



Caverion



Energiategollisuus



FINNAIR

fortum

Gasum



ILMARINEN



LUT  
Lappeenranta  
University of Technology



NESTE

NOKIA

Nordea

Outotec



PORVOON ENERGIA  
BORGÅ ENERGI



RAISIO



S-RYHMÄ

SITRA

SKF



Teknologiateollisuus



Telia

Turku Energia



TURKU

uponor

VAISALA



Turun yliopisto  
University of Turku



ÅLANDSBANKEN



## CLIMATE CORE: CREATING THE BIOVALLEY EARTO, 20 MAR 19

Henrik Ehrnrooth  
Chairman, Climate Leadership Council



## Topics

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Introduction: bioeconomy as a core component against climate change

Creating the Nordic Biovalley

CLC, cities, business and R&D working together

Key questions



# ALL SECTORS NEED TO CHANGE

Climate change and other megatrends  
are not separate

Megatrends are intertwined:

- Digitalisation and circular economy
- Bio-economy
- No-carbon/lo-carbon energy economy

**The result is a lot of large business opportunities**

# EVERYTHING WILL CHANGE...

## De/recarbonising industry



## Prices, taxes and financing



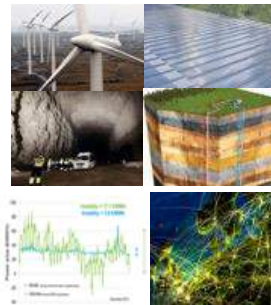
## New materials, active buildings



## Activating citizens



## New energy, storages



## Sustainable forestry and land use



## New "fuels" for transport



## New market mechanisms, smart grid

### ICT, IoT everywhere

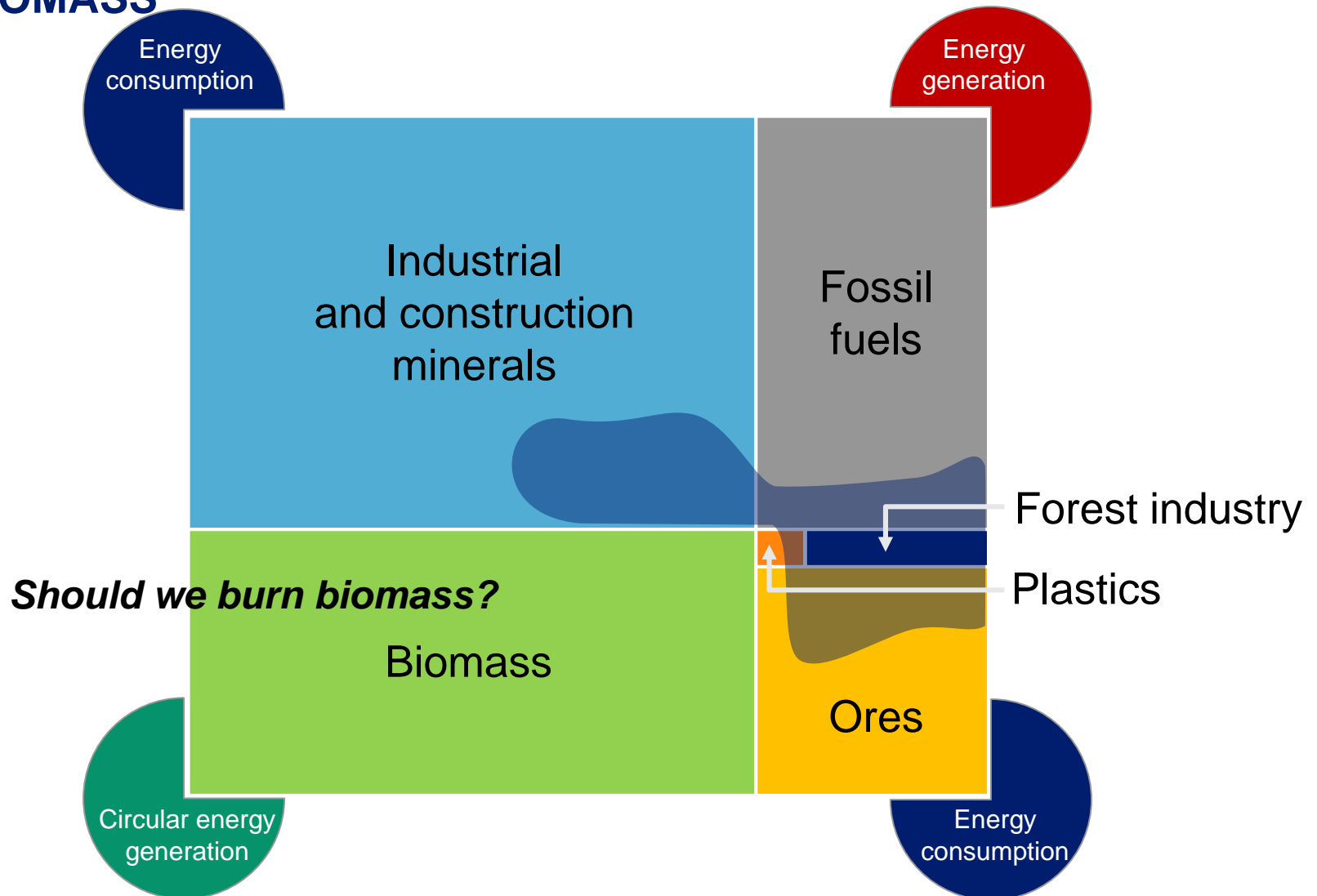


## New agriculture, also C sinks



J Keronen, Climate Leadership Coalition

# BUILDING BLOCKS OF HUMAN ENVIRONMENT: THE EXPANDING BIOMASS



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CLC and businesses acting together

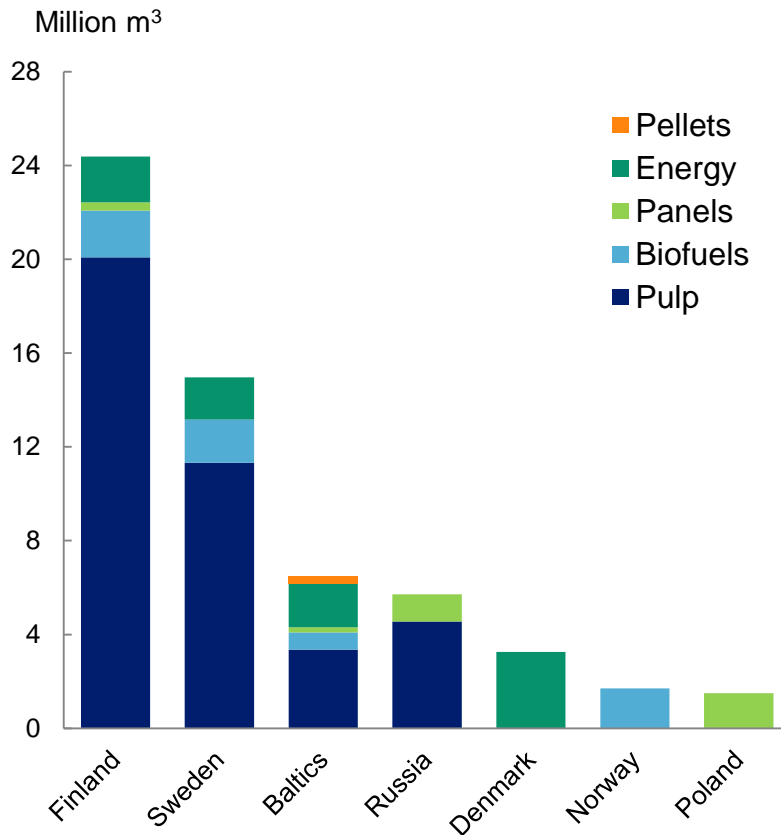
Key questions



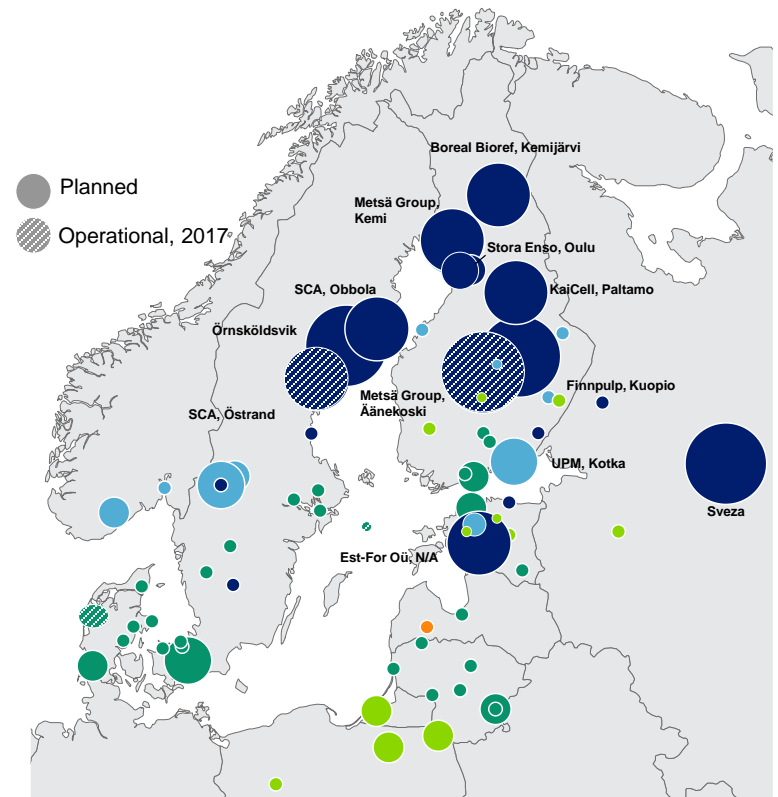
# PLANNED BIOINVESTMENTS AROUND THE BALTIC SEA: HOTZONE

The Baltic Sea region is the most active investment area in Europe

Wood intake capacity of planned investments

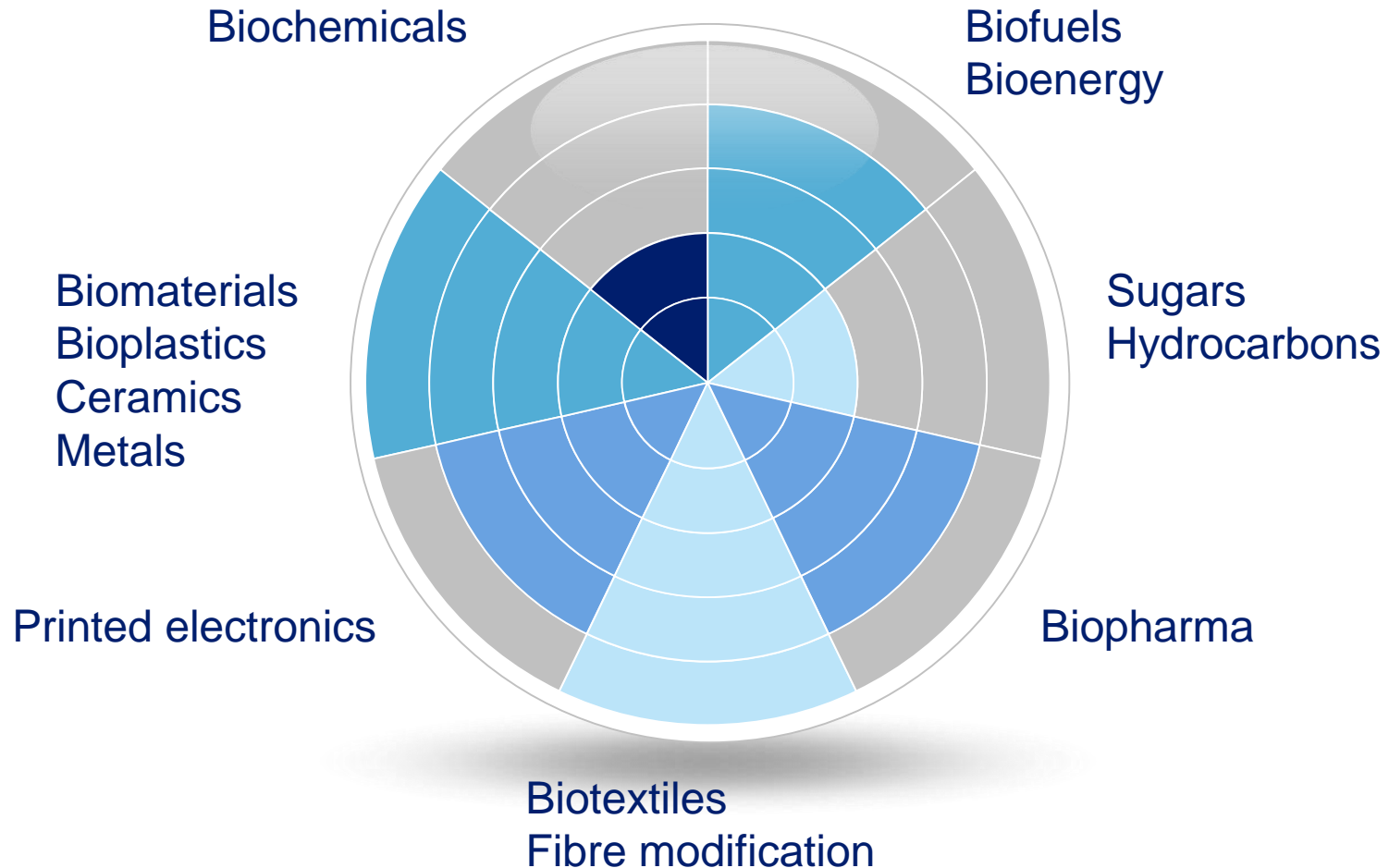


Investment pipeline around the Baltic Sea



# WHAT IS "BIOECONOMY"?

Bioeconomy already consists of expected and unexpected combinations of expertise





# THROUGH THE QUANTUM LOOKING GLASS



**Everything  
changes at nano-  
and quantum scale**

# SIX MUST-WINS

1

**Biobatteries and organic electronics platform**

4

**Biotextiles platform**

2

**Nanocellulose platform**

5

**Sugar platform**

3

**Carbon fibre and carbon materials platform**

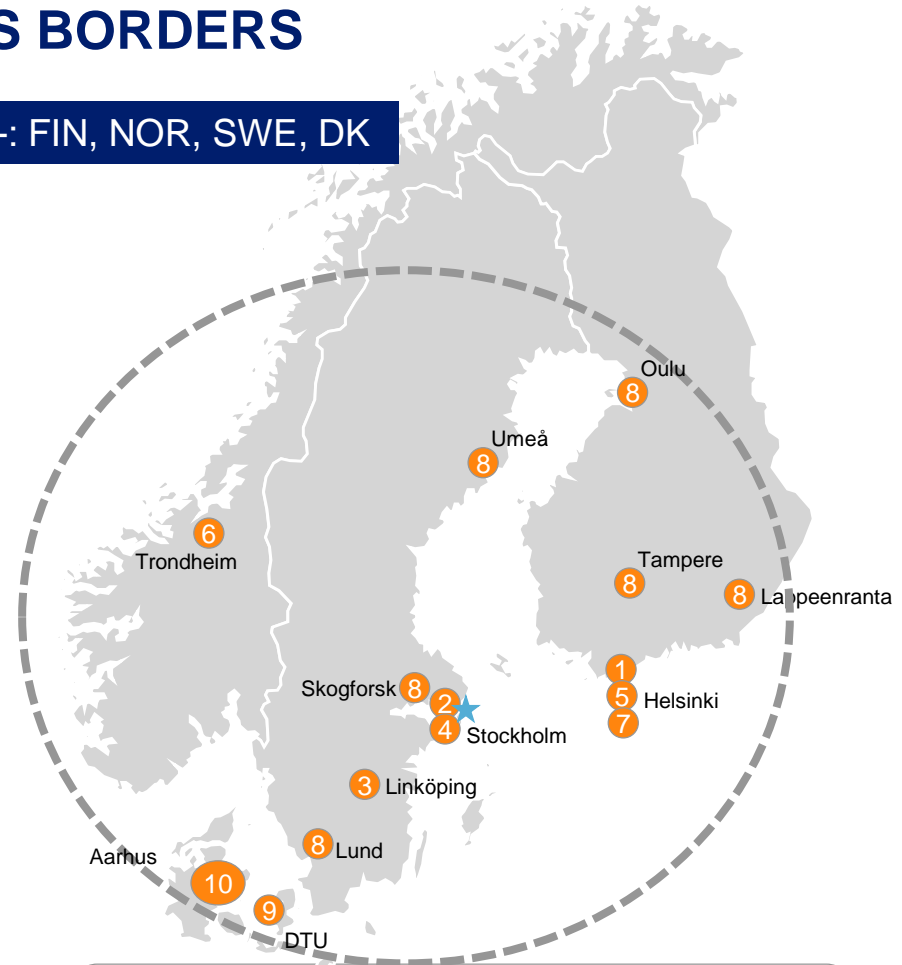
6

**Lignin platform**

# NORDIC RESEARCH UNDER HEADING "BIOECONOMY" – AND CREATING A BIOVALLEY ACROSS BORDERS

Small selection of research in bioeconomy, Top-10+: FIN, NOR, SWE, DK

- Aalto University(FI)
- VTT (FI)
- RISE(SE)
- Linköping University(SE)
- KTH(SE)
- NRIF(FI)
- PFI (NO) (part of RISE)
- **IN ADDITION AMONG OTHERS (FI, SWE)**  
SLU, Lappeenranta UT, Tampere UT, Lund U, Umeå U, Skogforsk, Oulu U
- DTU (DK)
- Aarhus University (DK)



## The whole research chain from forest to product

- Overlapping research across universities and research organisations

★ Wallenberg Wood Science Centre

# BIOVALLEY COMPONENTS: EXAMPLES

World class Nordic infrastructure already *de facto* crystallising into Biovalley

"Senses"

Lund MAX IV



Norwegian U of Life Sci



NRIF, FI



"Ecosites"

VTT Bioruukki



Smart Chemistry Park



Danish Biotech Ecosystem



"Critical mass"

Institutes and Univ.



"Connectors and funding"

Public/private



BUSINESS  
FINLAND

VINNOVA  
Sveriges innovationsmyndighet

THE WALLENBERG FOUNDATIONS  
dedicated to excellence in research since 1917



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## BOARD AND SOME DISTINGUISHED MEMBERS

<b>Chairman:</b>	<b>Henrik Ehrnrooth</b> , Chairman, Pöyry, Otava
<b>Vice-chairman:</b>	<b>Jorma Ollila</b> , Former Chairman, Nokia, Shell, Outokumpu
<b>Members:</b>	<b>Minna Arve</b> , Mayor, Turku <b>Jaakko Eskola</b> , CEO, Wärtsilä <b>Pekka Lundmark</b> , CEO, Fortum <b>Risto Murto</b> , CEO, Varma <b>Karl-Henrik Sundström</b> , CEO, Stora Enso
<b>Personal members:</b>	<b>Louis Blumberg</b> , CEO, Blumberg West Consulting, California <b>Ian Dunlop</b> , former oil, gas & coal executive, Chair, ETS Australia <b>Allen Herskowitz</b> , Chairman, Sport and Sustainability International <b>Pertti Korhonen</b> , Chairman, Business Finland <b>Sirpa Pietikäinen</b> , Member of the European Parliament <b>Raimo Sailas</b> , former Secretary of the State <b>Petteri Taalas</b> , Secretary General, WMO <b>Risto Volanen</b> , former Secretary of the State and CEO, Copa-Cogeca <b>Anders Wijkman</b> , Co-president, Club of Rome



A large transition is needed

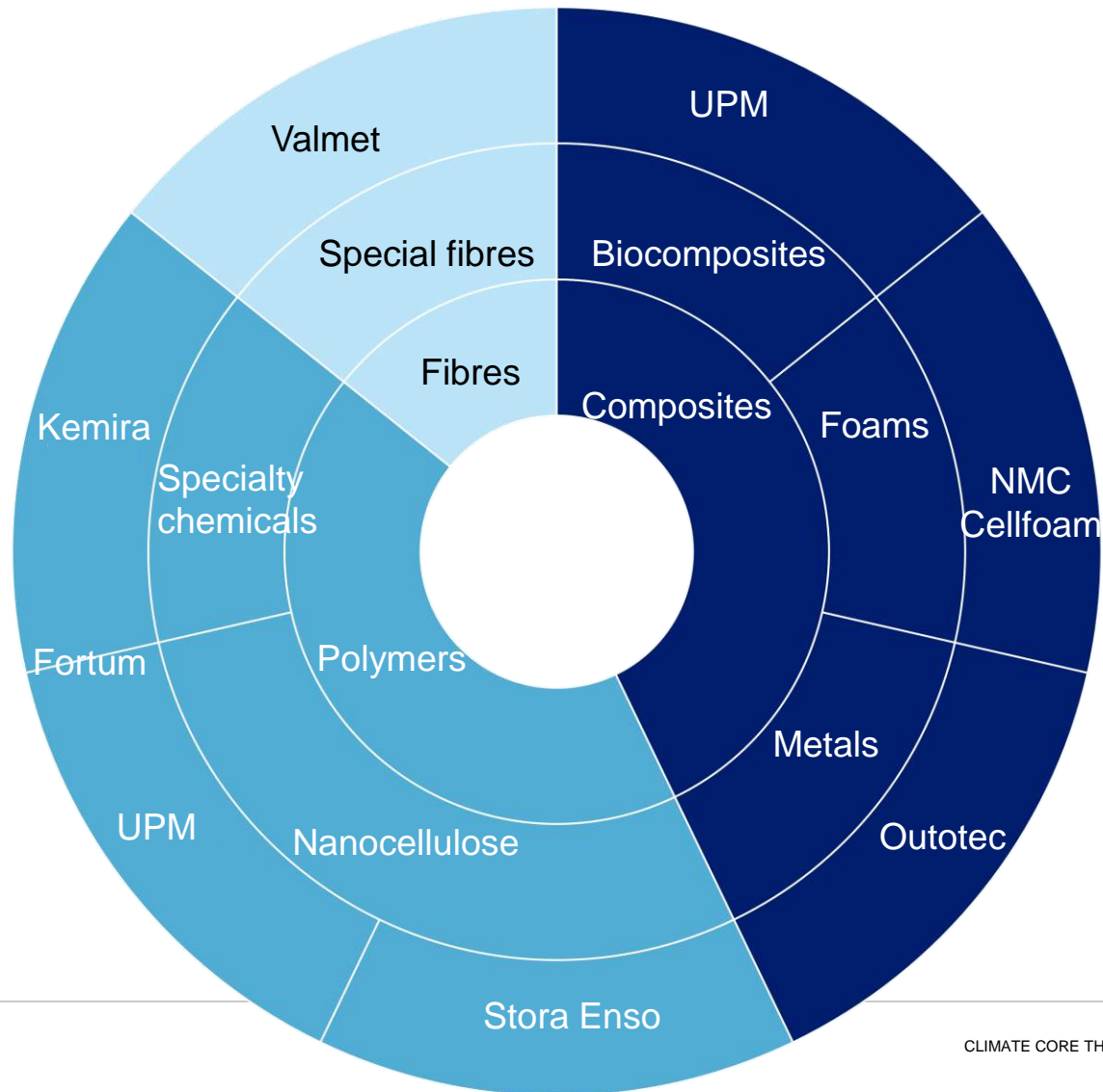
Systemic solution

Green business is profitable

We need to price emissions

# COMPANIES ALREADY ACTIVE: EXAMPLE FINLAND

Companies are already present in areas of promise for e.g. biomaterials





# CHALLENGES TO CREATE NEW GREEN BUSINESS FROM SUBSTITUTION

**1%**

## **BIOPLASTICS**

Cleaning the environment

**3.5 billion EUR/a**

**1%**

## **BIOPACKAGING**

Better sustainable packaging

**6 billion EUR/a**

**1%**

## **COTTON**

Saving water

**~0.5 billion EUR/a**

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**10 billion EUR/a**  
**Business of 1 ‘% solution’**

**1%**

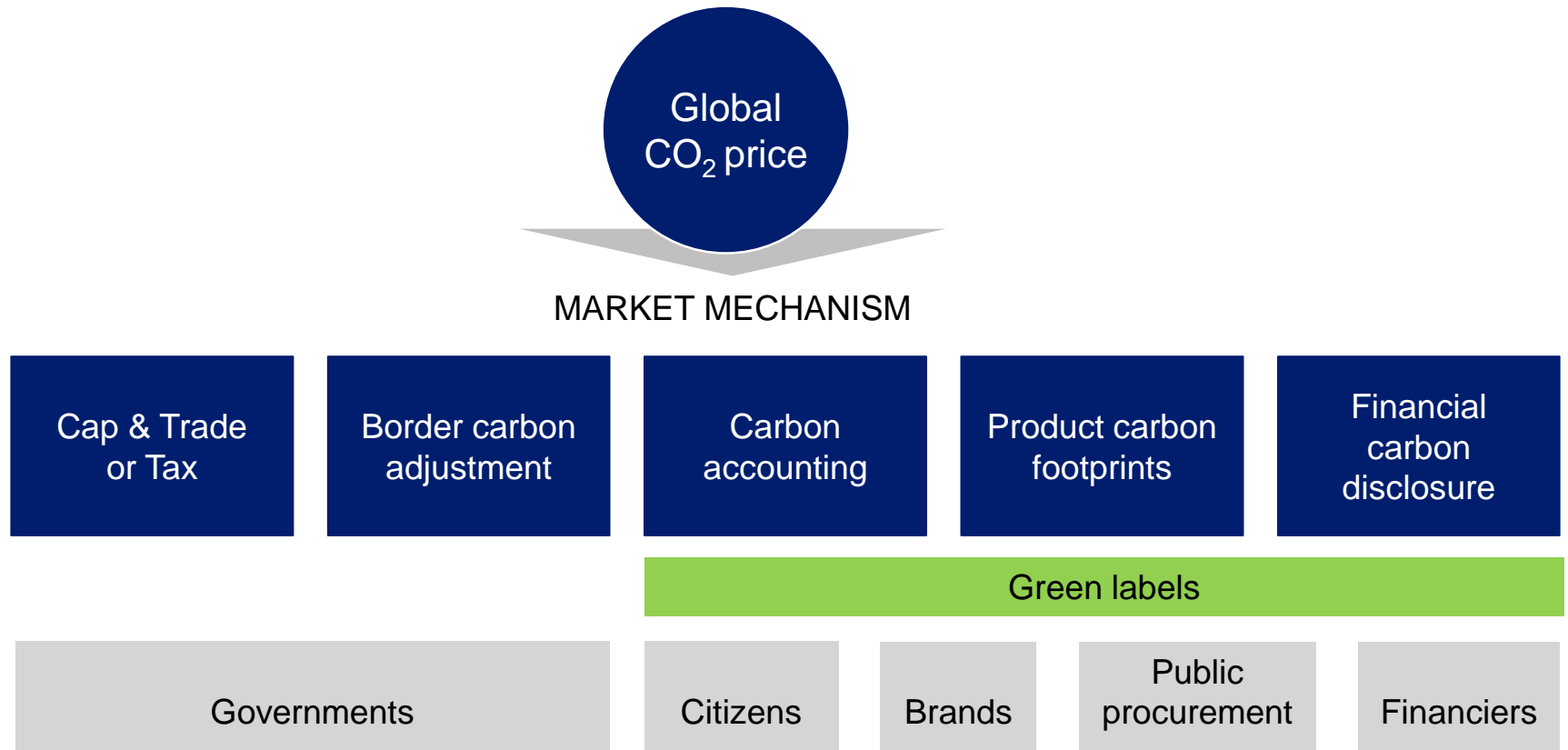
## **COAL**

Land impact

**28 Mha**

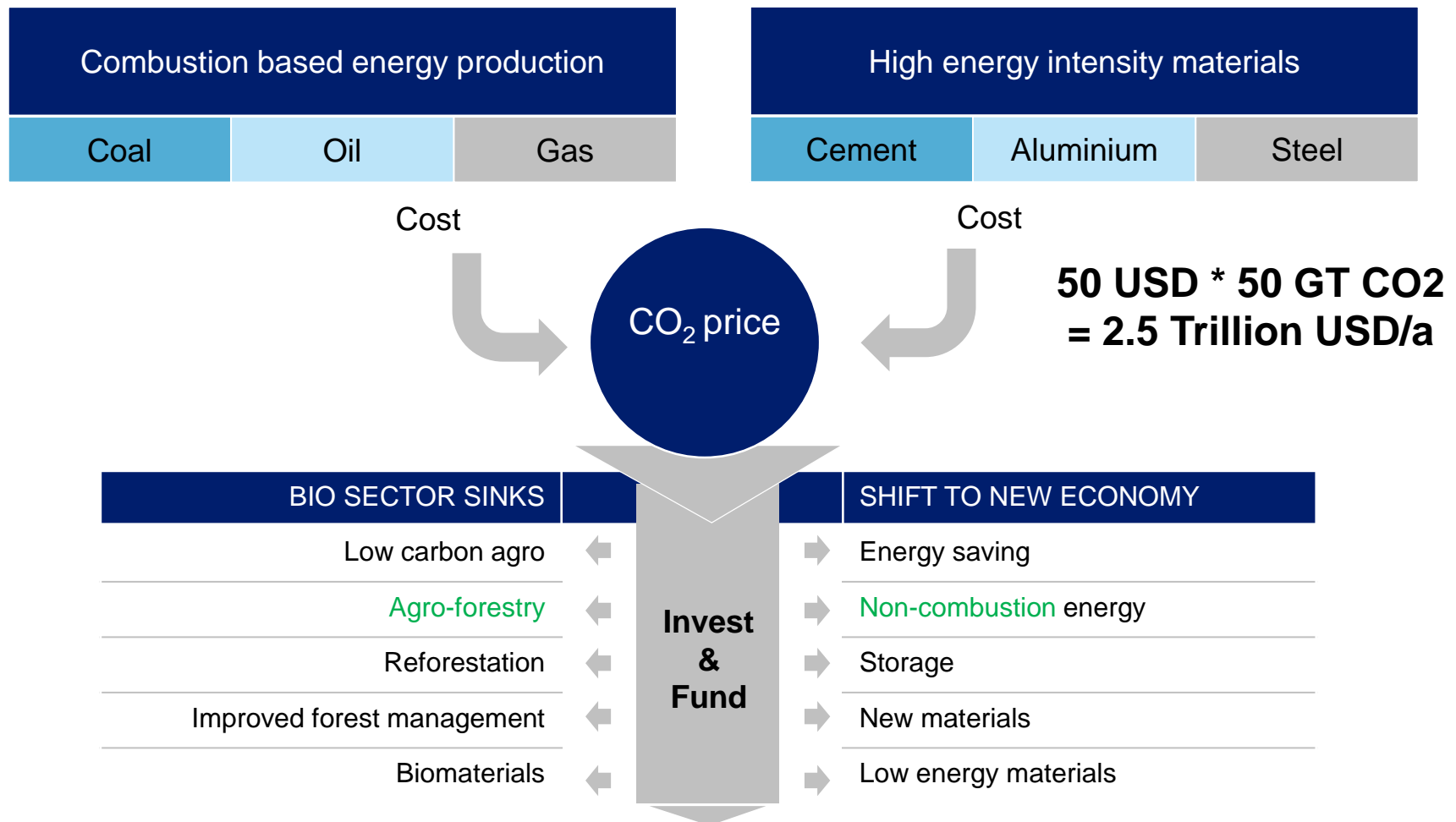
# MARKET DRIVEN SHIFT TOWARDS NEW ECONOMY

Putting a price on CO<sub>2</sub> creates a mechanism driving change



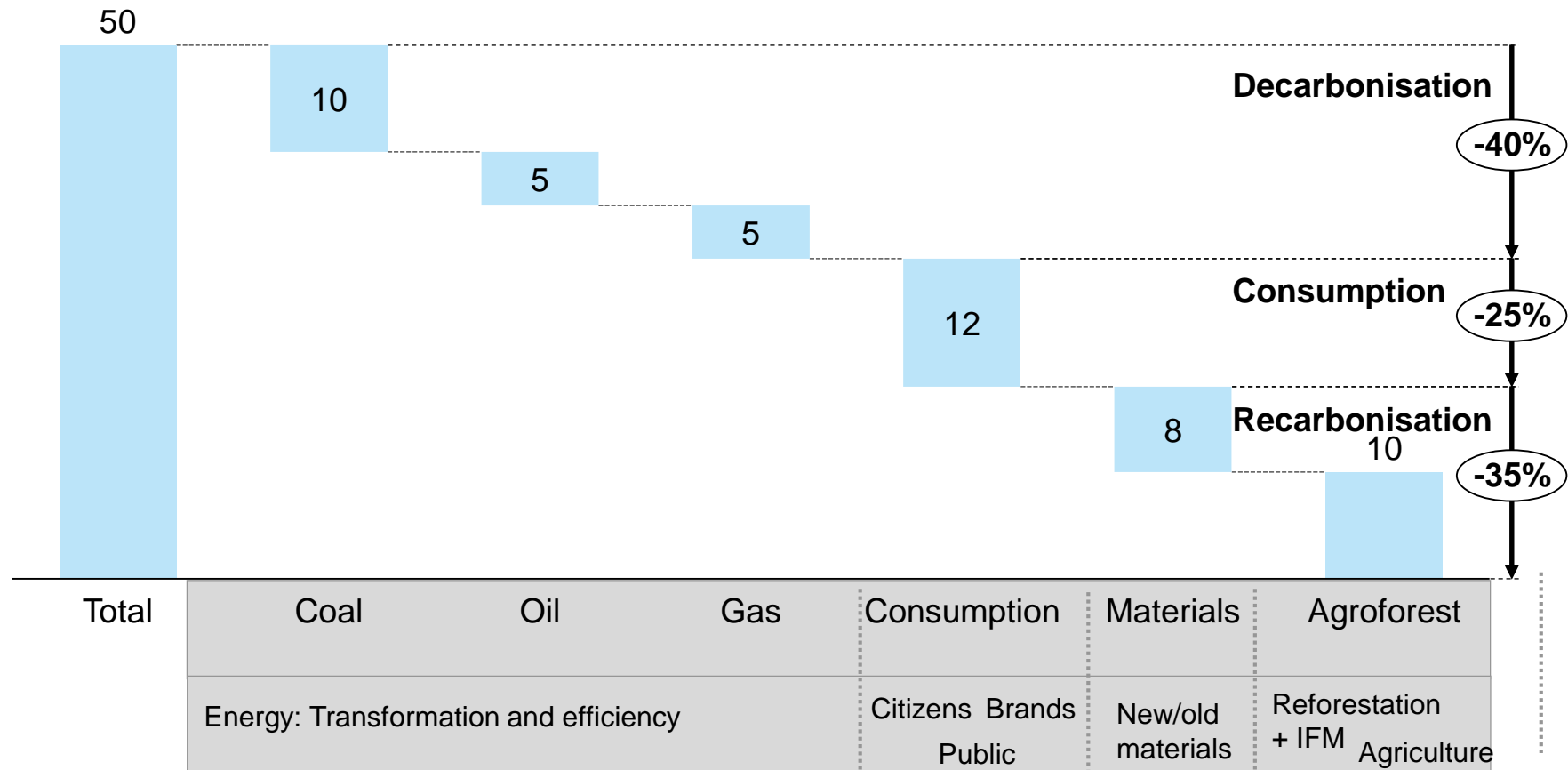
# FUNDING OF NEW ECONOMY

Pricing pollution creates funding for change



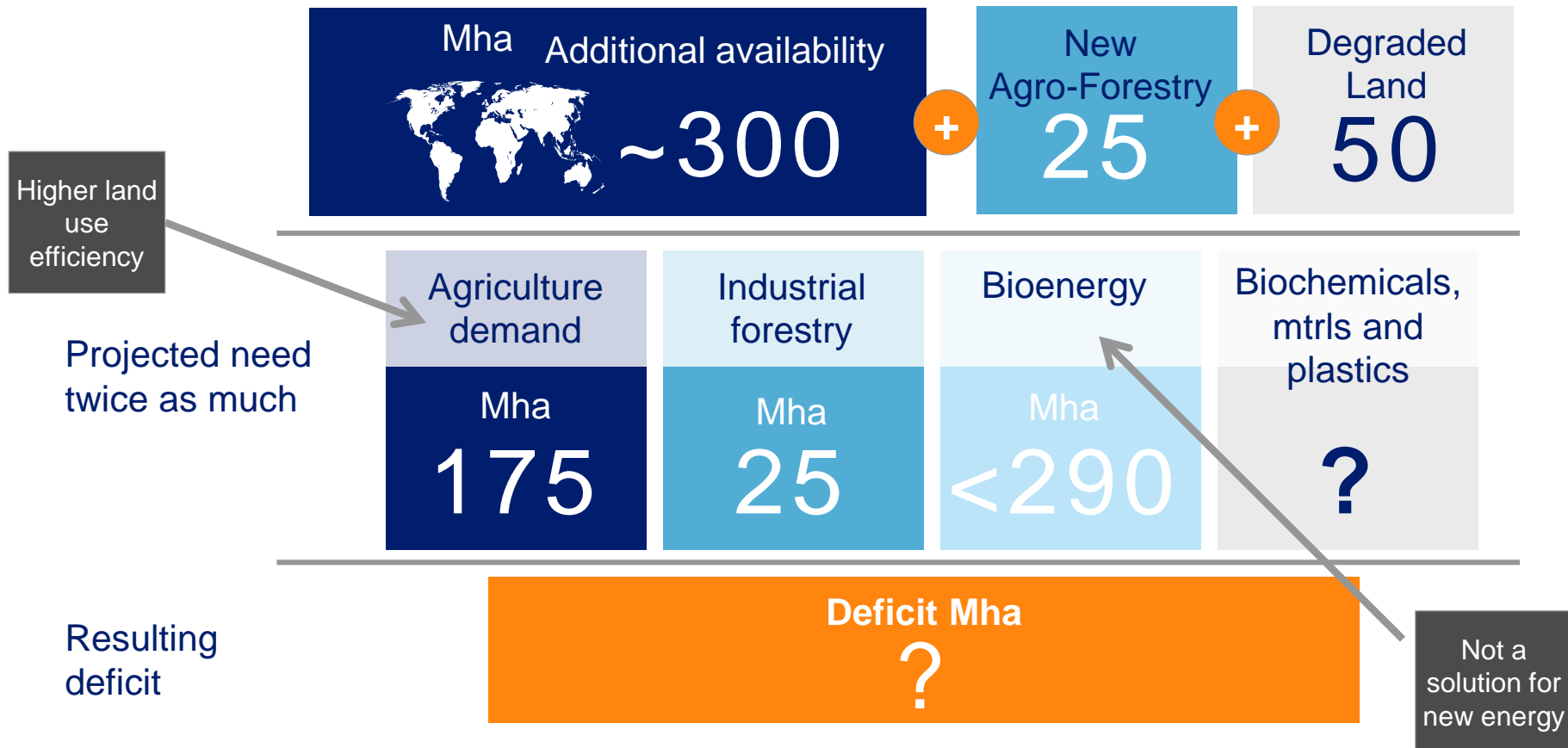
# EFFECTS OF CARBON PRICING

Estimating economic pathways for climate mitigation: what is the balance between decarbonisation of energy, consumption patterns and recarbonisation of materials?



# NATURAL SOLUTIONS ARE NOT A WELL-UNDERSTOOD OPPORTUNITY

Holistic view on agriculture and forestry increases available land for sinks - biofuels are a side-stream not a silver bullet for green energy



Source: Nilsson (2007)

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# KEY QUESTIONS



1. How can EARTO, organisations like CLC and companies work together to bring bioeconomy and Biovalley forward?
2. Tipping point: how can research institutes be joint leaders at this crucial moment of change – in technology, climate and society?

# Climate Leadership Coalition – developing business solutions for climate change



## International network



J Keronen, Climate Leadership Coalition

