

CREDIT SELLERS CALCULATOR

WP 4 Pilot project implementation

Activity 4.2 Pilot project preliminary actions

GECO2 – Green Economy and CO2

Safety and resilience | SO 2.1

Work Package:	4. Pilot project implementation
Activity:	4.2 Pilot project preliminary actions
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The CARbon Fixing Elaborator (CAFÉ)

The **CAFÉ (CARbon Fixing Elaborator)** is an informatic tool designed by the project as a Credit Sellers' Calculator.

It is organized in a modular form and requires as input the completion of an online questionnaire in which the seller should enter data from the chosen test fields for the purpose of measuring and calculating credits.

The calculator was conceived as a project only for orchards and vineyards, thus excluding arable and horticultural crops. The data required, shall cover the main soil and climate characteristics of the area and field management information mainly available from the logbook. The questionnaire transfers the data to the computing system.

The calculation system, made up of several informatic modules written in C/C++ and equipped with a simple graphical interface, estimates direct emissions, indirect emissions, biogenic emissions and field removals.

The calculator shall permit the holding to be placed on the market if the final data per hectare result in a storage of at least 0,5 t CO₂eq/ha and if a minimum of 3 conservative practices, out of the 10 retained, are applied.

Furthermore, to promote sustainability and assure additionality, the project requires that the farming company also apply a new, previously unapplied conservative practice.

The calculation outputs are saved to the DB Browser for SQLite Database and are subsequently read from the project portal where the purchase options and transactions take place.

The instrument provides a reference model for possible future developments of a voluntary regional market for carbon credits in agriculture and represents a major step forward in raising farmers' awareness of their capacity to emit and sequester CO₂ equivalent and in relation to the adoption of sustainable cultivation practices.

The GECO2 calculator mechanisms are built on the following scientifically based construction principles:

- **Conservation and prudence**

The data used for the calculation are converted into emission/storage of CO₂ equivalent (based on the agricultural management adopted) through modelling and conversion factors. The criterion of prudence is expressed in the carbon stocks and sinks chosen calculation methods and through the definition of buffers in calculating credits from agricultural systems. Conservativeness principles imply the use of conservative assumptions and the use of values and procedures able to ensure that a specified emission/reduction/sequestration would not be over-stated.

- **Use of buffers**

In order to apply the above-mentioned principles of conservation and prudence is foreseen the implementation of two different types of buffers related to the accumulation of carbon in soil and biomass. Both buffers have a sigmoid pattern that grows according to the number of practices implemented, starting from a minimum value and extending to an asymptotic maximum value for infinite practices adopted.

The buffer bounds implemented in the calculator are the following:

Soil buffer:

- 3 Practices: 0.68 (approx. 0.7);
- 11 practices: 0.94 (approx. 0.9).

Woody biomass buffer:

- 3 practices: 0.8;
- 11 practices: 0.9.

- **Scientific approach (completeness, use of literature data)**

Carbon emission due to anthropic activities are computed by considering energy (fuel and electricity) and agronomic inputs used for cultivation.

The adopted presumptive criteria model the future carbon storage in the farm ecosystem starting from a baseline and through the calculation of the carbon stored in the field. In the calculation, the local climate trend is assumed. Soil properties are an important factor for the carbon computation and must be defined by the user.

Completeness and application of environmentally relevant data, including the Life Cycle criteria (carbon footprint is calculated from the cradle to the field), the inclusion of fertilizers, soil improvers and pesticides, and vegetal residues management assures a technical systemic fully integrated approach. Calculators have been created in order to make operational calculation of credits easier within a scientific logical framework. The calculation method applied to carbon sinks and sources is based on ISO 14064-1 international standards.

- **Use of real farm data**

Calculation system is based on soil data and biomass assessment. For each experimental farm field, a baseline is computed. Baseline refers to field data.

- **Conformity to the environmental context**

The implemented model, applied to the farm calculator, includes farm and field data (history of the cultivation system, erosion, hedge and rows, natural patches, still erosion and watering processes).

Link:

<https://docs.google.com/forms/d/159rlzOEjrA8Sp00ThyILhC3FBI7ZqVBtDN8GZdLdYo8/edit>