the legal framework for SAFs in the aviation sector. The framework allows the certification of low LUC-risk feedstocks and SAFs
- Two approach can be implemented by system users: unused land approach and yield increase – in principle comparable to the options set out in the RED framework
- Yield increase also covers the option "improvements in post-harvest losses" including measure to be implemented after the harvesting of the sustainable biomass and before the documentation of the yield on first gathering point level
- A "low LUC-risk report" (comparable to the management plan) documents all relevant information for the certification process, including the measure applied, the status of the land on which the measure was applied and a calculation of the additional yield
- Main differences with the criteria in the RED framework are the different yield increase measures allowed the methodology to determine the yield increase baseline and the definition for unused land
- The requirement that for cultivation on unused land, a "little risk for displacement of services" must be verified for low LUC-risk certification, is an additional requirement

The following criteria and indicators for the certification of low ILUC-risk feedstocks were derived from the CORSIA approach.

Tab. 5: *Criteria, requirements and verification measure for the certification of low ILUC-risk feedstocks derived from the CORSIA framework*

Criteria/ Requirements for the certification of low ILUC-risk feedstocks	
Criteria/ Requirements	**Verification measure**

For a land to be eligible for the unused land approach, it also needs to have little risk for displacement of services from that land onto different and equivalent amounts of land elsewhere	*tbd*
The implemented yield increase measure is from one of the following categories: (i) Replanting (applicable for perennial plants), (ii) mechanisation, (iii) machinery or (iv) improved management including soil management, fertilisation, crop protection, pollination or other category(*) or *(v) improved (reduced) post-harvest losses*	*tbd*

Further publications

Various reports and papers published before the DA on low ILUC-risk certification was published by the EU Commission developed approaches for the certification of low ILUC-risk feedstocks and provided recommendations for the certification process under the RED. The following reports, papers have made important contributions and should be mentioned here from the authors' point of view:

- Peters et al. (2016): *Methodologies for the identification and certification of Low ILUC risk biofuels,* Ecofys
- El Takriti et al. (2016): *Understanding options for ILUC mitigation*, ICCT
- Malins (2019): *Risk management – Identifying high and low ILUC-risk biofuels under the recast Renewable Energy Directive*, Cerulogy

Proposals are also developed for the identification of high ILUC-risk feedstocks (e.g. Malins 2019). All publications have in common that their results and recommendations were considered in the later published DA from the EU COM. In the authors' view the main points and approaches have been considered in the legislation at EU level.

Sumfleth et al. 2020 provided a comprehensive overview and latest developments in low ILUC policies and certification. The focus of this report is on EU policies, possible certification approaches and ILUC modelling studies. Five potential practices for low ILUC-risk biomass production are identified:

- Increased yield
- Unused land
- Chain integration
- Loss reduction
- Livestock efficiencies

The following figure summarizes these potential methods for the implementation and verification of the proposed additionality practices.

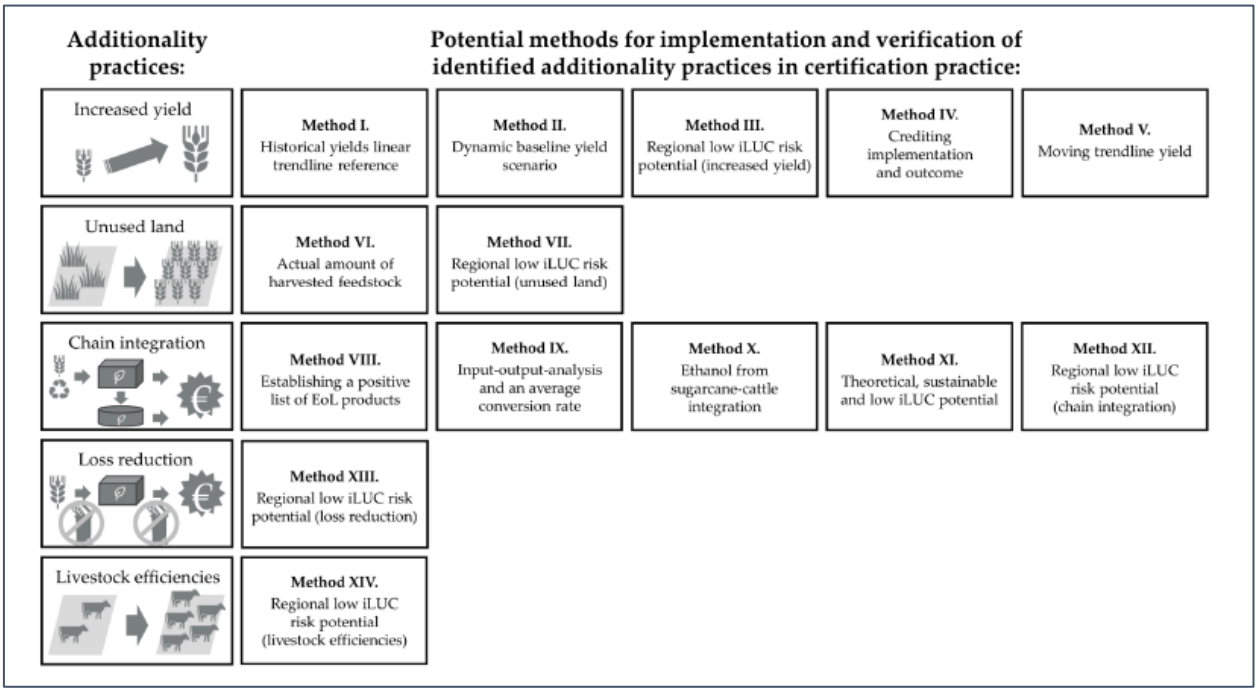

Fig 9: *Potential additionality practices*[3]

The first two practices (increased yield, unused land) are implemented in the EU RED framework. The option "livestock efficiencies" focuses on agricultural management systems with intensive livestock management. The remaining two options could potentially be integrated in a low ILUC-risk certification module:

a) Improved production chain integration by by-products, waste and residues:
   - other uses and application in the production of bio-based products

b) improvement of livestock production via increased productivity without taking more land into production
   - Development of a baseline scenario on land consumption for livestock production
   - Comparison of baseline scenario with the improved management practice
   - "Surplus land" can be used to produce low ILUC-risk feedstocks
   - The methodology was approved in a case study
   - High complexity and effort for calculating "surplus land"
   - Only applicable for farms cultivation agricultural crop land and livestock production

Summary

Findings and recommendations from several papers on low ILUC-risk certification published before 2019 are implemented in the DA on low ILUC-risk certification and the current draft IR.

[3] Sumfleth, B., Majer, S. & Thrän, D. (2020): Recent Developments in Low iLUC Policies and Certification in the EU Biobased Economy, *Sustainability,* 12, 8147

Sumfleth et al. summarize the latest developments on low ILUC-risk certification. The paper describes two further additionality measures not included in the RED and CORSIA framework:

- Improved production chain integration by by-products, waste and residues
- Improvement of livestock production via increased productivity without taking more land into production

The paper highlights in total five additionality measure, of which two are not covered under the RED and CORSIA approach. The author of the report recommends to test these two measures as part of the pilot certifications testing if these approaches can be covered as part of the certification process.

Tab. 6: *Criteria, requirements and verification measure for the certification of low ILUC-risk feedstocks derived from other publications*

Criteria/ Requirements for the certification of low ILUC-risk feedstocks	
Criteria/ Requirements	**Verification measure**
Improved production chain integration by by-products, waste and residues	*tbd*
Improvement of livestock production via increased productivity without taking more land into production	*tbd*