

Latvijas  
Biozinātņu un  
tehnoloģiju  
universitāte

# DIGITALISATION IN BIOECONOMY - A WAY FOR AN EFFICIENT AND SUSTAINABLE USE OF BIORESOURCES

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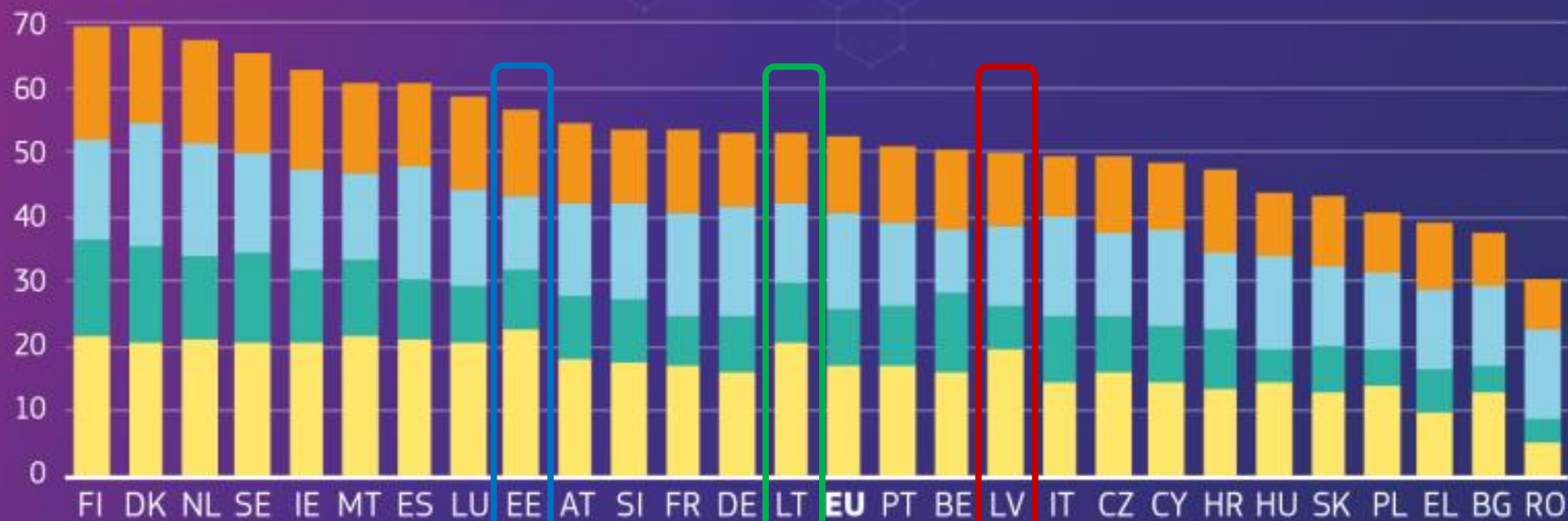
# What is digitalisation?

- ◆ Integration of digital technologies in:
  - ◆ everyday life;
  - ◆ existing operations in various sectors;
  - ◆ new business models;
  - ◆ governance etc..



# DESI 2022

Digital Economy and Society Index



HUMAN  
CAPITAL



CONNECTIVITY



INTEGRATION  
OF DIGITAL  
TECHNOLOGY



DIGITAL PUBLIC  
SERVICES

#DESleu #DigitalEU



# European Innovation Scoreboard 2022



## Innovation Leaders:

Sweden, Finland, Denmark, the Netherlands, and Belgium.



## Strong Innovators:

Ireland, Luxembourg, Austria, Germany, Cyprus, and France.



## Moderate Innovators:

Estonia, Slovenia, Czechia, Italy, Spain, Portugal, Malta, Lithuania, and Greece.



## Emerging Innovators:

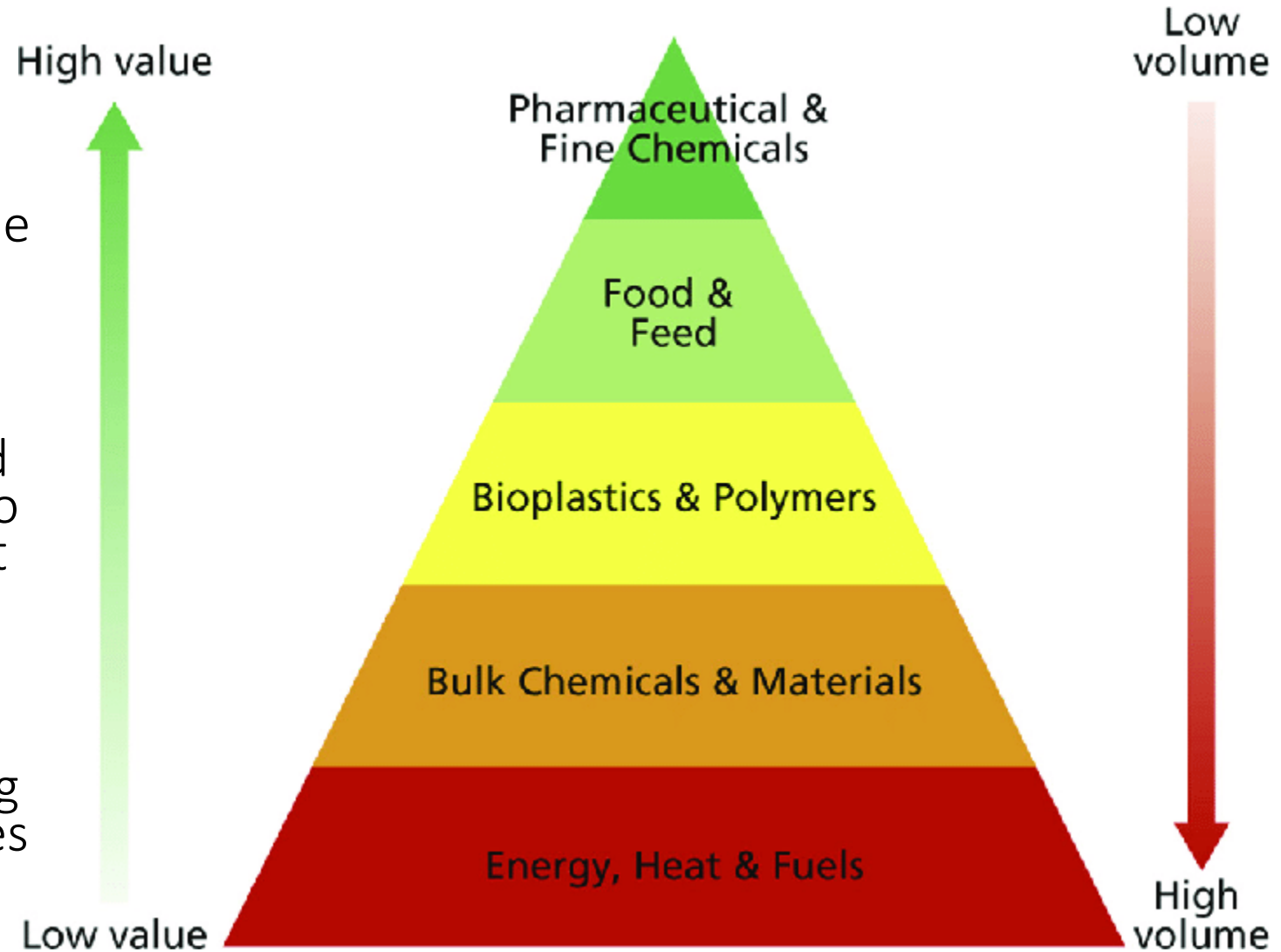
Hungary, Croatia, Slovakia, Poland, Latvia, Bulgaria, and Romania.



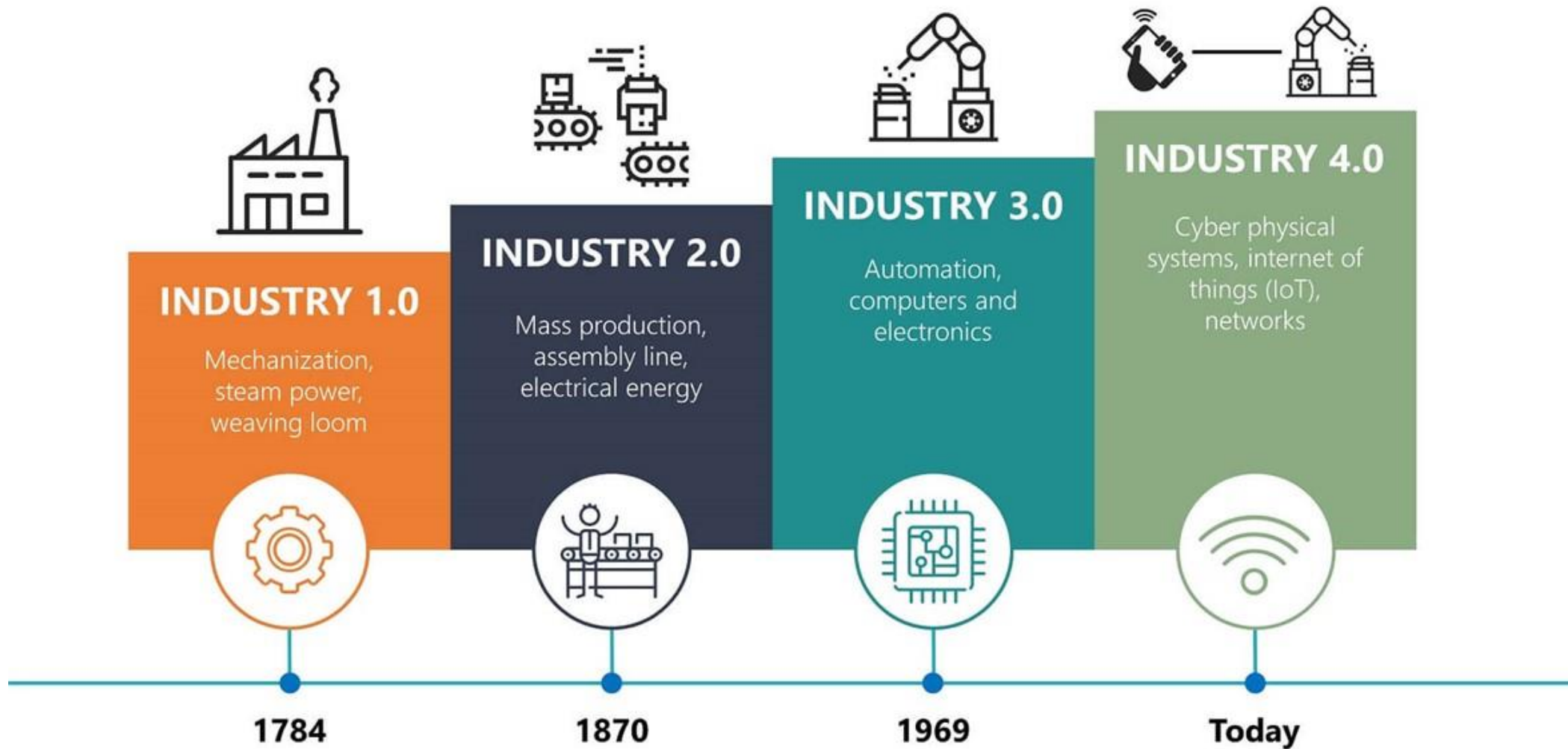
European  
Commission

## Bio-based value pyramid for efficient and sustainable use of bioresources

- The availability of bioresources is limited so we have to use them in the most optimal way – to make the highest value added possible while doing it in a sustainable way
- The availability of technologies and a capacity for innovation enables to use the bioresources in an efficient and sustainable way
- And use of digital tools provides even many more ways of increasing efficiency in the use of bioresources

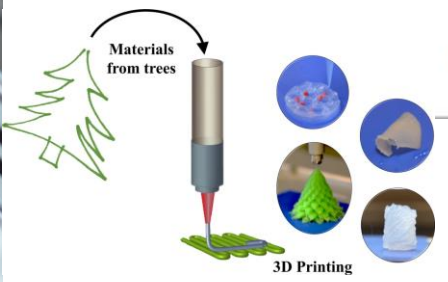
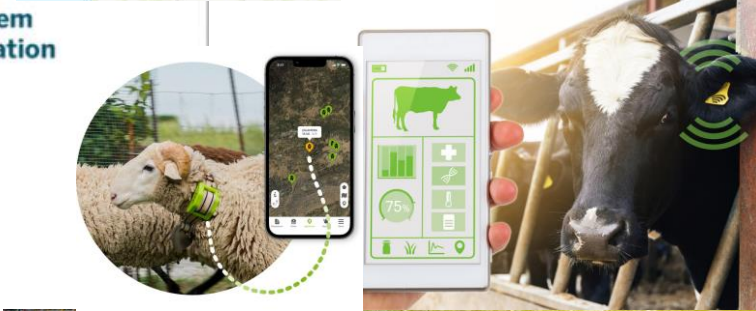
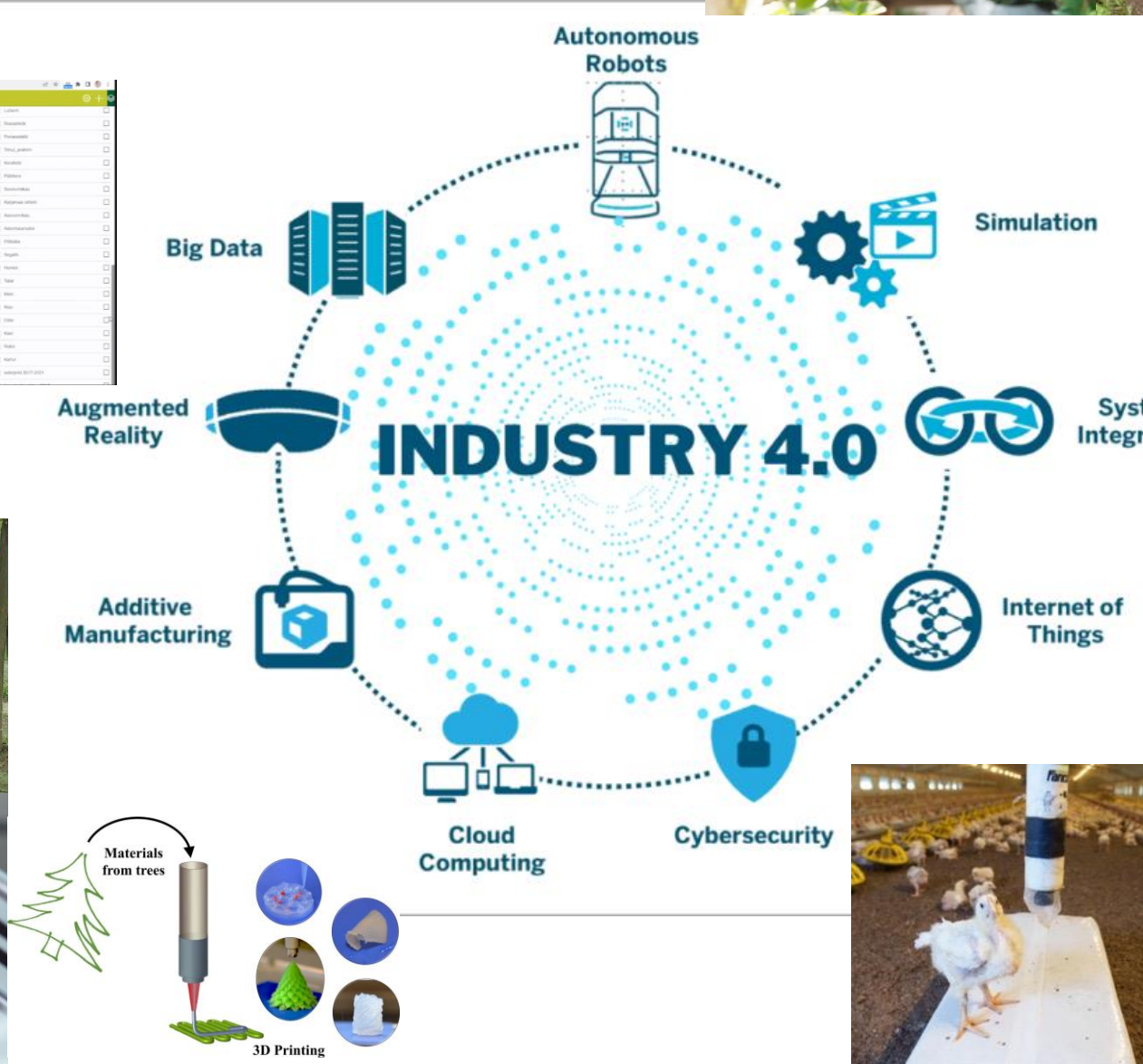
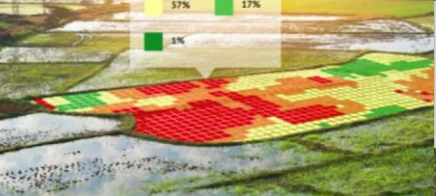
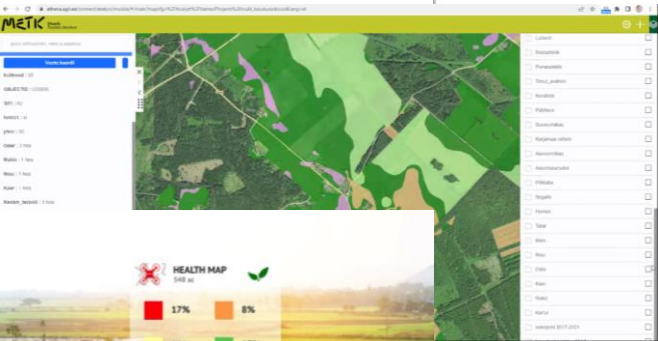


# Digitalisation and Industry 4.0, what is it?



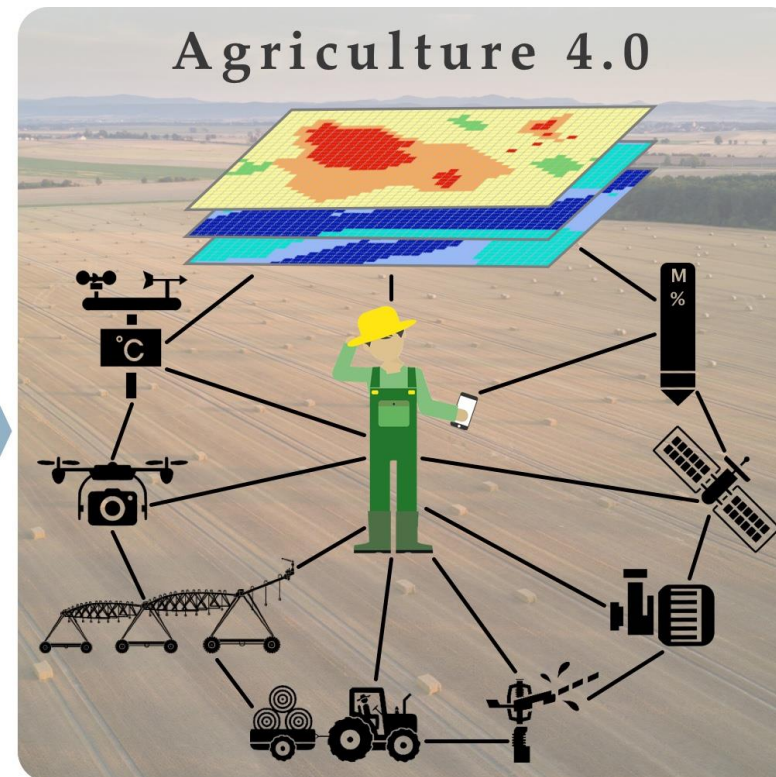
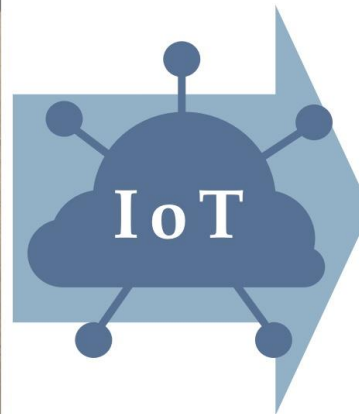
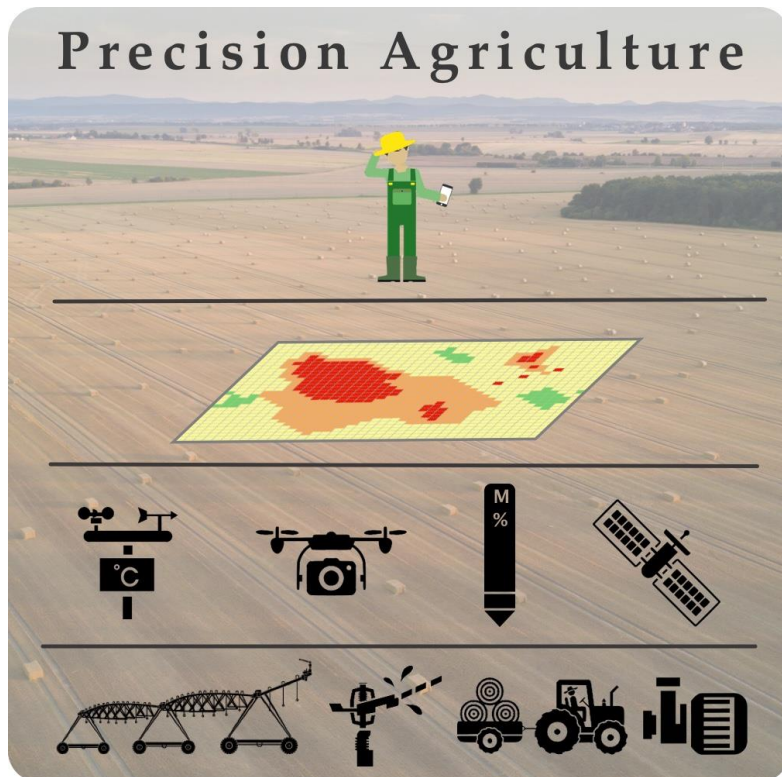


# Technologies of industry 4.0 in the bioeconomy sectors





# Future agriculture - Agriculture 4.0: Integrated use of all systems and tools





# What are the main benefits?

- ◆ Increased efficiency (reduction of manual labor; reduction of material costs with more efficient use of resources e.g. fertilizers)
- ◆ Increased sustainability with more precise use of pesticides and antibiotics
- ◆ More control of the processes of the farm/enterprise
- ◆ Tractability within the food-chain (blockchain technology)

*And many others, what are the benefits that you would think are the most important?*

# FUTURE FARMS

## small and smart

### SURVEY DRONES

Aerial drones survey the fields, mapping weeds, yield and soil variation. This enables precise application of inputs, mapping spread of pernicious weed blackgrass could increase wheat yields by 2-5%.

### FLEET OF AGRIBOTS

A herd of specialised agribots tend to crops, weeding, fertilising and harvesting. Robots capable of microdot application of fertiliser reduce fertiliser cost by 99.9%.



### FARMING DATA

The farm generates vast quantities of rich and varied data. This is stored in the cloud. Data can be used as digital evidence reducing time spent completing grant applications or carrying out farm inspections saving on average £5,500 per farm per year.

### TEXTING COWS

Sensors attached to livestock allowing monitoring of animal health and wellbeing. They can send texts to alert farmers when a cow goes into labour or develops infection increasing herd survival and increasing milk yields by 10%.

### SMART TRACTORS

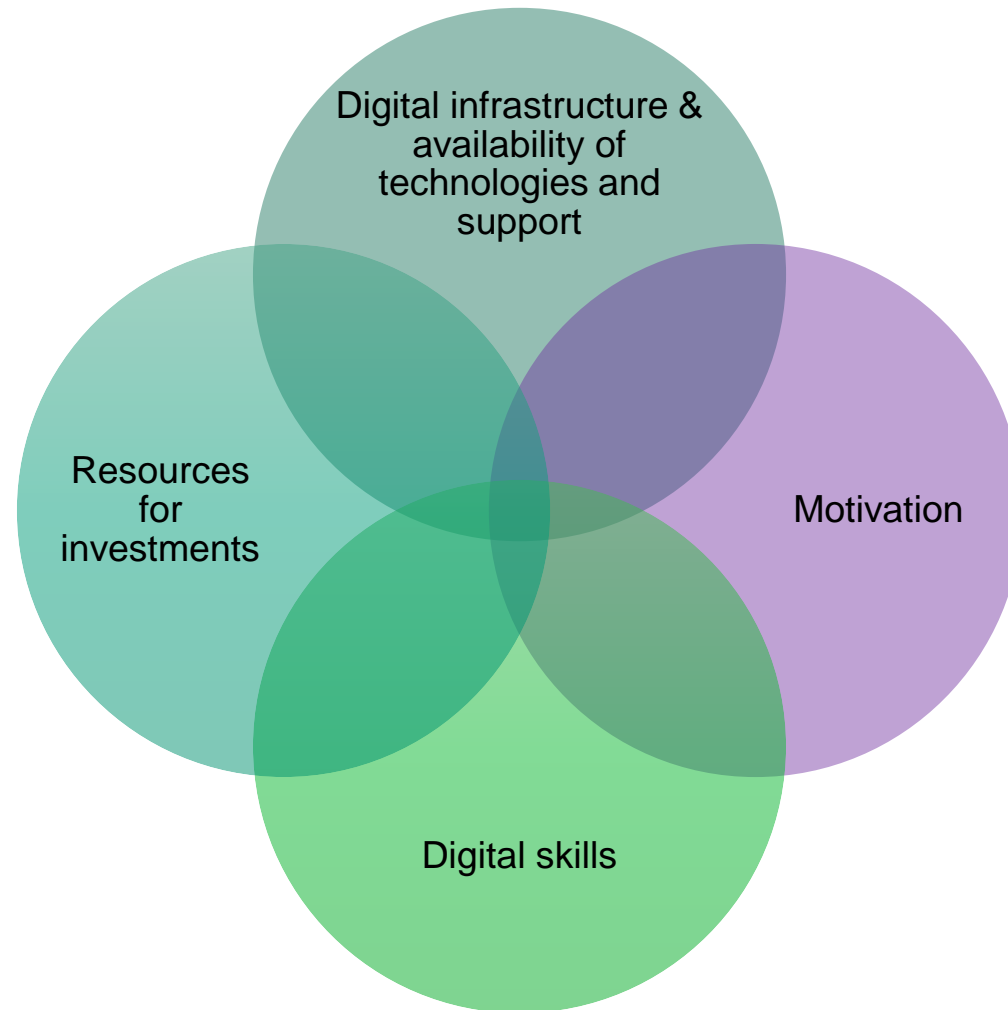
GPS controlled steering and optimised route planning reduces soil erosion, saving fuel costs by 10%.



## What motivates the use of new digital tools in the enterprises of the bioeconomy sector

- ◆ Issues that needs to be solved (ex production efficiency; lack of workforce; environmental issues)
- ◆ Cost/benefit analysis
- ◆ Market pressure (from consumers and other stakeholders)
- ◆ Change of regulation

## Drivers of the digital technologies



# The effects for educators

- ◆ We are preparing our students for the workplaces of tomorrow – what skills will they need?
- ◆ Will our students of agriculture and forestry need to be able to fly a drone after they finish their studies?

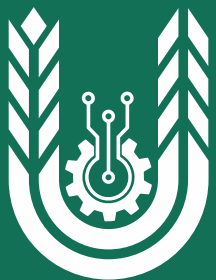
Ability to use the digital tools is needed right now, and it will be needed even more in the future

- ◆ What we can expect:
  - ◆ The need to work with more digital tools
  - ◆ The need to integrate different tools and systems
  - ◆ Ability to work efficiently and use these tools to be more productive



# How can we adapt?

- ◆ Develop competences & skills and a wider understanding about the use of technologies
- ◆ Expand the availability of technologies and infrastructure
- ◆ Change our habits – for adjusting the content of the study courses and for the evaluation of competences of the student, adjustment of requirements
- ◆ Ethical issues (i.e. the use of AI tools like ChatGPT - in which courses/ which cases it could/should be used, when it should not, who decides it? Do we have a policy to regulate it?)



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Thank you for  
your kind  
attention!

Do you have any  
questions?

