

# On the use of biomass in the Finnish forest sector

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## Outline

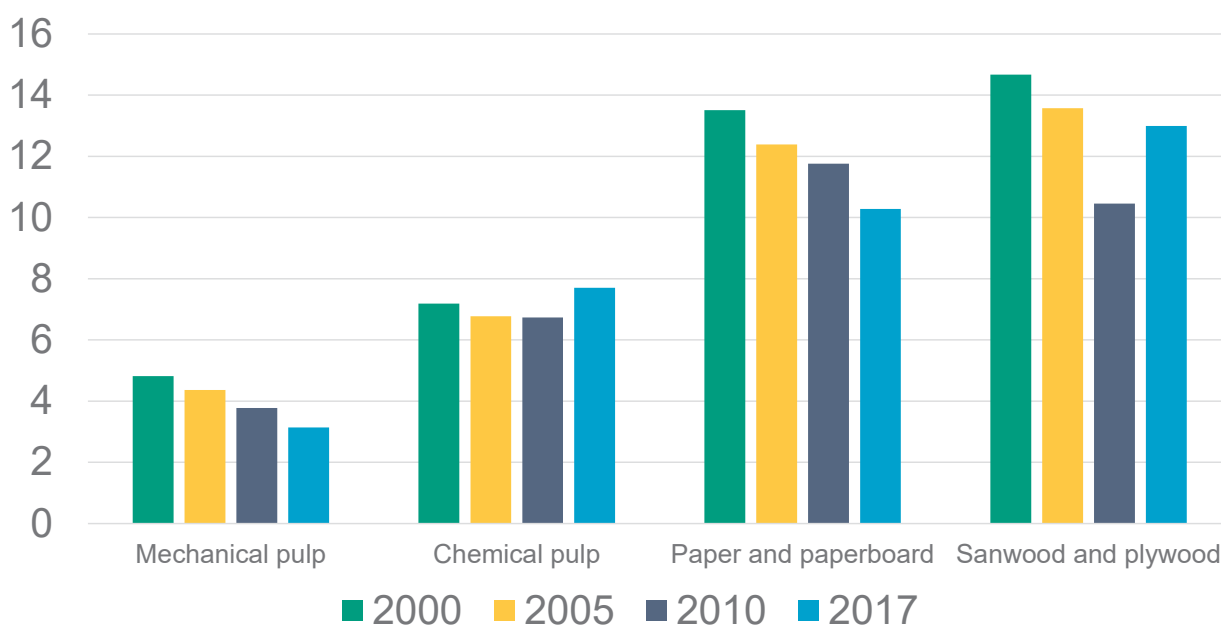
- Harvests and wood use in Finland, what has changed
- A glance to the investment plans & their impacts on the wood markets
- Some imaginary alternatives for getting more wood for *industrial use* without considerable increase in harvests
- Conclusions

There's a lots of market hype, but:

## Finnish forest industry used less wood in 2017 than in early 2000s

Only the chemical pulp output exceeds the former peak levels in Finland

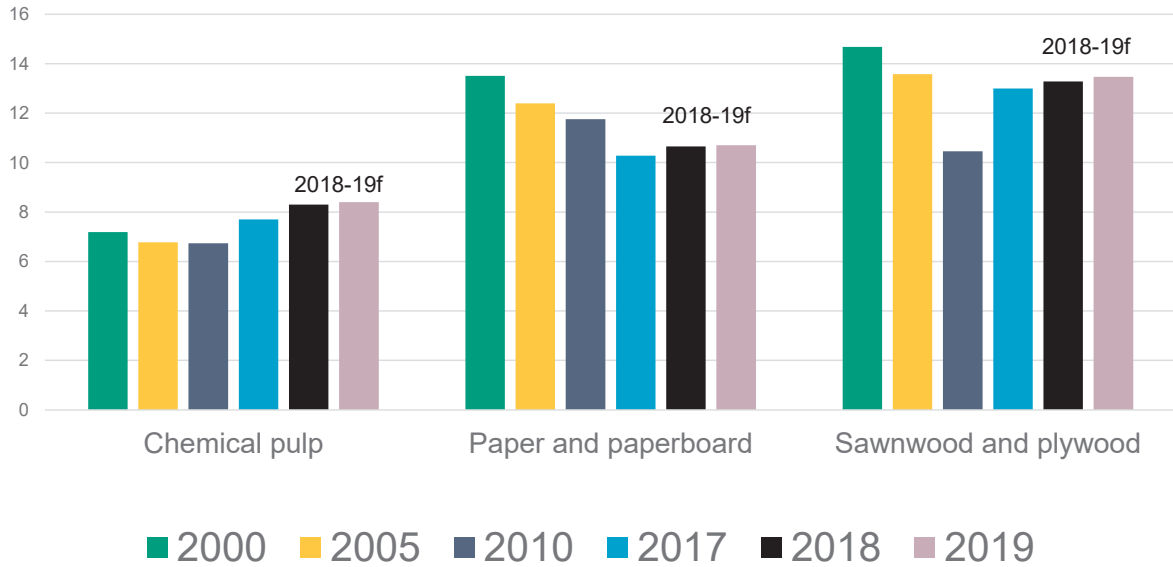
Forest industry production, Mm<sup>3</sup>, Mt



# Only chemical pulp output exceeds the former peak levels in Finland – also next year according to Luke’s forecast

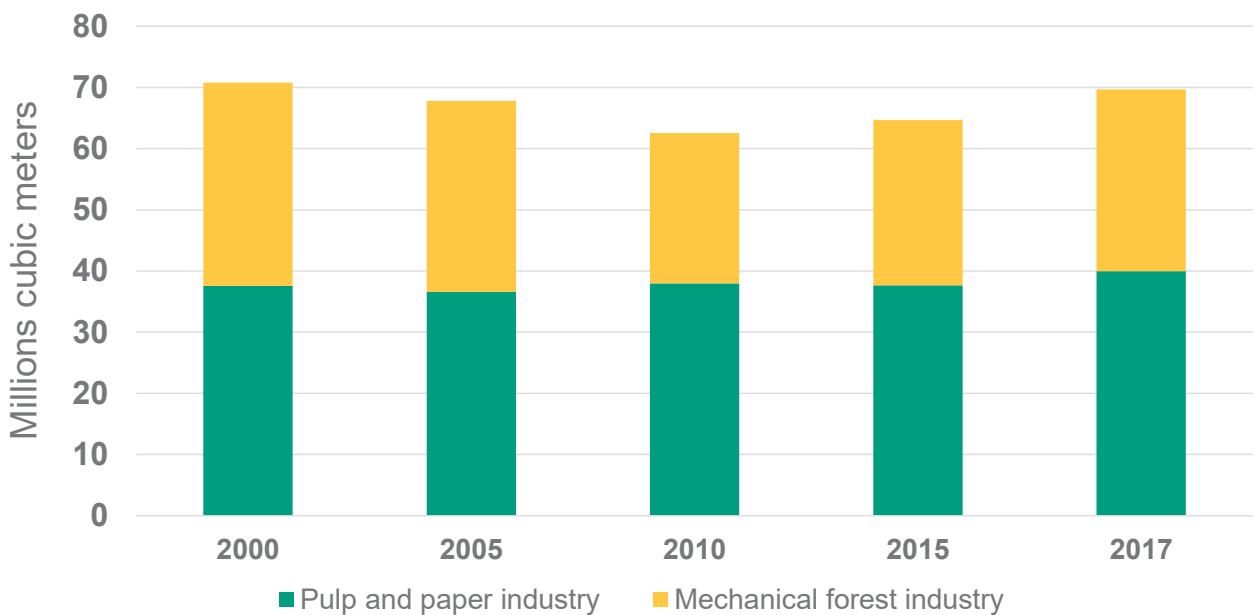
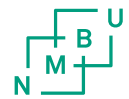


Forest industry production, Mm<sup>3</sup>, Mt



Source: FAO (yr 2000), Natural Resources Institute Finland

## → Use of roundwood in the forest industry was in 2017 still below 2000 level



Source: Natural Resources Institute Finland

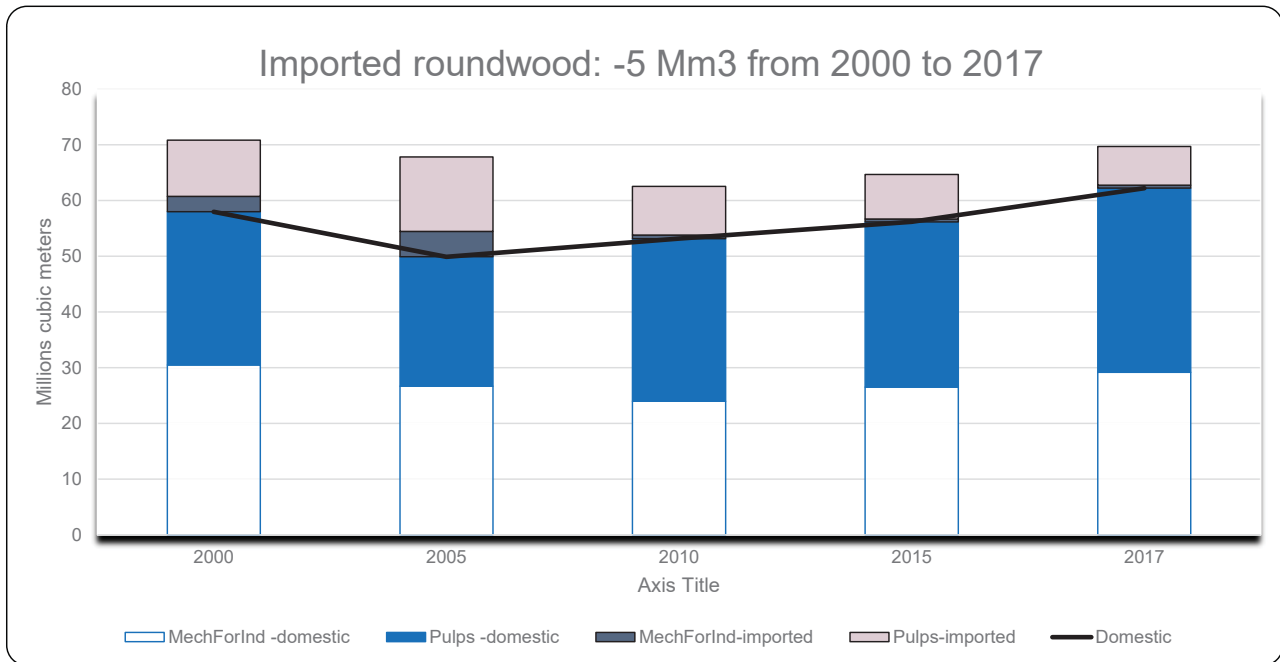
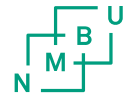
# Yet, the domestic wood harvests has increased from 2000 to 2017 by 11 millions m<sup>3</sup> **3 reasons**

## Harvests in Finland have increased because of

### **1) Less roundwood imports**

-5 Mm<sup>3</sup> from 2000 to 2017

# The forest industry uses more domestic roundwood



Source: Natural Resources Institute Finland, Forest industries

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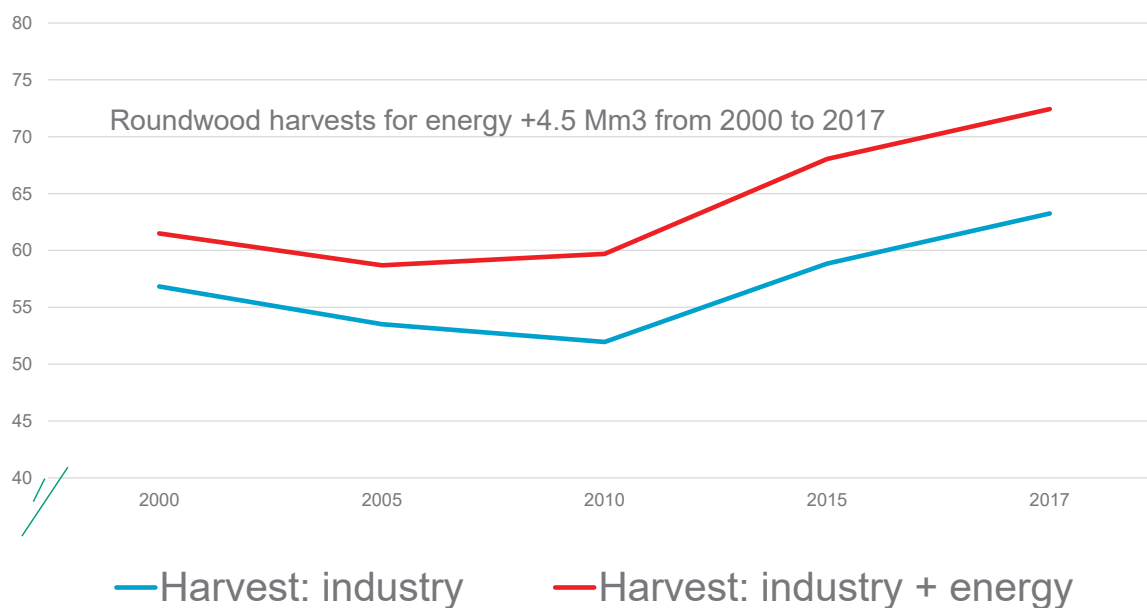
## Harvests have increased because of

**2) a heavy increase in use of roundwood for energy**

**+ 4.5 Mm<sup>3</sup> from 2000 to 2017**



# More domestic roundwood also to energy production



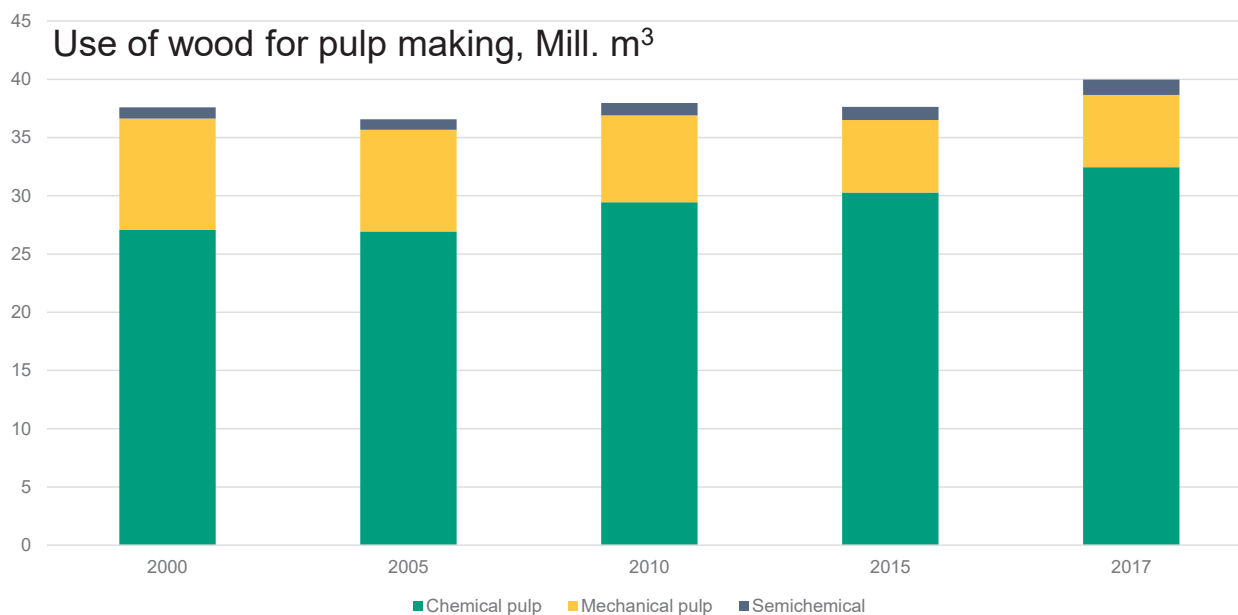
## Harvests have also increased because of

**3) Forest industry makes less mechanical but more chemical pulp.**

**Chemical pulp needs about twice as much wood per tonne of pulp than mechanical pulp.**



# Decline in mechanical pulping has «freed» 3 Mm<sup>3</sup> pulpwood



Source: Natural Resources Institute Finland

Tittel på presentasjon

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Pulp mills		Chemical pulp (Millions tonnes)	Wood use (Millions m <sup>3</sup> )
Kaibel Fibers	Paltamo	0.6	3.5
Finnpulp	Kuopio	1.2	6.7
Boreal Bioref	Kemijärvi	0.5	2.8
Metsä Fibre	Kemi	0 – 0.6	0-3.5
<b>Pulp mills, total</b>		<b>2.3 Mt</b>	<b>13-16.5 Mm<sup>3</sup></b>
Biofuel plants		Biofuels	Wood use (Millions m <sup>3</sup> )
Kanteleen Voima	Haapavesi	65 kt (ethanol)	0.88
North European Bio Tech	Kajaani II, Pietarsaari	60 MI (ethanol)	?
Haapajärvi- Nivala	Nivala	130 kt (bio oil)+ gasified biomass	0.93
Sunshine Kaidi New Energy	Kemi	225 kt (diesel, nafta)	2.8
Green Fuel Nordic (GFN)	Lieksa	180 kt (bio oil)	0.7
Nurmes Biopark	Nurmes	?	?
<b>Biofuels total</b>			<b>&gt;&gt; 5 Mm<sup>3</sup></b>

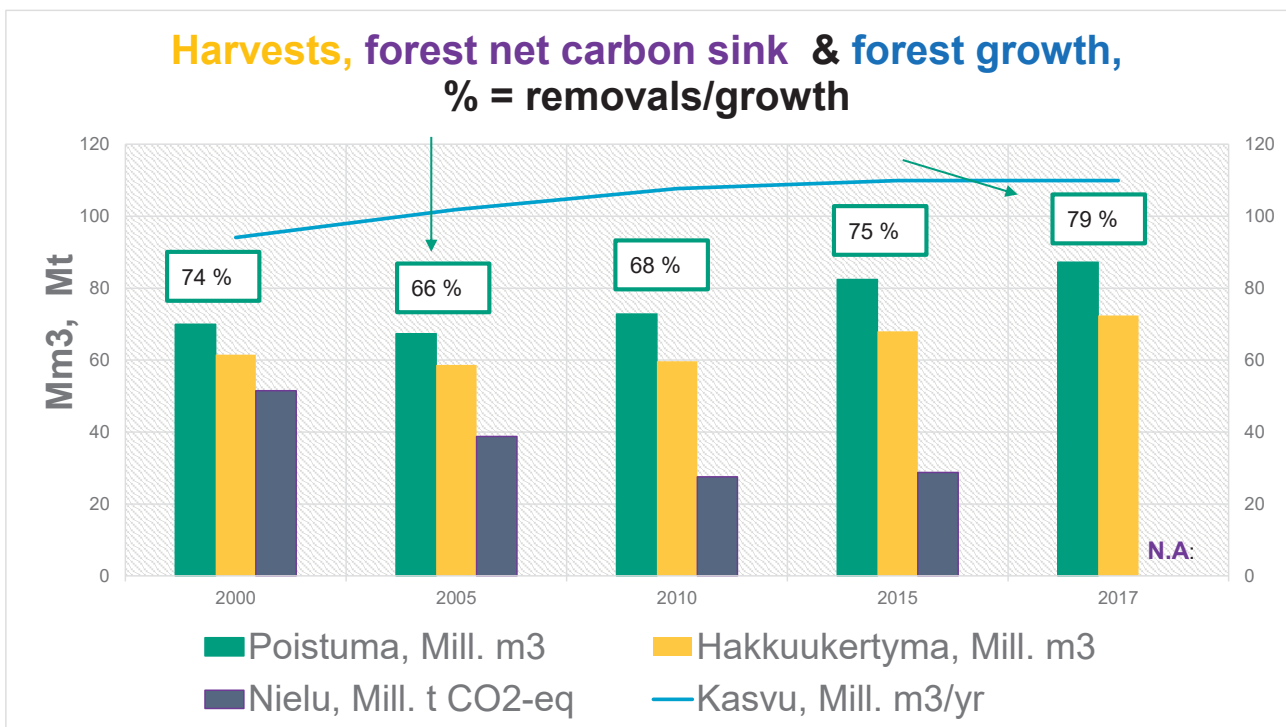
# Plans that would mean increase in the use of pulpwood & residues are abundant



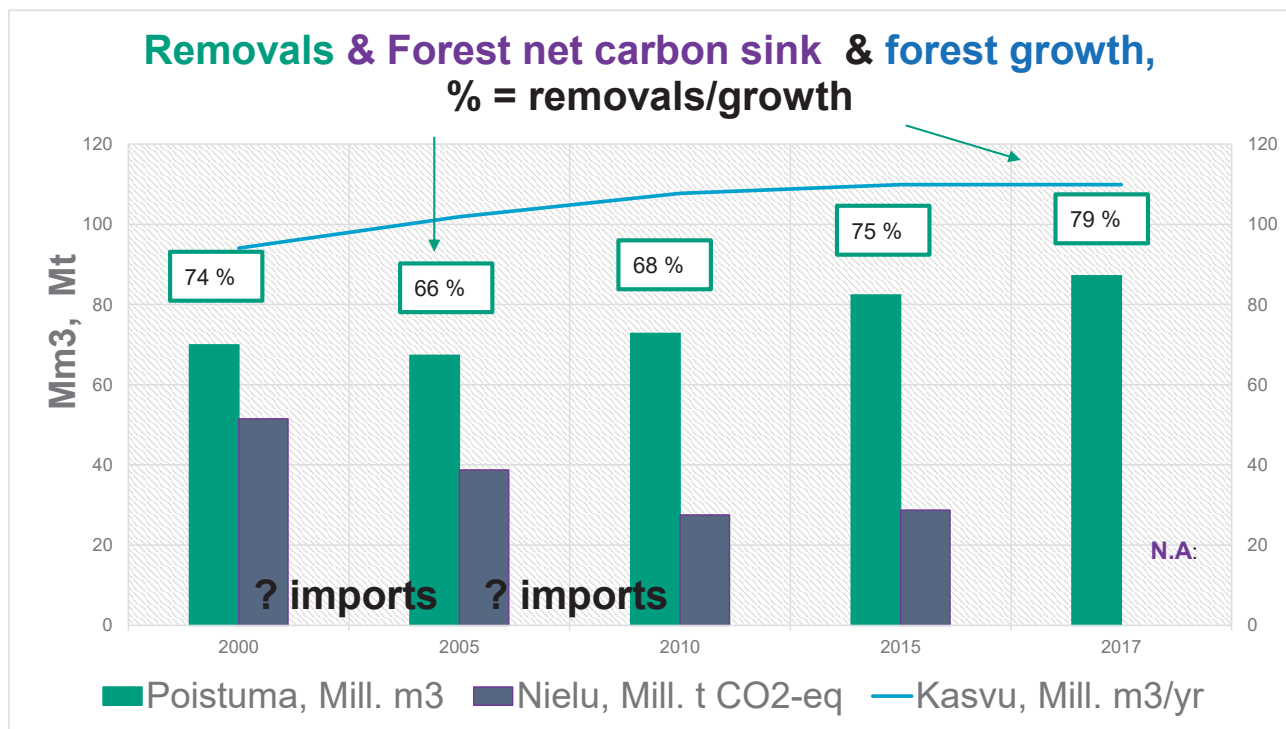
Pulp mill projects: + 13 – 17 Mm<sup>3</sup>  
Biofuel plant projects: > 5 Mm<sup>3</sup>  
 Total: >>> 18 Mm<sup>3</sup>

Forest growth – removals was  $\approx 23 \text{ Mm}^3$  in 2017, with new Äänekoski pulp mill not in full operation.

# Proportionally more of the forest growth is utilized now than before



# Reference forest management sinks $\neq$ reference GHG impacts of wood consumption



## Concerns about forest carbon sequestrating...



Compared to the **reference period in the EU LULUCF policy, 2000-2009**, the forest management in Finland was in 2017 more intensive\*, because of

- domestic wood-based energy replacing fossil fuels
- more biomass from the domestic carbon stock instead of foreign one (the origin of carbon used has changed with decreased imports)

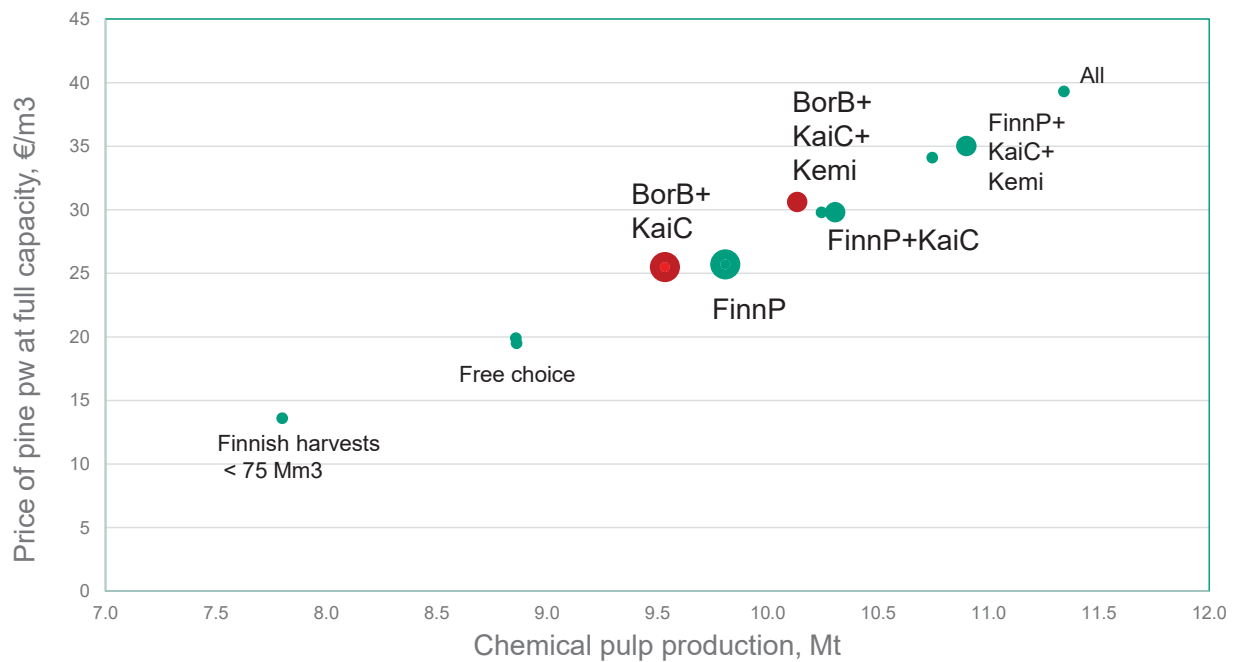
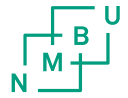
The ratio (removals/growth) used as a measure of intensity.

**If such intensity of forest use was used as measure stick, not much room for additional industrial capacity investments without carbon sinks declining respect to that.**

**Investments would also show in the price of wood ↑↑↑**

**Tentative calculations** with a Finnish forest sector model SF-GTM (*Model in the process of calibration to a new base year!! The figures will change...*)

# Potential market impacts of the pulp investments vary – (preliminary, tentative results)



Preliminary results !

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## Possibilities to clear room for some new industrial capacity



- **What if we wanted to get 5 Mm<sup>3</sup> of additional wood to forest industry, without increasing the domestic harvests:** that would allow e.g. to feed an additional pulp mill.

### Three imaginary options

# Possibilities to get e.g. 5 Mm<sup>3</sup> wood for new industrial capacity without increasing domestic harvests



## Three considerations

### 1) Fuelwood down

## 1) Take it from households?



- **Households used 6.4 Mm<sup>3</sup> roundwood for fuel in 2017 according to Luke's statistics.**
- Often polluting & inefficient way to heat
- Low degree of added value (*harvest -> chop -> burn*)
- Not always a necessity (*like many things in life...*)

Yet, -Necessity in some rural regions: alternatives?

- How to discourage the «non-necessary use » ?
- How to monitor: own use or gray business between neighbours?
- May contribute to better forest management
- 60 % birch and other deciduos

# Possibilities to get e.g. 5 Mm<sup>3</sup> wood for new industrial capacity without increasing the domestic harvests



## Three considerations

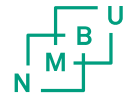
- 1) Fuelwood down
- 2) Import more and export less of wood

## Increase net imports



- Import 5 Mm<sup>3</sup> more of roundwood or sawmill chips, particularly from the countries not in the LULUCF agreement = Russia.
- Problems & considerations
  - Political risk of continuity, which investors might not take
  - Some other EU countries likely to compete on this option

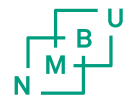
# Possibilities to get e.g. 5 Mm<sup>3</sup> wood for new industrial capacity without increasing harvests



## Three considerations

- 1) Fuelwood down
- 2) Import more and export less of wood
- 3) Change the structure of the industry: sawlogs - pulwood

# Possibilities to get 5 Mm<sup>3</sup> wood for new industrial capacity without increasing the total harvest volume in Finland



## Some imaginary options

- 1) Fuelwood down
- 2) Import more and export less of wood
- 3) Change the structure of the industry: sawlogs - pulwood

# Cycle more fibre to the process by shifting harvest to more sawlogs

	Roundwood for sawmills	Roundwood for pulping etc.	Sawmill chips for pulping	Total harvest	Total fibre
	<i>Millions cubic meters</i>				
2017	29.2	33.0	10.2	62.2	72.4
Alternative structure	39.1	23.1	15.2	62.2	77.4
Change	9.9	-9.9	5.0	0.0	<b>+5.0</b>

Assumed that for each 1 m<sup>3</sup> of new sawlogs 50% goes to pulpwood.  
Some of that is from energy sector which gets sawdust etc. for exchange.

# Cycle more fibre to the process by shifting harvests to more sawlogs

	Roundwood for sawmills	Roundwood for pulping etc.	Sawmill chips for pulping	Total harvest	Total fibre
Change	9.9	-9.9	5.0	0.0	5.0

## Considerations:

- **Is this harvest schedule feasible (forest structure)**
- **Sawnwood & plywood production (Mm<sup>3</sup>/yr) should increase by ~ 5 Mm<sup>3</sup>**
- **Pulp production should decrease**
- **Leakage!!** Changes in harvests and in the industry structure would roughly be matched with the opposite changes somewhere else.
- **Markets decide what is produced.**

# Conclusions



- Due to the coming **reference levels for the forest carbon sinks** and pressures for **increasing wood prices**, i.e., both economic and environmental reasons, there is rather **limited room for new forest industry capacity investments**
- By changing the structure of the wood use would give some possibilities to increase use in the forest industry (energywood>pulpwood, domestic >foreign, pulpwood>sawlog)
- Obstacles: markets & challenges of policy design. **We do not live in the central planning economy.**

**Last but not least: leakage !! Whatever Finland does, there is almost a similar opposite move elsewhere.**