

# Position Paper

WP 4 Pilot project implementation

4.5 Follow up activities

## GECO2 – Green Economy and CO2

### Safety and resilience | SO 2.1

<b>Work Package:</b>	<b>4. Pilot project implementation</b>
<b>Activity:</b>	<b>4.5 Follow up activities</b>
<b>Phase Leader:</b>	<b>ARPAE</b>
<b>Deliverable:</b>	<b>Position paper</b>

<b>Version:</b>	<b>Final</b>	<b>Date:</b>	<b>31/07/2022</b>
<b>Availability:</b>	Private		
<b>Responsible Partner:</b>	<b>ARPAE</b>		
<b>Editor:</b>	Antonio Cinti		
<b>Contributors:</b>	Leonardo Marotta		

## Table of contents

Introduction .....	3
The idea of the project .....	5
The role of Agriculture in Voluntary Carbon Market .....	8
In the transition towards a low-carbon economy .....	10

## Position Paper

### Introduction

The scientific community broadly agrees that the root cause of the global warming is linked to the proliferation of human activities, greenhouse gas (GHG) anthropogenics measured in carbon dioxide equivalent (CO<sub>2</sub> and). The greenhouse effect gradually warms the atmosphere leading to dramatic climatic, environmental, economic, and social upheaval. Adriatic communities too are called upon to play their part in adapting and combating the changing environmental conditions. Climate change is a problem that requires urgent and global responses.

The project stems from the consideration that our future, the future of agriculture, is closely connected with it.

There is a need to move the system towards environmentally sound behaviors that respond efficiently to the challenges of climate change.  
=ur tomorrow will only be positive if it will be sustainable.

Improving the natural seizure potential of soil, biomass and biomass is crucial for climate neutrality. There is a need to build a new model of carbon-based agriculture rewarding farmers for investment in the introduction of cultivation practices assuring carbon sequestration in ecosystems and a reduction of the release of carbon into the atmosphere.

This model will ensure:

- Easy accessing, low cost, transparency, participation of local actors
- Improvement of the carbon balance of agriculture and society
- Additional income for green farmers

- More biodiversity
- Increased resilience to climate change of agricultural and forestry land
- Increased awareness of emitting firms.

And this is the central theme of the project. This is one of the possible and necessary answers, a step in the chosen direction towards adapting our social and economic system to the challenges of climate change.

Geco2 is based on three integrated factors:

- A new local and sustainable model of agricultural cultivation
- Careful environmental sustainability market model created and monitored in accordance with European, national, and regional rules
- Effective economic sustainability by involving transformation companies and services, public institutions, consumers and citizens in the process of improvement and of a progressive carbon neutrality.

## The idea of the project

Up to now, the governance model of the voluntary market for CO<sub>2</sub>e credits has been developed mainly according to organizational criteria and modalities derived from the mandatory cap-and-trade system spread worldwide since the Kyoto agreements.

Voluntary carbon credits markets experiences, especially referred to agricultural sector, have been very limited at international level.

Factors that have hindered the development of the voluntary carbon credit market can be summarized as follows:

- Information deficit
- Uncertainty or lack of confidence of the public and stakeholders on the reliability of voluntary carbon markets
- A cumbersome and complex bureaucratic and regulatory system
- High cost of management practices
- Revenue uncertainty (low and variable prices)
- Concerns about the additionality criteria and effective permanence
- Unavailability, complexity, or high cost of monitoring, control, and audit functions
- Substantial entry barriers for SMEs.

GECO2, although its limitations, wants to be a different response to these problems, having tested a voluntary carbon credit market aimed at the involvement of the agricultural sector, based on the following few basic criteria:

- Regional and interconnected markets
- widespread participation also at the level of small and large enterprises

- Simple, IT-based market management system
- Low running costs
- System of organization and control governed at regional level

GECO2 was characterized by the experimentation of a local based, low cost, transparent, organised, participated, voluntary CO<sub>2</sub>e credits market applied to the agricultural sector.

No previous experiences of this kind have been developed before at local and international level.

The set up of this innovative model of market has been therefore particularly interesting from experimental point of view and it could be a significant reference point for further developments of public and private environmental policies and actions.

This GECO2 experimentation, for the first time, activated a voluntary credit market on a regional scale offsetting emissions with credits produced by project selected farmers.

The innovative idea of the project is also linked to the objective to connect voluntary carbon market, conservative agriculture practices and farm resilience to climate changes.

The project conditions describe the gases emissions/removals that occur once the selected practices have been implemented in compliance with farmer plan.

Calculator can provide the carbon balance before and after the project based on 10 selected cultivation practices. Each of these choices is made up of specific 'management actions.

Farm management practices to be considered - and modelled by carbon calculator - are listed below:

Practice 1: organic management

Practice 2: conservative plowing

Practice 3: confers crops

Practice 4: conservative land use management & biodiversity

Practice 5: conservative use of woody residues as carbon source for SOC.

Practice 6: conservative use of green residues as carbon source for SOC.

Practice 7: use of organic amendments.

Practice 8: avoid the use of synthetic fertilizers.

Practice 9: reduction of pesticides: use of pesticides less than 1 kg / ha.

Practice 10: optimal recycling of organic matter due to biomass produced within the experimental field.

In addition to the previous practices, GECO2 considers the following factors for the purpose of impacts and the assignment of credits, including the following management actions that affect the amount of carbon stored in the system:

- Amount of biomass in the orchard, determined since their age. This factor influences both the root biomass (underground) and therefore the structure of the soil, and the aerial biomass (epigeal) for the amount of carbon stored in the branches and leaves.
- Recycling of company waste both from woody and green biomass of the field itself, and from plant and animal biomasses.
- Direct emissions of fuels and indirect emissions of imported electricity.
- Carbon loss due to weathering processes and soil erosion. The assessment is made using carving calculator. It is implemented a soil loss model, in the Revised Universal Soil Loss Equation (RUSLE) framework, based on both Cover and Tillage practices.

The credits produced by farmers with the capture of carbon in soils and vegetation are evaluated with a calculator developed within the project. The calculation considers the absorptions in the soil and vegetation and emissions from the use of fuels and raw materials (including pesticides and fertilizers) of each farmer, creating a balance.

Each company can participate only if the budget leads to a minimum absorption of 0.5 tons per hectare for each company. Based on the calculated absorptions, the credits that each farmer produce are

created (considering appropriate safety coefficients). These credits are made available on a market platform. The credits are sold by each farmer to an emitting organization (buyer). The buyer calculates his emissions either through an analysis of the carbon footprint or through a specific energy consumption calculator built as a part of the project.

## **The role of Agriculture in Voluntary Carbon Market**

Primary sector, presently, contribute in climate change dramatic evolution, representing a significant part of global GHG emissions.

Nevertheless, a different farming management system can invert this trend.

In 2018, global emissions of greenhouse gases were 55.3 metric gigatons (Gt CO<sub>2</sub>e). Most of these emissions—37.5 Gt—come from carbon dioxide, which could be reduced significantly by adopting carbon capture agriculture practices.

Data from farming studies show the power of agricultural eco-systems that, if achieved globally, would drawdown the current annual Greenhouse gases emissions.

Soil carbon in Europe have the average loose between 1,5 and 2% of soil organic carbon, that means 50 - 100 t per hectare in 100 years, i.e., 500 -1000 kg carbon are louse in soils per hectare and year<sup>1</sup>. An increase of 12 - 20 t carbon stock can be reached in maybe 50 years. This would mean 240 - 400 kg additional carbon binding in soils per hectare and year (24-40 g C per m<sup>2</sup>). 240 kg SOC are equivalents of a carbon capture of 880 kg CO<sub>2</sub> (multiplying factor from C to CO<sub>2</sub> is 3.67), i.e 0,88 tonns equivalent carbon dioxide per hectare per year. 400 kg SOC are equivalents of a carbon capture of 1468 kg CO<sub>2</sub> (multiplying factor from C to CO<sub>2</sub> is 3.67), i.e 1,48 tonns of equivalent carbon dioxide per hectare per year.

---

<sup>1</sup> multiplying factor from C to organic matter is 1.72; multiplying factor from C to CO<sub>2</sub> is 3.67

Organic matter has long term positive effects on agroecosystems, reducing geomorphologic risks and dangers of drought. The improvement of soil structure and the reduction of erosion, increase nutrient retention and water infiltration. Plant biomasses contribute to enhance biodiversity, with positive effects for the habitat of birds and pollinators.

In this framework, to better understand the position of the project, is important to underline some agriculture topics and objectives selected by the project:

- a) Developing, amending and implementing specific strategies at farm level characterized by an integrative and inclusive approach, in order to increase soil organic carbon, and plant carbon stock, considering the specific environmental conditions.
- b) Promoting the sustainable and/or extensive agriculture environmental practices, land resource management practices and organic production to protect biological and traditional cultural landscape diversity, natural and semi-natural habitats including grasslands and woodlands.
- c) Promoting the compost production and use in the local rural system.
- d) Promoting the conservation and sustainable use of genetic resources for food and agriculture, local breeds of domestic animals, cultivated plant varieties.
- e) Promote association of local agricultural producers in the same production area.
- f) Taking into consideration existing local varieties as well as participations in programs/projects concerning agriculture biodiversity.
- g) Promoting organic production, local farmer markets, artisan food producers, community supported agriculture and other forms of small-scale sustainable food production in the framework of proximity and sustainability.

- h) Farmers participation into advanced training on rural environmental matters and practices.
- i) Integration with existing regional agricultural and rural development programmes focused on environmental protection and CO<sub>2</sub>e emission reduction;
- l) Evaluate existing innovations practices in rural carbon capture, waste, and energy management, smart energy and waste free solutions and systems.

### **In the transition towards a low-carbon economy**

Climate change is a problem that requires urgent, local and global responses. The project stems from the consideration that our future, the future of agriculture, is closely connected with our ability to move the system towards environmentally virtuous behaviours that respond efficiently to the challenges that climate change imposes on human society.

The experimented carbon market could be one of the answers to these problems.

There are two types of carbon markets: the compliance carbon markets support the trading of emission allowances by entities subject to mandatory targets set by national, regional or international emissions reduction regimes; the voluntary carbon markets, on the contrary, are not tied to emissions trading systems or regulatory requirements. Any company or individual can purchase carbon credits to offset their own carbon footprint voluntarily.

In the journey towards a greener world, voluntary carbon markets are expected to play a more impactful role.

The voluntary market can involve a wide group of firms and individuals. On the contrary the carbon compliance market tends to cover sectors with higher emissions excluding “de facto” SMEs from carbon market.

Firms which are already obliged to enter the emissions trading system, can access also on the voluntary carbon market to decarbonise further, going beyond their mandatory targets.

There is great opportunity to scale the voluntary carbon markets. Globally, the demand for voluntary carbon credits is expected to grow around 15 times over the next 10 years, to reach 2 billion tonnes in 2030.

More governments and companies are committing to net-zero targets. Last year, 1,500 companies across the world made net-zero commitments, a three-fold increase from the year before. This number will continue to grow rapidly. There is also greater international impetus for growing the voluntary carbon markets.

The central and innovative idea of GeCO2 is to connect actions to improve the environment, at local and regional level, through the creation of a voluntary carbon dioxide market based only on increasing of carbon stocks in agroecosystems, both in soil and biomasses.

GECO2 represent an opportunity for all the participating actors:

- local and public authorities will improve actions to support the environment and environmentally sound agricultural management in their regions. Furthermore, from the public point of view, together with the development of the voluntary market, could be strategically important to organise a CO<sub>2</sub>e monitoring system. In this frame the GECO2 market platform represents an opportunity to develop and set up a regional observatory of greenhouse gases budget.
- farmers will be able to create added value both from the sale of CO<sub>2</sub>e credits and the qualitative improvement of the cultivation system (supported by the introduction of innovative practices for storage CO<sub>2</sub>e in soil and biomass); with the side effect of resources regeneration, biodiversity increasing and landscape improvement.

- industrial and services companies, in particular within the agro- industrial chain, will be able to increase and create value, to qualify their products environmentally, taking a new green position ad competitive advantage.

Carbon markets should not be a way for other sectors to reduce their net GHG emissions by climate action in agriculture, but carbon neutrality should be aimed for within every sector itself. Instead of establishing carbon markets, which entail issues concerning exact quantification, monitoring and verification, the focus should lie on how new and existing public funds, like the Common Agricultural Policy (CAP), can be used to best incentivize favorable management practices.

In December 2021 the European Commission presented a Communication on ‘Sustainable Carbon Cycles’. The Communication addresses how to increase carbon sequestration and scale up “carbon farming” as a business model. In 2022, the Commission will propose a regulatory framework for accounting and certifying carbon removals, with the aim to provide the necessary legal framework to scale up carbon farming and provide clarity on the quality of carbon removals.

The key actions experimented in GECO2 are a base for a real change in carbon emissions reduction: financial incentives for change (payment for agriculture ecosystems services, increasing farm biodiversity and resilience, increasing farm circularity); education and communication of best practices in farming; citizen awareness about carbon emission and offsets; business and market creation.

In conclusion, the strategic positioning of the project can be placed in the development of local and regional markets based on carbon increase of agroecosystems. The GECO2 experience and the operational tools created by the project can provide an useful guidance for the possibility of new experimentation for regional CO2e voluntary markets promoted by public and private stakeholders at regional level.