The Carbon Farming project
24 March 2022; Marjon Krol

The Carbon Farming project

Interreg North Sea Region project

7 partners, 4 countries:

- NL: ZLTO en Bionext
- BE: Innovatiesteunpunt and Inagro
- GE: Thünen Instituut and 3N
- NO: Norwegian Land use Advisory Service

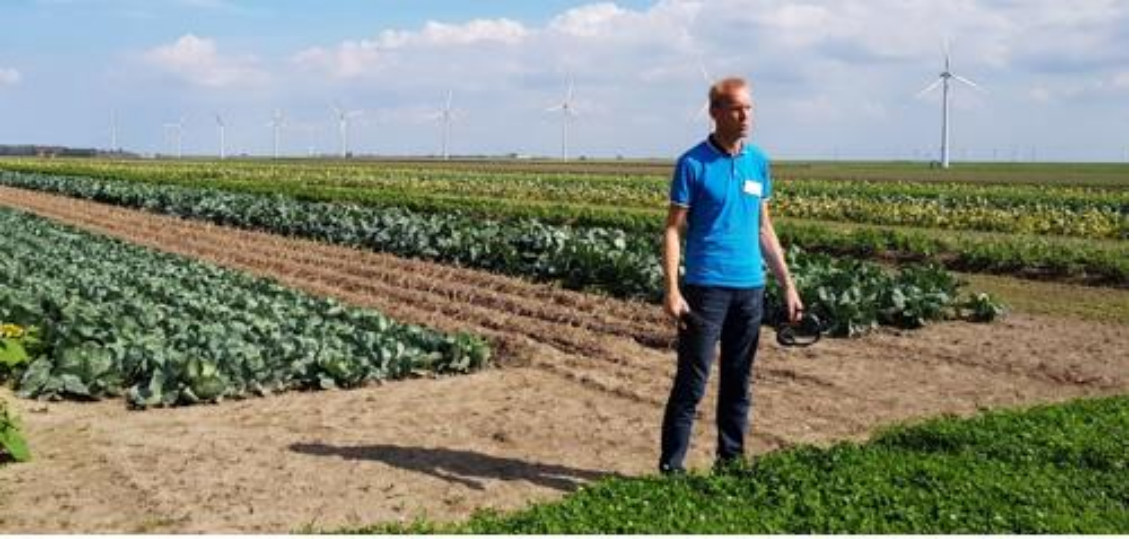
Key challenge: how to incentivize farmers to change to carbon farming?

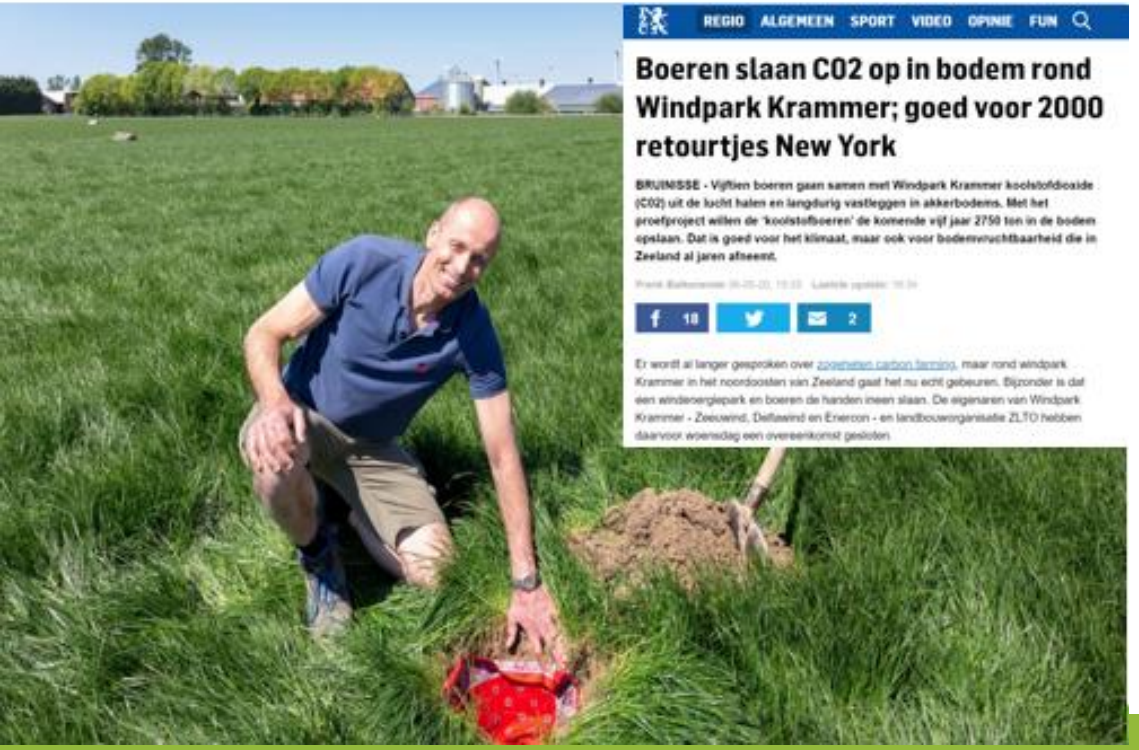
Objective: develop business models for carbon sequestration to incentivize farmers

Period: 2018 – August 2022

https://northsearegion.eu/carbon-farming/

ZLTO Bionext THÜNEN inagro Norsk Landbruksrådgiving Innovatiesteunpunt voor landbouw en platteland 3N





REGIO ALGEMEEN SPORT VIDEO OPINIE FUN

Boeren slaan C02 op in bodem rond Windpark Krammer; goed voor 2000 retourtjes New York

BRUINISSE - Vijftien boeren gaan samen met Windpark Krammer koolstofdioxide (C02) uit de lucht halen en langdurig vastleggen in akkerbodems. Met het proefproject willen de 'koolstofboeren' de komende vijf jaar 2750 ton in de bodem opslaan. Dat is goed voor het klimaat, maar ook voor bodemvruchtbaarheid die in Zeeland al jaren afneemt.

18 2

Er wordt al langer gesproken over zogeheten carbon farming, maar rond windpark Krammer in het noordoosten van Zeeland gaat het nu echt gebeuren. Bijzonder is dat een windenergiepark en boeren de handen ineen slaan. De eigenaren van Windpark Krammer - Zeewind, Delfawind en Enercon - en landbouworganisatie ZLTO hebben daarvoor woensdag een overeenkomst gesloten.

2 projects in NL: Windpark Krammer and DKG Keukens

- 17 farmers, 650 ha, 2900 tons CO_2 in 5 years
- Hybrid reward: € 100/ton CO_2; 70% activity-based & 30% result-based
- Development of methodology: carbon sequestration techniques, monitoring requirements, SOC measurements, and reporting
- Based on Dutch scientific soil research by Wageningen University
- Farmers can choose from a list of techniques and make an individual plan that suits their specific farm situation (tailor made)
- ZLTO acts as intermediary between farmers and buyers

2. Methodology: CS Measures & Quantification

- CS Measures based on Dutch scientific soil research → Roth-C modelling in combination with Long-Term Experiments (LTE's)

Tabel 1. Maximale potentiele CO_2 vastlegging in de Nederlandse landbouwbodem van geselecteerde maatregelen naar modelberekeningen van Lesschen et al. (2012) en de update van tabel Lesschen 2019 op basis van literatuuronderzoek in het kader van Slim Landgebruik met gebruik van bronnen die verschenen zijn sinds 2012 (Slier et al., 2019; Koopmans et al., 2018).

Maatregel	Lesschen et al. (2012)	Update Lesschen 2019	Literatuur bronnen
	Max. vastlegging ton CO_2/ha/jaar	Max. vastlegging ton CO_2/ha/jaar	
Niet-kerende grondbewerking	0.6	1.7 - 3.4	Sun et al. 2011; Crittenden et al. 2015; Cooper et al. 2016
Geen grondbewerking	1.2	0.6	Soane et al. 2012; Oorts et al. 2007
Vanggewas / groenbemester	0.4	0.4	Lijster et al. 2016
Verbeteren gewasrotaties	1.2	0.2 - 1.8	Lijster et al. 2016; Van der Burgt et al. 2017
Gewasresten achterlaten	0.8		
Niet scheuren grasland	3.6	0.9 - 3.8	De Wit et al. 2018; Fornara et al. 2016
Agroforestry		0.5	Cardinael et al. 2017
Kruidenrijk grasland		1.4	Lange et al. 2015; Sebastia et al. 2017
Compost toevoegen		0.4 - 2.0	Koopmans & Bloem, 2018
Dierlijke mest toevoegen		0.4 - 1.4	Koopmans & Bloem, 2018; Buysse et al. 2013

	Theoretic CO_2 seq. (tCO_2/ha/year)
Soil management	
Reduced tillage	1.7*
No tillage	0.9*
Extended crop rotation	1.6
Cover crop	0.4
Compost	0.4-2.0
Animal manure	0.4-1.4
Permanent grassland	0.9-3.8
Herb-rich grassland	1.4
Straw residual	0.8
Ecological management	
Flower borders	0.05-0.14
Trees	1.7-7.0
Agroforestry	2.3

Boer

Tonco Padmos
Akkerbouw
Scharendijke

Percelen

Kengetallen

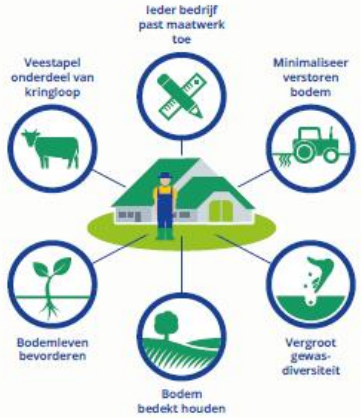
32 ton
CO_2 opslag op

54,8 hectare
landbouwgrond

Validatie
De kengetallen worden gevalideerd door middel van de volgende methodes:

- modellering koolstofopbouw/ organische stofbalans
- monitoring maatregelen
- labanalyses grondmonsters
- bodem sensordata

Kernwaarden

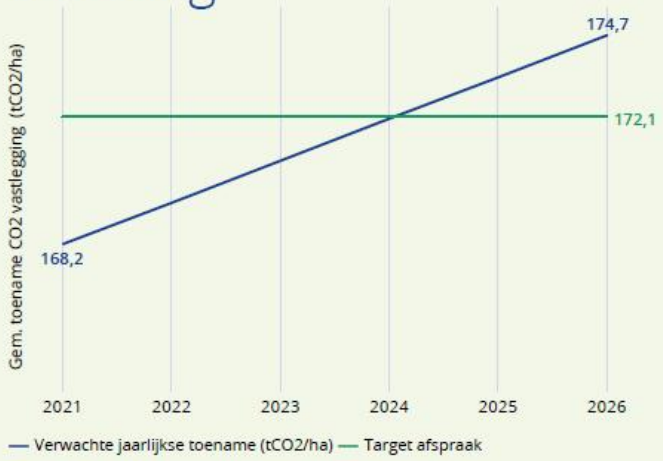


Maatregelen

Uitgevoerd in 2020:

- Geen grondbewerking
- Groenbemester
- Niet kerende grondbewerking
- Natuurcompost
- Vaste dierlijke mest
- Permanent grasland
- Kruidenrijk grasland
- Stro hakselen en laten liggen
- Akker- en bloemenrand
- Noten, fruit of voederbomen
- Voedselbos
- Lijnbeplanting

0-Meting



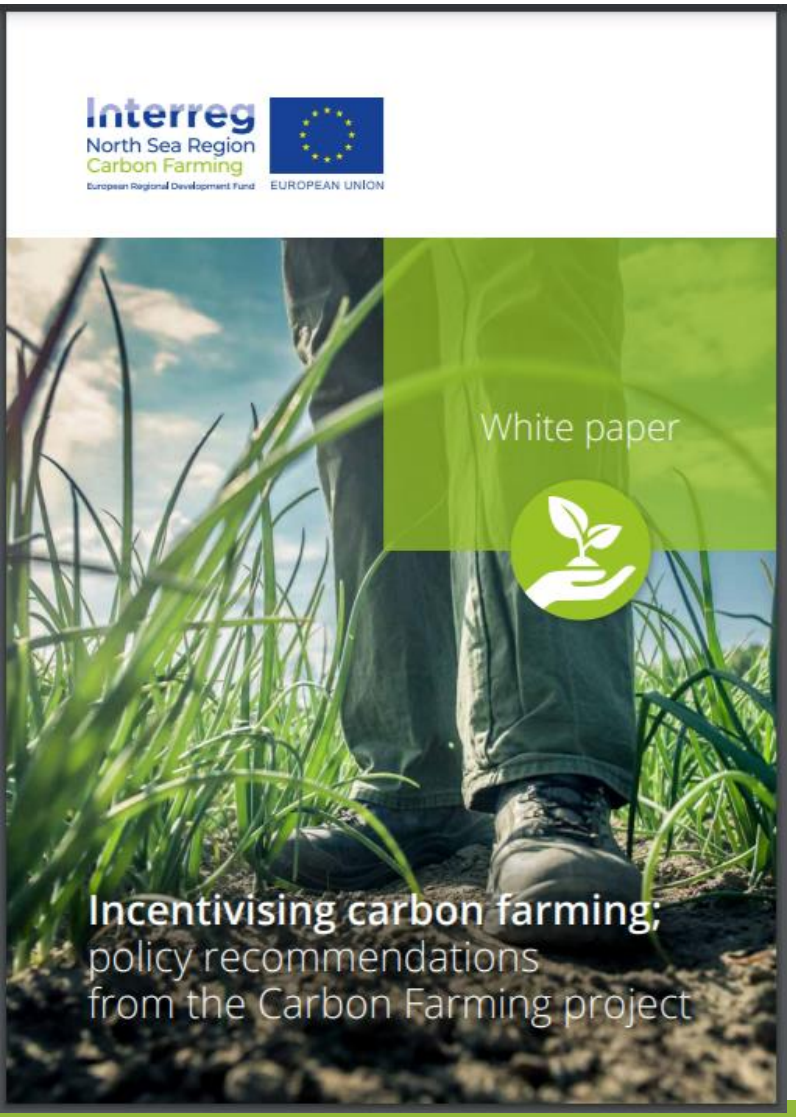
Annual report

Validation:

- Key figures by modelling
- Yearly monitoring of activities
- Soil-C lab-analyses at start and end of project
- Soil sensor data

Interreg North Sea Region Carbon Farming
European Regional Development Fund
EUROPEAN UNION
COÖPERATIE DELTAWIND
ZLTO
zeeuwind
Provincie Zeeland
ZLTO

Important



- Try to stimulate as many farmers as possible, because carbon farming is not only good for climate mitigation, but also for biodiversity, sustainable soil management, climate adaptation, water conservation etc.
- Conditions must be compatible with various farming strategies and circumstances: provide flexibility and customization with a list of possible measures to choose from.
- Preference for hybrid systems: action-based and result-based.
- Changing to carbon farming requires farmers to change their way of farming and this involves investments and risks.
- Funding is needed: stacking of public and private funding; the CAP alone is not enough
- In case of carbon credits: reliability is key, for investors and for farmers; addressing additionality, permanence, environmental integrity; the need for good MRV.
- Be aware that the development of carbon farming projects needs investments in time and money so pre-finance is needed.

Some considerations

- What should be our focus? Climate mitigation and the highest quality of carbon removal? Achieving co-benefits for biodiversity etc.? Involving as many farmers as possible?
- Should we have different types of credits? Light green <-> dark green? Simple validation <-> high quality certification (bronze, silver, gold)?
- What should the EU do? Set common minimum standards or provide for comprehensive rules on certification for each type of carbon removal? Focus on private operators or public authorities for validation and certification?
- Should we also impose conditions on parties that want to use carbon farming credits to offset their emissions, to avoid green washing?
- Should we focus on public financing, because of the uncertainties mentioned and because we think carbon farming is too important to leave to the market?

Interreg
North Sea Region
Carbon Farming
European Regional Development Fund

EUROPEAN UNION

Thank you

Marjon.krol@zlto.nl
+31- 6 533 63 937