

University of South bohemia  
Bioeconomy course  
Ceske Budejovice / 22-26 may 2017

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# BIOECONOMY: A PERSPECTIVE FOR EUROPE

# European Complexity

- 28 Member States
- 29 Commissions
- 736 MEP's
- More than 10 different governance systems
- More than 500 Ministers
- 24 Official languages – 552 Official interpreters
- More than 250 national newspapers
- More than 1000 committees
- More.....



# European Particularities



- Asynchronous economical development
- Heterogeneous Bio-industry
  - Expensive working power
- Complicated regulatory frame
  - Low public perception
  - Lack of raw materials
  - Lack of policy consensus
- Limited strategy for commercialization

# European Situation

- ◉ High Added Value products and services
- ◉ Target Markets
- ◉ Technology dependency
- ◉ Generous investment in Research & Innovation
- ◉ Limited competitiveness
- ◉ Brain Drain
- ◉ Development of the so called “Emerging Markets”
- ◉ The “North to South” technology transfer tends to be reversed

**Used to be**

**Current situation**

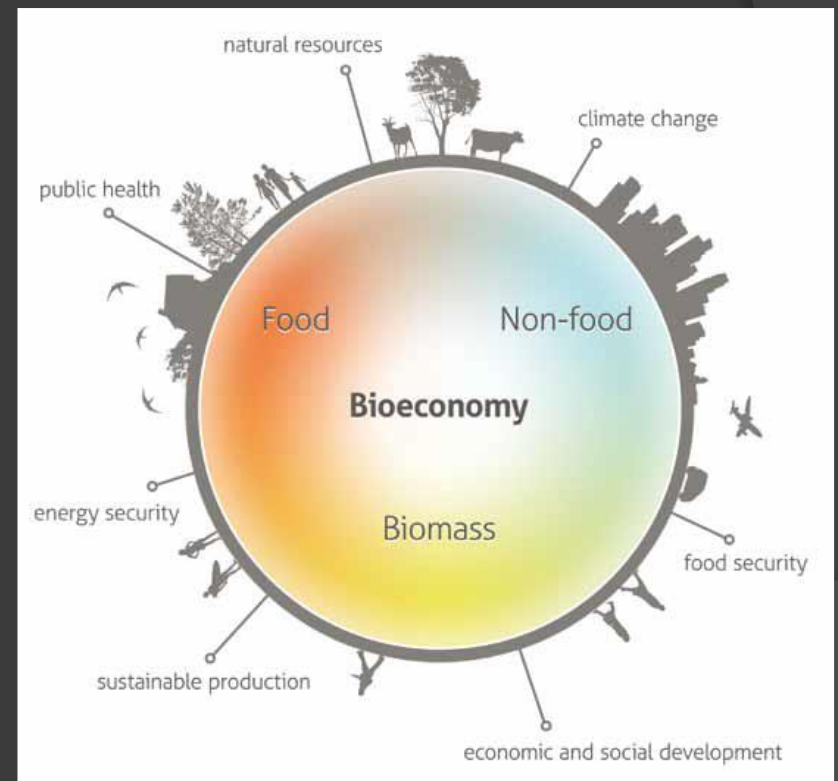
# Indispensable Necessity

◎ A New Alternative !!



# Integrated Bioeconomy

- *The integration of the Science with Business and Society*
- *Achievement of Food security, Energy independency and Environmental safety*
- *Guaranteeing its operation in a sustainable frame*



# Sustainability Operational System

## ⦿ Environmental Criteria

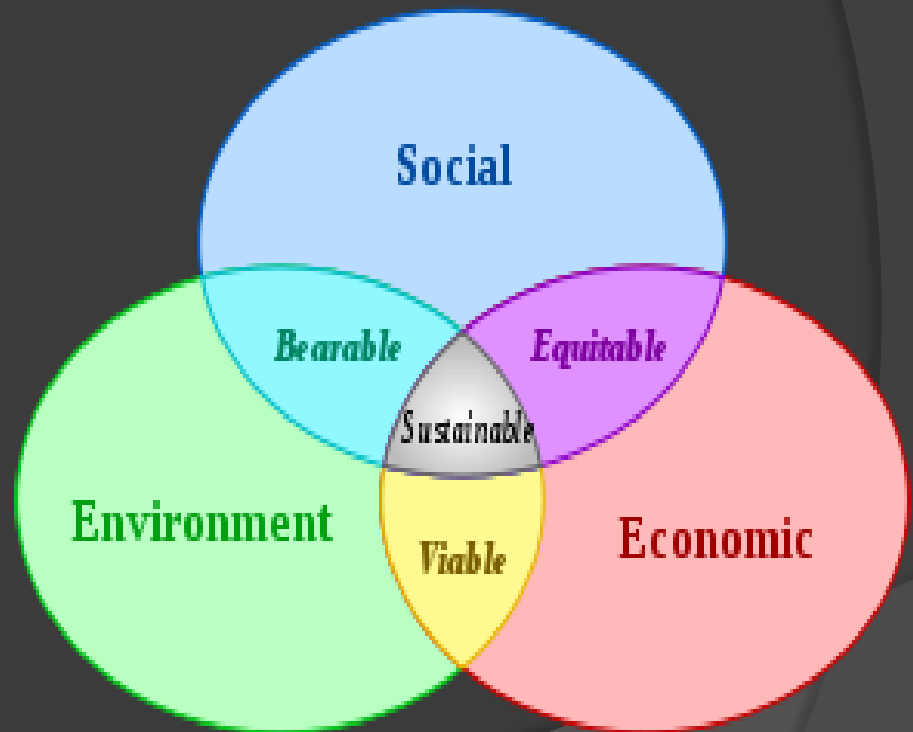
- Deforestation
- Biodiversity loss
- Toxic Emissions

## ⦿ Economic Criteria

- Prices
- Revenue

## ⦿ Social Criteria

- Job creation
- Public Perception



# Exploring the Potential

- Biorefineries
- Biofuels for Low Carbon Industry
- Bio-Based Materials & Composites
- Lignin-based Carbon Fibers
- Food Industry and Lateral Applications
- Materials from Nano-cellulose
- Textile Materials
- Sensors for Increased Resource Efficiency
- Evaluate the potential per Domain
- [Output / Added Value / Employment / Exports]
- Regionalization
- Integration to the National Priorities
- Socioeconomic Profile for each Domain
- Feasibility Study
- Cost-Benefit analysis

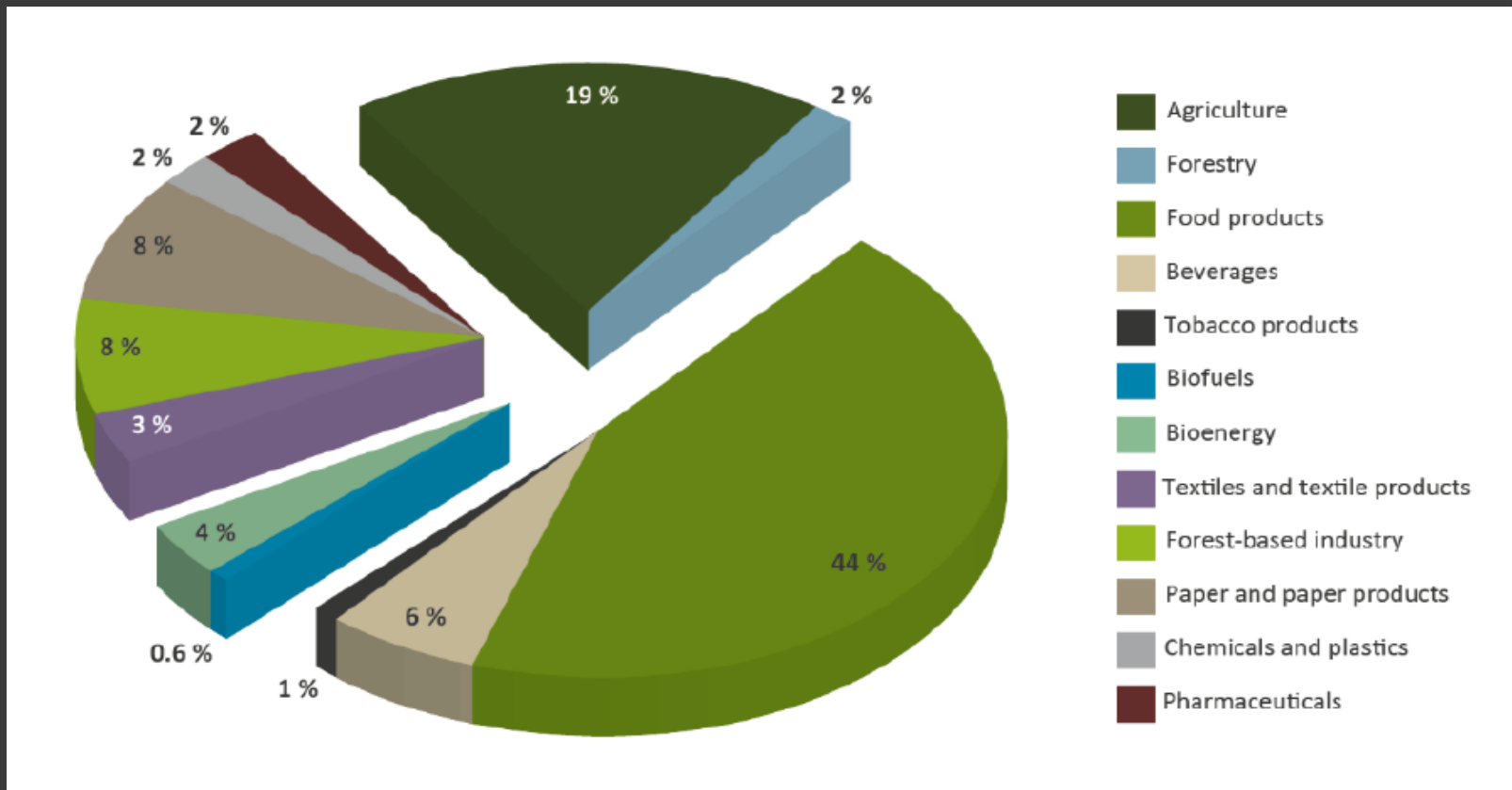
## Domains

## Actions



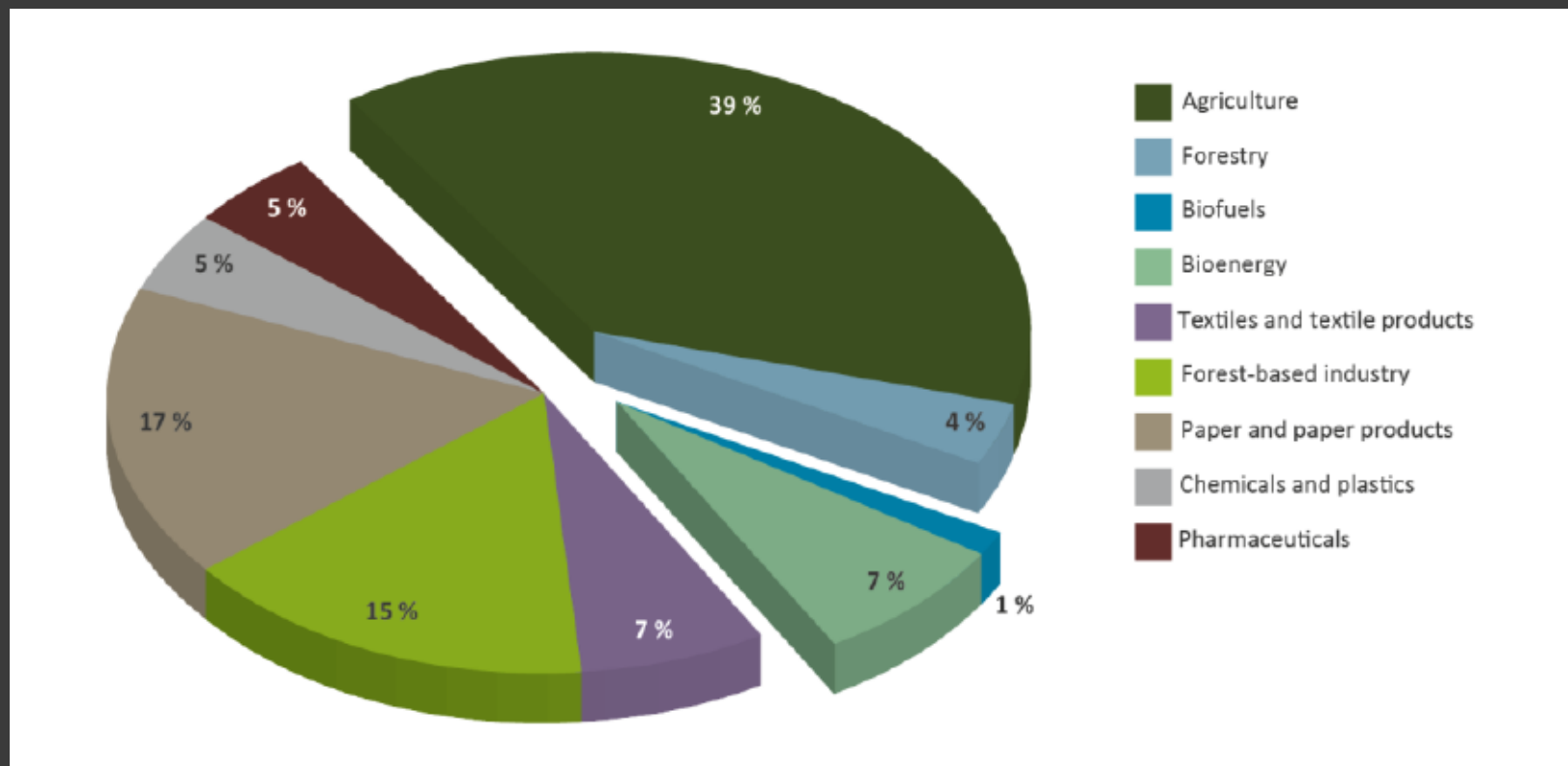
# Turnover of EU Bioeconomy

● Total: 2.8 Trillion Euro (2015)



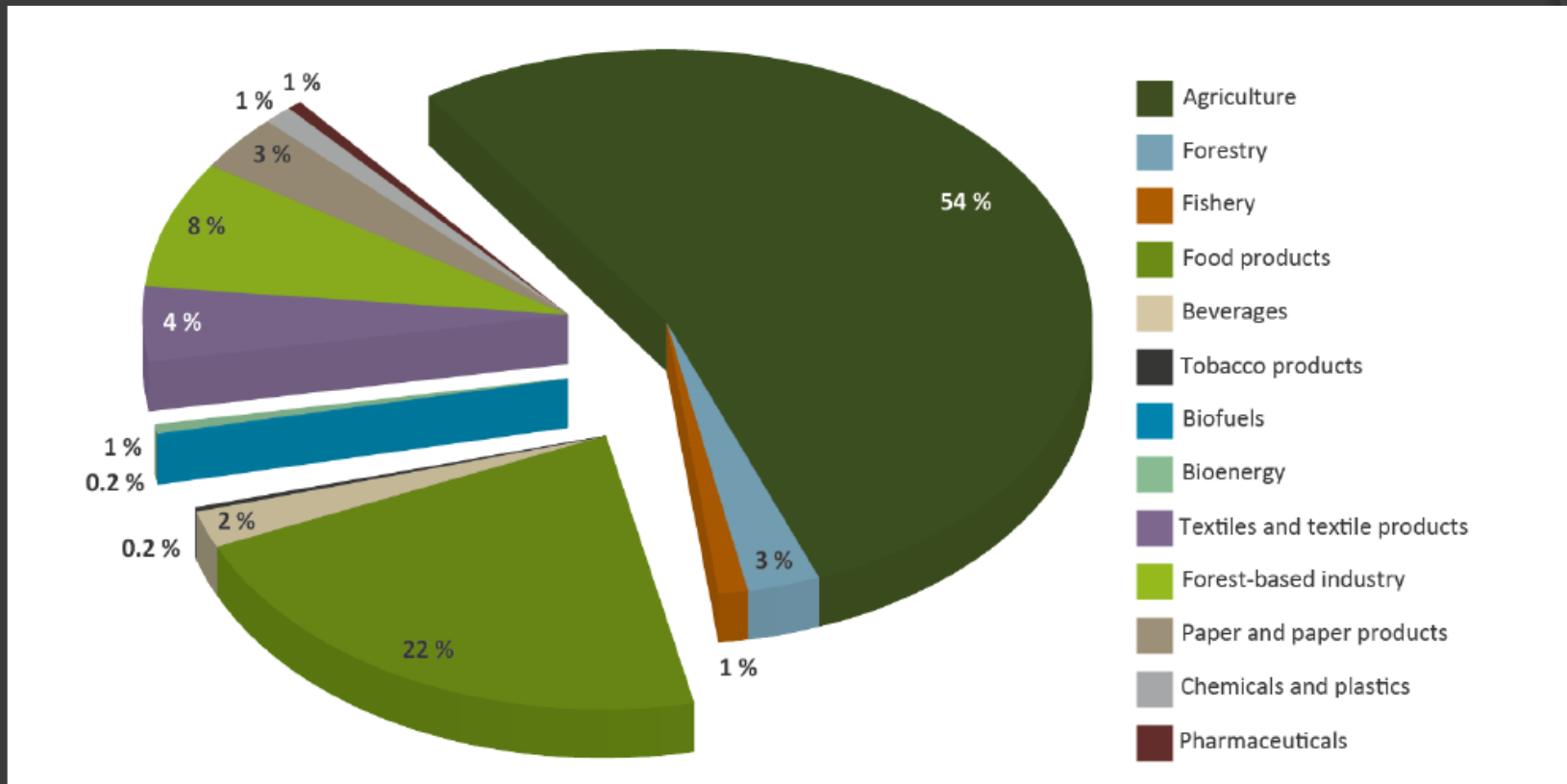
# Turnover of EU Bio-Based Economy

● Total 1.3 Trillion Euro (2015)

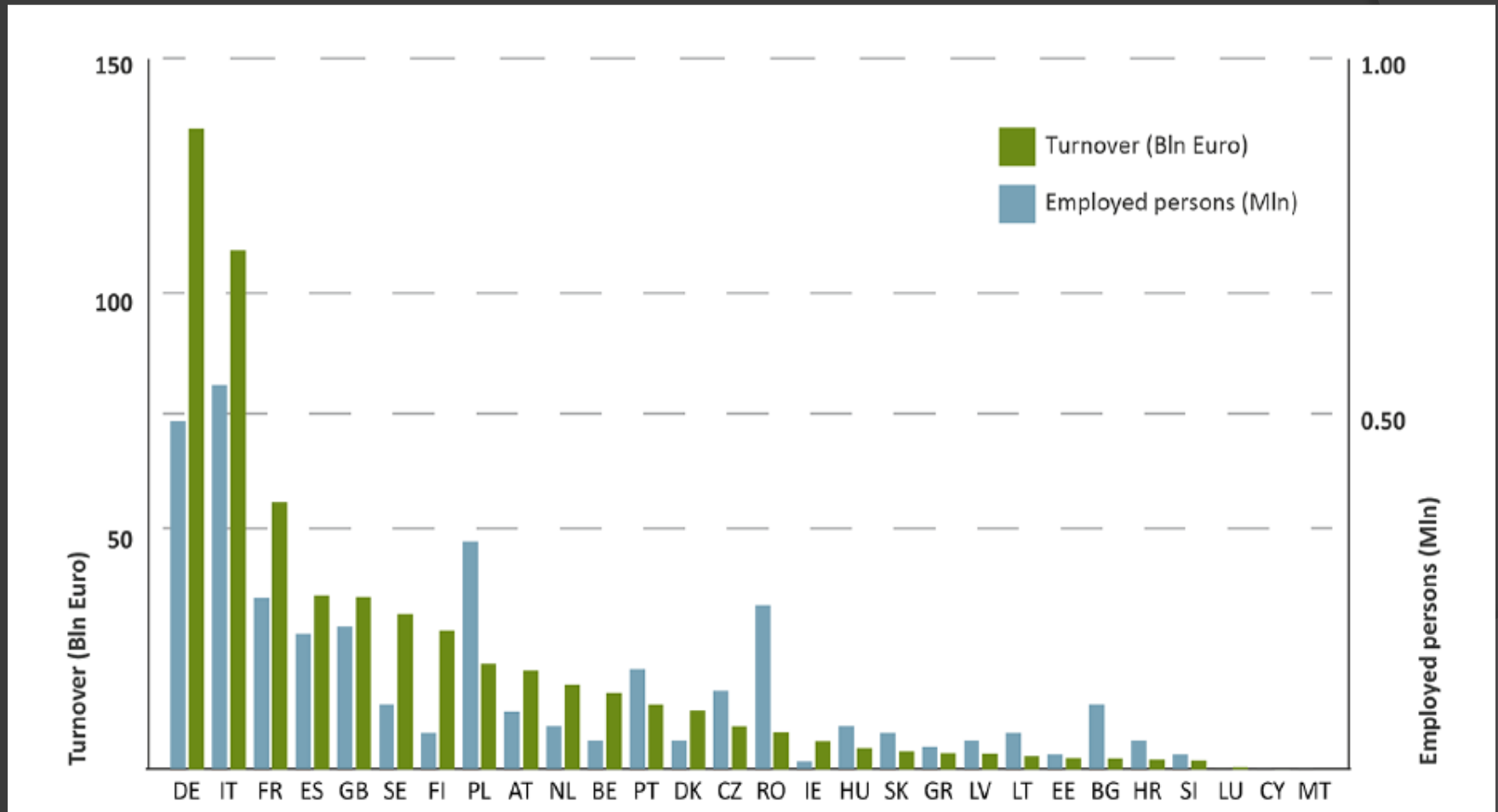


# Employment in the EU Bioeconomy

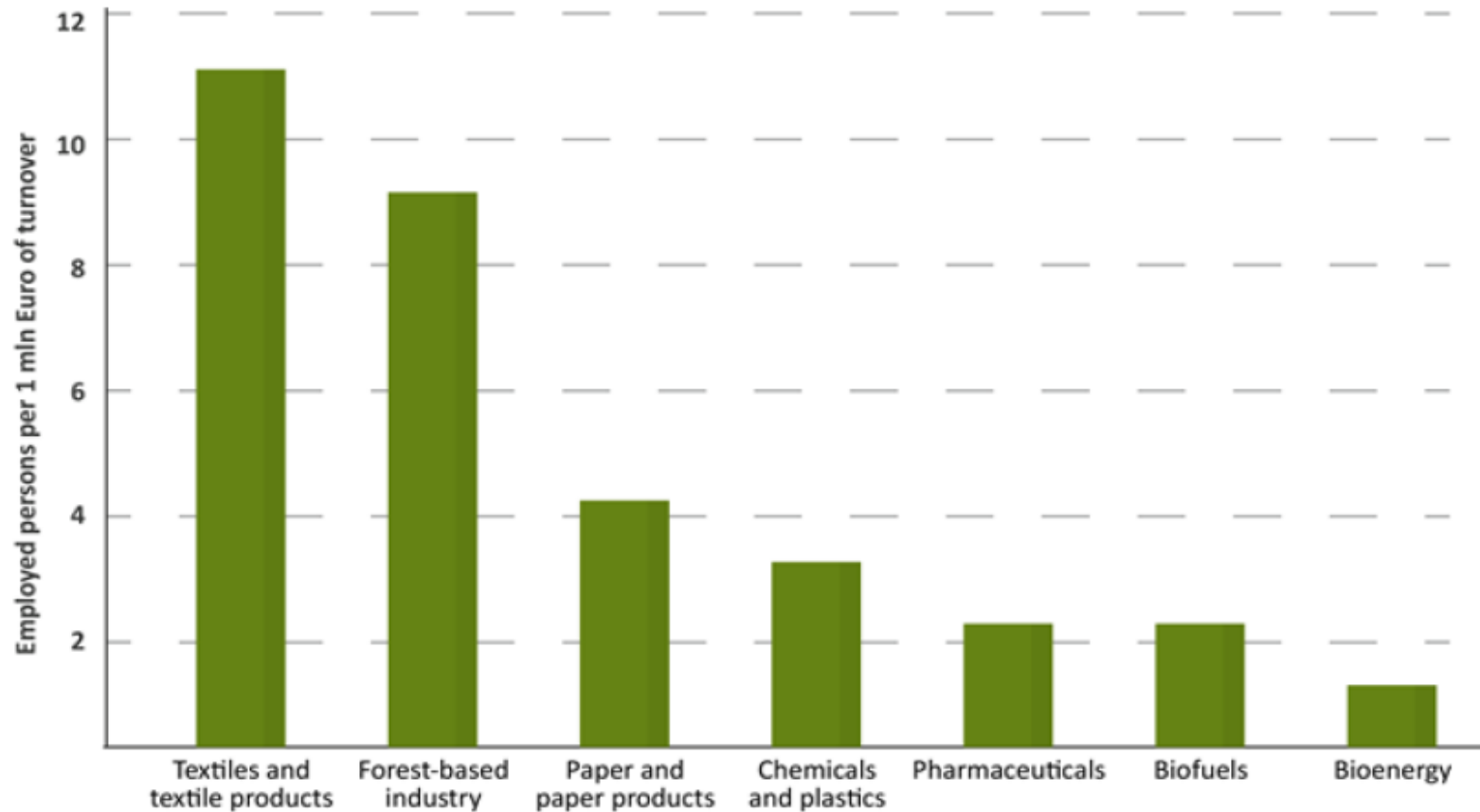
● Total 23.4 million (2015)



# The Best Performing Countries



# Employment / Turnover / Sector



# The Approach

↓ Products / Markets →	Existing	New
Existing	Low Uncertainty	Average Uncertainty
New	Average Uncertainty	Large Uncertainty

# Comparative Costs

Product Category	Fossil Feedstock Cost (€ / GJ)	Biomass Cost (€ / GJ)
Heat	3 (coal)	4
Power	6 (coal)	22
Transport Fuel	8 (oil)	10
Average Bulk Chemicals	30 (oil)	75

# EU – US Comparisons



	EU (2015)	US (2015)	US/EU
Employment	242.000	619.000	2.56
# Companies	1750	1375	0.78
R&D expenses	12.18 3.73	18.75 15.70	1,53 4.21
Revenues	21.73	46.44	2.13



# EU Perspective

- Annual turnover of more than 3 trillion €
- More than 25 million jobs
- Representing 9% of the EU workforce
- Market Capacity of Bio-based products in 2012: 2,5 m tons
- Estimated for 2020: Up to 25 m tons (10 times fold!)
- Aim: Innovation for Sustainable Growth



# The Global Perspective

Food  
Crisis



Climate  
Change

Energy Shortage



# Bioeconomy Policies around the World

- dedicated bioeconomy strategy
- bioeconomy-related strategy
- be-related strategy; dedicated be-strategy is under development
- dedicated be-strategy is under development



# Policy & Regulation

- ⦿ Homogenized projections among different regions (e.g. differences the bio-fuels and ethanol production between USA, EU, China, Brazil)
- ⦿ Availability of arable land in various countries and the competition of land use for food versus non-food applications
- ⦿ Consideration of common economical criteria
- ⦿ Compatibility of various regulatory systems between different regions
- ⦿ Homogenization of regulatory frames in successive steps of the research, development, commercialization and marketing

# Global Governance

- Upstream Funding Science
  - Establishing operational standards
  - Downstream Regulating
  - Educating the public and encouraging debates
  - Governing Innovation:  
*Linear model*
- ⦿ Governing globally
  - ⦿ The new geography of science
  - ⦿ Current Economical Dynamics
  - ⦿ Manpower Mobility
  - ⦿ Technology Transfer
  - ⦿ Clustering
  - ⦿ Inclusiveness (Equal treatment, equal chances)

**Traditional Scheme**

**New Dynamics**

# The Risk-Tolerance Issue

- ⦿ Any technological innovation contains a certain amount of risk during its application
- ⦿ No matter how high the risk is, innovation is accepted or rejected according to the importance of the expected benefit
- ⦿ For a rational risk assessment, must be considered both, Risk and Benefit in a common process
- ⦿ This way we may enhance the “Risk Tolerance”





# The Tools

- Funding Mechanisms
- The SME Potential
- Networking & Cooperation
- National Policies
- Education



# Funding Mechanisms

- ⊙ European FPs
  - H2020
  - SME Instrument
  - BBA
- ⊙ Eureka
  - Eurostars
- ⊙ ESF
- ⊙ EIB (EFSI)
- ⊙ National Funding Initiatives
- ⊙ Etc. etc.



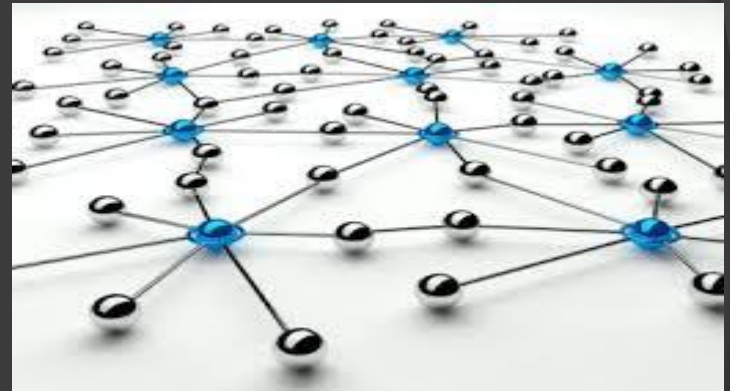
# Enabling the SME potential

- ◉ Registering and Networking the SME's of the region and detecting their potential for Bioeconomy related activities
- ◉ Incorporating the Bioeconomy theme in the National Strategy plan for the SME's
- ◉ Establishing a systematic information channel for the SME's
- ◉ Enabling existing networks and channels of cooperation
- ◉ Enhancing the participation in Research projects and action plans

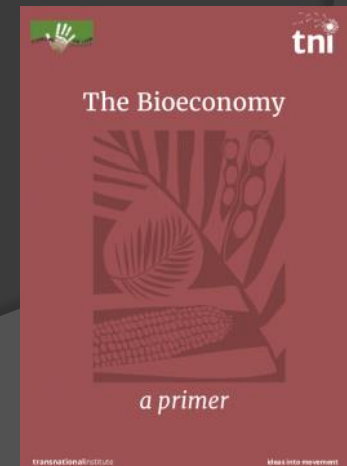
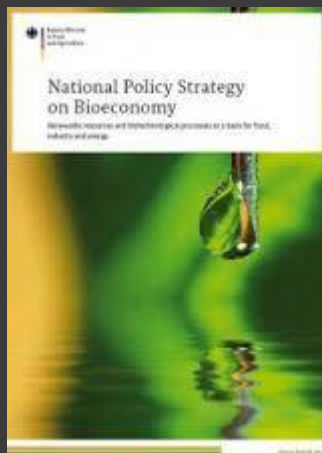
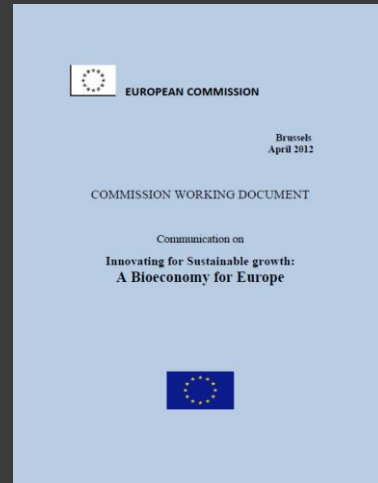
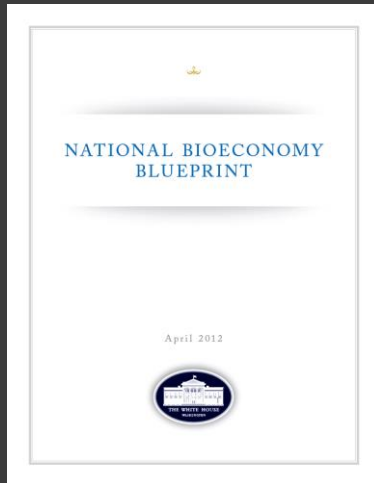


# Networking & Cooperation

- ❑ Bioeconomy Initiative of the European Commission
- ❑ European Federation of Biotechnology – Bioeconomy Task Force
- ❑ EuropaBio
- ❑ Bio-Tic Consortium
- ❑ Bio-Based Industries
- ❑ Other Platforms
- ❑ EU Countries Bioeconomy Initiatives, Clusters & Regions (Finland, Baltic Sea, Germany, IFIB)
- ❑ Non-EU Countries Bioeconomy Initiatives (Malaysia)



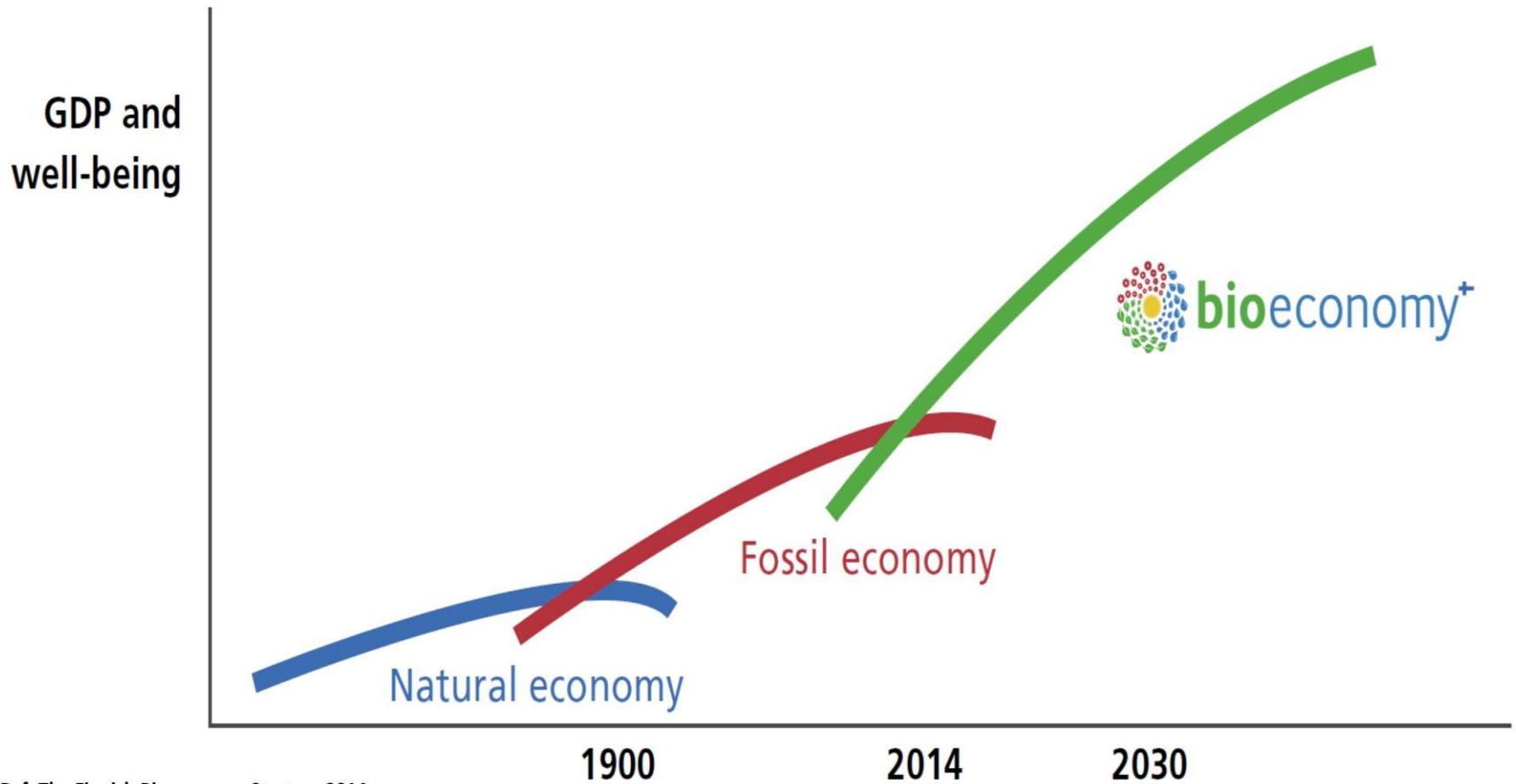
# Adopting National Policies



# Education

- E.g. Bioeconomy Course, University of South Bohemia / Czech Republic

# Message to Take Home



Ref: The Finnish Bioeconomy Strategy 2014

*Thank you*