



# ESCA

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# HISTORY OF CHANGES

DATE	PAGE	CHAPTER	CHANGES MADE	VERSION
23/07/2024	14	Specificities concerning biogas and biomethane production	Clarification on the use of the "manure" bonus	2
23/07/2024	15,16	Agricultural practices	Addition of a clarification to the definition of "intermediate cover".	2
23/07/2024	19	IPCC categories and decision rules	Updating the decision tree	2
23/07/2024	23	Soil analysis	Added explanation of soil analysis calculations	2
23/07/2024	24	GHG Calculator	Clarification of the reference method to be indicated in the calculator	2
23/07/2024	26	ef" factor	Clarification of the scope of application of the "ef" factor	2
23/07/2024	34	Appendix 3: Reference tables for establishing the CSR	Correcting data errors	2
10/10/2024	27	Tenant farmers	Addition of a sentence concerning the refusal to renew a lease agreement	3
10/10/2024	27	Ef" factor	Additional information added on the calculation of "Ef" and the notion of double counting	3
10/10/2024	28	Special cases	Addition of a "cessation of activities" paragraph	3
05/08/2025				

# INTRODUCTION

The Renewable Energy Directive (RED III) aims to promote the sustainable and increasing use of renewable energy sources. Adopted in 2023, it establishes an ambitious regulatory framework for the transition to a low-carbon economy.

The implementation of this directive is done through national schemes or voluntary schemes, such as 2BS. These schemes aim to facilitate the implementation of the objectives of the directive by providing an additional framework for the certification of renewable energies and to guarantee their environmental sustainability.

The RED III certification of fuels[1] is based on two essential pillars: the sustainability criteria of the raw material and the criteria for saving greenhouse gas (GHG) emissions. These criteria guarantee environmental sustainability and the reduction of GHG emissions associated with the production and use of fuels.

Regarding GHG emissions, RED III provides a standardized calculation formula to assess GHG emissions savings resulting from the use of renewable energy sources compared to emissions generated by fossil fuels. This formula incorporates a crucial factor called “ESCA” (*Emission Saving from Soil Carbon Accumulation*). This factor is used to quantify greenhouse gas (GHG) emissions savings resulting from the accumulation of carbon in the soil, primarily in the production of fuels from agricultural feedstocks.

$$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr}$$

Where :

- E = total emissions from fuel use, (gCO2 eq /MJ)
- e<sub>ec</sub> = emissions from the extraction or cultivation of raw materials, (gCO2 eq /MJ)
- e<sub>l</sub> = annualized emissions from carbon stock changes caused by land-use change, (gCO2 eq /MJ)
- e<sub>p</sub> = emissions from processing, (gCO2 eq /MJ)
- e<sub>td</sub> = emissions from transport and distribution, (gCO2 eq /MJ)
- e<sub>u</sub> = emissions from fuel in use, (gCO2 eq /MJ)
- e<sub>sca</sub> = emission savings from soil carbon accumulation via improved agricultural management, (gCO2 eq /MJ)
- e<sub>ccs</sub> = emission savings from CO2 capture and geological storage, (gCO2eq/MJ)
- e<sub>ccr</sub> = emission savings from CO2 capture and substitution, (gCO2 eq /MJ)

**This document focuses on explaining the new methodology for calculating the “ESCA” factor, introduced in Implementing Regulation (EU) 2022/996, published on June 27th, 2022.**

[1] Includes biofuels, bioliquids, biomass fuels, renewable liquid and gaseous transport fuels of non-biological origin, and recycled carbon fuels.



# WHAT IS THE ESCA?

ESCA, or “Emission Saving from Soil Carbon Accumulation”, is one of the factors used in the formula for calculating GHG emissions.

It is a term used to refer to the savings in greenhouse gas (GHG) emissions achieved through the accumulation of carbon in the soil through better agricultural management practices.

Soil carbon sequestration is one of the main approaches to reducing atmospheric CO<sub>2</sub> to mitigate global warming. It relies on the adoption of improved management practices that increase the amount of carbon stored in the form of soil organic matter.[2]

Implementing Regulation (EU) 2022/996 provides a detailed methodology on how to calculate and report ESCA to support the European Union's emissions reduction targets.

[2] Report on soil carbon sequestration for better land management – FAO:  
<https://www.fao.org/3/bl001f/bl001f.pdf>

$$e_{sca} = (CS_A - CS_R) \times 3,664 \times 10^6 \times \frac{1}{n} \times \frac{1}{P} - e_f$$

Where :

- CS<sub>R</sub> = is the mass of soil carbon stock per unit area associated with the reference crop management practice (in Mg\* of C per ha)
- CS<sub>A</sub> = is the mass of soil estimated carbon stock per unit area associated with the actual crop management practices after at least 10 years of application (in Mg\* C per ha)
- n = is the period of the cultivation of the crop considered (in years)
- P = is the productivity of the crop (in MJ/ha/year)
- e<sub>f</sub> = emissions from the increased fertilisers or herbicide use

\* 1 Mg = 1 t

# WHO CAN CLAIM THE ESCA ?

Economic operators eligible for the ESCA bonus must meet the following conditions:



- You must be certified in accordance with the 2BS specification and respect all the sustainability criteria established by the 2BS standards.
- Work with agricultural biomass suppliers who implement sustainable agricultural practices.
- Use a methodology for calculating greenhouse gas emissions in real values.

**Economic operators cannot claim an ESCA bonus on their raw materials, if the GHG methodology used to qualify them is in default value or NUTS2 value.**

The ESCA value calculated by the first gathering point in “kgCO<sub>2</sub>eq/ton dry matter” is then communicated throughout the chain (See Appendix 2). The first and last transformation units downstream of the gathering point must correct the ESCA, affecting the allocation and conversion factors (feedstock factor) of their respective processes. The biofuel producer will thus be able to convert the corrected ESCA into “gCO<sub>2</sub>eq/MJ” of biofuel and add it to the calculated total GHG emissions.

## PRINCIPLE OF IMPLEMENTING AN ESCA CLAIM

While the ESCA claim falls on the certified economic operator, it is the farmer who is responsible for implementing improved practices to promote the accumulation of carbon in their soil.

The surface area taken into account is that of the farm. The farmer must therefore provide a compilation of evidence of the implementation of good agricultural practices covering all sustainable plots (according to RED II) on his farm. It is recommended to have the same number of good agricultural practices each year across the entire farm. If necessary, he can subdivide his farm to form homogeneous groups (soil-climate, tillage and inputs). If different agricultural management practices are applied, GHG emissions savings claims must be calculated and applied for, individually for each method.

In the case of two energy crops on the same plot and the same year, the ESCA value is distributed proportionally to the LHV (MJ/kg) of the raw material. The ESCA bonus can only be allocated to the area (in hectares) where an energy crop is cultivated during the current year.



*STD-01 Indicator 2.4.3 (Major indicator): In the case of two sequential energy crops on the same plot and during the same year, the ESCA value is allocated proportionally to the added value (MJ/kg on a dry basis) of the raw material.*

*Verifier: Farm management system (tracing system, spreading notebook, distribution of ESCA value) Verifier: PCI of each raw material*

In case there is a change of first gathering point, the first initial gathering point is responsible for transferring the history of documents relating to the farmer's ESCA to the next one or directly to the farmer. The new first gathering point is then responsible for collecting the history of documents related to the farmer's ESCA.

**The management of the ESCA system is based on three different scenarios. These scenarios vary depending on:**

- the start date of improved agricultural management practices
- the submission of an ESCA claim before the date of entry into force of Implementing Regulation (EU) 2022/996, i.e. 30.06.2022.

The decision tree presented below as well as the detailed tables of the different scenarios presented in Appendix 1 provide an overview of the methodology to follow.



**STD-01 Indicator 2.4.1 (Major indicator):** To establish which case the farmer belongs to, the first gathering entity must have sufficient evidence.

Verifier: Cross-verification with section 2.7.7.3 of document 2BS-PRO-03.

Verifier: Assignment of a category

Verifier: ESCA self-declaration for each farmer

### Decision tree for the economic operator to determine where the farmer is in relation to ESCA claims

Did the farmer apply improved agricultural management practices before 30.06.2022?

Verifier: spreading notebook, manuring plan, satellite images

NO

The farmer is part of case no. 3

YES

Has the farmer submitted an ESCA declaration before 30.06.2022?

Verifiers: proof attesting to the information to/by the FGP of ESCA practices before 30.06.2022 (e.g.: date on which the calculator was filled in, attestation)

NO

The farmer is part of case no. 2

YES

The farmer is part of case no. 1

# CASE NO. 1: FARMERS WHO HAVE MADE ONE OR MORE ESCA CLAIMS BEFORE JUNE 30TH, 2022

The first case concerns farmers who improved their agricultural practices and claimed an ESCA bonus before the entry into force of Implementing Regulation 2022/996, i.e. before June 30th, 2022.

## a. Engagement

Improved agricultural management practices must be applied continuously to have an impact on soil carbon storage. This is why a commitment to the process is mandatory. The farmer commits to a period of 5 years, renewable at least once.

The farmer must commit to applying at least one of the best agricultural management practices annually, on the plots involved in the ten-year ESCA approach. (See Appendix 4)

The economic operator must provide the auditor with proof each year that its suppliers of agricultural biomass have implemented improved management practices during the previous years and that they are therefore respecting their commitment. In the event of non-compliance with this criterion, penalties will be applied.

The ten-year commitment in the ESCA approach must be signed before the first claim in the new approach. It concerns the continuity of application of good practices and not the delivery of materials.

## b. Determination of CSR

The CSR, part of the formula for calculating the ESCA factor, corresponds to the reference stock of carbon in the soil. It is measured per unit area in Mg of carbon per hectare. The CSR value must predate the change in agricultural management practices in order to establish a baseline. Once defined over time, this value remains unchanged for a given farm.

The CSR can be determined in several ways:

Option 1: Individual soil analysis carried out before the start of good agricultural practices\*.

Option 2: Measurement from a neighboring field or other fields with similar climatic and soil conditions as well as a similar field management history, if analyses exist for the year in which good agricultural practices were implemented\*.

Option 3: Use of a reference chosen in an interval indicated in the database (see Appendix 3)

The first option takes priority, if the measure does not exist, the second or third option must be used. If the third option is used, the result of the first soil test will become the new CSR.

*\*Analyses carried out in the past must enable to determine the carbon stock per hectare. Soil carbon stock is calculated by multiplying soil bulk density (g/cm<sup>3</sup> or kg/m<sup>3</sup>) by soil carbon content (percentage). If the bulk density of the soil is unknown, this measurement can be carried out at the time of commitment.*





### c. ESCA Claim Submission

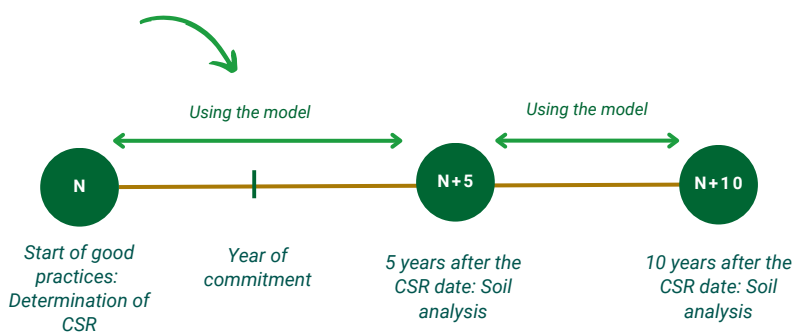
In this first case, the ESCA claim can be submitted without a transition period because the farmer was already registered in the process before the entry into force of Implementing Regulation 2022/996.

### d. Determination of the CSA

The CSA, part of the formula for calculating the ESCA factor, corresponds to the carbon stock associated with crop management practices. It is measured per unit area in Mg of carbon per hectare.

From the date of the CSR, the operator calculates a CSA based on a prediction model (modeled CSA) for 5 years. In the 5th year, at most, after the CSR date, the operator must carry out a first soil analysis (actual CSA) according to 2BS standards.

The prediction model recommended by 2BS is the IPCC Tier 2 model. 2BS has developed a calculator based on this model, which can be used to calculate the modeled CSA.



### e. Applicable cap

In this new approach, a cap has been established on the ESCA factor with the aim of limiting excessive claims.

This cap is expressed in grams of CO<sub>2</sub> equivalent per megajoule (gCO<sub>2</sub>eq/MJ) of biofuel and applies to the last interface producing the biofuel. However, the cap applicable to this last interface depends on the scenario in which the upstream farmer finds himself, who provided the raw material from which this biofuel originates. It is therefore essential that the cap data is transmitted throughout the supply chain.

In this first scenario, economic operators can apply a cap of 45 g CO<sub>2</sub>eq/MJ of biofuel or bioliquid during a transition period until the first measurement of the increase in carbon stock is carried out at the fifth year. Thereafter, the increase in carbon stock measured in the fifth year (actual CSA) will become a cap for annual declarations to be submitted in the following five years, even if it is lower.



**STD-02 Indicator 2.2.4 (Major indicator):** When real values are used, economic operators describe in detail and in writing all relevant information in order to justify all choices. It is necessary to divide the total amount of emissions into all relevant elements of the GHG emissions calculation formula. This also applies to formula elements that are not included in the default values, such as el, ESCA, eccr, and eccs. Relevant information includes a detailed description of the industrial process, data collected on site or in the literature, and the description of the calculation tool used if it is a "specific" tool. In case of unusual data, an explanation must be provided. This documentation must be available before the audit.  
Verifier: Document completed by the supplier including the ESCA cap to apply.

# CASE NO. 2: FARMERS WHO HAVE ALREADY IMPLEMENTED GOOD AGRICULTURAL PRACTICES BUT WITHOUT HAVING CLAIMED AN ESCA BONUS

This second case concerns farmers who have started to improve their agricultural practices but who have not claimed an ESCA bonus before the entry into force of implementing regulation 2022/996, i.e. before June 30th, 2022.

## a. Engagement

Improved agricultural management practices must be applied continuously to have an impact on soil carbon storage. This is why a commitment to the process is mandatory. The farmer commits to a period of 5 years, renewable at least once.

The farmer must commit to applying at least one of the best agricultural management practices annually, on the plots involved in the ten-year ESCA approach. (See Appendix 4)

The economic operator must provide the auditor with proof each year that its suppliers of agricultural biomass have implemented improved management practices during the previous year and that they are therefore respecting their commitment. In the event of non-compliance with this criterion, penalties will be applied.

The ten-year commitment in the ESCA approach must be signed before the first claim in the new approach. It concerns the continuity of application of good practices and not the delivery of materials.

## b. Determination of CSR

The CSR, part of the formula for calculating the ESCA factor, corresponds to the reference stock of carbon in the soil. It is measured per unit area in Mg of carbon per hectare. The CSR value must predate the change in agricultural management practices in order to establish a baseline. Once defined over time, this value remains unchanged for a given farm.

Option 1: Individual soil analysis carried out before the start of good agricultural practices\*.

Option 2: Measurement from a neighboring field or other fields with similar climatic and soil conditions as well as a similar field management history, if analyzes exist for the year of implementation of good practices agricultural\*.

If there is no data available for a neighboring field, a first measurement must be made immediately, at the time of commitment. The next measurement of the increase in carbon stock will have to be made five years later.

The first option should be preferred; if the measure does not exist, the second should be used.

*\*Analyses carried out in the past must enable to determine the carbon stock per hectare. Soil carbon stock is calculated by multiplying soil bulk density (g/cm<sup>3</sup> or kg/m<sup>3</sup>) by soil carbon content (percentage). If the bulk density of the soil is unknown, this measurement can be carried out at the time of commitment.*



### c. ESCA Claim Submission

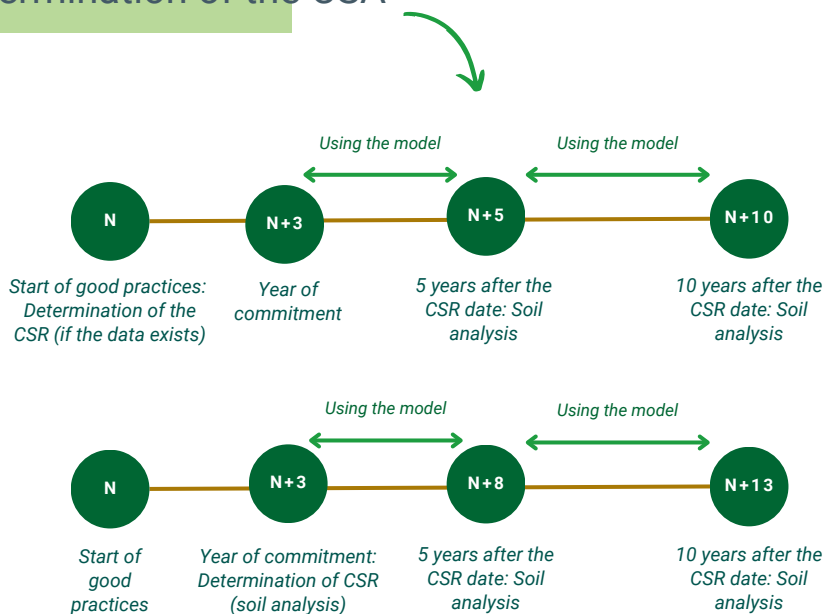
A minimum of 3 years of continuous application of an improved management practice is required, before the farmer or economic operator can submit a claim.

It is possible to submit retroactive claims annually, but no more than three years before the first ESCA claim. These ESCA can be valued by being distributed over a period of 10 years following the date of commitment.

### d. Determination of the CSA

CSA corresponds to the carbon stock associated with crop management practices. It is measured per unit area in Mg of carbon per hectare. From the date of the CSR, the operator calculates a CSA based on a prediction model (modeled CSA) for 5 years. In the 5th year, at most, after the CSR date, the operator must carry out a first soil analysis (actual CSA) according to 2BS standards.

The prediction model recommended by 2BS is the IPCC Tier 2 model. 2BS has developed a calculator based on this model, which can be used to calculate the modeled CSA.



### e. Applicable cap

In this new approach, a cap has been established on the ESCA factor with the aim of limiting excessive claims.

This cap is expressed in grams of CO<sub>2</sub> equivalent per megajoule (gCO<sub>2</sub>eq/MJ) of biofuel and applies to the last interface producing the biofuel. However, the cap applicable to this last interface depends on the scenario in which the upstream farmer finds himself, who provided the raw material from which this biofuel originates. It is therefore essential that the cap data is transmitted throughout the supply chain.

In this second scenario, economic operators must apply a cap of 25g CO<sub>2</sub>eq/MJ of biofuel or bioliquid.

The cap can be raised to 45 gCO<sub>2</sub>eq/MJ for the entire period of application of ESCA practices, if biochar is used annually as the only organic amendment or in combination with other authorized ESCA practices. If a calculation of the quantity of biochar is carried out by the first gathering point, 2BS recommends referring to the IPCC 2019 (Volume 4, Chapter 2, Annex 4).



**STD-01 Indicator 2.4.5a:** When the farmer uses biochar as an organic amendment, alone or in combination with other eligible esca practices, the first gathering point must induce a capping of the ESCA at 45gCO<sub>2</sub>eq/MJ biofuel or bioliquid.

Verifier: dated proof of purchase (invoices detailing product specifications) Verifier: spreading notebook including biochar.

# CASE NO. 3: FARMERS ENTERING THE PROCESS

This third case concerns farmers new to the ESCA approach and beginning to improve their agricultural practices.

## a. Engagement

Improved agricultural management practices must be applied continuously to have an impact on soil carbon storage. This is why a commitment to the process is mandatory. The farmer commits to a period of 5 years, renewable at least once.

The farmer must commit to applying at least one of the best agricultural management practices annually, on the plots involved in the ten-year ESCA approach. (See Appendix 4)

The economic operator must provide the auditor with proof each year that its suppliers of agricultural biomass have implemented improved management practices during the previous year and that they are therefore respecting their commitment. In the event of non-compliance with this criterion, penalties will be applied.

The date of commitment to the process corresponds to the start date of application of good practices.

The ten-year commitment to the ESCA approach concerns the continuity of application of good practices and not the delivery of materials.

## b. Determination of CSR

The CSR, part of the formula for calculating the ESCA factor, corresponds to the reference stock of carbon in the soil. It is measured per unit area in Mg of carbon per hectare. The CSR value must predate the change in agricultural management practices in order to establish a baseline. Once defined over time, this value remains unchanged for a given farm.

The value of the CSR will be based on a soil analysis which must be carried out in the year of the commitment.

## c. ESCA Claim Submission

The farmer or economic operator must have applied improved management practices continuously for at least three years from the date of commitment before being able to submit an ESCA claim.

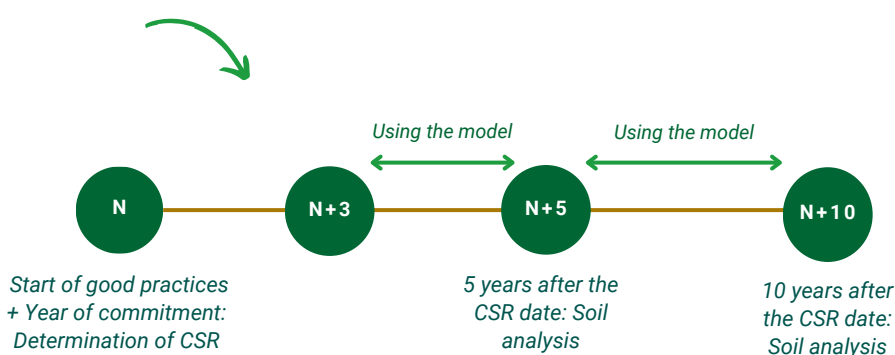




## d. Determination of the CSA

The CSA, part of the formula for calculating the ESCA factor, corresponds to the carbon stock associated with crop management practices. It is measured per unit area in Mg of carbon per hectare.

Between the 3rd and 5th year after the CSR date, the operator calculates a CSA based on a prediction model (modeled CSA). In the 5th year, at most, after the CSR date, the operator must carry out a new soil analysis (actual CSA) according to 2BS standards.



The prediction model recommended by 2BS is the IPCC Tier 2 model. 2BS has developed a calculator based on this model. This calculator can be used to calculate the modeled CSA.

## e. Applicable cap

In this new approach, a cap has been established on the ESCA factor with the aim of limiting excessive claims.

This cap is expressed in grams of CO<sub>2</sub> equivalent per megajoule (gCO<sub>2</sub>eq/MJ) of biofuel and applies to the last interface producing the biofuel. However, the cap applicable to this last interface depends on the scenario in which the upstream farmer finds himself, who provided the raw material from which this biofuel originates. It is therefore essential that the cap data is transmitted throughout the supply chain.

In this third scenario, economic operators must apply a cap of 25g CO<sub>2</sub>eq/MJ of biofuel or bioliquid.

The cap can be raised to 45 gco<sub>2</sub>eq/MJ for the entire period of application of ESCA practices, if biochar is used annually as the only organic amendment or in combination with other eligible ESCA practices. If a calculation of the quantity of biochar is carried out by the first gathering point, 2BS recommends referring to the IPCC 2019 (Volume 4, Chapter 2, Annex 4).



STD-01 Indicator 2.4.5a: When the farmer uses biochar as an organic amendment, alone or in combination with other eligible ESCA practices, the first gathering point must induce a capping of the ESCA at 45gCO<sub>2</sub>eq/MJ biofuel or bioliquid.

Verifier: dated proof of purchase (invoices detailing product specifications)

Verifier: spreading notebook including biochar.



# SPECIFICITIES CONCERNING THE PRODUCTION OF BIOGAS AND BIOMETHANE

In the case of biogas and biomethane producers, a bonus of 45 g CO<sub>2</sub>eq/MJ of manure can be allocated for improving agricultural and manure management in the case where animal manure is used as a substrate to produce biogas and biomethane.

A biogas plant can either benefit from the ESCA bonus through the use of manure or from the ESCA due to the application of good agricultural practices. The two options are not cumulative.



*STD-02 Indicator 2.2.5: For the ESCA factor, a bonus of 45 g CO<sub>2</sub>eq/MJ of manure is allocated for improving agricultural and manure management in the case where animal manure is used as substrate for the production of biogas and biomethane.*  
- Verifier: Manure production and storage capacity  
- Verifier: Monthly quantity introduced into the digester"

## AGRICULTURAL PRACTICES



The objective of this initiative is to demonstrate that the farmer adopts improved agricultural management practices aimed at increasing carbon storage in the soil.

As part of this approach, the farmer commits to implement at least one good practice each year, even if he does not claim ESCA each year on his farm.



*STD-01 Indicator 2.4.4 (Critical indicator): Each time the farmer implements agricultural practices favoring the storage of carbon in the soil under the ESCA, the first gathering point must have recorded information precise in terms of inputs and tillage.*  
Verifier: spreading notebook, agricultural management system, organic routes  
Verifier: purchase invoices for organic inputs, nitrogen-fixing plant seeds, catch crops or plant covers, etc.  
Verifier: self-declaration concerning ground work.

If different management practices are applied, a GHG emissions savings claim must be calculated and requested individually for each method.

An exhaustive list of good practices is given in the 2BS standards. Please see pages 15 and 16.

PRACTICE	DEFINITION	EVIDENCES
<b>DEEP TILLAGE</b>	Deep tillage of the soil (reference practice, not part of improved management practices)	
<b>NO-TILL</b>	<p>Soil mixing and fragmentation. Practice taking into account TCS (Simplified Cultural Techniques), strip-till, decompaction and subsoiling.</p> <p>It is authorized to practice exceptional tillage under certain conditions listed below: climatic accidents, plants weeded in the rotation, phytosanitary problems.*</p>	<ul style="list-style-type: none"> <li>• Technical itinerary (agricultural Notebook or Farm Management System)</li> <li>• Use of a Geographic Information System (GIS)</li> <li>• Use of sensors or drone imagery</li> </ul>
<b>DIRECT SEEDING</b>	<p>Soil fragmentation only on the sowing line.</p> <p>It is authorized to practice exceptional tillage under certain conditions listed below: climatic accidents, plants weeded in the rotation, phytosanitary problems.*</p>	
<b>ORGANIC FERTILIZATION</b>	<p>Operators must provide a significant contribution of organic matter (all waste and organic by-products from agricultural and human activities intended to be spread in the field. They can be of origin)</p> <p>Non-exhaustive list of organic matter:</p> <ul style="list-style-type: none"> <li>• Animal: livestock effluent, compost, dried blood, crushed horn</li> <li>• Plant: green waste, intra-plot agroforestry, ashes</li> <li>• Human: sewage sludge</li> <li>• Industrial: waste from sugar factories, starch production, vegetables, etc.</li> <li>• Digestats</li> <li>• Biochar</li> <li>• Fermentation of manure</li> <li>• Compost</li> </ul>	<ul style="list-style-type: none"> <li>• Technical itinerary (agricultural Notebook or Farm Management System)</li> <li>• Invoice, delivery note, stock tracking</li> <li>• Spreading book</li> </ul>

\*When exceptional tillage is carried out (subject to adequate evidence), the farmer may retain his classification in the "no-till" or "direct seeding" category (see page 19)

<b>INTERMEDIATE CULTURE</b>	<p>Seeding cover/catch/intermediate crops. Crop management practices should ensure minimum soil cover so as not to have bare soil during the most sensitive periods).</p> <p>Cover crop must achieve a cumulative yield (over 5 years maximum) of production, greater than 1.5 tonnes of biomass, with complete restitution of the biomass</p>	<ul style="list-style-type: none"> <li>• Technical itinerary (agricultural Notebook or Farm Management System)</li> <li>• Use of a Geographic Information System (GIS)</li> <li>• Use of sensors or drone imagery</li> </ul>
<b>MULCHING USING CROP RESIDUES</b>	<p>Agricultural technique consisting of covering the soil with organic material (mulch), in order to preserve and improve the structure and fertility of the soil, and limit evaporation and erosion. Mulching can be carried out directly with residue from the previous crop</p>	
<b>3 CROP ROTATION</b>	<p>At least one three-year rotation, including legumes or green manure in the cropping system, taking into account the agronomic crop succession requirements specific to each cultivated plant and climatic conditions. A multi-species cover crop between cash crops counts as one crop.</p>	
<b>RESTITUTION OF CROP RESIDUES</b>	<p>Action of leaving all crop residues on the agricultural plot which can be returned or left as mulch on the surface</p>	

# IPCC CATEGORIES AND DECISION RULES

To enable CSA modeling and use the IPCC Tier 2 prediction model, it is necessary to define for each farmer the IPCC categories corresponding to their practices. The categories are divided into two parts:

A part on tillage with 3 possible categories

<b>Full tillage</b>	Significant disruption with complete inversion and/or frequent tillage work (during the year). Low residue coverage (<30% for example) at the time of planting.
<b>Reduced tillage</b>	Primary and/or secondary tillage with less soil disturbance (generally shallow and without complete inversion), normally leaving >30% residue coverage at planting.
<b>No tillage</b>	Direct seeding without primary tillage, with minimal soil disturbance in the seeding area. Herbicides are generally used to control weeds.

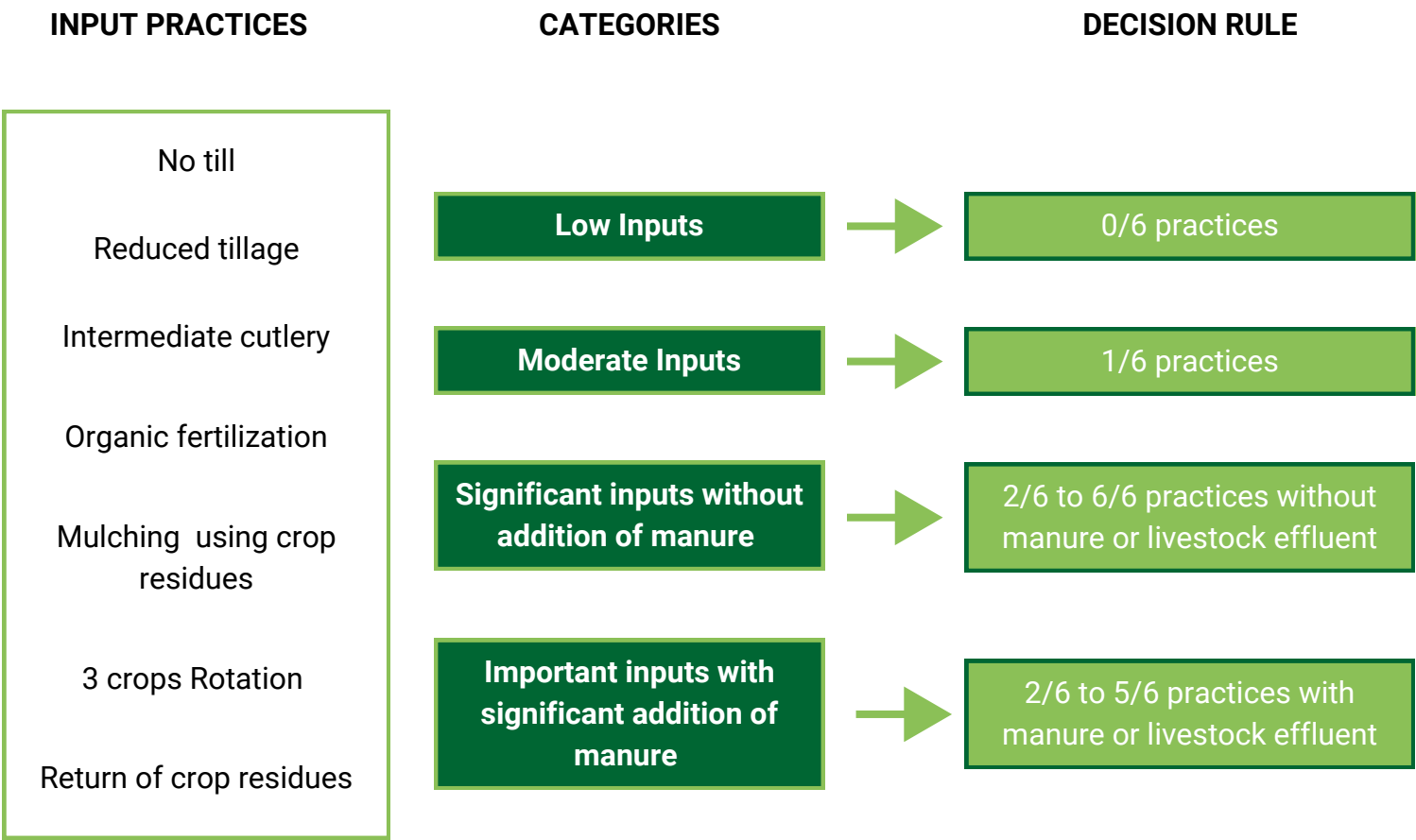
A part on inputs with 4 possible categories:

<b>Low inputs</b>	The residue rate is low when there is removal of residues (by collecting or burning), frequent bare fallowing, crops producing little residue (vegetables, tobacco, cotton, for example), absence of use of fertilizers minerals, absence of nitrogen-fixing crops.
<b>Moderate inputs</b>	Annual cultivation with planting of cereals, all residues being left in the fields. If residues are removed, additional organic matter (e.g. manure) is added. This also requires mineral fertilizers and nitrogen-fixing crops in rotation.
<b>Important inputs with manure</b>	Much greater carbon inputs compared to cropping systems with moderate carbon inputs, due to the additional practice of regularly adding manure.
<b>Important inputs without manure</b>	Much higher inputs of crop residues compared to cropping systems with moderate carbon inputs due to additional practices, such as crops producing a lot of residue, use of green manures, cover crops, improved vegetated fallows, irrigation, frequent use of perennial grasses in annual rotations, but without application of manure (see previous paragraph).

When entering the farmer's process, the first gathering point evaluates the farmer's practices over years N-x (x being a maximum of 5 years) to determine, using the decision tree below, the IPCC category in which the farmer is located. He must decide on a category for the tillage part and another category for the input part.



Tillage practices	Techniques implemented	Exceptions
NO TILL	Soil fragmentation only on the seed line	<i>It is authorized to practice exceptional tillage in certain conditions, for example: climatic accidents, weeded plants in the rotation representing less than 30% of the farm, phytosanitary problems.</i>  <i>Exceptional tillage allows us to remain committed to "direct seeding" and "superficial work" practices but implies taking into account the carbon release associated with this change in practice (see calculator)</i>
REDUCED TILLAGE	Soil mixing and fragmentation. Practice taking into account TCS (Simplified Cultural Techniques), strip-till, decor	
FULL TILLAGE	Any other technique regularly using tillage	





## Decision guide:

**For the large inputs  
with manure category:**

- No mandatory threshold for organic carbon intake.
- Concerning crop residues, IPCC rules must be followed (if there is export of residues this must be compensated by an addition of organic matter). (See STD-01 Principle 4)

**For the large input  
without manure  
category :**

- Establishment of at least one cover, which must achieve a cumulative yield (over 5 years maximum) of production, greater than 1.5 tonnes of biomass, with complete restitution of the biomass.
- Concerning crop residues, IPCC rules must be followed (if there is export of residues this must be compensated by an addition of organic matter).

Each year, the farmer must provide evidence to justify that he is still implementing the minimum necessary practices over years N-x (x being a maximum of 5 years), to remain in the IPCC categories assigned to him. If the minimum number of practices to reach its IPCC category is no longer reached, a new category, simulating less carbon storage, can be applied to the farmer. Similarly, if additional practices are put in place, the first gathering point may decide to change the farmer's IPCC category to a higher carbon storage model.

# SOIL ANALYSIS

Depending on the situation in which the farmer finds himself, soil analyzes must be carried out at regular intervals in order to measure the current stock of carbon in the soil and validate the CSA modeled on the basis of the IPCC Tier 2 prediction model. The soil analysis to obtain the actual CSA must be carried out only on plots where an ESCA claim has been registered at least once in the last five years.

*Soil carbon stock = Soil bulk density (in g/cm<sup>3</sup> or kg/m<sup>3</sup>) × Soil carbon rate (in percentage)*

Soil analysis includes the sampling process as well as laboratory analysis.

Sampling to analyze the carbon content in the soil must be carried out using the method listed below. Regarding sampling to measure bulk density, 2BS recommends carrying out three analyzes per farm, these must be representative of each type of soil present on the farm. It is also recommended that sampling be carried out under identical conditions for each new analysis. Bulk density is measured using the cylinder method, in accordance with standard NF11272.

Sampling is carried out either by a sampler or by the farmer. In both cases, sampling must follow the sampling protocol.

## 1. Representative sampling method

- a) sampling shall be made for each plot or field\*;
- b) at least one grab sample of 15 well distributed sub-samples per every 5 hectares or per field, whichever is smaller (taking into account the heterogeneity of the plot's carbon content), shall be taken;
- c) Smaller fields\* ( $\leq 5$ ha) with same climatic conditions, soil type, reference farming practice, and esca practice can be grouped;

Indeed, it is possible to group samples taken from different fields (fields of 5 ha maximum) with a maximum cumulative area of 20 ha. These fields must have the same soil and climatic characteristics, a similar management history in terms of tillage and carbon input to the soil, and they will be subject to the same improved management practice. In this case, samples can be pooled for analysis, including those from fields belonging to different farmers.

- d) sampling shall be done either before soil cultivation and fertilisation or a minimum of 2 months after harvest;
- e) direct measurements of soil carbon stock changes shall be taken for the first 30 cm of soil;
- f) the points of the initial sampling to measure the baseline of soil carbon stocks shall be used under identical field conditions (especially soil moisture);

\*Field means an area of land, used for growing crops or keeping animals, usually surrounded by a fence: [Cambridge Dictionary]

- g)* The sampling protocol shall be well documented.

Measurements of soil carbon stocks should preferably be carried out by accredited laboratories (ISO 17025 or equivalent). If such laboratories are not available, measurements can be carried out by a certified independent laboratory of proven impartiality. When using certified laboratories, preference must be given to laboratories undergoing accreditation (ISO 17025).

Soil analysis (soil carbon content, dry bulk density) must be carried out according to the method below or alternatively according to the default standards listed in 2BS-PRO-03 (§2.7.7.6)

## *2. Measurement of the soil carbon content:*

- a)* soil samples shall be dried, sieved, and if necessary grounded;
- b)* if the combustion method is used, inorganic carbon shall be excluded.

## *3. Determination of dry bulk density*

- a)* changes in bulk density over time shall be taken into account;
- b)* bulk density should be measured using the tapping method, that is to say by mechanically tapping a cylinder into the soil, which greatly reduces any errors associated with bulk density measurement;
- c)* if the tapping method is not possible, especially with sandy soils, a reliable method shall be used instead;
- d)* samples should be oven-dried prior to weighing.

To be compared to the model, the result of the soil analysis must take into account the measurement uncertainty and the sampling uncertainty. These uncertainties are communicated in the analysis reports from accredited laboratories.

After soil analysis, we obtain :

→ Analyzes every 5 hectares (including measurement and sampling uncertainty)  
or

→ Cumulative analyses for up to 20 hectares (including measurement and sampling uncertainty).

To compare the actual CSA with the modeled CSA, obtaining a final operational value is essential.

This involves calculating:

1. Low average
2. High average
3. Median

*The real CSA lies in the widest range.*

## EXAMPLE

Analysis 1: 30 t/C/ha (+/- 10%)

Analysis 2: 45 t/C/ha (+/- 10%)

Analysis 3: 35 t/C/ha (+/- 10%)

**Median: 35 tons per hectare**

**The current CSA will lie within the range :**

**33 tons C per hectare - 40.33 tons C per hectare**

	Low value	High value
Analysis 1	27	33
Analysis 2	40,5	49,5
Analysis 3	31,5	38,5
<b>Average</b>	<b>33</b>	<b>40,33</b>

# 2BS CALCULATOR

## (ACCORDING TO THE IPCC TIER 2 MODEL) [3]

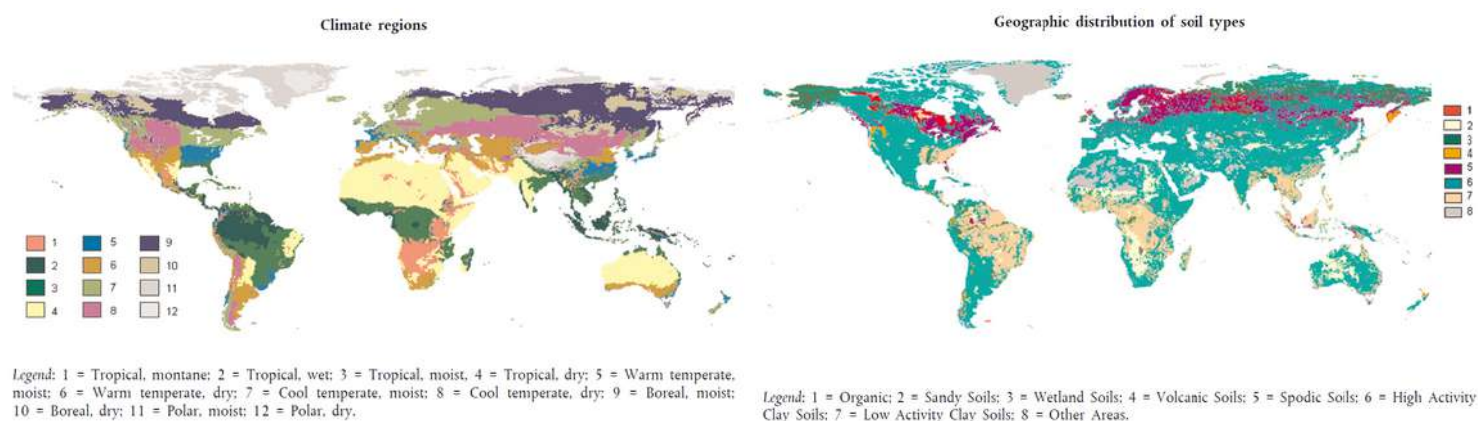
The prediction model recommended by 2BS is the IPCC Tier 2 model. 2BS has developed a calculator based on this model. This calculator can be used to calculate the modeled CSA.

### a. Application

The use of 2BS calculator by economic operators is not mandatory. However, it is necessary to use the methodology which is detailed in 2BS-PRO-03 (§2.7.7.7)

This calculator has been developed for use in France. In order to use the calculator in other countries, economic operators, representative bodies of operators or the relevant public authorities should provide 2BS with climate data and soil types by region for their respective countries. This adaptation will ensure accurate and effective use of the calculator, taking into account the environmental specificities of each country.

Below is a map of the world's soil types and climates[4]. To adapt the calculator to specific needs, the same type of data is required at the level of the chosen country.



In the 2BS calculator, the ESCA calculation is carried out in the “ESCA Calculator” tab.

[3] See the calculator “GHG-Calculator EEC ESCA 2024-V4” - soon available on [www.2bsvs.org](http://www.2bsvs.org)

[4] Commission Decision of 10 June 2010 - (2010/335/EU)



# 2BS CALCULATOR

## (ACCORDING TO THE IPCC TIER 2 MODEL) [3]

To begin, the economic operator enters their postal code. The calculator will thus determine the climate and soil type based on the IPCC climate maps (Tier 2).  
If in doubt about the precise location of the climate type (straddling several zones), the climate type with the lowest carbon stock per hectare must be considered.



**STD-01 Indicator 2.4.2:** When the first gathering point wishes to determine the climate and soil categories of a farm, it must use the IPCC climate maps (Tier 2 type) associated to date with the calculation model of ESCA or equivalent if the resolution is higher. If there is any doubt about the precise location of the climate type (straddling several zones), the climate type with the lowest carbon stock per hectare must be taken into account.  
Verifier: Use of IPCC level 2 climate maps

	Previous conditions:	Current conditions:	
Soil Management	Full-tillage	No till	
Input	Low	High without manure	
SOC <sub>REF</sub>	24	24	
F <sub>LU</sub>	0,76	0,76	
F <sub>MB</sub>	1	1,04	
F <sub>I</sub>	0,95	1,04	
	Initial C stock	CS <sub>A-modelized</sub>	Carbon stock change:
	17,33 tC/ha	19,73 tC/ha	-0,12 tC/ha/year

The economic operator then chooses his reference method as well as his current method (see p.18).

He then obtains a quantity of carbon storage in tC/ha/year at the farm level.

The reference method corresponds to the practices carried out before the implementation of improved agricultural management practices (e.g., 2008). The determination of the reference method is based on a declaration by the farmer.

It will also be necessary to provide crop yield as well as emissions associated to the use of fertilizers and herbicides from previous years (average of the last 3 years before entering the new ESCA approach) and the current year ("ef" factor) in order to obtain the final ESCA value for a given crop. (see p.26)

Productivity of the crop (measured as kg per ha per year)	2921	kg/ha/year
Emissions from fertilisers and herbicides, previous year (Emissions of the previous year when the same crop was cultivated, per kg of dry Feedstock)	376	grCO2/kg of dry feedstock
Emissions from fertilisers/herbicides, year N (Emissions of the current year per kg of dry Feedstock)	377,63	grCO2/kg of dry feedstock
Ef factor (Emissions from the increased fertilisers or herbicide use)	-1,63	grCO2/kg

e <sub>scA</sub> value	149 grCO2/kg of dry feedstock
------------------------	-------------------------------

CSR measured Value from the soil analysis (Case n°2 and n°3), or from the reference table (Case n°1)	15,00	tC/ha
Years Number of years since the date of CSR	3	year
CSA modelised CSA value based on the carbon stock change modelised (Previous vs current conditions)	15,36	tC/ha
CSA measured CSA value from the soil analysis	15	tC/ha
Comparison between CSA modelised vs measured % of deviation from the modelised value	-2,3	%

Finally, from the CSR and the number of years indicated (y), the calculator can determine the modeled CSA (CSR + y \* carbon stock change) and compare it to the actual CSA (to complete once the soil analysis has been carried out).

[3] See the calculator "GHG-Calculator EEC ESCA 2024-V4" - soon available on [www.2bsvs.org](http://www.2bsvs.org)

## b. Calibration

After the soil analysis (actual CSA), if the measured value is different from the modeled value (modeled CSA), the model used must be calibrated on the basis of the actual values measured and approved by 2BS. Actual soil carbon measurements must be reintegrated into the 2BS model, as implemented by the economic operator, in order to improve its predictive value and adjust the annual emissions savings resulting from the accumulation of soil carbon through agricultural management in subsequent years.

Calibration of the model is the responsibility of the economic operator (the first gathering point). It will be verified during audits as soon as the CSA is measured. 2BS will then provide the calibration rules. The model calibration will target the specific stock variation factors (FLU, FMG and FI) in order to obtain a more region-specific model. The difference between the CSR and the first CSA will help the economic operator to calibrate the model. Model calibration is not necessary if the model is verified by the first CSA measurement, i.e. if the modeled CSA is equivalent to the actual measured CSA.

# GROUP AUDIT

The internal audit of farmers by the first gathering point must be carried out on 100% of farmers annually.

The audit carried out by a third party (certification body) can be carried out in the form of a group audit. Indeed, an audit of several farms can be carried out when the farmers belong to the same case and the farms have:

- A similar climate and soil type
- A similar management history in terms of tillage;
- The same carbon contributions to the soil
- The same agricultural practices;

It is the responsibility of the economic operator to create homogeneous groups allowing the third-party auditor to audit the square root of the farmers. The sample size is the square root of the number of farmers and their selection is 75% done by risk analysis and 25% randomly.

If a farmer belonging to an audit group disengages from the ESCA process, the sanctions then only apply to the farmer concerned and not to all other elements of the group.



*STD-01 Indicator 2.4.6: When the first gathering point chooses to create homogeneous groups among farmers allowing the third-party auditor to audit the square root of farmers, the entity must have precise elements to justify its decision.*

*Verifier: Esca self-declaration for each farmer*

*Verifier: List of homogeneous groups (decision criteria)*

# PENALTIES

The methodology provides for a process of transferring penalties to suppliers of agricultural biomass (farmers). However, responsibility for ESCA claims on the market lies at the level of the economic operator (first gathering point, if applicable). Any penalties will be recorded at the level of the economic operator. The economic operator can pass on the penalties to the farmer.

## 1. If a farmer withdraws from the ESCA system (non-compliance with commitment)

- Farm ESCA values for the current year are added as emissions to the overall GHG emissions of the relevant energy crop, instead of being deducted as GHG emissions savings.
- The farmer is prohibited from including an ESCA value in the calculation of greenhouse gas emissions for the following five years.
- The list of farmers who have not respected the ESCA commitment as well as the sanctions applied are published on the 2BS website, shared with other voluntary schemes and included in the annual activity reports to be sent to the Commission.

## 2. If actual CSA < modeled CSA

If the first measurement of the increase in carbon stock in the fifth year (actual CSA) indicates a total annual increase in carbon stock less than the annual claims (modeled CSA), the annual difference (between the modeled CSA and the actual CSA) must be fully deducted during the next ESCA claim.\* After applying the penalty, the ESCA claims resume normally, as the penalty is applied for only one year.

\* In the case where an ESCA claim is made each year, this corresponds to the year following the year of soil analysis



*STD-01 Indicator 2.4.7 (Major Indicator): Whenever a farmer withdraws from the ESCA engagement, the first collecting entity must apply the appropriate sanctions described in 2BS-PRO-03 and maintain all records. This information is communicated annually to 2BS.*

*Verifier: Spreading notebook (agricultural practices)*

*Verifier: ESCA self-declaration for each farmer*

*Verifier: list of farmers excluded from the ESCA system*

*Verifier: list of sanctions applied to each farmer*

## 3. If real CSA > modeled CSA

If the soil analysis result (actual CSA) is greater than the value predicted by the model (modeled CSA), the difference between the actual CSA and the modeled CSA is added into the ESCA bonuses for the following five years.

## 4. If actual CSA > ESCA cap (45 or 25 gCO<sub>2</sub>eq/MJ)

When the result of the soil analysis exceeds the ESCA caps (45 or 25 gCO<sub>2</sub>eq/MJ depending on the case), the cap prevails.



*STD-01 Indicator 2.4.8 (major indicator): In case of non-correlation between the model and the measurement, the first gathering point must apply the appropriate sanctions described in document 2BS-PRO-03 and keep all records. This information must be communicated annually to 2BS.*

*Verifier: Soil analysis report and latest ESCA value from the modeling*

*Verifier: list of farmers concerned*

*Verifier: list of penalties applied to each farmer*

# TENANT FARMERS

For farmers who rent agricultural land, participation in the ESCA program is subject to the following condition : From the date of the CSR, the farmer must commit to stay on the same plot of land for the entire duration of the engagement, which is 10 years. This requirement is independent of the lease agreements, which can be for 1, 3, or 5 years.

Farmers must be able to demonstrate their long-term commitment by providing evidence of the renewal of their lease agreements. This evidence can include copies of successive lease contracts or any other official documents confirming their continuous presence on the specified plot.

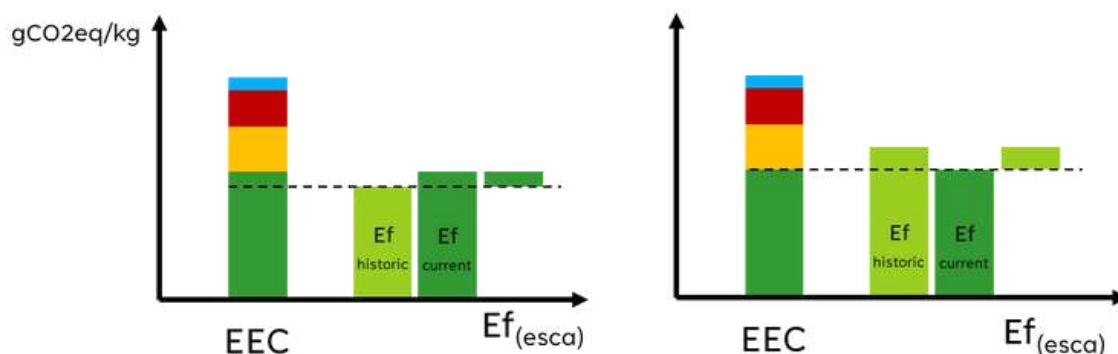
If, for any reason, farmers terminate their lease before the end of the 10-year engagement period, they will be subject to the penalties applied to farmers who withdraw from the ESCA program. These penalties are intended to maintain the sustainability of the agricultural practices promoted by the ESCA program.

In cases where the owner refuses to renew the lease of a tenant farmer, the "cessation of activity" rules explained in the "special cases" paragraph apply.

## “EF” FACTOR

$$Ef = Ef_{\text{historic}} - Ef_{\text{current}}$$

The factor "ef" represents the emissions associated with the increased use of fertilizers and herbicides. Nitrogen-fixing crops, which help reduce the need for additional fertilizers, can be included in the calculations. The increase in the use of fertilizers and herbicides is determined by comparing consumption before ( $Ef_{\text{historic}}$ ), calculated as the average of the three years prior to entering the new ESCA approach (commitment year), and after the adoption of new practices, taking into account the emissions for the current year ( $Ef_{\text{current}}$ ).



If  $Ef_{\text{historic}}$  is lower than  $Ef_{\text{current}}$ , the difference in additional emissions is already accounted for in the calculation of the "eec" factor. Therefore, to avoid double counting, the "Ef" emissions should not be included.

On the other hand, if  $Ef_{\text{historic}}$  is higher than  $Ef_{\text{current}}$ , the difference corresponding to the saved emissions can be calculated.

Economic operators have the option to choose a conservative scenario by estimating an  $Ef_{\text{historic}}$  lower than  $Ef_{\text{current}}$ . In this case, the calculation of "Ef" is not mandatory.

# THE 2BS REPORT

Each year, during the annual declaration, the first gathering point must communicate to 2BS:

- The number of suppliers using the GHG calculation methodology in real value and among them, the number of farmers claiming an ESCA bonus.
- Information relating to the non-correlation between the model and the measurement. The declaration will include, for each claimed lot, the contributors, the elements necessary and sufficient for the determination of the ESCA.
- The list of farmers excluded from the ESCA system as well as the list of sanctions applied to each farmer.

These elements will be verified by the auditor during the annual audit. They will allow 2BS to report to the European Commission and can be used for statistical purposes.

## SPECIAL CASES

As part of the 2BS-PRO-03 procedure, particular attention is paid to specific cases that may arise. In paragraph 2.7.7.15, entitled "Special cases", these situations are discussed in detail and explained exhaustively.

### **Cessation of Activity**

If a farmer ceases their activity (e.g., due to retirement or the termination of a lease by the landowner) and the activity is taken over by another farmer who wishes to continue with the ESCA approach:

- Case 1: If the new farmer is not already engaged, they commit to the OE to apply the good practices; the OE must then update the list of engaged farmers.
- Case 2: If the new farmer is already engaged in other farms with similar climatic and soil conditions to the new farm, they must continue to apply the same virtuous practices across all farms to declare an ESCA.
- Case 3: If the new farmer is already engaged in other farms, but these farms have different climatic and soil conditions compared to the new one, they must apply virtuous practices on the new farm, and a specific declaration for this new farm must be made.

If the new farmer does not wish to continue the ESCA approach, the commitment of their predecessor does not apply to them.

### **Extension of the surface of a farm**

- Case 1: If new land has the same type of soil and similar farming practices, the farmer manages the esca bonus in the same way as his other parcels.
- Case 2: If new land has different soil types and/or farming practices, a differentiated management of the esca calculation is required.



# TRANSITION PERIOD

Any seed harvested up to and including December 29, 2023, may follow the real-value GHG calculation methodology in force at the date of harvest. For seeds harvested on or after December 30, 2023, the new GHG calculation methodology must be applied (procedure 2BS-PRO-03):

## When a farmer claims carbon storage:



He must make a formal written commitment to his first gathering points (cooperative, agricultural trading), over 5 years, renewable at least once.



He must apply at least one of the best agricultural management practices each year :

- no till
- reduced tillage
- intermediate cutlery,
- organic fertilization,
- mulching or mulching using crop residues,
- rotation triennale,
- restitution of crop residues.



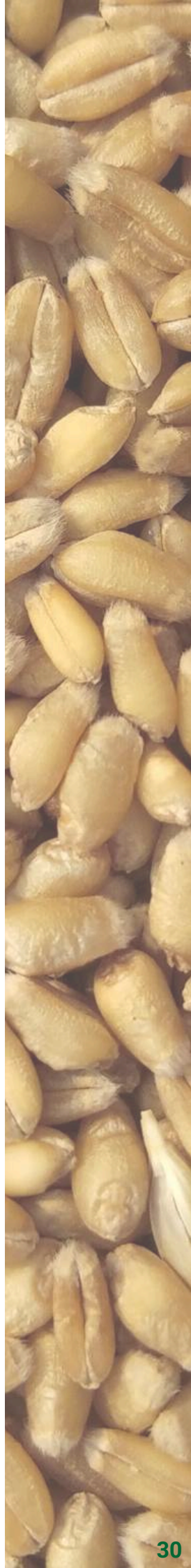
He must carry out soil analyzes at a regular interval from its CSR date, as specified in the cases above.

On the other hand, any Esca claim that took place before the application of the new sustainability certification rules must not comply with the caps provided for in Implementing Regulation (EU) 2022/996.

Thus, the rules provided in Implementing Regulation (EU) 2022/996 would not apply to the certification of any biomass having been declared before December 29, 2023, regardless of whether this biomass was transformed before or after December 29, 2023.

# DEFINITIONS

- **Esca:** reductions in emissions due to the accumulation of carbon in soils via better agricultural management expressed in grams of CO<sub>2</sub> equivalent per MJ
- **CSA:** is the estimated mass of carbon stock contained in the soil per unit area associated with actual crop management practices after at least 10 years of application expressed in Mg of C per ha.
- **CSR:** is the mass of carbon stock contained in the soil per unit area associated with the reference crop management practice expressed in Mg of C per ha.
- **IPCC Tier 2:** IPCC Tier 2, or Tier 2 of the Intergovernmental Panel on Climate Change (IPCC), refers to a method of calculating greenhouse gas (GHG) emissions that involves a more detailed and specific analysis of activities, as opposed to Tier 1 which uses generic emissions factors.





# ANNEXES

# ANNEX 1: SUMMARY TABLES OF SCENARIOS

## CASE NO.1

Farmers already engaged in authorized improved agricultural management practices and having submitted ESCA claims before June 30th, 2022.

Dates	Evidence	Date of submission of the ESCA declaration	CSR	CSA	cap
<p><b>The start date of good agricultural practices</b> corresponds to the date of the first declaration of the farmer's EEC and ESCA values to the First gathering point. This date cannot be earlier than 2020.</p> <p><b>The commitment date</b> corresponds to the date of signature of the commitment to the new ESCA approach, over 5 years renewable at least once.</p>	Evidence indicating the start of the application of improved agricultural management practices: proof attesting to the information to\by the OS of ESCA practices before 30.06.2022 (e.g. date to which the calculator was informed, attestation)	The operator can submit an ESCA declaration without a waiting period	<p>CSR should be measured as follows.</p> <p><b>Option 1:</b> individual soil analysis carried out before the start of good agricultural practices.</p> <p><b>Option 2:</b> measurement from a neighboring field if analyzes exist for the year in which good agricultural practices were implemented.</p> <p><b>Option 3:</b> Use of a reference chosen in an interval indicated in the database compiled by 2BS*</p>	After the CSR date, the operator calculates a CSA based on the model (modeled CSA) for 5 years. In the 5th year after the CSR date, the operator must carry out a first soil analysis (actual CSA).	Producers engaged before June 30, 2022 benefit from the ESCA cap at 45g eq. CO2/MJ of biofuel or bioliquid for 5 years, i.e. until the date of the 1st actual CSA. This cap is possible for a CSA occurring before June 30th, 2027. Subsequently, the increase in carbon stock measured in the 5th year (actual CSA) will become a cap for annual declarations to be submitted in the following 5 years.

\*The first option should be preferred, if the measure does not exist, the second or third option should be used.

## CASE NO. 2

Farmers already engaged in authorized improved agricultural management practices but who have not submitted an ESCA claim before June 30th, 2022.

Dates	Evidence	Date of submission of the ESCA declaration	CSR	CSA	cap
<p><b>The start date of good agricultural practices</b> corresponds to the date of application of improved agricultural management practices. This date cannot be earlier than 2020.</p> <p><b>The commitment date</b> corresponds to the date of signature of the commitment to the new ESCA approach, over 5 years renewable at least once.</p>	Evidence indicating the start of the application of improved agricultural management practices (e.g. spreading notebook, manuring plan, satellite images, etc.).	A minimum continuous period of 3 years for the application of the improved management practice is required before the commitment date, for the farmer or economic operator to submit a declaration.	<p>CSR should be measured as follows.</p> <p><b>Option 1:</b> individual soil analysis before the start of good agricultural practices.</p> <p><b>Option 2:</b> measurement from a neighboring field if analyzes exist for the year in which good agricultural practices were implemented. If there is no data available, a first measurement is taken immediately, at the time of commitment.*</p>	After the CSR date, the operator calculates a CSA based on the model (modeled CSA) for 5 years. In the 5th year after the CSR date, the operator must carry out a first soil analysis (actual CSA).	The maximum possible total value of the annual reporting of emission reductions from soil carbon accumulation through improved agricultural management (ESCA) is capped at 25g eq. CO <sub>2</sub> /MJ of biofuel or bioliquid for the entire period of application of ESCA practices.

\*The first option should be preferred, if the measure does not exist, the second option should be used.

# CASE N°3

Farmers starting the application of improved agricultural management practices after June 30th, 2022.

Dates	Evidence	Date of submission of the ESCA declaration	CSR	CSA	cap
The commitment date corresponds to the start date of application of good practices and therefore to the date of the CSR measurement.	Proof of the application of good agricultural practices (e.g. spreading notebook, manuring plan, satellite images, etc.).	A minimum continuous period of 3 years for the application of the improved management practice is required before the farmer or economic operator can submit a declaration	The CSR estimate will be based on a soil analysis on the date of commitment.	Between the 3rd and 5th year, it calculates a CSA based on the model (modeled CSA). In the 5th year after the date of the CSR the operator must carry out a new soil analysis (actual CSA)	The maximum possible total value of the annual reporting of emission reductions from soil carbon accumulation through improved agricultural management (ESCA) is capped at 25 g eq. CO2/MJ of biofuel or bioliquid for the entire period of application of ESCA practices



# ANNEX 2: SUSTAINABILITY DECLARATION (SD) TEMPLATE

The sustainability declaration template has been updated to add a field relating to ESCA caps. Information regarding the ESCA cap must be communicated throughout the supply chain so that the final interface can apply the appropriate cap. Depending on the farmers' situation, a percentage of the material may be subject to a cap of 45gCO<sub>2</sub>eq/MJ, while another portion may be subject to a cap of 25gCO<sub>2</sub>eq/MJ.

Raw Materials & intermediate products - RED II Sustainability declaration

In the framework of Renewable Energy Directive (RED) 2018/2001 (RED II)

Unique number of Sustainability Declaration

EU-2BSys-SD

Date of issuance of the SD

DD/MM/YYYY

Supplier certified by

Recipient

Company

Company

Entity Address

Entity Address

Shipping / dispatch address if different

Receipt / receiving address if different

Certificate number

Contract number

General Information

Type of raw material (1), or

Type of intermediary product (2)

Additional information (3)

Country of origin (raw material)

EU RED II compliant (4)

Quantity

m3

Metric tonnes

Sustainability criteria applicable to raw material (feedstock)

The raw material complies with the sustainability criteria according to Art. 29 (2)-(7) RED II (5)

The agriculture biomass is an intermediate crop (if applicable)

The agriculture biomass fulfills the measures for low N2O soil feedstocks (if required)

The raw material complies with the definitions of waste or residue according to RED II (6)

Greenhouse Gas (GHG) information

Total default value (grCO<sub>2</sub>/MJ) according to RED II, Annex V, Part A (7) to be applied by the last interface

Yes

No

If disaggregated default values (grCO<sub>2</sub>/MJ), Annex V, Part D (8), state DDV in the applicable element of the formula below

If NUTS 2 or actual values state the value (grCO<sub>2</sub>/dry-ton) in the applicable element of the formula below

If actual Etd emissions apply, specify the means of transport & the distance (Kms), then the applicable calculated emission in the formula below

Road

Train

Ship

EB Statement (grCO<sub>2</sub>/dry-ton)

$EB = [Eec + Ei + Ep + Etd + Eu - Eesca - Eecs - Eecr] =$

Disaggregated default value for oil extraction is applied

Yes

No

NA

Disaggregated default value for soil N2O emissions is applied

Yes

No

NA

Eesca: bonus of 45 grCO<sub>2</sub>eq/MJ of manure in the case animal manure is used as a substrate for the production of biogas and biomethane (biogas supply chains)

Yes

No

NA

Eesca: cap of 45 grCO<sub>2</sub>eq/MJ to be applied on (9)

%

NA

Eesca: cap of 25 grCO<sub>2</sub>eq/MJ to be applied on (9)

%

NA

Ei: bonus of 29 grCO<sub>2</sub>/MJ if biomass is obtained from restored land

Yes

No

NA

Incentives / subsidies received for the production of biogas (biogas supply chains)

Yes

No

NA

The transmission of SD number without the 2BS certificate number is useless

Additional explanations:

(1) - Raw materials are sustainable materials, collected by certified collection points (agricultural and forest biomass including residues from agriculture, fisheries and forestry, and wastes & residues)

(2) - Intermediary products are outputs of a first conversion process where sustainable raw materials have been processed

(3) - Whatever information, enabling a better description of the raw material or the intermediate product (if appropriate).

(4) - The claim "EU complaint", means that the upstream supply chain is certified by a voluntary scheme recognized by the EU

(5) - Applicable to agricultural and forest biomass including residues from agriculture, fisheries and forestry

(6) - According to RED II definitions for wastes & residues

(7) - The application of the total default value emissions determine the % of savings per biofuel production pathways

(8) - The DDV are applicable to the following elements of the formula: by step, eec (including N2O emissions), ep (including the oil extraction process), and etd emissions or total DDV (eec+ep+etd)

(9) - The information regarding the esca cap to be applied needs to be communicated throughout the chain for the last interface to apply the appropriate cap. Depending on the scenario of farmers, a percentage of the material may be subject to a cap of 45gCO<sub>2</sub>eq/MJ, while another portion may be subject to the 25gCO<sub>2</sub>eq/MJ cap.

E Total GHG emissions from supply and use of the fuel

Eec GHG emissions from the extraction or cultivation of raw materials

Ei Annualized (over 20 years) GHG emissions from carbon stock change due to land use change

Ep GHG emissions from processing

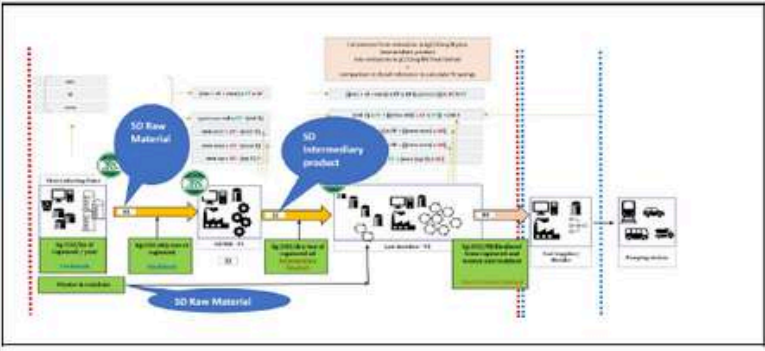
Etd GHG emissions from transport and distribution. Etd includes downstream emissions for distribution up to and including the filling station

Eu GHG emissions from the fuel in use (Biofuels for transport Eu = 0) \*

Eesca GHG emissions savings from soil carbon accumulation via improved agricultural management

Eecs GHG emissions savings from carbon capture and geological storage

Eecr GHG emissions savings from carbon capture and replacement



# ANNEX 3: EXAMPLE OF REFERENCE TABLE TO ESTABLISH THE CSR

The reference table below allows to determine the CSR when option number 3 is selected by farmers operating in scenario number 1.

This reference table has been developed specifically for use in France. To construct a reference table for another country, it is the responsibility of the economic operator, representative bodies of operators or the relevant public authorities to provide 2BS with carbon storage data sourced from public research or national databases.


The CSR interval is between the minimum and maximum value depending on the region, with the median and the average serving as indicators. It is imperative to set the CSR for each farmer when committing. This value remains unchanged until the next soil analysis (actual CSA). When a farm covers several regions, the CSR lies within the range of common values to both regions.

**Carbon stock by region for France (tonnes of carbon per hectare)**

	Maximum	Minimum	Médiane	Moyenne
Nord Pas de Calais	93	42	59	59
Provence Alpes Cote d'Azur	88	16	40	43
Picardie	86	26	42	45
Basse Normandie	85	27	55	55
Centre	82	10	44	44
Rhône alpes	82	20	45	48
Limousin	81	41	52	57
Auvergne	79	30	56	54
Haute Normandie	76	18	45	45
Corse	43	27	35	35
Franche Comté	137	31	61	64
Aquitaine	129	23	42	49
Lorraine	124	37	54	61
Alsace	113	21	52	55
Bourgogne	113	27	51	54
Languedoc Roussillon	113	12	36	40
Champagne Ardennes	103	32	53	56
Ile de France	102	21	48	48
Pays de la loire	101	25	47	49
Poitou Charentes	101	24	48	50
Midi Pyrénées	130	18	41	45
Bretagne	120	25	68	71

# ANNEX 4: COMMITMENT FORM MODEL

The commitment represents an official document, signed by the farmer, and given to the first gathering points where he sells his raw materials. To guarantee the traceability and transparency of the process, 2BS recommends that farmers keep a copy of this document. This not only allows them to have tangible proof of their commitment, but also facilitates any subsequent verification.

	<b>FARMERS' COMMITMENT TO THE ESCA APPROACH</b>	<b>Version: 2 (en)</b> <b>Date: 28/05/2024</b>
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I, the undersigned :

**Applicant identification**

Name:.....  
First names:.....  
Address: .....  
Applicant's position within the company.....

**Farm identification**

Company name:.....  
Legal form: ☐ GAEC ☐ EARL ☐ SCEA ☐ SARL ☐ Others.....  
SIRET NO.:.....  
Business address:.....  
Phone number(s):.....  
E-mail address:.....

At the date of signature of this document,

- Commit for a period of 5 years, renewable once, to apply annually at least one best agricultural management practice (reduced or no tillage, crop improvement/rotation, use of cover crops, including crop residue management, and use of organic amendments), on my farm as part of the ten-year ESCA approach.
- In the case of being a tenant farmer, commit to renting the same plot(s) included in the ESCA approach for the duration of the commitment.
- Be able to provide all relevant documents (e.g.: spreading book, manure plan, satellite image, invoices, third-party certificate or report, etc.) to justify the implementation of these practices on my farm. These documents must be referenced, transparent and verifiable, so that an auditor can check the veracity and relevance of the information they contain.

Signed in duplicate,

Place: ..... Date: .....

Signature:





## SUSTAINABILITY CERTIFICATION

### CONTACT US



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