National Food Technology Platforms: EU Circular BioEconomy and the AgroIndustrial SMEs Priorities”

1st TRAFOON Stakeholder Workshop
Novi Sad, 17th of May 2016

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Director Research & Innovation – ConfAgroicultura – Confederation of Farmers
Director International Projects – Brewers of Italy – Confindustria – Brewers of Europe
## EU Food Industry per Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Turnover (€ billion)</th>
<th>Value added (€ billion)</th>
<th>Number of employees (1,000)</th>
<th>Number of companies</th>
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</thead>
<tbody>
<tr>
<td>Austria</td>
<td>12.6</td>
<td>4.7*</td>
<td>58</td>
<td>3,921*</td>
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<tr>
<td>Belgium</td>
<td>44.5</td>
<td>6.7</td>
<td>89</td>
<td>4,912</td>
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<tr>
<td>Bulgaria</td>
<td>4.7</td>
<td>0.8*</td>
<td>99*</td>
<td>5,612</td>
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<td>Cyprus</td>
<td>1.5</td>
<td>0.4*</td>
<td>13*</td>
<td>863</td>
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<tr>
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<td>11.3</td>
<td>2.9</td>
<td>105</td>
<td>8,360</td>
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<tr>
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<td>25.4</td>
<td>3.2</td>
<td>55</td>
<td>1,610*</td>
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<tr>
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<td>0.3</td>
<td>13</td>
<td>422</td>
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<td>Finland</td>
<td>11.3</td>
<td>2.5</td>
<td>33</td>
<td>1,900</td>
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<td>France</td>
<td>157.2</td>
<td>29.3</td>
<td>500</td>
<td>10,000</td>
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<tr>
<td>Germany</td>
<td>163.3</td>
<td>11.5</td>
<td>550</td>
<td>5,960</td>
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<td>Greece</td>
<td>11</td>
<td>1.4</td>
<td>65</td>
<td>1,180</td>
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<tr>
<td>Hungary</td>
<td>8.3</td>
<td>2.0</td>
<td>97</td>
<td>6,556</td>
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<tr>
<td>Ireland</td>
<td>22.0</td>
<td>6.0*</td>
<td>43</td>
<td>689</td>
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<td>Italy</td>
<td>127.0</td>
<td>24.2</td>
<td>408</td>
<td>6,300</td>
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<td>1.6</td>
<td>0.3*</td>
<td>25*</td>
<td>788</td>
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<td>Lithuania</td>
<td>3.6</td>
<td>0.6*</td>
<td>42*</td>
<td>1,205</td>
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<td>Netherlands</td>
<td>59.2*</td>
<td>14.3</td>
<td>131</td>
<td>4,385*</td>
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<tr>
<td>Poland</td>
<td>49.7</td>
<td>8.9*</td>
<td>403*</td>
<td>13,708</td>
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<td>Portugal</td>
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<td>186</td>
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<td>0.7</td>
<td>30</td>
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<tr>
<td>Slovenia</td>
<td>2.2</td>
<td>0.5*</td>
<td>16*</td>
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<td>Spain</td>
<td>83.8</td>
<td>20.0*</td>
<td>446</td>
<td>30,000</td>
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<td>Sweden</td>
<td>19.2</td>
<td>4.4</td>
<td>56</td>
<td>3,400</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>937</strong></td>
<td><strong>174</strong></td>
<td><strong>3,943</strong></td>
<td><strong>138,455</strong></td>
</tr>
</tbody>
</table>

Source: Data & trends of the European Food and Drink Industry 2012 (FoodDrinkEurope)
Top 5 Member States in terms of food & drink industry turnover, 
2014 (€ billion)

- Germany: 160 billion
- France: 150 billion
- Italy: 140 billion
- UK: 100 billion
- Spain: 85 billion

Source: Federalimentare elaboration from preliminary Eurostat data
Turnover and employment in the EU bioeconomy (2011)

Source: SCAR – EUROSTAT 4th foresight 2015
# 2014 EU BIO-ECONOMY

**EU bio-economy turnover of 2.690 billion € with 22 million employees.**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Turnover (Billion €)</th>
<th>Employees (million)</th>
<th>Source</th>
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<tbody>
<tr>
<td>Food &amp; Drink Industry</td>
<td>1.186</td>
<td>4.4</td>
<td>FoodDrinkEurope</td>
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<tr>
<td>Agriculture</td>
<td>430</td>
<td>12,0</td>
<td>COPA-COGECA</td>
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<tr>
<td>Fisheries</td>
<td>14</td>
<td>0.5</td>
<td>FAO</td>
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<tr>
<td>Paper, Leather etc.</td>
<td>428</td>
<td>1,8</td>
<td>CEPI</td>
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<tr>
<td>Forestry</td>
<td>337</td>
<td>2,0</td>
<td>CEI-BOIS</td>
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<tr>
<td>Others</td>
<td>227</td>
<td>1,0</td>
<td>CEFIC</td>
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<tr>
<td>Bio-based materials</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>60 (est)*</td>
<td>0,15 (est)*</td>
<td>USDA, Arthur D Little, Festel, McKinsey, CEFIC</td>
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<tr>
<td>Enzymes</td>
<td>1 (est)*</td>
<td>0,005 (est)*</td>
<td>Amfep, Novozymes, Danisco/Genencor, DSM</td>
</tr>
<tr>
<td>Biofuels</td>
<td>7</td>
<td>0,15</td>
<td>EBB, eBio</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2.690</strong></td>
<td><strong>22</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: CE 2014
Bio-based Economy: feedstocks, processes and products (without food & feed)

**Biomass feedstocks**
- Sugar
- Starch
- Lignocellulose
- Oils & Fats
- Proteins
- Other Complex biomolecules (rubber, biosurfactants etc.)
- Mixed biomass, waste

**Processes**
- Physical-mechanical
  - Filtration
  - Distillation
  - Extraction
  - Fragmentation
  - Crystallisation
- Chemical
  - Pulping
  - Oxidation
  - Esterification
  - Hydrogenation
  - Hydrolysis
  - Etherification
  - Isomerisation
  - Polymerisation
- Thermochemical
  - Incineration
  - Gasification
  - Thermolysis
  - Pyrolysis
  - Hydrothermal
- Biotechnology
  - Fermentation
  - Aerobic conversion (composting)
  - Anaerobic digestion (biogas)

**Bio-based products**
- Wood-based materials
- Pulp & paper
- Platform & fine chemicals
- Fibres
- Pharmaceuticals
- Composites
- Surfactants
- Lubricants
- Polymers
- Bioenergy
- Biofuels
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.).
The European Technology Platform Food for Life: aims

- **Increase** R&D strategy;
- **Coordinate** research in Europe and prevent duplication;
- **Promote** SME participation, specific programmes and networks;
- **Focus**, align and collaborate transnationally between stakeholders;
- **Increase** multidisciplinary / cross-sector education and training;
- **Optimise** knowledge capture and dissemination of knowledge between Member States and towards farmers and SMEs.
36 Food for Life NTPs: think locally, act globally!

COORDINATOR: Italian Food for Life
• More than **35.000** SMEs and **4.600** national stakeholders involved (Industry, Farmers, Universities, Research centres, Consumers, National Public Bodies, Retailers, Financial institutions).

• **87** strategic documents visible and published on ETP website (SRA, Implementation Plan, Vision document etc.)

• **2 mln €** yearly availability of public national funds specifically for NTPs

• **450 mln €** yearly availability of public national funds for food chain research

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**Meetings**

3. Brussels, 6.06.2008  
5. Barcelona, 11.05.2009  
6. Riga, 2.10.2009  
7. Brussels, 4.03.2010  
8. Rimini, 16.09.2010  
9. Budapest, 2.05.2011  
10. Bonn, 2.11.2011  
11. Istanbul, 11.06.2012  
13. Vienna, 22.04.2013  
15. Athens, 11.03.2014  
16. Turin, 6.10.2014  
17. Prague, 13.04.2015  
18. Athens, 11.11.2015  
European F&D INDUSTRY INNOVATORS GROUPS

Major innovators: 41%

Process Major innovation 23%
Both: 13%
Product Major innovation 31%

Improvers who did not introduced major innovations: 44%

Only 15% of all F&D firms did not introduce innovations in the last 3 years

Source: SSA “SMEs-NET”
F&D INDUSTRY FUTURE TRENDS

- Wide variety of products.
- Convenience, ready to eat.
- Attention to specific nutritional needs.
- Tasty products, texture, density, colour, pack.
- Products affordable in price / quality ratio.
- Attention to specific needs: religious / ethnic / ethical.
- Attention to environment, sustainability, naturalness.
- 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 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**;
- **Low scale technologies** and scale economies;
- Resource and manufacturing **efficiency** to improve;
- Horizontal Innovation to be incorporated: new mats., ICT, process, pack, low scale, low cost 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;
Business models for the bioeconomy

• Circularity implies new ways of designing and manufacturing products, new relationships between economic actors, new ways of recycling components and waste, etc.
• Actors and activities will be reassembled in time and in space.
• Different production models in terms of scope and size should not only be able to co-exist, but also capture the synergies between them.
• Public sector involvement is needed for these new business models to work, as public goods are generated in the circular economy but often not remunerated by the market.
# Circular BioEconomy 2 (8 Actions)
The AgriFood Matrix

<table>
<thead>
<tr>
<th></th>
<th>Food</th>
<th>By products</th>
<th>Micro-Macro Ingredients</th>
<th>Feed</th>
<th>BioMaterials Non Food</th>
<th>Compost Fertilizers</th>
<th>BioGas</th>
<th>BioFuels</th>
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<tbody>
<tr>
<td>Meat industry</td>
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## Circular BioEconomy 2: Cascade Principle
### The European Matrix

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<tr>
<th>Industry</th>
<th>Food</th>
<th>By products</th>
<th>Micro-Macro Ingredients</th>
<th>Feed</th>
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<th>Compost Fertilizers</th>
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<th>BioFuels</th>
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<td>Sweets &amp; Candies</td>
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</table>
Circular BioEconomy
Global Challenges after 2008 crisis

• Nutrition security and climate change: sustainable food supply system (SFSP-FAO UNEP);
• Access to enough, safe and nutritious food: EU JPI FACCE and Healthy Diet for a Healthy Life and WANA;
• A more resource – efficient agriculture, marine and food chain, in rural and urban dimensions: FAO Agrifood Task force and IPCC and CFP
• Developing the human and social capital: High level panel of experts (FAO UNEP HLPE);
• Land use and rural development strategy: CAP, OECD WP on rural growth and CIHEAM;
• Long term strategy for the bioeconomy: EU biobased PPP – Green Economy and IAASTD and ETC group.
• Long term strategy for renewable energies: BIOGAS european development
Circ bioeconomy: The EU way – Agri Hot Topics

- New perennial grain crops and sustainable yields;
- New biological active compounds as alternative pesticides;
- Management of natural resources and biodiversity;
- Optimizing livestock production systems;
- Soil, marine and water conservation in a changing environment;
- Improved high quality plant based protein sources;
- Valorization of by-products and wastes in a circular bioeconomy (no losses);
- Innovative tools and methods to improve quality and safety of local and origin denominated food;
Circ Bioeconomy: the EU Way - Industry Hot Topics

• The food human axis: effect of ingredients, processing and way of consumption on human wellbeing, low scale, low cost technologies;

• 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 processed foods;

• New track systems and sustainable transportation and logistics, losses and waste reduction;

• Markers identification of varieties used in the production of DOP/IGP
1 Strategic Priorities, focus on SMEs Needs

1. A resource efficient food supply, including food processing, advanced and environmental-friendly technologies, through food chain approach, increasing consumer acceptance of food products and industry best practices.

Research and application of improved and new technologies, advanced process control, manufacturing and ICT solutions, management systems, innovative solutions are necessary for:

- enabling productive, flexible food manufacturing practices, with low cost and low scale technologies;

- efficient use of energy, materials, water and labour to promote nexus and reduce waste and losses and to maintain existing/current environmental impact of food products and packaging;

- systematic approach to optimise the exploitation of limited raw material and other biological resources;

- reduction of production costs without compromising food safety and quality;

- improve and retain consumer confidence and trust in food supply chain processes and practices;

- development of accessible, affordable technologies and equipment for SMEs which can deliver the above listed functions.
2 Strategic Priorities, focus on SMEs Needs

2. Delivering nutritional and pleasurable food products that meet dietary needs and prevent non-communicable diseases.

Food products should contribute to the improvement of consumer health and well-being through understanding of the relationship between diet and health for individuals, groups and populations, at the genomic to physiological level. Food products, assisting a balanced diet, should maintain the pleasure from eating. To achieve this, research should be carried out on:

- enhancing nutritional potential of new and not properly exploited raw materials and ingredients;

-- to preserve and enhance nutritional value and sensory properties in processing, distribution and sale through optimisation of existing and new processes and technologies;

-- reformulation of existing products and development of new concepts to create healthier alternatives without compromising product safety or quality and guidance and information for that;

-- Helping consumption decisions through better understanding of consumer perception of nutrition and health issues and trade-offs with pleasure from eating and associated behaviours to facilitate innovation
3 Strategic Priorities, focus on SMEs Needs

3. Promotion of transfer and accessibility of new and advanced knowledge and solutions and provision of skilled staff with updated, relevant competences.

There is a need for sustainable business models, systems and networks which convert research results into practically applicable solutions data, information for SMEs on:

- efficient use of material, energy, water and labour resources and relative nexus on circular economy;

- adaptation and application of advanced process control including safety control, manufacturing, ICT, energy management solutions and value chain management methods for the food supply chain;

-- preserving and enhancing nutritional value and pleasurable sensory properties in processing, distribution and sale and on reformulation of products to deliver food products which contribute to healthy life styles and prevent non-communicable diseases,

-- methods, tools and operational models which support to maintain and develop skills, knowledge and competence of staff in manufacture, distribution and sale of food.
THANK YOU FOR YOUR ATTENTION!

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