2nd meeting of the Carbon Removals Expert Group

Carbon Farming: mapping of certification methodologies

21-22 June, Brussels

Welcome and Introduction

Asger Olesen

European Commission

WAGENINGEN
UNIVERSITY & RESEARCH

Partners for Innovation

Climate Neutral Group

Review existing Carbon Farming certification methodologies – Forestry

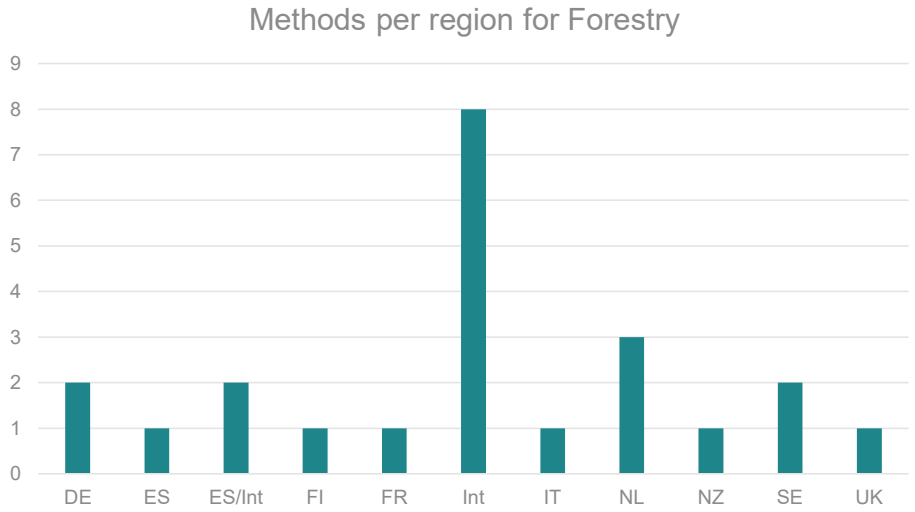
Carbon Farming meeting 22 June 2023

Sven van Baren (WUR)

CLIMATE ACTION

Results of survey for forestry

- 24 responses
- 20 individual methodologies
  - 8 international focus
  - 12 national focus (10 countries)
- 11 methodologies assessed on QU.A.L.ITY criteria



European Commission

Overview of assessed methodologies

Gold Standard

ECS Climate Forest

VERRA

Woodland Carbon code

SILVACONS
ULT

FSC Ecosystem Service
Procedure

Ecosystem Value – Waldwiederaufbau
(EVA), German Forest climate standard

Zertiforest

Label Bas Carbone

Spanish carbon footprint
registry

SNK Planting of new Forest

European Commission

QUANTIFICATION - Approach

Approaches for quantification of forest (carbon) stock

1. Literature or yield tables
2. Inventories over time
3. Remote sensing
4. Combination of techniques

Best practice would be combination of approaches (model, sampling and remote sensing) (IPCC guidelines)

European Commission

QUANTIFICATION - Baseline

- Most baselines are project based
  - Literature / models / yield tables
  - Measurements (field/RS)

- Most revaluate baseline after few year

Additionality

- Both regulatory and financial additionality are addressed in most methodologies
- Most methodologies ensure the project is not common practice
- Some require specific (transparent) reporting of additionality

European Commission

Long-term storage

- Certification period varies
- From 30 years to 100 years (after renewal)
- Or management specific
- Most methodologies use buffer approach (10%-25%) and store it in a “bank”
- Mitigation strategies
  - Avoid high fire risk sites
  - Climate resilient trees

European Commission

Sustainability

- Most methodologies address the no-harm principle
- Most methodologies require reporting of co-benefits or trade offs

- Co-benefits: climate, soil, community, biodiversity or SDG goals

European Commission

First conclusions

QU.
- Different quantification approaches are used, combination of model, inventory and remote sensing is recommended
- Not all methods revaluate baseline

A.
- Both regulatory and financial additionality are addressed in most methodologies

L.
- Certification period varies among methodologies, some depend on specific management strategy

ITY
- Most methodologies comprise no harm principal, some already report this

European Commission

Thank you

Contact:

Sven.vanbaren@wur.nl

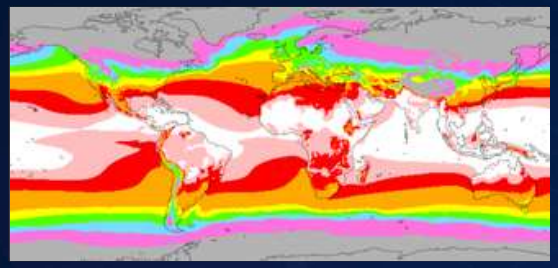
European Commission

Modern GIS supports carbon monitoring for the EU

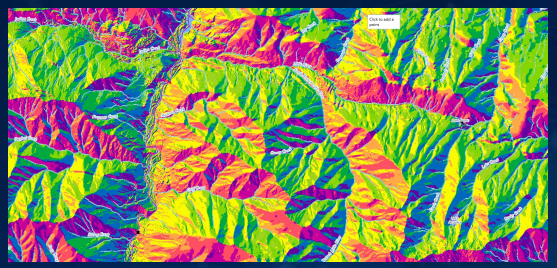
Carbon Certification for Sustainable Carbon Cycles

Alan Devenish
&
Philip Mott
Esri Inc.

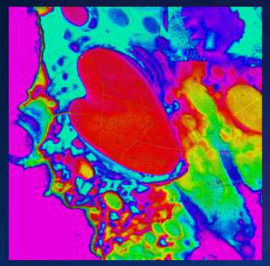
GIS | Integrating Data for Carbon Certification



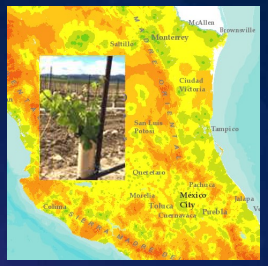
Remote Sensing



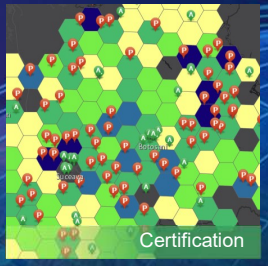
Environmental Assessment



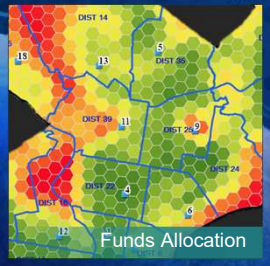
Land Use



Mapping



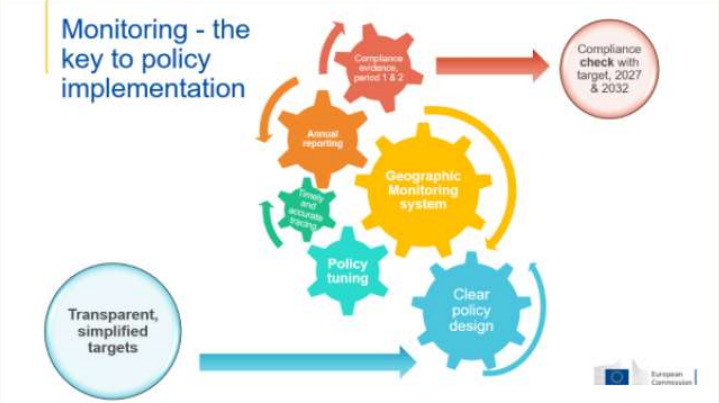
Natural Resource



GIS | Integrating Data for Carbon Certification

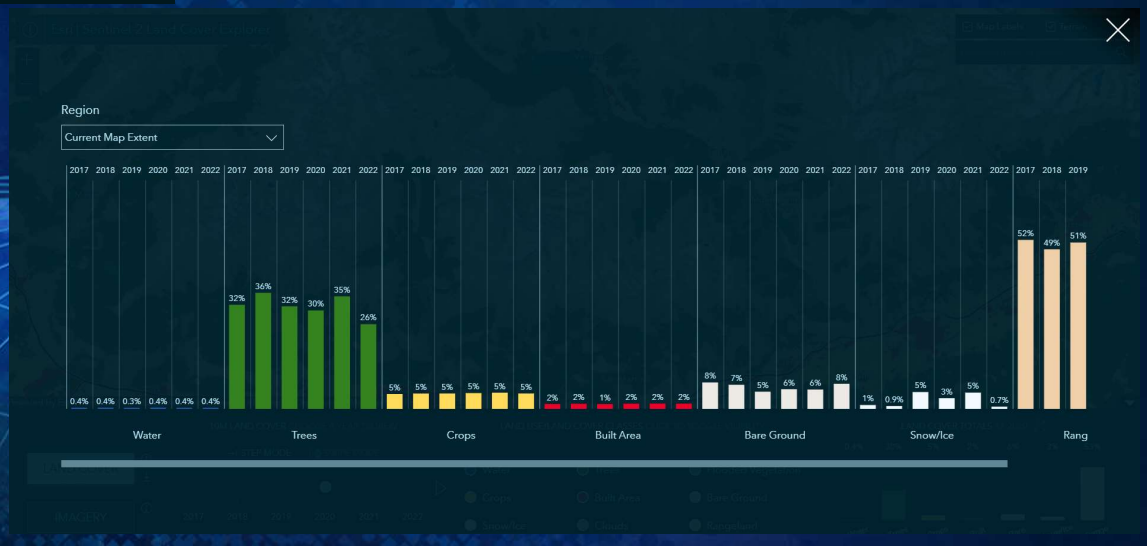
Fitting a modern GIS to an innovative policy

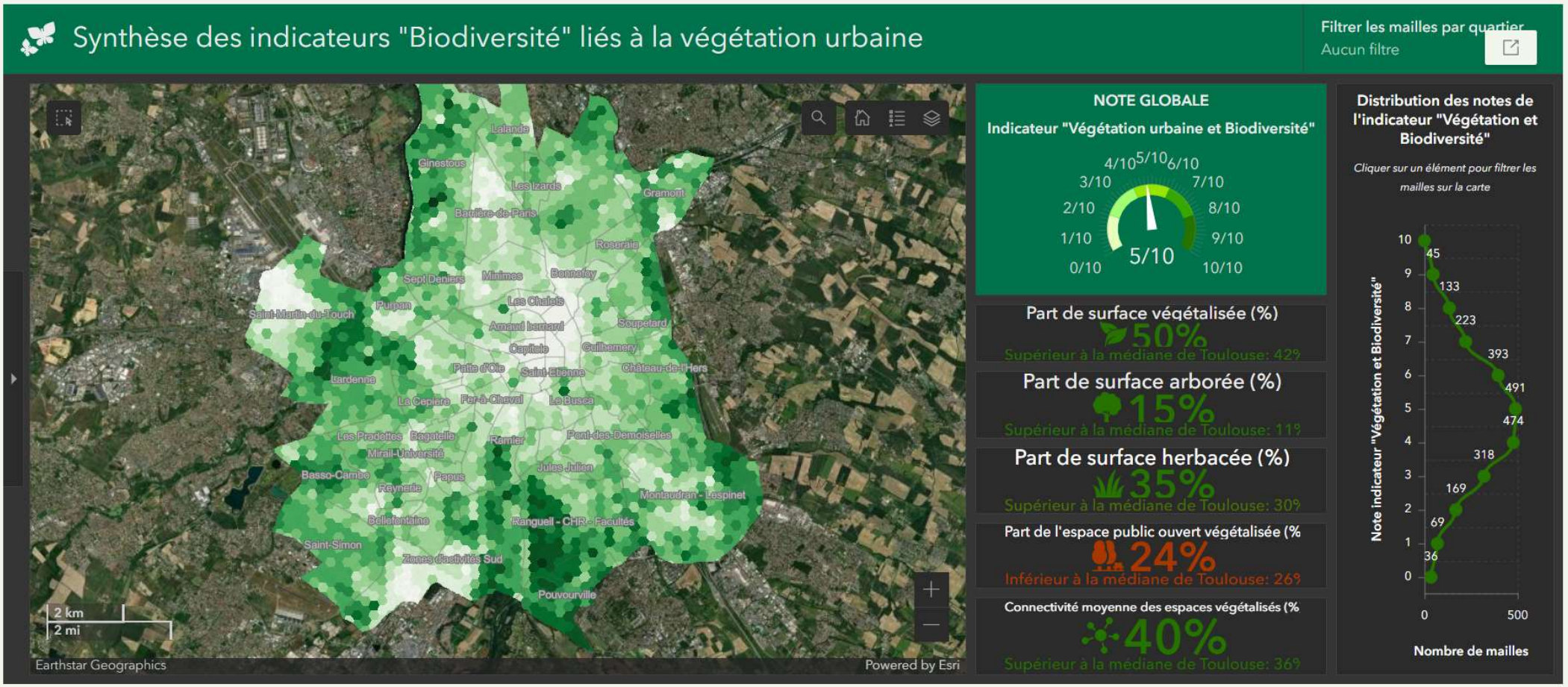
- The European Commission is implementing an ambitious policy for harmonized, authoritative carbon certification across the EU
- Modern GIS can host data and analytics as needed, allowing decision makers easy access to data and information, and act as an engine for engaging European citizens
- While the policy context is the first of its kind in the world, the technical challenges are standard for the GIS industry



Monitoring, Verification, Decision Making

Sentinel-2 data supports monitoring

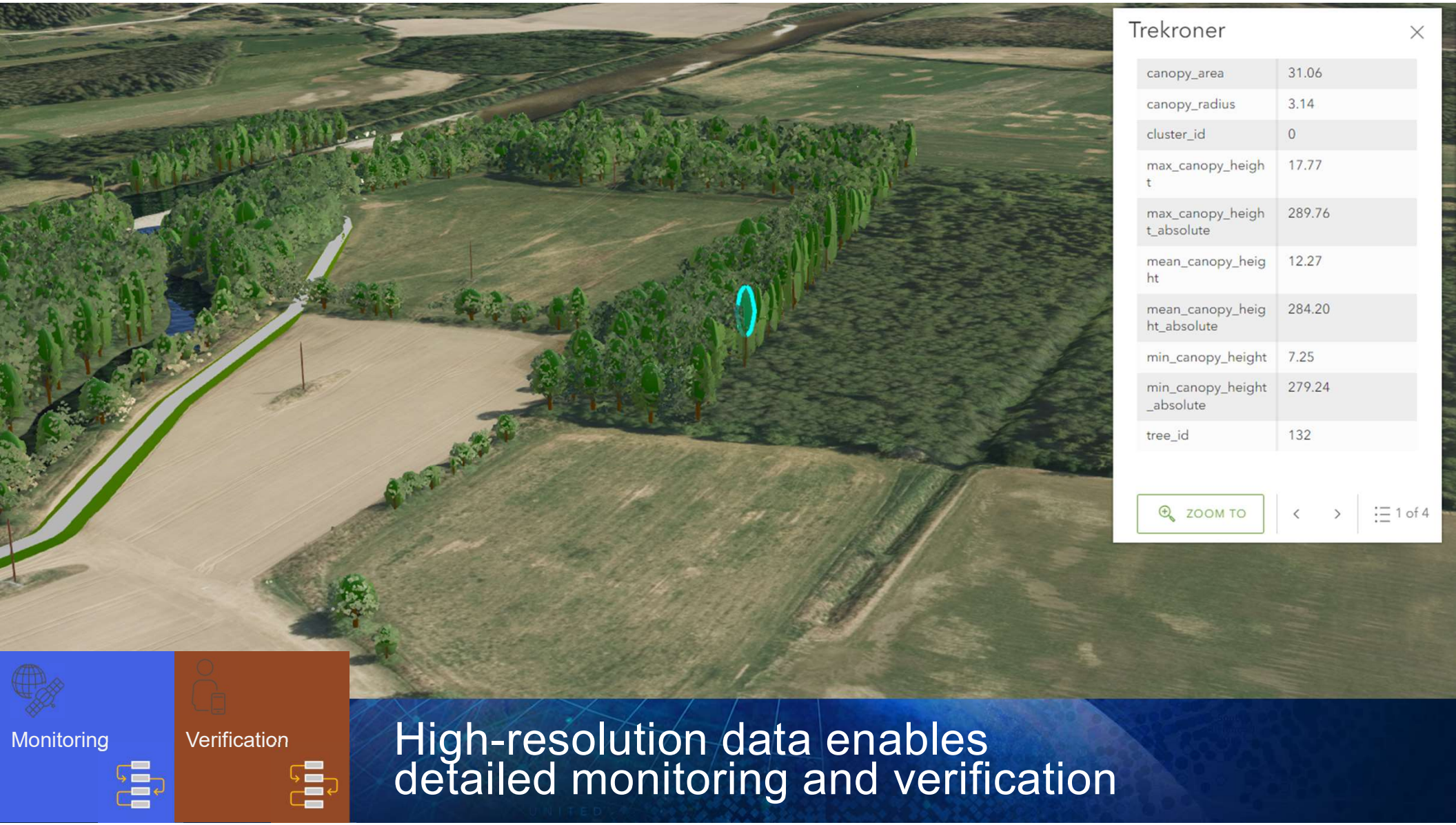




Etat des lieux - Végétation et Biodiversité - Toulouse Carroyage

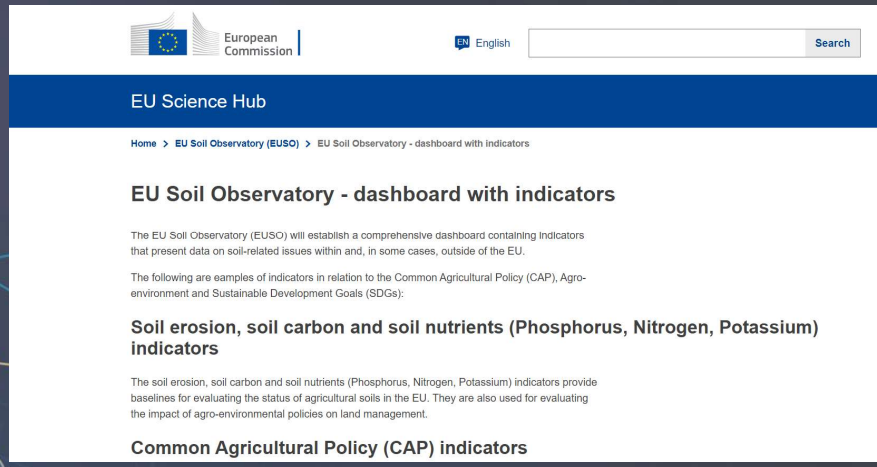
Monitoring

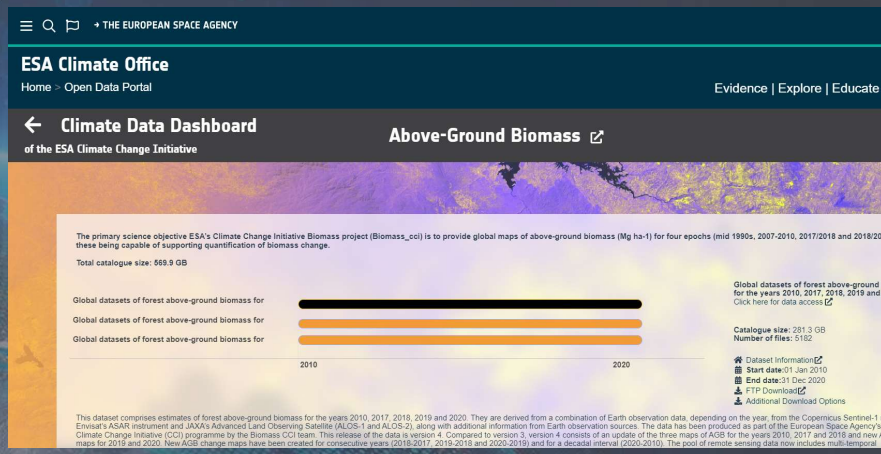
City-level vegetation data for biodiversity


Trekroner
canopy_area 31.06
canopy_radius 3.14
cluster_id 0
max_canopy_height 17.77
max_canopy_height_absolute 289.76
mean_canopy_height 12.27
mean_canopy_height_absolute 284.20
min_canopy_height 7.25
min_canopy_height_absolute 279.24
tree_id 132
ZOOM TO
1 of 4
Monitoring
Verification
High-resolution data enables detailed monitoring and verification

IPCC national carbon data has many facets

Combining data enhances the ability to understand





EEA - Services Monitoring

This data services are provided 'as is' to users without warranty of any kind, either express or implied, including quality and suitability for any purpose....

https://discomap.eea.europa.eu

GeoHive Hub

Create your own initiative by combining existing applications with a custom site. Use this initiative to form teams around a problem and invite your community t...

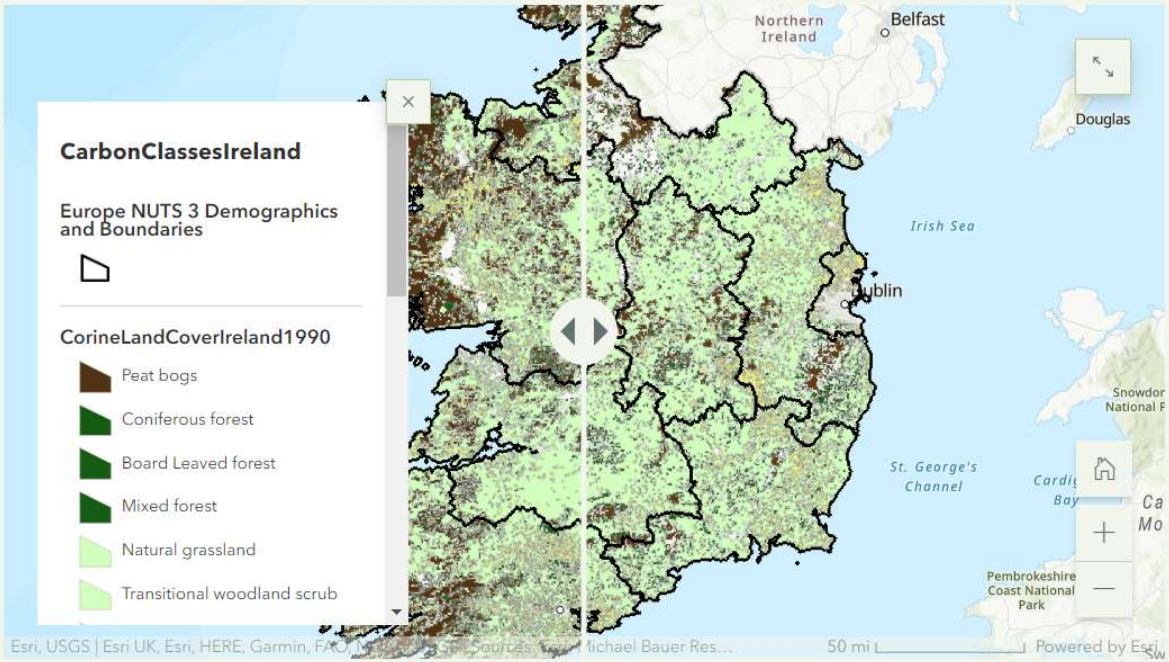
https://www.geohive.ie

Monitoring

Verification

Decision Making

Geospatial infrastructure supports all stages of certification

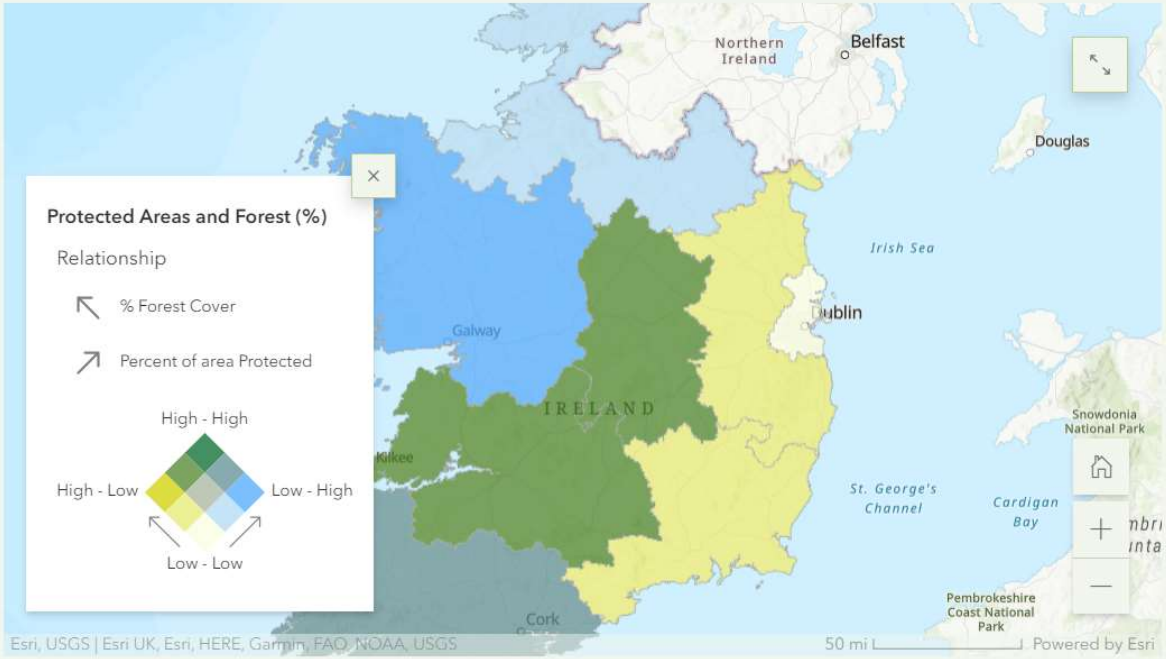


Land Cover in 1990 and 2018

Monitoring

Decision Making

Modern GIS provides multiple views of data

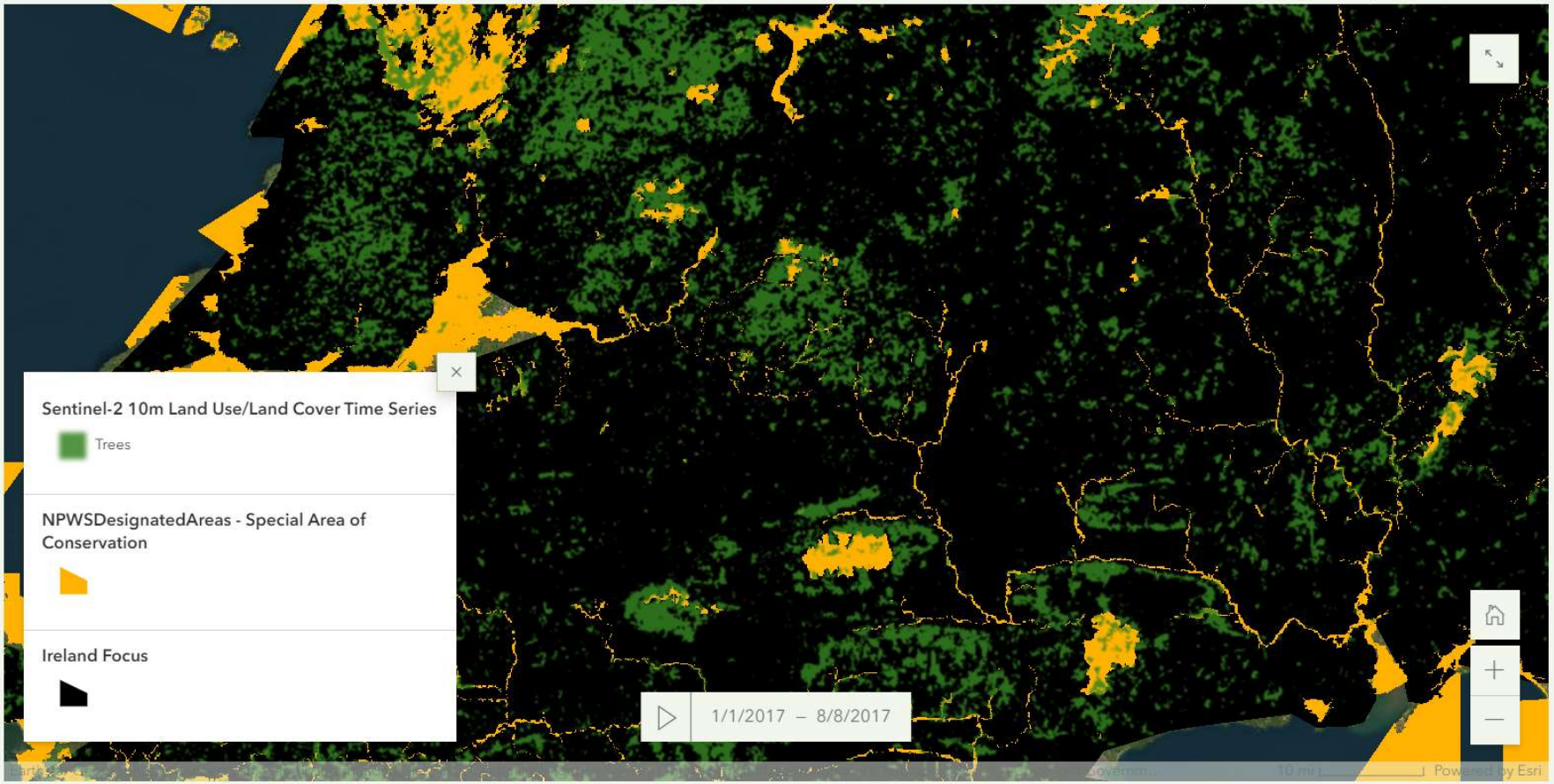


Ireland Forest and Protected Areas NUTS 3 (Percent)

Monitoring

Decision Making

Modern GIS provides multiple views of data

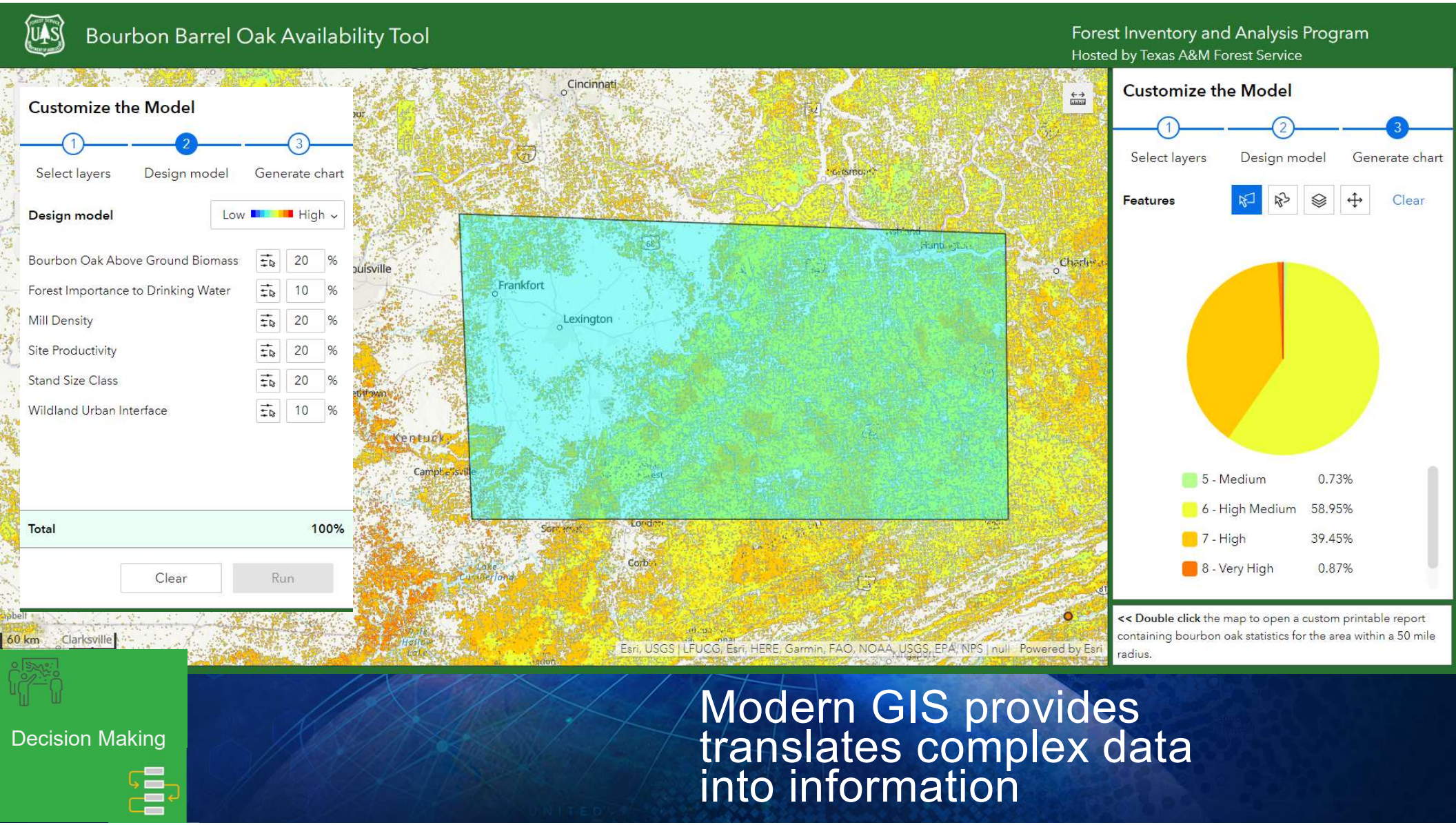


Ireland Forest and Protected Areas Visualization

Monitoring

Decision Making

Modern GIS provides multiple views of data

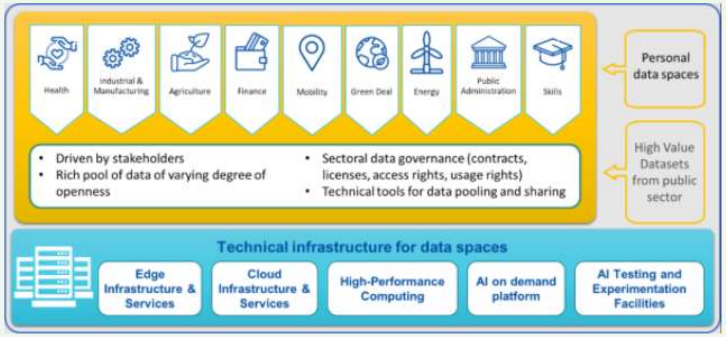


Decision Making

Modern GIS provides translates complex data into information

Capabilities continue to advance, and policy priorities develop and change. Geospatial infrastructure ensures that agencies are prepared to adopt improved land classification schemes and support innovations in areas like agricultural data spaces.

In addition, the ability to link data based on location allows for improved support of complementary or synergistic policies. Carbon certification, for example, could potentially involve several of the data spaces seen in the graphic to the right.



Data spaces as part of the European data strategy (Source)

As the carbon certification system is developed, what other policies could it support?

Monitoring

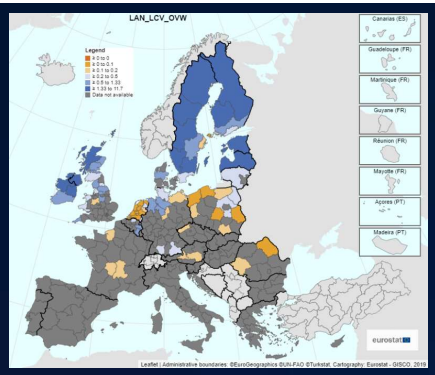
Verification

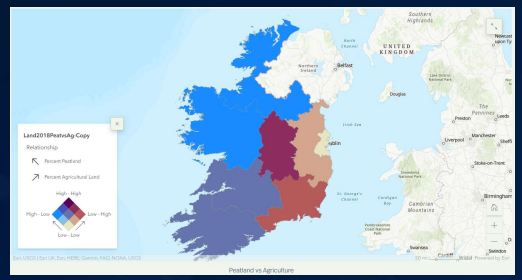
Decision Making

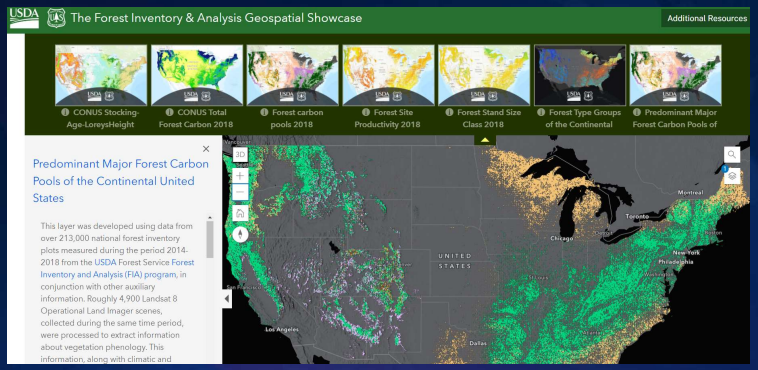
Innovative forms of deployment (1) – Multiple use of space

Multiple use of space can contribute to mitigating land constraints linked to competition for space, including for environmental protection, agriculture and food security.

In particular, under certain conditions, the agricultural use of land can be combined with solar generation in so-called agrivoltaics (or agri-PV). The two activities can establish synergies, whereby PV systems can contribute to crop protection and yield stabilisation [16], with agriculture remaining the primary use of the land area. Member States should consider incentives for the development of agri-PV while designing their National Strategic Plans for the Common Agricultural Policy, as well as their support frameworks for solar energy (e.g. through the integration of agri-PV in renewable energy tenders). It is also worth noting that, in the agricultural sector, State aid rules allow investment aid to sustainable energy.







Thank you, links and more examples here →

(Case sensitive)
https://arcg.is/eSb1X

Q&A on presentations

European Commission

ZERTI CARBON
BLOCKCHAIN CERTIFIED
CARBON SINK SOLUTIONS
FORESTATION · DIGITALIZATION · MONETIZATION

OUR ORIGINS

Initiated in Finland together with forest owners who want to have a real impact on climate change and who create carbon sinks targeting the maximum efficiency.

OUR TEAM: Seasoned professionals with diverse backgrounds

Panu Torniainen
Managing Director
Co-Founder

20 years of Lean Management experience with 8 years experience as a CEO running over 500mill€ business with factories all over Europe

Henri Syvänen
Sales&Marketing
Co-Founder

Eng, 5 years experience in international sales in Forest industry, tree planting, forest management and GPS based product development

Paco Conde
Business Development
C0-Founder

Civil Eng, MSc, MBA. 35 years of experience in strategy, innovation mgmt and entrepreneurship, corporate communication, project mgmt, venture building and tech-Scouting. Co-founded 6 startups

Victor Seriñana
Operations and Organizational Development
C0-Founder

Business MSc. 20+years of experience in international General Management positions, including multi-site companies, having led different M&A, business development and business transformation projects. Co-founder of 3 startups

ZERTI CARBON WAS FOUNDED IN 2021

ZertiForest, the Finnish service company and reforesting technology experts (a key members of Risutec) and the Catalan Blockchain Zertifier decided to team up in order to create the most transparent and the greenest way of compensating CO2 emissions. Our unique approach to solving carbon sink challenge and connecting interesting parties in order to reach net-zero policies is based on extensive ZertiForest's forest owning/operating experience combined with the cutting-edge ICT know-how of Zertifier.

European Commission

FORESTATION / Smart Climate Forestry

Different thinning models

Fertilizing

Fast planting process

Mixed forests

Soil-life under the roots

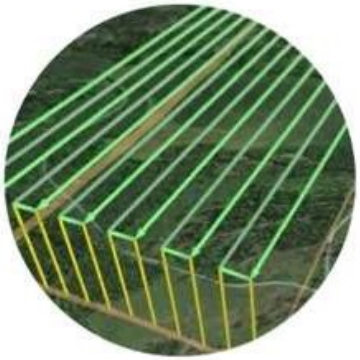
Biodiversity

DIGITALIZATION

STEP 1

Trees are mapped with drone tailored to forest inventories.

STEP 2

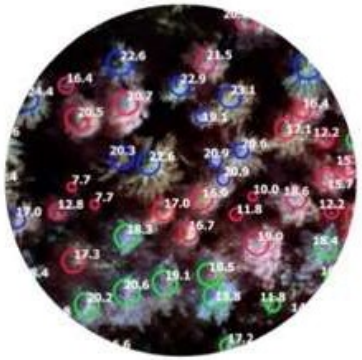


Individual pictures are joined into image mosaic covering the whole project area.

STEP 3

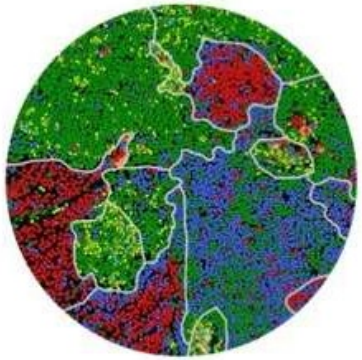
Pictures captured by drone are processed into digital 3D model of forest.

STEP 4



Species, tree height and dbh is measured or estimated for each tree.

STEP 5

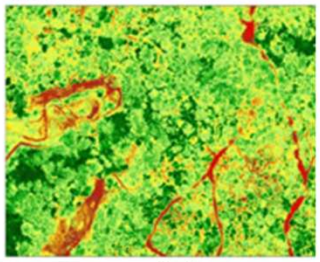


Stand borders are delineated accoirding to forest type.

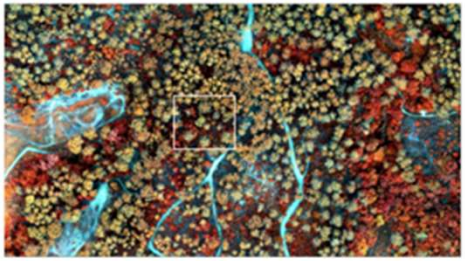
DIGITALIZATION

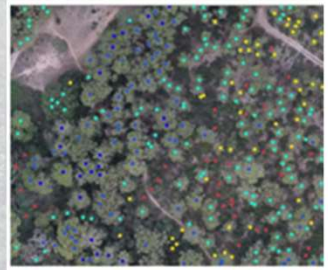
Ortomosaic d'alta resolució en espectre visible (RGB)

Índex NDVI

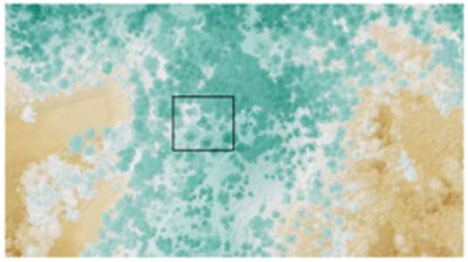


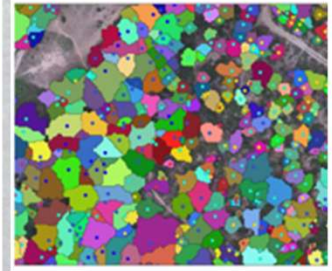
Ortomosaic d'alta resolució multiespectral (IrGB)-Visió a fals color

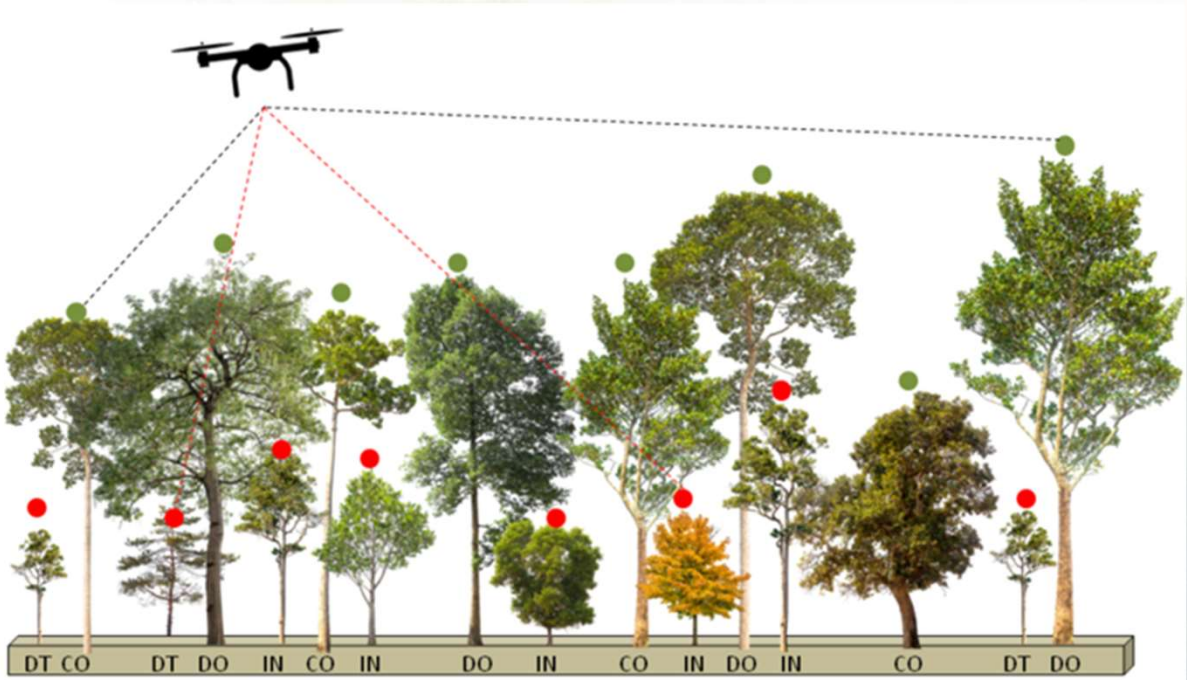




Model Digital d'Elevacions (Altura sobre el nivell del mar)







DO: Arbre dominant CO: Arbre codominant IN: Arbre intermedi DT: Arbre dominat

- Arbres de dosser superior que son susceptibles de detecció individual mitjançant dades remotes (DO i CO)
- Arbres de dosser inferior que no es poden detectar individualment mitjançant dades remotes (IN i DT)

FORESTATION & DIGITALIZATION:
DATA AND WHAT CAN WE DO WITH IT

- **Creating BASELINE**
- **Measuring the growth, based on tree level information**
- **Measuring tree specie mix**
- **Measuring additionality**
- **Creating Smart Climate Forest management plan for each forest block**
- **We are able to give points for biodiversity and make a plan to improve it**
- **Needle and ground sampling gives the facts of the nutrient balance**
- **For the thinning operations, it is possible to make a tree map**

MONETIZATION

ZERTIFIER®

MONETIZATION Z|CO2

ZERTICARBONTOKEN

Carbon Offset Blockchain Certified

Z|CO2 zerticarbon.com

Connecting Emitters to Cleaners

1 Ton of Captured CO2 (CCO2) = 1 token ZCO2

Earn based on CCO2

Safe, transparent & traceable

ZERTI CARBON

The basic idea behind Zerti Carbon is to provide a comprehensive service of connecting forest owners with clients in need of carbon sink solutions based on blockchain platform. As blockchain itself, our platform is safe and fully transparent - our clients have access to every step of the process - from locating the actual forests to acquiring their NFTs and CO2 tokens (ZCO2). In addition to that, we provide the extensive information about the forest ownership and the value of ZCO2 based on a very precise mathematic formulas that are related to the GPS information of every single tree and its capacity to capture CO2.

VIN
5YJSA1DG9DFP14705

BMW X5 2023

Your vehicle
BMW X5 Series Emissions (C02):
304g/km

+

ZERTICARBONTOKEN

Carbon Offset Blockchain Certified

ZCO2

zerticarbon.com

Zerti Carbon C02 Token

Carbon offset platform based on blockchain.
The most efficient net-zero solution available.
Decentralized · Transparent · Secure

+

VIN
5YJSA1DG9DFP14705

WALLET

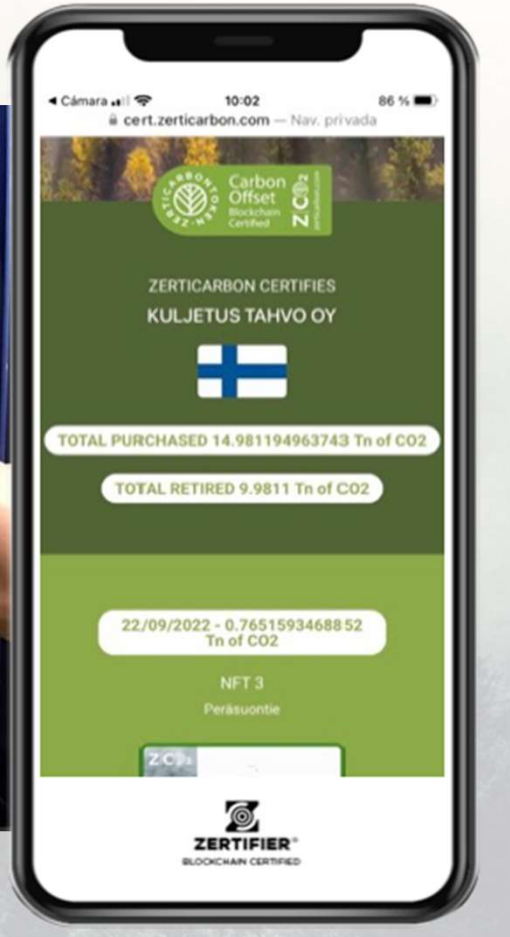
PUBLIC KEY
0xF915e5Da6120100xF915e5Da6120100100xF915e5D

PRIVATE KEY
(scratch to reveal)

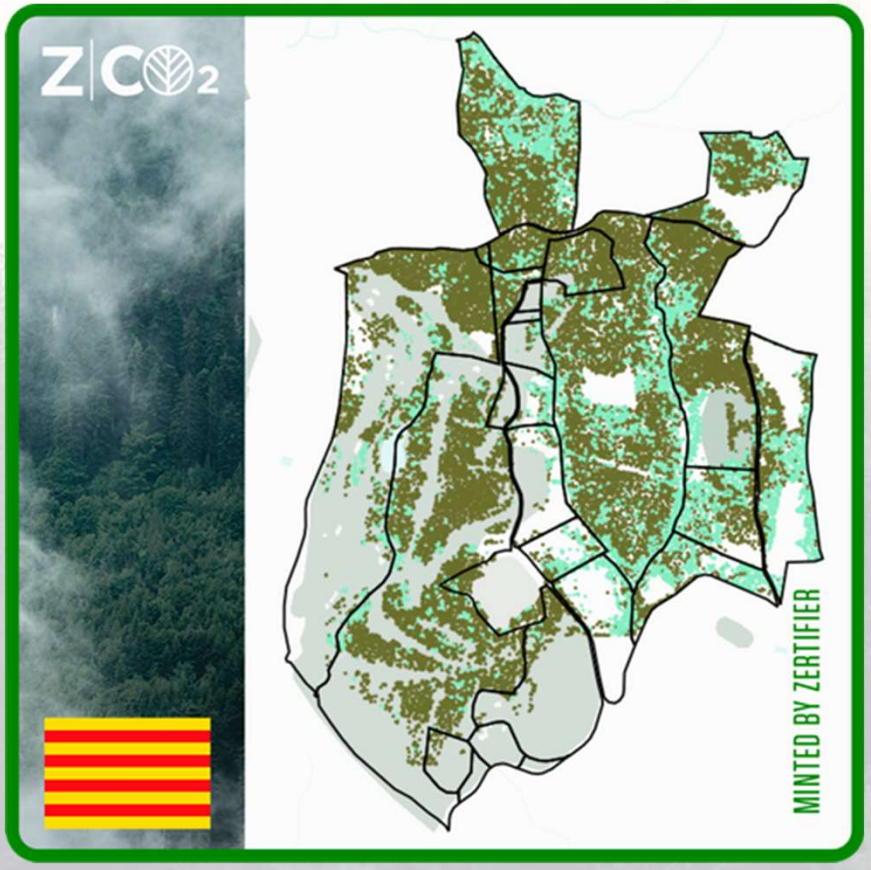
Digital wallet that connects
your vehicle with the carbon offset
blockchain platform.

zerticarbon.com

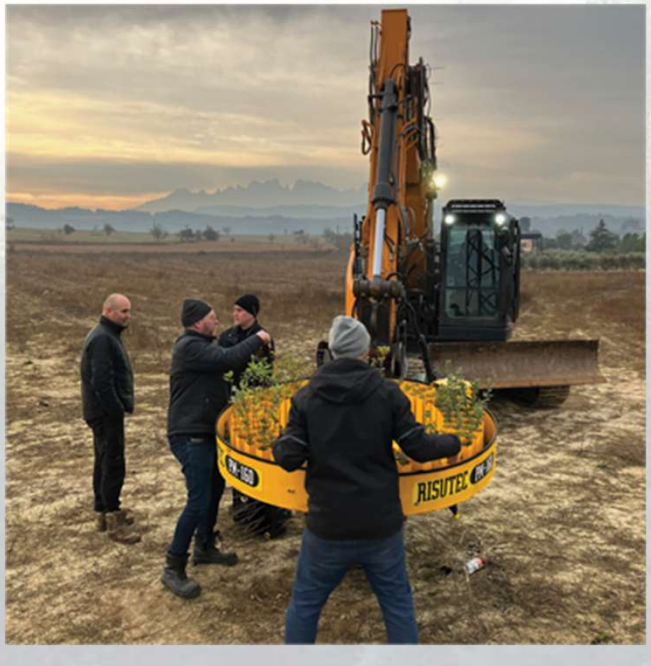
ZERTI CARBON CASE STUDY: KULJETUS TAHVO OY



PILOT PROJECTS IN CATALUNYA: SANT CUGAT



PILOT PROJECTS IN CATALUNYA: MANRESA



SUMMARY

Connecting forest owners and companies/individuals/investors

Attractive to forest owner in terms of income

Optimal solution to environment, protecting forests

Promoting/creating new forest areas

A solution that is true, based on the facts

Smarter way to manage forests, respecting the biodiversity

No chance to sell twice

No double counting

Economic solution to operate, no need for a ‘’middleman’’

Transparent on each step

VIDEO LINKS

ZERTI CARBON

OUR PLANTING PROCESS

MY TREE INITIATIVE

ZERTI FOREST

Z|CO2
Thank You for Your Time!
zerticarbon.com

German Forest Carbon Standard

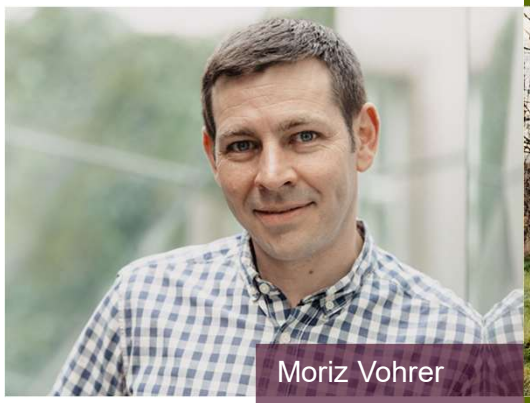
“Wald-Klimastandard”

Moriz Vohrer | 22. June 2023, 2nd meeting Carbon Removal Expert Group

Introduction

Moriz Vohrer

- French-German Double Diploma
  Forest & Environment Sciences
- CarbonFix Standard, 2006
- Gold Standard
  forest and agriculture protocols, 2012
- German Forest Carbon Standard, 2021

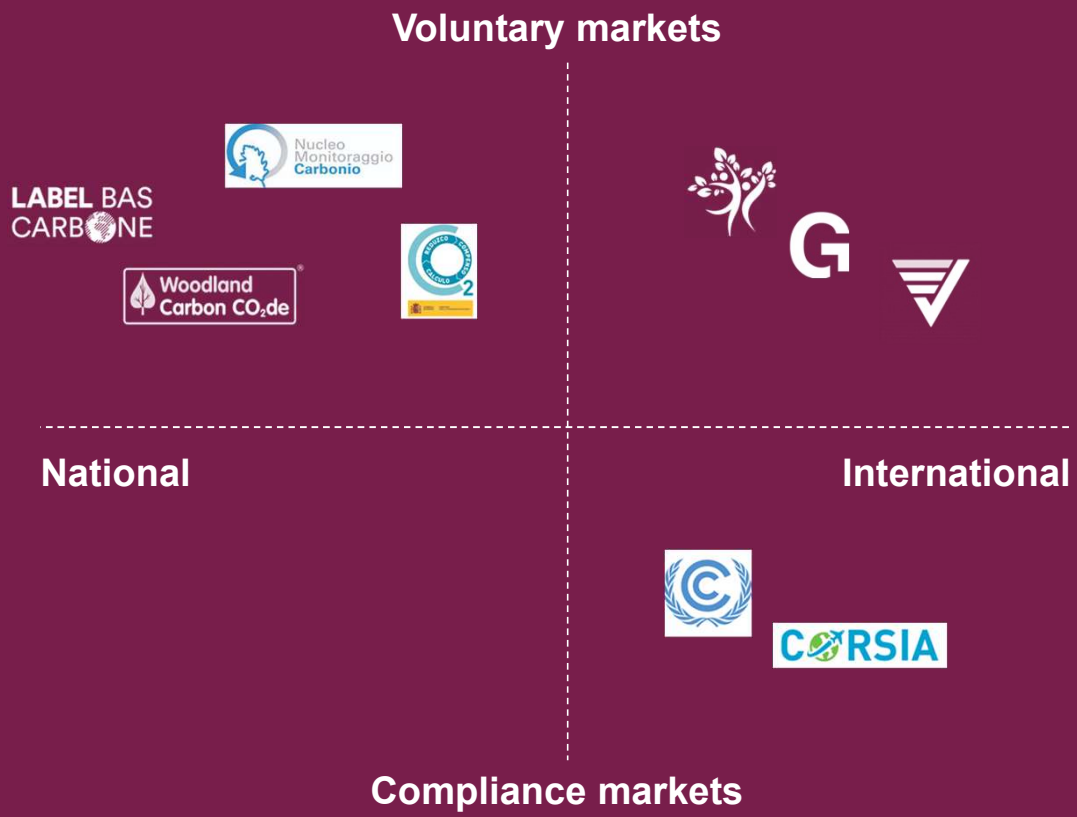


Moriz Vohrer

Ecosystem Value Association e.V. (eva)

- Non-profit organization under the German law
- Founded: 2021
- Objective: Develop standards for PES
- Focus: Germany and Carbon
- 15 people

How to develop?



- International and European forest carbon standards / frameworks
- **Guidelines** of

WWF

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Label bas Carbone https://www.ecologie.gouv.fr/label-bas-carbone
Woodland Carbon https://woodlandcarboncode.org.uk/
VCS https://certifications.controlunion.com/en/certification-programs/certification-programs
Gold Standard https://jbandco.ch/klimakompensation
Plan Vivo https://twitter.com/Plan_Vivo
Ökoinstitut https://www.oeko.de/
WWF https://de.wikipedia.org/wiki/Datei:WWF_Logo.svg

Structure

- 10 Principles
- 34 Criteria
- 88 Indicators

1. Legal Compliance
2. Project Management
3. Additionality
4. Ecological Sustainability
5. Social Sustainability
6. Methodologies
7. Permanence
8. Certification
9. Uniqueness
10. Impact

waldklimastandard.de

German Forest Carbon Council

Forest

Carbon Market

Science & Technology

Public & Civil society

- Multi-Stakeholder-Plattform
- > 35 people
- Assisting in the development
- Every 6 months
- Knowledge across entire Supply-Chain
- Many discussion - one common goal

Status quo

- 2 years of development
- full version (after summer 2023)
- 10 pilot projects
  50 in pipeline

- **Germany lost > 300’000 ha of forest after drought 2018/19**

Topics of the Day

1. Regulatory Additionality
2. Ecological & Social Safeguards
3. Baseline, Project act. & MRV
4. Permanence

- What do we do differently?
- 3 wishes to the EU

AdobeStock207007704

1. Additionality

- **Regulatory**
- Financial
- Climatic

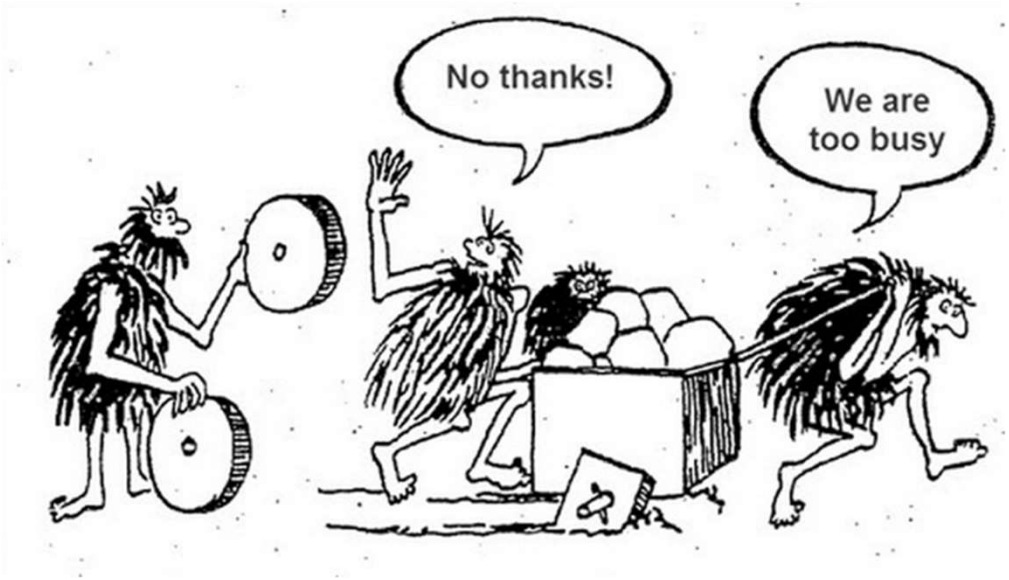
Regulatory Additionality

Based on legislation or based on science?

- What do I mean with this?
- until 2050 in Germany **95,000 ha/year** transformed to climate resilient forest
- Currently **41,000 ha/year** are transformed
  - existing forest & reforestation

Until legislation and subsidies do not reach this threshold, voluntary standards are additional

2. Ecological & Social Safeguards



Source: https://www.pinterest.de/pin/reinventing-the-wheel-the-chinese-quest--385831893060415517/

FSC

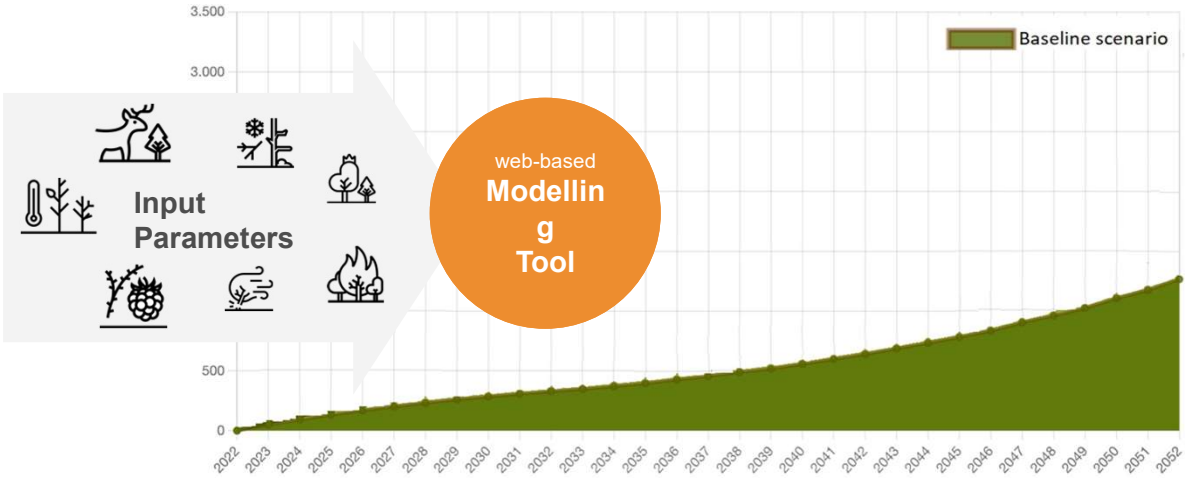
PEFC™

FSC: https://de.wikipedia.org/wiki/Forest_Stewardship_Council
FEFC: https://commons.wikimedia.org/wiki/File:PEFC_Logo.svg

3. Methodology

Baseline

- Natural regeneration
- How well protected is the forest?
- How resilient are the tree species?
- How strong is the competitive veg.?

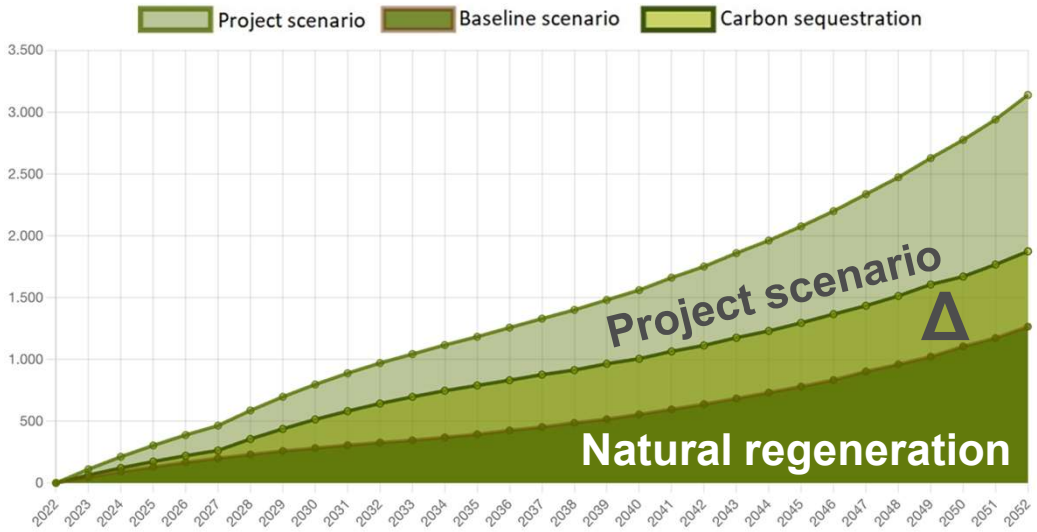


- by project developer - site specific
- verified by auditor
- science based
- updated min. every 3 years

3. Methodology

Project scenario

- Minimum 3 climate resilient species
- Science-based lists:
  Which and what combination?

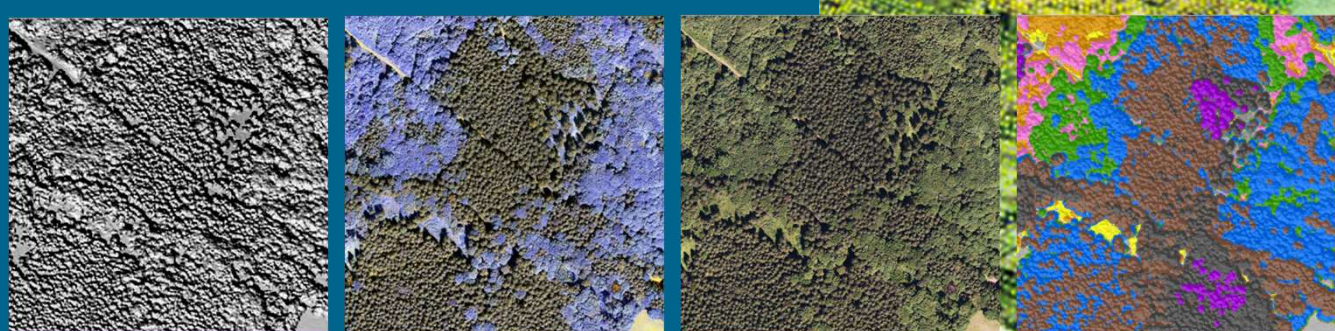


Δ = additional Carbon sequestration

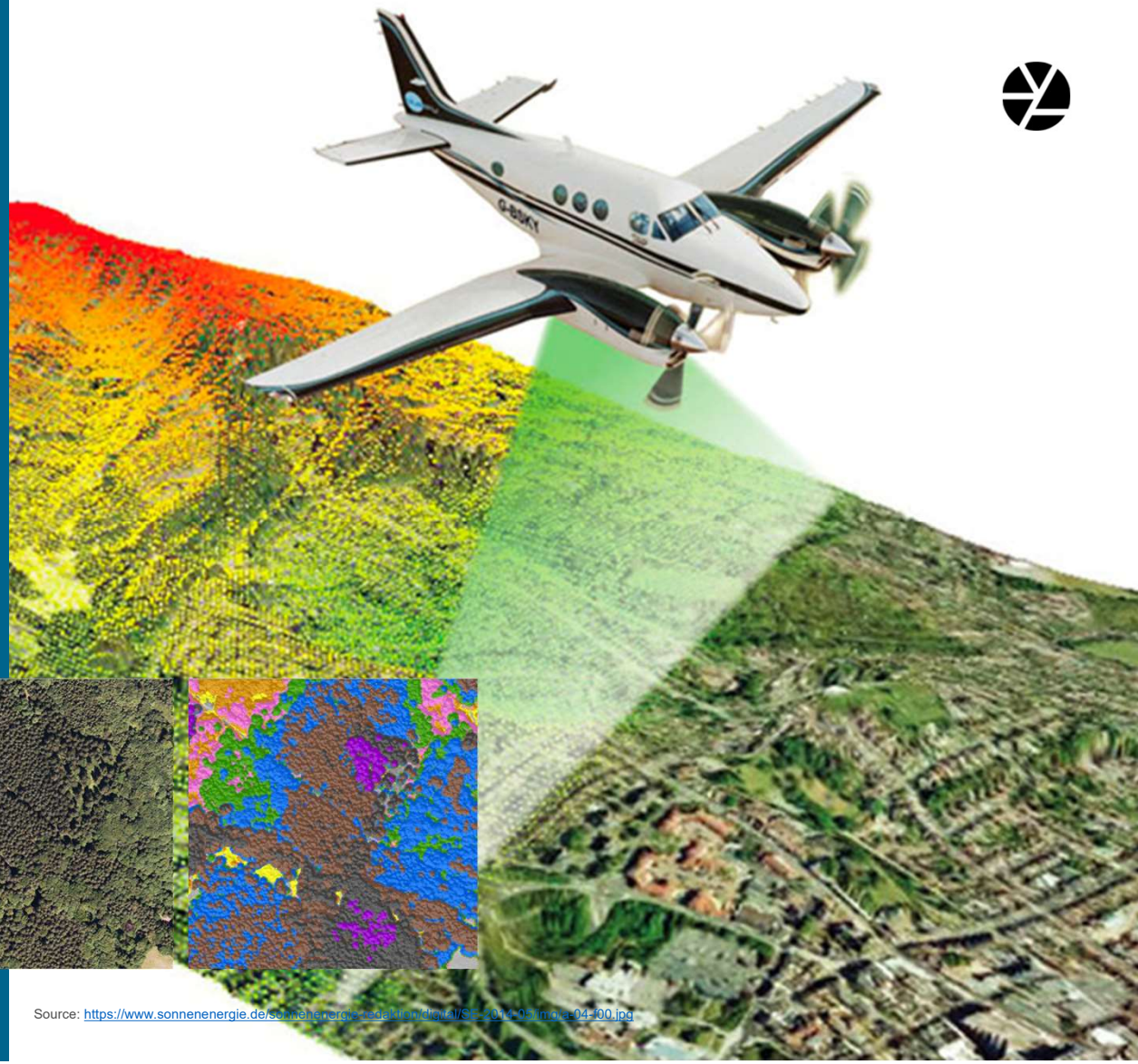
3. Methodology

MRV

- All projects at once
- Analysis of 3-5 years
- Remote Sensing and LiDAR
- Smallest unit: 0.5 ha
- Most cost-efficient



Source: Ing. Mag Gerd Harlander, Forest Mapping Management GesmbH



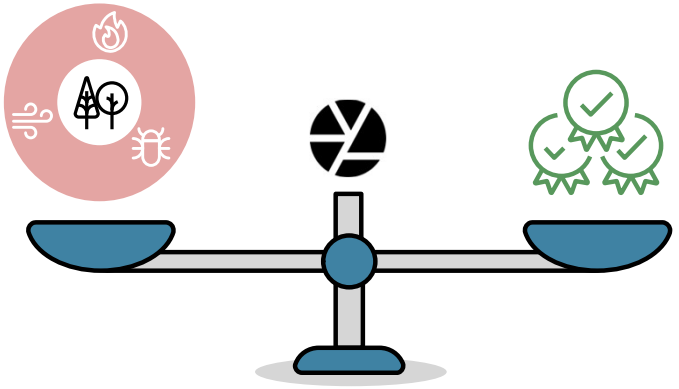
Source: https://www.sonnenenergie.de/sonnenenergie-redaktion/digital/SE_2014-05/mg/a-04-f00.jpg

4. Permanence

Fixed Puffer

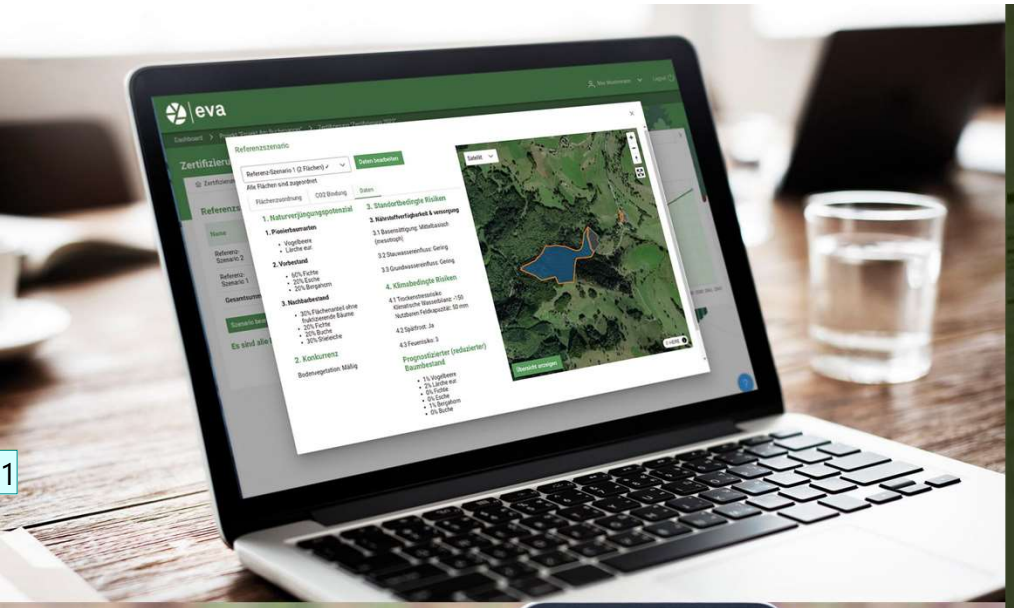
- all projects
- 15%
- AFOLU Non-Permanence Risk Tool
- New methodology = reassessment
- Buffer for shortfalls of
  - unavoidable risks
  - modelling
- Avoidable risks
  - by project developer

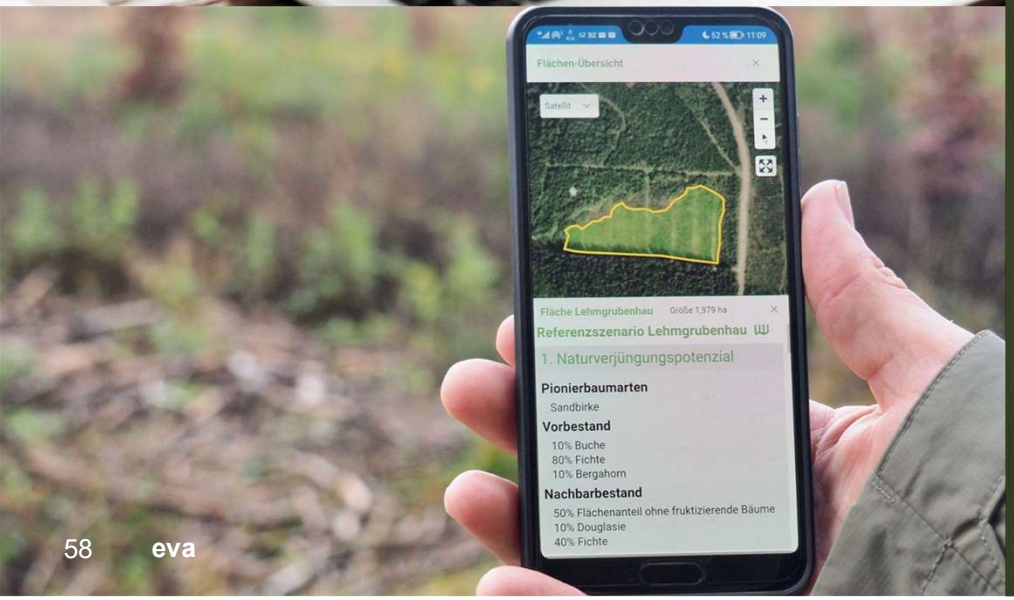
- Crediting Period: 20-30 years
- Monitoring entire 100 years (juridical question)



at

- 50%
- 3



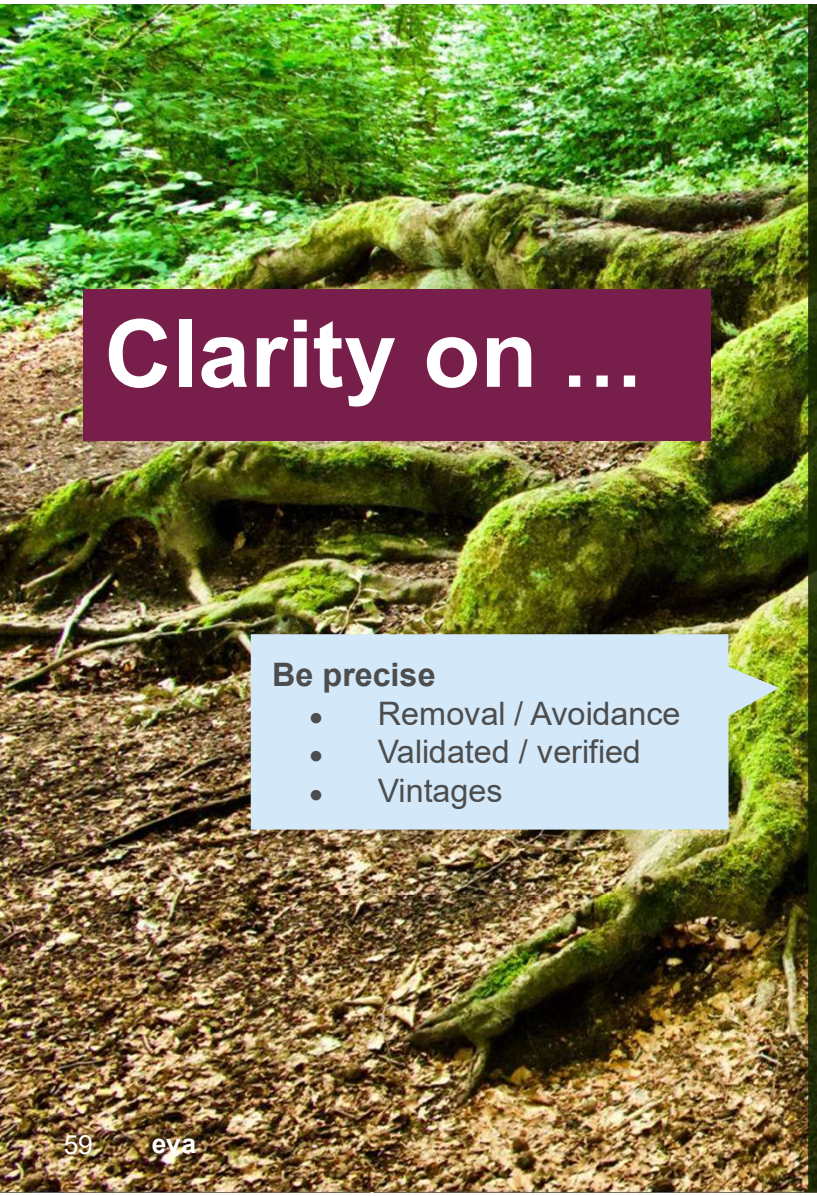


What do we do differently?

- High level on digitalization
- Cost efficient - at small projects sizes
- Audits with tablet/smartphone in the forest
- PDD + certif. report is created automatically
- Less than 4 months

1 @annedoerte.schmidt@ecosystemvalue.org - hier habe ich auch keine Bild ID zu
Reassigned to Anne Dörte Schmidt
Helena Böddeker, 19/06/2023

1 Das. untere Foto hab ich gemacht und gebe meine Rechte auf :D / für das obere krieg ich das glaub ich nicht mehr, sorry
Anne Dörte Schmidt, 19/06/2023



Clarity on …

Be precise

- Removal / Avoidance
- Validated / verified
- Vintages

3 wishes to the EU

1. … double counting

   tell us your plans

2. **… climate claims**

   When to say *"I'm carbon neutral"*

   "I'm contributing to the climate goals of the county XY"

3. **… permanence**

   Is 100 years (2123) the time frame we need to focus on?

   Should the permanence not focus on when we need to reach our goals: 2035, 2040

AdobeStock449423362

German
Forest Carbon Standard
“Wald-Klimastandard”

Thank you.
Keep it up!

Moriz Vohrer
moriz.vohrer@ecosystemvalue.org
+49 (0)178 3488 717

GOBIERNO DE ESPAÑA
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

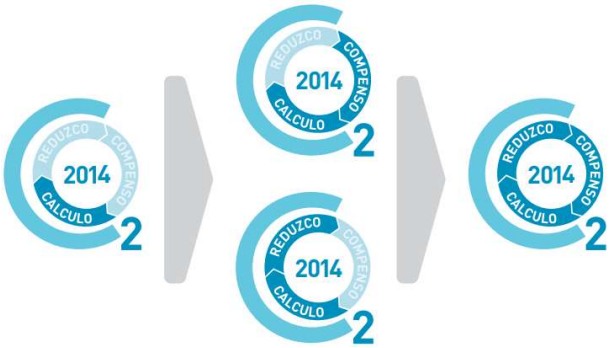
Spanish Registry of carbon footprint, carbon removal projects and offsetting

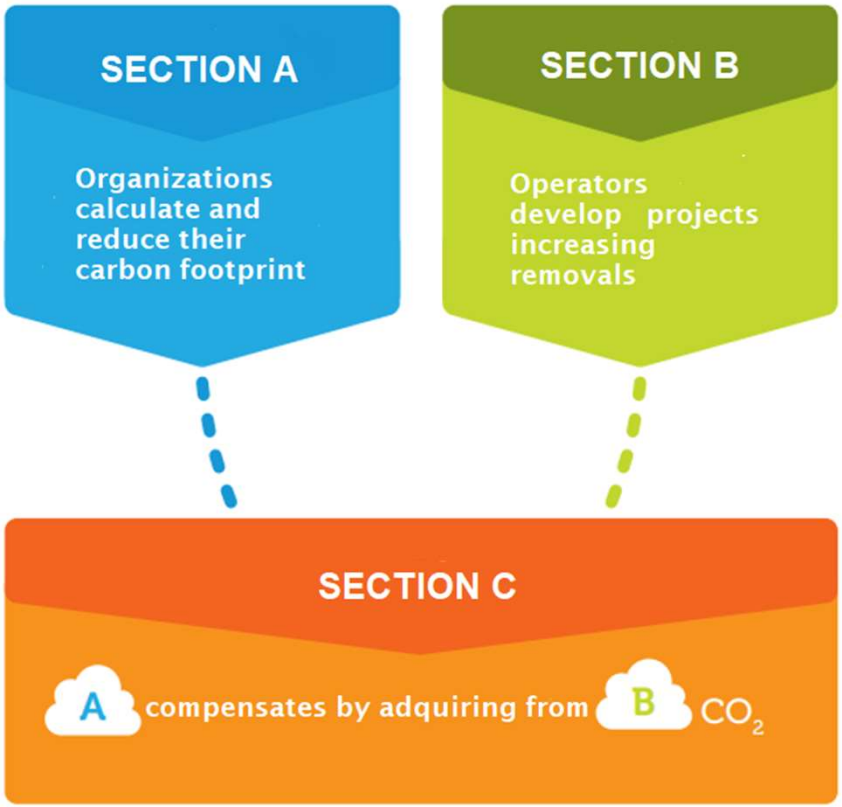
Iván Martínez
Expert Group on Carbon Removals
June 22nd 2023

European Commission

What is it?

- *Voluntary tool*
- *Legal basis; Royal decree 163/2014 (modification in progress) + complementary documents*

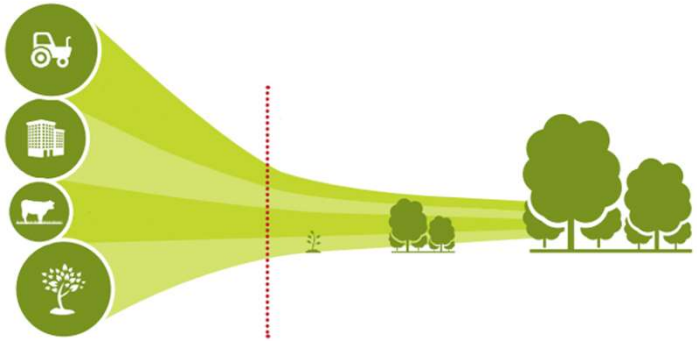




European Commission

Section B: Carbon removal projects

- *2 methodologies until now (more under development):*



Land converted to Forest Land

Restoration of burned forest land

European Commission

General requirements

- *Minimum 1 ha (FL definition)*
- *Minimum monitoring period 30 years (commitment to keep the forest in good condition)*
- *No limitations for activity period (usually much longer)*
- *Mandatory management plan, with a schedule of activities + Monitoring every 5 years at least*
- *Monitoring reports can be made by any professional with proven knowledge, independent to the project and unrelated to all parts (template under development)*
- *Description of other benefits*

European Commission

Quantification

- *Only CO2 attributed to CSC in living biomass (baseline=o)*

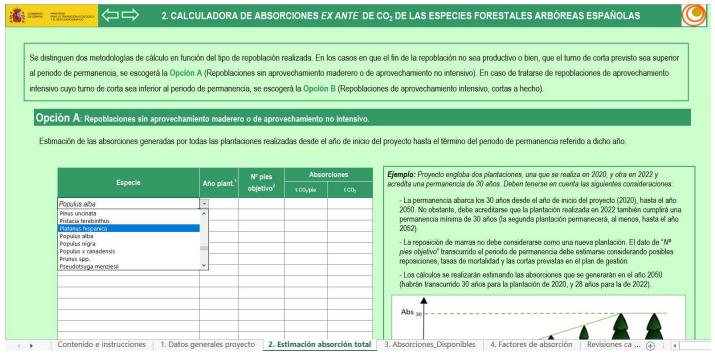
ANNUAL CHANGE IN CARBON STOCKS IN LIVING BIOMASS IN FOREST LAND REMAINING FOREST LAND (STOCK CHANGE METHOD)

$$\Delta C_{FF_{LB}} = (C_{t_2} - C_{t_1}) / (t_2 - t_1)$$

and

$$C = [V \bullet D \bullet BEF_2] \bullet (1 + R) \bullet CF$$

- *Ex-ante calculations (data from National forest inventory) + ex-post (measured data from monitoring reports)*



European Commission

Liability mechanisms

- *Guarantee fund: feed with 10% of every certified removal within the scheme*
- *The fund restores already used tonnes of CO2 that disappear due to force majeure (forest fires, pests, etc.)*
- *Area linked to disappeared removals shall be restored*
- *Approach to ensure no-harm to other environment objectives from current legislation*

European Commission

Certificates & public information

CERTIFICADO DE INSCRIPCIÓN EN LA SECCIÓN DE PROYECTOS DE ABSORCIÓN DEL REGISTRO DE HUELLA DE CARBONO, COMPENSACIÓN Y PROYECTOS DE ABSORCIÓN DE DIÓXIDO DE CARBONO

BOSQUE LA SERRETA

Código identificador del proyecto: 2023-b039
Promotor: RETREE & SPACE SOLUTIONS, S.L.
Localización: Ainsa (Huesca)
Superficie: 2,46 ha
Fecha de inicio del proyecto: 01/12/2022
Periodo de permanencia: 50 años
Breve descripción: *Recuperación de la cobertura arbórea en "la Serreta" situado en el municipio de Ainsa, mediante carrasco, quejigo, pino albar y pino salgareño.*

Con los siguientes datos de absorciones registrados al inicio del proyecto:

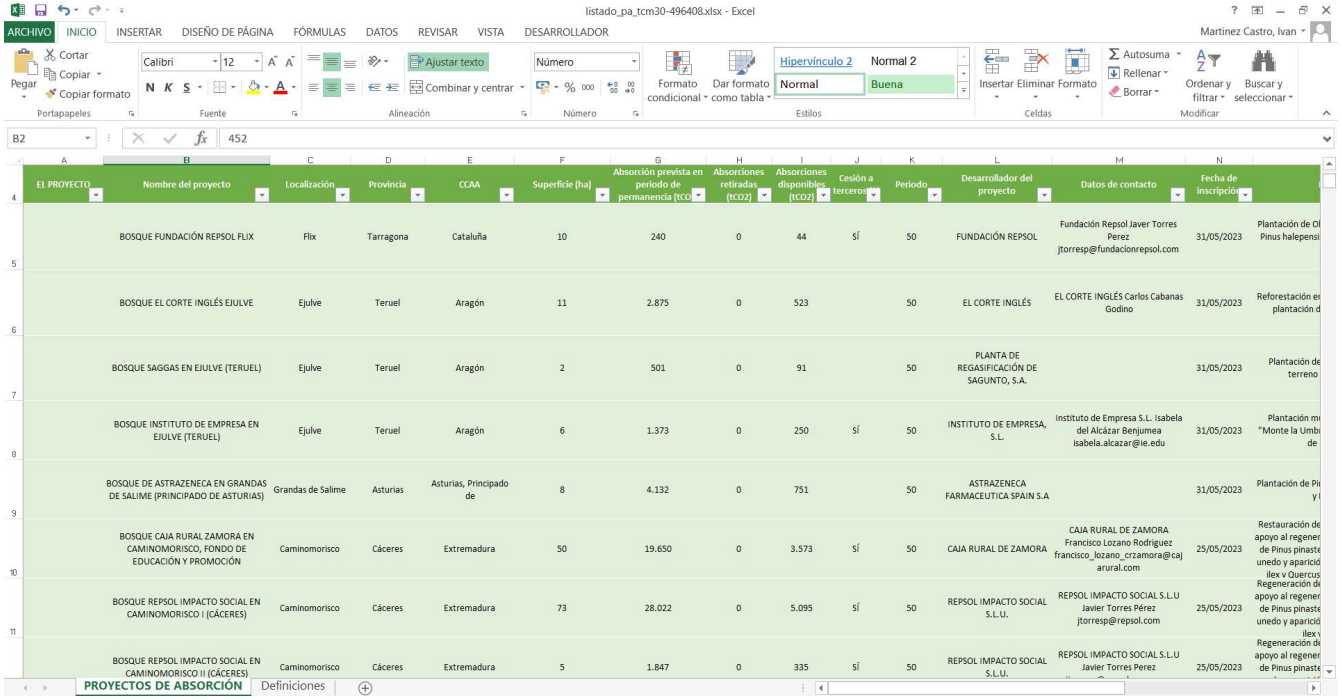
Absorción prevista en periodo de permanencia: 263 t CO_2
Absorciones registradas útiles: 53 t CO_2, de las que:

	t CO_2	Código unidades absorción
Abs.disponibles al inicio	48	2023-b039/00006-00053
Abs. cedidas a la bolsa de garantía	5	BG/2023-b039/00001-00005

Valvanera Ulargui Aparicio
Directora General
Oficina Española de Cambio Climático
Ministerio para la Transición Ecológica y el Reto Demográfico

Fecha de inscripción: 07/06/2023

La validez de esta inscripción está condicionada a la comprobación de las correspondientes acciones de seguimiento. Se podrá consultar el estado actualizado en la página web del Registro.



listado_pa_tcm30-496408.xlsx - Excel

EL PROYECTO	Nombre del proyecto	Localización	Provincia	CCAA	Superficie (ha)	Absorción prevista en periodo de permanencia (tCO	Absorciones retiradas (tCO2)	Absorciones disponibles (tCO2)	Cesión a terceros	Periodo	Desarrollador del proyecto	Datos de contacto	Fecha de inscripción	
	BOSQUE FUNDACIÓN REPSOL FLIX	Flix	Tarragona	Cataluña	10	240	0	44	SÍ	50	FUNDACIÓN REPSOL	Fundación Repsol Javer Torres Perez jtorresp@fundacionrepsol.com	31/05/2023	Plantación de Ol Pinus halepensi
	BOSQUE EL CORTE INGLÉS EJULVE	Ejulve	Teruel	Aragón	11	2.875	0	523		50	EL CORTE INGLÉS	EL CORTE INGLÉS Carlos Cabanas Godino	31/05/2023	Reforestación es plantación d
	BOSQUE SAGGAS EN EJULVE (TERUEL)	Ejulve	Teruel	Aragón	2	501	0	91		50	PLANTA DE REGASIFICACIÓN DE SAGUNTO, S.A.		31/05/2023	Plantación de terreno
	BOSQUE INSTITUTO DE EMPRESA EN EJULVE (TERUEL)	Ejulve	Teruel	Aragón	6	1.373	0	250	SÍ	50	INSTITUTO DE EMPRESA, S.L.	Instituto de Empresa S.L. Isabela del Alcázar Benjumea isabela.alcazar@ie.edu	31/05/2023	Plantación m "Monte la Umbi de
	BOSQUE DE ASTRAZENECA EN GRANDAS DE SALIME (PRINCIPADO DE ASTURIAS)	Grandas de Salime	Asturias	Asturias, Principado de	8	4.132	0	751		50	ASTRAZENECA FARMACEUTICA SPAIN S.A		31/05/2023	Plantación de Pi y
	BOSQUE CAJA RURAL ZAMORA EN CAMINOMORISCO, FONDO DE EDUCACIÓN Y PROMOCIÓN	Caminomorisco	Cáceres	Extremadura	50	19.650	0	3.573	SÍ	50	CAJA RURAL DE ZAMORA	CAJA RURAL DE ZAMORA Francisco Lozano Rodriguez francisco_lozano_crzamora@cajarural.com	25/05/2023	Restauración de apoyo al regener de Pinus pinaste unedo y aparició ilex y Quercus
	BOSQUE REPSOL IMPACTO SOCIAL EN CAMINOMORISCO I (CÁCERES)	Caminomorisco	Cáceres	Extremadura	73	28.022	0	5.095	SÍ	50	REPSOL IMPACTO SOCIAL S.L.U.	REPSOL IMPACTO SOCIAL S.L.U Javier Torres Pérez jtorresp@repsol.com	25/05/2023	Regeneración de apoyo al regener de Pinus pinaste unedo y aparició ilex y
	BOSQUE REPSOL IMPACTO SOCIAL EN CAMINOMORISCO II (CÁCERES)	Caminomorisco	Cáceres	Extremadura	5	1.847	0	335	SÍ	50	REPSOL IMPACTO SOCIAL S.L.U.	REPSOL IMPACTO SOCIAL S.L.U Javier Torres Perez	25/05/2023	Regeneración de apoyo al regener de Pinus pinaste

PROYECTOS DE ABSORCIÓN | Definiciones

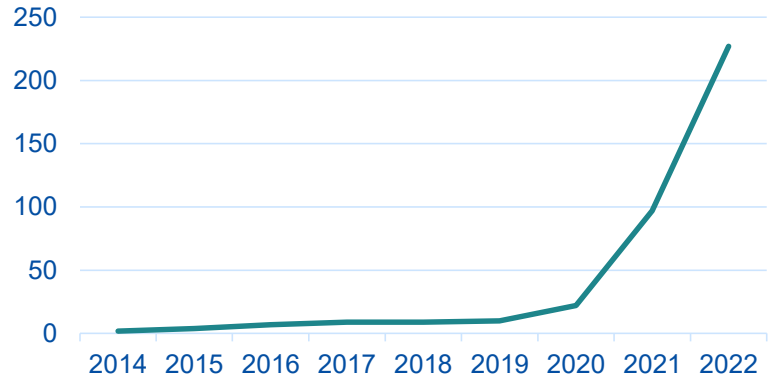
- *Operators declare that removals will not be used in any other scheme. Also acknowledgment that removals will be accounted under Spanish GHG inventory is required.*

European Commission

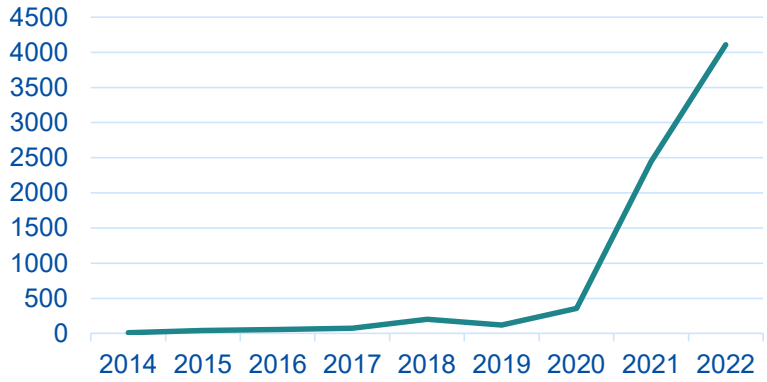
Current state

Total projects	Total area (ha)	Foreseen removals (t CO_2)	Utilised removals (t CO_2)	Available removals (t CO_2)	Guarantee fund (t CO_2)
452	8.687	3.777.301	39.895	647.201	68.689

Number of projects



Area



European Commission

Ongoing modifications, future chanllenges

- *New activities/methodologies under assessment: specific forest management practices, agricultural practices, wetlands, marine environment*
- *Consideration of other carbon pools*
- *More transparency: publicity of documents, visualization tool/web*
- *Harmonization of monitoring reports and information on other objectives (adaptation, biodiversity, disaster risk reduction, socioeconomic aspects…)*

European Commission

Bosques nenos 3

Sylvestris

Bosques nenos 7

HC-OECC@miteco.es

European Commission

E T I F O R
valuing nature
THE FOREST STEWARDSHIP COUNCIL®
ECOSYSTEM SERVICE PROCEDURE
(FSC PRO 30 006)
Anne Van Der Bruggen, Wesley Snell
FSC
FORESTS® FOR ALL FOREVER

Content

1. The FSC Ecosystem Services Procedure
2. Alignment with CRC QU.A.L.ITY criteria
3. Case studies

European Commission

THE FSC ECOSYSTEM SERVICE PROCEDURE FSC PRO 30 006

Overview

- **Impact demonstration framework** that verifies the positive impacts of forest management activities on five ecosystem services
- The procedure sets **quality thresholds and reporting requirements** that allow outcome indicators and methodologies suitable for the local context
- Reduces risk of unintended consequences through **stringent social and environmental do-no-harm safeguards**
- Produces **quantified, externally verified, annually audited impact claims** that allow forest managers to access markets for ecosystem services

European Commission

Background and Context

Source: FSC website, 2021

- >50 forest managers have applied the procedure all over the world
- >2.2 million hectares verified for positive impacts on carbon and other ecosystem services
- Widely applied in EU (Italy, France, Spain, Portugal, Germany, and more)

European Commission

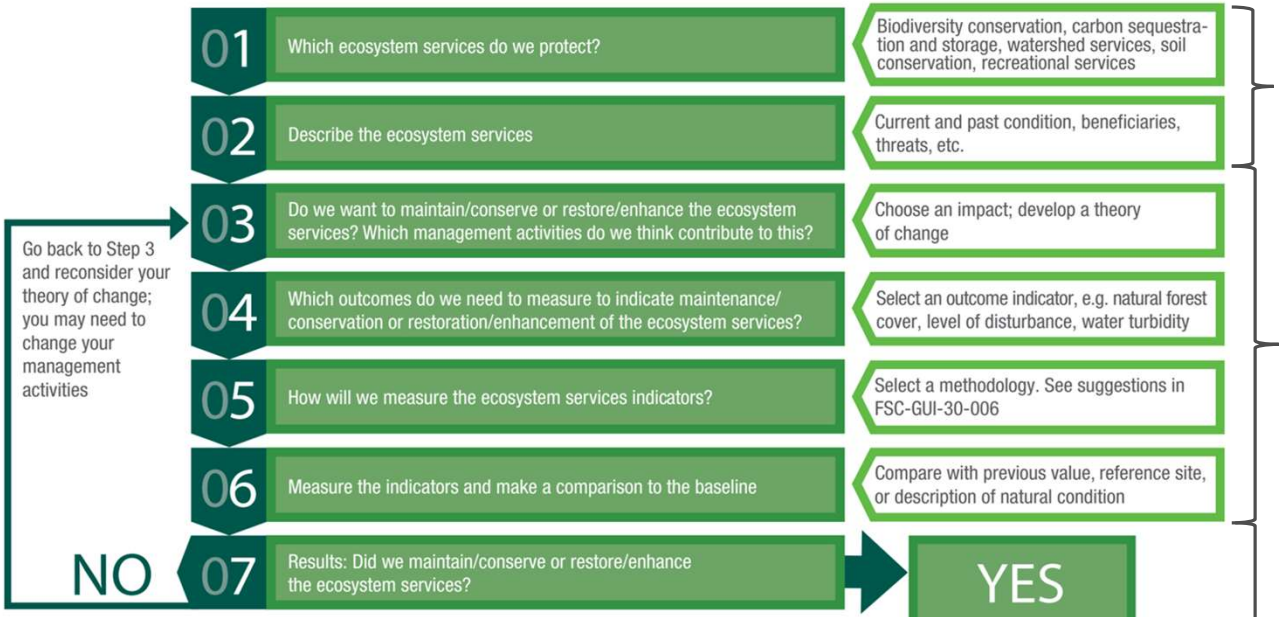
Scope of Ecosystem Services and Impacts

Code	Ecosystem Service	Impact
ES1	**Biodiversity Conservation**	1.1 Restoration of natural forest cover 1.2 Conservation of intact forest landscapes 1.3 Maintenance of ecologically sufficient conservation area networks 1.4 Conservation of natural forest characteristics 1.5 Restoration of natural forest characteristics 1.6 Conservation of species diversity 1.7 Restoration of species diversity
ES2	**Carbon Sequestration and Storage**	2.1 Conservation of forest carbon stocks 2.2 Restoration of forest carbon stocks
ES3	**Watershed Services**	3.1 Maintenance of water quality 3.2 Enhancement of water quality 3.3 Maintenance of the capacity of watersheds to purify and regulate water flow 3.4 Restoration of the capacity of watersheds to purify and regulate water flow
ES4	**Soil Conservation**	4.1 Maintenance of soil condition 4.2 Restoration/enhancement of soil condition 4.3 Reduction of soil erosion through reforestation/restoration
ES5	**Recreational Services**	5.1 Maintenance/conservation of areas of importance for recreation and/or tourism 5.2 Restoration or enhancement of areas of Importance for recreation and/or tourism 5.3 Maintenance/conservation of populations of species of interest for nature-based tourism 5.4 Restoration or enhancement of populations of species of interest for nature-based tourism
ES6	***Cultural Services*** **(v2 2024)**	6.1 Maintenance of cultural practices 6.2 Enhancement of cultural practices 6.3 Maintenance of culturally valued species or populations 6.4 Enhancement of culturally valued species or populations

Source: FSC-PRO-30-006 V1-0 EN 2018

European Commission

The FSC Ecosystem Service Procedure



Source: FSC-GUI-30-006 V1-0 EN

FSC-FM Certification: THE 10 PRINCIPLES OF FSC®

1. Compliance with Laws
2. Workers' Rights and Employment Conditions
3. Indigenous Peoples' Rights*
4. Community Relations
5. Benefits from the Forest
6. Environmental Values and Impacts
7. Management Planning
8. Monitoring and Assessment
9. High Conservation Values
10. Implementation of Management Activities

Social Safeguards

Economic Safeguards

Environmental Safeguards

Source: FSC-STD-01-001 V5-2 EN 2015

European Commission

ES PRO V2 AND QU.A.L.ITY CRITERIA

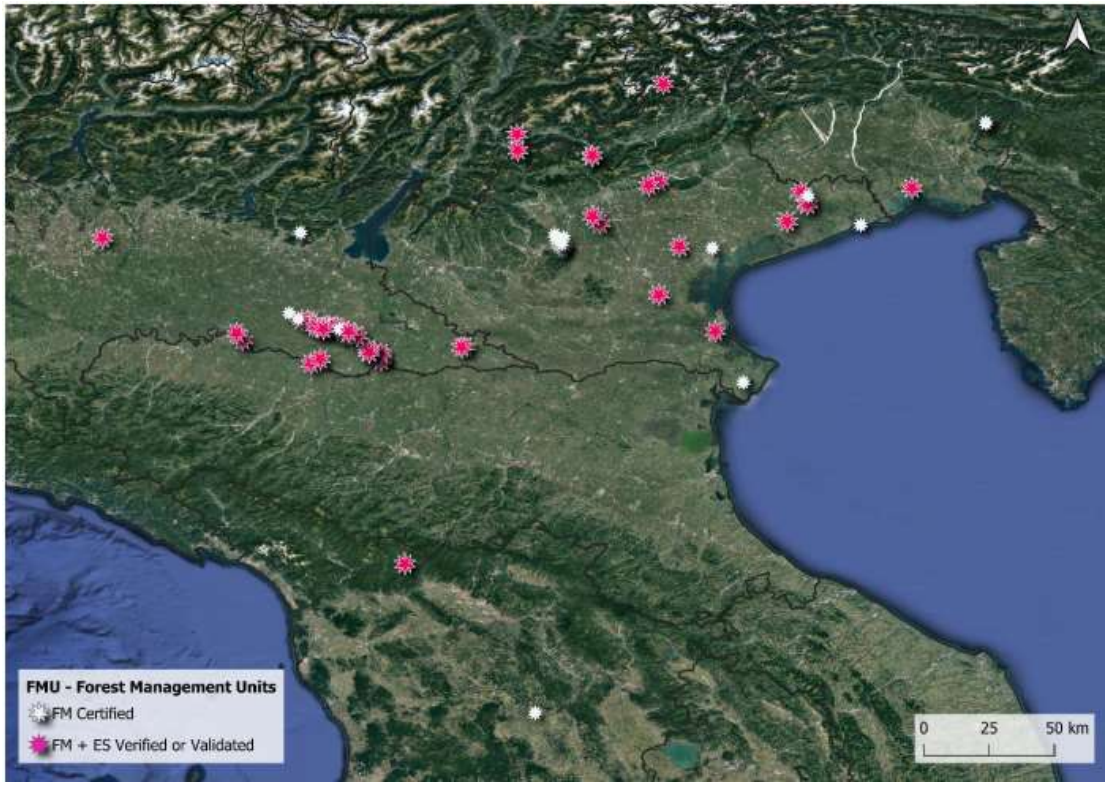
ES PRO alignment with CRC QU.A.L.ITY Criteria

QU.A.L.ITY Criteria (and beyond)	Current Version (v1-2 2021)	Current Revisions (v2 2024)
Quantification	• Quality thresholds for methods and indicators • Site-specific and reference baselines • Pre-approved methodologies (e.g. 2006/19 IPCC Guidelines)	• More rigorous baseline requirements in certain cases • Sources and management of uncertainty
Additionality	• Voluntary certification scheme • Theory of Change	• ES-specific legal and financial additionality tests
Long-term storage	• Annual audits • Identification and management of pressures and threats to ES (natural & anthropogenic)	• ES-specific monitoring plan • Impact reversibility management plan
Sustainability	• Multiple ES and impact categories • FSC-FM Principles & Criteria	• Integration of cultural services • Bundling of claims for multiple ES
Integrity & Credibility	• FSC-FM Principles and Criteria • Public database • Annual audits	• Impact registry • Safeguards for use of claims • Alignment with external standards (ISEAL, ICROA, GHG Protocol)

CASE STUDIES

Smallholder Forest Group in Italy

- Gruppo Foreste Sostenibili di Etifor is composed of >30 **smallholders and conservation forests**
- >3,000 hectares with verified positive impacts for **carbon, biodiversity, water, soil, and recreational** services
- **Works for all forest types** – large, small, public, private, productive, conservation-oriented
- **Includes blended finance models** with public and private contributions (see our BIOCLIMA initiative)



Source: GFSE Ecosystem Services Certification Document, 2023

European Commission

Utilities of the ES PRO for different actors in Sweden

Swedish forestry

Two different niches:

- Large forest owners
- Communities / organisations

Main reasons using the ES PRO

- Business and market demand
- Communicating impacts

Thank you

E T I F O R
valuing nature

FSC FORESTS FOR ALL FOREVER™

Forest Stewardship Council®
FSC ® International

FSC® 001000

www.fsc.org

Q&A on presentations

European Commission

Coffeebreak

European Commission

Discussion & conclusions by the rapporteur

European Commission

Lunchbreak

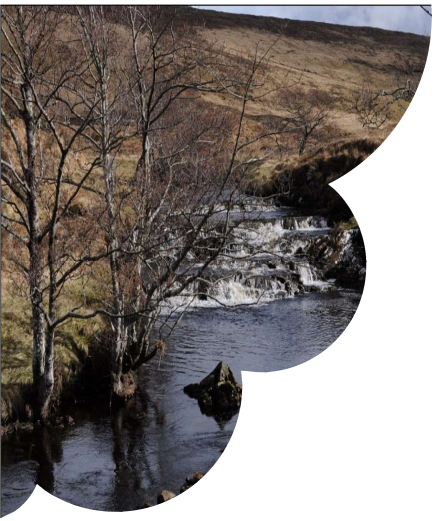
Peatland session starts at 13:30

European Commission

Peatland session

Chair: Francisca Demmendal-Wit (CRETA)
Rapporteur: Hans Joosten (Type A expert)

European Commission



Review existing Carbon Farming certification methodologies – Peatland

Expert Group Carbon Removals
Carbon Farming meeting 22 June 2023

Jasmijn Sybenga (Partners for Innovation / CRETA)

Results of survey for PEATLAND

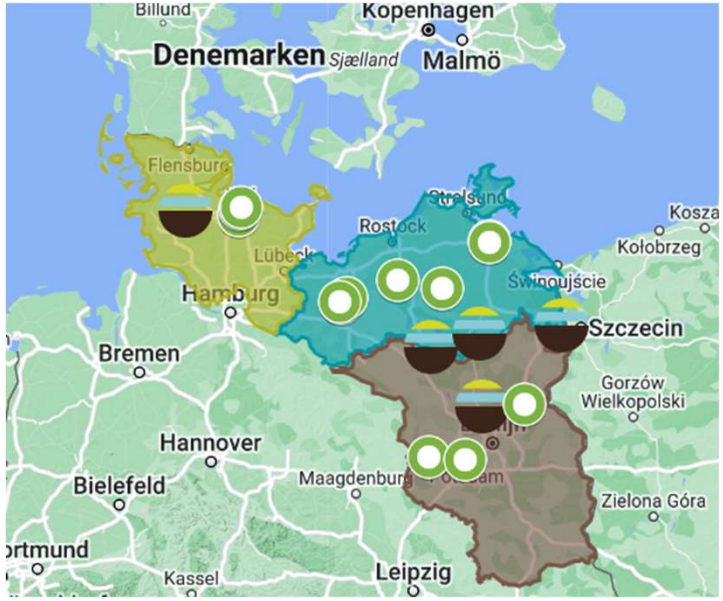
- 6 responses
- 4 individual certification methodologies
  - 4 operational certification methods, 2 (pilot) projects aimed at optimising sequestration capacity / implementation of innovative climate change mitigation measures
  - 3 international focus
  - 3 national focus (3 countries: DE, NL, UK)
- 6 methodologies assessed on QU.A.L.ITY criteria

Overview of assessed methodologies

Short name	Country/ Geographical focus	Validated against standard:	Eligible practice(s)
Provided by EU Survey respondents:			
MoorFutures	DE	ISO 14064, VERRA VM0036	Rewetting of drained peatlands reduces emissions of greenhouse gases (GHG). MoorFutures are carbon credits that map these emission reductions. Net carbon removal by new peat accumulation is also possible, but at much smaller scale and conservatively not yet included in the credit.
Wetlands4climate	Int	No	Carbon components considered are soil, aboveground and belowground biomass, and optionally deadwood and litter. GHG considered are CO_2, CH_4, and N_2O.
LIFE OrgBalt	Int	No	Paludiculture; Semi-natural regeneration; Agroforestry; fast growing species in riparian buffer zones; Conversion of cropland used for cereal production into grassland; legumes in conventional farm crop rotation; Strip harvesting in pine stands; Forest regeneration (coniferous trees) without reconstruction of drainage systems; Continuous cover forestry on peatland; Shifting to continuous cover forestry on peatland. GHGs: CH_4, N_2O, CO_2
SNK Currency for Peat	NL	SNK	Specific practices: restoration, management of vegetation, management of soil, management of water (like re-flooding)
ECS KlimaMoor	Int	ISO 14064 (by end 2023)	• Rewetting projects, improvement of the water balance • GHGs eligible for certification: CO_2 and CH_4
Added from other sources:			
UK Peatland Code	Int	ISO/IEC 14065 and EA-1/22 Peatland Code v1.2 (v2.0 under review)	Restoration of blanket bog or raised bog with an associated baseline condition of: actively eroding, draining, modified bog, drained cropland, in- and extensive grassland. Fens with an associated baseline condition of drained cropland, in- and extensive grassland and modified fen. GHG emissions used in the calculation of emissions factors include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), dissolved organic carbon (DOC) and particulate organic carbon (POC).

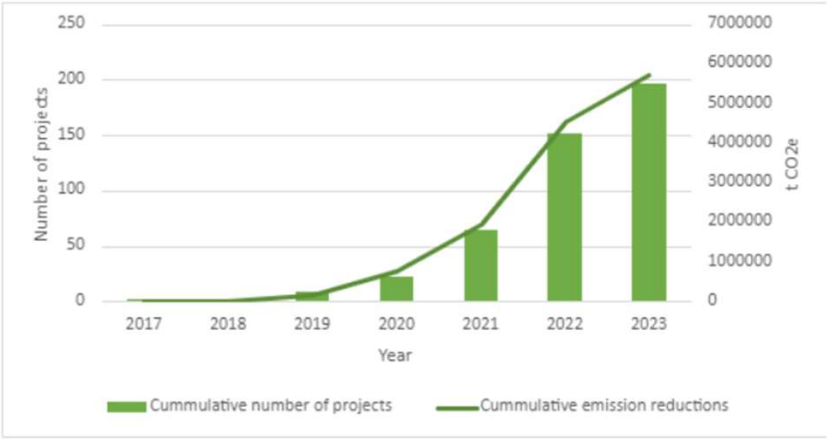
Uptake

- MoorFutures



- Peatland Code

Total number of Peatland Code projects	197
Number of projects registered and under development	166
Number of validated projects	31
Total Area of Peatland	26,855 ha
Average project size (for validated projects)	145 ha
Average project duration (for validated projects)	82 years
Projected emissions reduction as total number of validated, claimable Pending Issuance Units* (PIUs)	1,007,103 tonnes of CO2e
* 1 PIU = 1 tonne of Carbon Dioxide equivalents	



June 2023

QUANTIFICATION

Approaches:

- Most certification methodologies do not explicitly distinguish between the avoided release of carbon and the actual removals of carbon: Peatland Code and SNK, MoorFutures (in latter not yet in credit)
- GEST approach applied by MoorFutures / VERRA VM0036
- Addressing uncertainties: underestimation (KlimaMoor), buffer (MoorFutures, Peatland Code), project specific uncertainty/risk assessment (SNK)

Baseline:

- Baselines are in all cases (mostly) project based
- SNK includes standardised elements (water tables fixed in regulations)

Additionality and Long-term storage

Additionality:

- Regulatory as well as financial additionality addressed in KlimaMoor and Peatland Code, latter provides detailed requirements in series of additionality tests

Long-term storage:

- Certification periods of min. 30 years, in most cases up to 50 years (exception: SNK for particular case of maintaining agricultural function)
- Remote Sensing – not applied, not yet available at required level of accuracy

Sustainability

- All methodologies include a type of ‘environmental no harm’ mechanism. In some cases, the peatland restoration is planned with opinions of external stakeholders and experts

- Co-benefits are mentioned, but in most cases not monitored (exception: MoorFutures ecosystem services)

First conclusions

QU.
- All methodologies use project-based baselines, broadly applicable standardised baseline are so far not available.
- Indirect emissions are not in all cases taken into account – approaches vary in this respect.

A.
- Both regulatory and financial additionality are addressed in the mostly used certification methodologies, detailed assessment methods available.

L.
- Certification periods of 30 years, extendable to 50 years are possible in most cases. Various approaches available to mitigate the risk of release.

ITY
- All methodologies comprise no harm principal (and require this to be documented), valuation of co-benefits incl. biodiversity so far limited.

Thank you for your attention!
Questions?

j.sybenga@partnersforinnovaiton.com

Partners for Innovation

Q&A on overview

European Commission

IUCN National Committee United Kingdom

Peatland Programme

PEATLAND CODE

Dr Renée Kerkvliet-Hermans

Peatland Code coordinator, IUCN UK Peatland Programme

Peatland Programme Vision

The IUCN UK Peatland Programme has a vision for healthy, wildlife-rich peatlands in the UK, that provide multiple benefits for people.

VALUED PEATLANDS

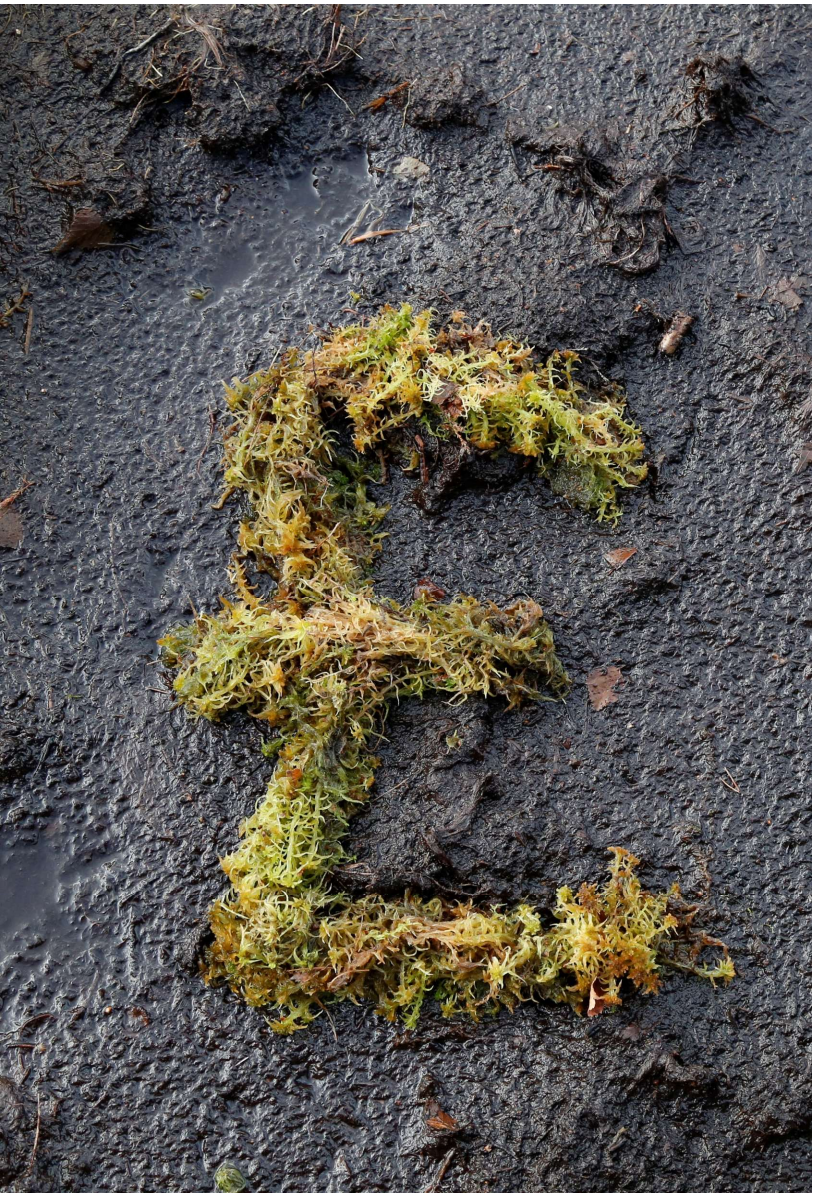
The value of our peatlands is better understood and prioritised for restoration and conservation.

STRONG PARTNERSHIPS

Bring together scientists, practitioners, land managers and policy makers and all those who can help to deliver strategic peatland goals.

ACTION THROUGH KNOWLEDGE EXCHANGE

Provide guidance and promote good practice for peatland management that is underpinned by scientific consensus and monitoring, and is responsive to new evidence.



IUCN National Committee United Kingdom

Peatland Programme

Funding gap

Almost 3million ha of peatland (as currently mapped) in the UK (2,962,622ha) –estimates c.80% in damaged state (IUCN- State of UK Peatlands, 2020)

ONS estimates £8-22 billion restoration costs but realised benefits of £45-51billion over the next 100 years (ONS UK natural capital: peatlands, 2019)

Public funding gap of £560 million to restore the UK's degraded peatland (GFI, eftec, & Rayment Consulting, 2021)

PEATLAND CODE

Peatland Code

A UK govt-backed, domestic voluntary carbon market standard

that…

landowners with eligible damaged peat can follow to attract private finance for peatland restoration by selling carbon units.

PC’s purpose is to underpin market trust and confidence

Peatland Code Development

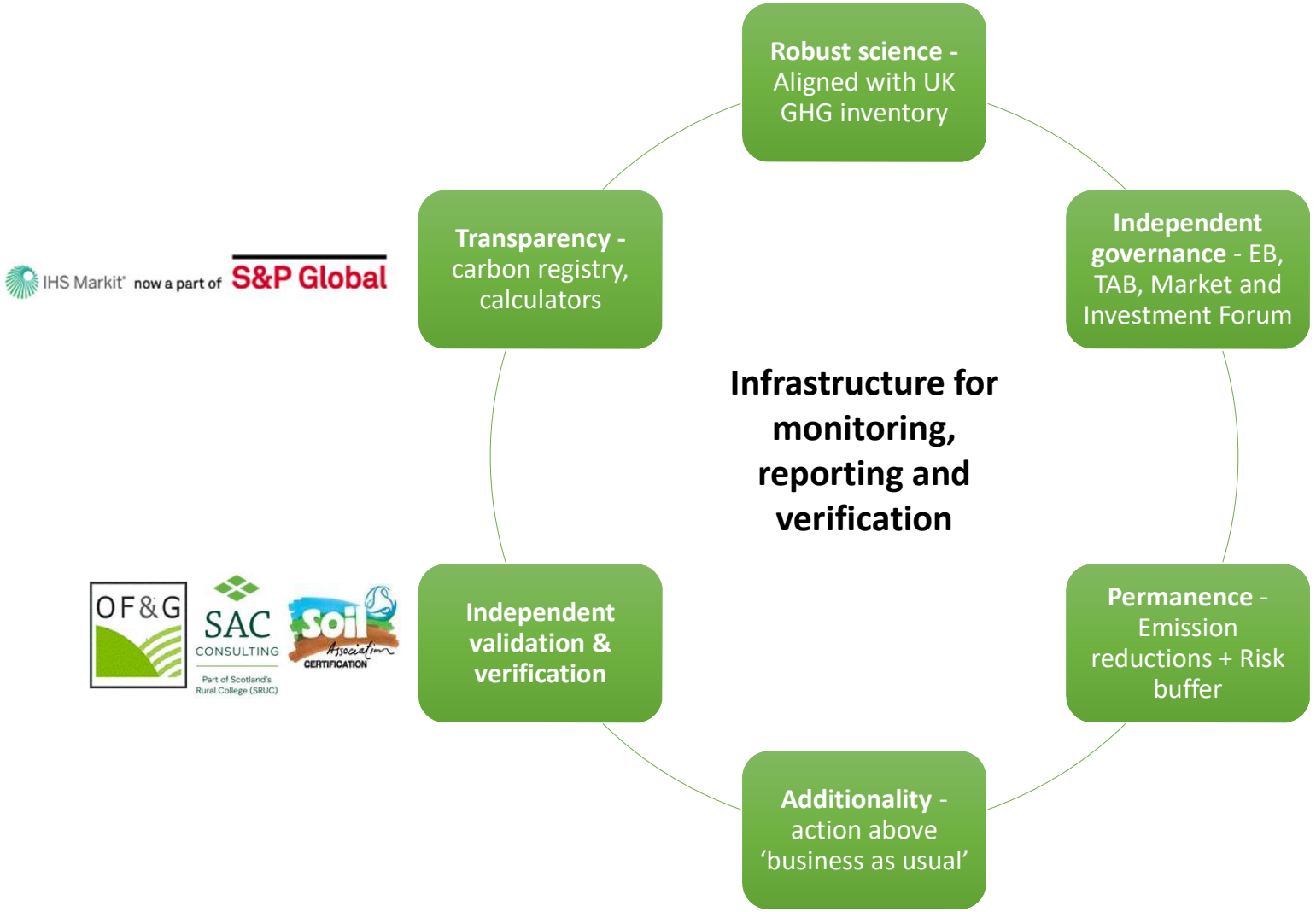
IUCN National Committee United Kingdom
Peatland Programme

- **Launch (2015)**
  - World Forum on Natural Capital
- **First Project Validated (2018)**
  - Blanket Bog at Dryhope, Scotland
- **UK Land Carbon Registry (2020)**
  - Peatland Code and Woodland Carbon Code
- **V1.2 update (2022)**
  - Post-restoration validation included
- **V2 update (2023)**
  - Fens included
  - EFs updated

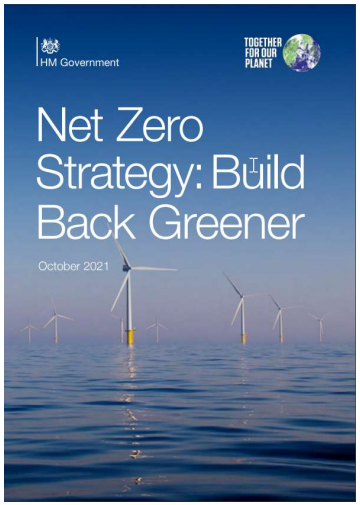
Peatland Code Management

- Core team
- Executive Board
- Technical Advisory Board
- Market and Investment Forum

PEATLAND CODE

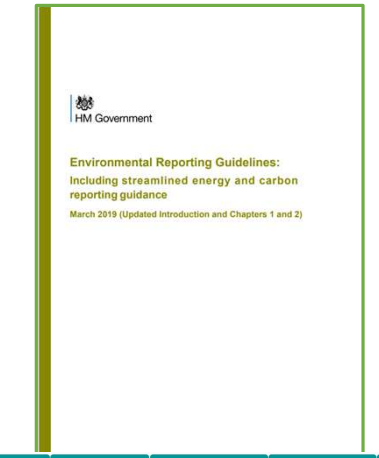

Robust science - Aligned with UK GHG inventory
Independent governance - EB, TAB, Market and Investment Forum
Permanence - Emission reductions + Risk buffer
Additionality - action above 'business as usual'
Independent validation & verification
Transparency - carbon registry, calculators
Infrastructure for monitoring, reporting and verification
IHS Markit now a part of S&P Global
OF&G
SAC CONSULTING
Part of Scotland's Rural College (SRUC)
Soil Association CERTIFICATION

Buyer confidence



Government-backed:

- Governments Net Zero Strategy
- Defra's 25 year Environment Plan
- Scotland's Climate Change Plan



UK Govt: Environmental Reporting Guidelines

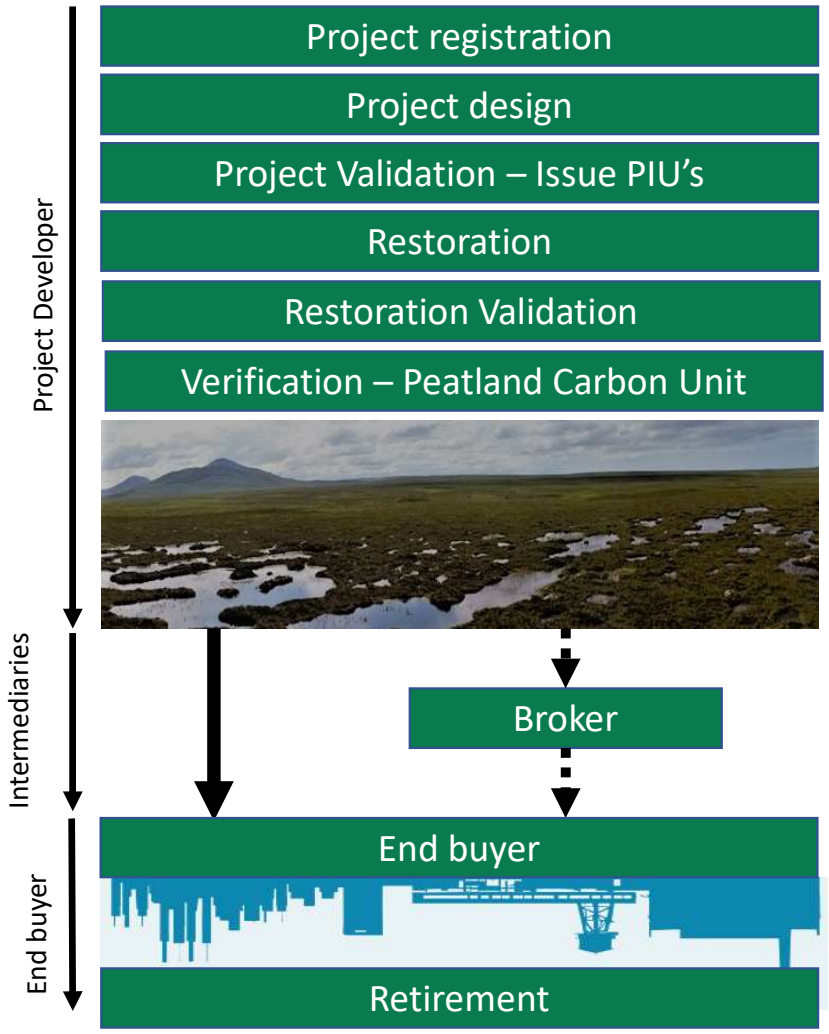
- 12,000 large companies mandated to report emissions
- Can use Peatland Carbon units

Transparent registry

- UK land carbon registry on IHS Markit

Account Holders | Projects | Issuances / Listings | Holdings | Retired Credits | API Retired Credits | Assigned Credits | Cancelled Units

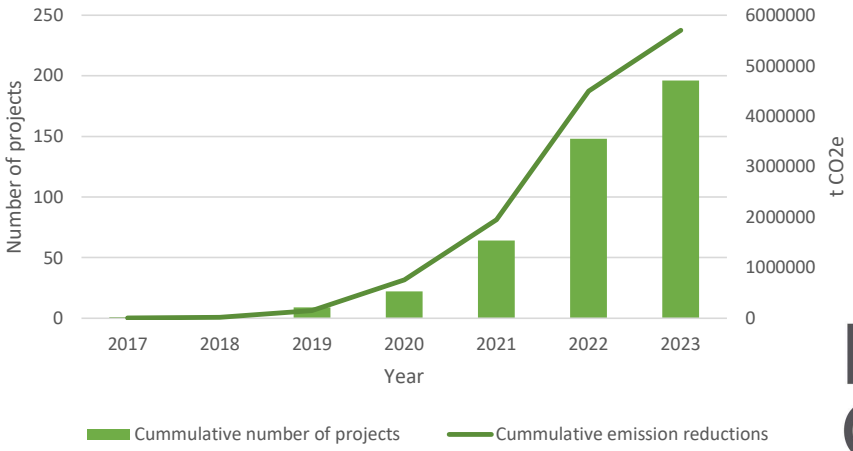
Name	Category	Standard Name	Project Type	Status	PIUs Listed	Validator	Developer	Country	Details
Abergwesyn Hill	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.		Wales, Powys	View
Achnacarry Estate (Phase 1)	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.	Angus Davidson Ltd	Scotland, Highland	View
Blaen y Coed	Carbon	UK Peatland Code	Peatland Restoration	Validated	Yes	Organic Farmers & Growers C.I.C.	Snowdonia National Park Authority	Wales, Conwy	View
Bwlch y Groes	Carbon	UK Peatland Code	Peatland Restoration	Validated	Yes	Organic Farmers & Growers C.I.C.	Snowdonia National Park Authority	Wales, Gwynedd	View
Carrick Peatland	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.	Tilhill Forestry	Scotland, Argyll and Bute	View
Ceannacroc (Phase 1)	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.	Angus Davidson Ltd	Scotland, Highland	View
Corriemulzie (Phases 1-3)	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.	Angus Davidson Ltd	Scotland, Rosshire	View
Cùl Mòr	Carbon	UK Peatland Code	Peatland Restoration	Under Development		Organic Farmers & Growers C.I.C.	Forest Carbon Ltd	Scotland, Highland	View



The Voluntary Carbon Offset Cycle, from Project Development to Retirement

Number of projects

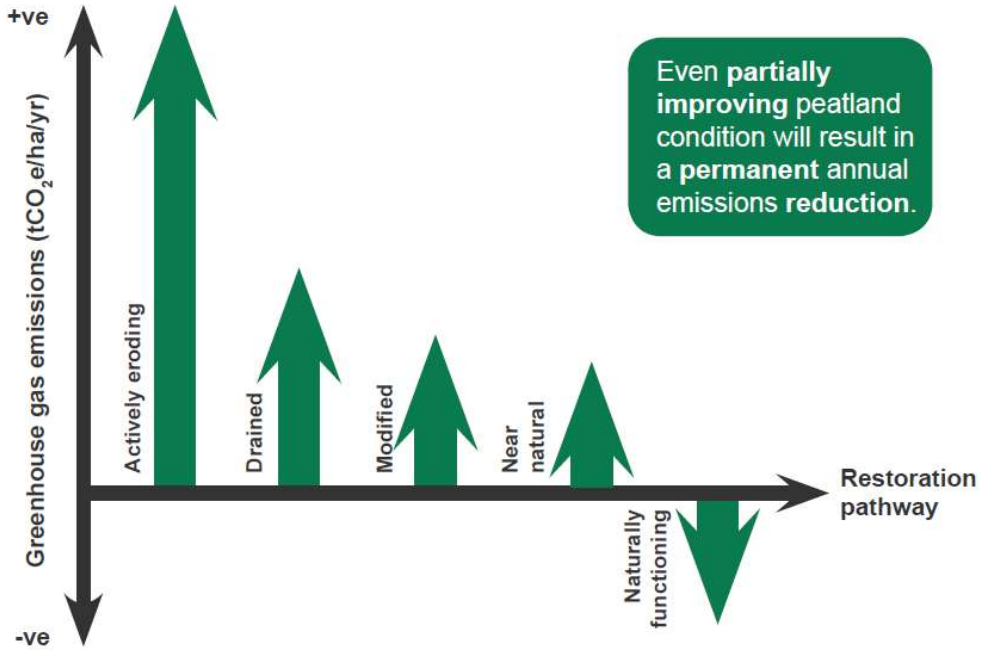
- **196** Projects registered
- 26,760 ha of peatland restoration, 5,700,000 tCO_2e emission reductions
- **39** Project validations
- **8** Restoration validations
- First verification happening right now



IUCN National Committee United Kingdom
Peatland Programme

PEATLAND CODE

Bogs



- Condition categories with Emission Factors
- Linked to UK GHG inventory

IUCN National Committee United Kingdom

Peatland Programme

Fens

- Effective water table depth used in emission calculator
- Restoration or only rewetting
- Paludiculture call for evidence

PEATLAND CODE

IUCN National Committee United Kingdom

Peatland Programme

Peatland Code next steps

- Paludiculture trial/call for evidence (Paludiculture Exploration Fund)
- Price index for UK voluntary carbon markets with WCC
- Carbon sequestration during transitional phase?
- Biodiversity metric
- Water quality/quantity metric (Hydro Nation Chair, SEPA, CEH, FR)
- UKAS pilot phase
- ICROA and/or ICVCM

PEATLAND CODE

Contact details

peatlandcode@iucn.org.uk

rkhermans@iucn.org.uk

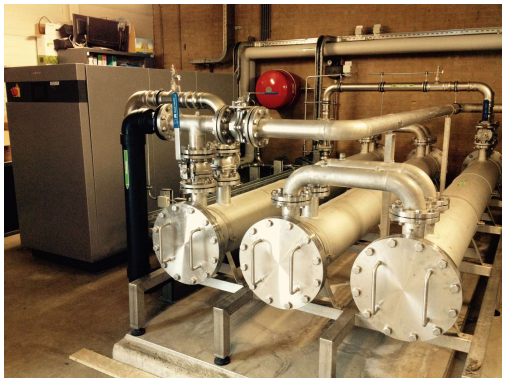
www.iucn-uk-peatlandprogramme.org

Presentation on Moor Futures by Franziska Tanneberger

Greifswald University

European Commission

SNK – certificates for voluntary climate action



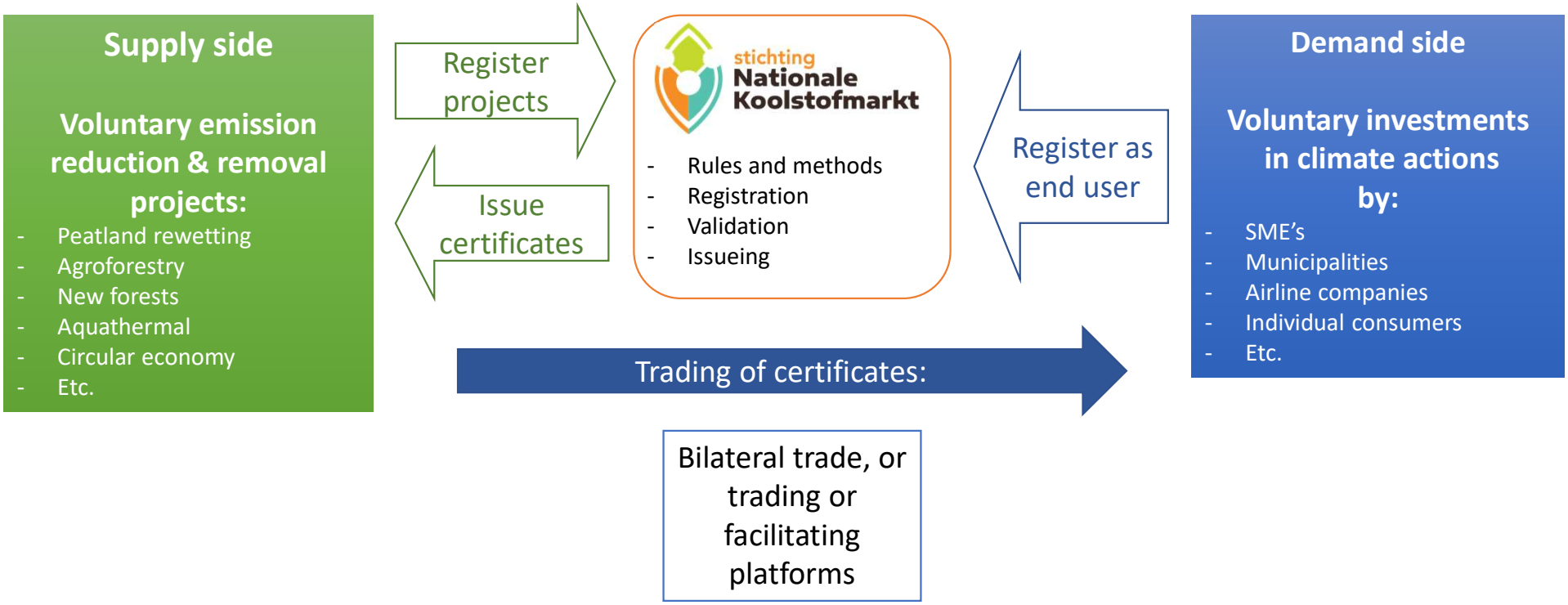
Wytze van der Gaast
secretariaat@NationaleCO2markt.nl

22 June 2023

How it started

- 2017 – Green Deal ‘Nationale Koolstofmarkt’
- 2019 – Stichting Nationale Koolstofmarkt established
- Focus on GHG emission reduction or carbon removal options that are not yet addressed by government policy
- Rulebook
  - Methods to calculate emission reductions or carbon removals
  - Rules for additionality and use of certificates
  - Check & double check

Basic market structure



What is the value of a certificate?

- An SNK certificate is token that a project:
  - Reduced/removed GHG emissions, which is
  - Additional to existing and planned policies, and
  - Validated / verified by independent experts.
- Recognition of reduction/removal as a product or service.
- The buyer can demonstrate voluntary investment in a domestic climate action project.
- The buyer cannot use the certificate for compliance with own climate obligations -> emission reduction/removal remain with sector of the project

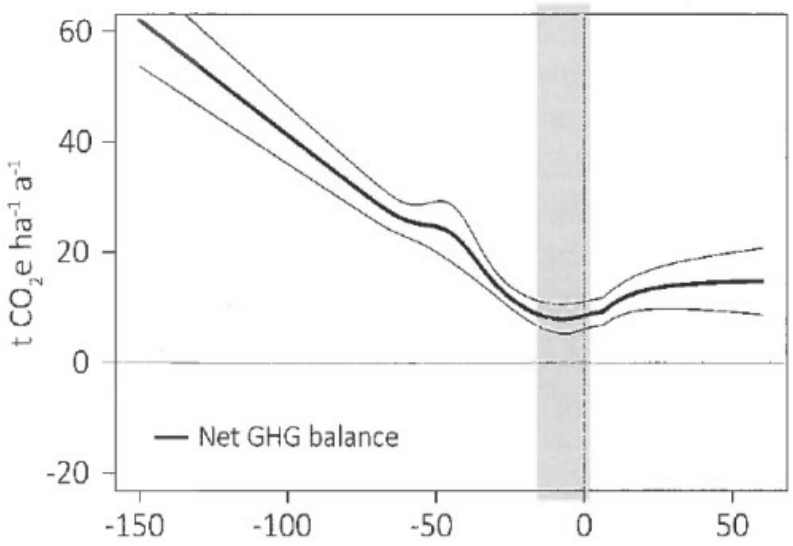
List of SNK methods

(https://nationaleco2markt.nl/methoden/)

Peat rewetting	Rewetting peat(y) soils by increasing groundater level in peat/wetlands
Aqua- & riothermie	Use thermal energy from surface and wastewater
Greenswitch	Removal of ammonium nitrate from animal manure and conversion into high value liquid nitrate fertilizer of organic origin (avoiding use of chemical fertilizers)
Cow credits	Feed additives to reduce cattle methane emissions
Improve tyre pressure of cars	Smart tyre pump for higher tire pressure and fuel savings of passenger vehicles
Trees-outside-forests	Afforestation in trees outside forest concepts, like agroforestry
Climate smart forest management	Climate smart forest management
Permanent grasslands	Carbon sequestration in permanent grasslands on mineral soils
Revitalisation of Ash Forests	Restoration / revitilization of ash forests (essenbossen)
Recell	Extraction of cellulose from waste sludges
Hemp	Long-term C sequestration in hemp-based products
Blue carbon	Carbon sequestration in salt marshes
Recycling hard plastics	Recycling hard plastic above national baseline

Rewetting peatland

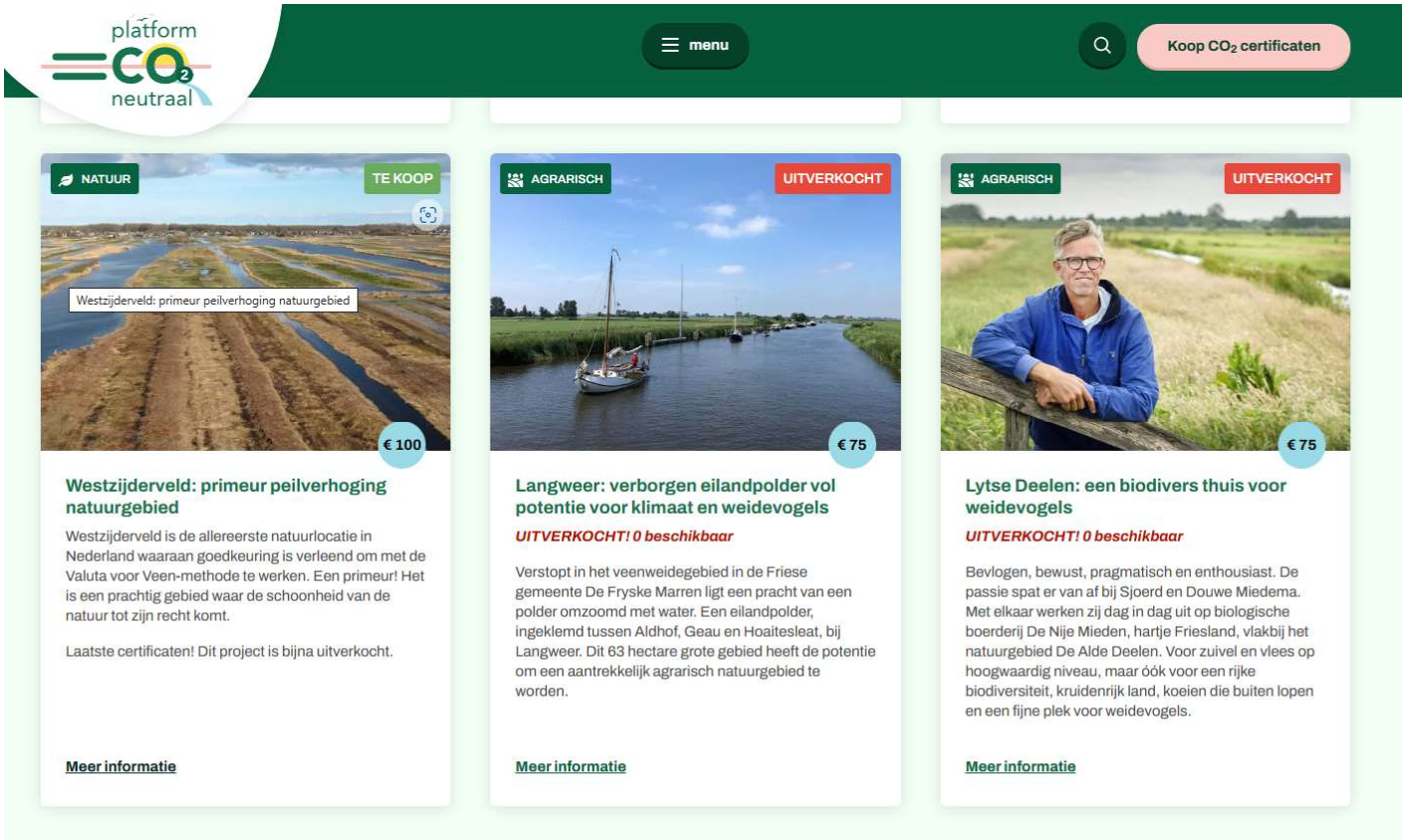
- Emissions from peatland in NL: 7 Mt CO_2
  - total emissions agriculture 27 Mt
- Methodology document:
  - Raising ditch water level
  - Water infiltration (pumps)
  - Embankment
- Baseline: business-as-usual groundwater levels (depends on region)
- Monitoring: digital wells
  - e.g. 6 wells for an area of 0-20 ha; 8 wells for 20-100 ha.)
- Certificates issued based on validated projectplan and/or verification report



Jurasinski, G., Günther, A., Huth, V., & Couwenberg, J. (2016). Greenhouse gas emissions. In W. Wichtmann, C. Schröder, & H. Joosten, Paludiculture – productive use of wet peatlands (pp. 79-93, Chapter 5.1). Schweizerbart Science Publishers.

State of play

- 18 projects registered at SNK
  - 6 kt CO_2 issued (ex ante)
  - 39 kt emission reduction estimated.
- Price per certificate: €75 – 100/ton
- However, farmers find process complex -> beyond their core business
- Therefore, bundling of activities in larger programmes.



From plan to certificate

1. Write a projectplan
2. Validation of the projectplan by external expert/reviewer
3. Implement project (incl. Monitoring)
4. Verification of reduction/removal by external expert
5. SNK issues certificate based on positive verification report (in register)

SNK only issues certificates -> trading in certificates is done by parties themselves

Rulebook item: **Proces van projectplan tot uitgifte van certificaten** (pdf).

More information?

contact:

Wytze van der Gaast

secretariaat@NationaleCO2markt.nl

www.NationaleCO2markt.nl

Universität Rostock Traditio et Innovatio

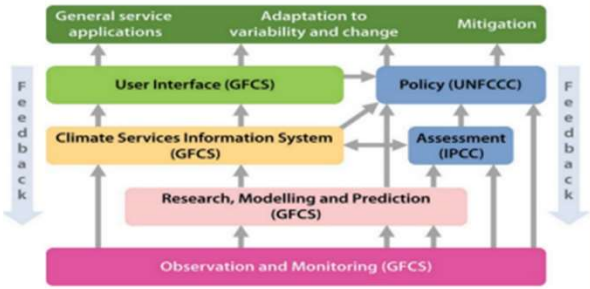
Remote sensing for wetland habitats

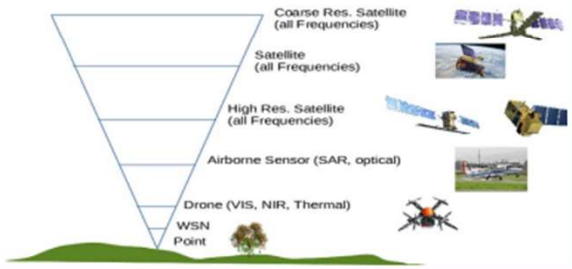
Prof. Dr. Philip Marzahn
Geodesy and Geoinformatics
University of Rostock

Universität Rostock Traditio et Innovatio

Why remote sensing?

- **Allows to perform measurements over large areas**
  - Direct:
    - Reflectance, emission, backscatter
    - Phase differences, range distances
  - Indirect:
    - “Plant as indicator”
- **Can provide input data to models at various scales**
- **Wide range of different sensors currently available**
  - Long time series
  - Multi-scale observation

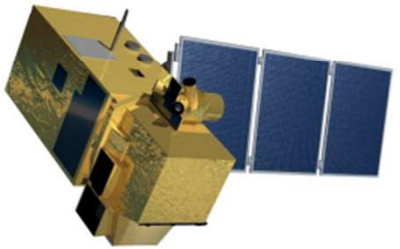




Source: GCOS (2016)

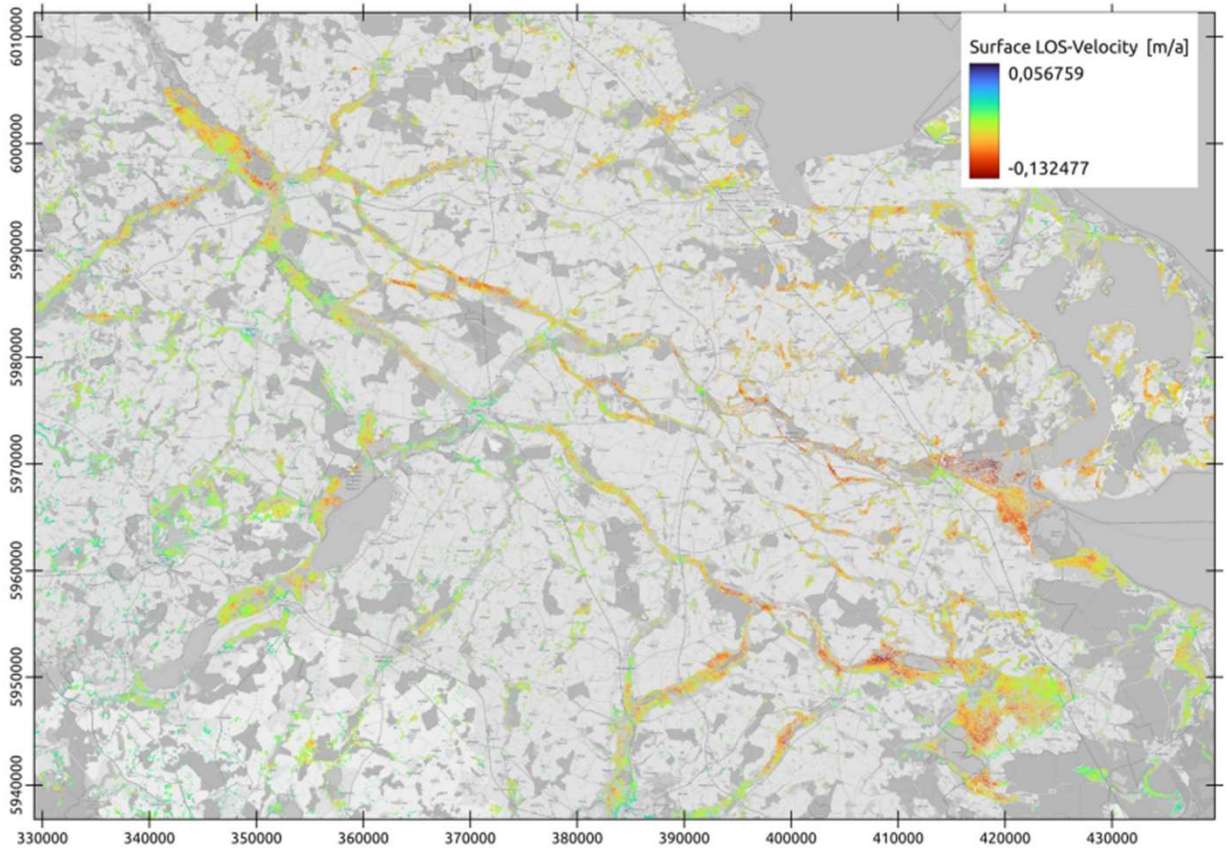
Monitoring of wetlands by remote sensing

- **Subsidence monitoring**
  - Sentinel-1 SAR interferometry
  - Indicator of C mineralization
- **Monitoring of water levels and area**
  - Sentinel-1 based approach
  - Approach using machine learning
- **Additional surface parameters to support monitoring:**
  - Soil moisture
  - Vegetation parameters



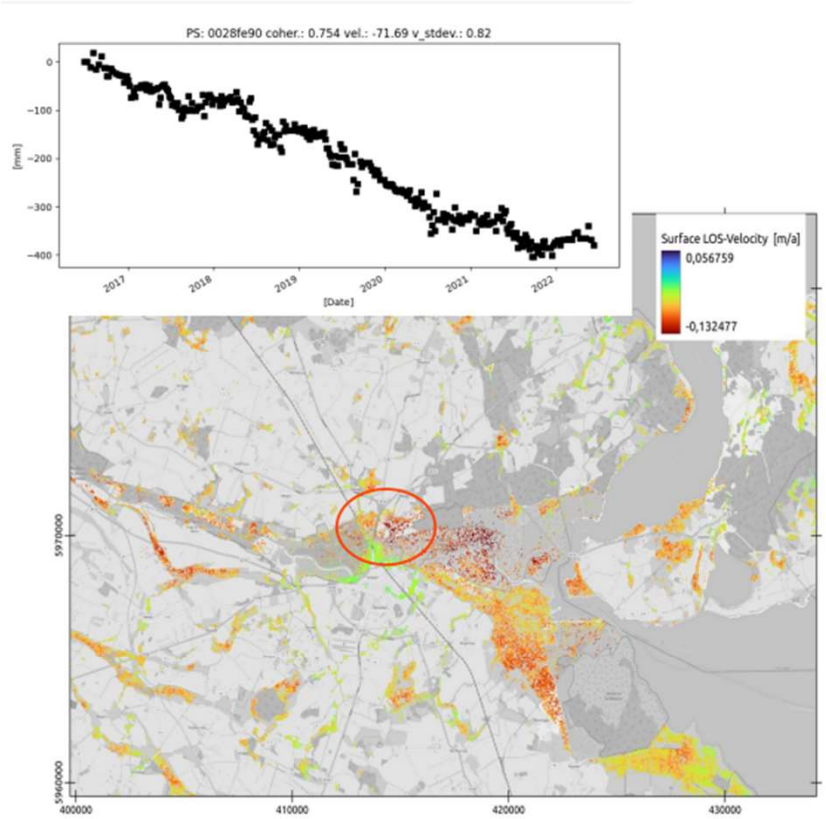
Subsidence monitoring of peatlands

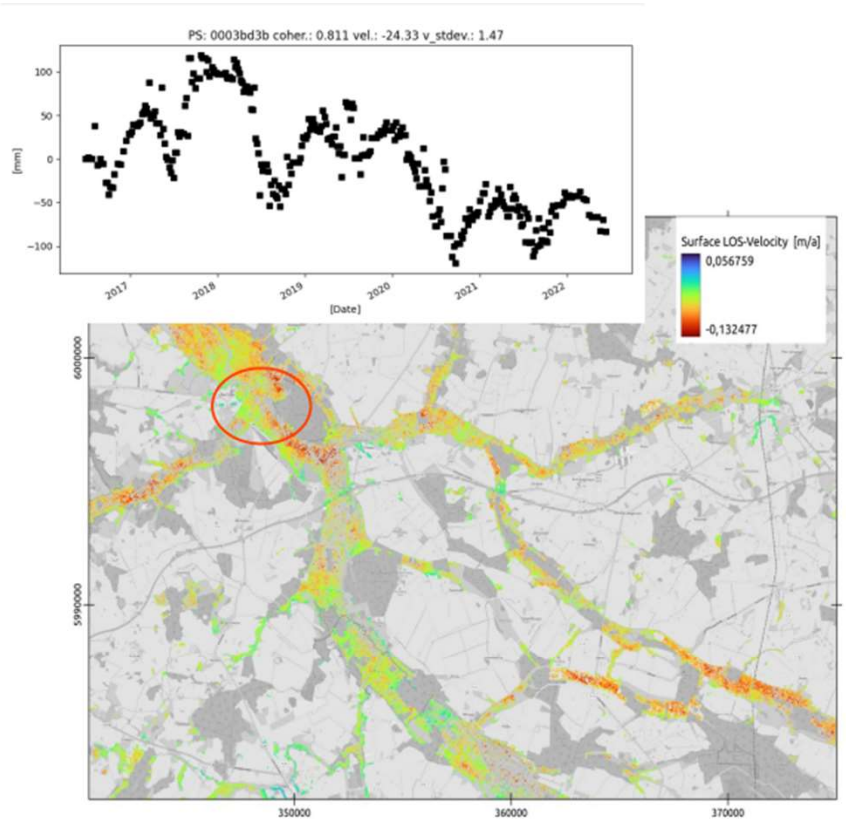
- Remote sensing technics allow for a spatio-temporal monitoring of wetlands
- Breathing (subsidence/heaving) of peatlands can be observed
- Subsidence of drained peatlands



Universität Rostock Traditio et Innovatio

Subsidence monitoring of peatlands

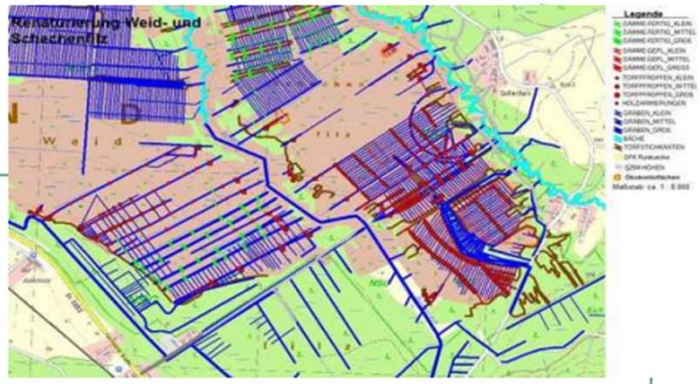


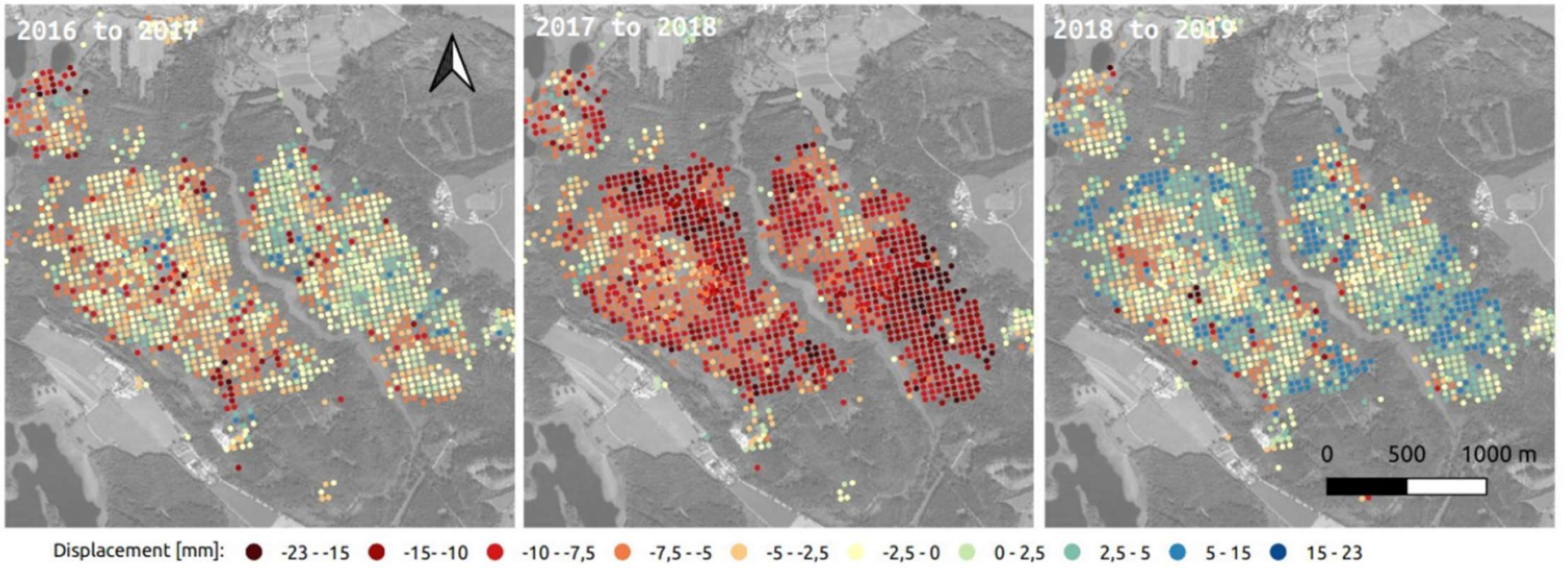


Universität Rostock Traditio et Innovatio

Monitoring of peat lands

- Seasonality and evaluation of re-wetting measures



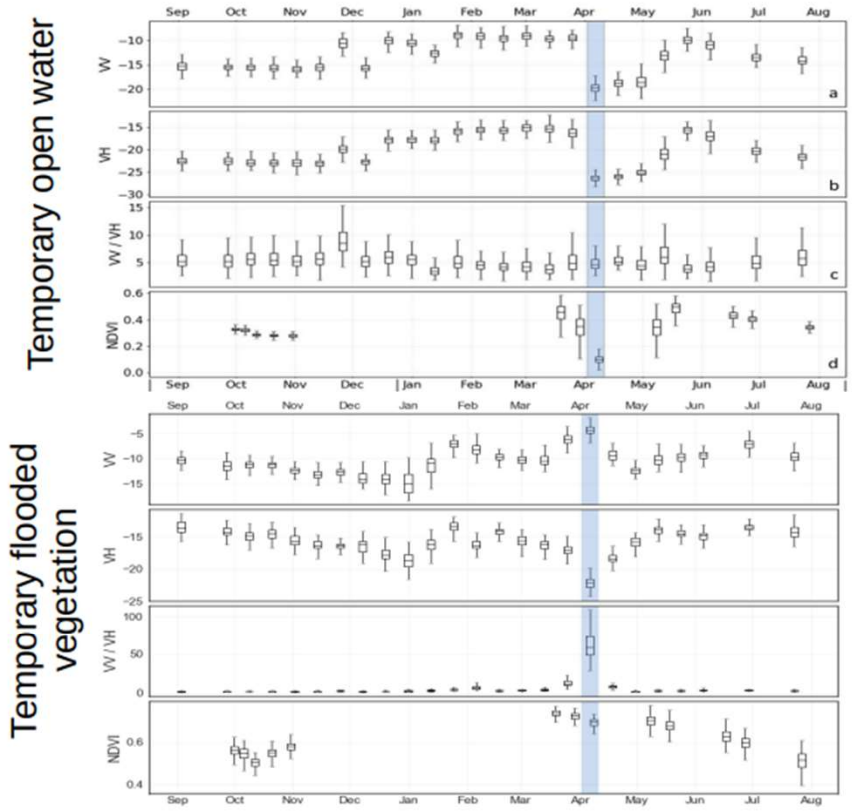


Monitoring of wetlands

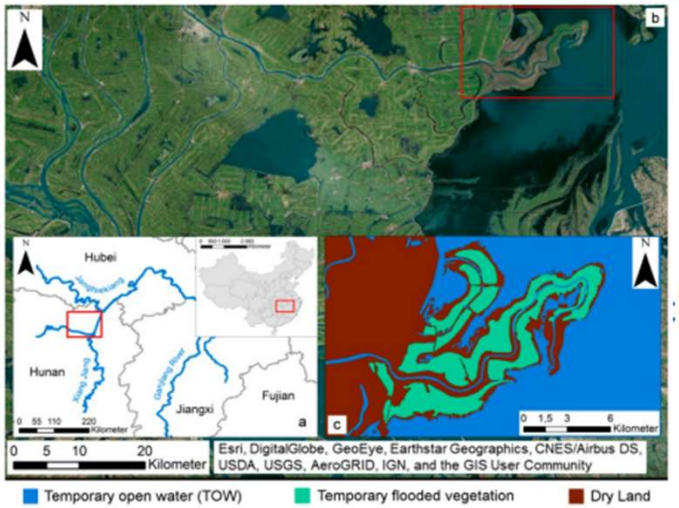
Real flood extent = temporary open water + temporary flooded vegetation

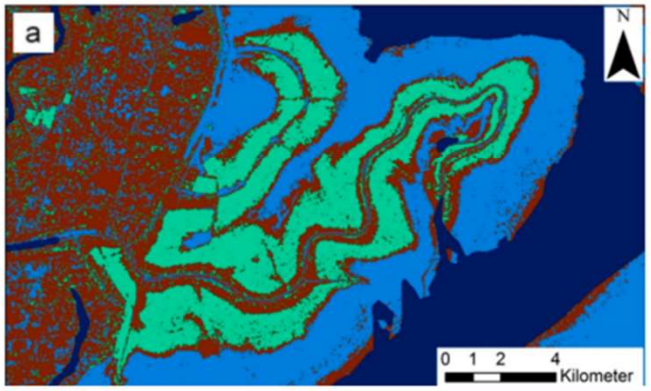
Universität Rostock Traditio et Innovatio

Monitoring of water levels and extend



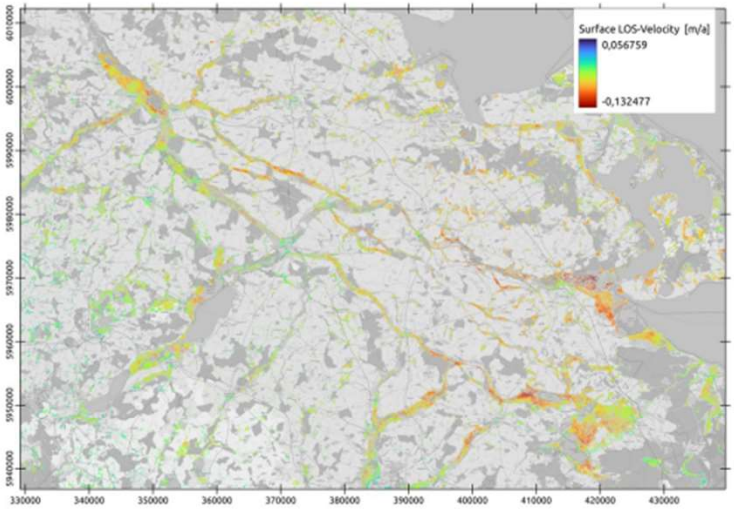
HPC and machine learning techniques for real time Monitoring



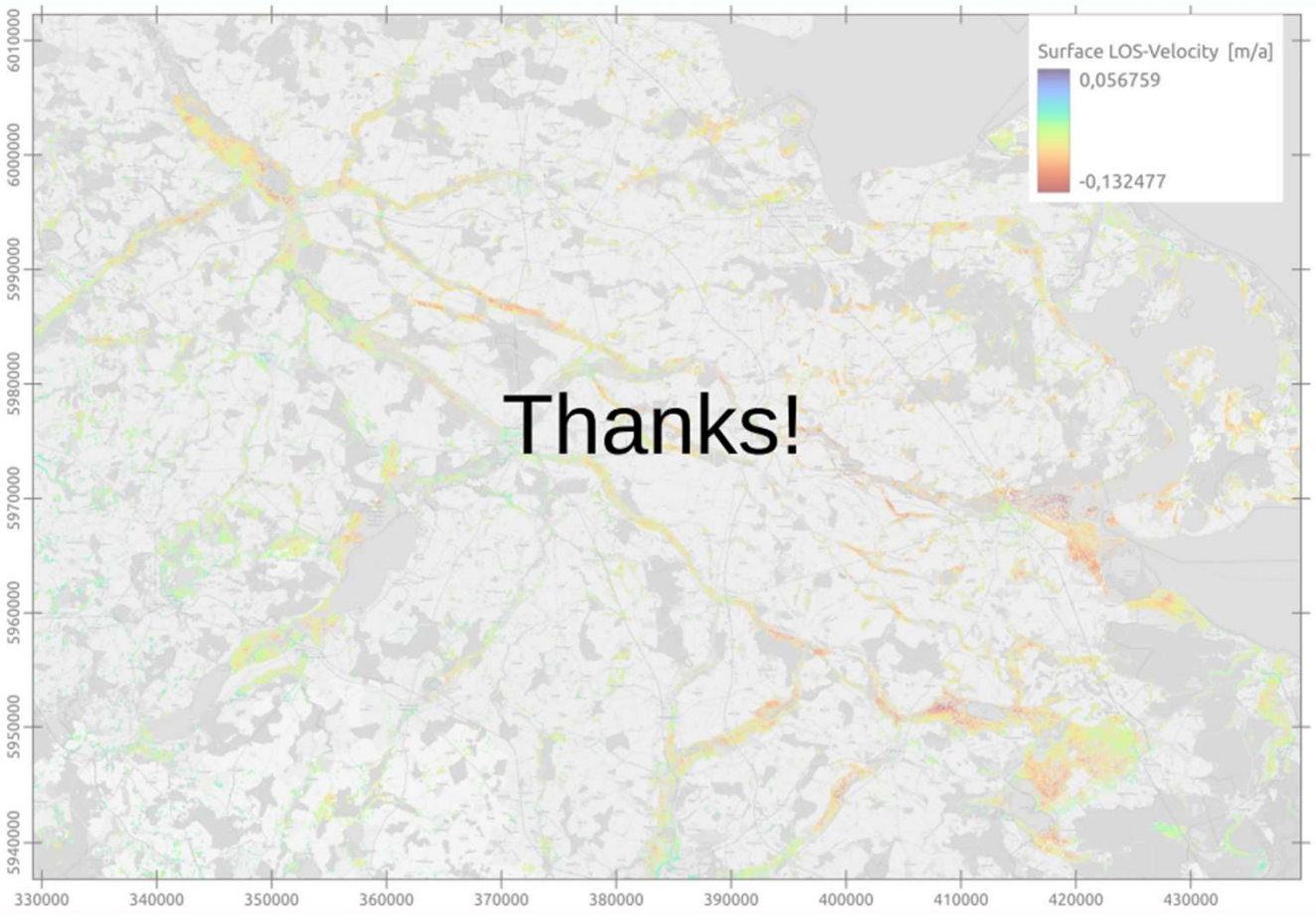


Conclusions

- **Remote sensing - especially microwave imagery - allow for a continuous monitoring of land surface processes**
  - Independent from illumination and weather conditions
  - Allow a penetration into a media
- **High potential for peatland monitoring with retrievals of:**
  - Subsidence of (peat-)surfaces
    - General subsidence patterns
    - Bog breathing
  - Water extend
    - Open water bodies
    - Submerged / flooded vegetation
  - Additional land surface parameters (not shown)
    - moisture contents (soil, vegetation)
    - Soil surface roughness
    - Land cover changes (mowing events, etc.)



Universität Rostock Traditio et Innovatio



Thanks!

Q&A on presentations

European Commission

Discussion and conclusions by the rapporteur

European Commission

Coffeebreak

Concluding session start at 15:45

European Commission

Concluding session

- Takeaways from the rapporteurs
- Next steps by CRETA
- Concluding remarks by Christian Holzleitner (DG CLIMA

European Commission

CARBON FARMING - SUMMARY CONCLUSIONS

- Existing carbon farming certification methodologies show varying degrees of alignment to the Qu.A.L.I.T.Y criteria.
  - Additionality shows a high degree of alignment.
  - Methodologies vary for quantifying the carbon removed and stored in soils (calculated, modeled, measured, and hybrid approaches) as well as for setting baselines (project baselines).
  - Long-term storage varies to the length of the crediting and monitoring periods.
  - Liability pools vary in their scale and mechanisms proposed.
- Uncertainties around length of storage of carbon in soils and the end use of certificates were raised.

Next steps

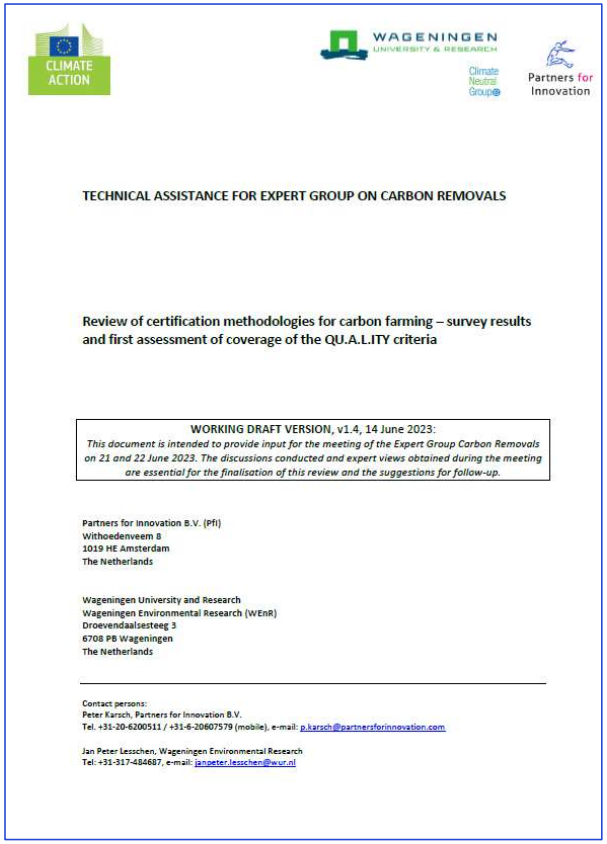
Carbon Farming

Carbon Farming meeting 22 June 2023

CRETA consortium

REVIEW OF EXISTING CERTIFICATION METHODOLOGIES

- Comments made during Expert Group meeting will be addressed
- Additional comments on Basecamp until 26 June
- Report will be finalised by half of July
- Will become publicly available



CLIMATE ACTION

WAGENINGEN UNIVERSITY & RESEARCH

Climate Neutral Group

Partners for Innovation

TECHNICAL ASSISTANCE FOR EXPERT GROUP ON CARBON REMOVALS

Review of certification methodologies for carbon farming – survey results and first assessment of coverage of the QU.A.L.ITY criteria

WORKING DRAFT VERSION, v1.4, 14 June 2023:
This document is intended to provide input for the meeting of the Expert Group Carbon Removals on 21 and 22 June 2023. The discussions conducted and expert views obtained during the meeting are essential for the finalisation of this review and the suggestions for follow-up.

Partners for Innovation B.V. (PfI)
Withoedenveem 8
1019 HE Amsterdam
The Netherlands

Wageningen University and Research
Wageningen Environmental Research (WEnR)
Droevendaalsesteeg 3
6708 PB Wageningen
The Netherlands

Contact persons:
Peter Karsch, Partners for Innovation B.V.
Tel. +31-20-6200511 / +31-6-20607579 (mobile), e-mail: p.karsch@partnersforinnovation.com

Jan Peter Lesschen, Wageningen Environmental Research
Tel: +31-317-484687, e-mail: janpeter.lesschen@wur.nl

TECHNICAL SCOPING PAPERS

- Goal: how can the QU.A.L.ITY criteria best be addressed in the development of certification methodologies in the context of the CFCR
- Build on results from review
- Include other studies that assessed methodologies, e.g. report of Ecologic
- Input from EG member: Provide comments, best practices, relevant reports, on basecamp, but make it specific
- Have discussions on specific topics with EG members, on basecamp, but maybe also online meetings
- Draft scoping papers by October/November for review
- Will be discussed during 5th EG meeting (Q1 2024)

Thank you

Contact:

janpeter.lesschen@wur.nl

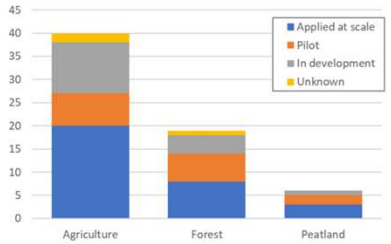
WAGENINGEN
UNIVERSITY & RESEARCH

2023 Expert Group Work Program

European Commission

From reviewing existing methodologies to drafting EU methodologies

127 responses to Survey



Q2 and Q3 2023

Scoping papers

Assessment of best practices

Q4 2023 and Q1 2024

Draft EU methodologies ("strawman")

Q2 and Q3 2024

Discussion and input from the Expert Group and stakeholders

Basecamp

European Commission

Thank you!

European Commission