“Trends Overview: strategic plans and analysis report. Circular Bioeconomy, Agriculture and Digitization»

FIELDS Kick Off Meeting

UNITO, Turin 3rd and 4th of February 2020

Dr. Daniel Rossi

EU Coordinator of National Food Technology Platforms - NFTPs
Chairman of the Research & Innovation WP – Copa-Cogeca – past FDE
Delegate Research & Innovation – Confagricoltura

Bioeconomy since 2005

The Bioeconomy of the last 15 years draws on two main pillars:

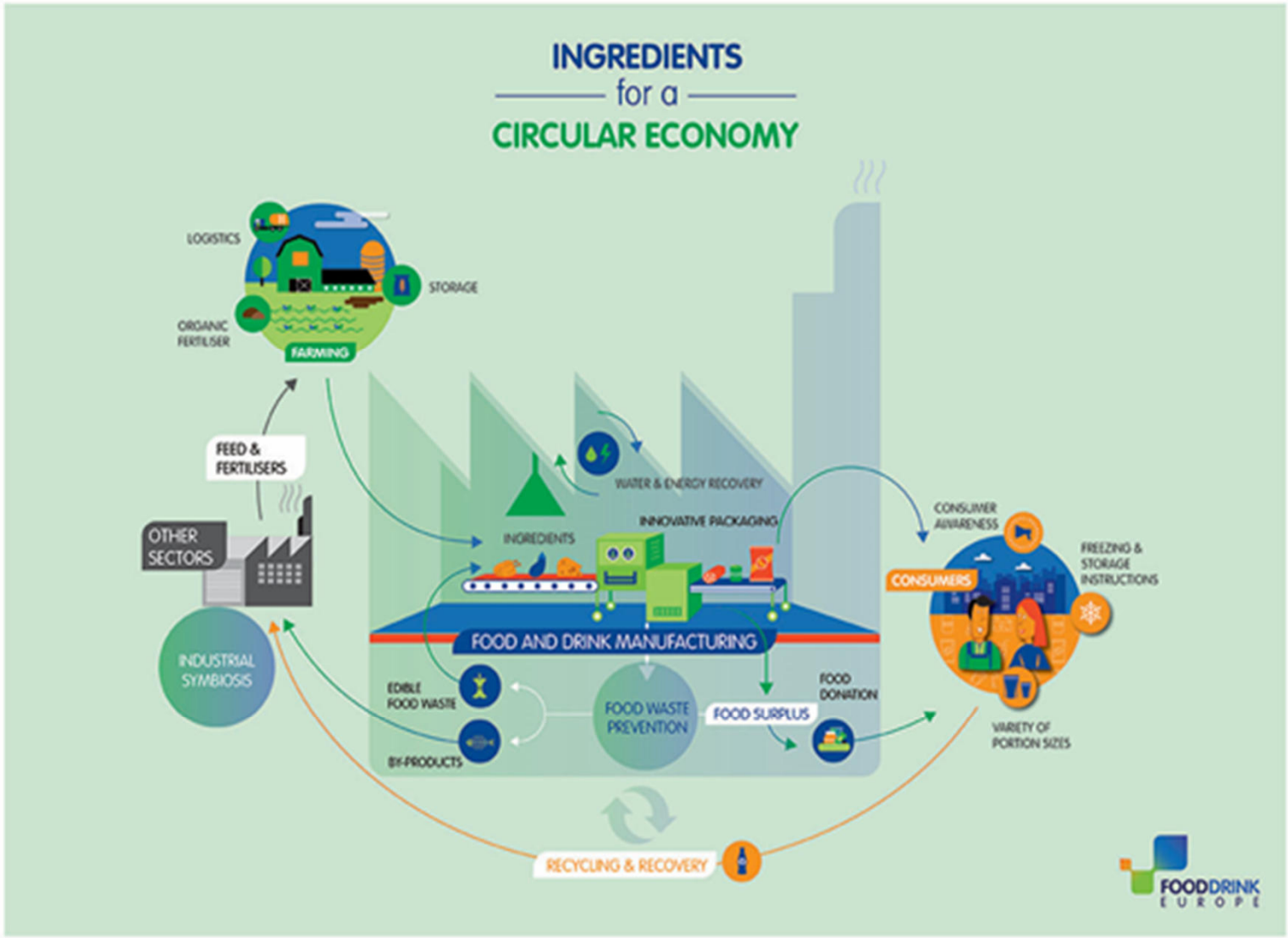
- The potential of biological resources

- The integration of new knowledge stemming from various disciplines, linking it with biotechnologies and life Sciences

Features of biological resources

The uniqueness of some remarkable features of biological resources makes them attractive for becoming the possible fundament of an economy:

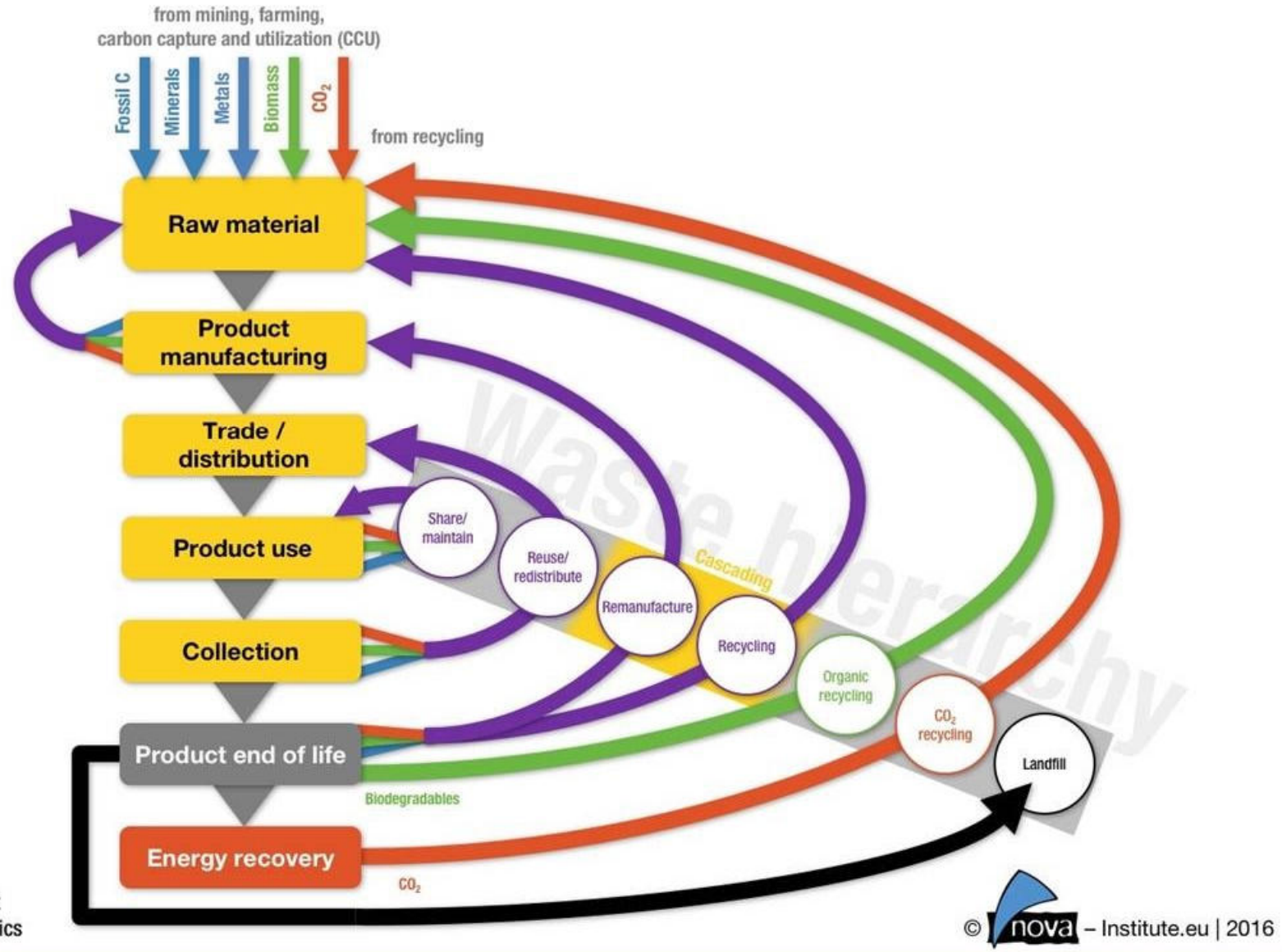
- Their Renewability
- Their $C0_2$ -“ friendliness” or even sometimes carbon neutrality
- Their Re-use or multiuse , also in the format of cascades
- Their potentials for new, better functions in their products, like higher stability, longer life, stronger endurance, less or no toxicity, less water, more convenient haptic surfaces for users etc.



https://circulareconomy.fooddrinkeurope.eu/library/

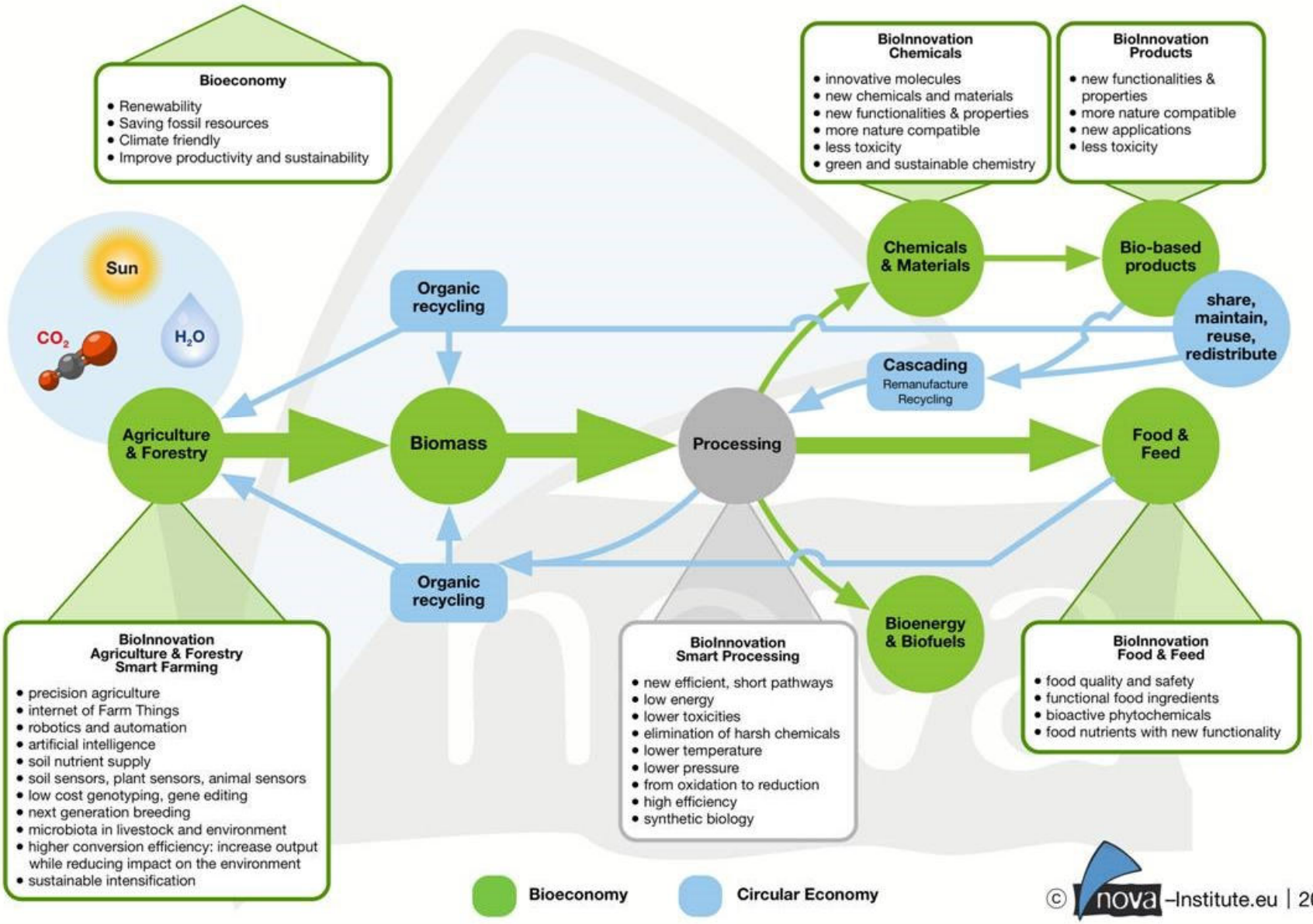
FOODDRINK EUROPE

Comprehensive Concept of Circular Economy



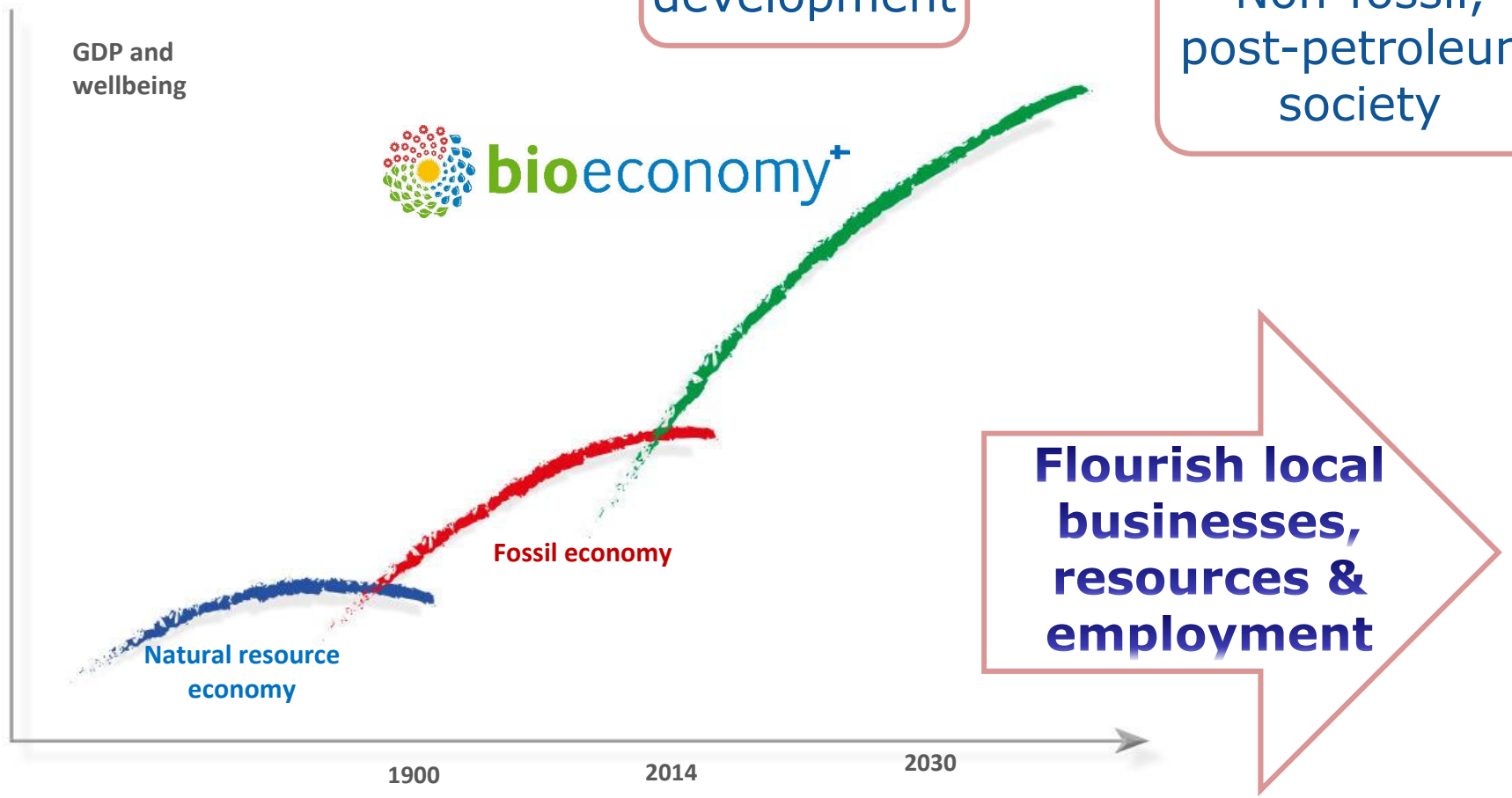
Graphic available at
bio-based.eu/graphics

Bioeconomy: More than Circular Economy



Sustainable development

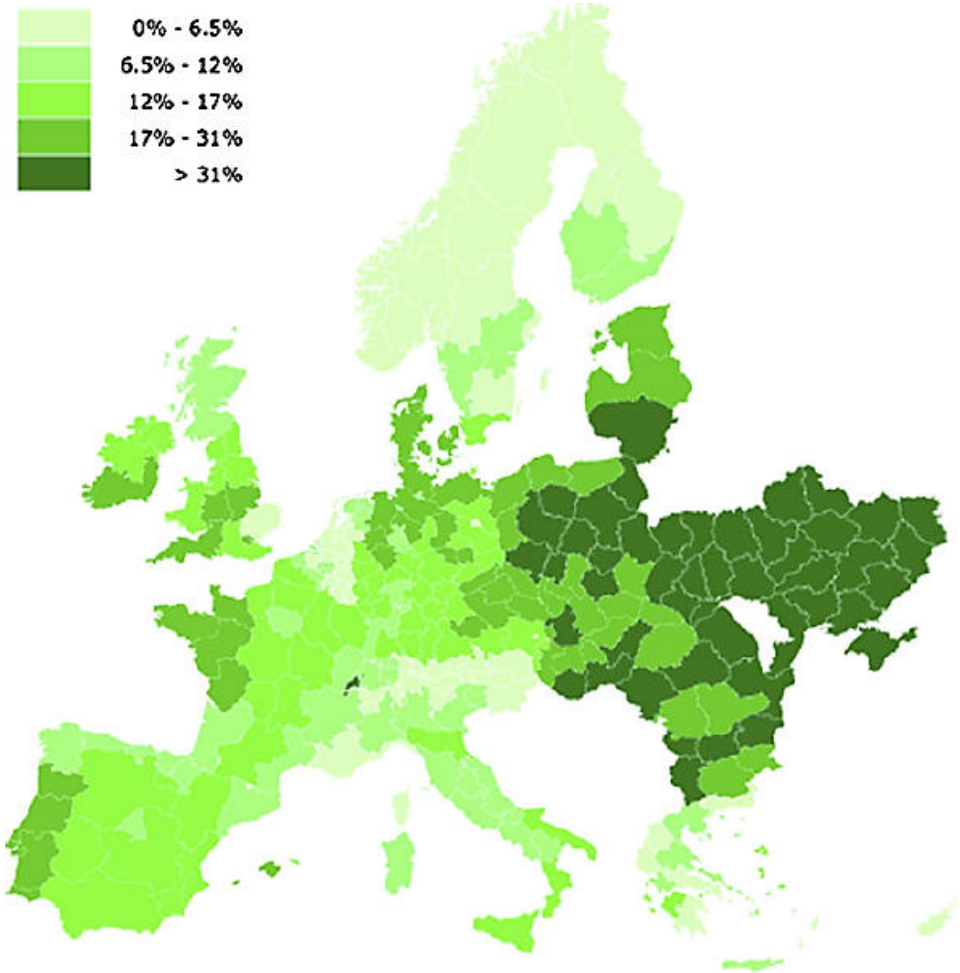
Non-fossil, post-petroleum society



Flourish local businesses, resources & employment

- Source: Finnish Bioeconomy Strategy, 2014

Exploiting potentials in regions …..



2018 'The **‘surplus’ land** potentially available for the production of biomass by 2030' Wit+ Figure 8

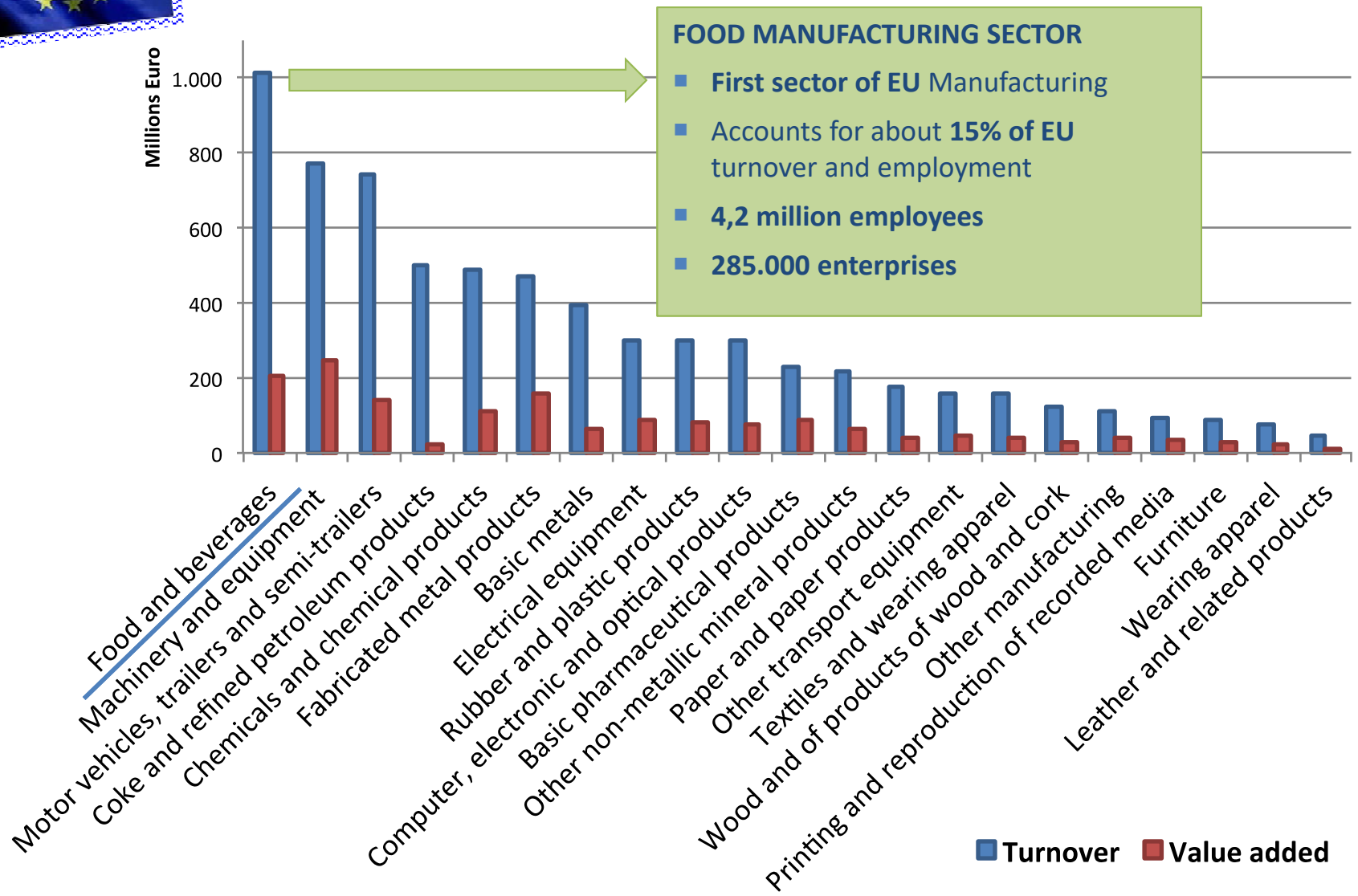
"The production costs at which biomass resources are available in Europe are variable, with significantly lower costs in CEEC than WEC"

Present status of the bioeconomy

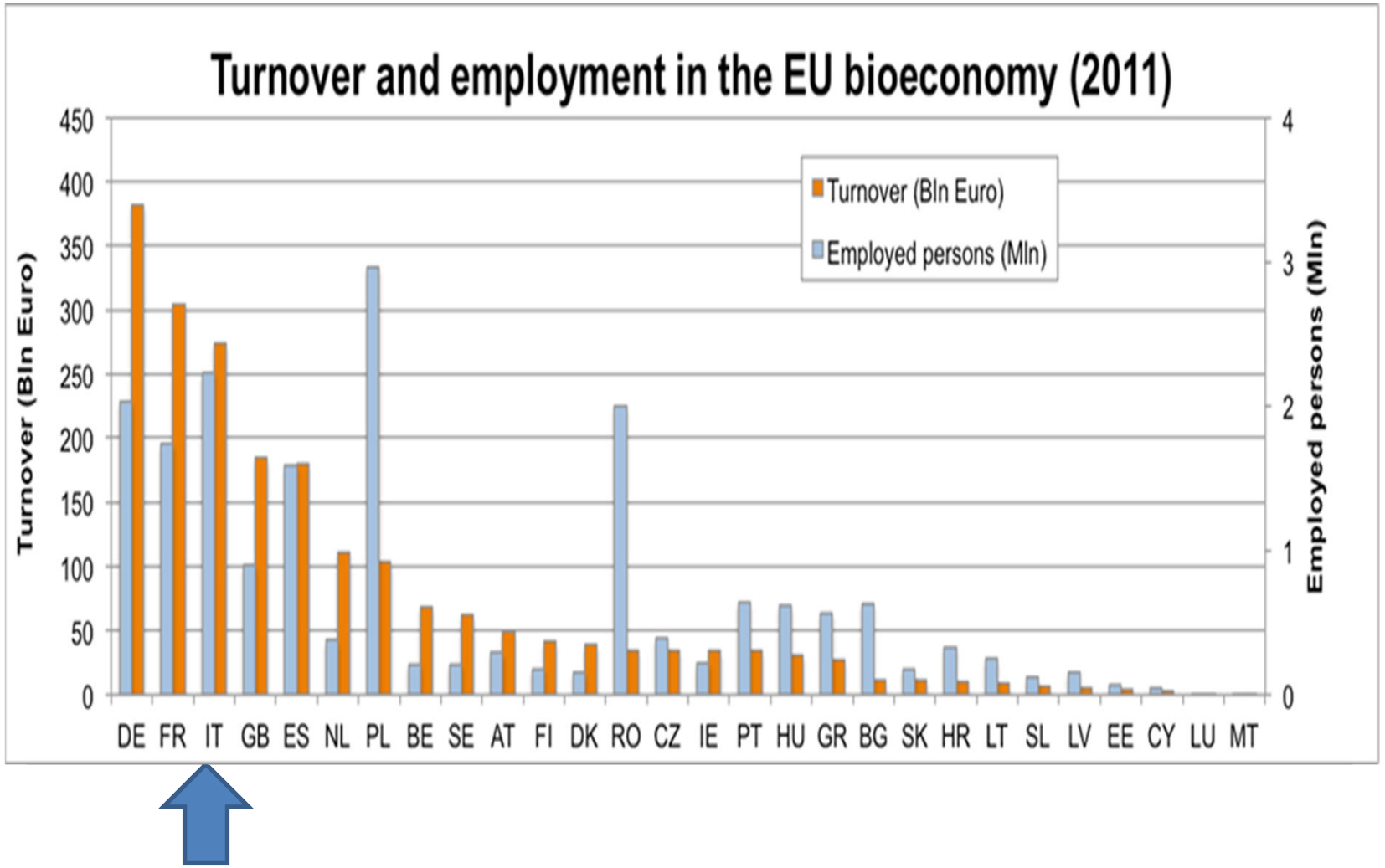
- About 50 states worldwide and half a dozen regions officially support the bioeconomy either via dedicated programmes, strategies, action plans, roadmaps etc. or via closely related political, programmatic and/ or strategic activities, the majority of them still in Europe.
- Many of these activities, however, are limited to biotechnology and/ or biofuels production and use.
- Today, almost 15 years after it‘s launch there is no more a single bioeconomy but there are many bioeconomies!
- This has an impact on the necessary frameworks, public funding, private investment and thematical content.

Bioeconomy Policies around the World

European Manufacturing Sectors



Source: Data & trends of the European Food and Drink Industry 2015 (FoodDrinkEurope)



Source: SCAR – EUROSTAT 4th foresight 2015

2018 EU BIO-ECONOMY

EU bio-economy turnover of 2.980 billion € with 21 million employees.

Sector	Turnover (Billion €)	Employees (million)	Source
Food & Drink Industry	1.304	4.2	FoodDrinkEurope
Agriculture	473	11,0	COPA-COGECA
Fisheries	16	0.5	FAO
Paper, Leather etc.	470	1,9	CEPI
Forestry	371	2,0	CEI-BOIS
Others (build, textile, seeds, breeds.....)	250	1,2	CEFIC - CIVA
Bio-based materials	96	0,31	
Chemistry	80 (est)*	0,15 (est)*	USDA, Arthur D Little, Festel, McKinsey, CEFIC
Enzymes	6(est)*	0,005 (est)*	Amfep, Novozymes, Danisco/Genencor, DSM
Biofuels	10	0,15	EBB, eBio
Total	**2.980**	**22**	

Bruxelles, 2019

Source: CE 2019

FOOD SUPPLY CHAIN

Driving forces in the food supply chain: agriculture, the food and drink industry and retail

6%
Share of the food supply chain in EU gross value added

10%
Share of the food supply chain in EU employment

- In 2014, there were 24 million people employed in the food supply chain.
- The total turnover amounts to €3.9 trillion and the value added almost reaches €700 billion.
- Around 31 million professionals work in the extensive food supply chain across the EU, from agriculture and the input industry to food and drink services.

Structural overview of the food supply chain (2014)

	Agriculture	Food and drink industry	Wholesale of agricultural and food products	Food and drink retail[1]
Turnover (€ billion)	414	1,095	1,254	1,114
Value added (€ billion)	211	219	104	164
Number of employees (million)	11.2	4.2	1.9	6.3
Number of companies (1,000 units)	10,800	292	341	803

Turnover, value added, employees and companies in the food supply chain (2014,%)

Employment in the extensive EU food supply chain (2014,%)

Source: Eurostat (National Accounts, SBS, FSS, Economic Accounts for Agriculture)

[1] 2013 data except for the number of companies

EU TOTAL FOOD CHAIN

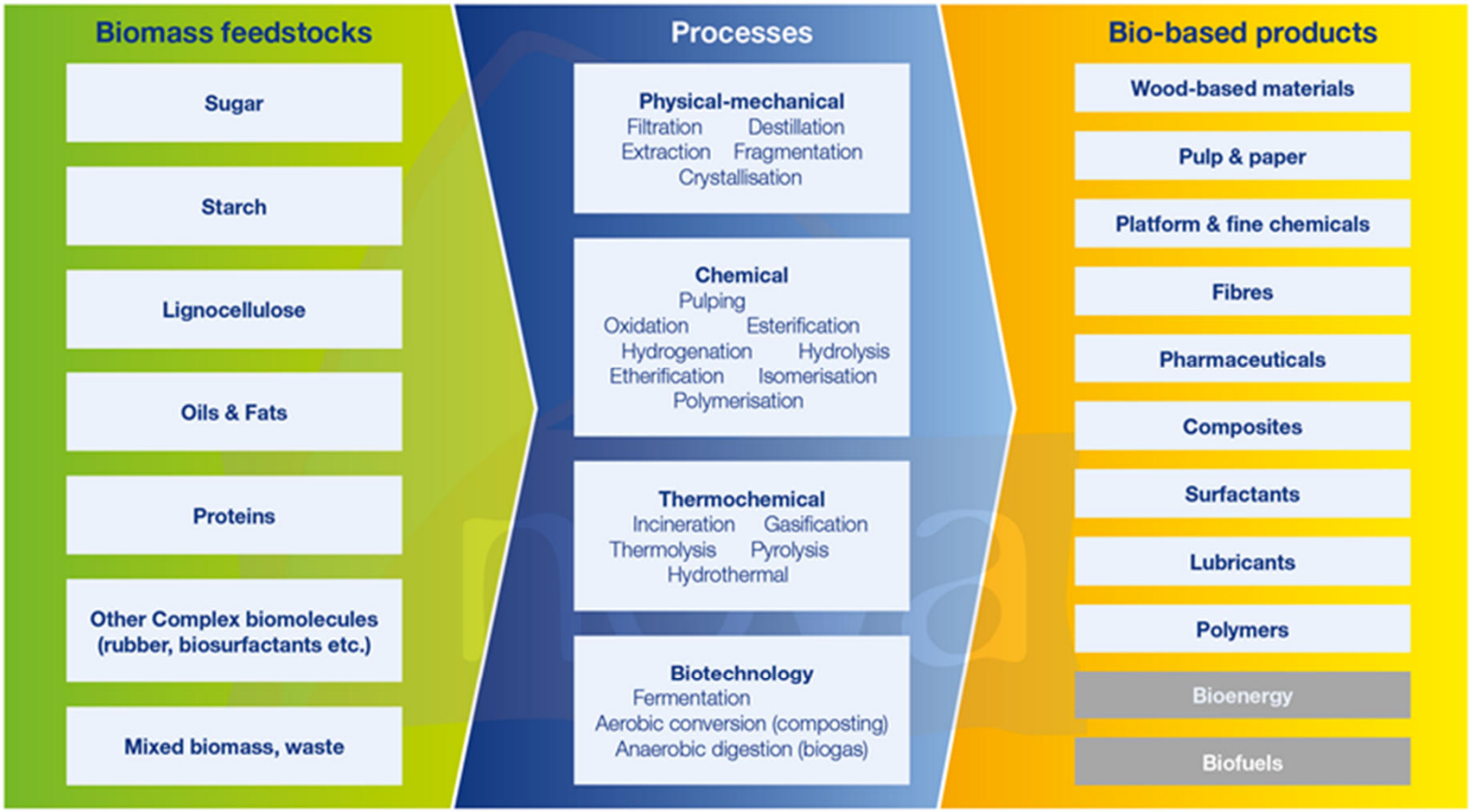
Structural overview of the food chain, 2010

		Agricultural holding	Food and drink industry	Wholesale of agricultural and food products	Food and drink retail
Turnover	€ billion	358	**953**	1,011	1,013
Value added	€ billion	202	**203**	88(2)	150(2)
Number of employees	million	11.0	**4.2**	1.8	6.4
Number of operators	1,000	13,700(1)	**287**	250	849

(1) 2007 data (2) 2009 data

Sources: Eurostat (SBS); DG Agriculture Statistical and Economic Information Report, 2011

Bio-based Economy: feedstocks, processes and products (without food & feed)

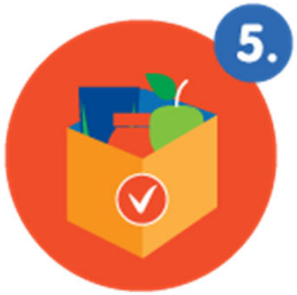


Prevention actions

UN SDGs application

EU measurement standards

Stakeholders platform



Legislation

Date marking understanding

Higher by-products

Life - cycle

Green public procurement

Energy by-product

Investment R&I

Education and behaviour

INGREDIENTS for a CIRCULAR ECONOMY

FOODDRINK EUROPE

New trends and business fields in Bioeconomy

- Industries broaden their portfolio of application more and more also to daily consumer goods, health care articles, cosmetics, cloths and garments. Examples go from biobased PET and PEF-bottles, shirts, eye-wear, shoeshine articles, rollers of longboards, hulls of ballpoints, toothbrushes, rubber tires and coatings for automotives and train coaches to biobased mortar and heat-damming , non flammable foams.
- Strong trend to interesting cross-border cooperation and industrial take-overs, where Japan, ROC and Canada get more and more active.

What can be concluded from these recent industrial developments inside and outside Europe ?

- There is a growing number of biobased production lines for intermediates and platform molecules, all focused around the renewable “C“ !

- There is a shift from science and research activities on the content of biological resources to more optimization of industrialized **processes** (hydrothermal, biological or combination of both).

- There is a shift from the cell factory to the real factory with the necessary growing attention on economics. This requires stronger attention also on elements of the back-end of value chains like norms, standards, marketing and consumer acceptance.

What can be concluded from these recent industrial developments inside and outside Europe ? (cont.)

- In addition CO_2 turns out more and more to become a potential resource, as well as waste and proteins become important objects of the bioeconomy.
- The frontiers among chemical products, biofuels, proteins for food and other purposes as well as for the concrete attribution to diverse industrial application fields start to become „blurred“!
- This might reach a new dimension by a stronger use of big data in the future.

What can be concluded from these recent industrial developments inside and outside Europe ? (cont.)

- There are strong private and sometimes private-public industrial investments in the U.S., in Canada (provinces of Alberta and Ontario, Australia with the provinces of Victoria and Queensland), China, but also in Europe (Bioproducts Mill by METSÄ Fibre in Änäkosti, Finland for 1,2 Mill. €).

  An additional recent example: strong financial investments into production facilities for biobased PHA's (Polyhydroxialkanoate) to replace hydro-carbonbased Polymeres as base for Bioplastics between Italian and French companies, (Bio-on, CristalUnion, Novamont and Eridiana Sodana) as well as the recent cooperation between BASF and Avantium on biobased PEF bottles plus.

Societal impacts

- Within societal strategic discussions on future and how to cope with global challenges, the bioeconomy only after 10 years has become a serious partner for dialogue with supporters of the **G**lobal **S**ustainability **D**evelopment to achieve their goals and also with the followers of a circular economy.
- Growing awareness that achievement of **GSD** goals and also of implementation of the circular economy will only be possible by an increased use of biological resources. But how to do this scientificly based and evidenced?
- Bioeconomy is the biological power engine of the circular economy, not just an integral part of it! There is more and more talk about the sustainable circular Bioeconomy!
- And the EU Green Deal is coming!

Changes and lessons learnt in the last 15 years with relevance to strategies and policies

- Biomass remains the primary natural resource of the bioeconomy, be it a carrier for energy or a modular part for chemicals, biochemicals, proteins or nutrients, etc..
- Recently, CO_2 is added to the portfolio of primary natural resources of the bioeconomy.
- Biorefineries will be the central production facilities of the bioeconomy. Their primary but not exhaustive feedstock will be biological waste resources and biomass: both of renewable nature.
- Carbonate processing facilities physically, hydrothermatically or biologicaly , like BIG-C (Germany, Belgium, Netherlands).

Changes and lessons learnt (cont.)

- Recycability and/ or multiple reuse of biomass in diverse forms including cascades, will be a prime function along new value chains like „from fork to farm“ oder „farm to fork“, „gate to plate“ etc. . Recently, the potentials of resilience of biological resources are added to this discussion.
- Biotechnologies, in particular industrial biotechnology and focused new knowledge stemming from converted technologies, like nano-, info- or cognitive sciences will remain the technology drivers of this new form of economy.
- CRISPR Cas (genoma sequence) and NBTs will also play an important role in this context.

Changes and lessons learnt (cont.)

- The joint potentials, but also joint interfaces and touching points among the digitalisation and the biologisation of our economy must be quickly further examined, made publicly aware to pressure groups and decision makers and , if possible, be translated into joined action plans and activities!
- This is not easy as digitalisation is more visible, less complex and less expensive than biologisation!
- There are other new trends emerging we must take into account:
  - potentials of resilience of biological resources,

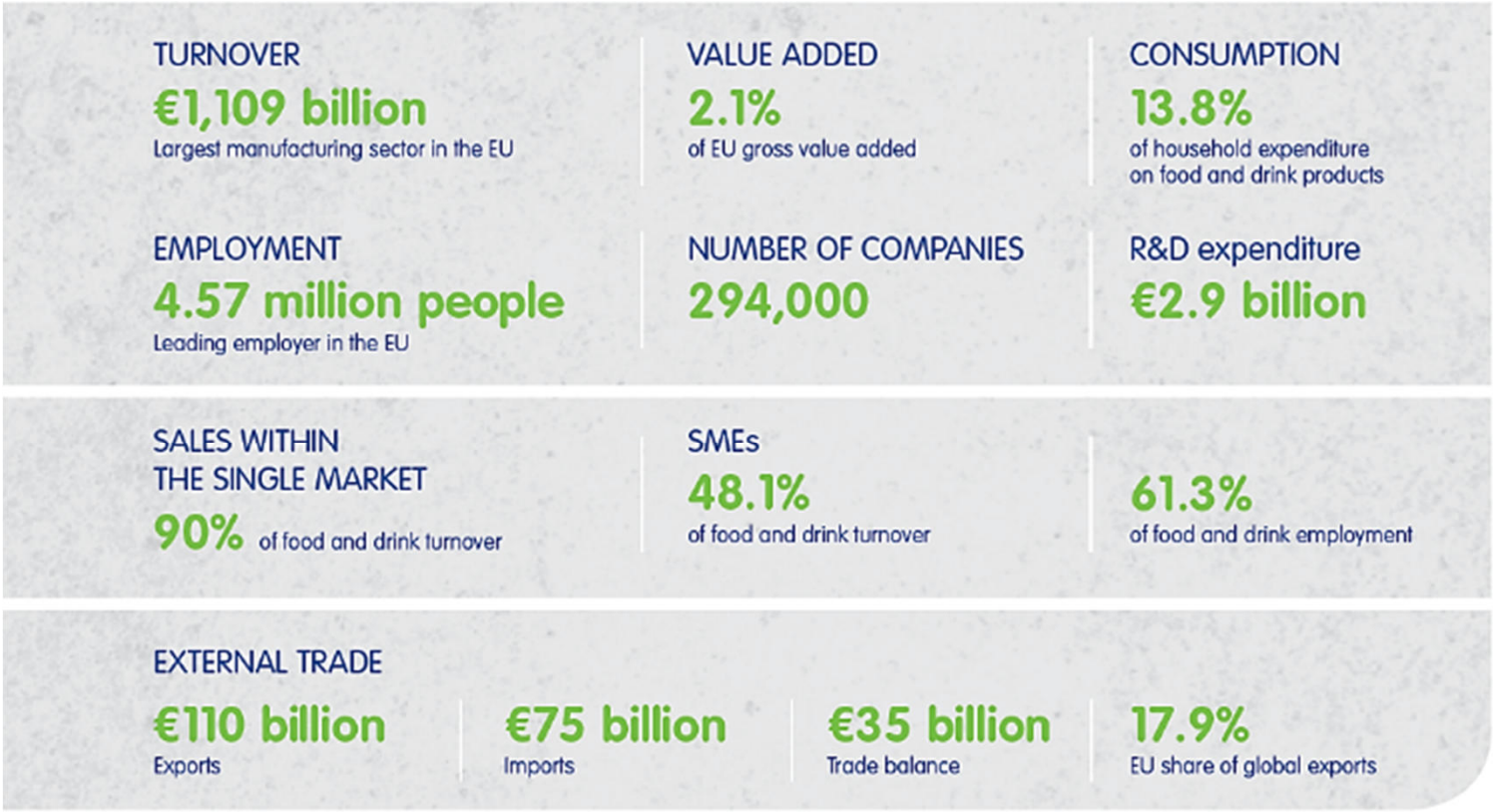
  -aspects on health (“one health”) and

  - last but not least big data.

BioEconomy : Cascade Principle
The European AgriFood Matrix

	Food	By products	Micro-Macro Ingredients	Feed	BioMaterials Non Food	Compost Fertilizers	BioGas	BioFuels
Meat industry	X	X		X	-		X	
Feed industry		X		X	X	X	X	
Milk & dairy	X	X	X	X	X			
Vegetable processing	*X*	*X*	*X*	*X*		X	X	
Bread & bakery	*X*	*X*		*X*	X			X
Sweets & Candies	*X*		*X*				X	
Juices & concentrates	*X*	*X*	*X*	*X*			X	
Analcoholic beverage	*X*		*X*		X			
Alcoholic beverage	*X*	*X*	*X*	*X*	X			X

The industry in a snapshot



Sources: Eurostat, Joint Research Centre, UN COMTRADE

FOODDRINK EUROPE

THE NATIONAL PICTURE

A key industry in the economies of the EU Member States

#1 employer

The food and drink industry is the biggest employer in manufacturing in half of the Member States

66%

Share of turnover of the EU's 5 largest food and drink producers

- The food and drink industry ranks among the top three manufacturing industries in terms of turnover and employment in most Member States.
- France, Germany, Italy, the UK and Spain are the largest EU food and drink producers by turnover.

Food and drink industry data as published by FoodDrinkEurope National Federations[1] (2015)

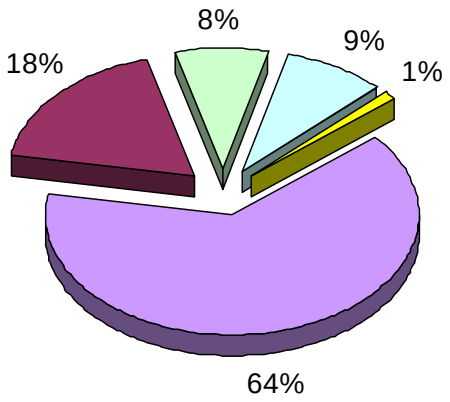
	Employment ranking in manufacturing	Turnover (€ billion)	Value added (€ billion)	Number of employees (1,000)	Number of companies
Austria	5	22.7	5.5	83.3	3,893
Belgium	1	48.6	8.1	88.5	4,452
Bulgaria	2	5.2	1.0	95.6	6,182
Croatia	1	5.3	1.2	61.0	3,256
Czech Republic	4	13.3	2.7	115.4	9,157
Denmark	2	25.4	4.5	61.6	1,607
Estonia	2	1.8	0.4	15.4	575
Finland	4	10.9	2.6	37.6	1,846
France	1	179.9	45.0	427.2	57,290
Germany[2]	3	168.6	36.7	569.2	5,812
Greece[3]	1	14.2	2.8	87.2	1,225
Hungary	1	11.5	2.0	106.6	6,812
Ireland	1	27.1	-	47.3	1,583
Italy	2	132.0	24.2	427.0	56,315
Latvia	1	1.7	0.4	23.7	1,120
Lithuania	1	4.0	0.8	44.1	1,609
Netherlands	1	70.0	11.3	128.6	6,065
Poland	1	55.6	9.9	417.5	14,534
Portugal	1	15.3	2.9	107.5	10,996
Romania	1	12.0	-	180.8	8,826
Slovakia[2]	3	4.0	0.8	29.3	278
Slovenia	3	2.2	0.5	16.5	2,258
Spain	1	104.2	19.3	349.2	26,016
Sweden	4	18.1	4.5	50.5	4,240
United Kingdom	1	131.6	38.9	418.2	6,620

[1] Or by Eurostat (SBS)
[2] Companies with more than 20 employees
[3] Small food and drink producers excluded

Italian Food Industry: 2011-2019 turnover

	2011 (Bil €)	2015 (Bil €)	2019 (Bil €)
FATTURATO (Valore)	124 (+2,3%)	133 (+2,4%)	144 (+2,5%)
PRODUZIONE (Quantità)	-0,3%	-0,9%	+0.5%
NUMERO IMPRESE INDUSTRIALI	6.957 (con oltre 9 addetti)	6.860 (con oltre 9 addetti)	6.810 (con oltre 9 addetti)
NUMERO ADDETTI	408.000	405.000	402.000
EXPORT	21,1 (+10,0%)	27,1 (+6,9%)	33,2 (+3,5%)
IMPORT	17,5 (+9,8%)	20,4 (+4,5%)	23,4 (+1,8%)
SALDO	4,6 (+7,0%)	6,7 (+19,7%)	9,8 (+26,2%)
TOTALE CONSUMI ALIMENTARI	206 (Variaz. Reale + 1,0%)	208 (Variaz. Reale -3%)	210 (Variaz. Reale + 0,3%)
POSIZIONE NELL'INDUSTRIA MANIFATTURIERA ITALIANA	2° posto (12%) dopo settore metalmeccanico	2° posto (14%) dopo settore metalmeccanico	2° posto (15%) dopo settore metalmeccanico

ITALIAN FOOD & DRINK INDUSTRY

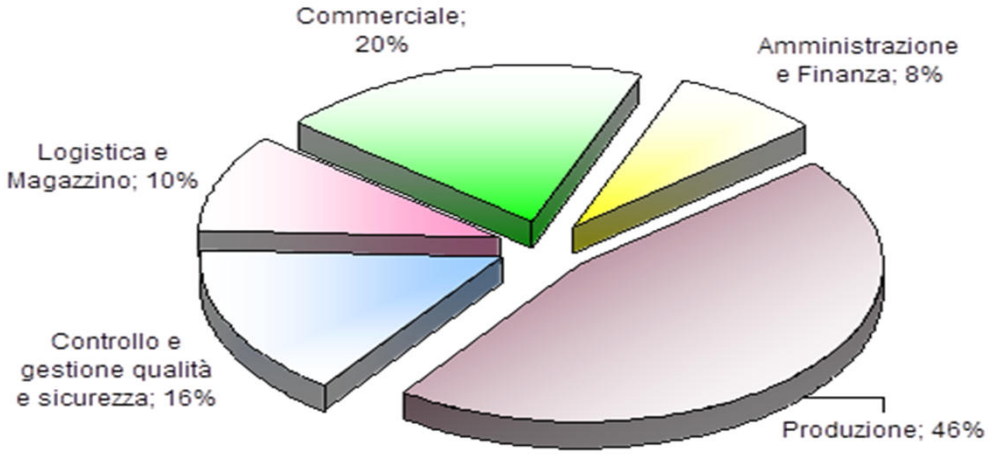


% TURNOVER COMPOSITION 2014

Billion €

Tradizionale classico	83,2	64%	
Tradizionale evoluto	23,4	18%	
Denominazioni protette (DOP, IGP)	10,4	8%	di cui 3,5 mld di export
Nuovi prodotti	11,7	9%	
Biologico	1,3	1%	
Totale	130	100%	di cui 25 mld di export

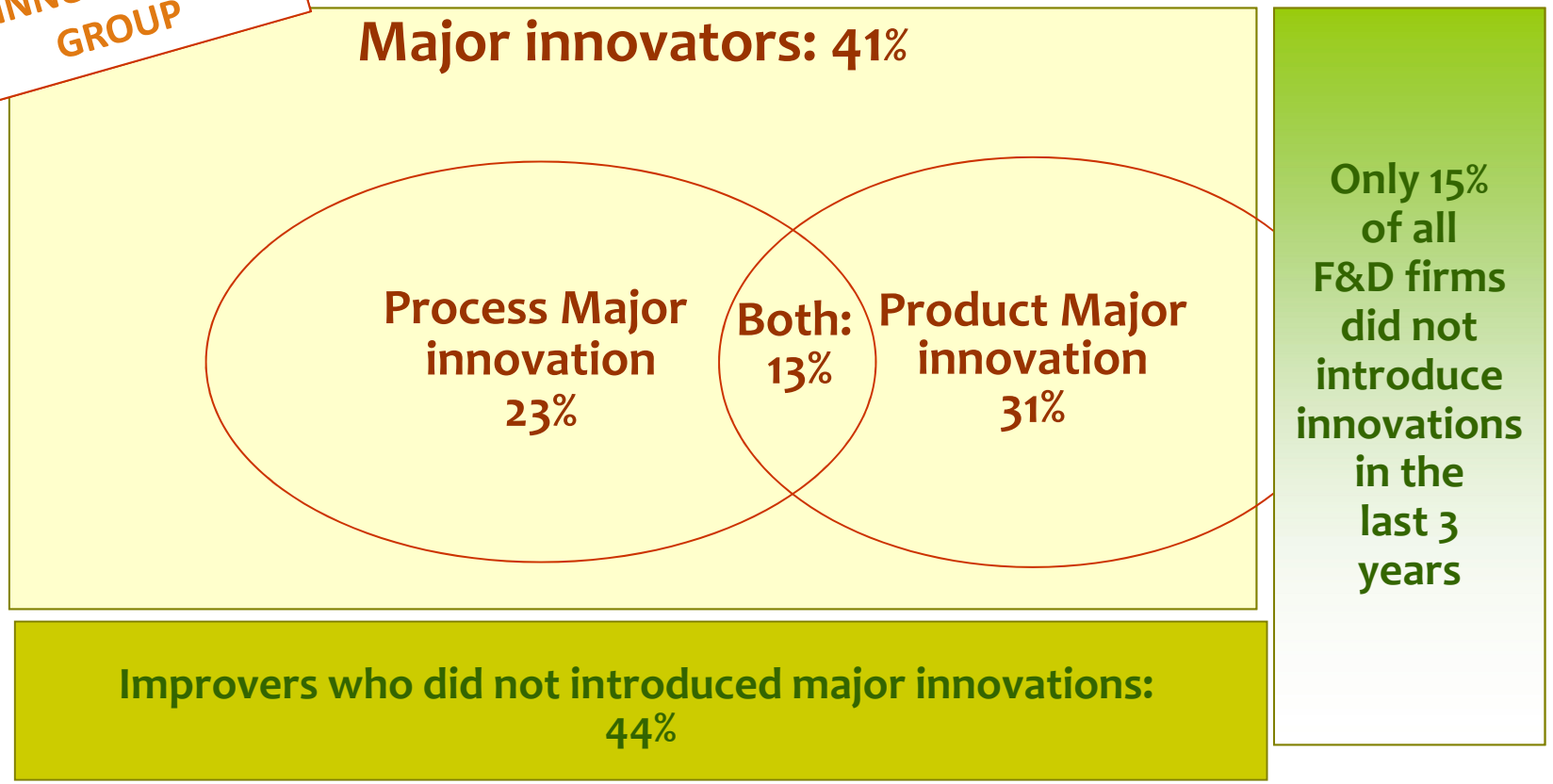
% DIRECT EMPLOYMENT COMPOSITION



EUROPE

European F&D INDUSTRY INNOVATORS GROUPS

INNOVATORS GROUP



Source: SSA "SMEs-NET"

R&D AND INNOVATION

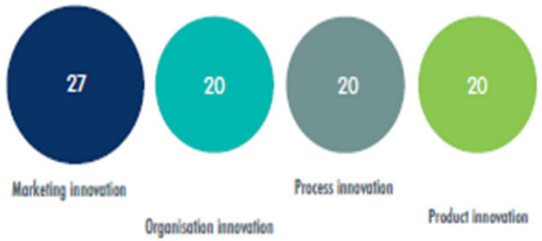
Innovation[1] activities of EU[2] food and drink companies: crucial for competitiveness

46%
Share of innovative companies

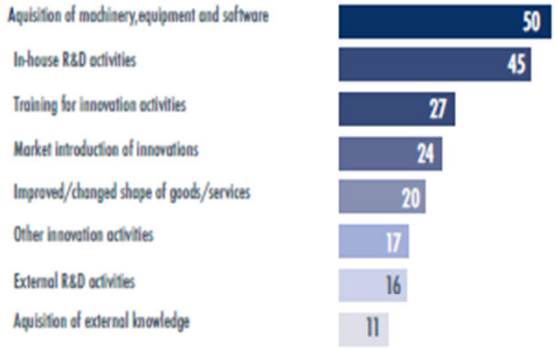
21%
Share of non-innovative companies that did not innovate due to barriers

- During the period 2012-2014, more than one quarter of all food and drink companies reported marketing innovations. Organisation, process and product innovations took place in 20% of all companies.
- Half of product and/or process-innovative food and drink companies were engaged in acquisition of machinery, equipment and software. 45% run in-house R&D activities.
- Key barriers to innovation were: lack of finance, low market demand for innovations and too much market competition.
- 62% of innovative food and drink companies introduced innovations with environmental benefits.

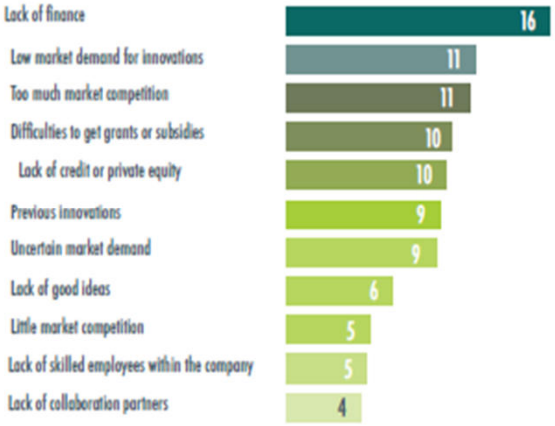
Types of innovation of EU[2] food and drink companies (2012-2014,% of total)[3]



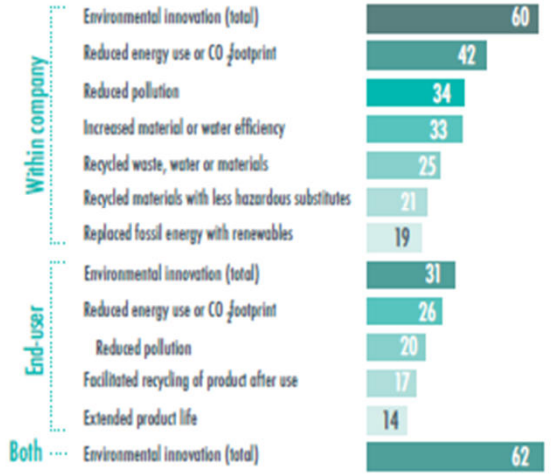
Innovation activities of EU[2] food and drink companies (2012-2014,% of product and/or process-innovative companies)[3]



Important barriers to innovation for EU[2] food and drink companies (2012-2014,% of non-innovative companies)



EU[2] food and drink companies that introduced innovations with environmental benefits (2012-2014,% of innovative companies)[3]



[1] Innovation is defined here as: the implementation of a new or significantly improved product or process; a new marketing method; a new organisational method.
[2] Based on available data
[3] Individual companies may have introduced more than one of these types of innovation.

Source: Eurostat (Community Innovation Survey, 2014)

INNOVATION AND CONSUMER TRENDS

Innovation key to greater consumer choice

Pleasure

Leading driver of food innovation in Europe

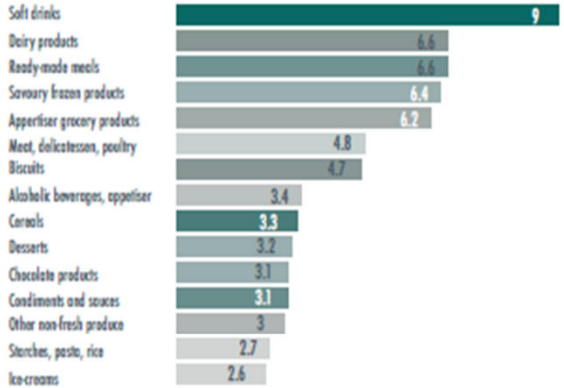
#1

Soft drinks are the world's most innovative food sector

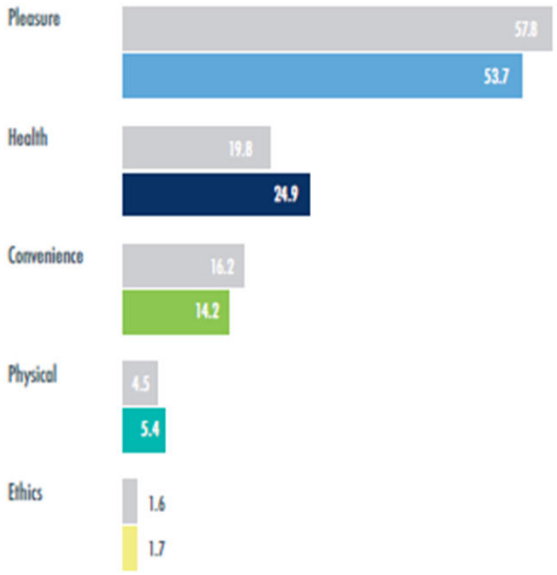
- Drivers of innovation can be divided into 15 trends, grouped along five axes, corresponding to general consumer expectations: pleasure, health, physical, convenience and ethics.
- Pleasure, including variety of senses and sophistication, is the leading driver of food innovation in Europe, with a 54% share in 2016.
- Health accounts for nearly one in four innovations launched. All the health trends (natural, medical and vegetal) gained ground in 2016, making health the most dynamic driver of food innovation in Europe in terms of growth.
- Soft drinks are world's leaders in innovation in 2016, pushing dairy products to second place. Ready-made meals stay at the third place.

Food innovation trends

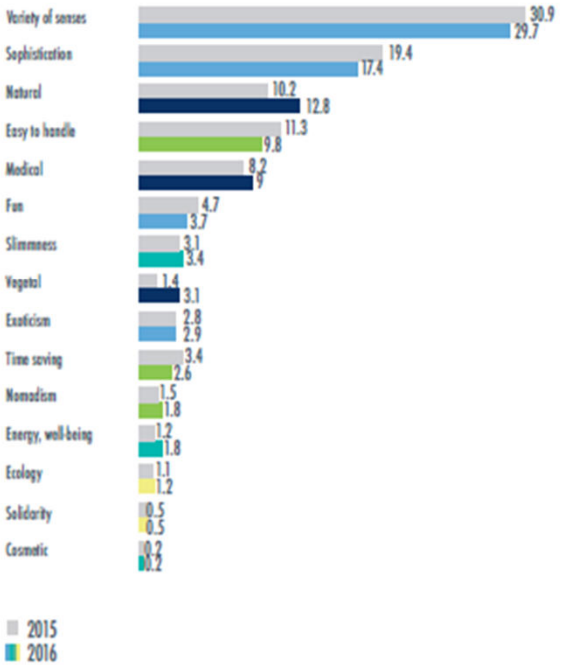
The world's 15 most innovative food sectors (2016,%)



Drivers of innovation in Europe (2015-2016,%)



Food innovation trends in Europe (2015-2016,%)



Source: XTC World Innovation Panorama 2017

SUSTAINABILITY OF THE FOOD AND DRINK INDUSTRY

Implementing the United Nations Sustainable Development Goals

9 billion

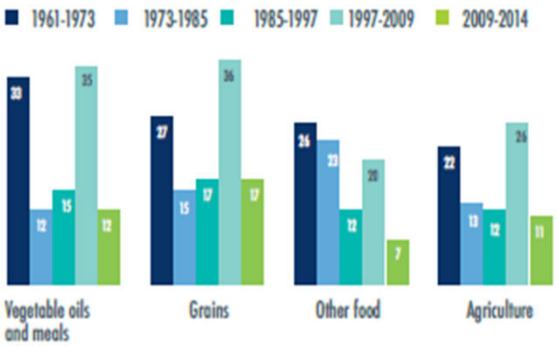
Global population in 2050

60%

Increase in global food supplies by 2050

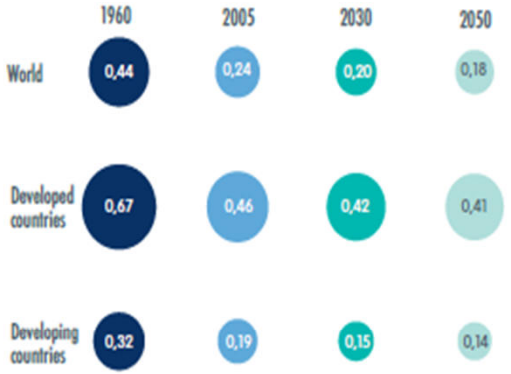
- Price volatility of agricultural commodities was peaking in the 1997-2009 period. Prices were more stable in more recent years. Overall highest volatility is noticeable for grains, followed by vegetable oils.
- In 1960, one hectare of land fed 2 people while in 2050 one hectare of land will be required to feed 5 people.
- Climate change increases the likelihood of more extreme temperatures and unpredictable weather events, which affect food production.
- Natural resources, upon which food production relies, will come under increased pressure in the future to meet a growing demand for food worldwide.

Volatility of world prices of agricultural commodities (%)



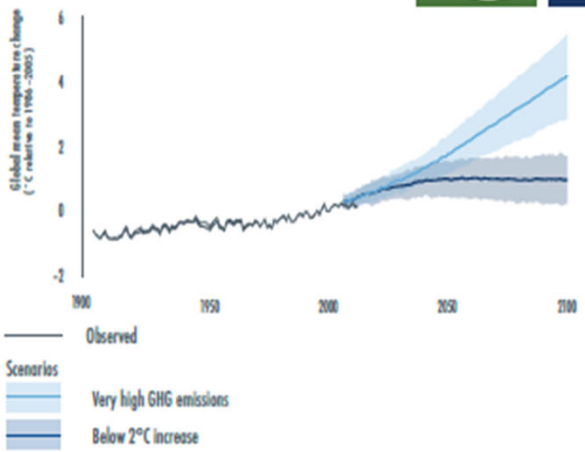
Source: European Commission, DG Agriculture and Rural Development

Arable land per capita (hectares in use per person)



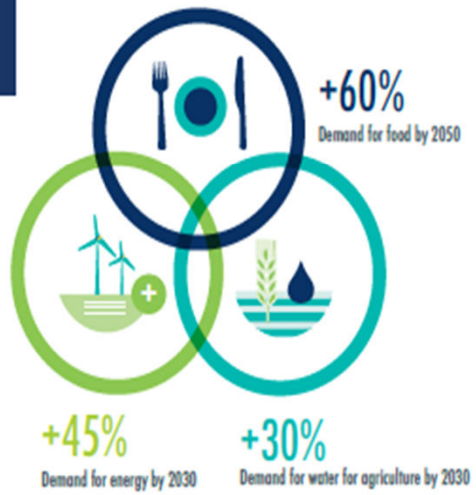
Source: World agriculture towards 2030/2050: the 2012 revision, FAO

Past and projected global temperature change



Source: Climate Change 2014: Synthesis Report, IPPC

Future global challenges (% increase)



Sources: The Future of Food and Farming (2011), FAO

European long-term priorities of The European Technology Platform Food for Life

- A more **competitive agri-food industry and chain** in Europe;
- **More innovation** in farming and food processing:
- **Farm for Tomorrow - Food Factory of the Future;**
- **Resource efficiency** in the Circular Bioeconomy
- **Improving added value of high quality foods,** traditional and PGI ;
- Dietary needs of the **elderly**, in **pregnancy**, in others target groups;
- Early **detection** of chemical and microbiological **hazards;**
- **Low cost and low scale processing, tech transfer** and networks for SMEs;
- Impact of food and drink **policies** in Europe (VAT, excise, access, comm.).

36 Food for Life NTPs: think locally, act globally!

COORDINATOR: Italian Food for Life

F&D INDUSTRY FUTURE TRENDS 2030

- Wide variety of products, diversity.
- Convenience, ready to eat.
- Authenticity, Origin, Territory, Landscape, Narrative.
- Attention to specific nutritional needs.
- Tasty products, texture, density, colour, portion, pack.
- Products affordable in price/quality ratio, ingred. quality.
- Attention to specific needs: religious / ethnic / ethical .
- Attention to environment, sustainability, organic, no chem, naturalness, no waste , recovery, recycling.
- New occasions: brunches, aperos, happy hours, street food, catering, slow food, grazing, gastros.

Challenges and responses for Food Manufacturers

- Scarcity in **raw materials;**
- **Globalization** to manage**;**
- **Local food chains and markets** enhanced**;**
- **Buyers and Retailers concentration;**
- **New ways of consumption;**
- High **stratification** of consumption;
- **New glocal values:** ethics, envi, ethnic, authentic, natural …;
- **New nutritional** and diet values;
- **New policies** on food&drink: neo protect, neo prohibi, neo info;
- **New trade policies:** Europe, Efta, Nafta, Asian, Ttip, Med, Mercosur.

- **Precision farming** and sustainability;
- Raw materials **diversity**; nutritional values
- **Low cost technologies** and downscaling
- Resource and manufacturing **efficiency** to improve**;**
- **Horizontal** Innovation to be incorporated: new mats., ICT, process, pack, low scale technologies
- From old to **young generation of entrepreneurs;**
- **Food Supply Chain** and **Collaborative Networks;**
- New **distribution systems** and **business models;**
- **Flexibility and differentiation to face new ways of consumption;**

RANKING OF FIRST SIX COMPETENCES REQUIRED FROM THE ITALIAN AGRIFOOD SMEs TO TAKE GRADUATES

MULTIDISCIPLINAR TECHNICAL SKILLS	1°
MANAGERIAL & BUSINESS SKILLS	2°
MARKETING & COMMERCIAL SKILLS	3°
ICT SKILLS, OFFICE MANAGEMENT	4°
LEGAL AFFAIRS	5°
FLUENT KNOWLEDGE OF LANGUAGES	6°

Fonte: Elaboration and forecast Federalimentare on "Italian Food for Life" NTP data

Milestones so far

FOOD 2030: Research & Innovation for Tomorrow's Nutrition & Food Systems

High-Level Event, 12-13 October 2016, Brussels

Harnessing Research and Innovation for FOOD 2030

Science Policy Dialogue, 16 October 2017, Brussels

Circular Economy
FOOD 2030 (16/10/ 2017)

copa cogeca
european farmers european agri-cooperatives

- **Implementing a Food System Approach**
- **Strengthening R & I Policy Coherence and Coordination**
- **Reinforcing R & I Member States Policy Alignment**
- **Boosting R & I Investment and Market Uptake**
- **Improving R & I Take Up of Emerging Technologies and new Ways of doing Science**
- **Improving Data Gathering and Monitoring in Member States**
- **Measuring Food and Nutrition Security R & I Output and Impact**

European Technology Platform Food for Life

Confagricoltura
Official Partner
ITALIA EXPO MILANO 2015
We are in Palazzo Italia

FOOD 2030
Research & Innovation
for tomorrow's
nutrition and food systems

Political Opportunity

Juncker Priorities & Modern CAP

Sustainable Development Goals

COP21+

World Food Day 2017

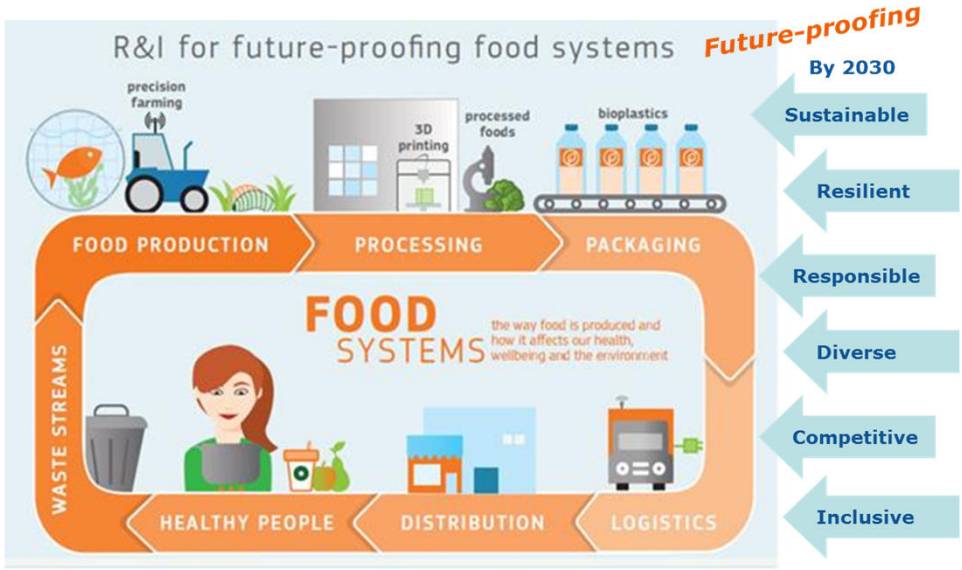
IPCC

Research and Innovation

European Commission

FOOD 2030

EU R&I Policy Framework to future-proof our nutrition & food systems



- Need for a systemic approach to future-proofing food systems by structuring, connecting and scaling-up R&I
- To provide evidence for policies and solutions (knowledge, methods, technologies, services, business models, etc.) addressing 4 priorities.

Priorities

- **NUTRITION for sustainable and healthy diets**
- **CLIMATE smart and environmentally sustainable food systems**
- **CIRCULARITY and resource efficiency of food systems**
- **INNOVATION and empowerment of communities**

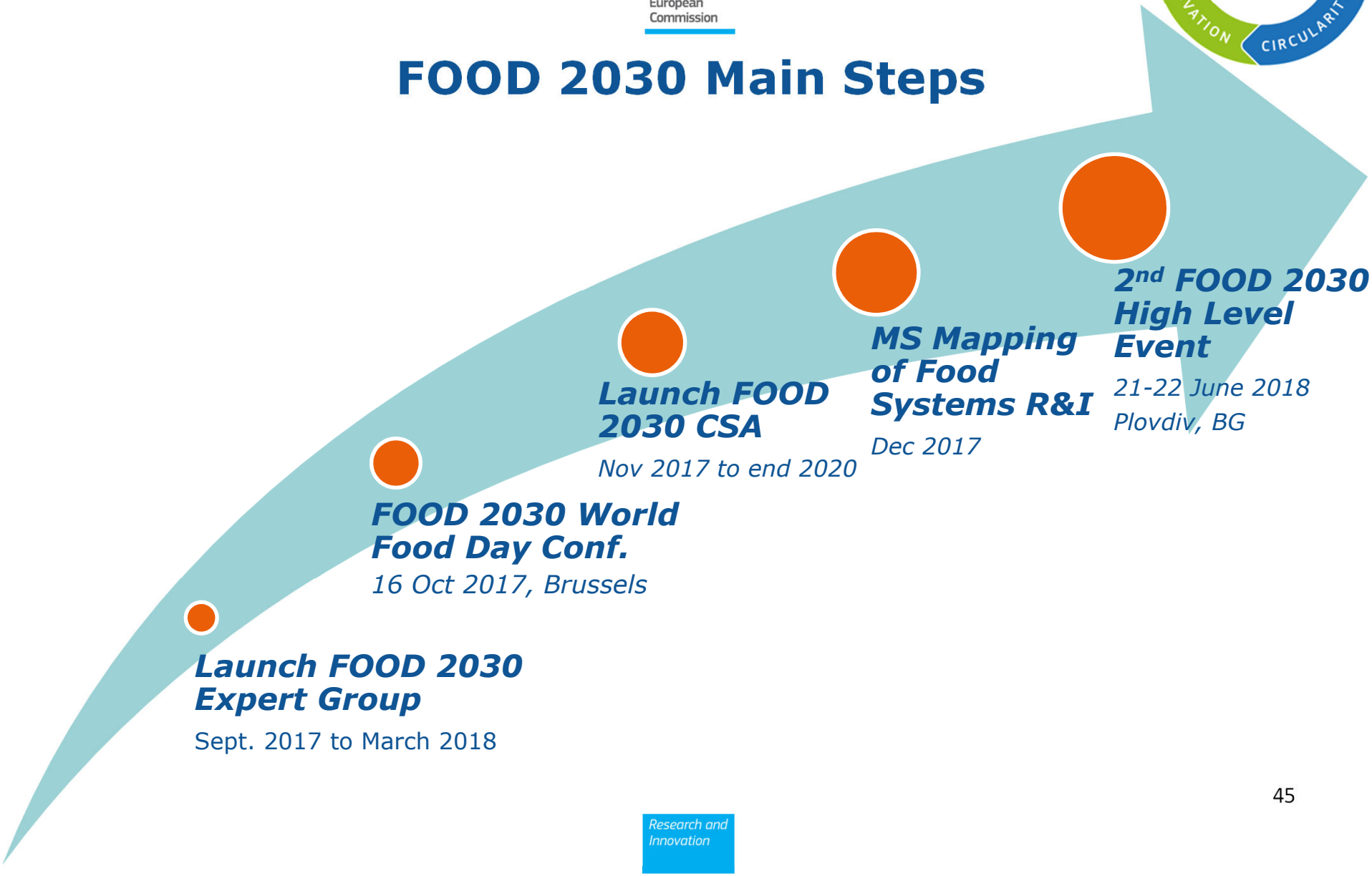
Drivers

- **Research breakthroughs**
- **Innovation and Investment**
- **Open Science**
- **International collaboration**

#FOOD2030EU

Research and Innovation

FOOD 2030 Main Steps



Launch FOOD 2030 Expert Group

Sept. 2017 to March 2018

FOOD 2030 World Food Day Conf.

16 Oct 2017, Brussels

Launch FOOD 2030 CSA

Nov 2017 to end 2020

MS Mapping of Food Systems R&I

Dec 2017

2nd FOOD 2030 High Level Event

21-22 June 2018

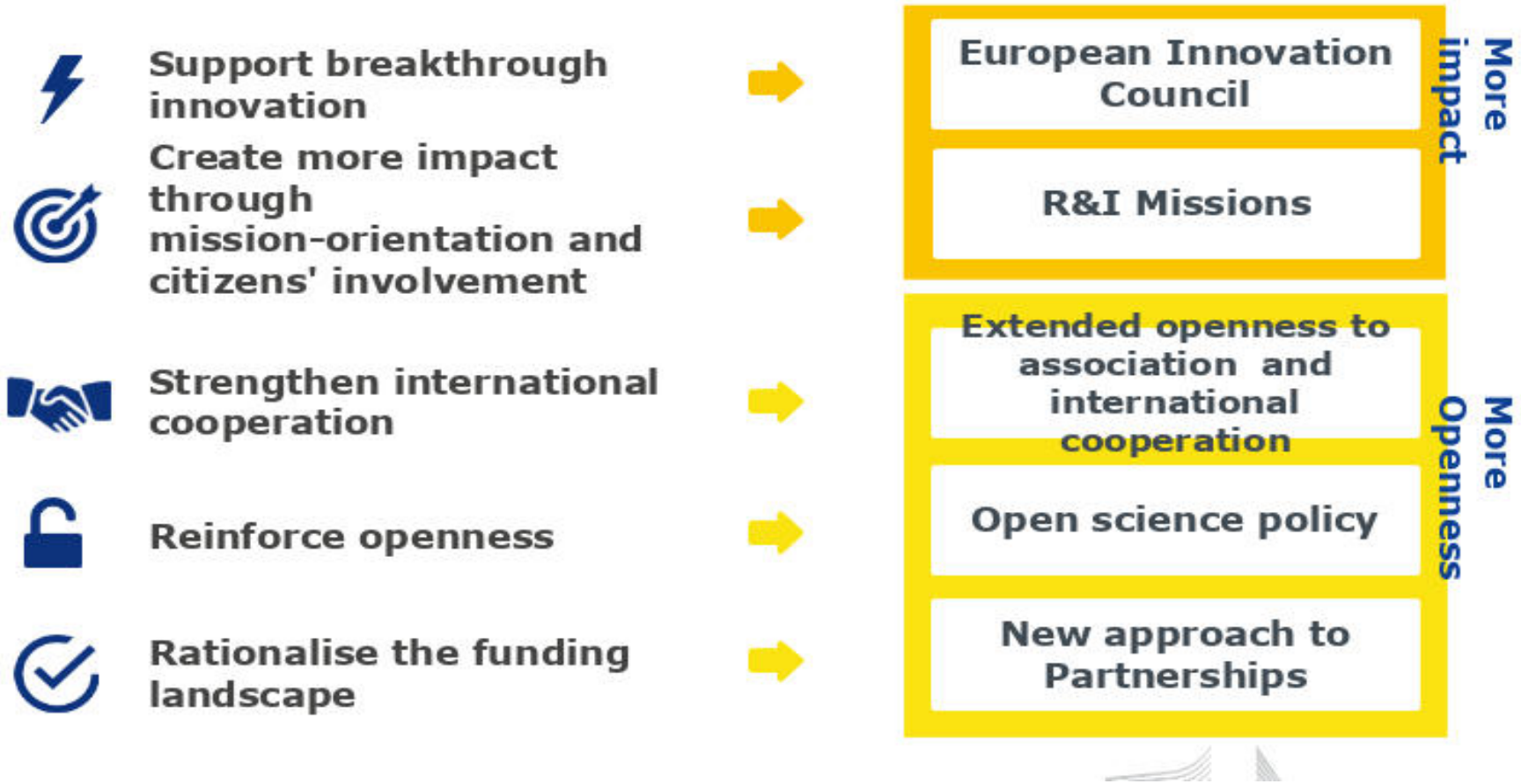
Plovdiv, BG

HORIZON EUROPE FP 9
(COM 2018, 7 6 2018)

copa cogeca
european farmers european agri-cooperatives

Key Novelties

[See Impact Assessment]



HORIZON EUROPE FP 9 (COM 2018, 7 6 2018)

copa cogeca
european farmers european agri-cooperatives

Budget

- **Open Science**:
- ERC 16,6 b;
- MSCA 6,8 b;
- research infrastructure 2,4 b.

- **Global Challenges and Industrial Competitiveness**:
- Health 7,7 b;
- Inclusive and Secure Society 2,8 b;
- Digital and Industry 15 b;
- Climate, Energy and Mobility 15 b;
- Food and Natural Resources 10 b;
- JRC 2,2 b;
- Missions (Artt. 7, 26) (10%).

- **Open Innovation**:
- EIC 10,5 b;
- European innovation ecos. 0,5 b;
- EIT 3 b.

- **Strengthening the European Research Area**:

- sharing excellence 1,7 b;
- reforming and enhancing the European R&I System 0,4 b.

European Technology Platform Food for Life

Confagricoltura
Official Partner
EXPO MILANO 2015
ITALIA
We are in Palazzo Italia

GRI Network activities

eip-agri
AGRICULTURE & INNOVATION

funded by European Commission

European Innovation Partnership
'Agricultural Productivity and Sustainability'

SHARING KNOWLEDGE • CONNECTING PEOPLE • TACKLING CHALLENGES

copa cogeca
european farmers european agri-cooperatives

The European way – The Mind Map

INNOVATIVE FARMERS & AGRO-COOPERATIVES

- Enhanced Knowledge Exchange
- - Farmers learning from farmers
- - Farmers leading Innovation
- - Links between conventional and organic systems

- Green Growth;
- - Efficient use of resources
- - Active management of natural resources
- - Climate change mitigation and adaptation
- - Closing the yield gap
- - Improved agrifood system productivity

- Fair and Competitive Value Chains
- - Collaboration across all sectors in the chain
- - New strategy for value chains and new business models

- Healthy Farming;
- - Integrated pest management
- - dealing with emerging pests and diseases
- - Enhancing biosecurity in housed livestock
- - Plant and animal breeding for resilience and robustness

Confagricoltura
Official Partner
ITALIA
EXPO MILANO 2015
We are in Palazzo Italia

European Technology Platform Food for Life

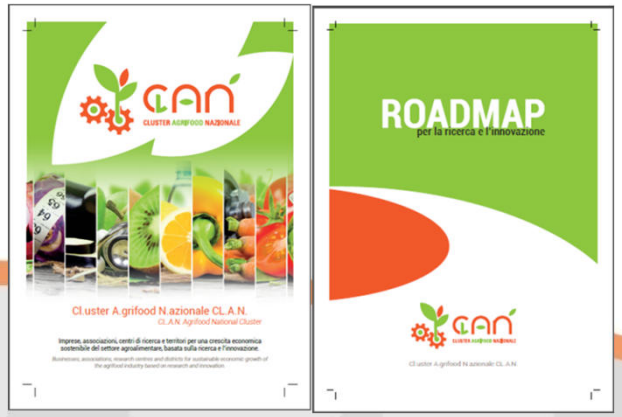
Circ. economy:the European Way -Industry Hot Topics

- The food human axis: effect of ingredients, processing and way of consumption on human wellbeing;
- Low Scale Low Cost new technologies (ict, pilots, niches, efficiency …)
- High quality stable and fresh food ready to eat with packaging extended shelf life;
- Consumer response to food price instability: from raw materials to retailers supplier;
- Valorization of genetic resources and technological improvements to increase the nutra-functional values of raw mat. and processed foods;
- New track systems and sustainable transportation and logistics, losses and waste reduction;
- Markers identification , integrity of varieties used in the production of traditional materials and food and DOP/IGP
- Sustainable production and new business models and value chains strategies
- Big data and digitization management

THE ITALIAN STRATEGY: ROADMAP FOR INNOVATION AND RESEARCH

- **CL.A.N. has developed a Roadmap for Innovation and Research:** this task involved universities, public and private research bodies, food companies, district representatives, industry associations and training organisations, to prepare a shared strategic vision of prospective technology scenarios in the Food Industry.

- The document is structured around **six Technology Pillars** which are true strategic development axes of the agrifood industry:
    1. **Health and well-being throughout the entire lifecycle**
    2. **Food safety**
    3. **Production processes for improved food quality**
    4. **Sustainable and competitive food production**
    5. **Machinery for the food industry**
    6. **ICT in the agrifood industry and technology transfer tools**



Source: CLAN

THANK YOU FOR YOUR ATTENTION !!!

d.rossi@confagricoltura.it

progetti-internazionali@assobirra.it