



Biodiversity impacts in the value chain: St1 Cellunolix® concept

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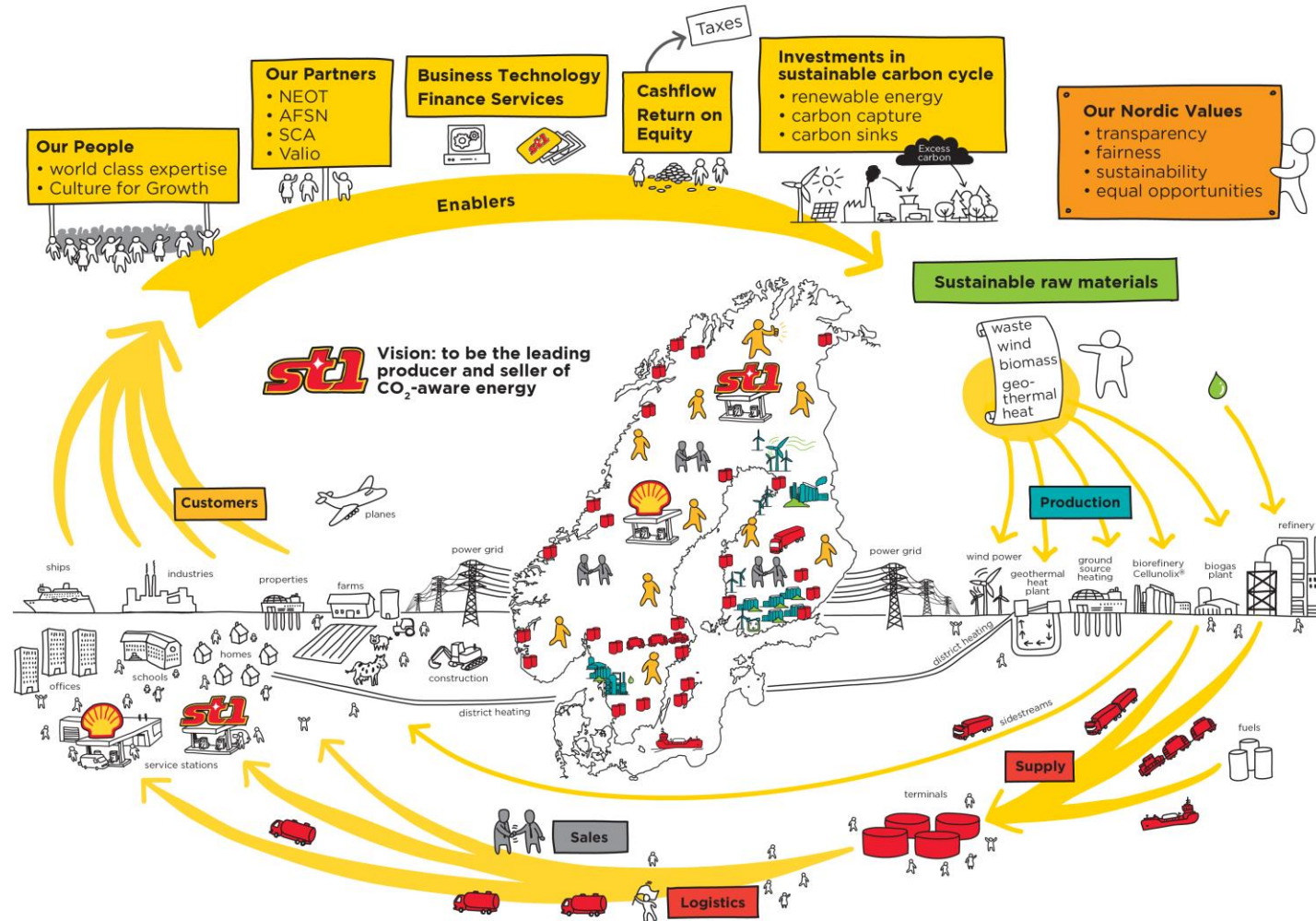
St1 solving global energy challenges

St1 Vision is to be the leading producer and seller of CO₂-aware energy

In the spirit of our vision, we research, develop, produce and invest to be able to provide our customers with CO₂-aware energy while creating positive societal impact

Our operations are strengthened by strategic long-term partnerships in various areas

GROUP STRATEGY: **st1** VALUE CHAIN



www.st1.com

St1 Biorefining



GOTHENBURG BIOREFINERY

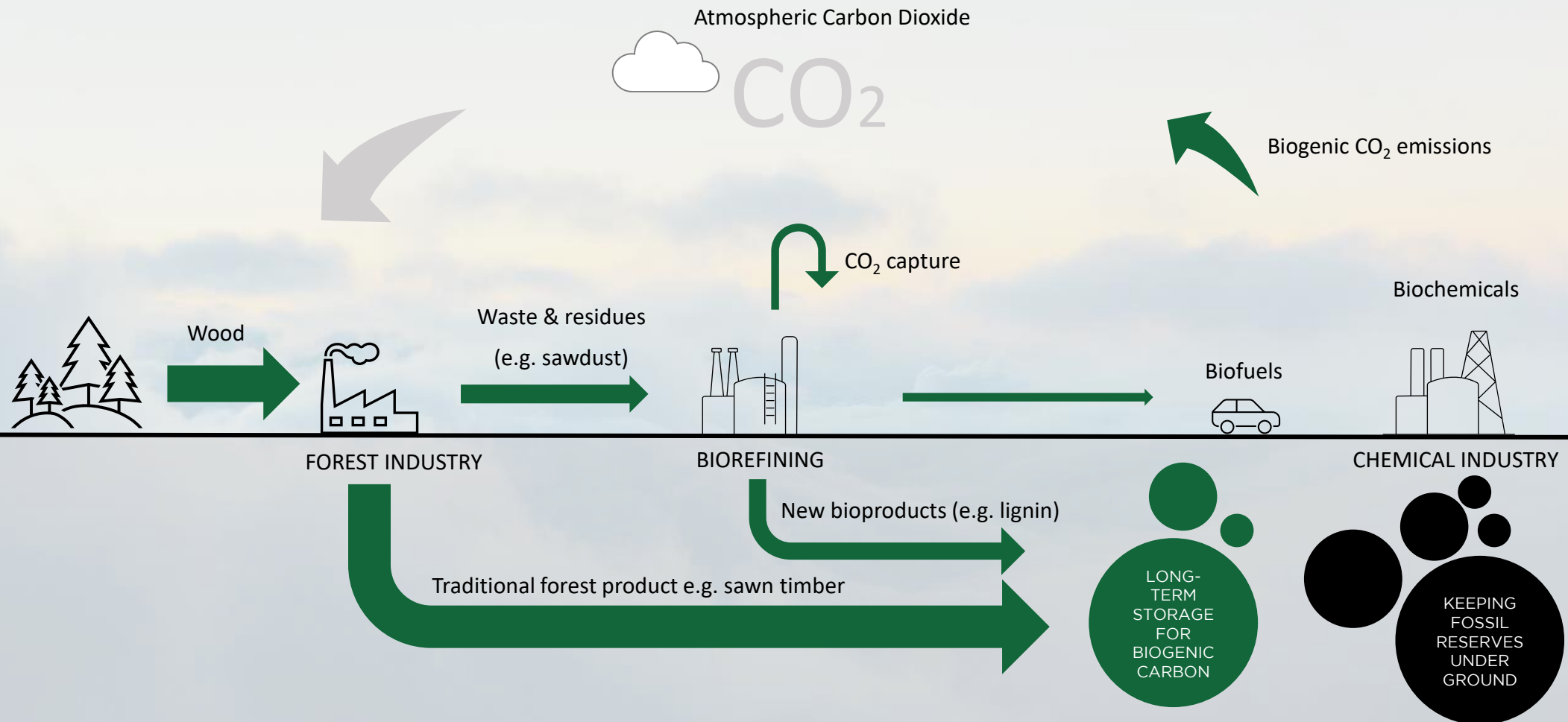
- A biorefinery is under construction at our oil refinery area in Gothenburg
 - The aim is to start the operations in the end of 2023
- In preparation, new hydrogen unit was commissioned in 2020
- The design of the biorefinery allows the use of a wide range of feedstocks with a yearly capacity of 200 kilotonnes
- The unit is capable of meeting the current and future specifications of the renewable fuels to be produced, which include HVO diesel, sustainable aviation fuel (SAF), and naphtha



RENEWABLE ETHANOL

- St1 is producing advanced ethanol fuel in Finnish and Swedish biorefineries
- Etanolix®, and Cellunolix®
- 100 % of the feedstocks are waste or residues, such as biowaste and sawdust
- Bioproduct portfolio varies depending on feedstock & process
- St1 is developing new advanced biorefining technologies with a strong focus on lignocellulosic feedstocks

CELLUNOLIX® BIOREFINING VALUE CHAIN



CELLUNOLIX® CONCEPT

In addition to ethanol, Cellunolix® biorefinery produces significant amounts of bio-based chemicals.



Bio-based
chemicals

Composites,
activated carbon,
biochar,
resins etc.

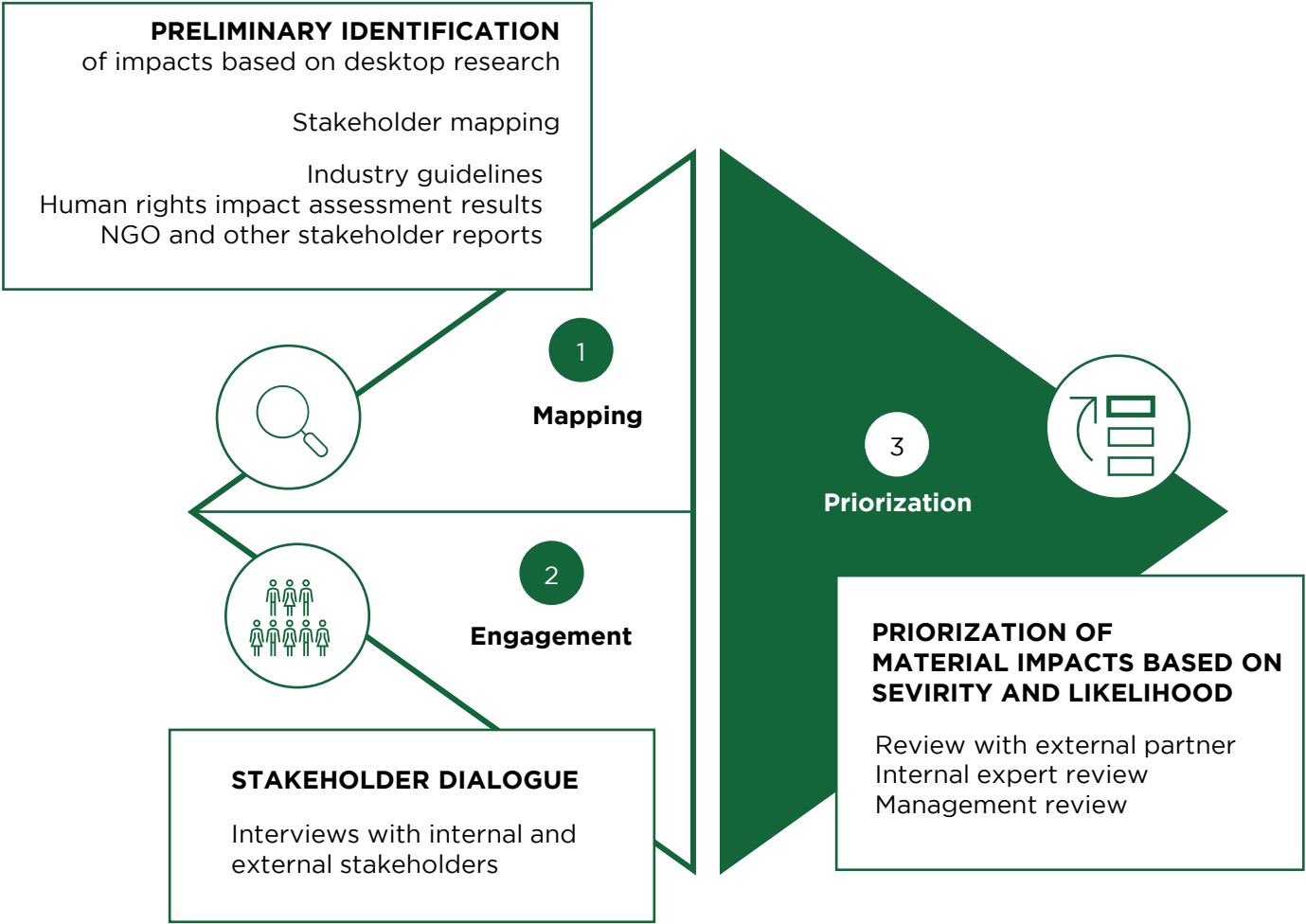
Organic
fertilizer

Biodiversity at St1

St1 GROUP LEVEL MATERIALITY ASSESSMENT



Materiality assessment (2022) helped us to identify, understand and highlight specific sustainability negative and positive impacts we have throughout our value chain on people and environment.



Severity



Scale

How grave/serious the impact would be?



Scope

How widespread would the impact be?
How many people affected?



Remediability

How hard would it be to put it right?

Likelihood



Nature of the business activity

How common the issue for the industry/sector?



Nature of the operating context

How common the issue for the country/region? Is there legal mechanism in place?



Nature of the business relationships

How many actors are involved/is there lack of visibility in the supply chain?

Selected material topics



Health, Safety,
Security &
Environment
(HSSE)



Supply Chain
Sustainability



Diversity & Equal
Opportunities



Biodiversity



Energy transition
and Climate impact



Energy Security

St1 SUSTAINABILITY OBJECTIVES



	Material topic	Sustainability objective	SDG	ESG	Performance highlights in 2022	Action points going forward
We are developing best-in-class ESG stewardship, by being a trustworthy and responsible actor, and a desirable partner in the energy sector	1	Sustainability governance is integrated into our core processes and decision making		Governance	- Code of conduct training is created - Materiality assessment is performed - Gap analysis of our operations against UN Guiding Principles and OECD Due Diligence guidelines	- Increase competence in Human and labor rights for management - Continue development of Group level sustainability roadmap - Increase due diligence competence in organization - Integrate sustainability criteria into project management frameworks
	Energy transition and Climate impact 2	We set measurable and effective emissions reduction targets and introduce new feedstocks to improve energy diversity		Environment	- Acquiring Brocklesby Ltd. - Biogas JV together with Valio - Developing wind portfolio - Developing energy transition roadmap	- SBTi method implementation - Establish carbon intensity (gCO₂e/MJ) targets for scopes 1, 2 and further developing scope 3 - Progress Wind & Biogas GWh targets - St1 Gothenburg Biorefinery startup
	Supply chain sustainability 3	We are developing compliant and transparent supply chain as well as more sustainable production		Environment, Social	- Development of third-party due diligence pilot process - The majority of main business partners and supplier screened against social criteria - ISCC certification obtained	- Development of centralized Group level supplier due diligence process - Develop social and environmental criteria for supplier sustainability audit - Create human rights training for our suppliers and business partners - Expand ISCC certification scope to St1 Green Processing Unit
	Energy security 4	We develop a sustainable retail network in the Nordics		Environmental, Social	- Investment in electric vehicle charging network - Digital solution for labour rights tracking - HSSE focus and training	- Expand EV charging network in the Nordics - Employee retention and talent development - Work with suppliers to unpack value chains and create transparency
	Biodiversity 5	We work to protect biodiversity and mitigate negative impacts through own operations and supply chain		Environmental	- Biodiversity is integrated into carbon sequestration project selection criteria - Biodiversity impact assessment started for biorefinery concept	- Conduct environmental impact assessment for St1 value chain - Increase internal competence
People are the heart of our value chain	Non-discrimination and equal opportunities 6	We aim for balanced representation and have zero tolerance in discrimination at all levels of employment.		Social	- Improved recruitment practices to minimize the risk of unconscious biases - Pay gap analysis	Increase internal and external (Game Changer) communication regards to, recruitment practices, wellness frequency, overtime capture, gender balance
	Health, Safety, Security & Environment (HSSE) 7	We will align our HSSE processes to industry best practice in the Nordics		Governance, Social	TRCF targets for St1 employees	- Develop Group level Health and Safety targets for contract labor - Establish a panel group to measure and develop Security and Environment objectives

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Piloting the screening of nature-related impacts in the CELLUNOLIX® value chain

BIODIVERSITY IMPACT ASSESSMENT IN THE CELLUNOLIX® VALUE CHAIN

Why to assess?

External pressure

Internal commitment

Legislation

Available funding

Goals

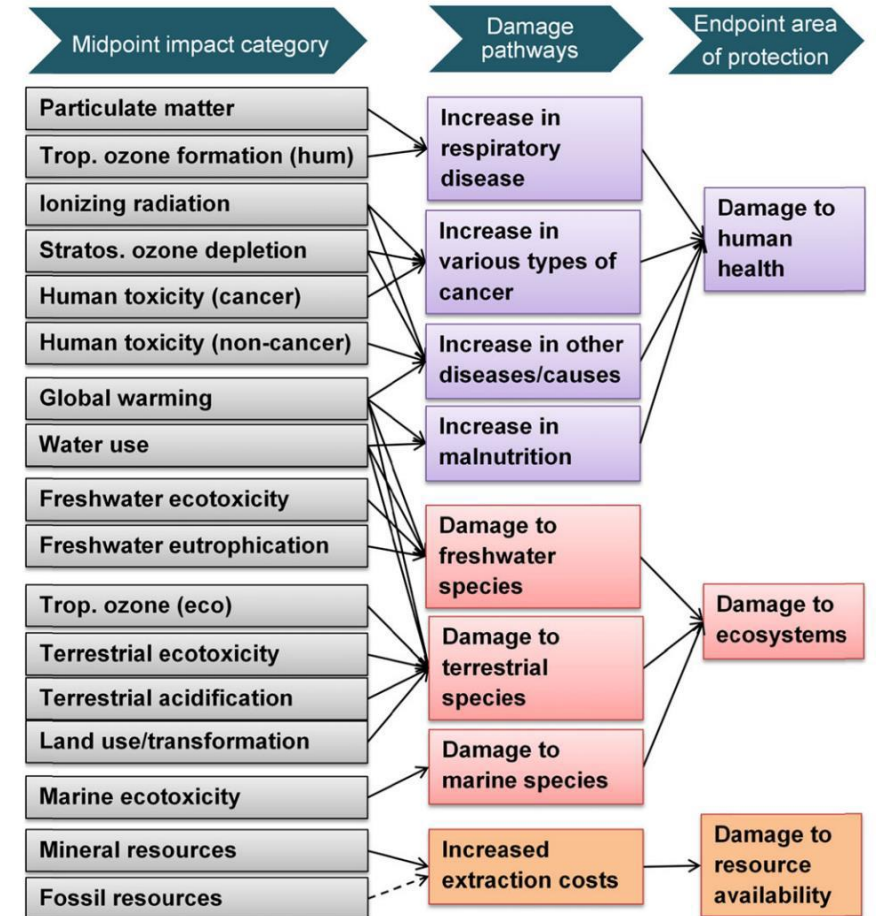
- **Increase the understanding** of the main biodiversity impacts within the Cellunolix® biorefining value chain
- Assess their **materiality**
- Provide **recommendations** to mitigate these impacts

METHODS AND TOOLS

- Materiality assessment included:
 - Expert-assisted workshops
 - Literature review
 - ENCORE tool

Align with Step 1 of the Science-Based Targets for Nature -framework (SBTN)

- The biodiversity impact of the **upstream value chain** and a simplified version of direct operations:
 - Quantitative assessment with a Life Cycle Impact Assessment (LCIA) -based method
 - ReCiPe2016
 - Unit: species.year



Overview of the midpoint impact categories covered in the ReCiPe2016 method and their relation to the endpoint areas of protection.

KEY RESULTS FROM THE ASSESSMENTS

CELLUNOLIX® VALUE CHAIN

Upstream

- St1 complies with renewable energy raw material sourcing strict regulation including the biodiversity criteria, **EU RED II**

- LCIA highlights:
 - **GHG emissions**
 - **Terrestrial ecosystem use**
 - **Water use**
- Raw materials causing the biggest impact on biodiversity
 - **Sawdust**
 - **Chemicals**

Direct operations

- Compliant with **Finnish national regulation (EIA)**:
 - No significant risks to surrounding environment

- LCIA highlights:
 - **GHG emissions**
 - **Water use**

Downstream

- Renewable products compliant with **RED II**.

- **Biodiversity handprint potential** of bioethanol and other bioproducts can be assessed when assessment methods are more mature

MITIGATION:

- Supplier engagement
- GHG emission mitigation
- Site specific analysis
- Keeping up to date with the development of the ecological compensation market



Thank you!