Excursion of Finnish Society of Forest Science to Latvia
27 - 29 August 2025

Impacts of potential EU forest climate policies on the forest-based sector

Risto Päivinen
Tapio Ltd.

TAPIO

Norges miljø- og biovitenskapelige universitet

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Forest Policy and Economics 92 (2018) 193–201

Contents lists available at ScienceDirect

Forest Policy and Economics

journal homepage: www.elsevier.com/locate/forpol

Economic impacts of setting reference levels for the forest carbon sinks in the EU on the European forest sector

A. Maarit I. Kallio[a,*], Birger Solberg[b], Liisa Käär[c], Risto Päivinen[c]

[a] Department Bioeconomy and Environment, Natural Resources Institute Finland, Helsinki, Finland
[b] Norwegian University of Life Sciences, Ås, Norway
[c] Tapio Ltd, Helsinki, Finland

EU Forest reference levels: The compatible harvest volumes compiled and assessed in terms of forest sector market development

Risto Päivinen, A. Maarit I. Kallio, Birger Solberg, Liisa Käär Forest Policy and Economics Volume 140, July 2022, 102748

EU policy on forest carbon sinks revisited (In review)

Elias Garvik and A. Maarit I. Kallio (2025)

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Method: The global partial equilibrium forest sector model EFI-GTM

After any changes in the market equilibrium the model finds a new equilibrium

EFI-GTM contains the following characteristics:

- The global forest sector divided in 57 regions (of which 31 are countries in Europe.)
  - Forest growth and harvest
  - 20 final forest industry products
  - 16 intermediate products
  - 5 log types + chips
  - wood use and production costs per unit produced
  - Trade costs
  - Profit maximizing producers and pre-determined economic growth for each region

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2. Main assumptions

- **Two main types of future scenarios are compared:**

  A: Baseline scenario (labelled *"Base"*), defined and quantified as a most likely development of the global forest sector (regarding harvest, production and consumption of forest industry productions)

  B: Policy influenced scenarios (labelled *"Limited"*), specified as the the *Base* scenario **except** that constraints on maximum harvest is assumed for each country in the EU + Norway (EU+N)

- **Same future market demand in the *Base* and *Limited* scenarios.** Determined by
  - economic growth
  - population growth
  - the need to substitute fossil-based raw materials with renewables.

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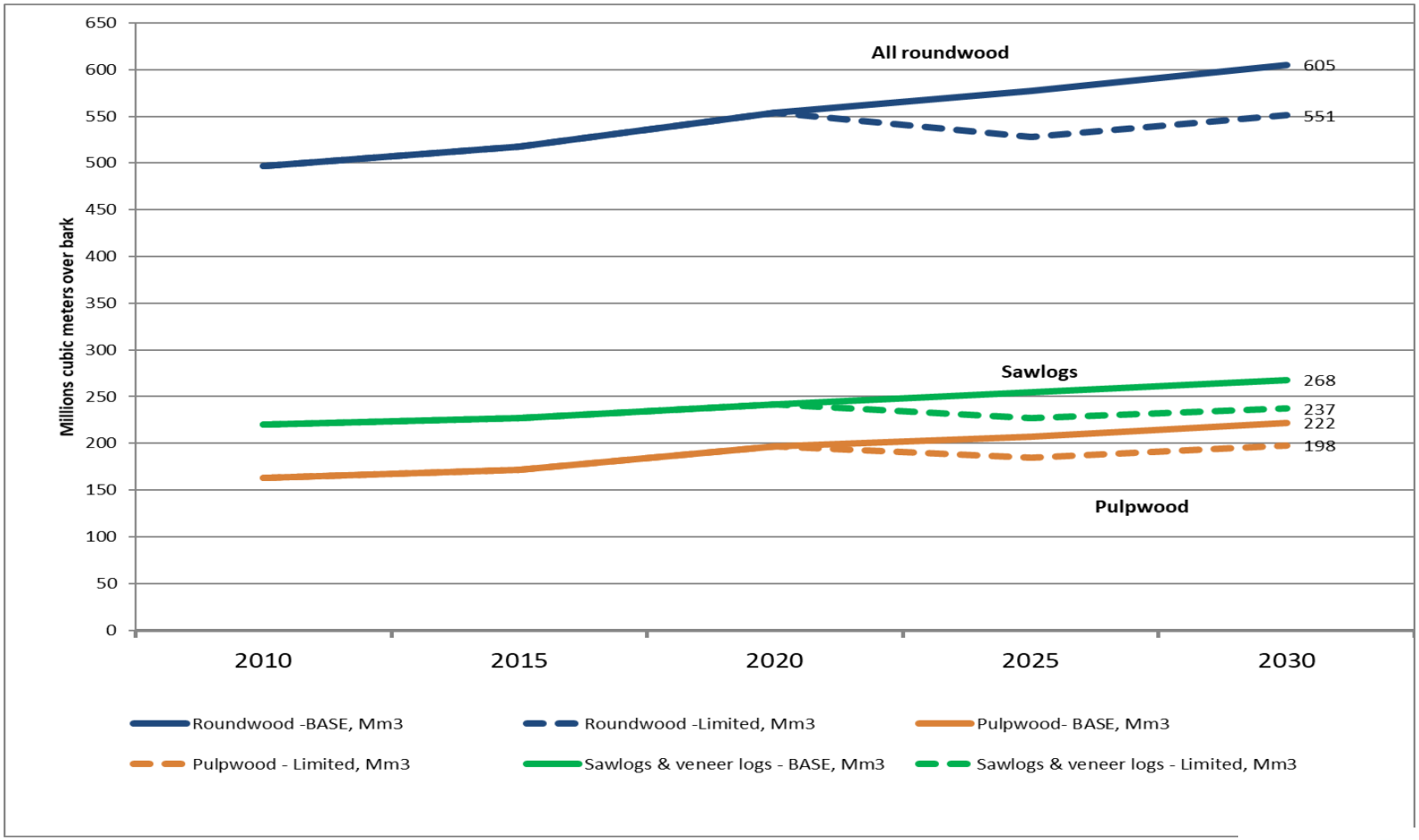
Constraining the harvest utilization of the forests decreases the growth potential of the EU+N forest sector

Projected roundwood harvests in the EU+N (5-year intervals) in *Base* and *Limited Alternativ 4*



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Largest decline would take place in labor intensive branches of forestry and sawnwood production in EU+N

Decline in the EU+N forest sector production due to achieving the assumed harvest limitation in 2030 in ”*Base”* vs *”LimitedAlt.4”*
(Leakage = % share of the decline in the EU+N production that is relocated to RoW)

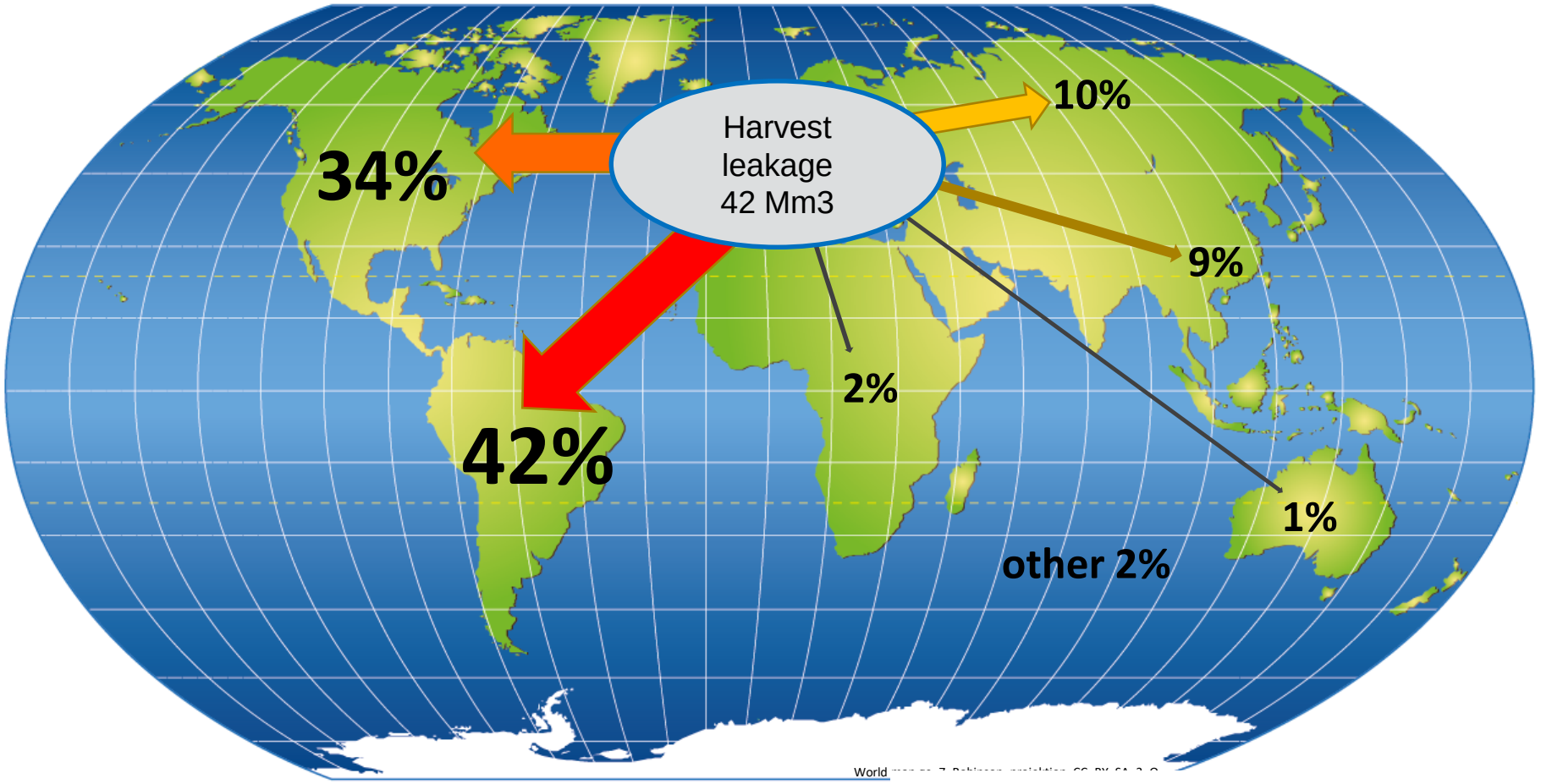
	Roundwood	Paper	Pulp	Sawnwood and plywood	Mechanical board
	Mm^3	Mt	Mt	Mm^3	Mm^3
The EU+N	**-53.7**	-1.6	-3	**-11.8**	-1.9
RoW	42.2	1	2.4	9.9	1.7
The World	-11.5	-0.6	-0.6	-1.9	-0.2
Leakage-%	**79 %**	**64 %**	**80 %**	**84 %**	**89 %**

The leakage % is rather stable - significant leakage takes place regardless of the chosen reference period.

Leakage = % share of the decline in the EU+N production that is relocated to other regions outside EU+N. ***Year 2030***

Alternative harvest references	Assumed maximum allowed harvest in EU+N (Mm3/year)	Round wood %	Paper and paperboard %	Chemical pulp %	Sawnwood and plywood %	Mechanical boards %
Alt.1 1990-2009	443	76	46	57	81	84
2000-2012	491	79	65	74	79	87
2006-2015	506	78	67	72	79	87
530/550 (growing harvest)	530 (in *2021-25)* and 550 (in *2026-30)*	79	64	80	84	89
530/550 Low Base demand	--"---	84	85	77	83	96

Regional allocation of the leakage of roundwood harvests in 2030 in the harvest alternative ”Limited Alt.4”



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Environmental concerns related to harvest and production leakage

Risks compared to Europe: green: the same level yellow : higher , red: clearly higher

	FOREST AREA CHANGE	CARBON STOCK CHANGE	PROTECTED FOREST %	MANAGE-MENT PLAN %	CERTI F.-AREA %	ENV PERF. PRO-DUCTION	CORRUP TION
EUROPE							
RUSSIA						No data	
NORTH AM							
SOUTH AM							

Conclusions

If harvest constraints implemented:

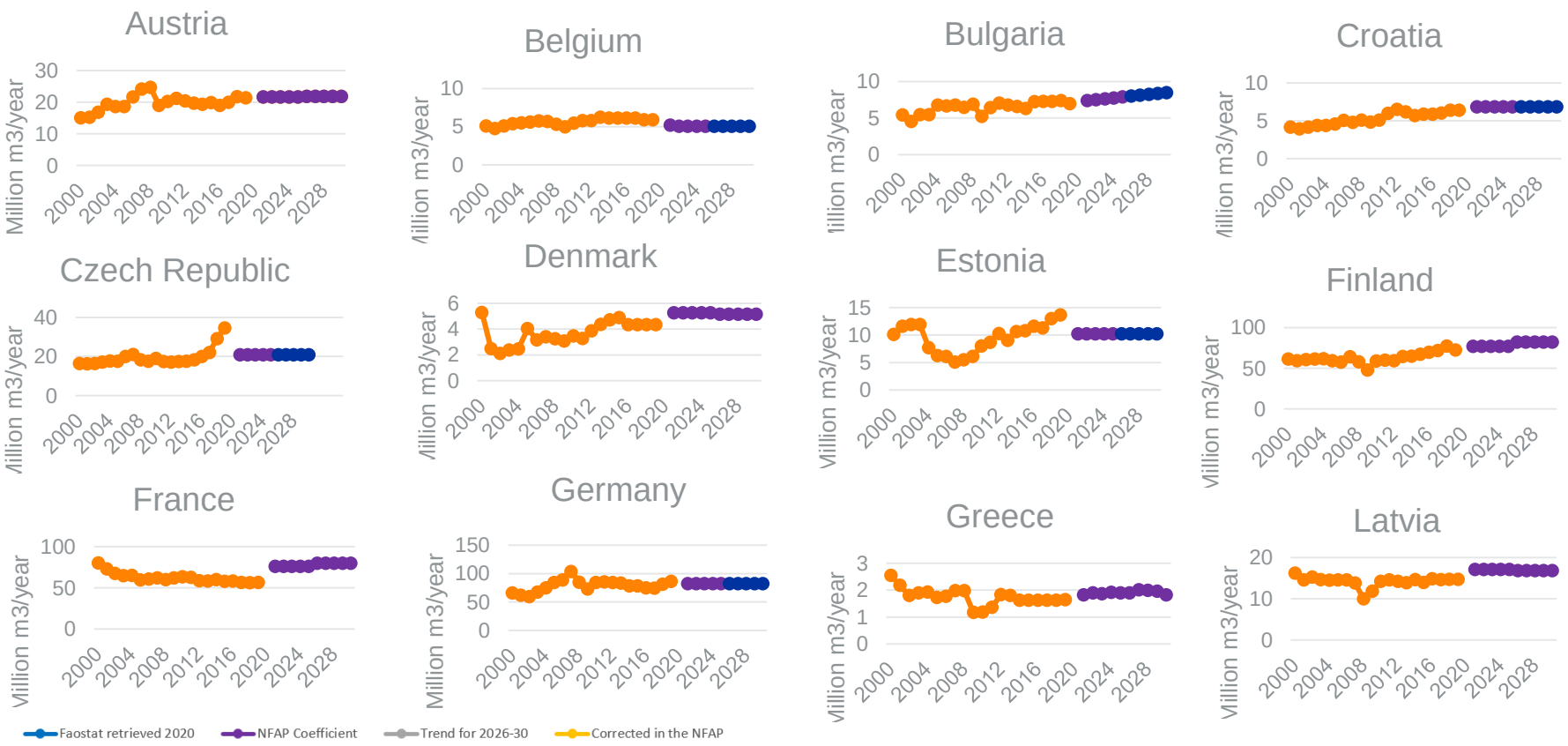
- **Harvests, forest industry production and thereby also employment opportunities leak from the EU+N to RoW**
- **Wood and wood-based product imports to the EU+N increase.**
- **Decline in the EU+N forest industry production increases prices of forest products globally**
  - **higher priced wood-based products will be partly substituted by other materials such as concrete, metal and plastics causing increased GHG emission .**

Commission sets Forest Reference Levels in a delegated act

28/10/2020

The Commission has today adopted the **forest reference levels (FRLs) for each Member State** to apply between 2021 and 2025. FRLs are benchmarks to
calculate the sum of greenhouse gas removals and emissions from existing forests in each Member State.
CO_2 removal from existing forestland is the backbone of the EU land use sink.

Historical FAOSTAT roundwood production in 2000-2019 and **HARMONIZED** assessed roundwood production for compliance periods 2021-25 and 2026-30 (million m3/a, overbark).



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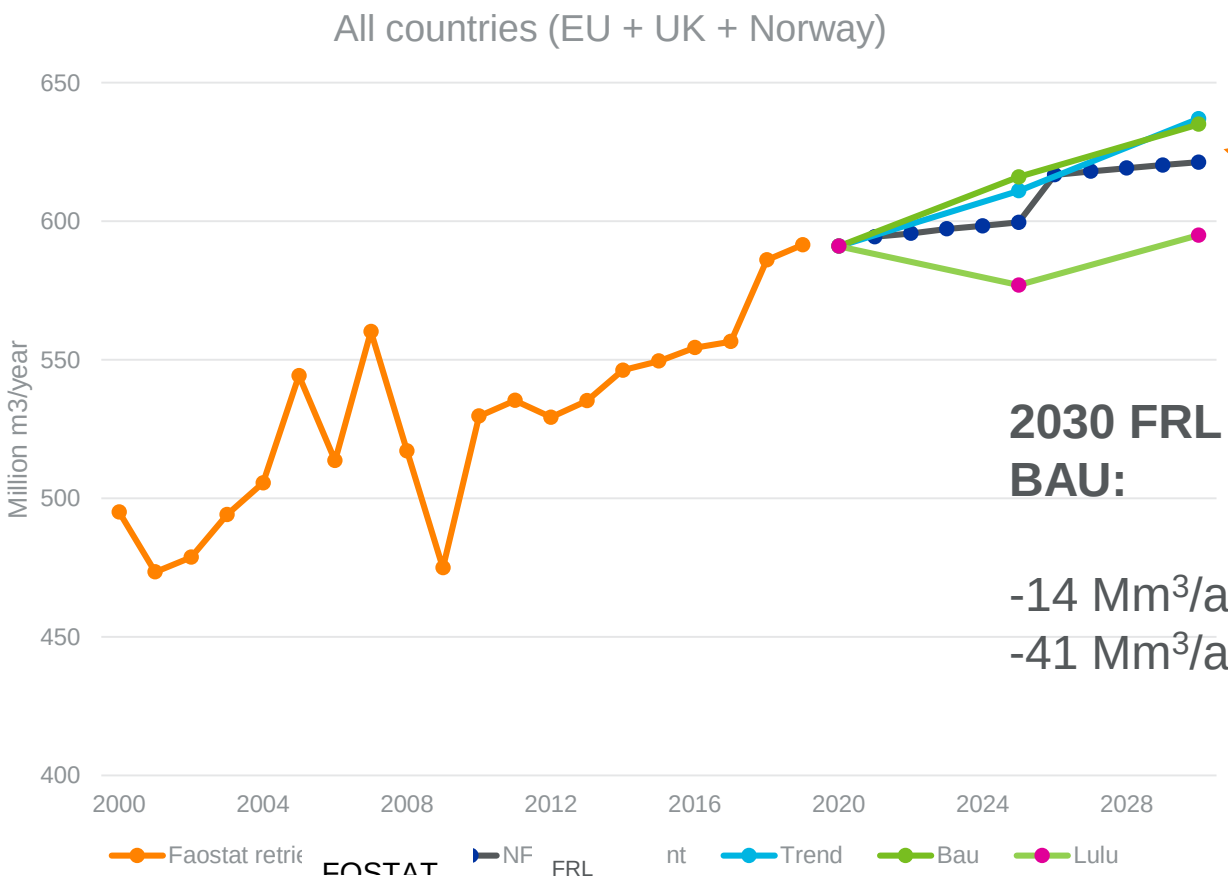
Harvest with and without reductions



Harvests in 2030 (Mm^3/a)

Trend: 637 Mm^3/a
BAU: 635 Mm^3/a

Total of FRLs: 621 Mm^3/a

Harvests if countrywise FRL limits: 595 Mm^3/a (else BAU market)

2030 FRL reductions with respect to BAU:

-14 Mm^3/a Total FRL below BAU
-41 Mm^3/a If countries limited to harvest up to their FRLs

Conclusions

- **Harvests lower than the market-driven levels would cause substantial carbon leakage.** *-> Limiting harvesting in one global region is not effective climate change policy instrument*

*For each 1 m^3 of reduced harvests in EU+UK+N, other regions were projected to increase their **harvests** by **0.64 m^3.** For **sawlogs**, the leakage rate was **0.84 m^3**.*

Thank you !