The European Commission's science and knowledge service

Joint Research Centre

European Commission

Technologies and big data: what potential for the agri-food sector?

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European Commission

Innovation & new business models through digitalisation

Producer

Manufacturer/
Processor
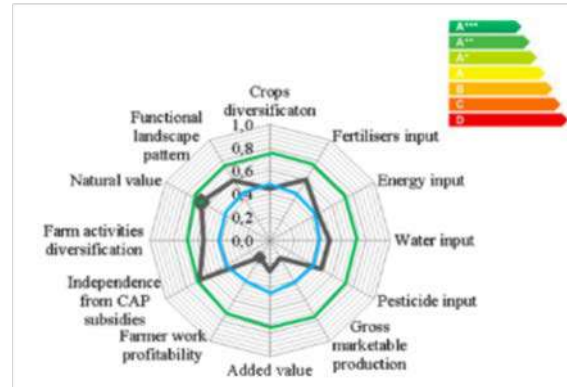
Distributor

Retailer

Consumer

Innovation

Producers

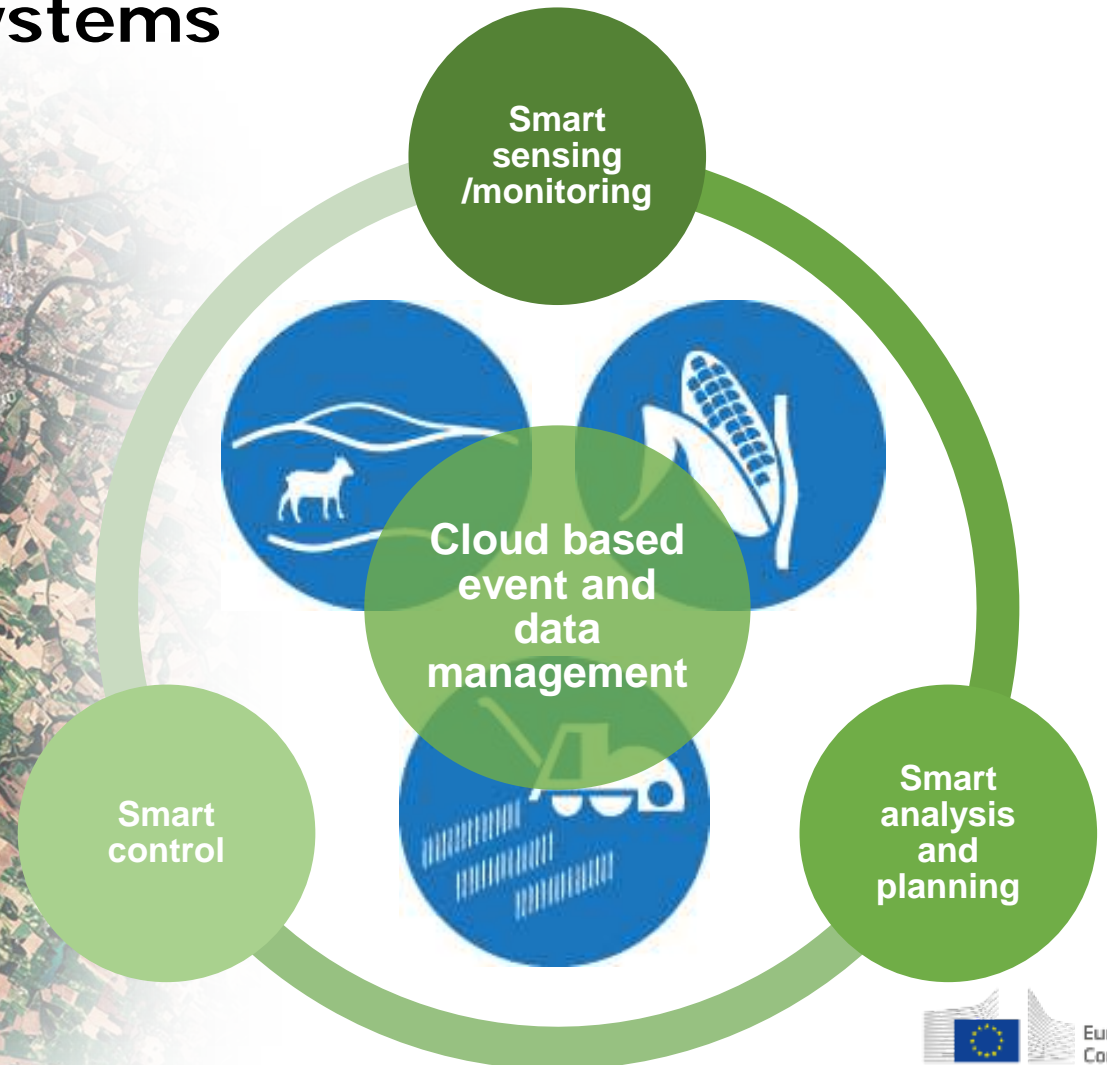| **On-farm**	**Farm-to-farm data**	**Farm-to-food**
Survey drones Fleets of agribots Smart farm machinery Sensors & logistics	Improved advice services from big data	Nutritious foods produced more efficiently

Manufacturers

Farm management information systems

IoT farm machinery

Survey drones & sensors

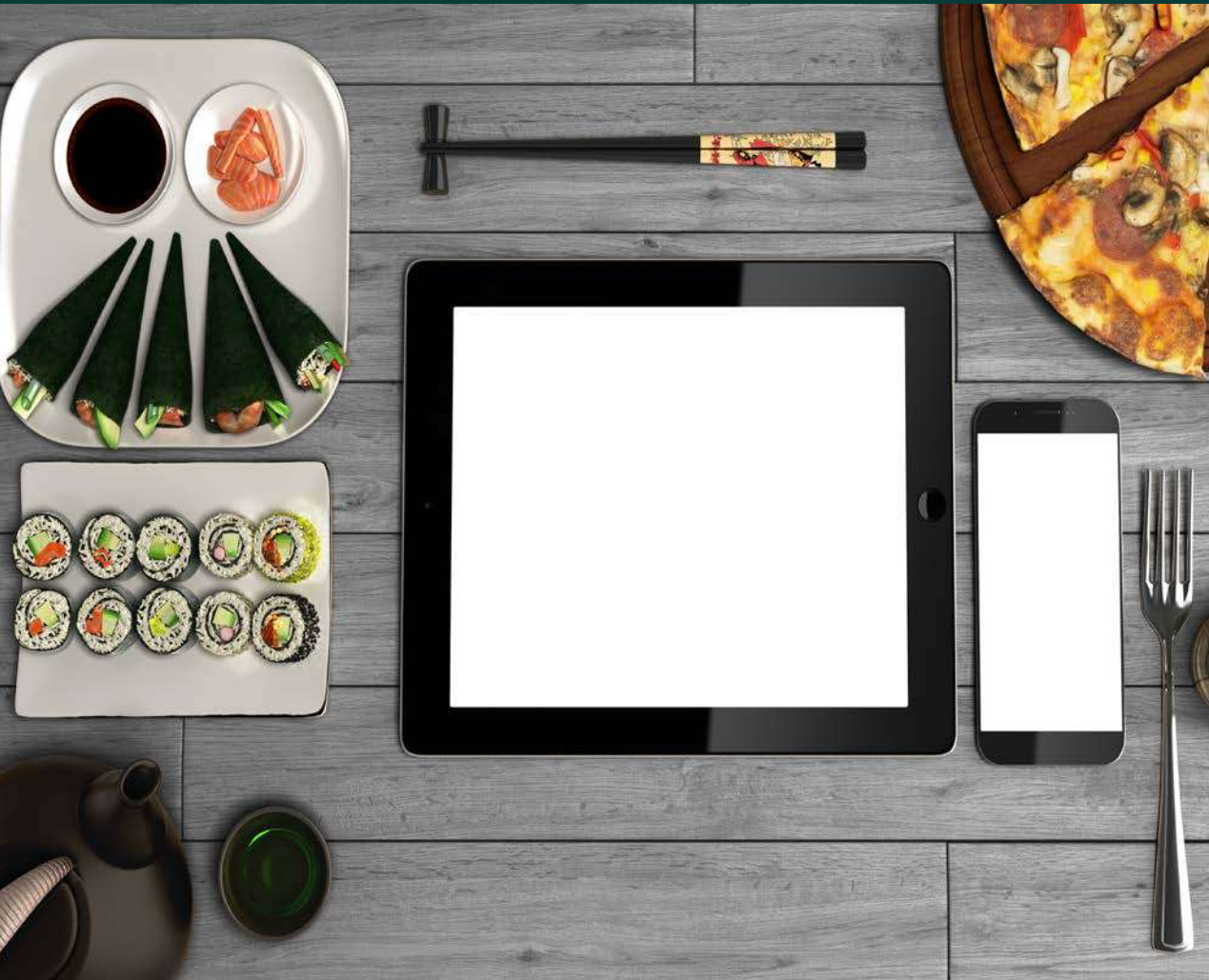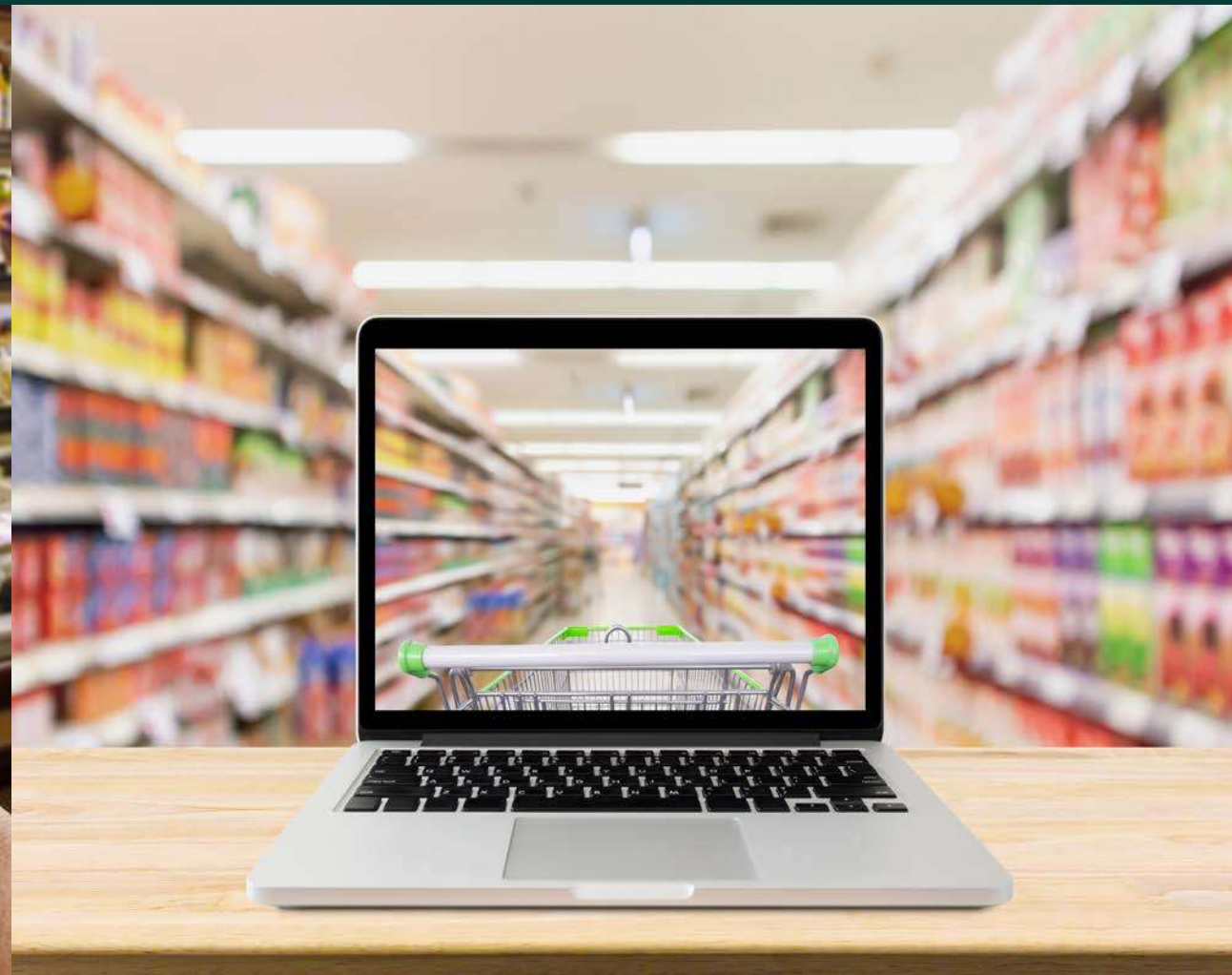**on-farm data integration**

cross-farm big data analytics

Smart sensing /monitoring

Cloud based event and data management

Smart control

Smart analysis and planning

Processors

Distributors

Retailers

Consumers

Digitalisation in the Agri-Food sector = Big data

Product tracking & Consumer purchase analytics

robots

HR sensors Radar

HAPs

VHR sensors

GNSS

Tablet PCs

Geotagged Photo via GSM

Farm sensors

Lidar Laser

Drones

Satellites Airborne

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The Cambrian explosion of data vs. computing power

Data Growth
40% per year

CPU Processing Power
20% per year

2006   2007   2008   2009   2010   2011   2012   2013   2014   2015   2016   2017   2018   2019   2020
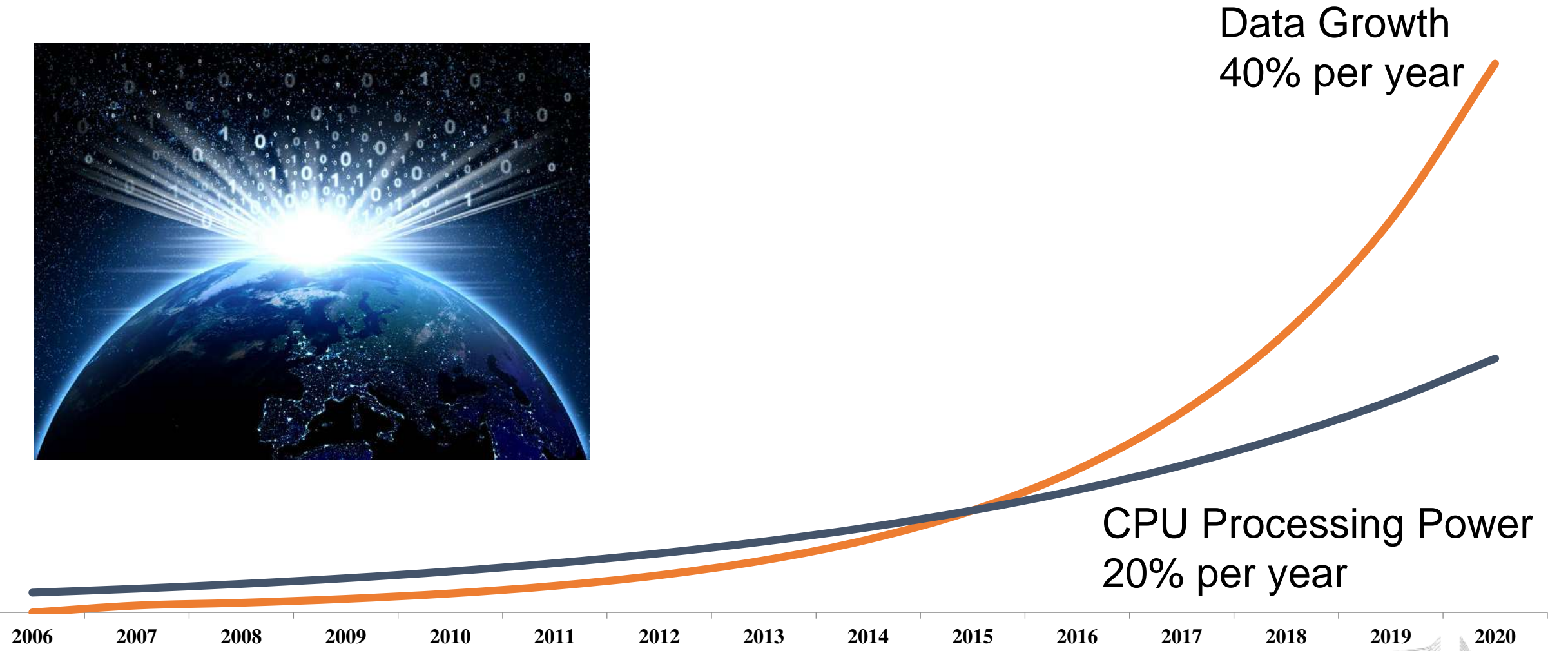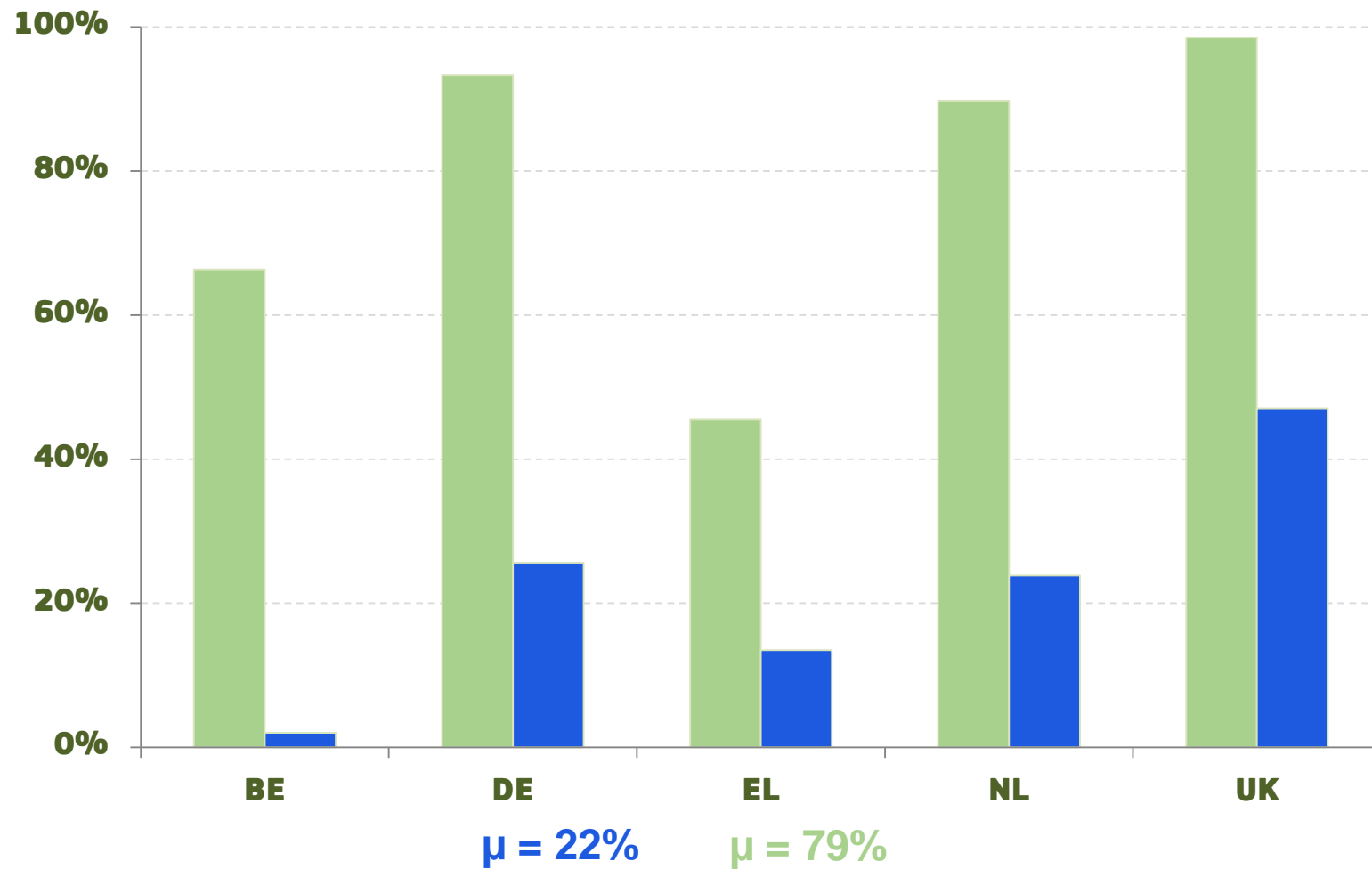
Energy Challenges and Opportunities of big data in the agri-food sector

Adoption drivers and barriers

Farmers **awareness** vs. **adoption** of PAT
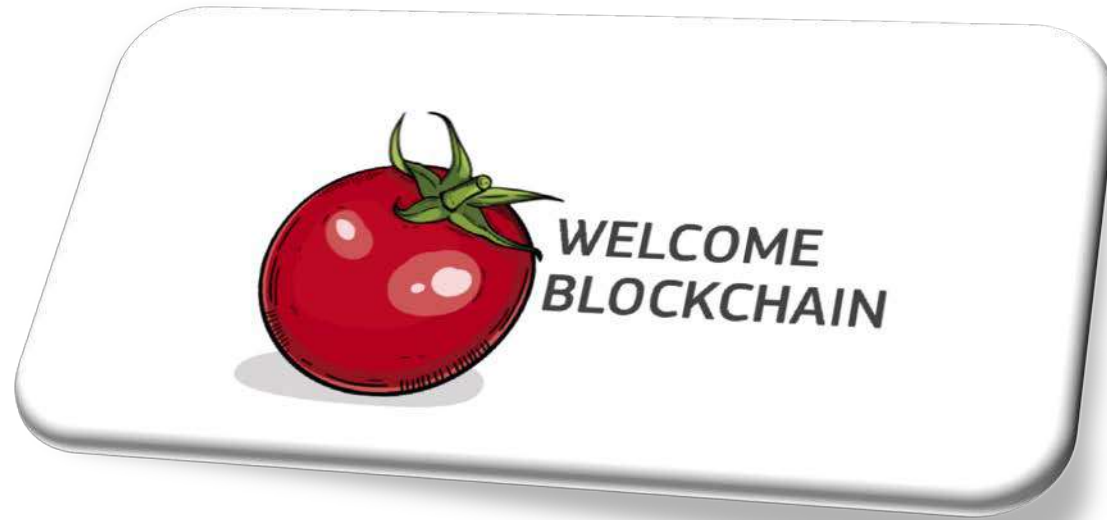
μ = 22%   μ = 79%

Cyber Security, Data security and Trust

DATA
SECURITY

TRUST

ACCESS

PROCESS

TRUST

INTEGRITY

PROVENANCE

ACCOUNTABILITY

CYBER SECURITY

DIGITAL TRANSFORMATION

BIG DATA

AGRI–FOOD SECTOR

My data, your data, our data?

Machinery manufacturer

Farmer

Public Authority

Research

Platform Provider

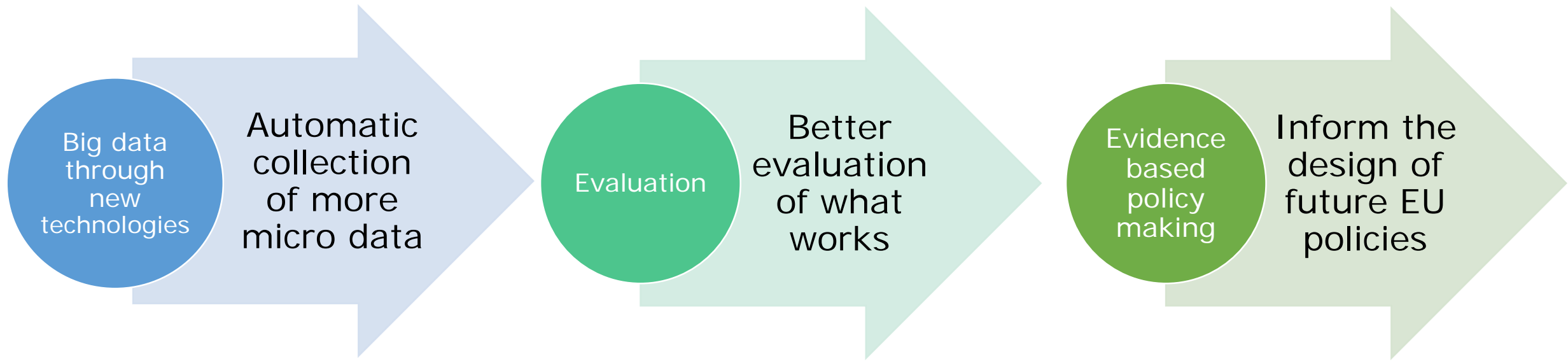# Blockchain in the Food Supply Chain

Which role for research in the data debate?

- a science-based discussion on how we deal with data

- ensuring the public good of data

- tackling open research questions

Better evidence-based policy making through big data

Big data through new technologies → Automatic collection of more micro data → **Evaluation** → Better evaluation of what works → **Evidence based policy making** → Inform the design of future EU policies

Examples of policy questions:

- Have EU veterinary programmes been effective in reducting the number of outbreaks of animal diseases?
- Have the greening measures of the CAP been effective in reducing the emissions of carbon dioxide/methane?

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Conclusions

① Agri-food systems become data-intensive

② Data Explosion is a true challenge also in terms of the energy footprint

③ New technologies like Blockchain can also offer solutions to the data ownership question

④ Nevertheless a science-based debate on how to deal with data is necessary

Thank you!

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