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Bio-based economy: are we going to enhance the market power of forest owners?

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Outline

1. Bio-economy: a fuzzy word
2. Two approaches to bio-economy
3. Some final considerations

Presentation available on the web: search "pettenella"

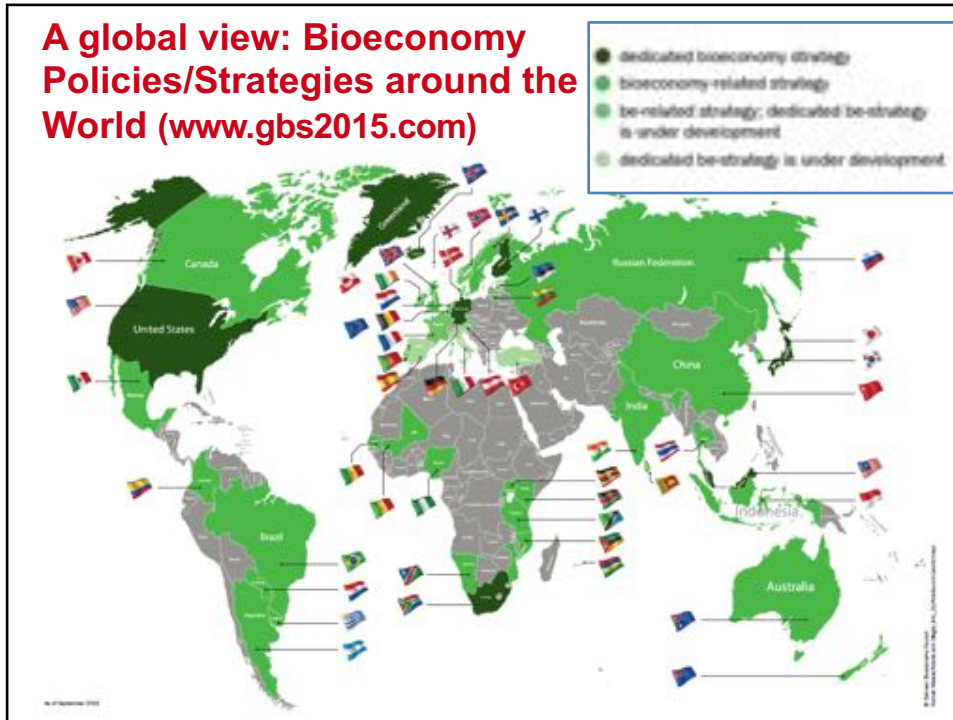
1. Introduction: bio-economy a fuzzy word

Bioeconomy: a fuzzy word...

A definition:

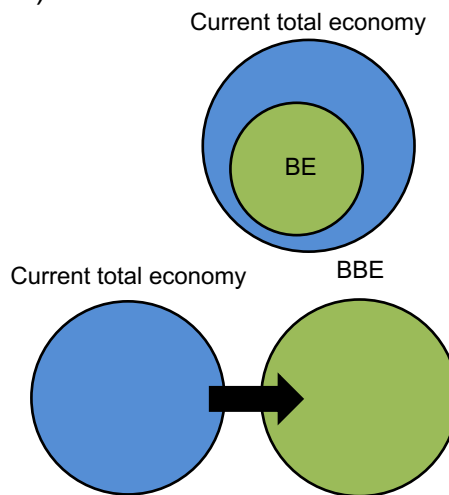
Bioeconomy “encompasses the **production of renewable biological resources** and their conversion into **food, feed, bio-based products and bioenergy**. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries” (EC, 2012)

Bioeconomy: the **3 “F”** (food, feed, fiber) + **bioenergy**



A difference that is not outspoken nor defined (Staffas *et al.*, 2013)

- **Bioeconomy (BE)** → a sub-part of the nation's total economy (often in relation to white biotech and life science)
- **Biobased economy (BBE)** → an economy where renewable resources instead of fossil ones constitute feedstocks for both energy, food, feed and materials




2. Two approaches to bioeconomy

Approaches to bioeconomy

2 different (complementary?) approaches that may help to understand the territorial differences in bioeconomy policies:

- the traditional, **technological** approach
- the emerging, **social** approach

Technological approach: an example from Finland







MetsäFibre

<https://www.metsafibre.com/en/about-us/Bioprodukt-mill/Pages/default.aspx>

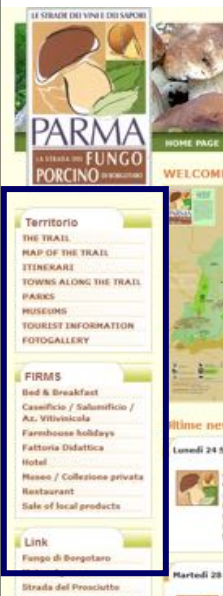
- Largest investment in the history of Finnish forest industry
- **100%** of wood raw material used
- **1.3 million tonnes** of pulp/year + bioproducts (e.g. textile fibres, biocomposites, lignin products, fertilisers...) and bioenergy
- **+150 jobs** created (**12,500** including value chain and consumption)

Äänekoski bioproduct mill

			
1.2 EUR BILLION	1,3 MILLION TONNES	240 %	6.5 MILLION M ³
INVESTMENT	CAPACITY	ELECTRICITY SELF-SUFFICIENCY	USE OF WOOD

Social Innovation in Mediterranean forests

Example: Borgotaro network (territorial marketing)



Territorio
THE TRAIL
MAP OF THE TRAIL
ITINERARI
TOWNS ALONG THE TRAIL
PARKS
MUSEUMS
TOURIST INFORMATION
FOTOGALLERY


FIRMS
Bed & Breakfast
Caseificio / Salameificio / Azi. Vitivinicola
Farmhouse holidays
Fattoria Didattica
Hotel
Museo / Collezione privata
Restaurant
Sale of local products

Link
Fungo di Borgotaro

Enterprises: 62

- 15 Agro-tourisms/ Farm businesses
- 12 Hotels/Guest quarters
- 8 B&B/Inns/Hostels
- 9 Cheese, sausage and wine growing and producing factories
- 2 Didactic farms
- 3 Museums/Private collections
- 30 Restaurants/Porterhouses
- 26 Typical products sellers

Imago product:
Boletus mushroom



The traditional (dominant)

approach (modified from Toman, 2012; Pettenella, 2015; Secco *et al.*, 2015)

	Technological approach
Focus on	<ul style="list-style-type: none"> • Technological innovations • Large scale investments • Value chain perspective • Sectoral development • Vertical integration
Input/output diversification	1 or more inputs Diversification in outputs
Market power	Increasing role of business owning/controlling the (new) technologies
Model regions	Northern EU (UK, Scandinavian countries)

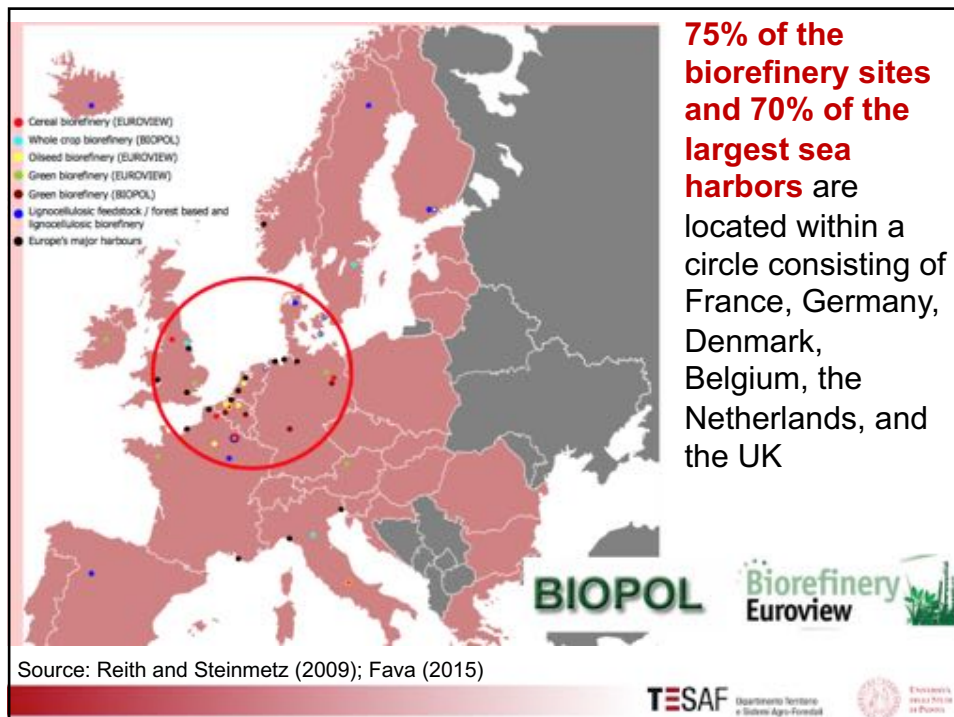
A strong emphasis on biorefinery within the bioeconomy framework

- A **key factor** in the transition to a bio-based economy will be the **development of biorefinery systems** (Scarlat *et al.*, 2015)
 - Biotechnology and the biorefinery concept are **essential components** of the bioeconomy (McCormick and Kautto, 2013)
 - The bioeconomy is integrating traditional agricultural, forest and marine biomass feedstock production systems with a **range of biorefinery options and applications** (SCAR, 2014)
- Biorefineries are increasingly **at the core** of the bioeconomy vision at the EU level and worldwide (World Bioeconomy Summit, 2015)

2 large biorefinery models

(Europabio, 2011, European Commission, 2012, Ceapraz *et al.*, 2016)

- A. Port-biorefinery** → **strongly connected to global flows of raw materials**, key-logistic location (inside/nearby harbors, along channels...), high specialization, threshold effects, and economies of scale
- B. Territorial biorefinery** → **strongly connected to local/surrounding territory** and (in general terms) dependent on a more diverse and more thorough valuation of various biomasses



The social approach

(modified from Toman, 2012; Pettenella, 2015; Secco *et al.*, 2015)

	Technological approach	Social approach
Focus on	<ul style="list-style-type: none"> • Technological innovations • Large scale investments • Value chain perspective • Sectoral development • Vertical integration 	<ul style="list-style-type: none"> • Social innovations • Small scale • Networks • Cross-sectoral development • Horizontal integration (= forests and agriculture as the green infrastructures for rural development)
Input/output diversification	1 or more inputs Diversification in outputs	Diversification in the use of inputs High added value products & services
Market power	Increasing role of business owning/controlling the (new) technologies	Role of networks, groups, associations, public-private partnerships...
Model regions	Northern EU (UK, Scandinavian countries)	Southern EU (Mediterranean region)

Different (complementary?) strategies

(modified from Toman, 2012; Pettenella, 2015; Secco *et al.*, 2015)

	Technological approach	Social innovation approach
Focus on	Adaptive strategy (“ <i>Old wine in new bottles</i> ”) → conventional wisdom of innovation generation	Bioeconomy: an opportunity to re-think to our consumers’ patterns
Input/output diversification	Focus on forests, agriculture, fishery as raw materials providers with biotechnology being the engine of the growth	It not only considers the protection of natural capital, “ <i>but it stresses as well the importance of addressing equity and social inclusion challenges in moving toward a green economy</i> ”
Market power		
Model regions		

3. Some final considerations

Conclusions

Bio-refineries: prevailing **large-scale** investments, **capital-intensive** → increased market power of the industrial complex and lower one of forest owners, asked to produce **low-value raw material** (biomass) and much **exposed to international competition**

Comparing a **family sawmill** with a bio-refinery, the first is producing much **more added value** and **employment** for the local residents (and the forest owners)

Conclusions

We should catch the real innovative aspects of bioeconomy that are related to **equity, social inclusiveness, promotion of local knowledge and employment creation,**

i.e. to **social innovation**, more than to problems connected to technology innovation (that can be market driven, without much public support).

Conclusions

... rural (forest) areas needs more social innovations than technological innovations

