

Bioeconomy: An initiative with a European perspective

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The Problems of our Times

**Food
Crisis**

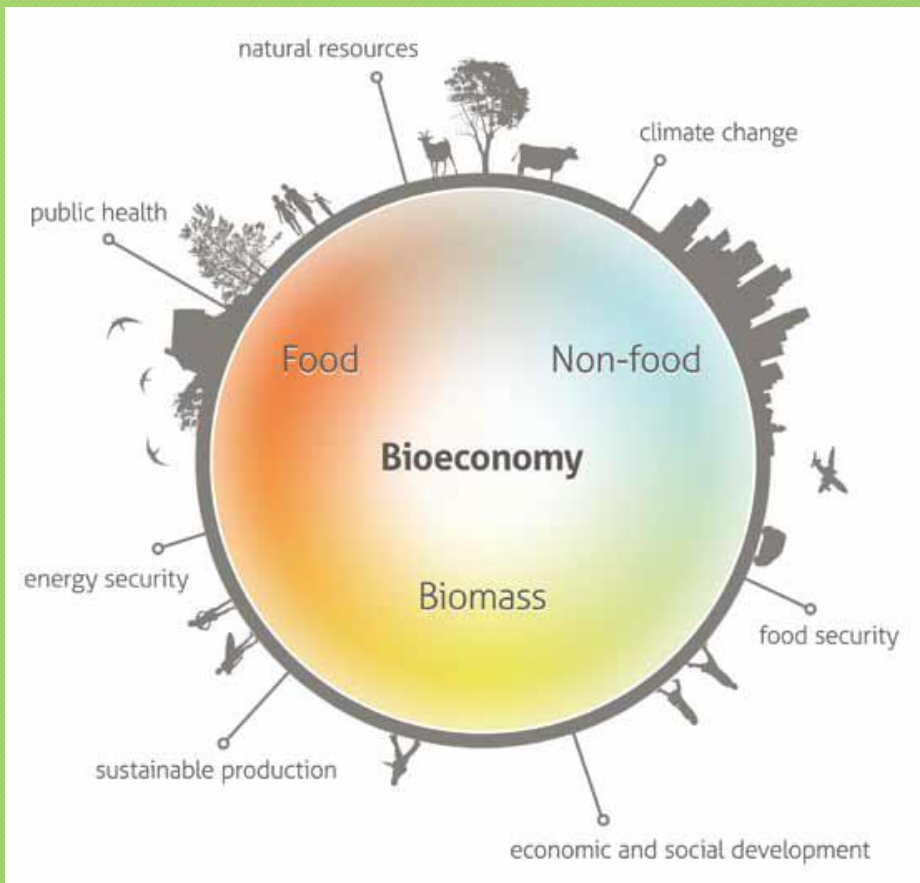


**Climate
Change**

Energy Shortage



Integrated Bioeconomy



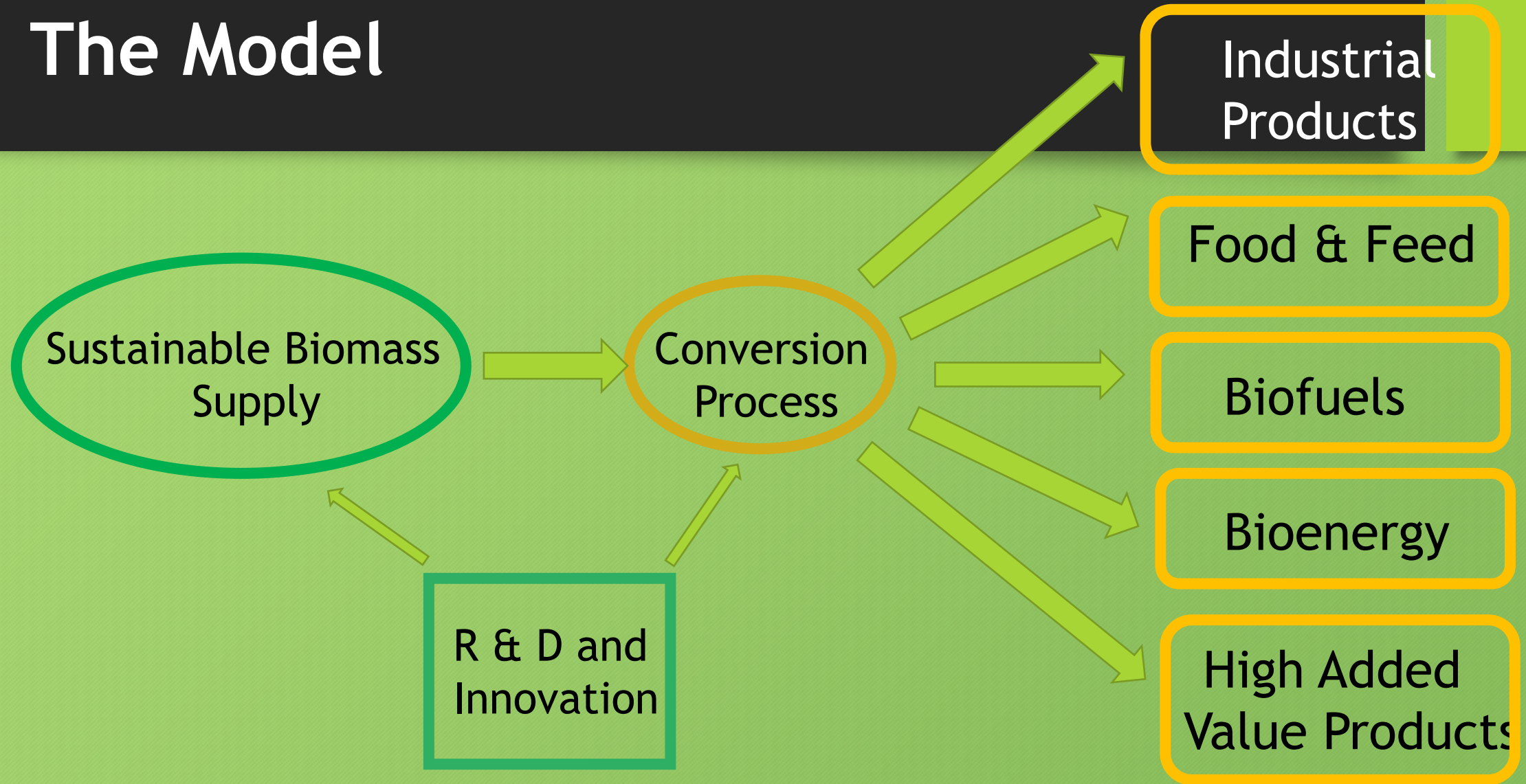
- *The integration of the Science with Business and Society*
- *Achievement of Food security, Energy independency and Environmental safety*
- *Guaranteeing its operation in a sustainable frame*

The Structure

- The Operational System
- The Lateral Issues
- The Impact

The Operational System

The Model



The expectations

Estimated Revenue Potential of Global Biomass Value Chains

• Agricultural Inputs	15 b €
• Biomass Production	90 b €
• Biomass Trading	30 b €
• Biorefining Inputs	10 b €
• Biorefining Fuels	80 b €

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

Global Drivers & Constrains

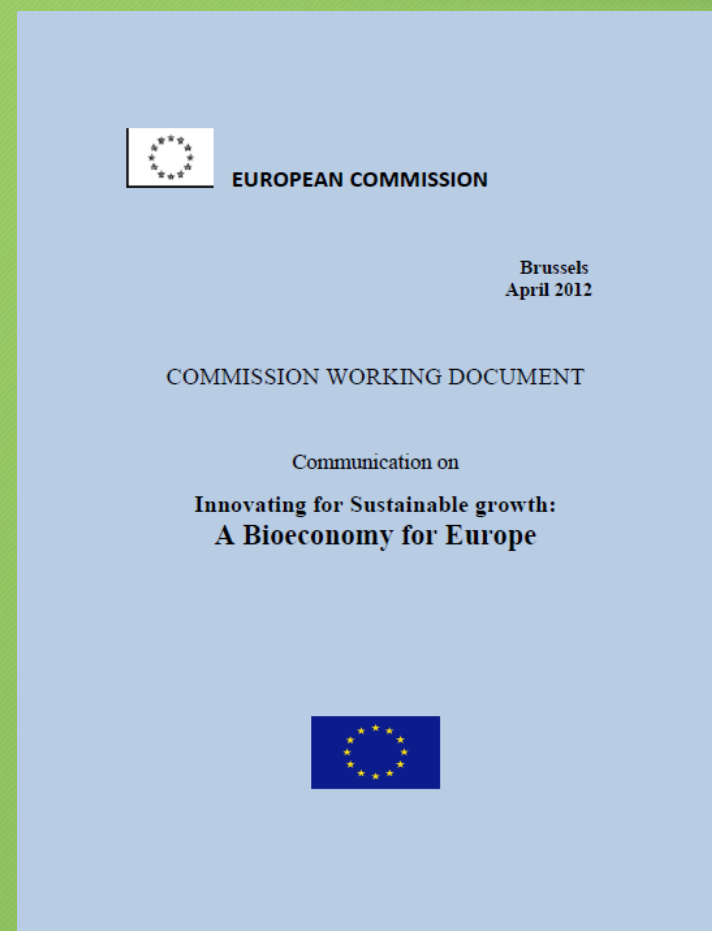
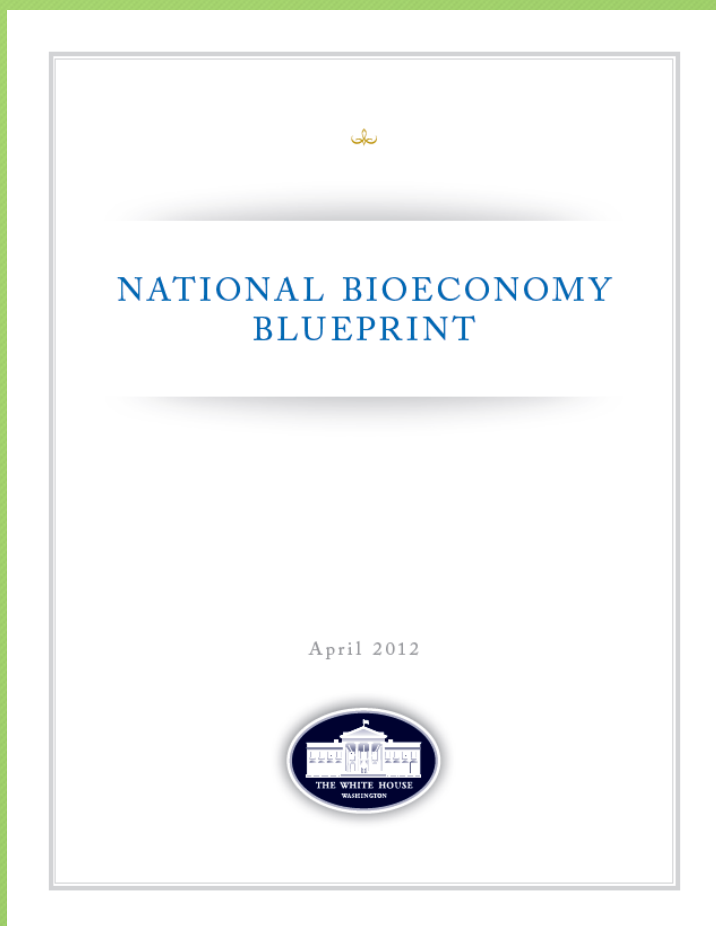
Drivers

- Environmental Pressure
 - Climate Change, Biodiversity Loss, Land Scarcity
- Higher Prices of Energy
- Population and Life Expectancy Growth

Constraints

- Emerging Environmental Sustainability Criteria
- Expansion of Bio-Based Feedstock Use
- Ensuring Global Food Security

Parallel initiatives



EU - US Comparisons



- *1.750 European biotech companies representing a global market capitalization of roughly € 83 billion.*
- *The 1.375 US biotech companies have a global market cap of € 755 billion!*

- *70% of the companies have less than 10 employees.*
- *Less than 10 % of the more established companies have more than 100 employees*

	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

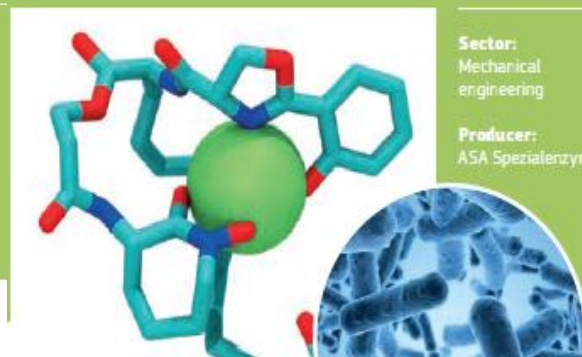
Applications in the Everyday Life I

Car tyre



Sector:
Automotive
Producer:
Continental

Rust remover



Sector:
Mechanical
engineering
Producer:
ASA Spezialenzyme

Bioethanol



Sector:
Chemical industry
Producer:
Clariant

Chewing gum



Sector:
Food & Beverages
Producers:
Evolve | Fertin Pharma

Wall plugs



Sector:
Construction
Producers:
Fischer | Dupont

Fibreboard



Sector:
Construction
Producer:
Etouch Innovation

Bike



Sector:
Consumer goods
Producer:
Lignotube
Technologies

Toothpaste



Sector:
Cosmetics industry
Producers:
BASF |
Neva Cosmetics

Applications in the Everyday Life II

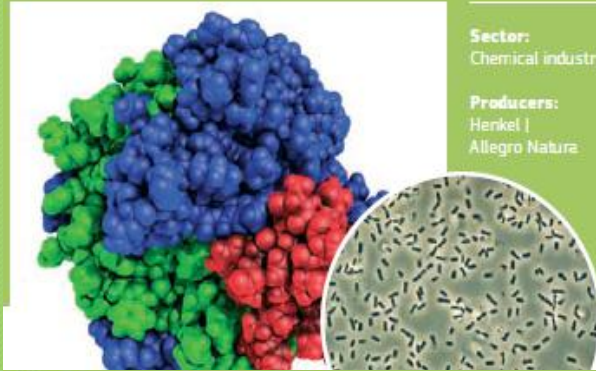
Toilet brush



Sector:
Consumer goods

Producers:
Tecnaro | Bio.K

Detergent



Sector:
Chemical industry

Producers:
Henkel |
Allegro Nature

Conditioner



Sector:
Cosmetics industry

Producer:
L'Oréal

Tennis racket



Sector:
Sports

Producers:
Lineo | Decathlon

Toilet paper



Sector:
Cosmetics industry

Producer:
Sofidel

Face cream



Sector:
Cosmetics industry

Producer:
Korres

T-Shirt



Sector:
Textiles

Producers:
Singtex | Nike |
Hugo Boss

Clothing

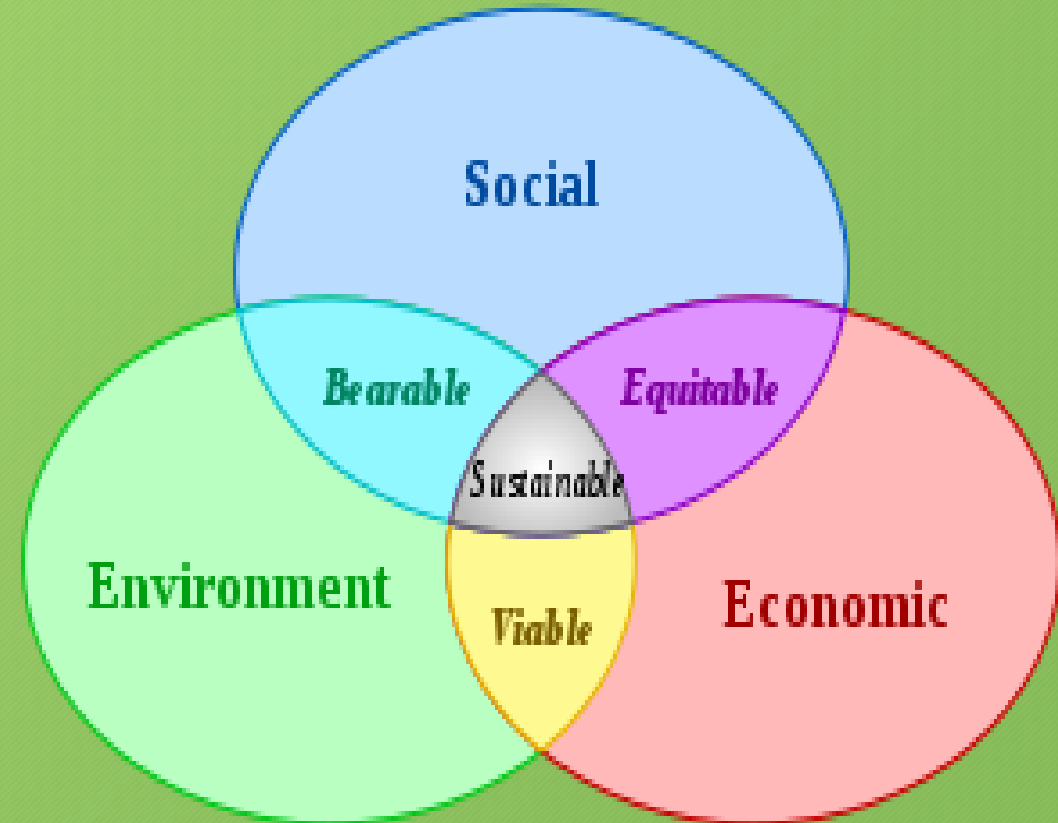


Sector:
Textiles

Producers:
Qmitch | Calida

Sustainability operational system

- Environmental Criteria
 - Deforestation
 - Biodiversity loss
 - Toxic Emissions
- Economic Criteria
 - Prices
 - Revenue
- Social Criteria
 - Job creation
 - Public Perception



The 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....



THE European particularities



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

EC public consultation for post crisis



EUROPEAN COMMISSION

PRESS RELEASE

Brussels, 5 May 2014

Public consultation on the Europe 2020 strategy: towards a post-crisis growth strategy for Europe

Today, the Commission has launched a public consultation on the Europe 2020 strategy, the EU's long-term growth and jobs plan. The consultation will be open until 31 October 2014. Through this public consultation, the Commission is seeking the views of all interested people and organisations on the Europe 2020 strategy.

- *At least 75% of people aged 20-64 in employment by 2020;*
- *To invest 3% of GDP in research and development by 2020;*
- *To cut greenhouse gas emissions by at least 20%, increase the share of renewables to 20% and improve energy efficiency by 20% by 2020;*
- *To reduce school drop-out rates to below 10% and increase the share of young people with a third-level degree or diploma to at least 40% by 2020;*
- *To ensure that 20 million fewer people are at risk of poverty or social exclusion by 2020.*

The strategy

Action Plan Focusing on 3 main pillars

- Development on new technologies and processes by using R&D and Innovation in a sustainable way
- Developing markets and competitiveness
- Substantial collaboration between policy makers and stakeholders

The approach

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

The methodology

- Establishing “Technology Watch “ & “Policy Watch”
- Mapping the Bioeconomy capacity
- Mapping “Failures”
- Detecting the status of implementation
- Creating Modules
 - Socioeconomic module
 - Environmental Sustainability Assessment Module
 - Developing Forecasting Analysis
 - Monitoring Market Developments
 - Networking Policy makers & Stakeholders



Input from BioIndustry

- European Decision Making on Emerging Technologies needs to become more Science - Based and less Politicized
- European Biotech Industry has returned to profitability. The EC needs to support this positive outlook
- Government Incentives need to promote faster rate of expansion
- Support to the SME's



The Lateral Issues

Global Governance of Science

Traditional Scheme

- Upstream Funding Science
- Establishing operational standards
- Downstream Regulating
- Educating the public and encouraging debates
- Governing Innovation: *Linear model*

New Dynamics

- Governing globally
- The new geography of science
- Current Economical Dynamics
- Manpower Mobility
- Technology Transfer
- Clustering
- Inclusiveness (Equal treatment, equal chances)
- Towards a 'new' constructive governance

Global Governance, 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

Risk Tolerance

25

- 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 Impact

Bioeconomy in Europe: facts & figures

- Annual turnover of 2 trillion €
- 23 Million employees
- 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



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

