

CARBONCHANGE

Digital Services for the sequestration and valorization of CO₂ in agriculture

Thanks to CARBONCHANGE, you can assess the mitigation potential of agricultural practices through a process analysis conducted with a physically based dynamic model, which allows a low application costs and facilitates access to the method also for small and medium-sized farms.

Climate change represents one of the greatest challenges that humanity will have to face in the near future. Fighting rising temperatures, melting glaciers, pollution, the increased frequency of droughts and floods is now an imperative requirement even in agriculture and forestry.

The new sustainability concept for the agricultural sector must deal with the increasing needs of global production and productivity, in order to ensure the future food security, through a continuous adaptation process to new agro-climatic conditions using innovative approach which also contribute to climate change mitigation and biodiversity conservation efforts.

In the new CAP programming period (2023-2027) carbon sequestration in soils will be included among the support schemes.

CARBONCHANGE method

The **CARBONCHANGE** method enables (given the scientific evidence available at this time) the quantification of the soil organic carbon storage resulting from improvement of agricultural activity or management technique that is connected to a new and clear-cut removal of CO₂ from the atmosphere.

This CO₂ removal is **assessed** by comparison between the baseline scenario and the alternative one characterized by the most "sustainable" management. CO₂ removal and GHG emissions reduction are assessed for each area affected by the accounting with the CARBONCHANGE method and are **expressed in tons of equivalent CO₂**.

When applying this method, **consideration is given to any GHG** (greenhouse gas) emissions that might be recorded outside the area involved in the project, but which are attributable to the adoption of sustainable practices (**leakage**).

The methodology is designed to **ensure a complete, consistent, transparent and conservative quantification**, and possible **certification** by authorized parties, of carbon removals resulting from the adoption of regenerative agricultural practices in crop fields.

The system is configured with a Software as a Service approach that is delivered through the operation of a "**Carbon Calculator**". The Software is based on the **peer-reviewed model "ARMOSA"**, developed by the University of Milan researchers, calibrated and validated in different Italian and European realities.

Carbon calculator with the Armosa model

The CARBONCHANGE Carbon Calculator establishes the carbon sequestration capacity of the project's base case soils and quantifies the incremental CO₂ removal and soil storage provided by regenerative practices.

The ARMOSA Crop Systems Simulation Model, on which the CARBONCHANGE Carbon Calculator is based, is a software program that represents, through a series of equations, the dynamic processes of the agroecosystem and how they vary in response to agricultural management, climate, and soil conditions.

The model calculates soil (e.g., organic carbon content, nitrate and ammonia nitrogen, leaching, CO₂ and N₂O emissions) and crop (e.g., yield, aerial biomass, nitrogen content) variables on a daily basis.

The advantages of choosing CARBONCHANGE

Modeling implemented in the software developed by UniMi research and consistent with the most recent scientific acquisitions

Certified service to support the process of generation and management of carbon credits

Service delivery
Software as a Service
(SaaS)

Cloud-native software interfaces with high scalability and replicability

Integration of upcoming EU regulatory developments (FIT FOR 55 PACKAGE & PAC2023)

Potential market-place for carbon of carbon credits