Support for the implementation of the provisions on ILUC set out in the Renewable Energy Directive – Lot 2

Mitigating ILUC: Pilots and review

Phase 1 report

Prepared for:

European Commission

Submitted by:

Guidehouse Netherlands b.v.
Stadsplateau 15, 3521 AZ Utrecht, The Netherlands

Commission reference: ENER/C2/2018-462
Guidehouse reference: 210301
29 June 2021

Table of Contents

List of Tables

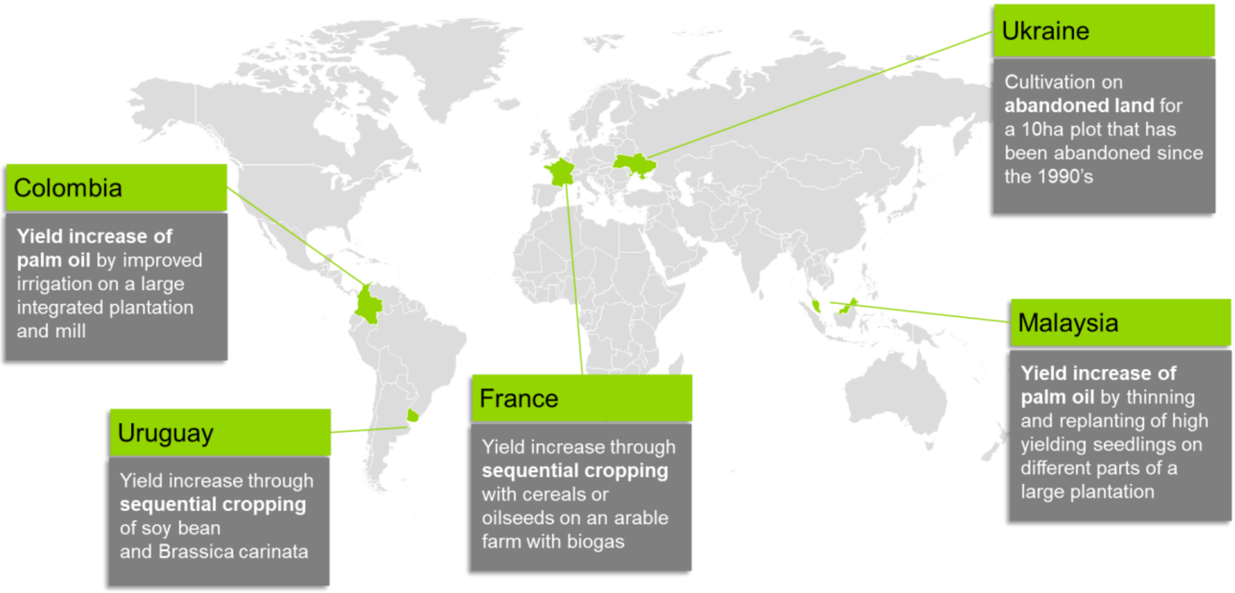
List of Figures

Executive Summary

This report sets out the findings from **Phase 1** of the **Low ILUC-risk Certification Pilot project** (ENER/C2/2018-462 Lot 2). The project aims to support the European Commission in the development and implementation of low ILUC-risk certification, the criteria for which are set out in Delegated Regulation 2019/807[1], and to review the relevant aspects on certification described in the feedstock expansion report[2] that accompanies the legislation.

The project sets out to achieve those aims by conducting pilot projects to test the low ILUC-risk certification methodology on farms and plantations in different geographical regions (Europe, South-East Asia and Latin America) for different types of crops (oil crops and starch crops) and different types of "additionality measure" which aim to produce additional biomass, namely via yield increase on an existing farm or via new cultivation on abandoned land. An overview of the five pilots conducted in Phase 1 is shown on the map in Figure 1. Detailed results for each Phase 1 pilot can be found in the individual pilot reports.

Figure 1. Map overview of pilot projects in Phase 1



In general, the pilot projects all had good availability of verifiable data and the pilot participants were able to fill in the necessary documents and conduct the necessary calculations. However, some found the methodology complex and there are some open methodological issues that require refinement.

The pilots identified the following three key topics as needing further development in Phase 2 of the project:

1. Additionality test – especially further development of the non-financial barrier test

2. Determining the dynamic yield baseline for palm – especially the extent to which weather could be factored into the baseline calculation, and

[1] Commission Delegated Regulation (EU) 2019/807 of 13 March 2019: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.133.01.0001.01.ENG

[2] European Commission COM(2019)142, 13 March 2019: https://ec.europa.eu/energy/sites/ener/files/documents/report.pdf

3. The approach to calculate additional biomass for sequential cropping, with respect to the definition of a “main crop” and refining a “compensation mechanism” to take into account if the secondary crop impacts the yield of the main crop.

The pilot projects were not yet able to test the approach to certify small holders or group certification (due to COVID-19 travel restrictions). This will therefore also be a topic for Phase 2, also given the expectation that small and medium sized farms and plantations would have a relatively larger potential to increase their yields.

The work in Phase 2 will also take into account stakeholder feedback related to the implementation of low ILUC certification, from the public consultation on the draft Implementing Act on voluntary schemes[3].

[3] Public consultation on the draft Implementing Act on voluntary schemes open 29 June 2021 to 27 July 2021: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12723-Sustainable-biofuels-bioliquids-and-biomass-fuels-voluntary-schemes-implementing-rules-_en

1. Introduction

1.1 Objective and scope of the report

This project supports the European Commission in the implementation of the provisions on indirect land-use change (ILUC), as set out in the recast Renewable Energy Directive 2018/2001/EU. This project is Lot 2 of a larger piece of work on ILUC[4]. *Lot 2 Mitigating ILUC: Pilots and Review (ENER/C2/2018-462)* covers the development and implementation of low ILUC-risk pilot projects and a review of the relevant aspects of the feedstock expansion report[5] that accompanies the Delegated Regulation 2019/807 on ILUC[6].

- The pilot projects aim to test all aspects and the applicability of the methodology to certify low ILUC-risk biofuels and bioliquids as specified in the REDII and the ILUC specific Delegated Regulation. Five pilot projects test the methodology at plantations in three different geographical regions (Europe, South-East Asia and Latin America) for different types of crops (oil crops and starch crops) and different types of additionality measure (yield increase and cultivation on abandoned land).

- The subject of the review is chapter four of the feedstock expansion report that accompanies the Delegated Regulation.

This report sets out the results of Phase 1 of the project, setting out an overview of the pilot projects conducted, how they were selected, the findings from the first round of pilot audits and a review of the parts of the feedstock expansion report that relate to low ILUC-risk certification. More detailed results for each pilot can be found in the individual pilot reports.

1.2 Policy background

Sustainability criteria are set for the use of biofuels in the EU transport sector. Biofuels need to comply with these sustainability criteria to be counted towards national and EU renewables targets and to qualify for public support schemes. Criteria were introduced as part of the Renewable Energy Directive (RED) and have contributed towards limiting the risk of *direct land use change impacts* associated with the production of conventional biofuels and bioliquids, but they do not address *indirect land use change impacts*.

Indirect land use change (ILUC) occurs when the additional demand for land to produce biofuels leads to the expansion of agriculture onto land that has other uses. If this agricultural expansion is into high carbon stock land, it could (partly) negate the GHG savings obtained by using biofuels instead of fossil-derived fuels. The risk of ILUC led to the introduction of Directive 2015/1513 (the 'ILUC Directive') setting a limit to the contribution of

[4] Lot 1 aims to review chapter three of the feedstock expansion report, which is used to determine high ILUC feedstocks

[5] European Commission COM(2019)142, 13.3.2019. Report from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions on the status of production expansion of relevant food and feed crops worldwide. https://ec.europa.eu/energy/sites/ener/files/documents/report.pdf

[6] Commission Delegated Regulation (EU) 2019/807 of 13 March 2019 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council as regards the determination of high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed and the certification of low indirect land-use change-risk biofuels, bioliquids and biomass fuels. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.133.01.0001.01.ENG

conventional biofuels towards the RED target. This Directive introduced the concept of 'low ILUC-risk biofuels'.

The recast of the Renewable Energy Directive (REDII) entered into force on 24 December 2018. REDII promotes the development of renewable energy in the coming decade through an EU-wide binding renewable energy target of at least 32% by 2030. REDII also:

- Restricts the total contribution of **crop-based biofuels** in each Member State to one percent over the contribution from those to the gross final consumption of energy from renewable energy sources in 2020.
- Limits the contribution of **high ILUC-risk fuels** to the 2019 level from 2021 onwards (their contribution will be gradually reduced down to 0% by 2030).
- Defines **low ILUC-risk biofuels**, with the Commission publishing a Delegated Regulation (EU) 2019/807 in March 2019 to set the criteria permitting the identification of low and high ILUC-risk biofuels.

Low ILUC-risk biofuels offer an opportunity for economic operators to avoid the cap set on high ILUC-risk fuels.

Core to the concept of low ILUC-risk biofuels is the ability to produce 'additional biomass'. This is biomass produced on top of current and trend-based future agricultural production, meaning that displacement of food and feed production is avoided. In this way, crop based biofuels do not displace the existing use of crops for food and feed, but are produced from a new feedstock base which is additional to current production levels. The Delegated Regulation allows for the certification of additional biomass that is either:

- Biomass produced on an existing farm or plantation as a result of an additional, above-baseline **yield increase**, or
- New biomass cultivation on **unused, abandoned or severely degraded land**.

Delegated Regulation 2019/807 on ILUC was accompanied by a report from the Commission to the Parliament on the status of production expansion of relevant food and feed crops worldwide (COM(2019) 142), further referred to as the 'feedstock expansion report'. The fourth chapter of this report focuses on the certification of low ILUC-risk fuels.

Article 7 of the Delegated Regulation requires the Commission to review all relevant aspects of the feedstock expansion report and the small holder provision in Article 5. This project serves to assist the Commission in this review by testing the quality, performance, and reliability of the criteria set in the Delegated Regulation to characterise low ILUC-risk biofuels prior to widespread use. In this project, we therefore work with plantation managers in different regions (Europe, Latin America and South-East Asia) for different crop types, to gather and process the required data to establish the validity and robustness of the criteria selected, ensuring it follows the principle of additionality and can be applicable irrespective of the type of crop, type of plantation or location of the plantation.

The outcome of this project is a first-of-a-kind insight into whether and how the Delegated Regulation can be applied in practice. The project delivers a critical review of the Delegated Regulation and chapter four of the feedstock expansion report and recommendations on how the Delegated Regulation could best be implemented or interpreted.

Note that a draft low ILUC-risk certification guidance was developed for the Commission by Navigant (now Guidehouse) and IEEP in a parallel project under the voluntary scheme assessment Framework Service Contract ENER/C1/2018-513. This draft guidance formed the foundation for the certification documents developed and piloted in this project.

The Commission is preparing an Implementing Act on voluntary schemes, which will also include further details on how to implement low ILUC-risk certification.[7] This project has served as input to the Implementing Act.

[7] Public consultation on the draft Implementing Act on voluntary schemes open 29 June 2021 to 27 July 2021: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12723-Sustainable-biofuels-bioliquids-and-biomass-fuels-voluntary-schemes-implementing-rules-_en

2. Pilot design and methodology

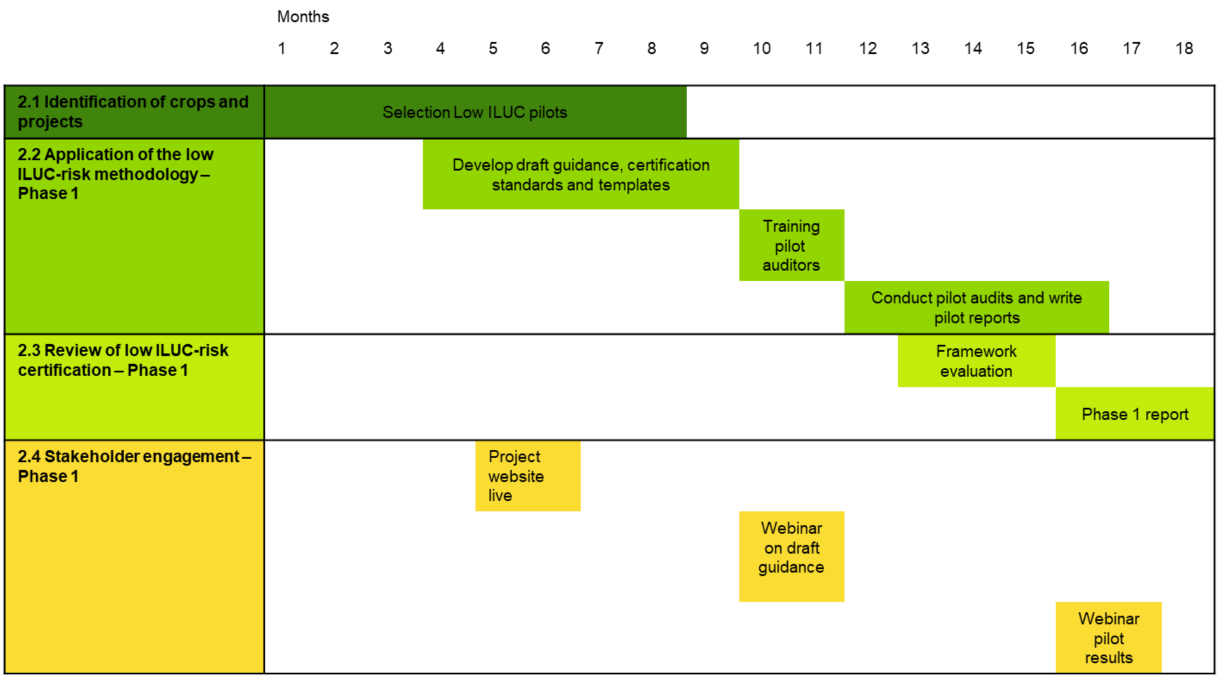
2.1 Project timeline

The Lot 2 ILUC pilot project comprises two phases, each 18 months. This split enables iteration and improvements, building on the findings of Phase 1. The project started in January 2020 and should be concluded in early 2023. Final results of the project can thus inform a review of the feedstock expansion report, and criteria, factors and rules in the Delegated Regulation in 2023.

At the start of Phase 2, it is envisaged that pilots can be re-designed and certification guidelines revised, based on pilot results from Phase 1 and on stakeholder and expert feedback. Having a reporting moment at the end of Phase 1 also enables findings from Phase 1 to inform the Commission in the drafting of the Implementing Act on voluntary schemes. Whilst it was not the original intention to develop *new* pilots for Phase 2, but rather to continue the pilots as set up in Phase 1, this will be considered whilst scoping Phase 2 to ensure that Phase 2 can build on the results of Phase 1 whilst also focusing on the key outstanding questions.

Figure 2 shows the timeline of the key tasks in Phase 1. Phase 2 comprises the same tasks as Phase 1, although the timeline will differ. Task 2.1 to select the pilots can be shorter in Phase 2 as the aim will be to refine the pilot design rather than to initiate all new pilot projects. Similarly, Task 2.2 will be an update to existing guidance documents rather than drafting full new documentation. Stakeholder engagement will be ongoing throughout the Phase, with a stakeholder workshop/webinar towards the end of the project.

Figure 2. Project tasks and timeline Phase 1



Note on the impact of the global COVID-19 pandemic on the project

The project kicked-off in January 2020, so the impact of the global COVID-19 pandemic started to become apparent in the first few months of Phase 1 of the project. The approach to several of the tasks and their timeline had to be adjusted to reflect the situation and restrictions imposed by the pandemic.

We had planned on-site scoping visits to each potential pilot site or holding company during Task 2.1 to establish a working relationship between the project team and the pilot organisation and to co-develop the pilot design. This was not possible, so contacts were established and relationships built online.

We identified steps we could take to accelerate the project timeframe for some of the pilots, to mitigate initial delays caused by the pandemic, and the inability for pilot participants to travel. These included selecting pilots for which good data was available in a digital form and where an additionality measure had already been taken. This meant we could conduct both a baseline and additionality audit, without having to wait for an appropriate point in the harvest cycle. Therefore the timelines for Tasks 2.2 and 2.3 remained relatively unchanged.

In terms of approach, travel restrictions remained in place internationally throughout Phase 1 of the project. The pilot audits were all conducted in Q1 2021. In some cases domestic travel was still permitted. Therefore, wherever possible for the pilots, a local Control Union auditor conducted the pilot audit onsite and other members of the consortium joined the audit preparation, and audit opening and closing meetings online.

For Task 2.4, the project website went live in June 2020 (https://iluc.guidehouse.com/lot-2). All stakeholder outreach moved online from March 2020, including holding a webinar on the draft guidance in November 2020 and the main Phase 1 stakeholder webinar in May 2021. Running these stakeholder outreach events as online webinars had the benefit of enabling broader international participation from pilot participants and other interested stakeholders located outside Europe.

2.2 Methodology to select pilots

The steps to identify, select and design the pilots in Task 2.1 are schematically presented in Figure 3 below.

Figure 3. Steps to identify pilots (Task 2.1)

2.1.1 Identify and select Pilot projects	2.1.2 Pilot design	2.1.3 Site visits to pilot projects	2.1.4 Signature Pilot agreements	2.1.5 Interim report Task 2.1

• Preliminary list of >5 pilots
• Enhance list via
  • Consortium network
  • Project website
• Assess suitability
  • Individual suitability
  • Collective completeness
• EC stage gate approval
• Initial contact with holding management
	• Plots delineation (size and location)
	• Crop types & varieties
	• Crop-growth planning
	• Agricultural practice
	• Detailed additionality measure
	• Approach on baseline setting
	• Agreement on number of site visits and on-site audits
	• Company/holding ownership and relation to the plots
	• Clarify Pilot rules of engagement
	• Overall pilot process and general rules of engagement
		• Meet biomass producer and holding management
		• Discuss pilot design, baseline setting and the application of additionality measures.
		• Discuss (draft) pilot agreements
			• Preparation Pilot project agreements
			• Signature Pilot agreements by the plantation/holding.
				• Summary of all activities and outputs of Task 2.1

During the proposal phase we connected to various biofuels and feedstock producers to gather interest for participating in the low ILUC pilot projects. We received signed Letters of Intent from seven relevant plantation owners or holdings, or associations representing these and presented these to the Commission, alongside other suggestions for potential pilot projects.

At the start of the project, and together with the Commission, we reduced the long-list of nine suggested pilot projects to a short-list of five which represented the best combination of **individual suitability** and **collective completeness**, using the criteria in Table 1.

Table 1. Individual suitability & Collective completeness

Individual suitability	Collective completeness

• Preliminary scope and design
  ◦ Crop type, location, scale, additionality measure, pilot planning
• Relevance and credibility
  ◦ Relation to REDII/Delegated Regulation additionality criteria
  ◦ Expected outcomes
  ◦ Company/holding commitment
  ◦ Data transparency commitment
	• All scope regions
	• All scope crops
	• All additionality measures
	• All low ILUC-risk criteria/items

The five short-listed projects individually and jointly allow for testing low ILUC-risk biofuel feedstock cultivation on specific plantations covering different crop types (oil and starch) in different geographical regions (EU, South-East Asia and Latin America). The identified pilots cover both strategies for low ILUC-risk biofuels as included in the Delegated Regulation: (a) producing additional biomass through above-baseline crop yield increases and (b) crop cultivation on unused, abandoned or severely degraded land.

Dialogue was then established with potential pilot organisations for each of the short-listed pilots to establish or confirm interest and develop the details of each pilot project. For two of the pilots, the company who signed the original Letter of Intent was able to continue discussions and take part in the pilot, and for the other three, further exploratory work was needed to identify a lead pilot organisation.

2.3 Overview of selected pilots and rationale

Figure 4 and Table 2 show an overview of the five pilot projects that were selected and conducted in Phase 1. The overview includes the country, feedstock type and the type of additionality measure. A more detailed introduction to each pilot is included in section 2.5. The planting season was initially considered as part of the rationale as it informs the timing of harvest data, although in the end most of the selected pilots had already implemented the additionality measure so data was available without waiting for a next harvest. The individual suitability and collective completeness of the pilot projects are described below.

Figure 4. Map overview of pilot projects in Phase 1

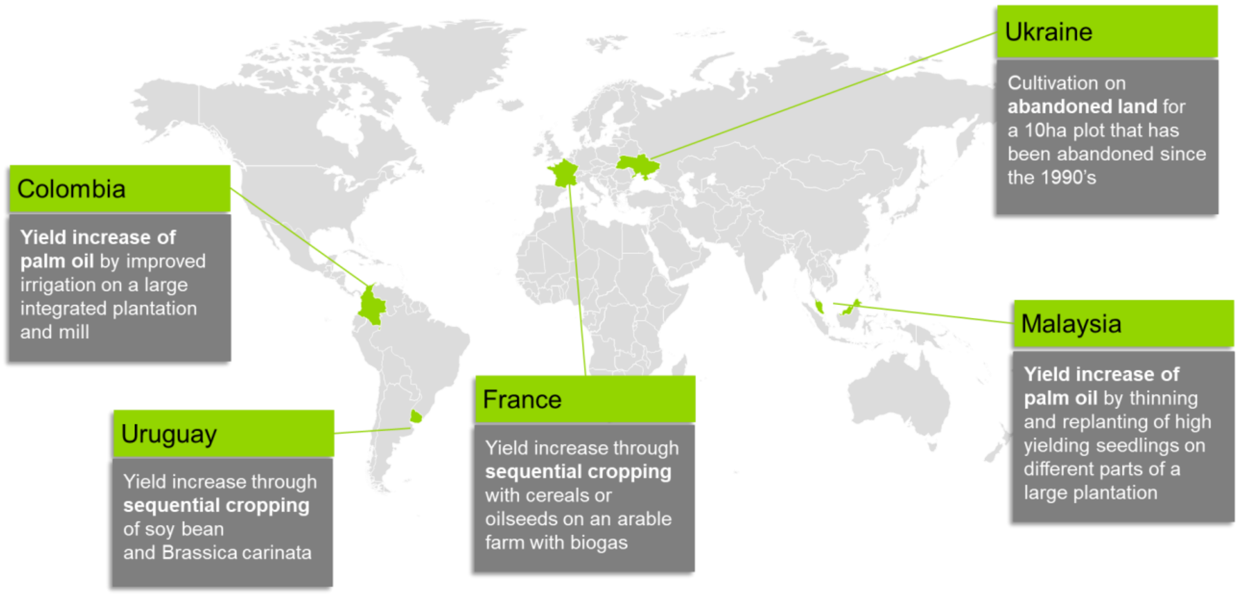


Table 2. Overview of pilot projects in Phase 1

Pilot description	Crop type	Country and Region	Additionality measure	Pilot organisation	Planting season	Rationale
Palm oil yield increase	Oil palm (perennial oilseed)	Malaysia, SE Asia	Yield increase: thinning and replanting of clonal seedlings	Confidential large plantation	Year round	Large palm producing country
Palm oil yield increase	Oil palm (perennial oilseed)	Colombia, Latin America	Yield increase: improved irrigation	Palmeras de la Costa (plantation) and Fedepalma (industry association)	Year round	Large palm producing country
Soy bean and Brassica carinata sequential cropping	Annual oilseeds	Uruguay, Latin America	Yield increase: sequential cropping	UPM	May-Nov	Good data availability. Proven yield increase measure
Sequential cropping on arable farm with biogas	Starch and oilseeds (annual)	France, EU	Yield increase: sequential cropping	Arvalis (research institute) and farmers taking part in RECITAL project	April/May	Starch and biogas. Concept implemented in Italy so want to test further north

Cultivation on abandoned land	N/A*	Ukraine, Europe	Abandoned land	Agrobiznes	N/A	Abandoned land, non-EU Europe

*As the Ukraine pilot studied abandoned land, no crop is currently grown, but it is planned to grow rapeseed in the future.

2.3.1 Individual suitability

The individual suitability of the five pilots that were finally selected is described below.

Malaysia, Oil palm yield increase

- Palm is currently the only high ILUC-risk crop, as defined by the criteria in the Delegated Regulation, so it is a priority to test in the pilots.
- South East Asia is the largest producing region, so it was a priority to conduct a pilot in this region, although there is some political sensitivity.
- The lead pilot company has an international presence, so was able to bring broad insights into the applicability of the methodology. For the first pilot audit, the pilot company identified a large plantation in the Sabah region of Malaysia that has good data availability and that is implementing better agricultural practices to improve yield on an ongoing basis. The data availability enabled us to test all the calculations required in the low ILUC methodology.
- The pilot company also identified a group of small holders they work with who could test the small holder provision and the feasibility of group certification in Phase 2. It was not possible to work with this group in Phase 1 as we prioritised plantations with known good data availability to ensure we could test the methodologies. The travel restrictions from the COVID-19 pandemic also meant it would not have been possible to work with the small holders during Phase 1 as it was felt this will require (at least) domestic travel by the pilot company to support small holders through the pilot process.

Colombia, Oil palm yield increase

- This pilot offers a second opportunity to test the approach for oil palm yield increase, which was chosen as palm is the only feedstock that meets the threshold to be defined as high ILUC under the legislation.
- Fedepalma, the association of Colombian palm oil producers, has supported the pilot throughout. Fedepalma supported our team to identify a short list of plantations who could take part in the pilot, according to mutually agreed criteria. Three plantations were shortlisted by Fedepalma. Fedepalma took into account the strength of the plantation's technical team, an existing RED certification, the implementation of best agricultural practices for at least three years and the use of a good information management system.
- The plantation chosen to take part in the pilot in Phase 1 was Palmeras de la Costa, an integrated plantation and mill in the Northern Oil Palm Zone of Colombia.
- Colombia also offers the possibility to test other aspects of the methodology in Phase 2, supported by Fedepalma. A key aspect might be to test the small holder

provision and the application of group certification. Although most small holders there are larger than 2 hectares – Fedepalma indicate that of the 5000 palm small holders in Colombia, only 47 are under 2 hectares – however, 85% cultivate an area less than 50 hectares.[8]

Uruguay, soy bean and Brassica carinata sequential cropping

- The main party involved is this pilot is UPM Biofuels S.A., the Uruguayan subsidiary of UPM-Kymmene Corporation a forest industry company headquartered in Helsinki, Finland. UPM Biofuels produces renewable and sustainable products for the transport and petrochemical industries.

- UPM has been implementing sequential cropping for several years in Uruguay. The measure is targeted at producing additional feedstock for EU biofuels. UPM has a knowledgeable project team and good access to data.

- UPM signs supply contracts with farmers on an annual basis, so this may mean that we have to work with data from different farms in Phase 2. However, as the measure has already been implemented, historic data is available to test both the baseline audit and additional biomass audit approaches. Having access to data from different farmers in the two phases could also be a benefit as it provides an opportunity to test scenarios under the low ILUC approach, for example different crop rotations or units, whilst still maintaining the central contact via UPM.

France, sequential cropping on arable farms for biogas

- This pilot provides an opportunity to test the low ILUC approach in the EU. It is also the only pilot looking specifically at biogas, rather than biofuel. The project team has previously worked on yield increase via sequential cropping in Italy connected to the Biogas Done Right initiative. The concept is tested in Italy, so the decision was taken to test the extent to which it can be replicated in France, which is further north and as such has a shorter growing season.

- The project team identified an opportunity to work with an existing research project called “RECITAL”, which focuses on sequential cropping from an agricultural perspective. This offers the opportunity to work alongside that project to test the low ILUC-risk certification perspective. The RECITAL project runs for the period 2020-2023 and is led by Arvalis Institut du Végétal, a French applied agricultural research organization, in partnership with the Association of Biogas Farmers of France (AAMF) as well as the network of Chambers of Agriculture and other economic operators of France.

Ukraine, Cultivation on abandoned land

- This pilot provides the opportunity to test cultivation on abandoned land in non-EU Europe.

- At the proposal stage, an initial Letter of Intent was signed with an agricultural holding company in Ukraine. However, that company was not able to identify land within their operations that had been previously abandoned. Therefore, an alternative approach was taken to identify land that has previously been abandoned, via local research institutions.

[8] Personal communication Fedepalma 21 May 2020

- A literature search on abandoned land in Ukraine identified which regions could have the largest potential for abandoned land. Through this exercise, we identified Ukrainian academics from the Ukrainian National Forestry University who have done extensive research on abandoned agricultural land in Ukraine. This team analyses satellite images and performs mapping of such land. Through contacts if these academics, an area of land was identified that we believed could meet the definition of abandoned land in the legislation. Whilst it is not currently growing feedstock for biofuel, it does allow to test the definitions of abandoned land in the legislation and to demonstrate that the land is suitable for agriculture.

- The plot of land tested is owned by a company called Agrobiznes. The plot formerly grew rye in the Soviet era nearly 25 years ago on what is known as “kolkhozes”, or community state companies, and was then abandoned. The project team worked in collaboration with researchers from the Ukrainian National Forestry University, a representative from the local administration, and a representative from Agrobiznes, to test the methodology for determining abandoned land.

2.3.2 Collective completeness

Taken together, the five pilot projects allow to test both oil and cereal feedstocks (two perennial oil palm plantations, one farm with annual rotation of soy bean and Brassica carinata), across three geographical regions (one in South East Asia, two in Latin America, one in the EU and one in non-EU Europe), and both main types of ILUC measure (yield increase and cultivation on abandoned land).

Phase 1 did not include a pilot on any sugar crops, such as sugar cane. We reached out to several different organisations in the sugar cane sector, both during the proposal phase and once the project had started, and noted that interest is low. Sugar *cane* ethanol already has relatively low GHG emissions associated with its ILUC score in the REDII and the EU biofuel market has relatively low importance for Latin American ethanol producers, so parties do not see the immediate business priority to engage. In the EU sugar *beet* setting, we see little room for low ILUC production because the yields are already high and there is little unused or abandoned land in the regions where sugar beet is produced.

We furthered our efforts to find a suitable sugar cane party from March 2020 onwards and identified several mills that might be interested via the BonSucro voluntary scheme. However, a coronavirus wave hit Latin America during late Spring and early Summer and the identified mills were no longer able to commit resources at that time. Given this situation and the importance of oil palm as the only high ILUC feedstock, a decision was taken in discussion with the Commission to focus efforts on developing a second palm pilot instead of a sugar pilot. Note that sugar cane was the subject of a case study in the project to develop the low ILUC certification guidance in the context of Framework Service Contract ENER/C1/2018-513.

It was not possible in Phase 1 to test the approach to certifying small holders or group certification. Whilst a group of small holders was identified, it was decided not to try to work with the small holder group until (at least) domestic travel within the country is permitted, which will hopefully be the case in Phase 2.

2.4 What the pilots will test

The aim of the pilot projects is to **test all aspects of the methodology for low ILUC-risk certification** of biofuels and bioliquids as specified in the REDII and Delegated Regulation 2019/807.

All pilots will test the proposed **process** for a project to become low ILUC-risk certified, the ability to produce **additional biomass** and the **quality**, **robustness** and **feasibility** of auditing. In addition, there are specific aspects of the Delegated Regulation that will be relevant for the different pilots to test. An overview of these is shown in Table 3.

Table 3. Specific aspects that each pilot will test

Aspect tested	Malaysia	Colombia	Uruguay	France	Ukraine
ILUC measure	Yield increase	Yield increase	Yield increase	Yield increase	Abandoned land
Data availability	x	x	x	x	x
Additionality test	x	x	x	x	*
Dynamic yield baseline for perennial crops	x	x			
Dynamic yield baseline for sequential cropping			x	x	
Methodology to determine land type					x
Sustainability of additionality measure	x	x	x	x	x
Certification of additionality measures taken in the past	x	x	x	x	
Small holders	(option for Phase 2)	(option for Phase 2)			
Group certification	(option for Phase 2)	(option for Phase 2)	(option for Phase 2)		

* Note that the pilots currently do not include an unused land case in which the additionality test would need to be applied.

The relevance of each of the aspects to test is described below.

ILUC measure. The Delegated Regulation allows for the certification of additional biomass that is either biomass produced on an existing farm or plantation as a result of an additional, above-baseline yield increase, or new cultivation on unused, abandoned or severely degraded land.

Data availability. The pilots test whether sufficient robust and auditable data is available to do the necessary calculations and the degree of granularity (e.g. block, whole plantation), for example historical yield data, data on cost of additionality measure and historical feedstock prices. For the pilot on abandoned land, the pilot tests the availability of land type documentation from government records or landowners.

Additionality. Low ILUC measures must pass the “Additionality test”, i.e. that they become financially attractive or face no barrier preventing their implementation only because the biofuels can be counted towards the REDII targets (from Article 5(1)(a) of the Delegated Regulation). The yield increase pilots test the financial attractiveness assessment and the non-financial barrier analysis (cultivation on abandoned land is exempt from the Additionality test).

Dynamic yield baseline for perennial crops. A crucial step for all low ILUC-risk certification is to establish an appropriate baseline, i.e. how much biomass would have been produced in the absence of the low ILUC additionality measure. The methodology to construct a dynamic yield baseline for perennial crops – in this case oil palm – is tested. Oil palm is a tree with a ~25 year non-linear yield growth curve, which needs to be taken into account in setting the dynamic yield baseline.

Dynamic yield baseline for sequential cropping. The methodology to construct a dynamic yield baseline for sequential cropping is tested. This is especially relevant for plots that are part of a crop rotation program which does not have a clear rotation pattern, including summer and winter cropping.

Methodology to determine land type by satellite imaging analysis and soil sampling:

- **Satellite imaging analysis capabilities and limitations**. Satellite imaging can theoretically be used to demonstrate the type of land of a particular plot (e.g. agricultural or grassland) using the Normalized Difference Vegetation Index (NDVI). It could also potentially be able to determine the crop profile of the agricultural land to specifically demonstrate that food or feed was grown under the REDII Article 40(2) definition. The abandoned land pilot tested the feasibility of this and the potential limitations of this method, such as cloud cover in images, availability of images, ability to determine crop profiles, etc.

- **Soil sampling for land type demonstration**. A potential complementary or substitute method to satellite imaging for demonstrating the land type would be soil sampling. The Centre for Ecology and Hydrology prepared an advice note in the context of this project that explores the feasibility of using soil sampling to demonstrate that abandoned land was formerly agricultural based on potential DNA markers in the soil. This report was produced independently of the audit and was a theoretical assessment (soil sampling was not conducted on the pilot site).

Sustainability of the additionality measure. All low ILUC additionality measures need to be conducted in a “sustainable manner”, as required by the Delegated Regulation 2019/807. “Sustainable manner” is not further defined. The low ILUC module is designed to be used as an add-on to existing EC-recognised voluntary schemes, which is designed to ensure that additionality measures meet the core REDII sustainability criteria, and often go further than the core criteria, depending on the voluntary scheme.

Certification of additionality measures taken in the past. The Delegated Regulation allows for the certification of additionality measures taken up to 10 years in the past, as long as the required data is available. We will look to test this concept in several of the pilots. This approach also allows us to mitigate some of the impact of timeline delays due to the COVID-19 pandemic.

Small holders. Small holders less than 2 hectares (as well as cultivation on abandoned or severely degraded land) are exempt from the formal additionality test. Therefore, we would like to test the approach to certifying small holders, to test the feasibility of certification and the extent to which the size threshold is appropriate. A group of small holders in Malaysia was identified in Phase 1, however it was not possible to work with this group due to travel restrictions related to the COVID-19 pandemic.

Group certification. In part related to small holders is the concept of group certification. We would like to test how the concept of group certification could be applied to low ILUC-risk certification. We would like to explore to what extent should group certification be allowed for low ILUC-risk certification, how should a group be defined, how should a baseline be set (group level of individual farmers) etc. Note that our working assumption is that – in line with the current rules for EC-recognised voluntary schemes – this approach would be intended for small holders but would not necessarily need to be restricted to small holders below 2 hectares.

2.5 Introduction to each pilot

The following sections describe an introduction to each pilot project and the first round of pilot audits in the first quarter of 2021. The results of each pilot are further described in described in the individual pilot reports.

2.5.1 Pilot 1: Malaysia, Oil palm yield increase

2.5.1.1 Pilot introduction

This pilot tests the low ILUC-risk certification methodology for oil palm yield increase. The pilot is supported by a large plantation owner and the audit was conducted on a plantation located in the Sabah region in East Malaysia, with two estates of ~3700 ha and ~3100 ha (Figure 5). This plantation is owned and operated by the pilot company and was chosen because they have good data availability which allows testing of different options and approaches in the low ILUC-risk methodology.

Figure 5. **The pilot plantation is located in the Sabah region of Malaysia**

The plantation is in its second cycle of oil palm trees grown on this land. Replanting of the first generation of oil palm trees started in 2001 and is done on an ongoing basis. The plantation is currently certified to ISCC EU, which is EC-recognised, and in addition to the RSPO and MSPO certification schemes.

2.5.1.2 Additionality Measures

Two additionality measures were tested on different areas of the plantation: thinning of mature stands (~7-8 year old trees) and replanting of old stands with higher yielding clonal seedlings.

- Thinning is the removal of whole trees to prevent that insufficient sunlight impedes productivity. A slight decrease in yield is observed after thinning but is followed by a yield increase from year 2 or 3 onwards as the remaining trees have more space to grow palm fruit bunches. Thinning is normally a one-time action, done on different sub-plots of the plantation when the trees in that sub-plot are around 7-8 years old. It can be done by injecting herbicide in the oil palm trunk or by cutting the tree using a chainsaw. It is considered an additionality measure by the economic operator because it is not a standard practice for oil palm plantations.

  In this pilot, thinning was implemented on a total planted area of ~3400 ha, divided into 102 blocks. These blocks were replanted between 2001-2007 and thinning was implemented in 2015 onwards.

- Replanting using clonal seedlings is additional because standard practice is to use DxP seedlings (most typical commercial seedling that is a cross of dura and pisiferas). Clonal seedlings require expertise for selection and preparation of the clonal material and are more expensive compared to standard DxP seedlings.

  In this pilot, replanting of clonal seedlings was done on a plot of total planted area of ~2500 ha with 76 blocks. The blocks are replanted on an ongoing basis, and this pilot studied the period from 2010-2017 when 6 to 18 blocks were replanted per year.

The additionality measures have already been introduced, each at different times on different areas of the plantation. The audit was therefore able to test both the setting of the dynamic yield baseline and the additionality test (“baseline audit”) and the calculation of additional biomass (“additionality audit”).

2.5.1.3 Audit

The pilot audit was performed on **24 and 25 February 2021** by Zulkarnain Ishak, an RSPO and ISCC-trained auditor working for Control Union. The audit was performed **remotely** due to domestic travel restrictions with the global pandemic.

Note that this pilot is supported by a large plantation owner. Together with the company, it was decided to focus this first pilot audit on their large plantation for which they have good access to data. This enables the team to thoroughly test the proposed approaches for conducting the additionality test and determining the dynamic yield baseline and additional biomass.

We plan to test the certification of small holders and the approach to group certification in a next audit round in Phase 2 of the project, when (at least) domestic travel is permitted, supported by the same agribusiness.

2.5.2 Pilot 2: Colombia, Oil palm yield increase

2.5.2.1 Pilot Introduction

This pilot tests the low ILUC-risk biomass methodology for yield increase of oil palm on a large plantation. The chosen plantation is a large (3,400 ha) plantation integrated with a palm oil mill, and located at 10°06’ 05.23”N y 74°00’ 38.32”W in the Northern Oil Palm Zone in Colombia (Figure 6). The plantation and mill owner is Palmeras de la Costa. The plantation was established in 1971. The plantation is currently ISCC, RSPO and Rainforest Alliance certified.

The pilot is also supported by Fedepalma, the association of Colombian palm oil producers who helped to identify suitable plantations for the pilot in Colombia.

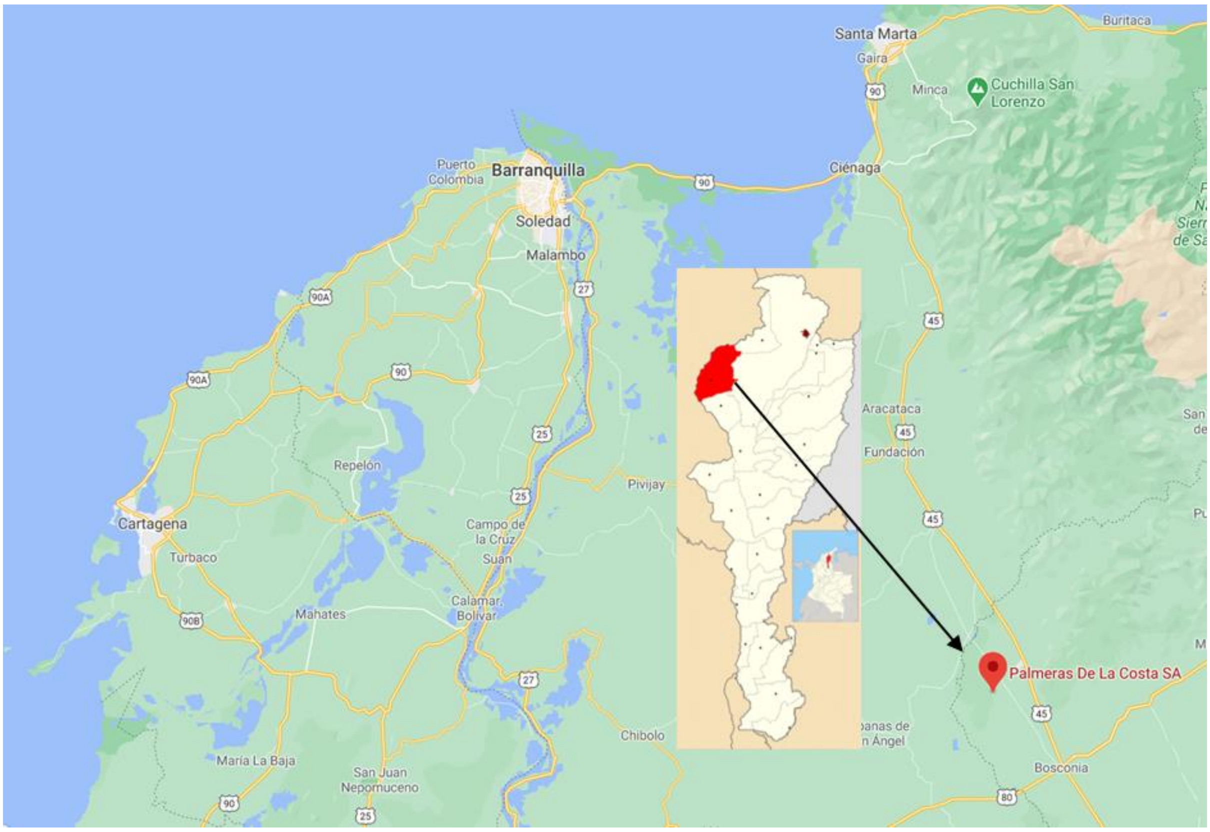


Figure 6. The pilot plantation is located in the Copey region in the Northern Oil Palm Zone of Colombia.

2.5.2.2 Additionality Measure

The additionality measure tested was **improved irrigation**. This measure explored the installation of a micro aspersion irrigation system in 3,000 ha of Palmeras de La Costa plantation. This is an area where rainfall is relatively low.

The irrigation system was installed in 2018, although it started operating at full capacity in late 2020. Therefore, the current data does not yet show the full effect of the measure. Now that the additionality measure has been implemented, the annual yield is expected to increase from 15 mt fresh fruit bunches per hectare (FFB/ha) to around 19 mt FFB/ha.

The audit was therefore able to test both the setting of the baseline (“baseline audit”) and, partially, the calculation of additional biomass (“additionality audit”).

2.5.2.3 Audit

The pilot audit was performed between the **24 and 26 of February 2021** by Ignacio Falcone, an ISCC-trained auditor working locally for Control Union. The audit was performed **on-site**, between the local auditor and Palmeras de la Costa’s sustainability team. Note that other members of the project consortium joined the audit remotely due to COVID-19 restrictions.

2.5.3 Pilot 3: Uruguay, Sequential Cropping

2.5.3.1 Pilot introduction

This pilot tests the low ILUC-risk biomass methodology for yield increase by sequential cropping of Brassica carinata, planted as a winter crop, following a main crop of soybeans. The pilot is set in a farm which cultivates Brassica carinata as contract farming for UPM Biofuels in Uruguay. The chosen farm is located in Colonia (Figure 7) and has 4 years of sequential cropping historical data. UPM sources Brassica carinata for biofuel production from different farms each year. Different farms are contracted on an annual basis, depending on which farms choose to cultivate Brassica carinata that year. UPM-Kymmene (i.e. UPM Biofuels Uruguay) is RSB certified and the supplying farms are audited within the scope of the UPM certification each year.

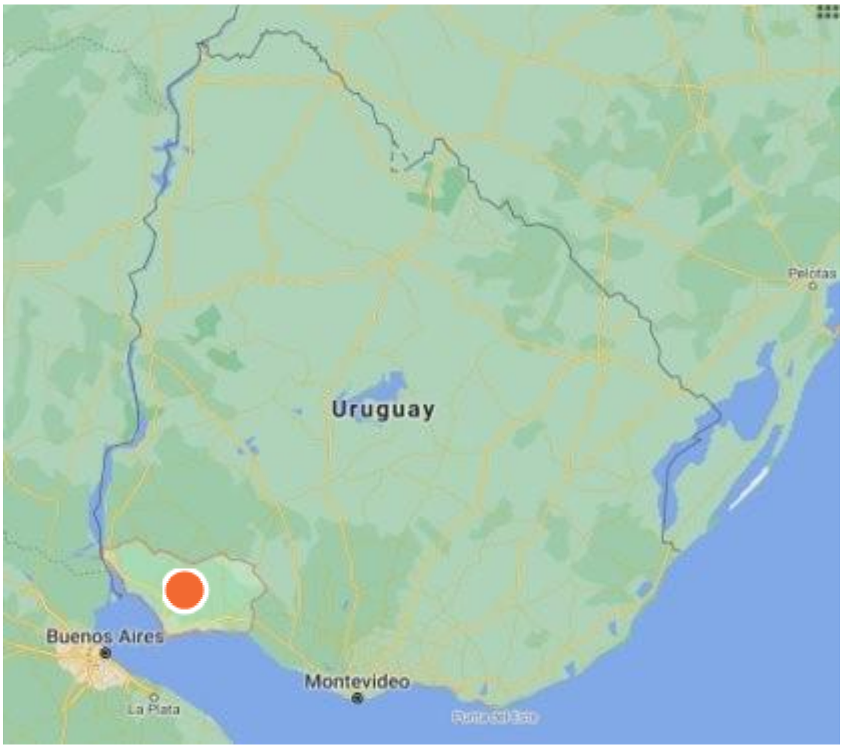


Figure 7. The pilot farm is located in the Colonia department of Uruguay

2.5.3.2 Additionality Measure

The additionality measure tested is the introduction of **sequential cropping**. This is the practice of planting a second crop in a year on the same plot of land, instead of leaving the land fallow during winter. It is considered an additionality measure because it produces additional biomass from a plot that is already under operation, replacing fallow land or a non-productive cover crop.

The additionality measures have already been introduced in the farm. The audit was therefore able to test both the setting of the baseline ("baseline audit") and the calculation of additional biomass ("additionality audit").

2.5.3.3 Audit

The pilot audit was performed between **17 and 19 of March 2021** by Anahi Durhelli, an ISCC-trained auditor working for Control Union and based in the region (in Argentina). The audit was performed **remotely** due to travel restrictions set by the Uruguayan government due to the COVID-19 pandemic.

Note that this pilot is supported by UPM, an international bioeconomy company based in Finland who currently uses Brassica carinata oil to produce biodiesel at a partner's facility. UPM Biofuels agrees supply contracts with farmers in Uruguay on a seasonal basis. UPM Biofuels is not involved in the crop rotation process outside the Brassica carinata planting season.

Together with UPM, it was decided to focus this first pilot audit on one farm that has been part of their Brassica carinata sequential cropping project for several years. For this reason, they have good access to historical data. This enabled the team to thoroughly test the proposed approaches to conduct the additionality test and the determination of the dynamic yield baseline and additional biomass.

2.5.4 Pilot 4: France, Sequential Cropping

2.5.4.1 Pilot introduction

This pilot tests the low ILUC-risk certification approach for yield increase from sequential cropping for biogas on an arable farm in France.

The French pilot is led by IEEP in close collaboration with Arvalis, a French research institute specialised in arable farming. In 2020, Arvalis launched a research project on sequential cropping called "RECITAL". The focus of the RECITAL study is on the performance of energy crops within sequential cropping rotations and aims to optimise cropping rotations which include sequential energy crops. This pilot is therefore able to work alongside RECITAL to test the low ILUC certification approach.

The farm chosen for the Phase 1 pilot audit is an arable farm located in the Centre-Val de Loire region of France (centre-west of France, see Figure 8)[9]. The farm produces cereals and oilseeds in rotation. It started to implement sequential cropping before the pilot project started. The sequential crop used in this first phase of the pilot is triticale (a cereal), grown over winter.

The pilot farm is part of a group of 14 farms which jointly manage their crop production. Together they own and jointly manage 3,500 ha of arable land, of which 400 ha are subject to sequential cropping (95% winter sequential crops, 5% summer sequential crops). This particular setting means that more detailed yield and financial data are available than might normally be the case on a typical farm in this region, as farmers in the group need to closely monitor costs and yields for profit re-distribution purposes at the end of the campaign.

In addition, some farms in the group co-invested in a biogas plant which is fed notably with sequential crops grown on the farms. Being involved in biogas production rather than biofuel, the pilot farm is not currently certified under any EC-recognised voluntary scheme.

[9] Initially, three different farms were short-listed for the French pilot. For the purpose of the Phase 1 audit, it was decided to focus on one farm only. The two other farm sites may be involved at a later stage of the pilot project.

Figure 8. The pilot farm is located in the Centre-Val de Loire region of France

2.5.4.2 Additionality Measure

The additionality measure tested in the French pilot is **sequential cropping**. Sequential cropping is the practice of planting a second crop in a year on the same plot of land. It is considered an additionality measure because it produces additional biomass from a parcel of land that is already under cultivation, by maximizing the time in which the parcel produces biomass. Typically, sequential crops are grown during winter time[10] and this was the case examined in the French pilot project.

As required by the certification guidance, one specific parcel was selected for the purpose of the pilot audit (see Figure 9). The 'VO70' parcel is 28.44 ha.

The additionality measure was already implemented on the farm and on the selected parcel before the start of the pilot project. The audit was therefore able to test both the setting of the baseline ("baseline audit") and the calculation of additional biomass ("additionality audit").

[10] Growing sequential crops during summer is also possible, although a lot less frequent.

Figure 9. Map of parcel VO70 chosen for the pilot audit

2.5.4.3 Audit

The pilot audit was performed on **11 March 2021** by William Rey, an ISCC-trained auditor working for Control Union in France. The audit was performed **onsite** by the local Control Union auditor. The parcel landowner, the crop rotation manager (managing crop rotations on the land of the 14 farms involved in the group) and a researcher from Arvalis were also physically present for the audit.

Initially, three different farms were short-listed for the French pilot, as travel restrictions have been uncertain during the COVID-19 pandemic. For the purpose of the audit, it was decided to focus on one farm only where an onsite visit could be organised. The farm chosen, located in Centre-Val de Loire, actually operates as part of a group of farmers who jointly manage their land. The farms make joint investments and share machinery. This means that the pilot farm collects detailed yield and financial data because of their functioning as part of the group. The farm also has a track record of testing sequential cropping methods which has been valuable in understanding decisions a farmer may face in implementing this additionality measure in practice. The two other farm sites, located respectively in Bretagne and in the Bourgogne regions, may be involved at a later stage of the pilot project.

The audit tested the low-ILUC certification on parcel “VO70” in year 2019. The audit tested both the setting of the baseline (“baseline audit”) and the calculation of additional biomass (“additionality audit”).

2.5.5 Pilot 5: Ukraine, Abandoned land

2.5.5.1 Pilot introduction

This pilot was conducted to test the low ILUC-risk certification methodology for the recultivation of biomass on abandoned land, defined as “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” (Delegated Regulation 2019/807, Article 2(3)).

The 10 ha plot of land that was tested is located in Reklynec village in the west of Ukraine (Figure). It is currently owned by a private owner/farmer and is not currently under cultivation and therefore not certified to a voluntary scheme.

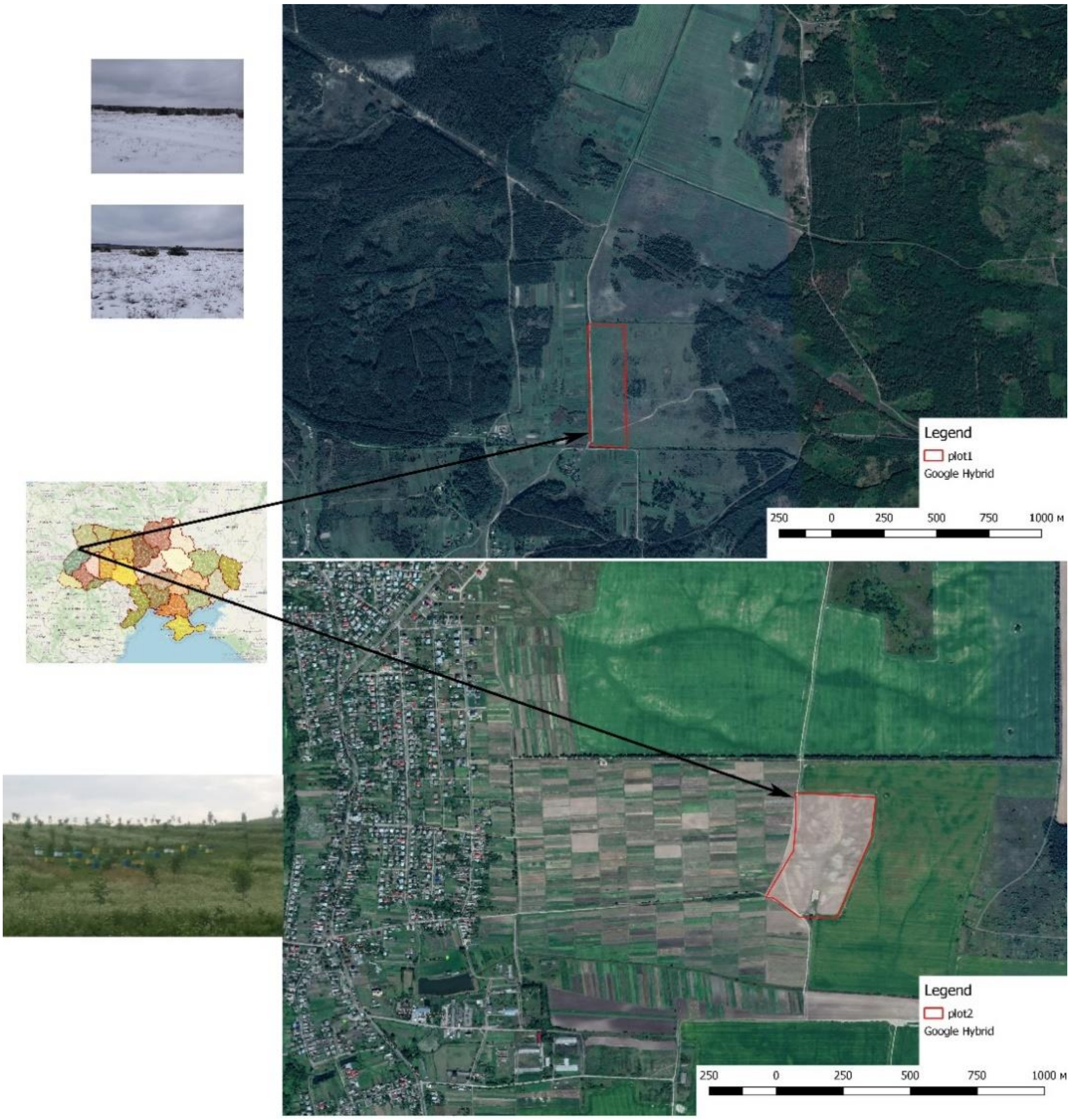


Figure 10. Plot of land tested in the pilot (top) located in Reklynec village in Ukraine and a neighbouring control plot (bottom) used during the satellite imaging analysis. Photos taken in 2021.

The land used to be part of a state-owned farm, or “kolkhoz”, that grew rye from approximately 1960-1980. After the collapse of the Soviet Union in the 1990’s, the land was no longer owned by the state, and was split up into small land titles allocated to people living in the area who used to work on the kohlkoz. Often in Ukraine, these changes in ownership caused land to become abandoned, especially plots that were not very fertile.

The plot studied in this pilot was relatively sandy and low quality land, thus has only been used for some animal grazing from 1996-2021. The maximum number of cows grazing on the land reached 40 heads from 2003-2005, but on average was about 20 cows, and dropped to only 5-7 cows in recent years. It was also used for informal haymaking from 1996-2010.

During the period of abandonment (since the 1990’s), vegetation naturally grew on the land. Today, it is categorized as grassland, but there are some trees that have grown. The central part of the land has 6-10 year old pine trees that are approximately 2 metres tall, estimated to cover 15% of the plot through satellite imaging.

2.5.5.2 Additionality Measure

The additionality measure tested is the **recultivation of biomass on abandoned land** that was formerly agricultural. The owner of the land has signed a land lease agreement with an agricultural company, ‘Dolyna Agro’ LLC. They intend to grow organic berries on the plot. Although this is not a biofuel feedstock, the methodology to demonstrate the status of abandonment can still be tested. The land will first grow rapeseed and soybeans to clear the land of weeds and prepare it for berry production. This is standard practice in Ukraine. These oilseed feedstocks could be used for biofuel production.

2.5.5.3 Audit

The 7-hour baseline audit was conducted on **26 January 2021 onsite** by Anton Opria of Control Union, an ISCC trained auditor.

Oleh Chaskovskyy of the Ukrainian National Forestry University also attended the audit in person. Prior to the audit, Oleh performed a satellite imaging assessment of the pilot plot with his colleague Yuri Myklush to assess whether the plot of land met the criteria to be defined as abandoned according to Delegated Regulation 2019/807.

During the audit, the landowner and the co-owner of ‘Dolyna Agro’ LLC, the agricultural company who leases the land, were also physically present.

2.6 Pilot audit approach

For each pilot, we did one pilot audit in Phase 1. For all the yield increase pilots, the additionality measure had already been taken, so we were able to do a combined “baseline audit” (to calculate and check the dynamic yield baseline and additionality test) and “additionality audit” (to check the volume of additional biomass).

The overall aim of the pilot audits is to test the certification approach for low ILUC-risk certification. There are several parts to that aim:

- To test the overall certification approach and process – are the steps logical and is the documentation clear?
- To test data availability – is robust and verifiable data available to conduct the necessary calculations?
- To identify any issues with the low ILUC methodology so that they can be further developed.

For the first round of audits in Phase 1 in particular, identifying and addressing methodological issues was a key focus.

The pilot audits were conducted by local ISCC-trained auditors from the certification body Control Union. Prior to the audits (in October/November 2020) the local auditors attended a half-day training on the low ILUC methodology and guidance. The pilot audits were conducted in the first quarter of 2021. Due to COVID-19, the consortium had to join the audits remotely. Wherever possible, the local Control Union auditor joined the audit in person (see “Audit” sub-sections in section 2.5 for details for each pilot).

Before the audits were scheduled, the consortium shared with all pilot companies the certification documents developed by the project team, namely: the Low ILUC Certification Handbook, Audit checklist and Management plan template. The project team talked the pilot companies through the documents and the companies had an opportunity to reflect and ask questions.

Each pilot audit was conducted over the course of two days. Once the audits were scheduled and prior to the audit date for each pilot, Control Union shared an “Audit Plan” with the pilot company, which includes an agenda for the audit and the list of data and document templates needed from the pilot company. The main template for the pilot company to fill in is the management plan template. For the palm yield increase pilots, the consortium also shared a dynamic yield baseline Excel calculation tool, and for all yield increase pilots the consortium shared an NPV Excel tool to conduct the financial attractiveness assessment. This allowed the pilot company to be ready with the appropriate data and filled in management plan at the start of the audit.

In general, the first day of the audit consisted of a kick-off meeting where the agenda of the audit was presented, followed by data collection. The auditor then independently assessed the data and filled the audit checklist accordingly. The second day consisted of questions from the auditor to the pilot company, a final filling of the audit checklist and the audit was concluded with a meeting between the auditor and pilot company discussing the results, walking through the audit checklist, and clarifying any remaining questions on either end. Where time zones allowed, the consortium joined either the concluding audit meeting, or if not, a feedback meeting was scheduled between the audit, the pilot company and the consortium in the days following the pilot.

A summary audit report was then written by Control Union for the consortium to summarise the process, results, and feedback for each pilot.

The list of documents prepared during each audit and the responsible party is summarised in the table below. In addition to these documents, the pilot lead in the consortium (either Guidehouse or IEEP) also prepared a pilot report with the findings from each pilot.

Table 4. List of documents from pilot audit and responsible parties

Responsible party	Document
Pilot company	Management plan
	Dynamic yield baseline and additional biomass calculation*
	Financial attractiveness assessment*
	Other supporting data as relevant. E.g. copies of voluntary scheme certificates (e.g. ISCC, RSPO), maps and kml files, planting schedules, satellite imaging report
Control Union	Audit checklist
	Summary audit report

* The dynamic yield baseline, additional biomass calculation and financial attractiveness assessments were not prepared for the Ukraine pilot as for cultivation on abandoned land, the baseline is zero and it is exempt from the additionality test.

3. Review of low ILUC-risk certification

3.1 Introduction

This chapter aims to support the Commission's review of Section IV of the feedstock expansion report, as set out in Article 7 of the Delegated Regulation. The feedstock expansion report describes the concept underlying low ILUC-risk certification, with the following headings:

- Preventing land displacement through additionality measures
- Ensuring additionality beyond business as usual
- Guaranteeing robust compliance verification and auditing

The Commission asks that a review (emphasis added) "*establish whether the [low ILUC-risk] criteria can be implemented in practice so they are achieving the following objectives:*

- *Additionality: In line with the main objective, low ILUC certification should trigger **real additional improvements** in productivity and production that go beyond the expected increase. As a consequence, it should apply only to the additional amount of feedstock resulting from the application of increased productivity-promoting schemes or cultivation of crops on areas which were previously not used for cultivation of crops. The criteria should include elements **addressing the risk of windfall gains**.*
- *The criteria shall be applicable to **all relevant types of food and feed crops** that are commonly used for production of biofuels and bioliquids*
- *The criteria shall be applicable both **in the EU and in third countries***
- *The criteria should be implementable both for **single holdings or groups of holdings***
- *Implementation of the approach shall ensure additionality in a **feasible and verifiable** manner while **limiting costs for the producer***
- *The approach shall meet **adequate standards of reliability, transparency and independent auditing**. It should **take account of annual yield fluctuations** and variation of yields.*

Section 3.2 gives an overview of the findings from the pilots following the overall headings in the feedstock expansion report and the specific aspects tested (section 2.4). The following sections describe a synthesis of the overall findings from the first round of pilots, according to the same headings. More detailed results for each pilot can be found in the individual pilot reports. Chapter **Error! Reference source not found.** describes the extent to which the approach is applicable to different feedstocks, regions and types of production.

Whilst it was not possible to explicitly test the approach to certifying small holders in Phase 1 of this project, Appendix B describes some background information on the exemption for small holders from proving additionality and different definitions of small holders used, which acts as input to how we can test the small holder approach in Phase 2.

3.2 Overview of pilot findings

This section gives an overview of the findings from the pilots following the overall headings in the feedstock expansion report and the specific aspects tested (section 2.4).

The aspects tested are scored green, yellow or red for each pilot. **Note that the aim of the pilots is to test the aspects of the methodology for low ILUC-risk certification, testing data availability, auditability and the practicality and robustness of the approach. The aim was <u>not</u> to certify the pilot examples.** Therefore the scoring and rationale reflects whether the pilot was able to follow the methodology and provide robust, auditable data, not whether the pilot would pass the test or be low ILUC-certified. A key example of this is the financial attractiveness test, where pilot companies were in general able to follow the calculations required, based on auditable data, but the pilot examples did not pass the test and there were concerns raised by participants about how the test would work in practice.

Theme	Question	Sub-question	Malaysia	Colombia	Uruguay	France	Ukraine
Additional biomass vs dynamic yield baseline	Could a dynamic yield baseline be reliably calculated?	Availability and reliability of data	Very granular data available. Large variability between subplots	Information system and data back to 2016	Data was available because the farm is in a UPM programme	The CAP ensures detailed maps, identifying the crops grown at parcel level, are commonly available	N/A
		Accuracy of the resulting yield baseline	Option 1A and 1B led to different results. Impact of weather was larger than the impact additionality measure	Only small difference between DYB option 1A and 1B	The years chosen to include in the baseline have an impact. Some difference between unit approaches tested.	Significant differences between all methods tested	N/A
	Could a yield increase following the additionality measure be reliably calculated?	Availability and reliability of data	Granular yield data available (subplot level)	Granular yield data available	Yield data available because farm is in UPM program	Granular yield data available (parcel level)	N/A
		Accuracy of the resulting yield increase	Difficult to attribute a yield increase solely to an additionality measure and disentangle other factors like weather	Full impact of yield increase expected to show next year (2021 onwards)	Big difference in the results of the different approaches	Different methods resulted in different results	N/A
	Does the approach adequately take into account annual yield fluctuations and variation of yields?		Age of trees is taken into account but weather caused large yield fluctuations which are not taken into account in the baseline	Age of trees taken into account in the baseline setting	Crop rotation and yields relatively consistent	Rotation pattern means have to go back several years to see historic yields for same crop	N/A

Theme	Question	Sub-question	Malaysia	Colombia	Uruguay	France	Ukraine
Additionality test (financial attractiveness/ barrier analysis)	Could financial additionality be reliably demonstrated?	Availability and reliability of data	Granular cost data available at subplot level	Reliable cost data available	Reliable cost data available	Financial data available at very granular (parcel) level	N/A
		Accuracy of the resulting financial analysis	Large difference in costs in $/ha between subplots	The net present value (NPV) of the additionality measure was relatively easy to calculate as CAPEX and OPEX data were readily available and could be verified	Calculated from the farmer perspective. This analysis did not include previous expenses, such as R&D, to develop Brassica carinata as a commercial crop	Analysis reflected cost and benefit to the farmer but did not include cost of agronomic expertise on sequential cropping that needed to be developed	N/A
	Were (non-financial) barriers identified?	Availability and reliability of data	Non-financial barriers were described but unclear how to demonstrate as reliable	Not tested	Non-financial barriers were described but auditor found hard to verify	No applicable non-financial barrier could be identified	N/A
		Accuracy of the resulting non-financial analysis	Unclear to the auditor how to determine the validity of the barriers objectively	Not tested	The auditor found the non-financial barrier analysis vague and open for interpretation	N/A	N/A
Abandoned land	Could the land be reliably identified as abandoned?	Availability and reliability of data	N/A	N/A	N/A	N/A	Reliable satellite images available from 1986-2020, complemented with local interviews. Local archives did not have any documents available to demonstrate land was previously agricultural.
		Accuracy of the identification	N/A	N/A	N/A	N/A	Many reliable indices to analyse satellite images, complemented with local interviews

Theme	Question	Sub-question	Malaysia	Colombia	Uruguay	France	Ukraine
Administrative burden	Describe the administrative burden for the economic operator to get low ILUC certified		Calculations done at sub-plot level. Fairly low additional volumes and uncertainty on volumes of low ILUC-risk biomass.	Uncertainty on volumes of low ILUC-risk biomass.	The calculations of all the different methods are a big administrative burden compared to the amount of additional biomass.	The calculations of all the different methods are a big administrative burden compared to the amount of additional biomass.	Satellite imaging may need to be performed by a third party, but no financial and non-financial barrier analysis needed.
Sustainability of additionality measure	Describe the sustainability impact of the additionality measure for the pilot farm		The farm is RSPO, MSPO, and ISCC EU certified and therefore sustainability needs to be appropriately managed	The farm is RSPO and ISCC certified and therefore sustainability needs to be appropriately managed. A 70% reduction in water consumption was achieved with the additionality measure (irrigation system).	The farm is RSB certified. UPM Biofuels found a reduction of soil erosion and a higher nutrient retention and conservation	The farm is not certified, but no issues were identified. The farm also showed further soil enrichment, nutrient recycling, and reduction in the use of chemical inputs.	The farm is not certified as it is not in cultivation during the pilot. There is a risk of direct land-use change emissions.

3.3 Dynamic yield baseline and additional biomass

3.3.1 Calculation of a dynamic yield baseline

Overarching question: Could a dynamic yield baseline be reliably calculated?

The approach to calculate a dynamic yield baseline was able to be followed across the different pilots. The study did, however, reveal several open questions in the methodology and areas that need to be further developed. In some cases there was also a significant variability of the dynamic yield baseline obtained for a specific farm/plantation when using the different methodologies and assumptions, e.g. the specific years over which the dynamic yield baseline is calculated, or the type of crops taken into account in the baseline for sequential cropping. The dynamic yield baseline also appears sensitive to weather events occurring over the period for which it is calculated, which has a direct impact on the amount of low ILUC-risk biomass that economic operators are entitled to claim.

Availability and reliability of data

Good quality historical yield data were available for all the pilots, and for some pilots yield data was available per sub-plot, which made it possible to follow the methodologies set out to calculate a dynamic yield baseline in all cases, and for auditors to verify the underlying yield data. It was possible to link the yield data back to the specific plot of land.

It should be noted that data availability was part of the rationale for selecting some of the pilot companies. Most were already certified to a voluntary scheme and most had also engaged in optimising their yields and/or implementing low ILUC practices before the study started. It is therefore likely that such good data availability and granularity is not necessarily representative of all farmers. Consequently, we assume that the pilots represent "best in class" operations as far as data availability and reliability is concerned. This is particularly the case for historic yield data, which may not be readily accessible, especially for farmers who rent their farmland. Several pilot companies also questioned whether parties that are not already certified to a voluntary scheme would have the necessary data readily available. It should be noted that farms located in the European Union are likely to maintain a good level of data availability and reliability, since compliance with the Common Agricultural Policy requires detailed crop data to be kept at parcel level.

Accuracy of the resulting yield baseline

Although the pilot companies were able to follow the calculations to determine a dynamic yield baseline due to the availability of reliable yield data, the “accuracy” or representativeness of the resulting yield baseline was considered challenging in all pilots but one (Colombia). This is due to the following elements:

- The Malaysian pilot project revealed a high level of variability in yield data between subplots from the same plantation. Therefore, averaging yields over an entire plantation, as was done in the Colombian pilot, may not be representative for every subplot in the Malaysia pilot and could result in an inaccurate dynamic yield baseline.

- Weather has a large impact on yields in all the pilots. Therefore, the weather both during the historical yield period and after the additionality measure is implemented impacts the resulting dynamic yield baseline and subsequently the amount of low ILUC biomass operators are entitled to claim. In the Malaysia pilot, the effect of weather events on yield was larger than the effect of the additionality measure for some subplots in some years.

- For the dynamic yield baseline for palm, the additional low ILUC biomass to be claimed varied by whether Option 1A or 1B was used in the Malaysian pilot. The average growth curve in Option 1A and the growth curve provided by the economic operator in Option 1B slightly varied, especially in year 1-4 of growth. This difference in dynamic yield baseline results in differing volumes of additional biomass to be claimed. For the Colombian pilot, there was some difference between the additional biomass that could be claimed using Option 1A or B, but the variance was not as large.

- For Malaysia, the growth curve provided by the pilot company for Option 1B for the subplots undertaking replanting was based on historical yields from the previous planting cycle on the same plantation. This curve was potentially inaccurate because the trees were planted at different densities in the growth curve provided compared to the current practice.

- For sequential cropping, a significant variability was observed when comparing the dynamic yield baseline obtained for the same parcel through different calculation methods. The crop rotation in the last three years, used to determine the dynamic yield baseline, has a big impact on the level of the baseline. For instance, in the French pilot, one method calculated a dynamic yield baseline based on the full crop rotation yields and another only included the yield of the crop (rapeseed) that was replaced in the rotation by the sequential crop (and a different main crop) in the test year. The latter method de facto excluded yields from the cereals in the rotation in the baseline, resulting in a lower dynamic yield baseline and, by consequence, significantly higher amounts of additional biomass that could be claimed (from 5.33 t/ha to 1.68-2.93 t/ha). For Uruguay, the farmer only started growing Brassica carinata in 2019, but there were some years in the past (1 year ago and 4 years ago) where they had grown a winter cereal crop. If this winter crop is included in the baseline, it significantly increases the level of the baseline and therefore decreases the volume of additional biomass that could be claimed.

- For France especially, the complexity of the crop rotation made it difficult to determine which crops should be included in the baseline calculation. The chosen baseline period, rotation pattern, and the type of crops that are included in the calculation of the dynamic yield baseline leads to significant variations in the resulting baseline.

Practical issues, loopholes and areas of improvements (From project managers and auditors)

The variations in approaches (see above) and results when calculating the dynamic yield baseline represent a potential chance for operators to pick the method providing the lowest possible baseline yield to maximize low ILUC outputs. This could also lead to an uneven playing field between economic operators, as those with greater data access may be advantaged. Therefore, the approaches used to calculate the dynamic yield baseline should be narrowed down to reduce this variability. Based on pilot projects, Option 1A for the calculation of a dynamic yield baseline for palm plantations is more consistent; therefore, Option 1B should only be accepted in exceptional circumstances.

The pilots on sequential cropping reveal that even quite common crop rotation patterns can lead to complexities in setting a baseline, if the order of rotations is not consistent or rotations include several different crops. Challenges exist regarding both time and geographic dimensions:

- Time. As illustrated in the French and Uruguayan pilots, the cycle of crop rotation cannot be established over a single year, but over two or three years. It is not binary, e.g. one year with, one year without cover crop. The frequency of planting a secondary crop may be over several years and there can be several different crops, which poses the question of which one(s) to include in the baseline calculation.

- Geography (physical location). Rotations are implemented over several parcels at a given moment in time. Therefore, a given parcel may undergo different main and secondary crops over a 2-3 year cycle, which means that a constant annual pattern cannot be used to calculate a dynamic yield baseline and/or additional biomass for a specific parcel.

3.3.2 Calculation of additional biomass

Overarching questions: Could a yield increase following the additionality measure be reliably calculated? Does the yield increase represent a “real” increase compared to business as usual?

While the completeness and robustness of data provided in pilots allowed the calculations to be completed, the different calculation methods bring variability in the calculation of additional biomass, especially for sequential cropping (for palm, the variability related more to setting the dynamic yield baseline rather than the additional biomass calculation). The variability is problematic with regards to the reliability of the low ILUC biomass volume claimed. In addition, non-ILUC practices or natural events contribute to variation in yields, so distinguishing their contribution to yield increases, compared to purposefully implemented low ILUC practices remains challenging.

It can therefore be concluded that a yield increase cannot currently be reliably calculated due to the breadth of approaches and variations in results. Similarly, whether the yield increases measured in pilots represent a “real” increase cannot be reliably established. Further work is needed to narrow down the range of methodology options and to consider the extent to which external factors could or should be included in the baseline or additional biomass calculations.

Availability and reliability of data

As mentioned in the previous section, reliable yield data were readily available in all pilots, which allowed pilot companies to calculate a yield increase as per the established methodology.

Accuracy of the resulting yield increase

As with the calculation of the dynamic yield baseline, operators were able to perform the calculation of yield increase according to the established methodology.

For sequential cropping however, a significant variability in the amount of additional biomass produced can be observed depending on the approach used and whether additional biomass is based on mass, energy content or crop component content (i.e. starch, oil, protein etc). For instance, the Uruguayan pilot project calculated additional biomass ranging from 7% to 103% of the biomass baseline. Additionally, the analysis of crop components in additional biomass shows that not all crop components are produced in the same proportions when additional biomass is produced (because different feedstocks are grown). In the French pilot example, proteins and sugars increased with all of the calculation approaches, but starch and fat decreased in certain cases. The possibility for the low ILUC approach to look more specifically at the crop composition of additional biomass should be further explored in Phase 2.

As with the calculation of the dynamic yield baseline, pilot project operators also reported that external elements (e.g. weather) play a significant role in the observed biomass yields after implementation of the additionality measure. In some examples the impact of these external factors is larger than the expected yield increase. Since the weather events and other external factors are not similar during the 3 years of the historical yields and the 10 years following the additionality measure, yields cannot be directly compared. These external factors are challenging to disentangle from the effect low ILUC measures implemented.

The uncertainty over the exact amounts of additional biomass volumes is problematic for feedstock producers when developing business plans, as the potential income from low ILUC biomass cannot be estimated with precision in the long run. Volumes of additional biomass may vary from year to year and across the different parcels, which makes the logistics of selling low ILUC biomass complicated to organize (since a farmer can only claim the additional above-baseline biomass as low ILUC and not the remainder of the crop) and reduces the commercial attractiveness of implementing low ILUC practices.

Practical issues, loopholes and areas of improvements (From project managers and auditors)

The exact effect of such non-low-ILUC practices or natural events is difficult to disentangle from other yield increase measures. The most significant of these is weather, but there are other factors. For example in the Malaysia palm pilot, factors such as steepness of the plot and tree density also effect yield and the impact and cost of the yield increase measure.

The amount of additional biomass being claimed as low ILUC is expected to vary considerably each year, based on natural events (e.g. rainfalls, drought, pathogens, etc.). This makes any kind of financial planning challenging, as the exact amount of extra revenue, and therefore potential investments, from low ILUC biomass cannot be reliably planned.

Both palm pilots pointed out that, due to the perennial nature of the crop, it can take around two years after the implementation of the additionality measure to see the yield increase effect. The pilot companies recommended that the company should be able to choose when their 10-year low ILUC claim period can start.

As currently defined, the unit used for the calculation of historical yields and dynamic yield baseline is in tonnes/ha, which allows for the aggregation and comparison of biomass outputs from different crops. For sequential cropping, using weight does not make sense, given different expected yields and component values between crops. Therefore, it would be more meaningful to base biomass yields on the amount of oil, starch or other components per ha, but this would reduce the comparability and aggregation of yields from different crops. An alternative approach, which is especially relevant for biogas, is to consider the energy content of crops per ha.

3.3.3 Yield variations

Overarching question: Does the approach adequately take into account annual yield fluctuations?

Feedback from pilot projects reveal that both the dynamic yield baseline and annual yield variations may be significantly impacted by parameters (e.g. natural events, other cultivation practices) other than the implemented low ILUC practices. The current approach does not allow distinguishing between these different parameters and their respective impact in yield variations and additional biomass.

Phase 2 of the project and other research efforts should focus on better understanding how non-ILUC related parameters influence yield variations and develop guidance as per how to better distinguish their effects from dedicated low ILUC practices.

3.4 Additionality test (financial attractiveness / non-financial barriers)

3.4.1 Financial additionality

Overarching question: Could financial additionality be reliably demonstrated?

The financial additionality analysis was feasible to perform due to sufficient availability and reliability of data. However, some issues have been found during the process and difficulties in the methodology were highlighted related to the variability of biomass volumes and costs over the period considered. The Certification Body involved in the pilots suggested that in reality the economics of biofuel supply chains are much more complex than the financial attractiveness test allows for as there are many factors determining the price of a commodity, so considering only additional yield for only the EU fuel market will be very theoretical.

The additionality measures for the pilot projects all resulted in positive net present value (NPV) calculations, thus failing the financial attractiveness test. This could be seen as logical as the investments had been made already in the absence of a valorised low ILUC-risk certification.

Availability and reliability of data

Overall, all pilot projects had detailed and auditable financial data available for the evaluation. Therefore, the financial attractiveness NPV calculation was conducted in all pilots with relatively few challenges. In general, data for labour costs, material costs and other costs were available and verifiable. The challenges related to:

- **Estimating the cost of measures not yet taken**. For some measures, an economic operator will have an estimate of the cost, for example based on a quote for new capital equipment. However, for other measures the cost might be difficult to predict. For example, in the Malaysia pilot, the actual cost of thinning of palm varied greater than 10-fold for the different subplots of the plantation on a EUR/ha basis, so for them estimating a per ha cost would be potentially difficult.

- **Variability in historic feedstock prices.** Feedstock prices vary on a daily basis and across years as they are influenced by many different factors. The guidance suggests to use an average price over the period of historic yield data, but could be more specific about e.g. whether to use a weighted average.

- **Predicting future additional biomass volumes**. Making a reliable estimate of future additional biomass volumes, as impacted by non-linear growth curves, non-ILUC-related practices and weather events is extremely challenging.

- **Selecting an appropriate discount rate**. Both the Malaysia and Colombia pilots said their typical discount rates were substantially higher than the rate suggested in the guidance.

Some projects also said that their good data availability might not be the typical situation of all farms. For example, the Uruguayan project pointed out that many farms in the country are rented by farmers and therefore there might be lack in data availability and continuity if a farmer has not used the same plot for three years. While for the French project there was very granular, detailed, and precise level of data due to the farm group arrangement, which is not common in the region. Therefore, the availability and reliability of data in the pilot projects are considered above standards of what regular farms would normally collect, especially in countries where official data are scarce and/or where feedstock producers are not the owner of the land.

A crucial point to note is that all the yield increase pilots had already taken the additionality measure, so it was possible to verify their historical cost records. However, in the situation that the additionality measure has not yet been taken, verifying a future cost estimate could be much harder for auditors.

Accuracy of the resulting financial analysis

The NPV could be calculated accurately in all pilots due to the availability and reliability of detailed CAPEX/OPEX data. However, some difficulties were reported by pilot companies. The unit used in the calculation has an impact on the results; for example in the case of palm oil in Colombia, NPV was calculated with crude palm oil prices (i.e. after feedstock processing), rather than fresh fruit bunch prices to better reflect on actual profitability of investments in yield improvement practices. This was also done because the plantation and mill are integrated, so actual fresh fruit bunch prices are not available in this case. In such a case, the calculation of financial attractiveness based on raw biomass (i.e. post-harvesting) prices would not necessarily provide the most accurate analysis; for certain types of biomass, financial attractiveness may be better assessed on processed feedstocks than after harvest. Phase 2 should further explore whether a unit based on the transformed feedstocks (e.g. crude palm oil – CPO or palm kernel oil - PKO) could make the evaluation of additional revenues from low ILUC practices more accurate.

Results are also significantly impacted by the discount rates applied to the investments. Typical discount rates were found to vary regionally. The Malaysian project suggested 7-12% while the Colombian project 16%. With higher discount rate the resulting NPV would be lower, so more likely to pass the financial attractiveness test (noting that neither the Malaysia not Colombia pilots passed the test even with the higher discount rates).

Lastly, another issue raised was that the NPV value is affected by whether the calculation is based on an individual farmer or the company collecting and aggregating. Therefore, this should be clarified in the methodology.

Practical issues, loopholes and areas of improvements (From project managers and auditors)

Several fundamental issues were encountered during the implementation of the financial attractiveness analysis. In general, all the pilot projects resulted in a positive NPV, which means none of them would pass the financial attractiveness test. This is in part explained by the fact that all the pilots had already implemented their measures before the project started, so it had been a necessity for the yield increase investments to be profitable vis-à-vis the companies or their investors[11]. As suggested by some project's participants, the

[11] Pilot project operators in Colombia reported that the capital investments made were significant and would likely not having been made without guarantees over their profitability (regardless of ILUC certification).

methodology should not create a mechanism that incentivises only the most expensive and unprofitable measures.

Three important challenges were identified:

- **Uncertain financial benefits.** The exact level of financial benefits (e.g. additional revenues or price premium) from low ILUC certification are unknown, as the mechanism is not yet implemented. Expecting a farmer to make an investment with a negative NPV without a guarantee of a return on that investment is unrealistic

- **No incentive for non-high ILUC feedstocks**. Whereas low ILUC certification has a direct policy incentive mechanism under the REDII for high ILUC feedstock producers wanting to avoid the phase-out of high ILUC feedstocks, no specific incentive (e.g. price premium) exists for non-high ILUC feedstocks to undergo low ILUC certification. Therefore, it is unrealistic to expect those economic operators to invest in new and potentially expensive cultivation practices that result in a negative NPV without any guarantee of potential return on investment via a price premium.

- **Uncertain price premium for farm**. There is uncertainty whether a low ILUC premium would be realised back at farm or plantation level, given that any such premium would likely be collected downstream by biofuel producers / retailers who often do not have a direct relationship with the feedstock producer.

The feedstock expansion report makes an analogy with the concept of additionality here and the additionality concept used in the CDM mechanism. In discussions with pilot companies, a fundamental difference was observed. The aim of the additionality concept is similar in both mechanisms: the low ILUC mechanism aims to stimulate yield increases that would not have happened in the absence of the policy mechanism, in the same way that the CDM aimed to stimulate emissions reductions that would not otherwise have happened. CDM projects usually require an investment in a technology that reduces the emissions from an industrial installation. This might improve plant efficiency and should decrease fuel input costs to a plant, but there is usually no change to the product the plant produces. Therefore the value an operator gets from the product relies on the value of the CDM emission credits that can be sold (in a book and claim manner) to a government or company. However for the low ILUC mechanism, the yield increase measure leads to an increased volume of biomass. The biomass commodity has a relatively high base price. Therefore it is hard to find an additionality measure that is so expensive that it would not be worthwhile doing on paper from a straightforward economic perspective. This we should conclude that where yields are not optimised, other barriers play a significant role.

3.4.2 Non-financial barriers

Overarching question: Were (non-financial) barriers identified?

Since the financial attractiveness assessment was not passed, the pilot companies in Malaysia, Uruguay and France also attempted a non-financial barrier analysis. Several non-financial barriers were identified, such as access to specialist agronomic expertise, skills or tools or access to the EU biofuels market. However, all pilot projects reported that the non-financial barrier analysis, as currently formulated, is too vague. Auditors did not feel equipped to determine the validity of the barriers objectively. Auditors needed to judge whether the barriers are valid, and whether the barriers apply in that specific case.

In general, the comment was made that non-financial barriers represent more of an obstacle to farmers increasing yields rather than the lack of financial attractiveness. Phase 2 should look more deeply at whether the reported non-financial barriers can be considered representative of large-scale operators (e.g. lack of technical knowledge). Phase 2 should also explore the barriers faced by small and medium sized farmers and whether these are likely to be different to the barriers faced by the larger companies taking part in the pilot projects.

Availability and reliability of data

Non-financial barriers have been described for some of the pilots, however auditors felt that this assessment was subjective and they were not equipped to objectively determine the validity of the barriers, thus leading to issues on the reliability of the data and information provided. Further guidance is required both on which barriers are appropriate and on how an economic operator should demonstrate that the barrier applies in their situation.

Accuracy of the resulting non-financial analysis

Generally, the analysis of non-financial barriers was deemed ambiguous and open for interpretation by both the economic operators and the auditors.

The criteria to determine the validity of the arguments is not clear and therefore there is not a unique way to pass the test. In the Uruguayan pilot, it was mentioned that it is not clear if the analysis should be done from the UPM perspective (the biofuel producer that supports the pilot) or from the farmer perspective. Further detail is required in the definition of the standard to enable an unambiguous judgment from the auditor.

Practical issues, loopholes and areas of improvements (From project managers and auditors)

Several issues were identified in the non-financial barrier test, mostly related to the qualitative nature of the non-financial barriers that makes it difficult to accurately assess them. Therefore, auditors and economic operators were not able to objectively judge the legitimacy of the non-financial barrier claims in some of the pilots, due to limited guidance and unclarities. Particularly, the economic operators said they required further information on the type of non-financial barriers that could be stated, because there is not a clear definition of common practices as baseline to evaluate against.

The descriptions of non-financial barriers provided in the pilots also lacked detail to prove those barriers applied to their situation and to describe how the low ILUC certification would alleviate the barrier. For the cases where the feedstock was not a high ILUC crop, this is also because the low ILUC certification does not give a direct benefit to that feedstock under the REDII. Furthermore, the validity of the analysis of non-financial barriers over ten years was questioned, as the situation may evolve regardless of the project itself (e.g. change in policy/subsidies, commercial maturity).

3.5 Abandoned lands

Overarching question: could the land be reliably identified as abandoned?

Abandoned land was tested in the Ukraine pilot. In that pilot, the land could reliably be demonstrated as abandoned through satellite imaging analysis performed prior to the audit and verified through local interviews during the baseline audit. Satellite imaging can be used to demonstrate both the required >5 years of abandonment or presence/absence of intensive/extensive grazing. However, more data and added complexity are required to demonstrate that a food or feed crop (as defined in REDII Article 40(2)) was previously grown, and other methods would be needed to complement the analysis. Similarly, for small-scale grazing, the threshold is not clear when an area is used for “substantial” animal fodder.

Availability and reliability of data

The reported availability and reliability of data in the Ukraine pilot was good enough to perform the required analyses.

Satellite imaging was readily available for the years 1986-2020 and the freely available Landsat images were used in this pilot. In general, the NDVI Index served well to demonstrate whether land was agricultural in the years studied. The observations were complemented with interviews of local people during the audit. In this particular case, local archives did not have any documents available to demonstrate land was previously agricultural as the land had been abandoned for more than 25 years (the period that the Ukrainian authorities keep records for).

Accuracy of the identification

Overall, the identification through satellite imaging was accurate, but some technical challenges have been encountered. For some years where only cloudy images were available, the NDVI Index could not be determined. Therefore, some years such as 2002 had to be excluded from the dataset.

Practical issues, loopholes and areas of improvements (From project managers and auditors)

The satellite imaging analysis performed by Ukrainian National Forestry University concluded that the plot of land turned from agricultural land to grassland over the period of 1986 to present day. It shows that the land was agricultural in 1986 and was grassland in 1998 as well as 2010. The challenge with the satellite imaging in the case of low ILUC biomass certification is that it is difficult to determine whether the former agricultural land specifically grew food or feed crops according to the REDII Article 40(2) definition. According to GRAS, it is technically possible to identify the crop type through satellite imaging if sufficient data is available from neighbouring plots growing the same crop. This could also be complemented with data from a country’s relevant agricultural ministry on regional harvesting calendars and interviews with local community members. For this pilot however, there was the additional challenge that the land was agricultural back in the 80’s, when Landsat image quality was much lower. Determining the crop profile would be more challenging using lower quality images from decades ago.

The satellite imaging method should be sufficient to show if and when the land was under an agricultural regime, but may not be solely sufficient to demonstrate specifically whether food or feed crops were previously grown on the land, as required by the definition of abandoned land. Local interviews were used in the pilots to complement satellite imaging analysis. Local archives were not available as they are only kept for 25 years and the period of abandonment in this case was longer. They are more likely to be available for shorter periods of abandonment.

Other methods, such as soil sampling and environmental DNA sequencing, are able to demonstrate that a certain crop species was grown but are not able to demonstrate when those crop species were grown on the land.

Another potential issue is related to the conversion of abandoned land into agricultural land. Any conversion of land needs to meet the core REDII sustainability criteria. Some land use changes are permitted, but in that case any GHG emissions associated with the direct land use change need to be taken into account. However, it is unclear whether GHG emissions associated with permitted direct land use change need to be taken into account when converting the specific piece of abandoned land in the pilot to agricultural land. Should the land be considered to already be agricultural land in which case no dLUC emissions need to be considered, or should it be considered a grassland in which case dLUC emissions would need to be considered. In case the dLUC needs to be taken in consideration, the GHG savings requirement is unlikely to be met for any biofuel produced from the land.

In addition, there could be biodiversity concerns that would prevent land conversion meeting the core REDII sustainability criteria if the land has been abandoned for a long period and biodiversity or the vegetation have increased, especially if the ecological climax (ultimate vegetation stage) in a given region is forest. Biodiversity was not an issue for this plot of land in Ukraine, but could be in other contexts, regions or climates. Phase 2 could be used to further dig into the question of when an abandoned land reaches a point where its conversion may create non compliances with either land-use or GHG requirements of REDII.

3.6 Robustness of compliance and auditing

3.6.1 Can audits of low ILUC measures be performed according to standards of reliability, transparency, and independent auditing?

3.6.1.1 Ensuring a limited assurance level

According to the auditors and staff from voluntary schemes involved in the pilot projects, ensuring a limited assurance level is a constant requirement in their practices. This level of assurance is in line with what the REDII currently requires and primarily boils down to the stringency of compliance checks, e.g. number of samples analysed, number of days spent in audit, frequency of audits. Therefore, as long as the rules for evaluating compliance with low ILUC criteria are clearly established by voluntary schemes, it would not require any particular adaptation in the existing assurance systems implemented by Certification Bodies.

Should the EC require a “reasonable” level of assurance, i.e. higher than what is currently required from assurance provider, this would in turn have significant consequences over the practice of Certification Bodies, in particular the size of samples to be analysed when auditing economic operators. Auditors consulted in this study would assume that audits would also require several weeks if a reasonable assurance level was required, which would also significantly impact on costs.

3.6.1.2 Impact on costs

Assurance providers involved in the pilot projects report some additional costs to be expected when assessing conformity with low ILUC requirements.

Additional audit time is spent on checking compliance with low ILUC requirements, which automatically leads to additional audit costs. This includes the preparation of the auditors, e.g. guidance from external consultants on the implementation of the complex additional requirements as well as on-site verification, document preparation and general administrative duties. Assurance providers estimate that an extra day of work for a single farm and half a day for any extra farm for multi-site could cover additional requirements for low ILUC certification.

In addition, voluntary schemes may apply licensing costs based on actual volumes of certified biomass/biofuel. Therefore, additional licensing costs may be applied to additional low ILUC biomass. As an example, currently the annual fee with ISCC is between 50-500 Euros, based on the total turnover of material in metric tons by the unit (sustainable material; < 2.000 mt per year – 50 Euros). However, according to assurance providers, these costs might be primarily borne by the First Gathering Points (FGPs), when the FGP is the certification unit (as opposed to the farm) and may not necessarily represent direct external costs for the farmer. This aligns with the recommendation to further explore in Phase 2 whether the additionality test could ever be evaluated at the first gathering point rather than at the farm level.

3.6.1.3 Main non-conformities found

As reported in the previous sections, several difficulties were encountered in pilot projects to come to reliable and consistent results regarding additional biomass, but those cannot be technically regarded as non-conformities. Assurance providers unambiguously reported that pilot projects had implemented the required approach adequately, difficulties or ambiguities in results being rather linked to a lack of clarity and guidance in how the low ILUC requirements are established than on economic operators not being in conformity with them. Evidence used to establish conformity would require further investigation, as in the case of abandoned land, where direct stakeholder consultation (interview) was used to complement historic data. This could be considered less reliable than official land-use data (e.g. cadaster), but in absence of those, direct inputs from economic operators or local population is seen as good practice in regular sustainability audits.

3.6.1.4 Training/Monitoring needs for auditors

All local auditors who undertook the pilot audits were already ISCC-trained, and some were also qualified to conduct audits to other voluntary schemes including RSPO. Prior to the pilot audits, the local auditors took part in a half day training from ISCC (as part of the project team) specifically on the low ILUC certification approach.

We recommend that a specific low ILUC-risk training shall be mandatory for Certification Body’s auditors before conducting low ILUC-risk certification audits. This ensures that only “qualified” auditors conduct the auditing, as it already happens for other certified supply chain (e.g. waste/residues and small holder). One additional day of training for the auditors should be considered in addition to the previous general/basic training for the specific voluntary scheme that the low ILUC-risk module is being used as an add-on to.

Regarding the monitoring of auditors it is expected to be part of the integrity program conducted by the Voluntary Scheme as well as controlled and monitored by national competent authorities. In addition, Certification Bodies have their internal monitoring system that also to comply with accreditation requirements (ISO 17065, 17021 or 14065). Certification Bodies also have the obligation to assure that auditors are competent for the type of audit and company scope they are auditing. New auditors will be subjected to a training plan that includes joining audits with an already qualified auditor and, as final step, they should perform a full audit under the supervision of an experienced auditor.

3.6.2 Is there a risk of windfall gains? i.e. in terms of volume of additional biomass claimed or because project is not really additional

A risk of windfall gains exists when the effect of implemented low ILUC measures cannot be distinguished from other improvements in yield, thus leading to assume that all additional biomass would be claimed as low ILUC. Alternatively, there is a risk of windfall gains if projects are certified as low ILUC when they are not additional, in other words they would have happened without the REDII.

Several pilot projects reported that non-ILUC related practices or natural events had a significant impact on the calculation of the dynamic yield baseline and yield increase. Those influences cannot be easily disentangled from low ILUC practices when it comes to measuring additional biomass, thus making the risk of windfall gains significant. It should be noted that this risk acts in two directions – i.e. weather has a large impact on yields and that impact can be either positive or negative. Similarly for sequential cropping, the unit used to calculate additional biomass could lead to windfall gains.

For abandoned, severely degraded, or other unused land, there is not the issue of a dynamic yield baseline, as all the biomass cultivated on the land can be claimed as low ILUC risk. Therefore, windfall gains could only be claimed if a plot of land was incorrectly or fraudulently claimed as abandoned, severely degraded, or other unused land.

The financial attractiveness test, as currently formulated, is hard to pass. Thus, the risk of windfall gains from a project not being additional is currently assessed as low. The non-financial barrier test however requires further elaboration to ensure it is meaningful, auditable and robust.

3.6.3 What would be the opportunities for fraudulent claims?

In the context of this study, fraudulent claims are considered to be situations whereby economic operators would attempt to commercialise larger volumes of biomass than what they are actually allowed to within their scope of certification. Fraudulent claims from non-certified operators were not considered, since these are not specific to the implementation of low ILUC practices and should already be addressed by voluntary schemes tracking fake certificates and related transactions.

Fraudulent claims opportunities are inherently bound to the capacity of auditors to accurately cross-check the data used by economic operators to calculate additional biomass or demonstrate that the cultivated land was abandoned. Such risks can generally be considered higher when robust yield data or satellite imaging are not available for auditors, although this is not specific to low ILUC certification. Since the attractiveness of low ILUC certification is more limited for non-high-ILUC feedstocks, risks of fraudulent claims are higher for high ILUC feedstocks, which is currently only palm. Therefore, fraud mitigation efforts to ensure access to accurate and reliable data should primarily focus on large palm producing countries, especially average/historic yields.

For all the low ILUC cases, there is a risk that, because low ILUC material cannot be physically distinguished from non-low ILUC material, the system relies very heavily on the voluntary scheme certification system being robust and economic operators making accurate claims and passing those claims down the supply chain correctly. It should be noted that for yield increase measures, a single farm will – by definition – produce both low ILUC and non-low ILUC material, because only the above-baseline biomass can be claimed as low ILUC. Therefore the origin of the material or identity of the supplier will not distinguish whether the material is low ILUC or not. The low ILUC-risk claim needs to be very robustly passed down the supply chain as one of the sustainability characteristics and auditors need to be very thorough in their checking of calculations and volumes of low ILUC-risk claims made down the supply chain.

Similarly, in the case of sequential cropping, it will often be difficult to physically distinguish between a crop grown as the main crop and grown as a secondary crop, which could result in a potential risk of fraud. However, in some cases it is possible to physically distinguish. In the case of Uruguay, Brassica carinata is only (currently) grown as a secondary crop. In the French case, as the farm is using the secondary crop for biogas, the secondary cereal crop is harvested at an immature stage when it would not be able to be sold for food or liquid biofuel, and the crop is harvested whole to send to silage for biogas.

A couple of (palm) stakeholders raised the concern that because only the additional biomass can be claimed, low ILUC supply chains will be quite fragmented and there will be a need to (at least administratively) aggregate volumes within the supply chain, which might lead to quite complicated logistics. Note that complexity is not the same as fraud, but complexity increases the risk of honest mistakes and makes supply chains harder to audit, which might make fraud harder to detect.

For yield increase additionality measures, if there is a high value for low ILUC certified materials, there is an incentive and therefore a potential risk for economic operators to intentionally underestimate their historic yields so that larger additional volumes of biomass can be claimed.

For abandoned, severely degraded, and other unused land, fraudulent claims would require submitting a fraudulent satellite imaging analysis or forged government documentation demonstrating land status. Since satellite imaging analyses requires specific skills and experience and will most likely be performed by third parties, this risk is considered to be low.

3.7 Administrative burden

The administrative burden was reported differently between the project implementing the abandoned/degraded land approach and the projects implementing the yield increase approach. The administrative burden for compliance with low ILUC measures for abandoned/degraded land was deemed reasonable, but satellite imaging may need to be performed by a third party.

For the pilot projects implementing yield increase additionality measures, some commented that the administrative burden was high in relation to the relatively low amounts of additional biomass and seasonal variability of low ILUC biomass. This should be seen in the context that several of these pilot companies already had relatively high yields, so their potential to further increase yields was low. On the other hand, the pilot companies were all already certified, so it should be considered that the administration required for a company that is not yet certified to get low ILUC certified would be considerably higher.

In addition, the methodology was judged to be complex, with some opportunity cost for economic operators, due to time spent to understand and implement the additional biomass calculations. According to them, some methodological questions remain which would benefit from further refinement, guidance or tools.

Crops which are not considered as high ILUC have limited direct policy incentive to seek low ILUC certification. For palm, currently the only high ILUC feedstock, it is expected that the number of palm producers willing to seeking REDII and low ILUC certification will be limited due to:

- uncertainty over exact amounts of low ILUC biomass that can be produced;
- existing bans on all palm use for biofuels in several EU member states, making the EU biofuels market in general less attractive for palm producers.

3.8 Sustainability

Three of the four yield increase pilots were already certified to an EC-recognised voluntary scheme (both ISCC and RSPO for the palm pilots, and RSB for the Uruguay pilot), and continue to be so after implementation of the additionality measure. This is taken as the basis for the projects proving they are sustainable. The fourth yield increase pilot (France) was not certified, but the ISCC criteria were checked as part of the pilot audit checklist and no concerns were found.

For Ukraine, the land is not yet under cultivation and therefore is not certified. The main sustainability question is related to direct land use change GHG emissions (see section 3.5) – although the land conversion could be certified to an EC-recognised voluntary scheme, any biofuel made from the resulting feedstock would struggle to meet the required GHG saving threshold in the REDII if dLUC emissions need to be taken into account. Furthermore, long periods of abandonment may lead to increases in carbon stock and biodiversity, which would contravene the core REDII sustainability criteria if that land is converted. Both of these aspects would be covered by the existing REDII sustainability criteria and voluntary schemes, so the methodology has safeguards for these. High biodiversity was not considered a concern in the case of the Ukraine pilot.

The sequential cropping pilots were reported as being generally beneficial to the environment, especially regarding the retention of nutrients and carbon in the soil and reduction in the use of chemical inputs. This was particularly the case in the French pilot in which, in addition to the benefits for the soil from the use of catch crops, additional biomass is used in a digester to generate biogas. The resulting digestate is then used as fertilizer, which further enhances soil enrichment and nutrient recycling, while reducing costs related to the use of chemical inputs. UPM Biofuels also found that the sequential process in the pilot is creating a positive soil carbon balance following increased crop biomass, thanks to a reduction of soil erosion, higher nutrient retention and conservation, increase total annual yields.

In the pilot project implementing micro irrigation (Colombia), the operator reports a reduction in water consumption of 70%, which is being monitored by the local water board.

Finally, the implementation of additionality measures could be considered economically beneficial for farmers due to additional revenues from extra biomass as well as reduced use of inputs.

The multiple environmental benefits stemming from the implementation of low ILUC go beyond the core REDII sustainability criteria described in Article 29 of the REDII. This could be beneficial for economic operators seeking compliance and certification by EC-approved schemes with a broader scope of environmental and social requirements, than what the REDII requires (e.g. ISCC, RSB, Bonsucro, etc.), whereas for economic operators engaged with voluntary schemes limited to the exact REDII scope (e.g. REDCert, 2BSvs, etc.), such benefits would not exist.

One open question to be further investigated in Phase 2 regards the change in the biodiversity status or forest coverage of abandoned land where vegetation regrowth and an enrichment in vegetal and animal species can be observed. A tipping point exists where the conversion of abandoned land back to agriculture or forestry may contravene land-use change restrictions described in Article 29 of the REDII. Therefore the evolution of the conservation status of abandoned/degraded land should be further explored.

3.9 Certification of measures taken in the past

The Delegated Regulation allows for certification of additionality measures taken up to 10 years in the past. The four yield increase pilots considered certification of additionality measures taken in the past. In all cases good quality historic data was available, sufficient to allow the pilot companies to do the required calculations and for auditors to audit those calculations. However, the fact that the measures had already been taken made the additionality test conceptually difficult to pass because the measures were in all cases financially attractive and the measures were all taken before the REDII had been implemented.

4. Applicability of the low ILUC methodology to different feedstocks, regions and scales.

4.1 Is the low ILUC certification approach applicable to any type of feedstock?

All the pilot projects were able to follow the calculations to determine the dynamic yield baseline, volume of additional biomass (when the measure had already been taken) and to attempt the financial attractiveness test calculation. However, it is important to mention that currently the additionality test only makes sense for high ILUC feedstocks because no specific incentive for non-high ILUC feedstocks to be certified is included the REDII. Therefore, the incentive to engage in low ILUC certification is expected to vary across feedstocks.

Note that our understanding is that, according to the definition of food and feed in REDII Article 2(40)[12], sequential cropping (crops grown not as the main crop) and crops grown not on agricultural land (e.g. crops grown on severely degraded land), could be counted outside the food and feed cap without passing the additionality test and being formally low ILUC certified. We recommend that this is the subject of additional guidance from the EC, in particular to define “main crop” and “agricultural land” (especially with respect to whether agricultural land would also include abandoned agricultural land).

Additional biomass could be estimated for all the feedstocks tested, namely palm, triticale/rye/oat, rapeseed/soybeans and carinata. However, several issues were reported with regards to details of the calculation, including whether to apply the palm baseline at a subplot of plantation level and the exact crops and years to be used for the calculation of the dynamic yield baseline for sequential cropping. The guidance sets out different approaches to be followed to set the dynamic yield baseline, depending on whether the crop is annual or perennial or whether sequential cropping is implemented. The perennial crop approach is very specific to palm as it requires using a growth curve that is specific to that crop. Other perennial crops, such as sugar cane, would require a different approach. [13]

The Colombia and Malaysia pilots (palm) were able to use both growth curve options, but further work is required to narrow down those options to remove the ability for economic operators to “cherry pick” the option that gives the most desirable baseline for their situation.

For sequential cropping, two main challenges were identified in regard to the calculation of dynamic yield baseline and additional biomass: 1) the crop rotation pattern (and therefore which crops to include in the baseline) and 2) the units used to compare different feedstocks.

1) The variability of crop rotation patterns (type of crop and temporality of crops cycles) makes it difficult to consistently establish the dynamic yield baseline and additional biomass. It is recommended to revert to an approach where the baseline for the secondary crop in a sequential cropping system is zero, but takes into account any impact on yield of the main (see also Section 5).

[12] REDII Article 2(40) ‘food and feed crops’ means starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land

[13] The case study conducted in the preparation of the low ILUC guidance suggested that the annual crop approach could be implemented for sugarcane, although no pilot project using sugarcane was eventually selected for Phase 1.

2) Some of the pilot projects revealed that the estimation of additional biomass based only on the total biomass produced (on a mass basis) on a defined plot may not be sufficiently precise. In turn, it is suggested to look at the specific crop components (e.g. starch, oil, sugar, proteins, etc.) produced in the baseline scenario and compare it to the yields obtained after the implementation of sequential cropping. In the French pilot, while the amount of proteins and sugar produced on the selected plot increased after the implementation of sequential cropping, starch and fats were produced in lower amounts. Further work is required to narrow down the options for which unit(s) should be used in which scenarios, to ensure that the approach can be appropriately implemented for any (combination of) feedstocks.

Therefore, it would be preferable for additional biomass to be estimated at crop component level, rather than by total mass. Energy content could still be useful, especially in the case of biogas. The crop component approach allows a better estimate of potential market effects of implementing low ILUC measures, as substitution of alternative feedstocks would be based on their component value. This, however, would make the approach more complex by leading economic operators to look at multiple production outputs, both for the calculation of the dynamic yield baseline and additional biomass. This would also require customizing the approach to the different feedstock types, which would in turn reduce the comparability of low ILUC biomass from different sources, especially as the different feedstocks have variable compositions.

Another factor of variability between feedstocks concerns the supply chain stage, at which additional biomass is assessed. Whereas the initial methodology assumed that low ILUC biomass could systematically be evaluated immediately after harvesting, the Colombian pilot projects suggest that, in the specific case of palm oil, additional biomass could be measured at the oil mill stage, i.e. when palm fruit bunches are being pressed to produce crude palm oil, which is then refined onsite. This is due to the fact that crude and refined palm oil have a significantly higher commercial value than fresh fruit bunches. A similar approach could be applied to oilseeds by and large, but not necessarily to crops, for which, the initial processing stages do not add as much commercial value as with palm oil.

4.2 Is the low ILUC certification approach applicable to any region?

All pilots recognized that the amount of data available, competence of personnel, both at the economic operator and auditor levels, and overall implementation of the low ILUC approach worked relatively well. Auditors involved in pilot evaluation nevertheless recognized that the amount and accuracy of available data were likely above the usual standards, since the economic operators involved in pilots are already certified to voluntary schemes, were chosen because they were likely to have good data, and have – in some cases – been involved in taking measures to improve their yields for several years.

It is therefore likely that the availability of data and evidence may vary considerably between different regions, especially between EU and non-EU countries. This is particularly the case for yield and land-use data, which the EU requires to collect as part of the farmers’ duties to receive support in the context of the Common Agricultural Policy (CAP). The Uruguay project also revealed that economic operators renting their lands might face more difficulties to access and collect historic data regarding yields or past uses of their land; similar observations can be expected in other countries where a large share of farmers do not own their land. In addition, farmers already certified to an EU-recognised scheme are expected to be better prepared than non-certified farmers with regards to the implementation of data management systems and preparedness for audits.

The accuracy and availability of the data shared by economic operators in the context of an audit, and used by auditors to verify compliance, depends on their own capacity to keep records of yields, feedstock prices and costs of additionality measures, which can be complemented by historic data recorded and stored by local, regional or national institutions. These capacities could vary regionally.

Wherever weather events are particularly extreme (e.g. drought, monsoon, hurricanes, etc.), the observed variability in both dynamic baseline line and additional biomass due to factors others than implemented low ILUC practices is expected to increase. Therefore, additional investigations should be undertaken to explore how to adequately take external factors (including the evolution of economic patterns, which may affect the agricultural productivity in a defined region) into account.

Therefore, as with feedstock types, the low ILUC approach is generally applicable across all regions, but would require specific guidance and support in regions where data are less systematically recorded or less reliable.

4.3 Is the low ILUC certification approach applicable to any production scale or single and group holdings?

The pilot projects in Phase 1 worked with large operations. The approach to small holders has not been tested at this stage. It could nonetheless be anticipated that the challenges observed in Phase 1, with regards to the complexity and variability of results when calculating the dynamic yield baseline and additional biomass would be exacerbated when applied to smaller operators. It could also be anticipated that small holders will generally have more difficulties in accessing reliable data, which can be used in setting the baseline and evaluating additional biomass (although the approach is designed so that economic operators can provide their own data and do not need to access e.g. national statistics). Larger operators reported that the burden of implementing low ILUC practices was high in relation to the uncertain benefits due to the variable amounts of low ILUC biomass being claimed every year. This burden will be even heavier for small holders, albeit they may have a greater potential to increase their yields.

The evaluation of financial attractiveness is also expected to be more problematic for smaller operators, due to their access to the necessary data to conduct the calculations. It is for this reason that small holders less than 2 ha are exempt from the additionality test (the various definitions of small holders are discussed in Appendix B). Generally, small(er) farms might be more affected by non-financial barriers than larger operators, due to a limited access to knowledge and agronomic expertise, and more limited access to financial reserves, loans, subsidies, etc. In Phase 1, large pilot companies described non-financial barriers but it was not clear whether they actually affected their operations or constitute obstacles. Therefore, the non-financial analysis should be further developed especially for smaller operators (e.g. <50 or 100 ha) to understand whether non-financial barriers represent a bigger issue than for larger operators.

Our working assumption is that the low ILUC certification approach should be able to be used in a group certification context, however that was not tested or further developed in Phase 1 as it relates in part to small holders (although the approach would not necessarily need to be restricted to small holders below 2 hectares). This is a topic we would like to further develop in Phase 2 and aligns also with testing the extent to which the unit of certification could or should be a first gathering point or mill, who often act as a “group leader” in existing EC-recognised voluntary schemes,

5. Concluding remarks and recommendations for Phase 2

Based on learnings from the five pilots, the following conclusions and recommendations have been drawn:

5.1 General

Required data is available and verifiable. All pilots had good availability of data necessary to implement the low ILUC methodology. Although data availability may have been better in the selected pilots than in a typical case, the pilot auditors felt that the data required for low ILUC certification is reasonably available and the low ILUC module can fit well alongside the existing voluntary scheme approach. In general the approach can be implemented with adequate standards of reliability, transparency and independent auditing.

A dynamic yield baseline can be calculated for different feedstocks and both in the EU and in third countries. However, as the REDII only gives a direct policy incentive for high ILUC feedstocks to seek low ILUC certification, for non-high ILUC feedstocks an economic operator undertaking a low ILUC-risk project that passed the financial additionality test would expect to make a loss. There is no mechanism in the REDII for low ILUC certification to help those projects become financially attractive or to overcome barriers.

Further work needed to determine the appropriate scale of certification, also in the context of group certification. Several of the pilots performed the calculations at different levels. For example, in the palm pilots, one determined the dynamic yield baseline at plantation level and the other at subplot level. This was in line with the level they applied the yield increase measure(s). While the subplot level provided greater accuracy for data such as yield and costs, it also increases the complexity. For the economic operator, this increases the administrative burden and complexity of the timing and logistics of selling low ILUC biomass. For the auditor, it makes it more challenging to verify calculations and data. These trade-offs should thus be further explored. Furthermore, one palm pilot conducted the additionality test at the plantation level and the other conducted the test at the level of the mill. This should be further explored in Phase 2 in the context of further developing guidelines for group certification whether the first gathering point or mill is often the unit of certification under existing EC-recognised voluntary schemes.

Uncertainty of low ILUC-risk certification and volumes seems high. The costs for yield increase measures, feedstock prices and the level of future yield increases were all found to be variable and difficult to forecast. This creates challenges in conducting the financial attractiveness test in a robust, replicable and defensible way and also creates uncertainty for the economic operator – both because of the uncertainty about whether they would pass the financial attractiveness test and because the volume of biomass that they would be able to claim varies year on year. This uncertainty, combined with the fact that economic operators can only claim the above-baseline biomass as being low ILUC, brings into question how attractive the mechanism will be for economic operators in practice.

Factors other than the additionality measure can have a big impact on yields. Other factors, and in particular weather, will affect yields both in the historic yield period and once the additionality measure is implemented. The impact of these factors needs to be disentangled from the impacts of the additionality measure to accurately and meaningfully set a dynamic yield baseline and calculate the real additional biomass due to the additionality measure.

Trade off between complexity and practical implementation. For some pilots we conclude that there is a need to better take into account, for example, weather in the dynamic yield baseline, to ensure that the mechanism can measure real improvements in yield due to the additionality measure. However, other insights lead us to conclude that the mechanism is complex and would ideally be further simplified, especially if it is to be implemented by small and medium sized enterprises that likely have the largest potential to increase their existing yields.

Methodology is complex but administrative burden seems proportionate. The pilot companies found the methodology complex, although the complexity would be reduced with a finalised methodology. The approach is designed to be used as an add-on to existing voluntary scheme certification. The most complex calculations are required for the initial certification, which then lasts for ten years, with annual audits in line with the existing voluntary scheme audits to verify the volume of additional biomass. The administrative burden is likely to seem high for projects that only produce a small volume of additional biomass.

5.2 Additionality

The financial attractiveness test is difficult to pass and it may be hard to find projects that are made possible by a relatively weak and uncertain value signal. A key problem with the financial attractiveness as currently defined is that the base commodity (biomass) has a relatively high inherent value. Several of the pilot companies thus said that it is hard to conceive of an additionality measure that is so expensive that producing additional biomass should not pay back. There are many uncertainties in the value proposition from the low ILUC mechanism and it is unrealistic to expect a farmer to make an investment that has a negative NPV without a stronger guarantee of a return on that investment. The approach should focus on stimulating measures that overcome barriers rather than incentivising the most “expensive” or unprofitable yield increase measures.

Further guidance is needed to make the non-financial barrier analysis clearer and more objective. The guidance should focus on which non-financial barriers can be valid and how an economic operator should demonstrate that the barrier applies in their situation. The work should focus especially on barriers faced by smaller and medium sized farmers who are more likely to face such barriers and have the potential to increase their yields.

5.3 Perennial crops

Different dynamic yield baseline methodologies result in differing volumes to claim. Different dynamic yield baseline approaches (Option 1A and 1B) lead to different results; further work is needed to develop the approaches so that Option 1A provides adequate differentiation between systems to provide a baseline that is meaningful in local conditions, and to ensure that it is possible to robustly verify project specific baselines proposed by economic operators under Option 1B. The option to which the methodology is constrained to would need to be very robust and be universally implementable.

Observed yield increases for palm are delayed compared to annual crops. There is a delay of 2-3 years between the implementation of an additionality measure (or even bad weather event) and the observed effect on yield of palm as compared to annual crops for which the impact of the yield increase measure is usually seen that year. The beginning of the 10-year certification period could be reconsidered for palm. For example, it could instead begin at the year of observed yield increase rather than the year after implementation.

5.4 Sequential cropping

Different crop rotations have a significant impact on the dynamic yield baseline. The crop rotation followed before the additionality measure has a significant impact over the dynamic yield baseline calculations. Assumptions over the crops to include make a significant difference in the amount of additional biomass that a sequential cropping operation can claim. For example, the inclusion or not of previous winter crops into the baseline calculation can make a significant impact in the claimed additional biomass.

The choice of unit used when comparing different feedstocks leads to differing volumes of additional biomass that could be claimed. Conducting the dynamic yield baseline and additional biomass calculations using different units (e.g. mass, energy, crop components) as described in the guidance can significantly affect the volume of additional biomass that can be claimed as low ILUC. This opens the question who should select the approach used (the auditor or the economic operator). The guidance should provide a clearer process to select the most suitable approach.

The dynamic yield baseline approach should be changed for sequential cropping, to be more in line with the definition of the food and feed cap. A clear definition of "main crop" is needed. Even without low ILUC certification, the food and feed cap excludes crops that are not grow "as a main crop […] provided that the use of such intermediate crops does not trigger demand for additional land". Given this context, and the significant complexities caused in setting a dynamic yield baseline even with a relatively simple crop rotation system, we recommend that where a sequential crop is added in a period of the year where previously no crop was grown for harvest, then the baseline for that *new* sequential cropping is considered to be zero, but any impact that crop has on the yield of the main crop would need to be taken into account. This solves the crop rotation issue, and leaves the question of further guidance on how to demonstrate any impact on yield of the main crop, which includes the question of units. In addition, a clear definition of "main crop" is required.

5.5 Abandoned land

Further clarity is needed on when direct land use change emissions need to be taken into account. The definition of abandoned land in the REDII requires land to have been abandoned for a minimum of 5 years. The period of time it takes land to convert from agricultural land to grassland or even forest will depend, amongst others, on the climate and use of the land during the period of abandonment. After 5 years it might be possible that the land could still be classified as agricultural and therefore no direct land use change would be identified. However, after longer periods, it may become challenging for the land to comply with the REDII GHG criteria. This will depend on a case-by-case basis. The methodology should further detail when dLUC should be taken into consideration as this will ultimately determine if biomass from this land can comply with the GHG criteria.

Biodiversity needs to be a key part of the assessment, especially if land has been abandoned for a long period, to ensure land use change can comply with the core REDII criteria. Long periods of abandonment also brings into question how the biodiversity of the land may have increased during the period of abandonment. Auditors should diligently assess the biodiversity of the land before it has been recultivated.

A clearer definition is needed for "substantial" grazing. With the current methodology, the lack of a clear definition for "substantial amount of fodder for grazing animals" (Delegated Regulation, Article 2(2)) leaves it to the discretion of the auditor. A threshold such as number of livestock per hectare, or clearer guidance to auditors which criteria can be used to assess whether grazing is substantial. A threshold is not advisable since this could vary quite broadly per region and per type of animal. In addition, from an ILUC perspective, it could also be an important factor whether there is other land available in proximity for animals to graze if displaced. These types of considerations for auditors to examine could help guide them to make a decision.

External support is needed for satellite imaging analysis. It has been demonstrated that satellite imaging could be a powerful tool for demonstrating abandoned land in the absence of other documentation or interviews. However, this assessment cannot be done by economic operators unless they have in-house GIS expertise. If satellite imaging is to be relied on as a tool to demonstrate abandoned land, a centralised platform for economic operators to enter the geographical coordinated of their plot and receive a land history status assessment could help facilitate this. Some previous studies[14] have suggested that such a platform would cost in the order of 160-250 kEUR.

EC guidance needed on definition of "agricultural land". Our understanding is that, according to the definition of food and feed in REDII Article 2(40)[1], crops grown not on agricultural land, could be counted outside the food and feed cap without passing the additionality test and being formally low ILUC certified. We recommend that the EC explicitly clarifies this status especially with respect to whether crops grown on unused, abandoned agricultural land and severely degraded land should be assumed to be outside the food and feed cap.

5.6 Priorities for Phase 2

The pilots identified the following three key topics as needing further development:

1. Additionality test – especially further development of the non-financial barrier test

2. Determining the dynamic yield baseline for palm – especially the extent to which weather could be factored into the baseline calculation, and

3. The approach to calculate additional biomass for sequential cropping, with respect to the definition of a "main crop" and refining a "compensation mechanism" to take into account if the secondary crop impacts the yield of the main crop.

The pilot projects were not yet able to test the approach to certify small holders or group certification (due to COVID-19 travel restrictions). This is a topic that will be a focus in Phase 2, also given that it could be expected that small and medium sized farms and plantations would have a large opportunity to increase their yields.

In general, the pilot projects all had good availability of verifiable data, yet they still found the methodology complex. Further efforts to simplify the approaches, provide more guidance, and to test the approaches with companies who do not have such granular data or who are not already certified might also be beneficial.

The work in Phase 2 will also need to take into account political or practical implementation aspects related to the implementation of the low ILUC certification, based on the feedback from economic operators and policy makers from the public consultation on the draft Implementing Act on voluntary schemes.

[14] Ecofys (2016). Methodologies for the identification and certification of Low ILUC risk biofuels. https://ec.europa.eu/energy/sites/ener/files/documents/ecofys_methodologies_for_low_iluc_risk_biofuels_for_publication.pdf

As well as further developing guidance, tools and worked examples, aspects that Phase 2 of the pilots could focus on include:

- **Additionality**
  - Developing and testing an alternative approach to the financial attractiveness test
  - Further develop the non-financial barrier test (especially for “medium” sized farmers)
- Test the approach to certify **small holders** and further develop the group certification approach – emphasis on simplification of the approach, and consideration of the level that the additionality test is conducted
- Dynamic yield baseline for **palm**
  - More work needed on standard growth curve for palm to ensure curve is accepted by stakeholders and applicable in most situations (Option 1A)
  - Trade off between taking weather into account in the dynamic yield baseline and simplifying the approach
- Calculating additional biomass for **sequential cropping**
  - Definition of main crop in different settings, alternative options for the “compensation mechanism” to ensure sequential cropping does not “trigger demand for additional land”
- **Unused, abandoned or severely degraded land**
  - Test “other unused land” – what categories count, what needs to be demonstrated, how land could pass the additionality test
  - Using mapping to find examples of abandoned land that would not require a dLUC calculation
- **Data availability**
  - Test feasibility to certify parties that are not already certified and do not already have good data / good yields, including parties that are not already VS certified
  - Test how to verify data and (cost/yield etc) estimates for the NPV calculation when measures are not yet taken

Appendix A. Summary of Phase 1 stakeholder webinar (19 May 2021)

A.1 Introduction

The Consortium held a public webinar to present the findings from the first round of pilot audits in Phase 1, to answer questions from stakeholders regarding Phase 1 results and to collect inputs for Phase 2. Participants were able to ask questions via a dedicated chat; the Consortium answered some questions during the webinar and in a dedicated session at the end. Questions that could not be answered during the webinar were compiled, along with a detailed answer from the Consortium or DG ENER in a dedicated FAQ. The presentation from the webinar – which includes a detailed Annex with findings per pilot that was not presented at the webinar, a recording of the webinar and an overview of the frequently asked questions are all available on the project website.[15]

All members from the Consortium, some pilot project managers and DG ENER contributed to the presentations and the discussion.

A.2 Agenda

The webinar was held on the “Go To Webinar” platform on 19 May 2021 from 14:00 to 17:00 Central European Time. The agenda was as follows:

1) Welcome (Guidehouse / DG ENER)

2) EU Policy Context (DG ENER)

   Update on the ongoing policy developments, including development of the implementing act on voluntary schemes, the EC’s forthcoming public consultation, timing and connections with the low ILUC pilot project.

3) Low ILUC-risk Certification Guidance (Guidehouse)

   Introduction to the low ILUC-risk pilot project and recap of the low ILUC-risk certification methodology – as adapted from Delegated Regulation 2019/807 – and tested in the pilot projects.

4) Main lessons from Pilot Projects in Phase 1 (Guidehouse/Pilot Project Managers)

   Overview of pilot project results per topic and analysis of the practicality of the low ILUC-risk certification approach, including additionality, abandoned lands, calculation of dynamic yield baseline for palm, calculation of additional biomass for sequential cropping and the specific experience of UPM in the Uruguay pilot project.

5) Questions and Answers (Consortium / DG ENER)

6) Next Steps (Guidehouse / DG ENER)

[15] https://iluc.guidehouse.com/lot-2

A.3 Participants

In total, 199 attendees joined the webinar, representing 28 countries from Europe, Asia and Americas. Participants also represented a wide range of professional sectors, including but not limited to feedstock and biofuel producers (36%), Institute/academia/consultancies (21%), Governments/NGOs (16%) and Certification Bodies (14%).

Note: country and sector representations are based on interactive polls, which were not filled by all participants. Results are nevertheless deemed representative of the audience.

A.4 Main points of discussion (Q&A sessions)

- The low ILUC pilot project has numerous ties with the ongoing policy work coordinated by DG ENER. This includes the upcoming Implementing Act on Voluntary Schemes, which will provide further guidance on the implementation of the REDII by EC-recognised voluntary schemes, and will include an Annex on low ILUC-risk certification. The following points were clarified during the discussion:
    - An official public consultation on the draft Implementing Act on voluntary schemes is currently being organised by DG ENER and should launch for consultation for 1 month from mid-June.
    - The official transposition date for the REDII is 30 June 2021. No formal rules will be imposed regarding the transition between REDI and REDII for voluntary schemes, but a working guidance will be provided in the coming weeks. The EC is in continuous discussion with voluntary schemes.
- Clarification questions were raised regarding the low ILUC-risk approach in general, and the methodology developed in the project specifically, including:
    - It was clarified that fuels produced from feedstocks considered as high ILUC risk will be subject to a cap and be phased out by 2030, unless they are certified as low ILUC.
    - The main role for low ILUC-risk certification under the REDII is as a way out of the high ILUC phase-out, which is softer than simply banning a feedstock. This gives the incentive for farmers and plantations to be more performant and apply good practices. Certified low ILUC-risk food/feed crops will be considered as conventional feedstocks, hence capped at 7% but biomass from intermediary crops (crops that are not the “main crop” and do not “trigger additional demand for land”) are not subject to this cap.
    - Unlike the high ILUC concept, which is defined at global level, the low ILUC concept applies to the local (farm/plantation) level. Whatever happens at the processing stage, including additional GHG emissions, is not considered in the approach.
- Questions regarding the pilot projects included the following:
    - The pilot project on **sequential cropping** did not pass the additionality test. The project did not pass the financial attractiveness test. It became apparent that in REDII, as currently defined, a sequential crop could count outside the food/feed cap without passing the additionality test. Our interpretation at this stage is a sequential cropping project which does not meet the additionality test would not be low ILUC certified, but can still be outside the food/feed cap.

For this, it would still need to prove it is not triggering any additional demand for land though.

- In **sequential cropping**, a clear and robust definition of the “main crop” is required, as there could be several interpretations (key recommendation). A risk also exists that the sequential crop becomes the main crop. Sequential cropping is addressed in the Implementing Act on Voluntary Schemes (low ILUC chapter, i.e. calculation of additional biomass).

- None of the pilot projects passed the **financial attractiveness test** (i.e. they all resulted in a positive NPV without an assumption about a low ILUC price premium). This is partly explained by the fact the chosen projects had already taken yield increase measures so it is logical to assume they were financially attractive. However, the uncertainty around the mechanism would make it hard for a farmer to implement any yield increase measures if the NPV was negative; in principle, there should be a premium for low ILUC but this is uncertain and the investment would remain unattractive without another financial incentives.

- **Small holders** below 2ha are exempt from the additionality test. **Horizontal integration** is also possible, as in the Colombia example, where the plantation and mill were integrated. A processing company helping small farmers could therefore be considered as the operator implementing low ILUC measures, rather than individual farmers.

- The **barrier analysis** might be most useful for some of the medium-sized farmers who do not have ready access to finance or agricultural expertise. That sector faces barriers to improve their yield, which are not faced by larger companies.

- It is possible to implement a **package of additionality measures**, but these must be defined at the beginning (baseline audit), alongside the financial attractiveness test. Additionality measures defined during the baseline are valid for 10 years; if another measure is taken within these 10 years, operators can take another additionality test to adjust the baseline, which will then be valid for another 10 years.

- With regards to new cultivation on **unused, abandoned or severely degraded lands**, the additionality measure is the new cultivation. It is not necessary to also implement a yield increase measure to qualify for low ILUC-risk certification.

- There is no difference in the (10-year) **validity of low ILUC certification**, based on the type of measure implemented.

• Several participants raised questions regarding the parallel project (Lot 1) and related policy updates on the high ILUC concept. It is expected that a dedicated high ILUC webinar will be planned in the coming weeks.

• Some questions were raised in relation to the Delegated Act on the revision of Annex IX, which is supported by another Consortium led by E4tech. Some of the feedstocks evaluated for potential inclusion by the Annex IX Consortium are also relevant to the low ILUC approach, such as cover and intermediate crops. However, it should be noted that the eligibility for inclusion in Annex IX is ruled by specific criteria (Art. 28 in REDII), which go beyond the sole ILUC dimension. The types of cover and intermediate crops evaluated in the Annex IX project were also slightly different, as they covered catch crops, rotation crops and intermediate crops, all of which are not namely defined in REDII. The Consortium defined those terms and, in light of what the current Annex IX already covers, chose to focus on “any crop that is not the primary crop cultivated in a field in a given year and that is grown at a different time than the primary crop”. Relevant feedstocks are grains, starch, oil, sugar, beans and meals from these crops (ligno-cellulosic material is already included in Annex IX).

- **Sustainable Aviation Fuels (SAF)** are an option to reduce emissions. The CORSIA program includes sustainability criteria and the concept of ILUC. The low ILUC project looked at ILUC from the EU REDII perspective; the CORSIA concept is overall similar but differs in the details. The Colombia pilot project is also taking part in a CORSIA low ILUC project (timeline not final – some coordination with ICAO needed), so the pilot project could also be used to better understand similarities and differences, although this is outside the immediate scope of this project.

A.5 Results from interactive polls

After the main lessons from the pilot projects was presented, attendees were asked to respond to two questions via the “PollEV” interactive voting website. Attendees were invited to type as many responses as they chose, and to “upvote” responses from other attendees that they agreed with. The questions were designed to give an insight into the specific areas of interest from the attendees. The first question in particular guided the prioritization of the questions discussed verbally in the question and answer session. The questions were:

1. Which aspect of the methodology would you like to further discuss?

2. Which topics should we focus on in Phase 2?

Question 1: Which aspect of the methodology would you like to further discuss?		
Upvotes	Topic	
68	**Sequential cropping**	
	31	Sequential cropping
	27	Definition sequential crop, cover crop, intermediate crop
	4	DYB and perennial crops
	3	Double cropping
	3	Annex IX
41	**Additionality**	
	22	Financial attractiveness test
	12	Additionality test
	7	Financial and non-financial barriers
22	**Yield increase**	
	13	Yield increase and financial attractiveness
	7	How to define the additional biomass yield
	2	Yield increase
21	**Low ILUC methodology**	
	12	Decrease complexity, increase practicality
	8	Simplification, costs and developing countries
	1	Cost of resources for compliance administration

20	**Abandoned land**	
	11	Abandoned land
	5	Degraded land
	4	Abandoned land and satellite images
16	**Dynamic yield baseline**	
	9	Dynamic yield database
	4	Average growth curve calculation (for palm)
	3	Impact local, climate change and climate
4	**Smallholders**	
8	**Other**	
	5	Methodology for classifying a crop as high ILUC
	3	Other

Question 2: Which topics should we focus on in Phase 2?		
Upvotes	Topic	
31	**Sequential Cropping**	
	21	Intermediate and cover crops
	6	In EU Legislation
	4	Other
24	**Smallholders**	
20	**Low ILUC Concept**	
	15	Feasibility of low-ILUC production
	5	Other
17	**Reducing complexity and costs**	
16	**Barrier analysis**	
	9	Barrier analysis
	7	Alternatives financial attractiveness/barrier analysis
	6	Financial barrier analysis
6	**How to implement certification at a national or regional level**	
4	**Yield increase in palm oil**	
3	**Expanding to projects / farms with less robust prior data**	
2	**Dynamic yield baseline**	
1	**Other**	

Appendix B. Definitions of small holders

Article 5(1)(a)(iii) of the Delegated Regulation 2019/807 exempts small holders from needing to prove compliance with the additionality criteria – the financial attractiveness test or non-financial barrier analysis. However, they still need to show they are producing additional biomass and comply with the core REDII sustainability criteria. The feedstock expansion report (page 18) explains that the main reason for this exemption is “small holders, particularly in developing countries, for instance, will often lack the administrative capacity and knowledge to conduct such assessments while evidently facing barriers that hinder the implementation of productivity-increasing measures.”

The Delegated Regulation considers small holders to be holdings less than 2 hectares, explaining that “an estimated 84% of the world’s farms are managed by small holders cultivating less than 2 ha of land”, referencing a report by Lowder et al.[16]

As part of the Commission’s review of the legislation, Article 7 of the Delegated Regulation requires the Commission to review “the factors justifying the small holders provision”. None of the pilots in Phase 1 worked with small holders, however this section provides some background information on the different definitions of small holders.

There is no universally accepted definition of small holder. The concept of small is relative to the agroecological and socio-economic considerations of the particular context. However, stakeholders we have engaged with throughout this project – including the pilot companies – have consistently questioned the definition used in this context and said that 2 hectares is too small. In the next sections we describe the data and definitions of small holder and family farms described in Lowder et al, and the definitions of small holder used by EC-recognised voluntary schemes.

B.1 Small holders vs family farms

The common perception of small holders is often that they are small family-run farms. While there is no universally agreed definition of family farms, there are some common aspects in literature that describe this category. Family farms are often defined by a) the use of family labour and b) the farm is managed by the family. Some definitions limit the size of the farm explicitly by establishing a maximum land area for the farm, beyond which the farm is no longer considered a family farm. Other definitions include the share of household income from non-farm activities not exceeding a certain level

The terms small farms and family farms should not be used interchangeably. Figure 11illustrates the difference by looking at the number of farms worldwide and the percentage of agricultural land they cover. The data from Lowder et al show that a relatively similar number of farms worldwide are considered family farms and small farms: 90% of farms worldwide are considered family farms, while 84% of farms are small farms. However, when looking at the area of agricultural land they cover, we see a large difference. Small farms cover about 12% of the world's agricultural land, while family farms cover about 75% of the world’s agricultural land. This may explain the stakeholder perception that there are very few small holders less than 2 ha because, whilst the number of such small holders is high, the land area covered is low and as such they are perceived to be uncommon. Be aware that the most used definitions are not mutually exclusive, as all small holders are family farms but not all family farms will be small holders.

[16] Lowder, S.K., Skoet, J., Raney, T., 2016. The number, size, and distribution of farms, small holder farms, and family farms worldwide. World Dev. 87, 16–29

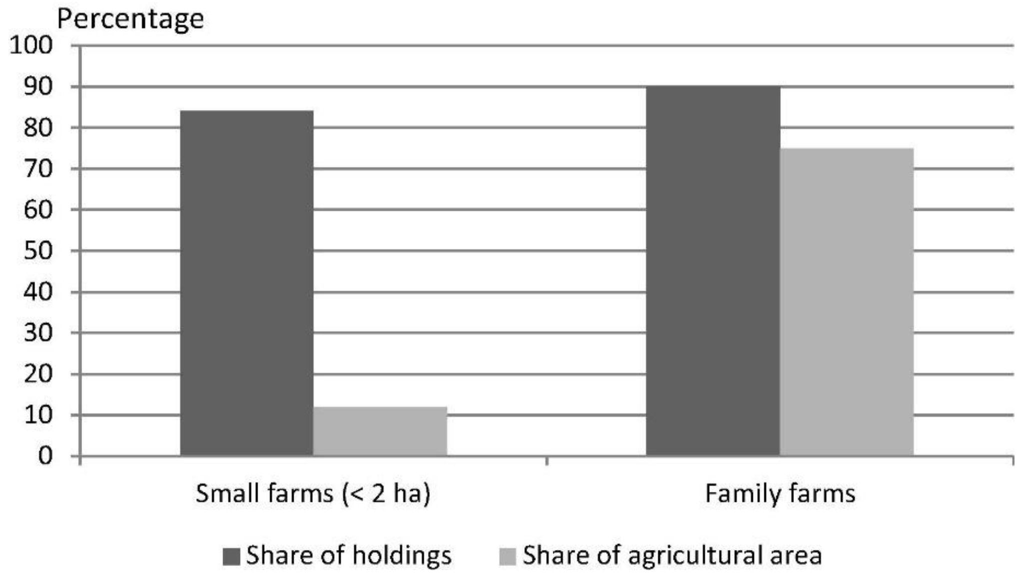


Figure 11. Difference in share of holdings and agricultural area for small farms (<2 ha) and family farms (Source: Lowder et al)

Stakeholders from different continents have consistently said that the definition of small holders below 2 hectares is very small and there are a lot of small farms larger than 2 hectares that would struggle with the low ILUC methodology. Figure 12 shows that small holders less than 2 ha do make up by far the highest percentage of farms by number (84%), but only a small percentage by land area (12%). Small holders less than 50 ha make up approximately 40% of land area, which is significantly higher, although much less than family farms. Thus, increasing the size of small holders would increase the area of farmland that would be exempted from the proof of compliance with the additionality criteria. The key question is: Is there any evidence that small farms larger than 2 ha, possibly family farms, have lower yields than big(ger) commercial farms and experience similar barriers as small holders? This is a topic that could be further explored in Phase 2.

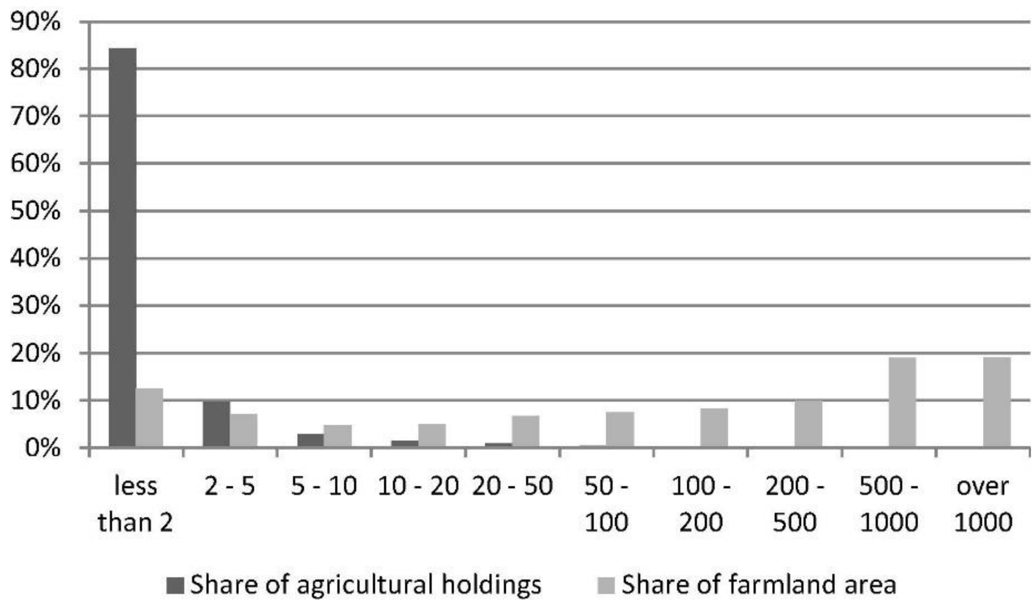


Figure 12. Share of agricultural holdings and farmland area for different farm sizes (Source: Lowder et al)

B.2 Voluntary schemes

Voluntary schemes have their own definitions of small holders. ISCC is one the largest voluntary schemes worldwide for the certification of biofuels. ISCC uses the term “independent small holder” (ISH) to describe farm where: a) The labour on the farm is principally provided by the family; b) the farm provides the major source of income for that family; c) on that land, small holders are free to choose how to use land, which crops to plant and how to manage it; d) the land is not contractually bound to any oil mill and may receive support or extension services from government agencies or other support system; e) the planted oil palm area on the own land of an ISH is **less than 50 hectares**. The current average size of an ISCC-certified independent small holder is 2-3 hectares[17].

The voluntary scheme RSPO has some similarities in the definition of small holders. They also state that the family should provide most of the labour on the farm and that the farm provides the principal source of income. RSPO also defines small holders as **less than 50 hectares**. Furthermore, RSPO defines small holders as farmers who grow oil palm alongside subsistence crops; and RSPO recognizes three types of small holders, which are not bound to a mill, called independent small holders, or if they are bound to a mill, called scheme- and associated small holders.[18]

Voluntary scheme certification can play a role in supporting small holders and family farms. According to ISCC, ISH certification leads to increase in revenues, independence of oil mills, access to new markets and technologies and, enhanced livelihood and community welfare. RSPO also claims a similar result. ISCC will implement a “Price Premium Contribution” mechanism for ISH, to give ISH a share in the price premiums when certified as part of a fully traceable and deforestation free supply chain. Another form of financial support from voluntary schemes is by providing funding to meet the schemes objectives and to cover certification costs (RSPO Small holder Support Fund (RSSF)).

It is important to be aware that sustainability, yield and income are not always aligned with the definition of Low ILUC and additionality. We propose to further research the approach to small holder certification in Phase 2.

[17] ISCC 2018. Certification concept for Independent Small holders (ISH) under ISCC. https://www.iscc-system.org/wp-content/uploads/2017/10/ISCC-ISH-Certification-concept_PPT.pdf

[18] RSPO Small holders. https://rspo.org/smallholders

guidehouse.com