

# **Sininen bio- ja kiertotalous**

**Suomen mahdollisuudet kansainväliseen kasvuun**

**Sinisen biotalouden kärkihanketilaisuus 15.3.2019**

**TkT Ilmari Absetz,  
Ohjelmajohtaja, bio ja kiertotalous  
Business Finland**





# WE ARE WORLD CLASS FORERUNNERS IN SUSTAINABLE SOLUTIONS

BUSINESS  
**FINLAND**

## **Best Environmental Performance in the World Environmental Performance Index 2016 (EPI)**

EPI ranks the performance of 180 countries on protection of human health and protection of ecosystems.

## **World Class Cleantech Innovation 2017 Global Innovation Index**

Finland ranked #2 in global cleantech innovation.

## **Finland makes excellent use of its human capital Human Capital report 2017, World Economic Forum**

Finland ranks # 2 in human capital based on indicators such as education, well-being and employment.

## **Finland — doing the most good for the world The Good Country Index 2019**

The Good Country Index a measure of what each country on earth contributes to the common good of humanity.

## **The Happiest People on the Planet World Happiness Report 2018**

The Finns topped both overall and immigrant happiness.

## **Best Quality of Life in the EU Eurostat 2019**

With Denmark, Finland ranks #1 in quality of life in the EU.





**INTERNATIONAL  
GROWTH**

# **BUSINESS FINLAND MISSION IS GROWTH, RENEWAL AND SUCCESS**

**Promoting Innovation**

**Promoting Exports**

**Attracting investments and travelers**



**BEST ECOSYSTEMS  
IN THE WORLD**

## **Tools**

- Research and innovation funding
- Guidance and coaching
- Networking and contacts
- Expertise and vision of our domestic and International networks
- Theme choices and programs



# FINLAND - THE SUPER-POWER IN SMART & SUSTAINABLE SOLUTIONS

## SOLUTIONS

The circular economy provides opportunities for Finland's traditional key industries, but also offers vast unexplored potential for entirely new business.

- Efficient cycles of scarce resources
- Bio-based , recyclable and ecological materials
- From fossil to renewable energy resources
- Nutrient and water cycles
- Towards zero-waste
- Services replacing ownership
- Circular design enabling long life of products and effective material cycles

# #1

Finland ranked  
the leading  
contributor to  
humanity



# BIO AND CIRCULAR FINLAND

Program 2019 – 2022,  
innovaatiorahoitus 150 M€

## VISION

- Finland is showing the way for solving global challenges and Finnish bio and circular solutions are utilized globally.

## PURPOSE

- Develop competitive Finnish bio and circular based solutions and ecosystems which solve grand challenges and have huge potential to known global markets
- Enhance the export growth of Finnish bio and circular solutions and ecosystems.





# MAIN GOALS

## ■ Revolution to new textiles

- Forest-Based Textiles and/or New High-Value Products
- Textile Re-Use and Material Circulation
- Circular economy data platforms and business concepts
- Finland has a concept and commercial reference process on textile circulation and growing SME's
- World-class competence, 3-4 pilot/demo plants and 2-3 investment decisions (estimated 200 M€ including invest in Finland)



## ■ From Forest via sea to end customers - together with Smart Mobility Program

- Autonomous and smart logistics save 10 %
- Continuous container monitoring and tracking create new customer value
- Finnish forest industry large companies, sawmills, value added products
- One world class demo (Rauma) including forest, mill, ground and marine digitalized smart logistics

## ■ Circular Economy of Plastics

- New biodegradable plastics, 1-2 pilot plants
- World-class competence ecosystem for plastic circulation new businesses
- 2 new markets in developing countries
- 2-3 circular plastic pilot refineries, 1-2 investment decisions, and globally scalable concepts in Finland



## ■ Integrator business models with licencing and services

- Ecosystem export and scale-up with global investors created, tested and used successfully





# A circular economy ecosystem





A photograph of a paved road with a dashed center line and a large white arrow pointing forward. The road is flanked by green vegetation. The text "CASE EXAMPLES:" is overlaid in the center of the image.

**CASE EXAMPLES:**



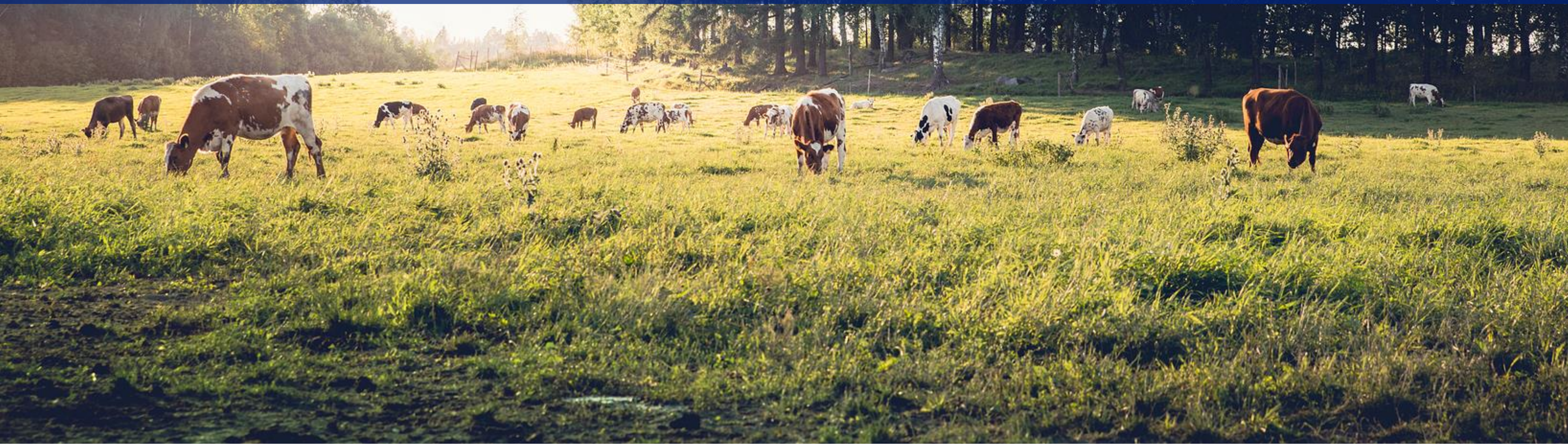
## **Fortum ForBest – More Environmentally Friendly Textiles from Wood**

Fortum is developing high-value products from agro residues and woody biomass to replace the use of fossil and other environmentally taxing raw materials.



## CARBO – Towards Carbon Neutral Milk Chain

Valio's vision is to develop a carbon neutral milk chain based on the Finnish grasslands. This CARBO project and the ecosystem that is created aims at radical reduction of greenhouse gas emissions in milk production chain by utilizing different technologies as well as development of long-term carbon sinks in grasslands.





# Breakthrough in nutrient recycling

## -ecosystem

### Goal:

To accomplish the breakthrough in nutrient recycling and to create new Finnish business for international markets

### Business spearheads:

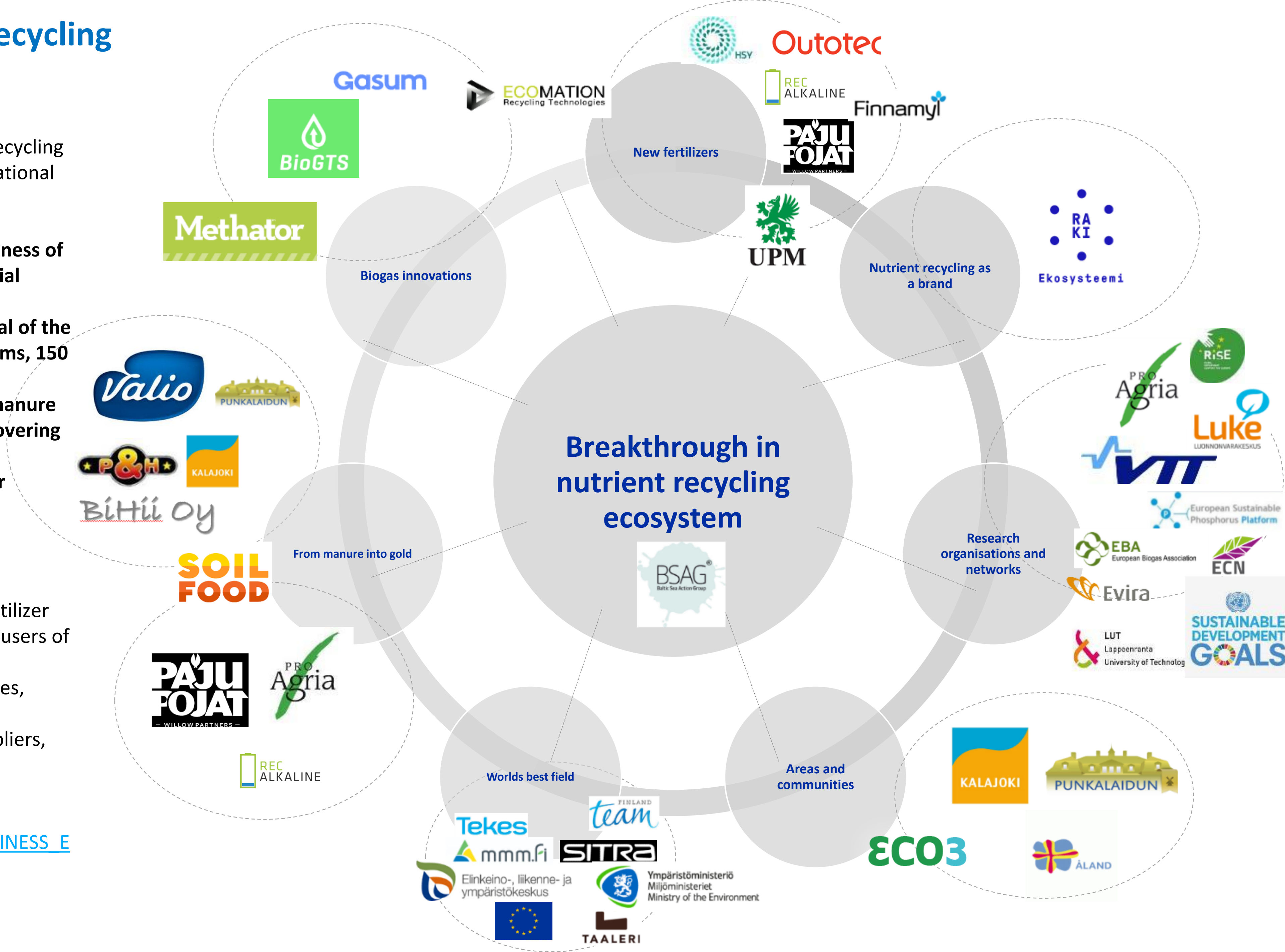
1. Worlds best field: **improving productiveness of the soil, carbon storage, market potential globally 1 mrd. €**
2. From manure into gold: **Market potential of the optimal use of manures nutrients in farms, 150 milj. €**
3. Biogas innovations: **Decomposition of manure and other nutritive substances and recovering nutrients, market potential 17 TWh**
4. Future fertilizers: **New recycled fertilizer industry, market potential 15-50 milj. €**
5. To make recycling of nutrients a brand.

### Ecosystem accompanies:

- Biogas technology providers, recycled fertilizer producers, soil improvement actors, end users of nutrition products
- SME's, large scale companies, communities, research organisations
- Raw material producers, technology suppliers, end users

### More information:

[http://www.bsag.fi/NUTRIENT\\_CYCLING\\_BUSINESS\\_ECOSYSTEM\\_FI.html](http://www.bsag.fi/NUTRIENT_CYCLING_BUSINESS_ECOSYSTEM_FI.html)





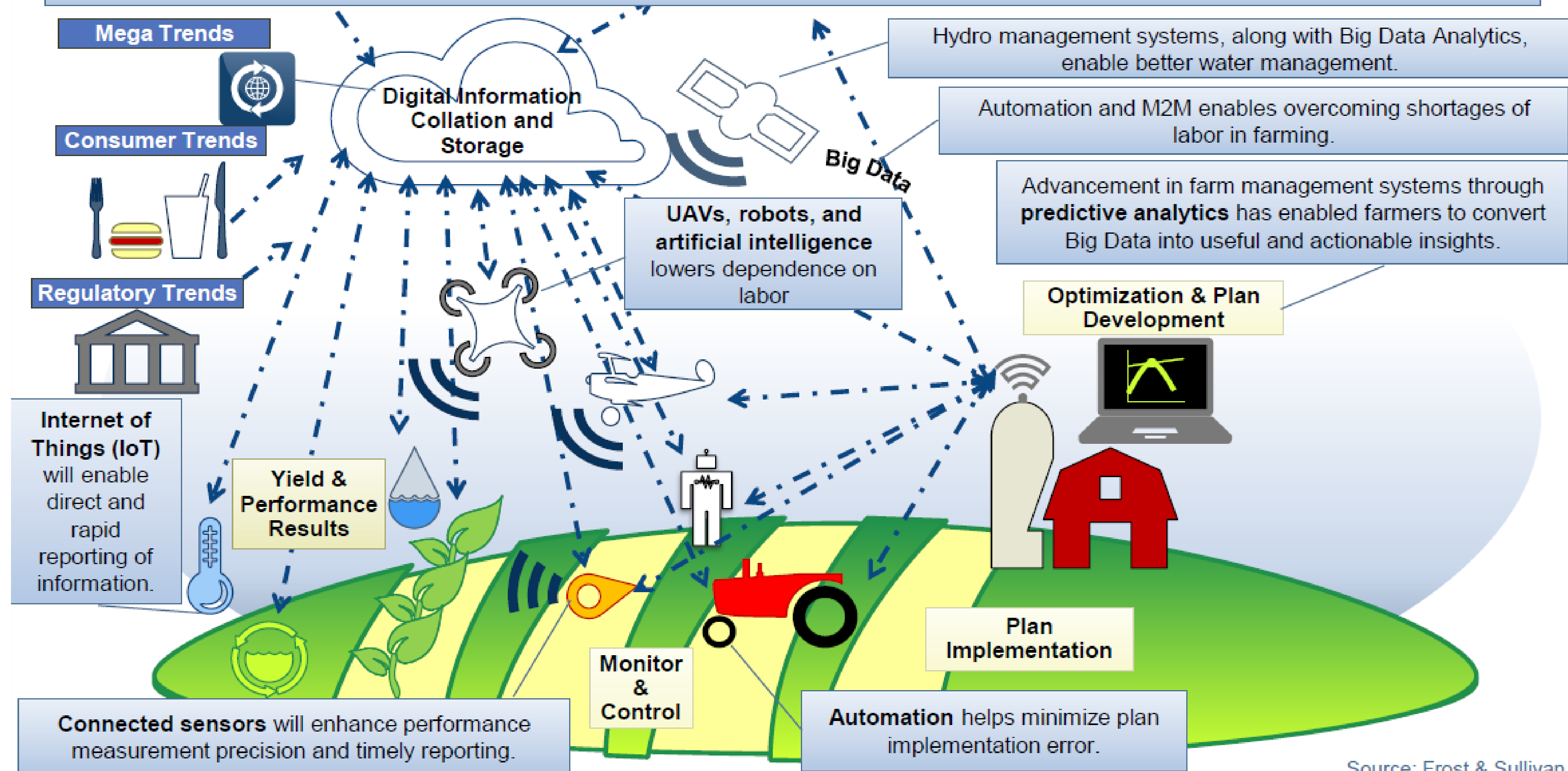
# WOODBASED FIBRES ARE CHALLENGING PLASTIC





**Key Takeaway: Enabling technologies that address the challenges faced by farmers in the most cost-effective way possible will be in demand.**

Cloud has significantly lowered cost of information collation and storage and increased ease of use with appropriate farm management software.





# Vesijohtoverkoston osaaminen nousuun



**Idea:** Kehittää eurooppalaisena yhteistyönä vesijohtoverkostoja. Water-M -projektiin osallistuvat Suomesta Measurepoliksen lisäksi EHP-Tekniikka, Econet, Keypro ja remoteMX sekä tutkimuspartnereina Oulun yliopisto, Savonia AMK ja THL Kuopiosta.

**Vaikutus:** Tieteellistä osaamista ja pk-yrityksiä yhdistävä projekti luo uusia vientituotteita ja -palveluita veden laadun ja määrän mittaukseen, vesijohtoverkoston valvontaan ja niiden säätöautomaatiikkaan.

Water-M on ensiaskeleita yhteistyön kansainvälistymiselle, jonka Tekes-rahoitus on mahdollistanut. Suomalaiskonsortion koordinaattorin rooli sopii yrityskehitysyhtiöllemme erinomaisesti.

**Jussi Mäkinen**

Toimitusjohtaja, Measurepolis Development Oy



# Circular Water Ecosystems

- Water ecosystems aiming at integrated solutions on selected areas:
  - Waste water purification combined with circular economy
    - Water => Sludge => Fertilizer
    - Sludge => Gasification => Bio Gas => Traffic Fuel or Electricity
    - Cleaned water to industry or municipality water systems
  - On-line monitoring and AI-based control for watersystems could be scalable globally
- From bottle – to pipes: Developed world needs high class smart water systems
- Developing world needs light infrastructure solutions
  - On-going Fusion Grid project combines connectivity and DC smart grids to remote areas, villiges and favelas etc. which are missing infra-structure. The integrated concepts need sanitation and water solutions (such as internet sanitation centres).
- Marine wind-energy parks and sweet water storage with extra energy
- Marine biomass biorefinery concept and solutions



# National and Global Need & Scalability

# People & Sea & Nature

## Intelligent Sea

Connectivity and communication infrastructures needed for e.g. remote operations

## Sea Infrastructures

Circular harbors with smooth automated logistics and vessel control

Sustainable ships, cleaner fuels, hybrids and circular waste processes

Renewable smart energy production sites

Modern closed loop fishfarming

Tested solutions and consortiums ready to scale up.  
Data is turned into information and utilized for improving maritime governance and policy.

Visions for Sustainable Baltic and Mediterranean Seas and commitments to develop forerunning & coherent marine governance in shore states to compose a foundation for the mission.

Baltic and Mediterranean Seas become lead markets for sustainable modern maritime economy.  
Commitment to fulfill the vision by adopting forerunning legislation and innovative sustainable solutions.

Crossborder pilots and demonstrations are set up. They produce data and platforms for new business ecosystems.

The global blue economy, grows twice the rate of the mainstream economy by 2030  
Task is to match cutting edge companies with public and private investors

Saving our seas  
is high value business  
for Europe

Adoption of ecological compensation methods

Removing mircopollutants from wastewater

Plastics and phosphorous recovery

Water purification and nutrient circulation

Circular and digital farming to reduce nutrients to sea

Clean seas and shores for people and business

Tourism and recreation

Virtual and mixed reality in tourism



# **SOS - Save Our Seas**

**Sustainable circularizing of seas and sea-shore ecosystems**

**The suggested EU-mission challenges industries, coastal countries, cities and rural areas to circularize and become sustainable business-leaders in Europe and in the global developing and developed markets and the societies to be safe, clean, healthy, and recreational for their citizens and visitors.**


**The Baltic Sea and Mediterranean Sea are two important economical regions with shared responsibilities of solving major water, air and shore pollution problems into new globally scalable business opportunities.**

**New value creation is a strong driver based on inspiring purpose and unique concepts.**



*Editorial*

# Blockchain with Artificial Intelligence to Efficiently Manage Water Use under Climate Change

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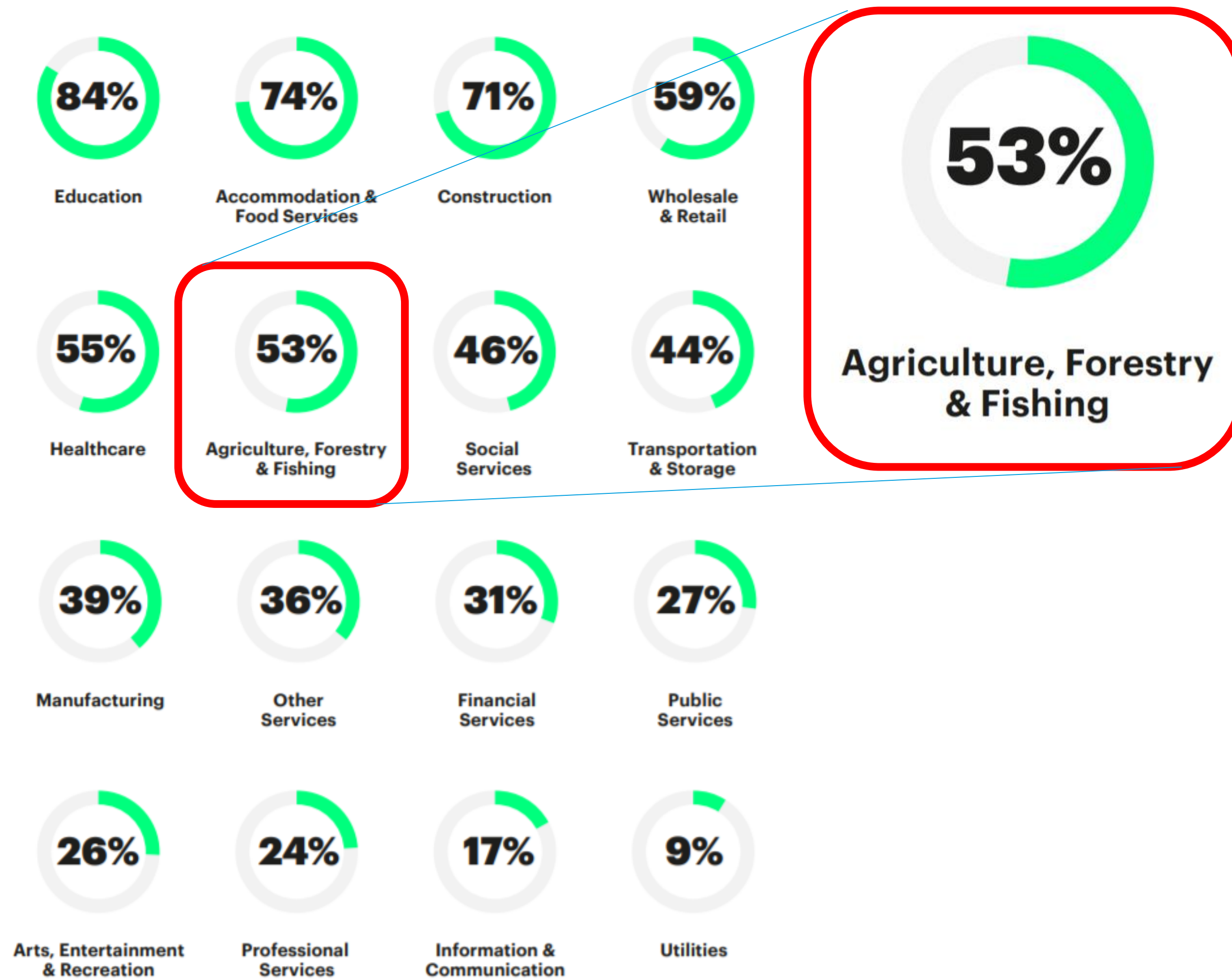
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**Figure 6. The impact of AI on profits by industry**

Share-of-profit increase per industry between baseline in 2035 and AI steady state in 2035 (%)



# HOW AI BOOSTS INDUSTRY PROFITS AND INNOVATION

By Mark Purdy and Paul Daugherty

## THE VALUE OF AI TO INDUSTRY



# ECOSYSTEMS DEPLOYING CONNECTIVITY, IOT & AI IN DIFFERENT INDUSTRIES



## Smart Flexible Energy System

ABB, Empower, Nokia, Siemens, VTT



## Smart Build Environment

Kone Corporation led project



## Smart Traffic (LAND)

Transtech, Dynniq, Nokia, Vaisala,  
VTT



## Connected Industry Ecosystem

Cargotec, Fastems, Konecranes, Ponsse,  
Nokia, Tieto



## OneSea – Autonomous Maritime Traffic

Rolls-Royce, ABB, Tieto, Cargotec,  
Ericsson, Meyer, Wärtsilä



## AI for Health –Eco-System

GE, HUS, IBM, VTT; THL, Orion, Nokia



## Bio-Economy digitalisation – Digital Fiber

Siemens, VTT + 30 companies



## Digital Design & Manufacturing Excellence

Sandvik, AGCO, Roima, Normet, Intopalo,  
Wapice, Creanex, Futurice, Insta

**Finland can reinvent herself through digital technologies in the programmable world.  
Finland can become most relevant to the world and to herself-new wealth creation.  
More international collaboration partners needed. Speed-of-change!**



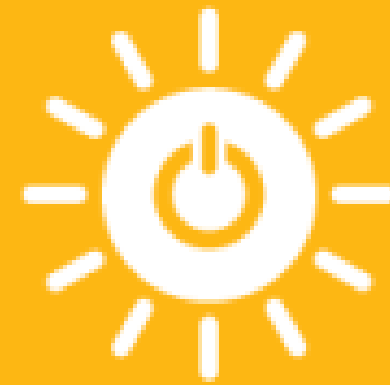


# **SUSTAINABLE DEVELOPMENT** GOALS

**6** CLEAN WATER  
AND SANITATION



**7** AFFORDABLE AND  
CLEAN ENERGY



**8** DECENT WORK AND  
ECONOMIC GROWTH



**9** INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



**11** SUSTAINABLE CITIES  
AND COMMUNITIES



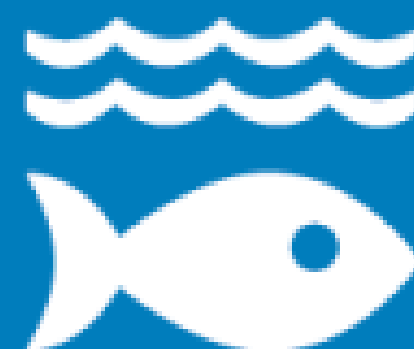
**12** RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



**13** CLIMATE  
ACTION



**14** LIFE  
BELOW WATER



**15** LIFE  
ON LAND



**17** PARTNERSHIPS  
FOR THE GOALS





# KIITOS THANK YOU



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