



Remarks on the future of a European circular bioeconomy

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Insights based on EFI Publication

FROM SCIENCE TO POLICY 5

Leading the way to
a European circular
bioeconomy strategy

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Lauri Hetemäki, Marc Hanewinkel, Bart Muys,
Markku Ollikainen, Marc Palahí and Antoni Trasobares

Foreword
Esko Aho, Cristina Narbona Ruiz, Göran Persson and Janez Potočnik

1. Why circular bioeconomy is important?
2. Why it matters how we define the circular bioeconomy?
3. Outlook for forest-based bioeconomy markets
4. Priorities for advancing circular bioeconomy

Why Circular Bioeconomy is important?

- *Unrealistic* to assume that the way we currently consume and produce would lead us to reach global agreements: SDGs & Paris Climate Agreement

- *Realistic* approach is to change the economic model
 - get rid-off of fossils, non-renewables and linear model

Crucial how we understand circular bioeconomy. It will define:

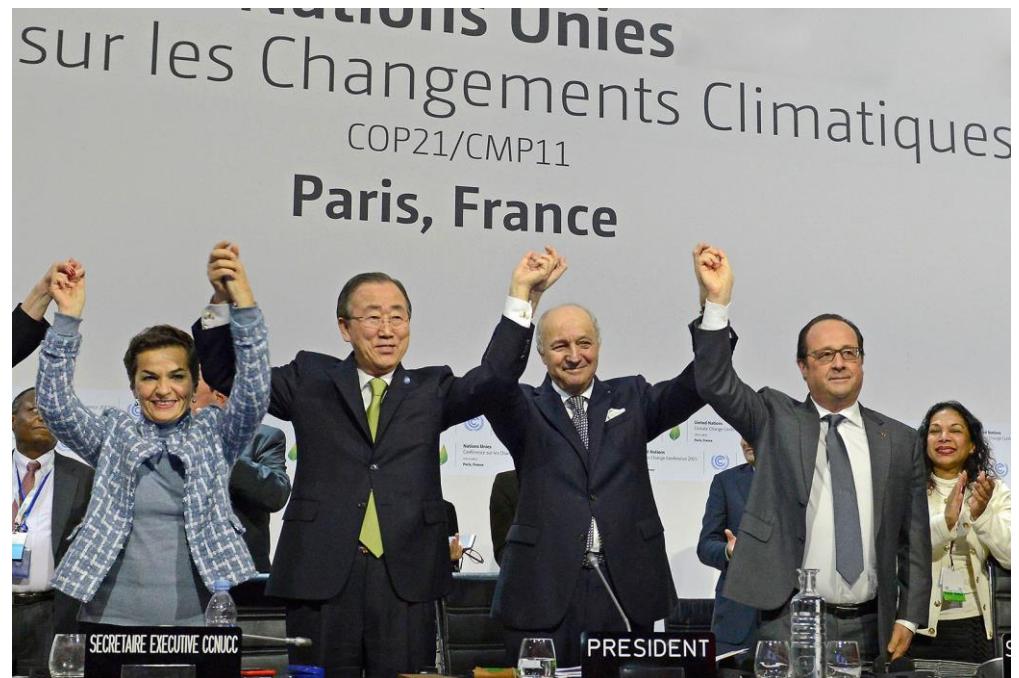
1. What we try to achieve with it
2. The acceptance, and therefore the success, of it
3. What policies and measures are needed to implement it

Circular bioeconomy is not an *end* itself, but a necessary *tool* to achieve the global targets

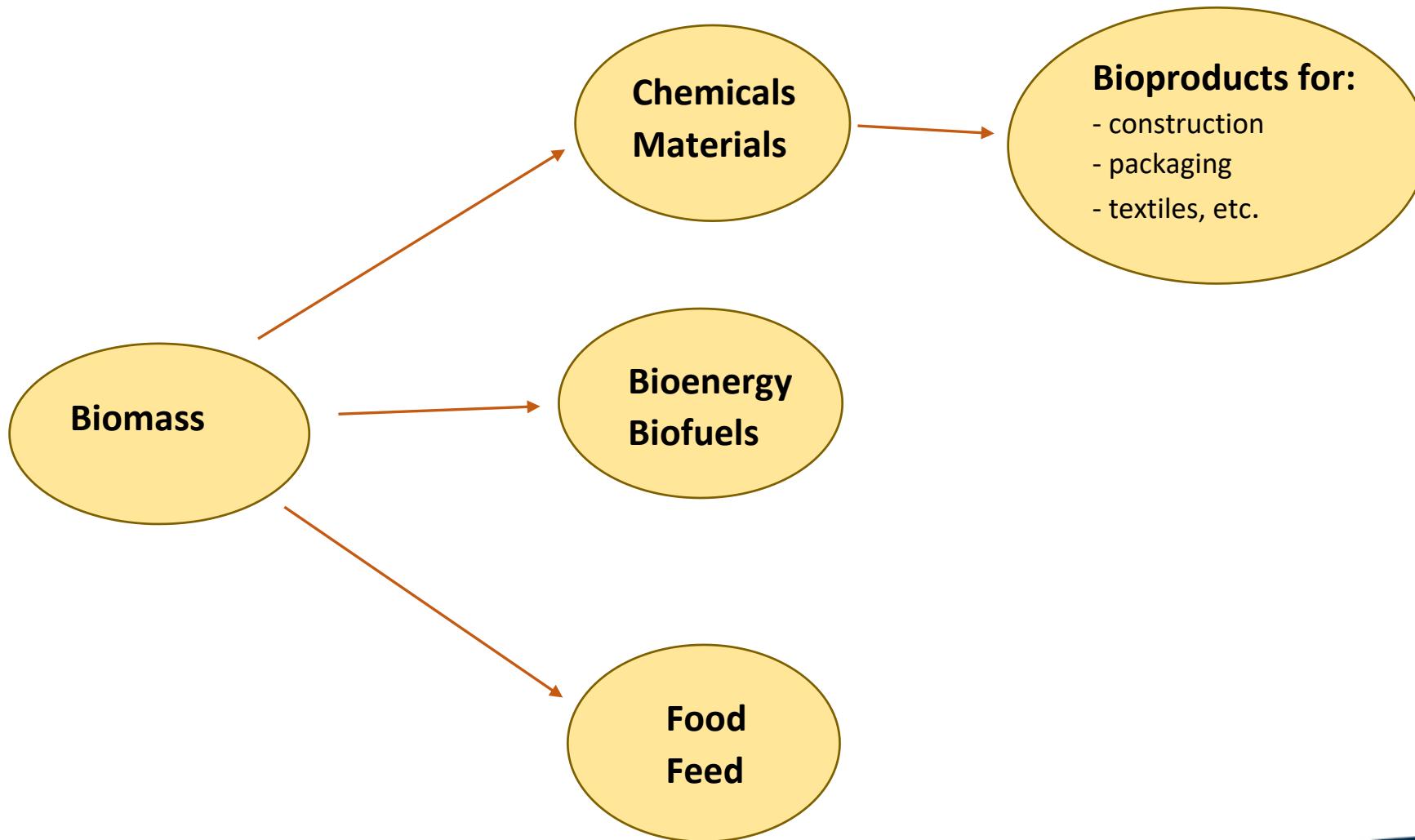
SDGs



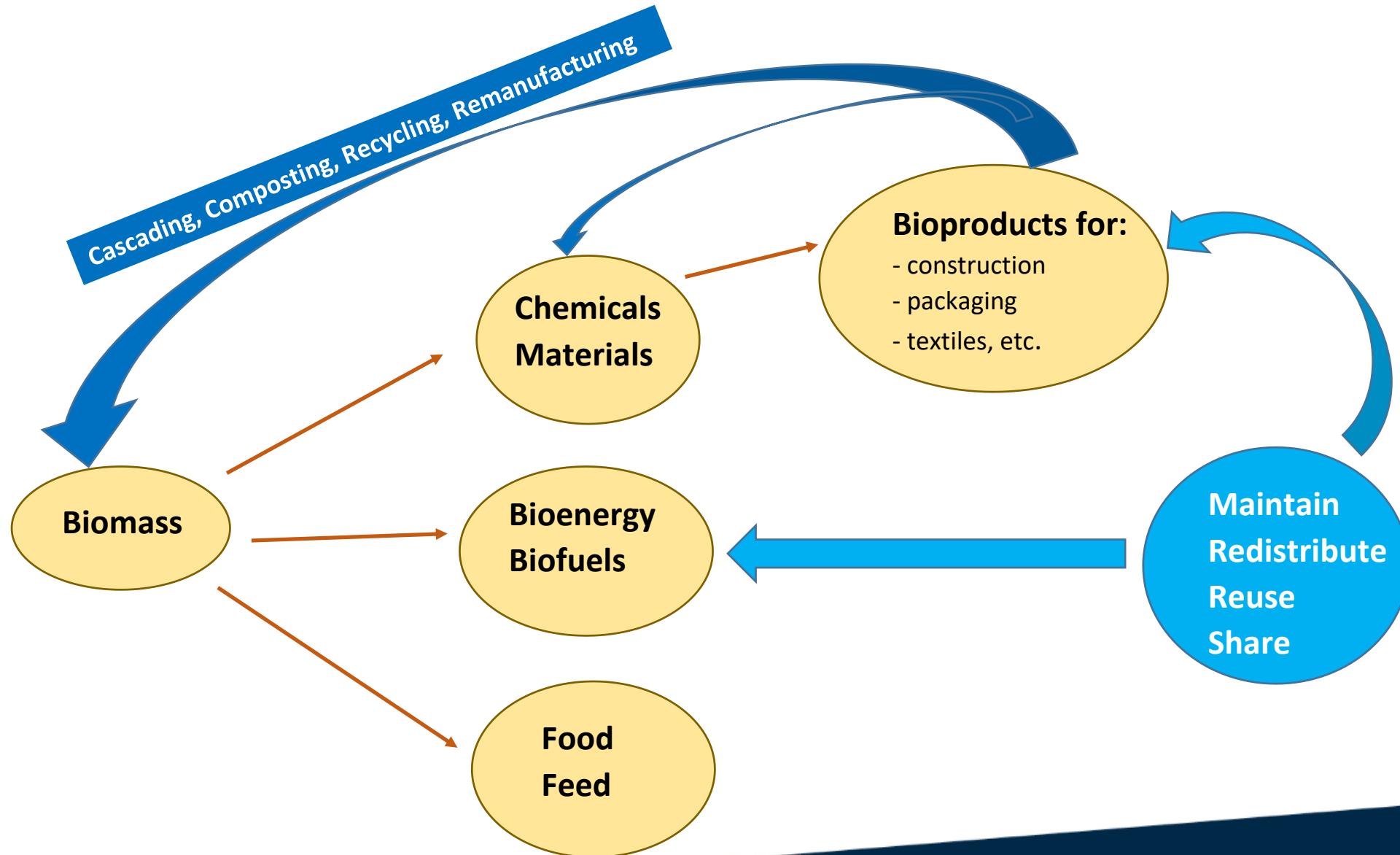
Keeping global temperature rise
this century well below 2°C



Bioeconomy: Conventional and EU strategy (2012) view

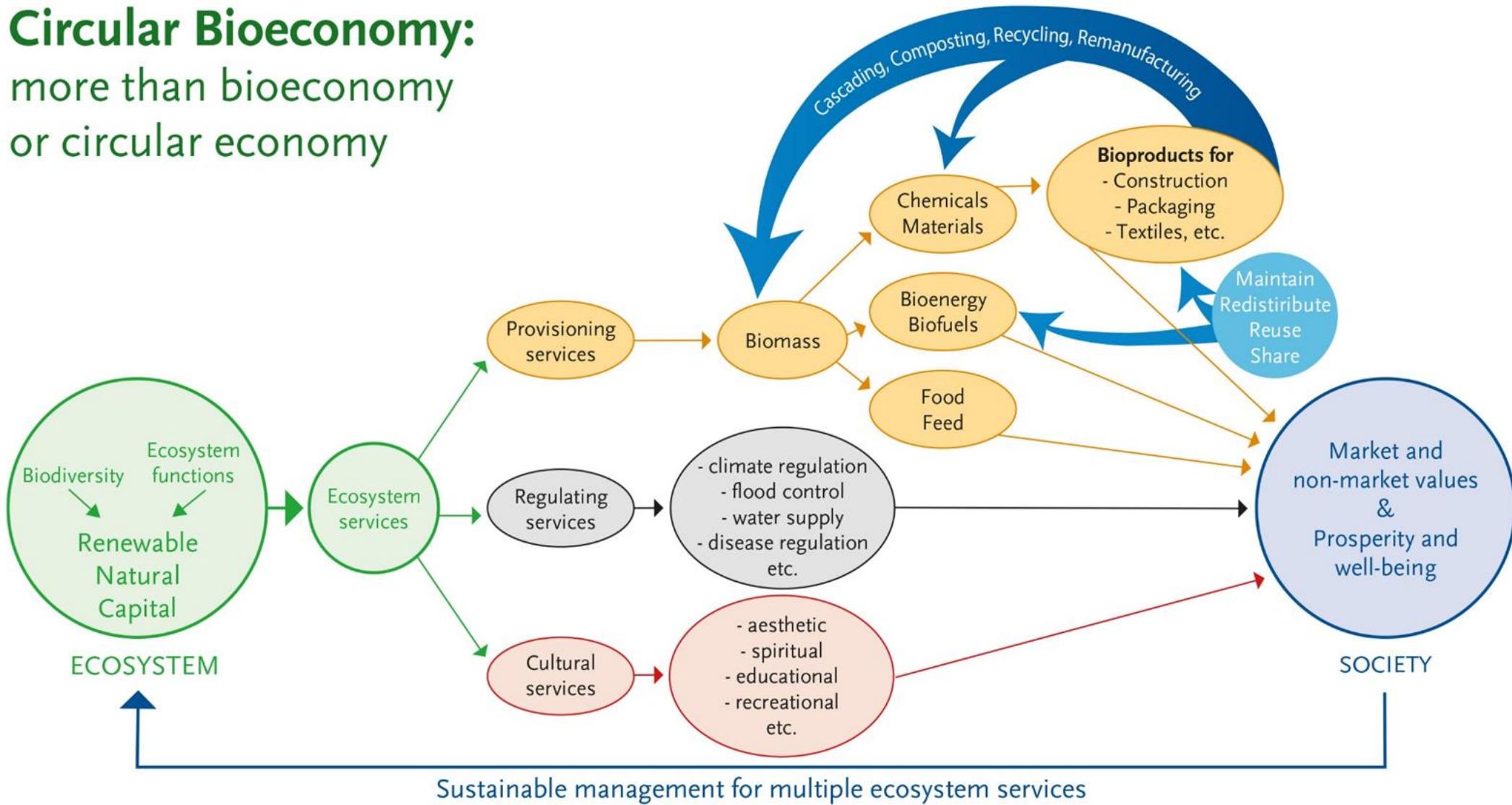


Bioeconomy: Conventional with Circular Economy (EMF)



- But it is necessary also to include the *natural capital* concept and all the *ecosystem services* under circular bioeconomy
- Also, traditional circularity aspect needs to be complemented with the circularity of the society managing the nature (e.g. forests)

Circular Bioeconomy: more than bioeconomy or circular economy



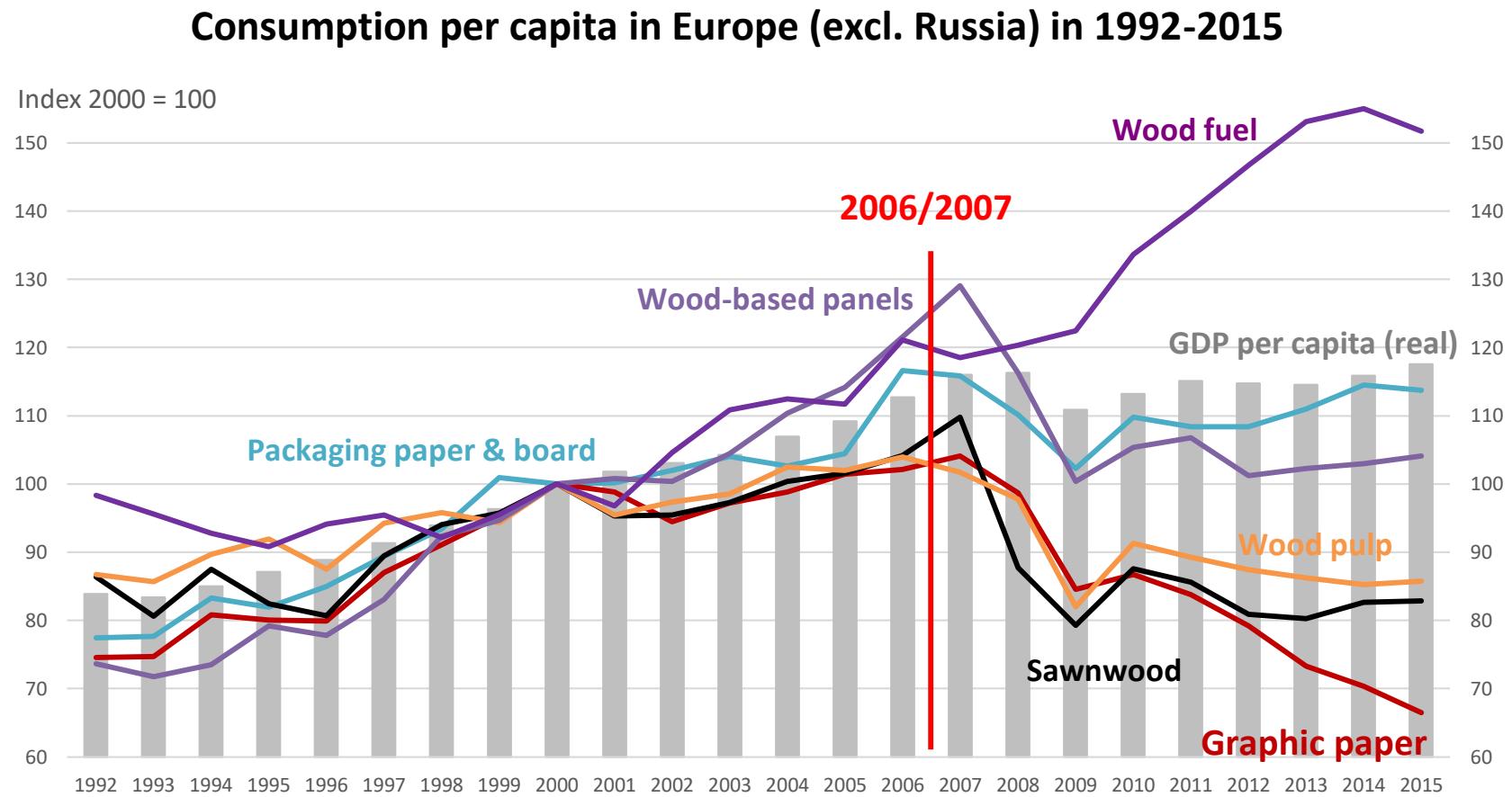
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Source: Heteräkä, L., Hanewinkel, M., Muys, B., Ollikainen, M., Palahí, M. and Trasobares, A. 2017. Leading the way to a European circular bioeconomy strategy. From Science to Policy 5. European Forest Institute.

How does the outlook for forest bioeconomy markets look



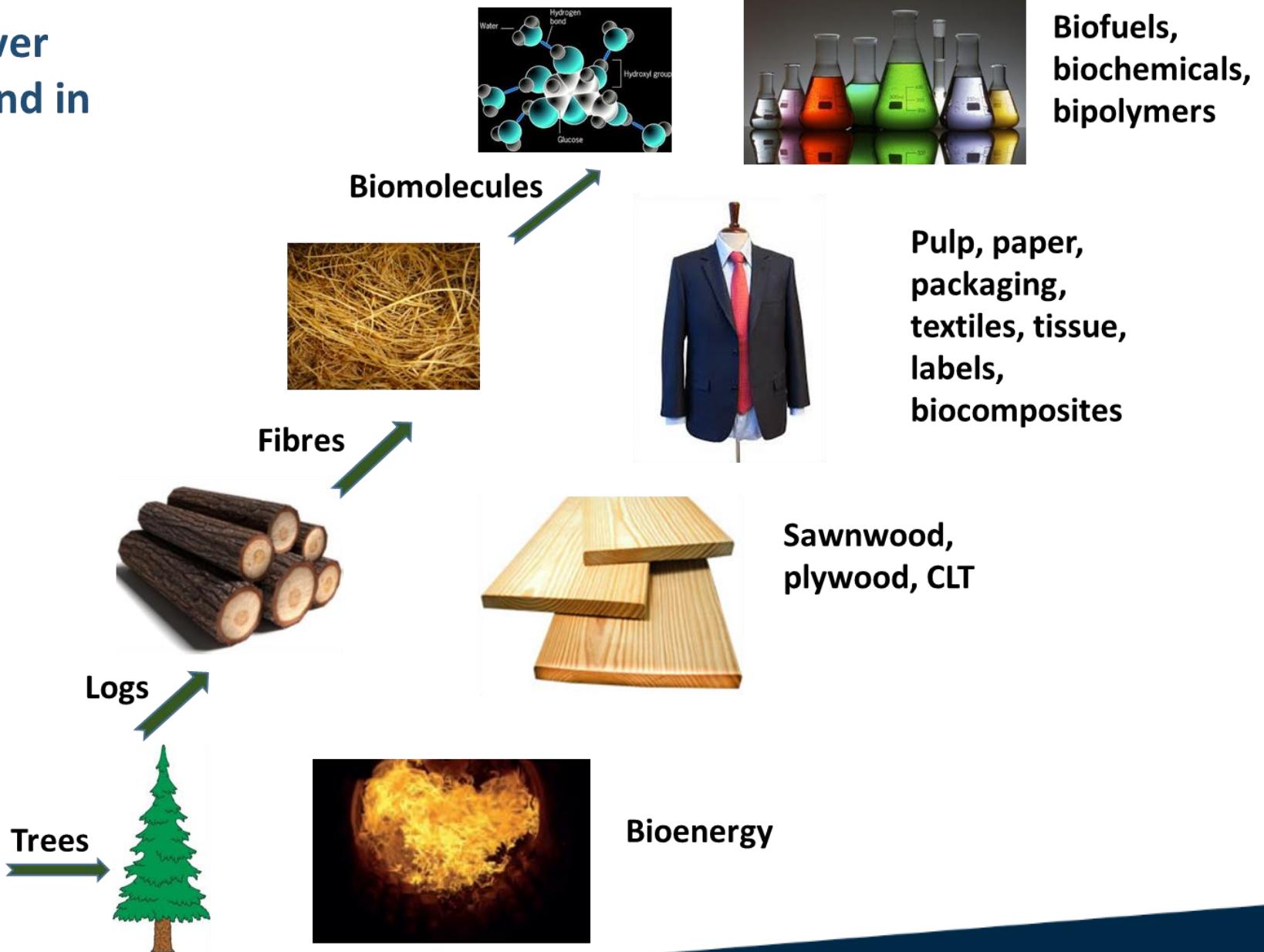
Traditional forest bioeconomy products consumption in Europe has been slow, stagnating or declining since 2006/2007



Source: Jonsson, R., Hurmekoski, E., Hetemäki, L. & Prestemon, J. 2017. What is the current state of forest product markets and how will they develop in the future? In Winkel, G. (ed.) What Science Can Tell Us, no. 8, European Forest Institute.

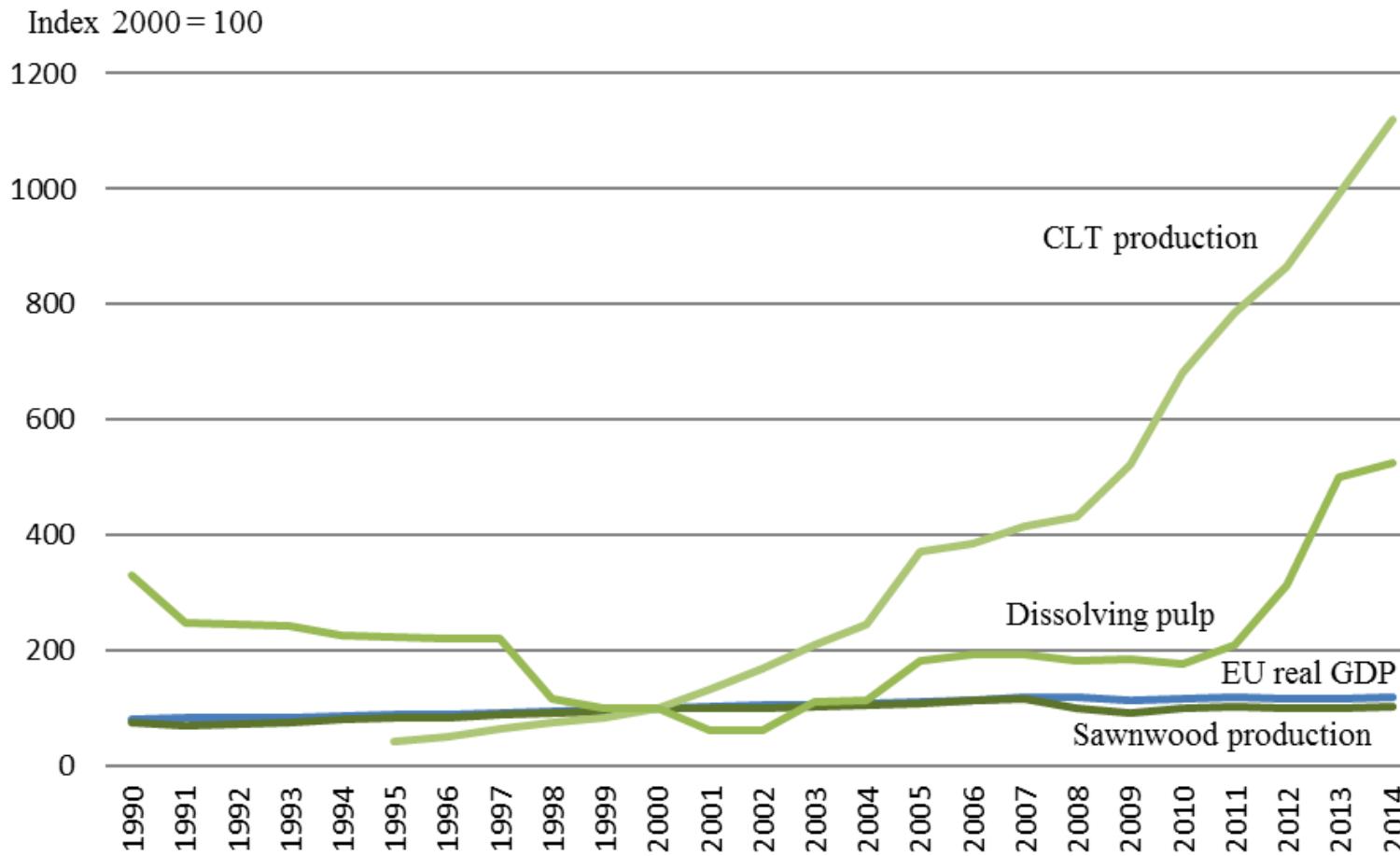
- For some products, the development is not anymore following economic growth and population growth as in the past
- How about the new forest-based bioeconomy products?

Forest bioeconomy uses ever smaller parts of biomass and in more diverse way



Growth determined mainly by other factors than GDP

EU production 1990-2014



Cross Laminated Timber (CLT)

> 15 % average annual growth rate since 2007, despite the economic downturn!

Dissolving pulp

> Pöyry (2015) expects the global demand to double by 2030

- The climate and sustainability goals and policies, and the changing consumer preferences have a major influence on the demand for bioeconomy products
- However, hardly any studies on the outlook of new forest-based bioeconomy products
- Lets look at one very recent attempt to provide an outlook



Hypothetical example: 1-2% market share by 2030

Canadian Journal of Forest Research, *in print*



REVIEW

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Diversification of the forest industries: role of new wood-based products

Elias Hurmekoski, Ragnar Jonsson, Jaana Korhonen, Janne Jänis, Marko Mäkinen, Pekka Leskinen, and Lauri Hetemäki

- Forest-based products from *Canada, Finland, Sweden* and *USA* gain 1-2% market share of the global construction, biofuels, biochemicals, plastics and textile markets by 2030

- What would be the impacts to *production volume, turnover* and *wood consumption?*

Significant turnover prospects with moderate roundwood consumption impacts

	Textiles	Construction	Biofuels	Biochemicals	Plastics and packaging	TOTAL
Production value, billion euros	1 - 6	4 - 46	4	4	4 - 15	18 - 75
Unit value, euros/ton	769 - 2228	209 - 2245	815 - 1250	1000 - 2725	843 - 2500	
Sawlog consumption, mil. m³		7 - 117				7 - 117
Pulpwood consumption, mil. m³	7 - 15				2	8 - 16
Woodchips & sawdust cons., mil. m³			27 - 37	33 - 45	2	63 - 85
Lignin consumption, mil. m³		2				2
Tall oil consumption, mil. m³			1			1

Source: Hurmekoski, Jonsson, Korhonen, Jänis, Mäkinen, Leskinen & Hetemäki
 2018. Diversification of the forest industries: Role of new wood-based products,
Canadian Journal of Forest Research.

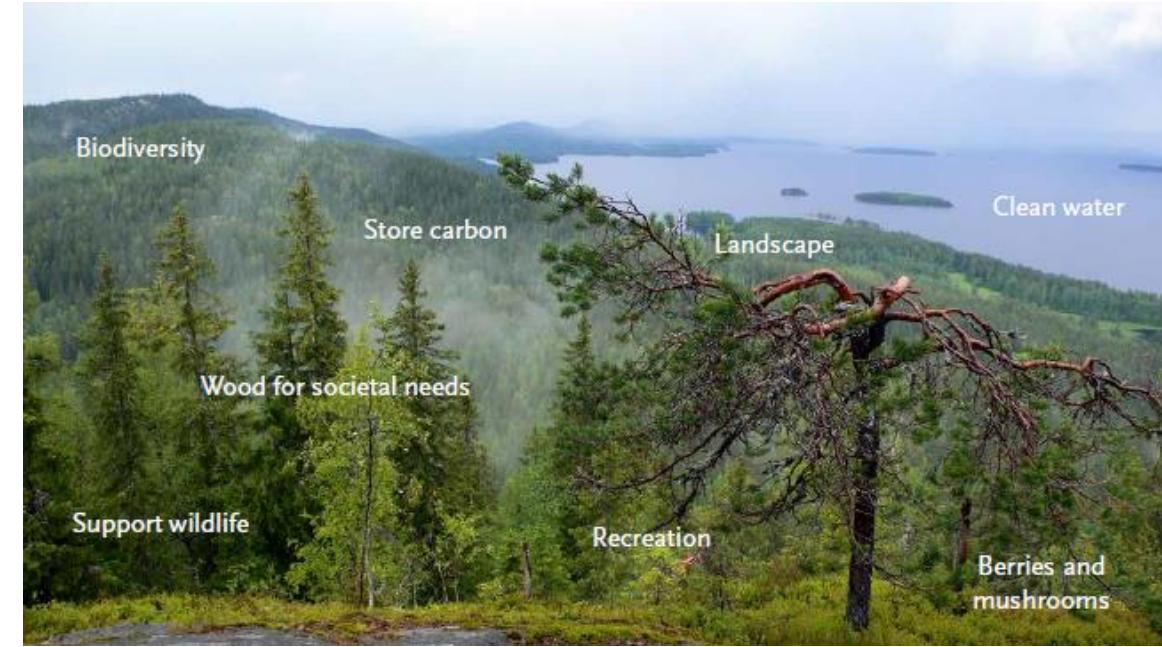
Implications of the hypothetical example

- Turnover increases by 10 - 40% by 2030 compared to today. Compensates many times the expected decline of turnover from graphics paper productio: *forecasted to be around 5.5 billion euros by 2030*
- The scale of turnover is very senstive to assumption in which section of the value chain industry will operate: *raw material or end product producer*
- Wood consumption would increase 2 - 21 % by 2030 compared to current level
- Biofuels and biochemicals production do not necessarily increase significantly roundwood demand - mainly based on *sidestreams* and *forest residues*
- New bioeconomy products tightly linked to production of current forest products

The outlook for forest-based bioeconomy products looks good, but it can take place only if we at the same time enhance the *services* related to forests

All ecosystem services need to be included under circular bioeconomy, because:

- To succeed (*also advancing SDGs*)
- We will not be able to engage urban population - 75% EU citizens - without advancing also regulating and cultural services (*recreation, water supply, public health, etc.*)
- To find *synergies* and address *trade-offs* between different ecosystem services and biodiversity
- In the end, it will be the role of political process to find acceptable balance between the different needs



Priorities for advancing circular bioeconomy development?

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Priorities for circular bioeconomy strategy

- Create a science-based circular bioeconomy **narrative**
- Do not assume a bioeconomy is *sustainable* - make it
- Abolish fossil subsidies and increase the role of CO₂ price
- Invest in *R&D*, innovations and new skills
- Provide the right *regulatory framework*
- Embrace biobased *services*
- *Coordinate the different policies and measures*



The emerging European circular bioeconomy needs to challenge the old linear fossil economy!



Thank you!

