Economic impacts of potential EU forest carbon sink policies on the forest-based sectors

Preliminary results

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OUTLINE

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I. Objectives

The following (research) question is adressed: ***What are likely economic impacts on the European forest sector and globally if harvest regulations for climate mitigation were introduced at country level in Europe?***

To analyse this question consistently, one has to take into account at least the following factors:

- The forestry situation in each country (sustainable harvest levels)
- The forest industry capacities and production costs, and the dependences/competition between the industries for wood fiber
- Trade of wood and forest industry products between each European country and regions outside Europe
- Demand for forest industry products
- Behaviour of the various market actors/agents involved

II. Methodology

- **Apply the global partial equilibrium forest sector model EFI-GTM**

Probably the most advanced global forest sector model in use today.

- The model simulates the development of the forest sector based on economic theory of competitive markets. The model solutions find the prices and quantities which secure that the markets for all products are in equilibrium – i.e. that supply equals demand in each year
  - for each product in each country/region
  - including trade
  - under pre-specified assumptions regarding
    - demand and production costs for forest industry products
    - forest growth and sustainable harvest levels

- The model is particularly suitable for «what-if» analysis of the impacts of policy changes – like the one analysed here regarding forest harvests

II. Methodology

EFI-GTM contains the following main characteristics:

- The global forest sector divided in 57 regions (of which 31 are countries in Europe.)
- Forest growth and harvest for each country/region
- 20 final forest industry products (including 2 sawnwood, 4 boards, 8 paper and 4 bioenergy product types,etc), all with country/regional specific demands.)
- 16 intermediate products (including sawlogs, pulpwood, forest residues, sawmill chips and residues, 3 types of chemical pulp, 4 types of recycled paper).
- 5 log types (sawlog and pulpwood divided on hardwood and softwood) + chips
- Production technologies (wood use and production costs per unit produced), specific for each of the above mentioned products and countries/regions.
- Trade costs between each country/region for each product.
- Profit maximizing producers and pre-determined economic growth for each region

For more information see : Kalllio, Moiseyev & Solberg (2004), Solberg, Kallio and Toppinen (2010),Moiseyev, Solberg & Kallio (2013), Kallio and Moiseyev (2016)

III. Specific assumptions and preliminary results

Comparing future scenarios of the forest sector development

Baseline (”Base”):

- Market driven development of the global forest sector

Policy scenario (”Limited”):

- Market driven development of the global forest sector as in ”Base”
- Constrained utilization of forest resources in the EEA in the future

Assumed development of market demand in both scenarios

- The demand growth assumptions are based on
  - economic growth
  - population growth
  - the need to substitute fossil-based raw materials with renewables.

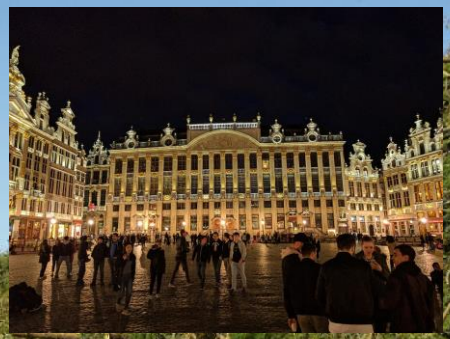
- Bionenergy in important role in attaining the goal of global warming < 2 C.

Forest carbon sink policy approximated by constraints to roundwood harvests

Harvests of roundwood in the EU, Norway and Switzerland after 2020 limited not to exceed:

- average national levels of **2000-2012**

Sawlogs

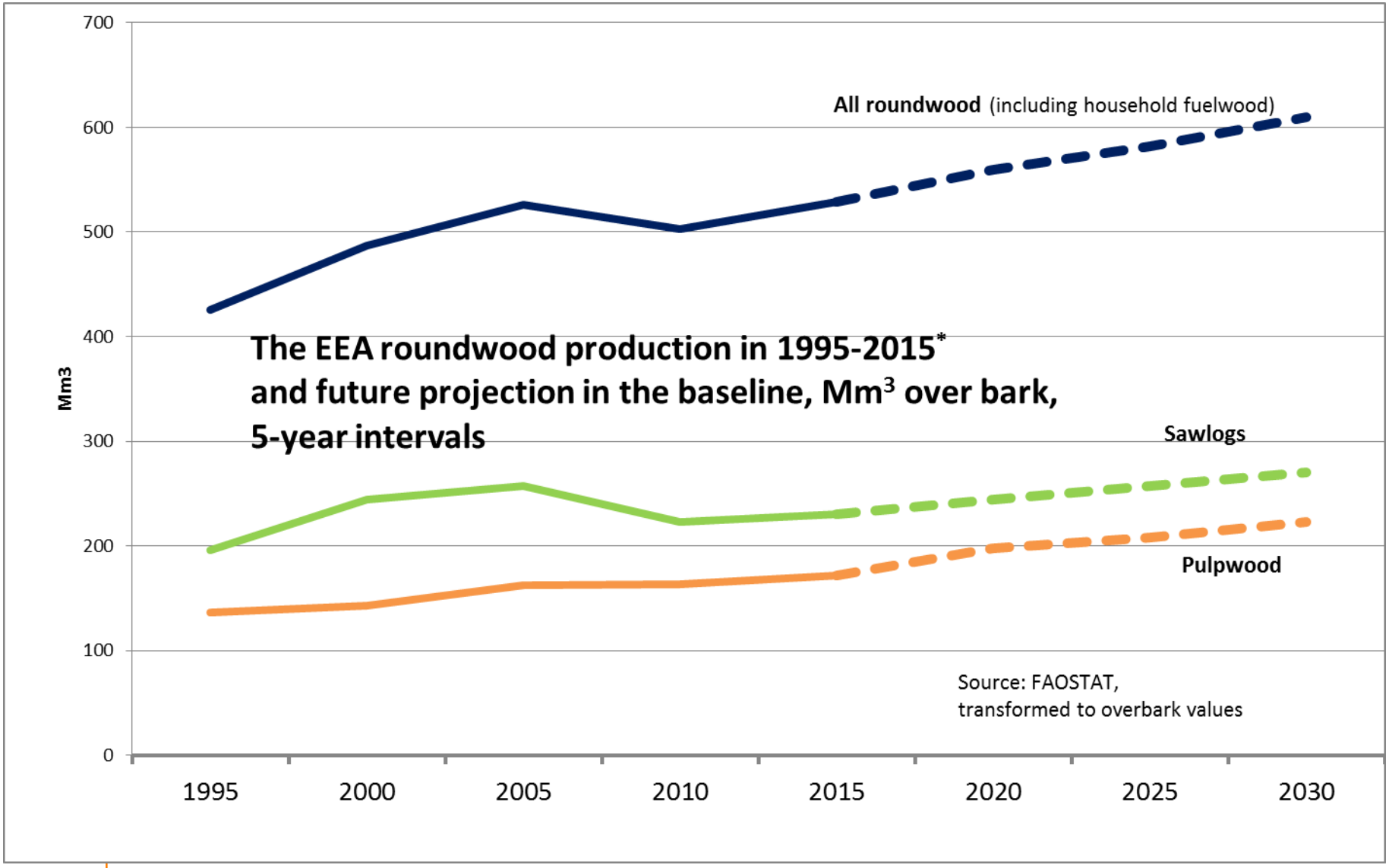


Energy wood

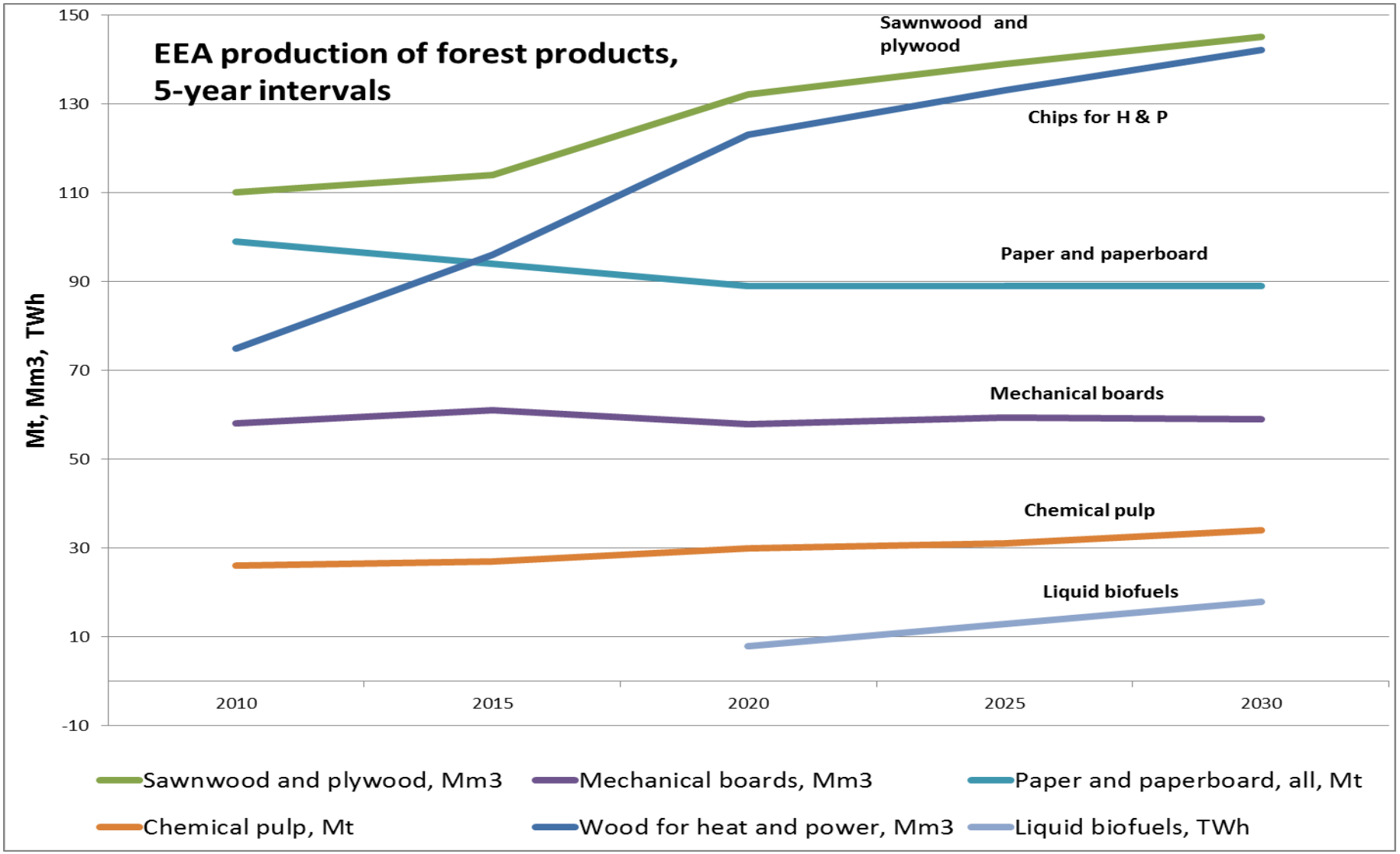
Pulpwood

Forest sector in the baseline

The EEA harvests are gradually increasing due to the increased harvest potential and global product demand



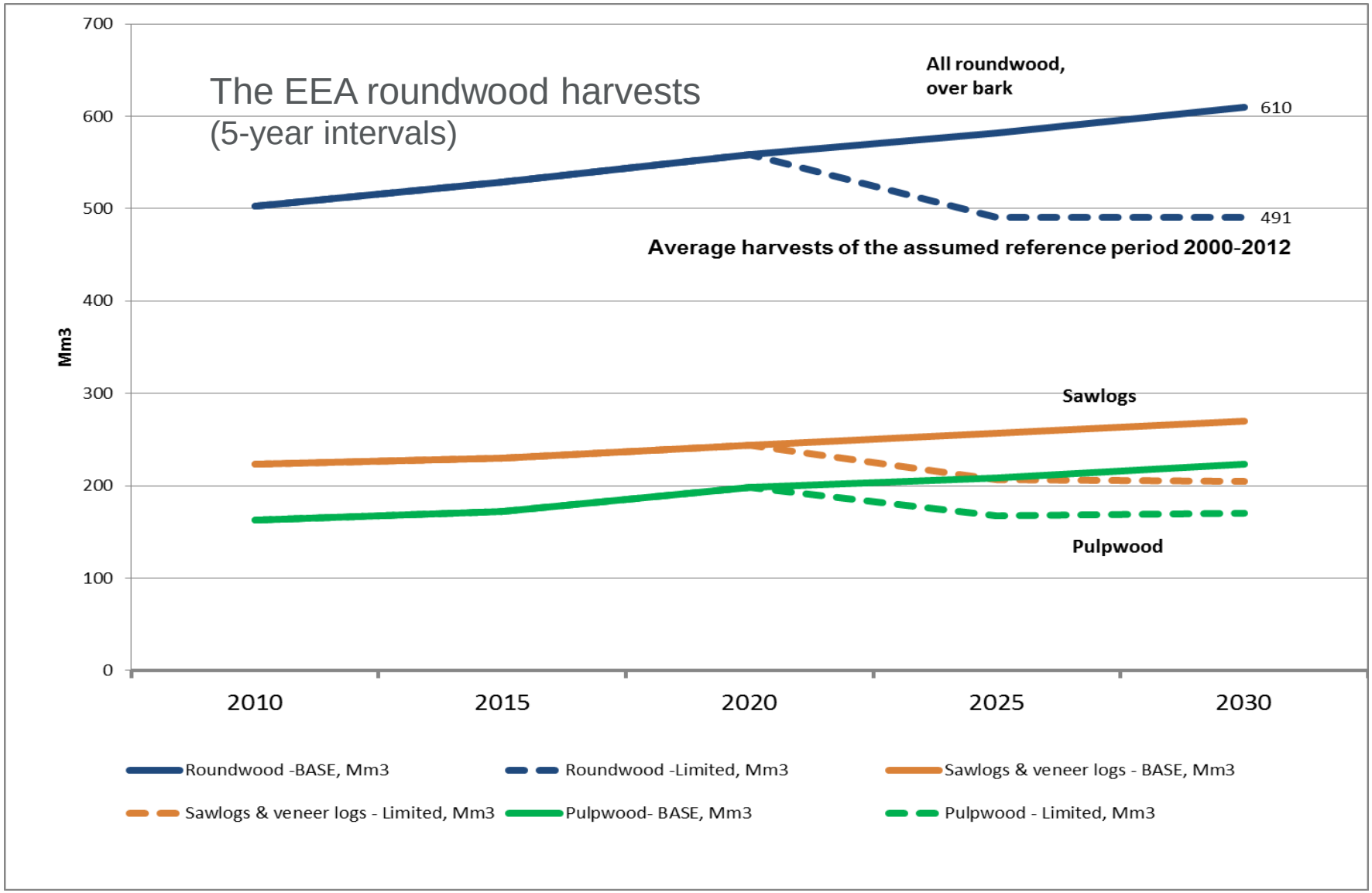
Production of sawnwood, pulp and wood-based energy in the EEA responds to the growing demand



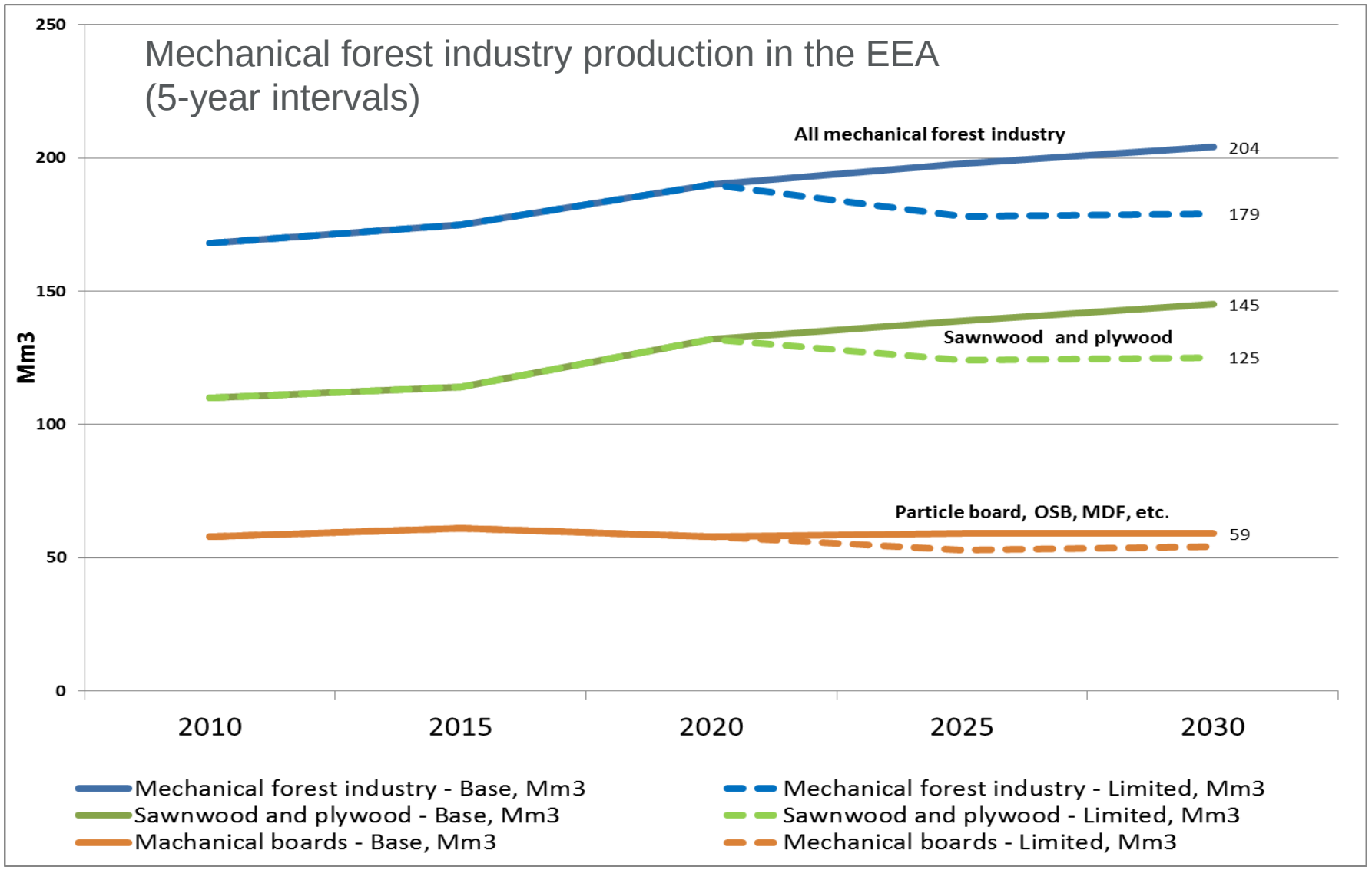
Preliminary results of the study:

Changes in the forest sector if the EEA countries comply with the assumed policy of limited harvest levels

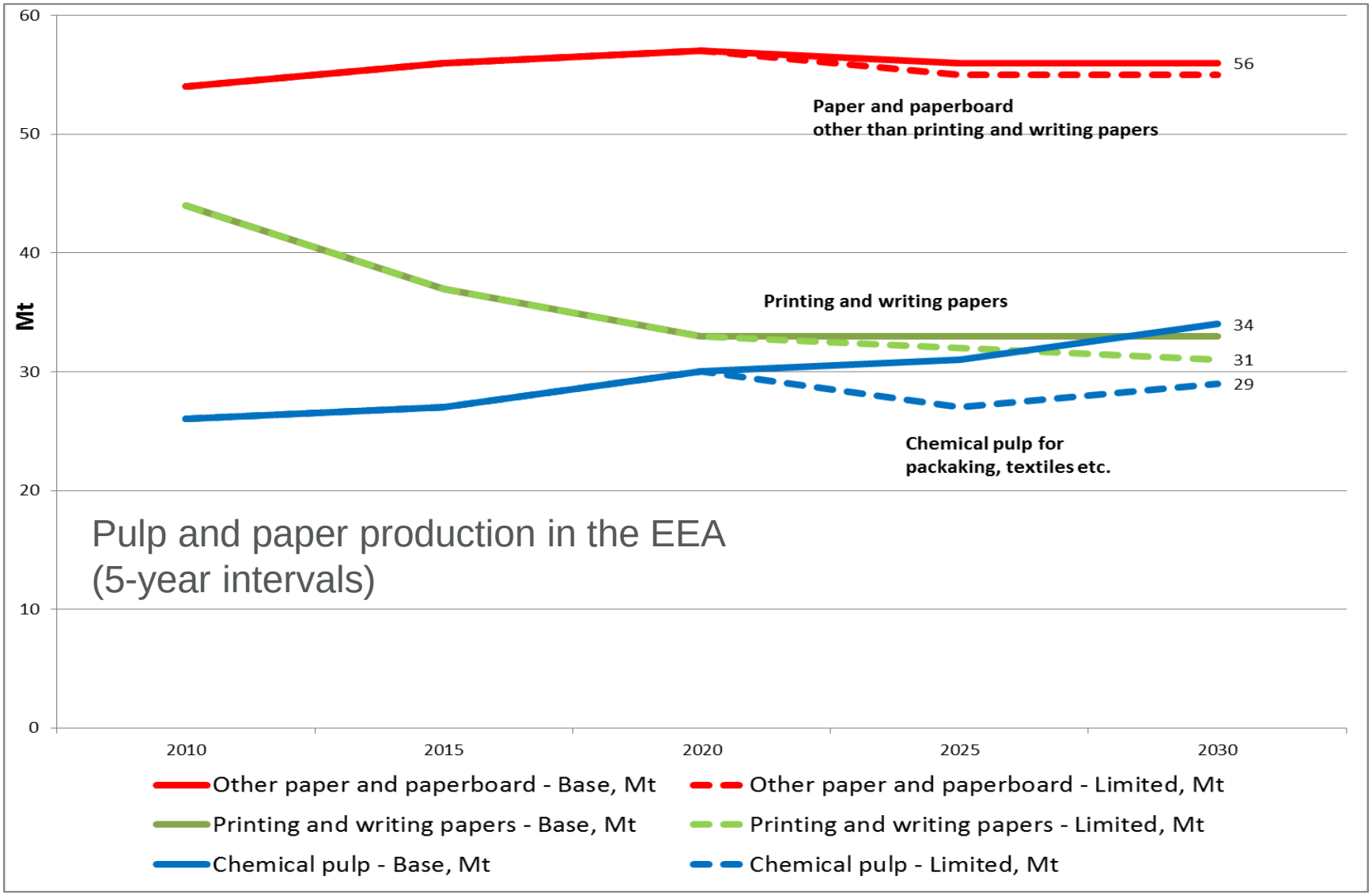
Limiting the utilization of forests to past levels cuts the growth potential of the EEA forest sector



Harvest limitations may jeopardize the desired shift towards production of carbon storing wood products



The harvest limitations would harm the growth of the pulp industry.



Biggest decline is in labor intensive branches of forestry and sawnwood production in the EEA

Decline in the EEA forest sector production due to achieving the assumed forest sink goal, 2030 in ”Base” vs 2030 ”Limited

	Round wood	Paper and paperboard	Chemical pulp	Sawnwood and plywood	Mechanical boards
Mt or Mm^3	-118.3	-2.6	-5.4	-19.2	-5.5
%	-19.4	-3.5	-15.7	-13.5	-8.8

If EEA production falls, production will shift to RoW to meet growing demand – despite the EU policies

Change in forest sector production under limitations vs. baseline, 2030

	Round wood	Paper and paperboard	Chemical pulp	Sawnwood and plywood	Mech. Boards
	Mm^3	Mt	Mt	Mm^3	Mm^3
The EEA	**-118.3**	**-2.6**	**-5.4**	**-19.2**	**-5.5**
Rest of the World	**92.9**	**1.7**	**3.9**	**15.2**	**4.7**
The World total	**-25.4**	**-0.9**	**-1.5**	**-4.0**	**-0.8**

A large part of forest industry production growth in the EEA will relocate outside Europe if harvests are constrained.

Change in forest sector production under limitations vs. baseline, 2030

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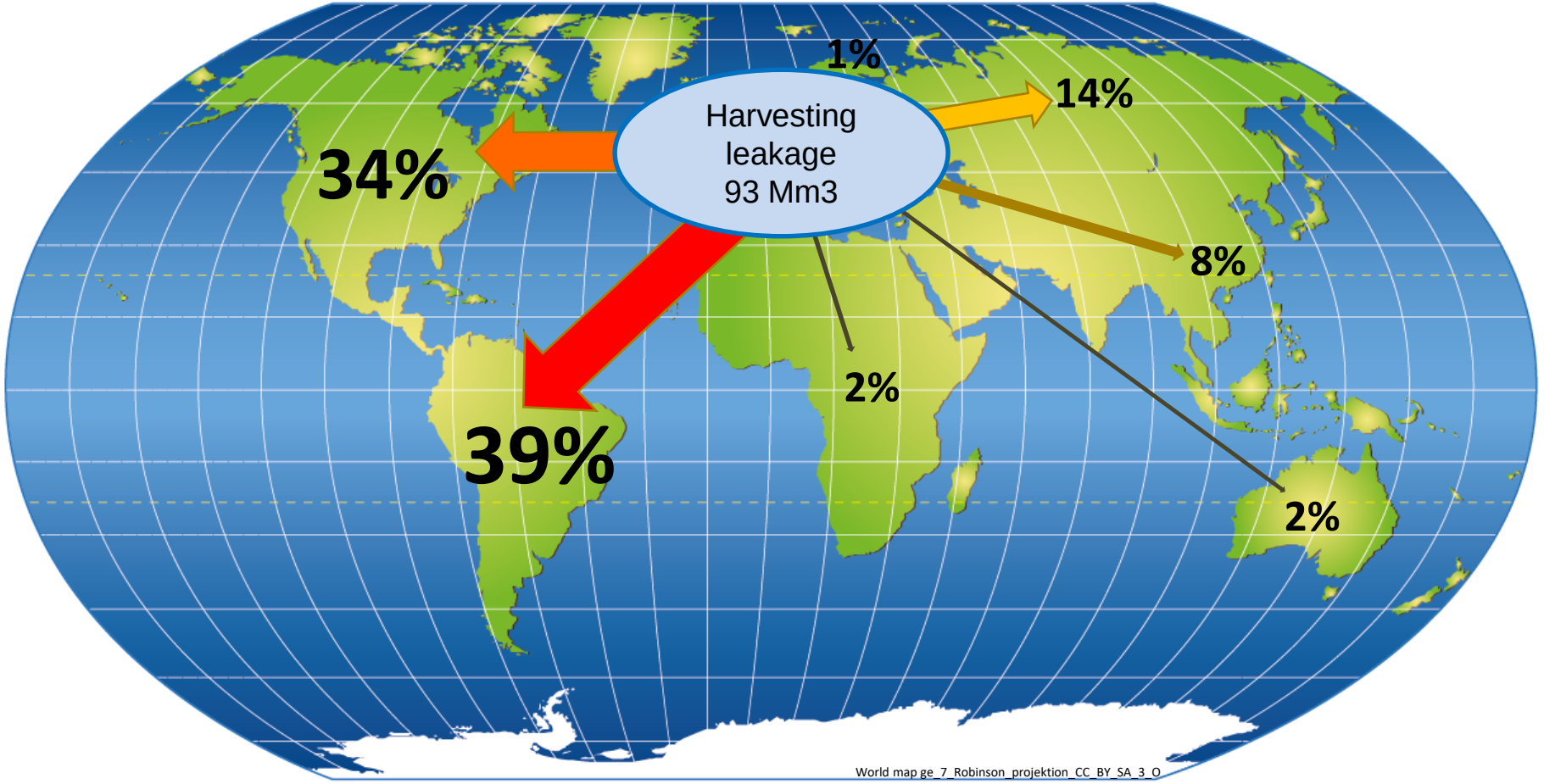
Rest of the World	**92.9**	**1.7**	**3.9**	**15.2**	**4.7**
Leakage-%	**79%**	**64%**	**72%**	**79%**	**85%**

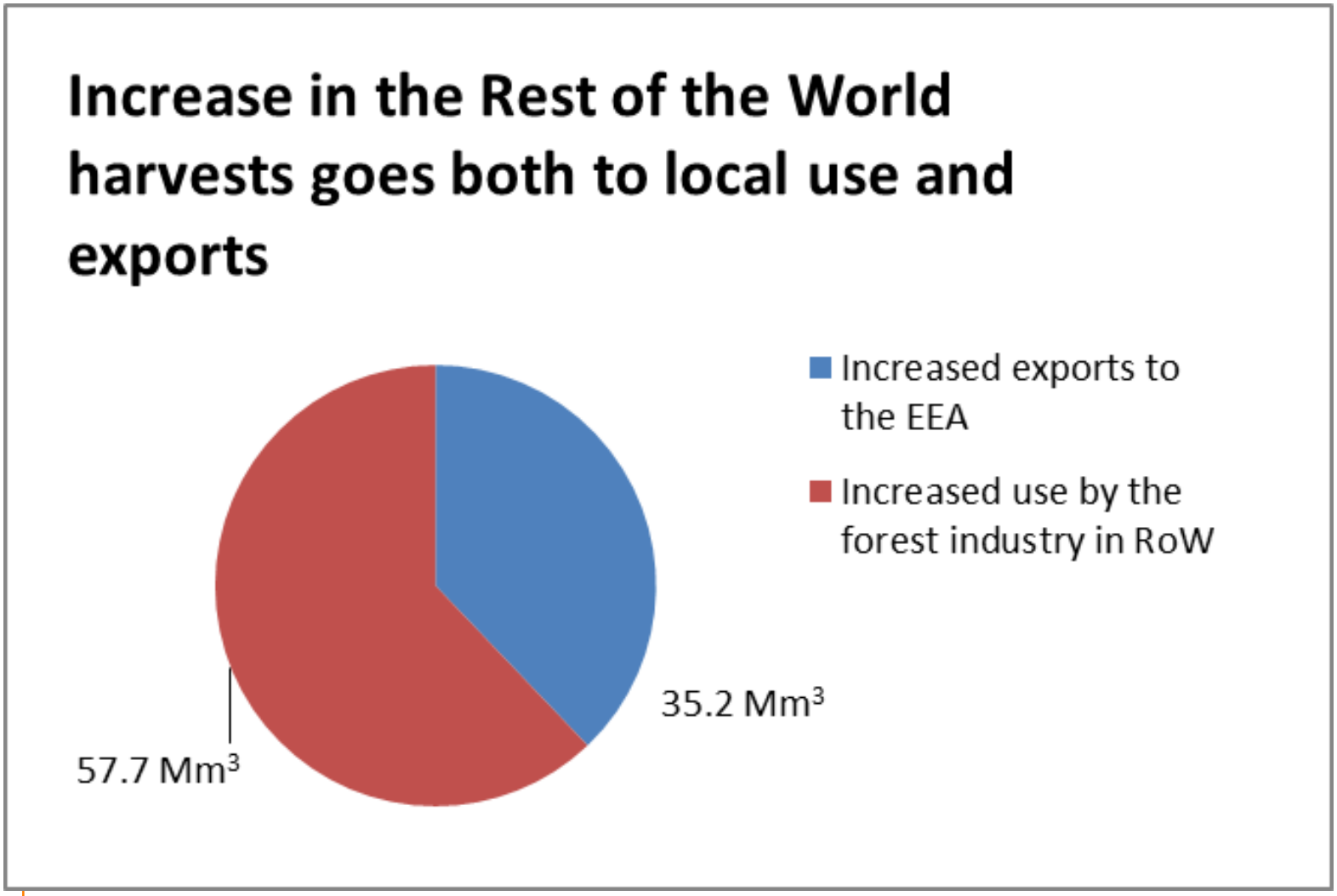
Leakage-% = Share of the decline in the EEA production that is relocated somewhere else

Harvesting in EEA decreases 119 Mm3 and 80 % of it leaks to the Rest of the World



Economic impacts of the potential EU forest carbon sink policies on the forest-based sectors. Comparing baseline scenario and limited harvest scenario in 2030. Preliminary study results.

More than 1/3 of the increase in roundwood harvests in RoW will be imported by EEA



Leakage takes place regardless of the chosen reference period.

Leakage =
Share of the decline in the EEA production that is relocated somewhere else.
Year 2030

Reference period	Round wood %	Paper and paperboard %	Chemical pulp %	Sawnwood and plywood %	Mechanical boards %
2000-2012	79	64	72	79	85
1990-2009	76	46	55	81	83
2006-2015	78	67	70	80	85

Also *alternative baselines* were tested. Leakage phenomenon proved to be rather insensitive to these as well.

IV. Conclusions

If implemented:

- **Harvests, forest industry production and thereby also employment opportunities leak from the EEA to the RoW**
  - **jobs will disappear from the labor intensive mechanical forest industry and forestry throughout Europe.**

- **Wood and wood-based product imports to the EEA increase.**

IV. Conclusions

- **Decline in the EEA production increases prices of forest products globally**
  - **higher priced wood-based products will be partly substituted by other materials such as concrete, metal and plastics.**
- **The increased harvests in RoW would reduce forest carbon sinks there.**
- **Leakage takes place regardless of the chosen reference period.**

Thank you!

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