



EUROPEAN FOREST  
INSTITUTE

# 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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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:

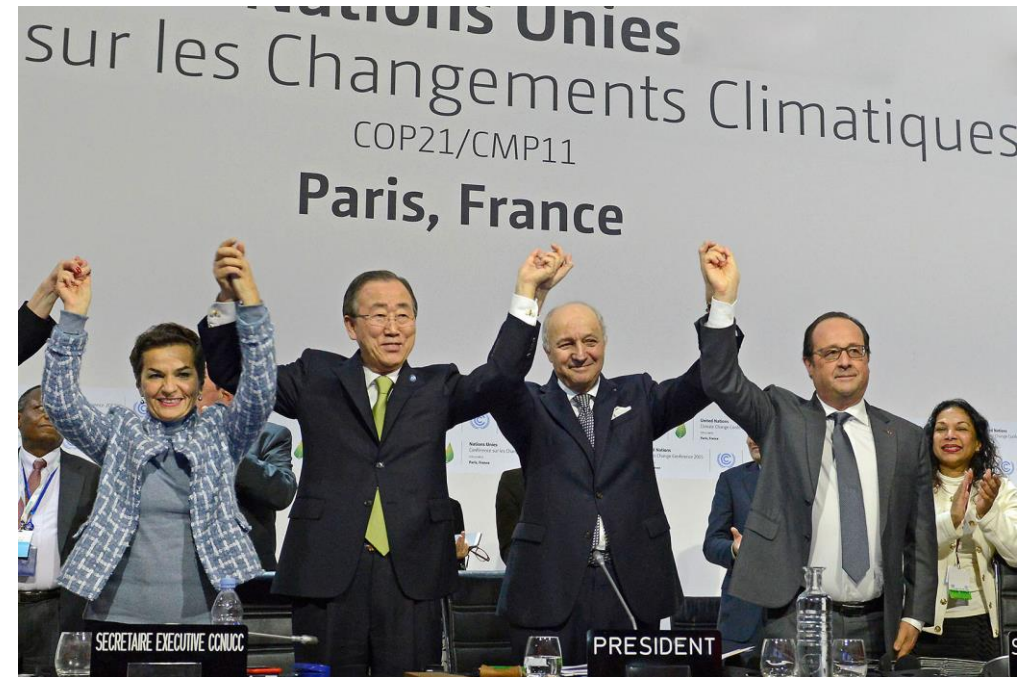
1. What we try to achieve with it
2. The acceptance, and therefore the success, of it
3. What policies and measures are needed to implement it

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

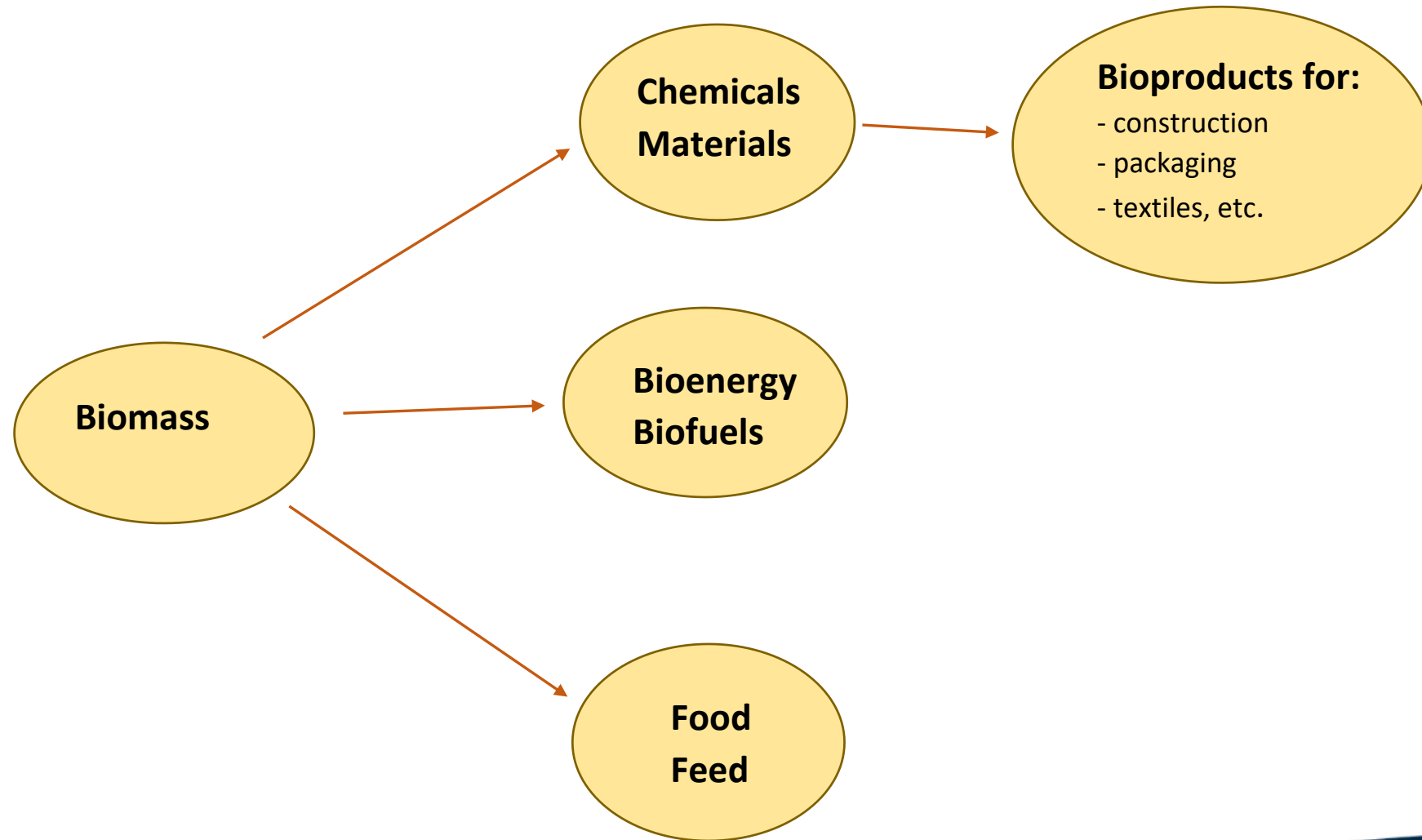
## SDGs



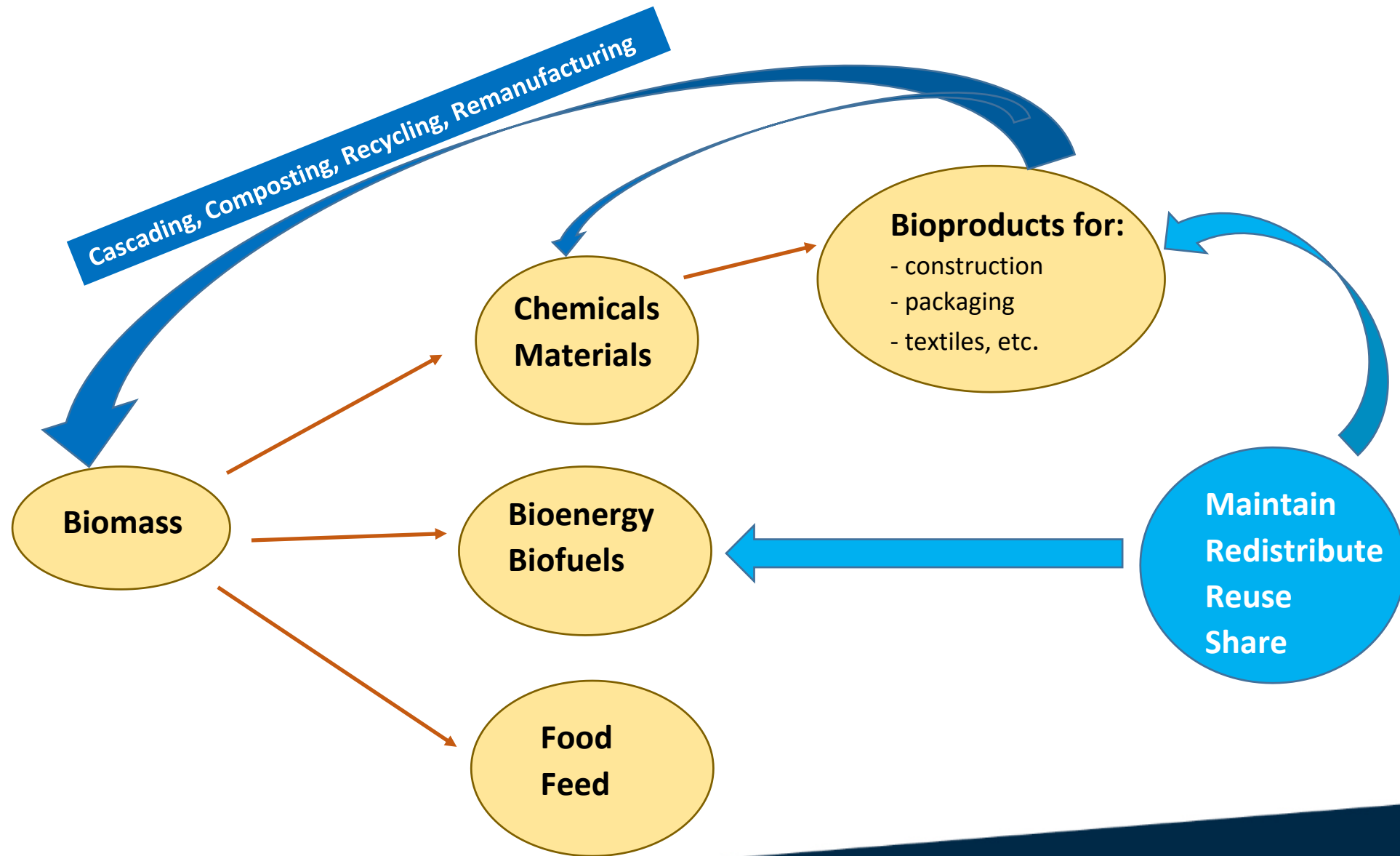
Keeping global temperature rise this century well below 2°C



# Bioeconomy: Conventional and EU strategy (2012) view



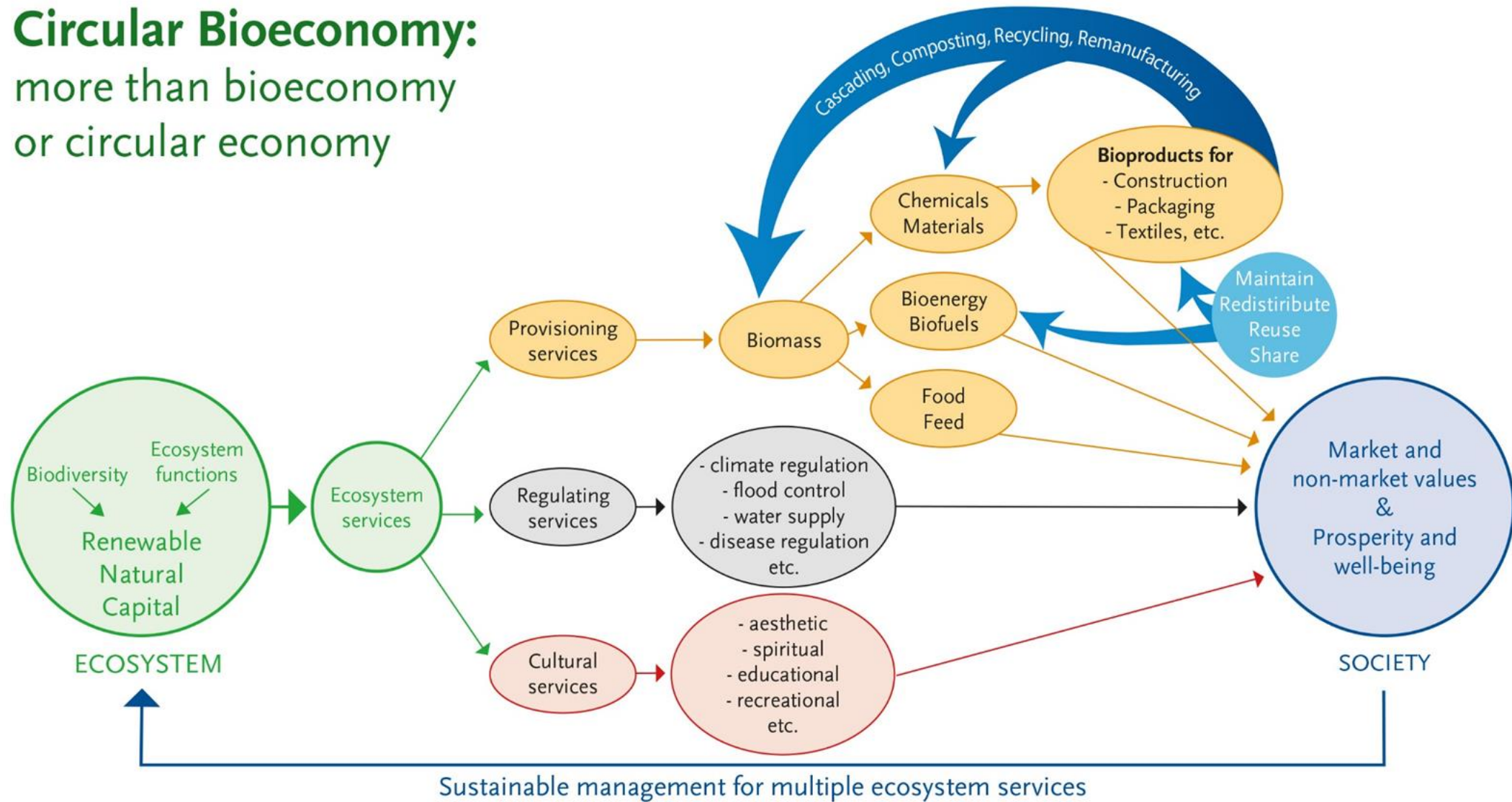
# Bioeconomy: Conventional with Circular Economy (EMF)



- 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

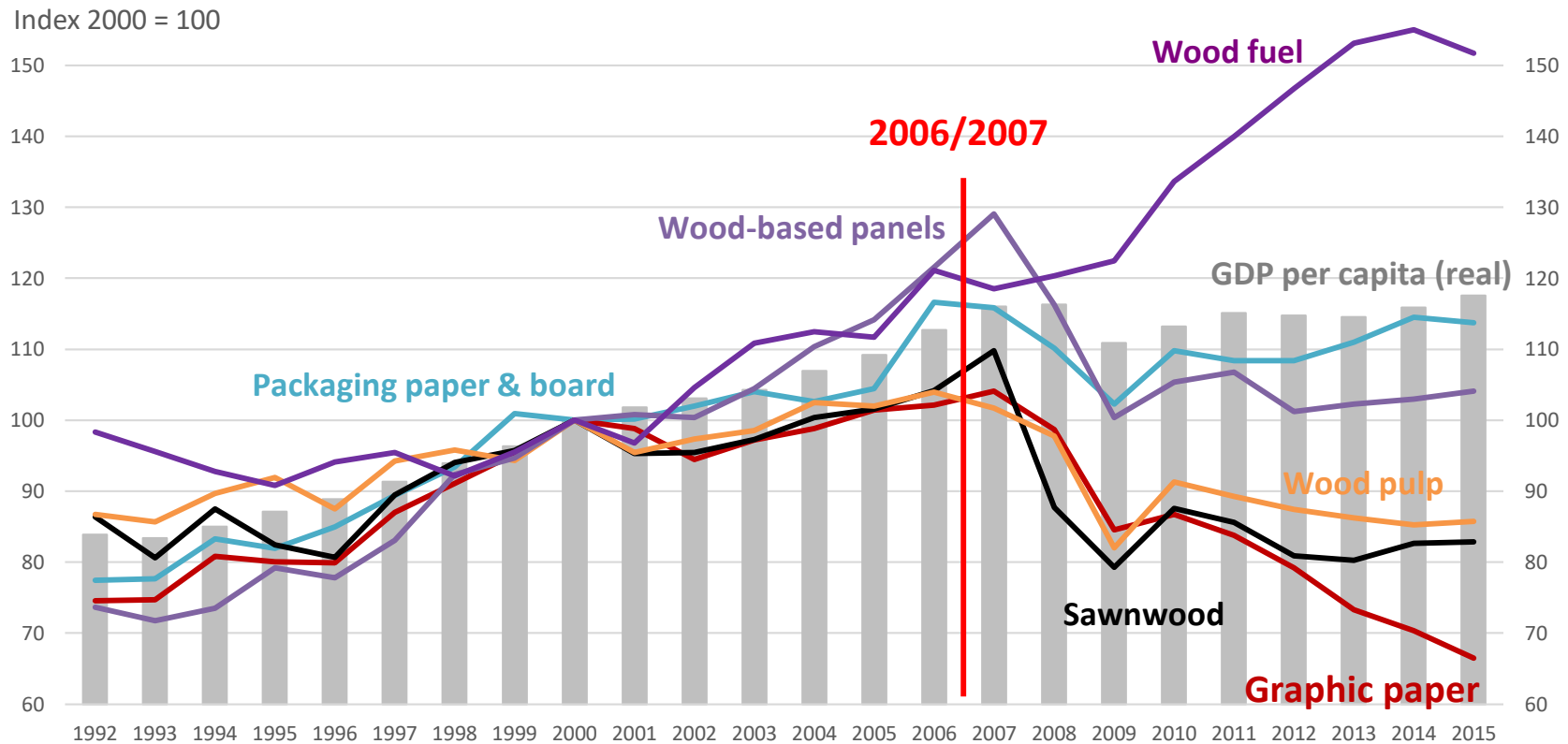


# How does the outlook for forest bioeconomy markets look



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

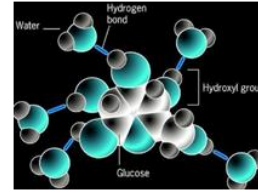
Consumption per capita in Europe (excl. Russia) in 1992-2015



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



Biofuels,  
biochemicals,  
bipolymers

Biomolecules



Pulp, paper,  
packaging,  
textiles, tissue,  
labels,  
biocomposites

Fibres



Sawnwood,  
plywood, CLT

Logs



FOREST

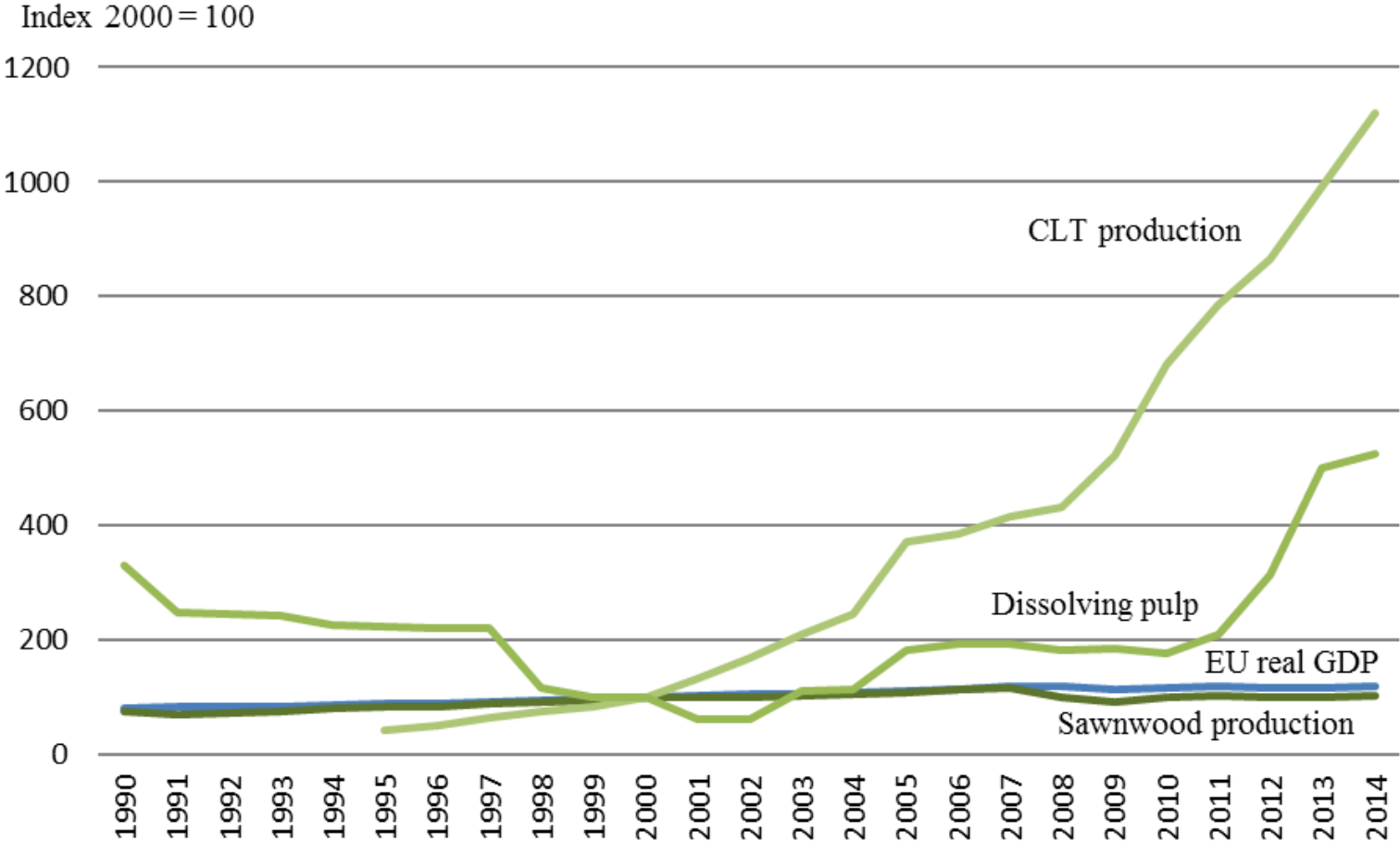
Trees



Bioenergy

# 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*



1  
REVIEW

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
<b>Production value, billion euros</b>	1 - 6	4 - 46	4	4	4 - 15	18 - 75
<b>Unit value, euros/ton</b>	769 - 2228	209 - 2245	815 - 1250	1000 - 2725	843 - 2500	
<b>Sawlog consumption, mil. m<sup>3</sup></b>		7 - 117				7 - 117
<b>Pulpwood consumption, mil. m<sup>3</sup></b>	7 - 15				2	8 - 16
<b>Woodchips &amp; sawdust cons., mil. m<sup>3</sup></b>			27 - 37	33 - 45	2	63 - 85
<b>Lignin consumption, mil. m<sup>3</sup></b>		2				2
<b>Tall oil consumption, mil. m<sup>3</sup></b>			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 production: *forecasted to be around 5.5 billion euros by 2030*
- The scale of turnover is very sensitive 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?

 FROM SCIENCE TO POLICY 3

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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 CO<sub>2</sub> 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!***

