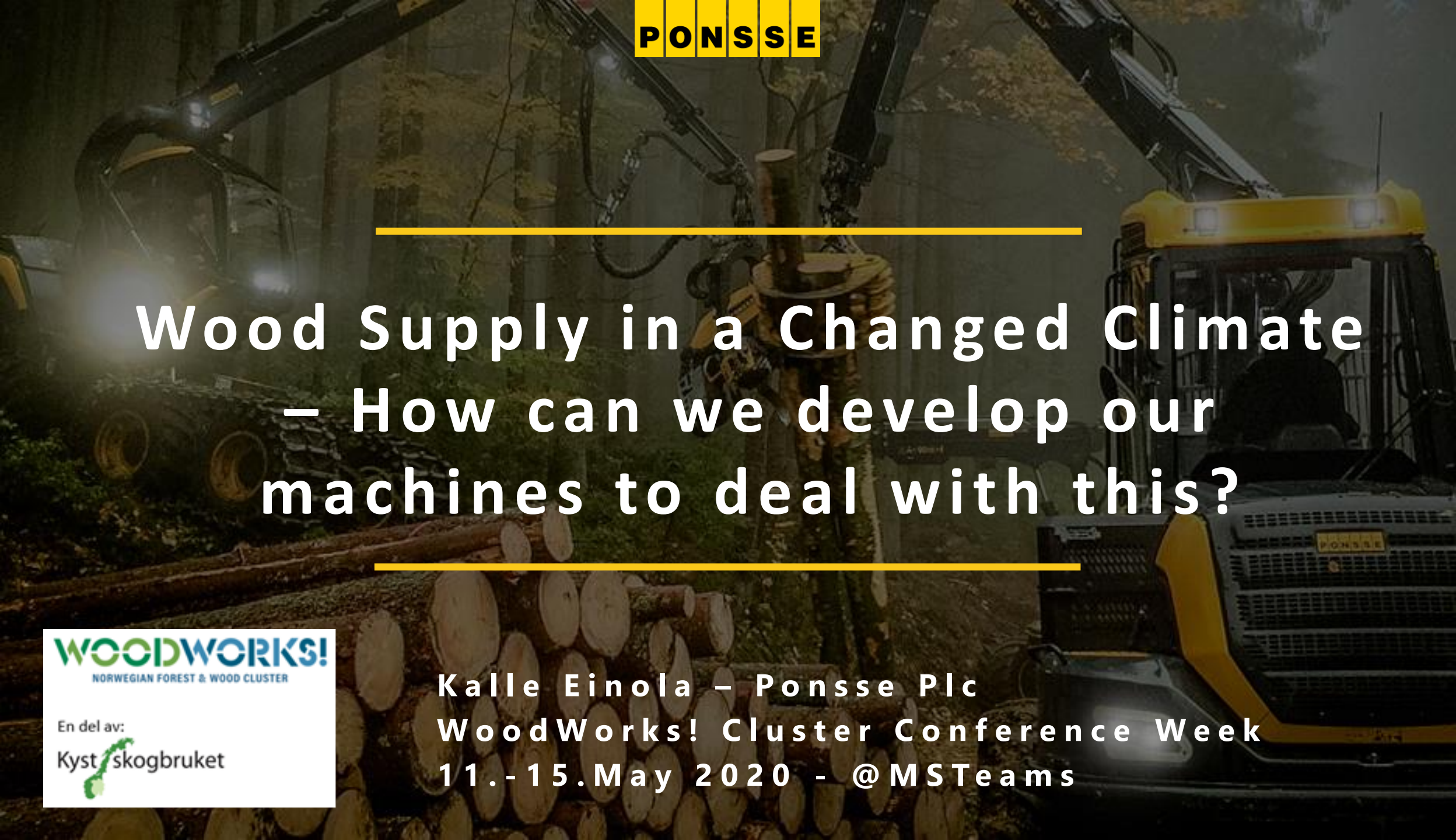


Wood Supply in a Changed Climate – How can we develop our machines to deal with this?

Kalle Einola – Ponsse Plc

WoodWorks! Cluster Conference Week

11.-15.May 2020 - @MSTeams

PONSSE Company Facts

- **100%** CTL –focused, leading forestry technology OEM based in Vieremä, FINLAND, Since 1970

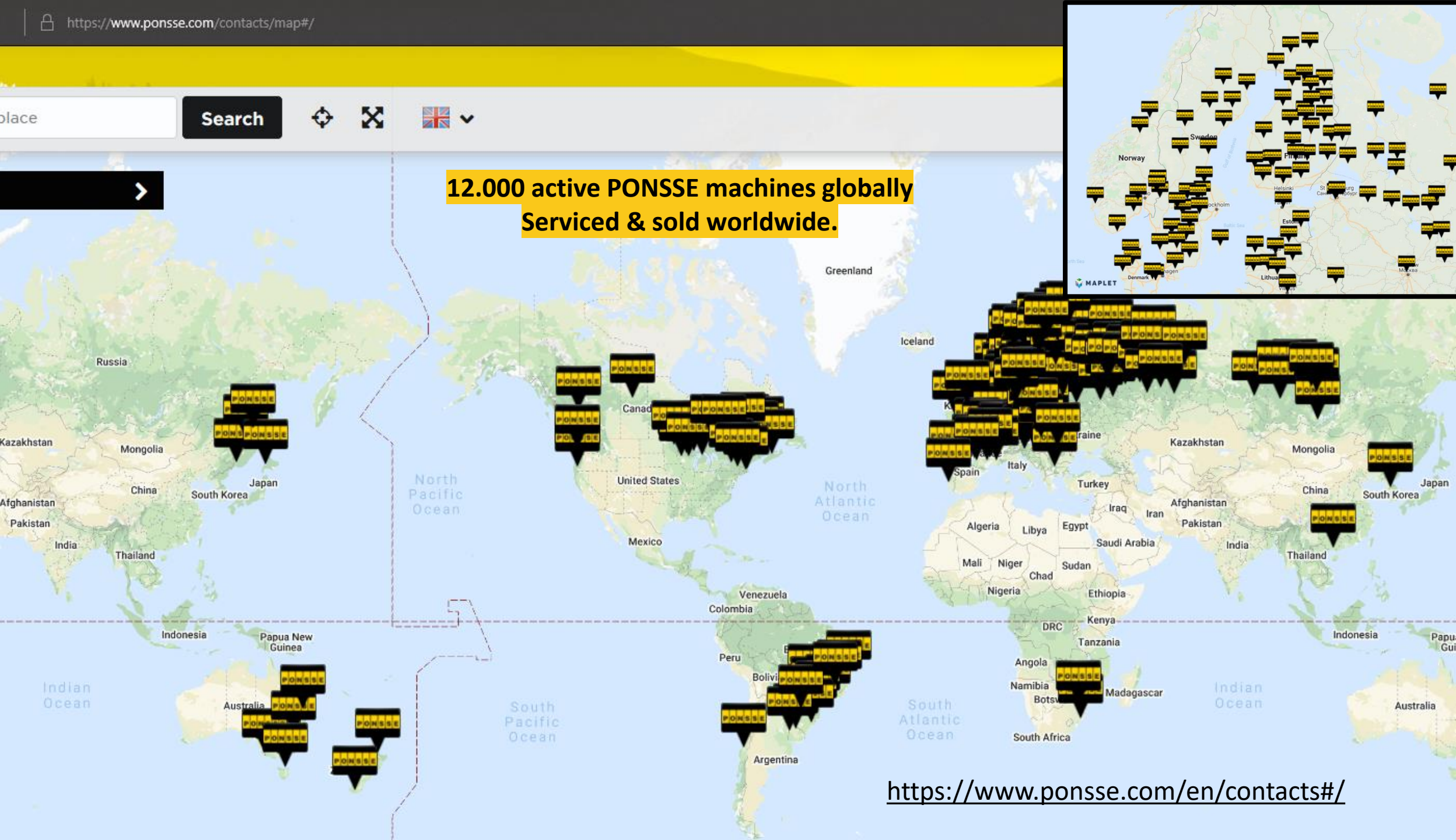
- NASDAQ OMX Nordic list company
  - Strong family ownership
  - 2019 key figures
    - Turnover **MEur 667**
    - Operating Profit **MEur 67**
- **12** Subsidiaries (sales + EPEC Oy), **32** Dealers globally

1 800 employees globally

80 %
of the machines are exported

20 %
of the turnover comes from service business

46 %
of the R&D engineers are developing information systems


https://www.ponsse.com/contacts/map#/
Search
12.000 active PONSSE machines globally
Serviced & sold worldwide.
Greenland
Iceland
Russia
Kazakhstan
Mongolia
China
Japan
South Korea
Afghanistan
Pakistan
India
Thailand
Indonesia
Papua New Guinea
Australia
Canada
United States
Mexico
Venezuela
Colombia
Peru
Bolivia
Argentina
Spain
Italy
Turkey
Iraq
Iran
Algeria
Libya
Egypt
Saudi Arabia
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Kenya
DRC
Tanzania
Angola
Namibia
Botswana
Madagascar
South Africa
North Pacific Ocean
North Atlantic Ocean
South Pacific Ocean
South Atlantic Ocean
Indian Ocean
Norway
Sweden
Finland
Denmark
Lithuania
MAPLET
https://www.ponsse.com/en/contacts#/

PONSSE Products

THE PONSSE HARVESTER PRODUCT FAMILY

Model	Beaver	Fox	Scorpion	Scorpion King	Cobra	Ergo 6w	Ergo 8w/Ergo Active Frame	Bear
Power	EU & NA: 150 kW Other countries: 145 kW	EU & NA: 150 kW Other countries: 145 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 260 kW Other countries: 240 kW
Harvester head	H5 or H6	H5 or H6	H5 or H6	H5, H6, H7, H7euca or H77euca	H5, H6, H7, H7euca or H77euca	H6, H7, H7euca, H77euca or H8	H6, H7, H7euca, H77euca or H8	H7, H7 HD, H8 H8 HD, H8 top saw
Crane	C44+	C44+	C50	C50	C5 or C44+	C5 or C44+	C5 or C44+	C55 or C6
Special features	A versatile, all-round machine from first thinning to regeneration felling.	An agile eight-wheeler for difficult terrain and soft harvesting conditions.	A next-generation harvester designed with the driver and the environment in mind.	The best stability and ergonomics on the market added with the excellent performance of the double-circuit hydraulics.	A multi-talented machine for all cutting methods.	The most powerful all-round machine in its size category: equipped with double-circuit hydraulics.	An extremely powerful eight-wheeler equipped with double-circuit hydraulics and capable of performing even in the most challenging terrain.	An eight-wheel powerhouse for heavy-duty harvesting.

THE PONSSE HARVESTER HEADS PRODUCT FAMILY

Model	H5	H6	H7	H7 HD	H7 euca	H77 euca	H8
Starting weight	900 kg (1,984 lbs)	1 050 kg (2,315 lbs)	1 150 kg (2,535 lbs)	1 200 kg (2,646 lbs)	1 200 kg (2,646 lbs)	1 300 kg (2,867 lbs)	1 250 k
Maximum opening (feed rollers)	530 mm (20.8 in)	600 mm (23.6 in)	650 mm (25.6 in)	650 mm (25.6 in)	630 mm (24.8 in)	600 mm (23.6 in)	
Cutting diameter	640 mm (25.2 in)	640 mm (25.2 in)	640/720 mm (25.2/28.3 in)	640 mm (25.2 in)	640 mm (25.2 in)	640 mm (25.2 in)	72 (
Base machines	Beaver, Fox, Scorpion, Scorpion King, Cobra or tracked carrier over 10 tons	Beaver, Fox, Scorpion, Scorpion King, Cobra, Ergo and tracked carrier over 15 tons	Scorpion King, Cobra, Ergo, Bear and tracked carrier over 20 tons	Bear and tracked carrier over 20 tons	Scorpion King, Cobra, Ergo and tracked carrier over 20 tons	Scorpion King, Cobra, Ergo and tracked carrier over 20 tons	F 4 to

THE PONSSE FORWARDER PRODUCT

Model	Gazelle	Wisent		Bison Active Frame	Buffalo King	Elephant King/ Active Frame	Buffalo Dual
Power	EU & NA: 150 kW Other countries: 145 kW	EU & NA: 1 Other c 145	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW	EU & NA: 210 kW Other countries: 205 kW
Load carrying capacity	10 000 kg		14 000 kg (15 000 kg)*	16 000 kg	18 000 kg		14 000 kg (15 000 kg)*
Loader		K70+ or K90+	K90+ or K100+	K90+ or K100+			K90Dual+ / H5
Special feature	A li		The new champion on forwarders. Available in 6-, 8- and 10-wheeler. ActiveFrame: only in 8-wheeler.	Unbeatable powerhouse for long transport distances.	The king-size carrier of heav loads.	great load carrying capacity and superior tractive force. Available in 8-wheeler.	A multi-purpose machine. Available in 8-wheeler.

* with balan

Challenging work environment

- Productivity demand of professional, industrial wood procurement is higher than ever
  - Long reach (11m) harvesters are needed to achieve necessary strip road distance in thinnings & continuous growing forestry plans
  - High capacity forwarding to avoid excess number of driving rounds
  - - - > professional, purpose-built & also environmentally well performing equipment is needed

- Cut-To-Length logging operations moving to all the time more difficult topological areas
  - At one hand to low bearing capacity soils, peatlands, wetlands
  - At other hand to steep slopes

- Mild winters and very little or no frost in many market areas

How to limit the soil impact?

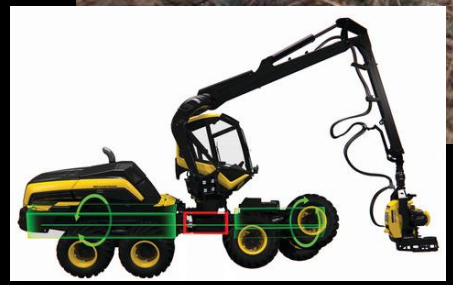
- Not too many options actually….
  - Either you need to lower machine weight OR increase contact area under the machine
    - Going down in machine size does not seem too possible because of productivity goals as well as other constraints (boom reach etc.)
  - You can distribute the ground pressure more evenly
    - Both static & dynamic behaviour
  - You can harvest & forward smarter to avoid excess soil impact (ground & weather data, route planning & optimization)

In practice?

- Some PONSSE ways to manage forest soil impact
  - 8 wheeled harvesters (more contact area, but also great for stability, especially in slopes)
  - Active Chassis systems (distribution of load more evenly)
    - Scorpion, Ergo, Bear harvesters - active stabilization systems
    - Active Frame forwarders
  - Long wheelbase rear bogies on forwarders (Increased contact area for general purposes)
  - 10 wheeled forwarders (extra high contact area for wetlands)
  - High flotation tyres & tracks (for general & special applications)
  - Machine weight optimization especially in forwarders
  - Traction assist winch systems for steep slope operations (productivity increase & avoidance of soil erosion)
  - Rut measurement systems, smart strip road positioning and smart forwarder routing – Under development

More axles

Active Chassis Systems



Long wheelbase rear bogie

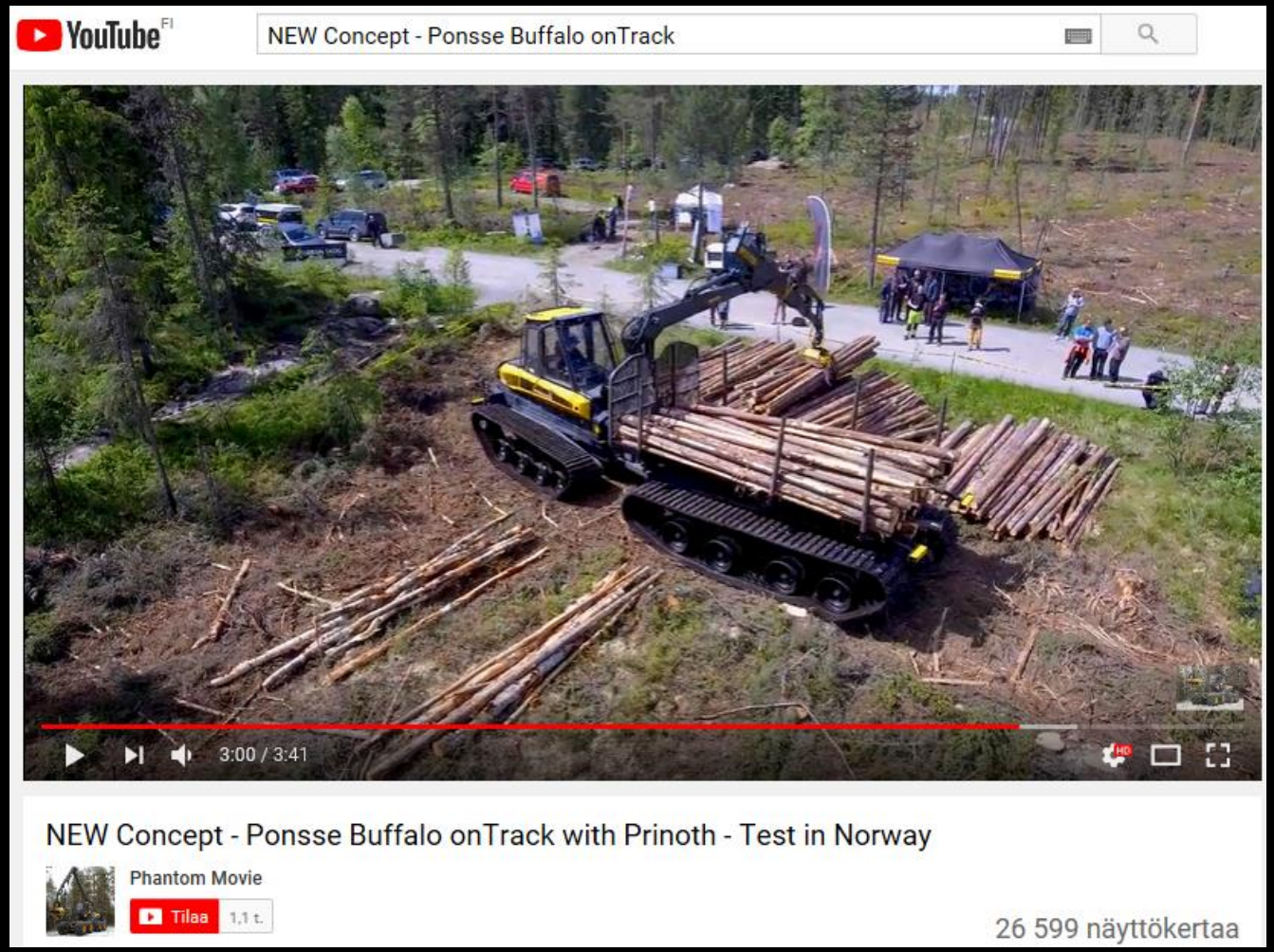
High flotation tracks


1100mm wide + 10W
10W

Traction assist winch


OnTrack – Rubber tracked concept

OnTrack – An EU co-op project



Source : https://www.youtube.com/watch?v=DFj4QPQlYXE

Source: https://www.linkedin.com/feed/update/urn:li:activity:6326157977959178240/

Digitalization

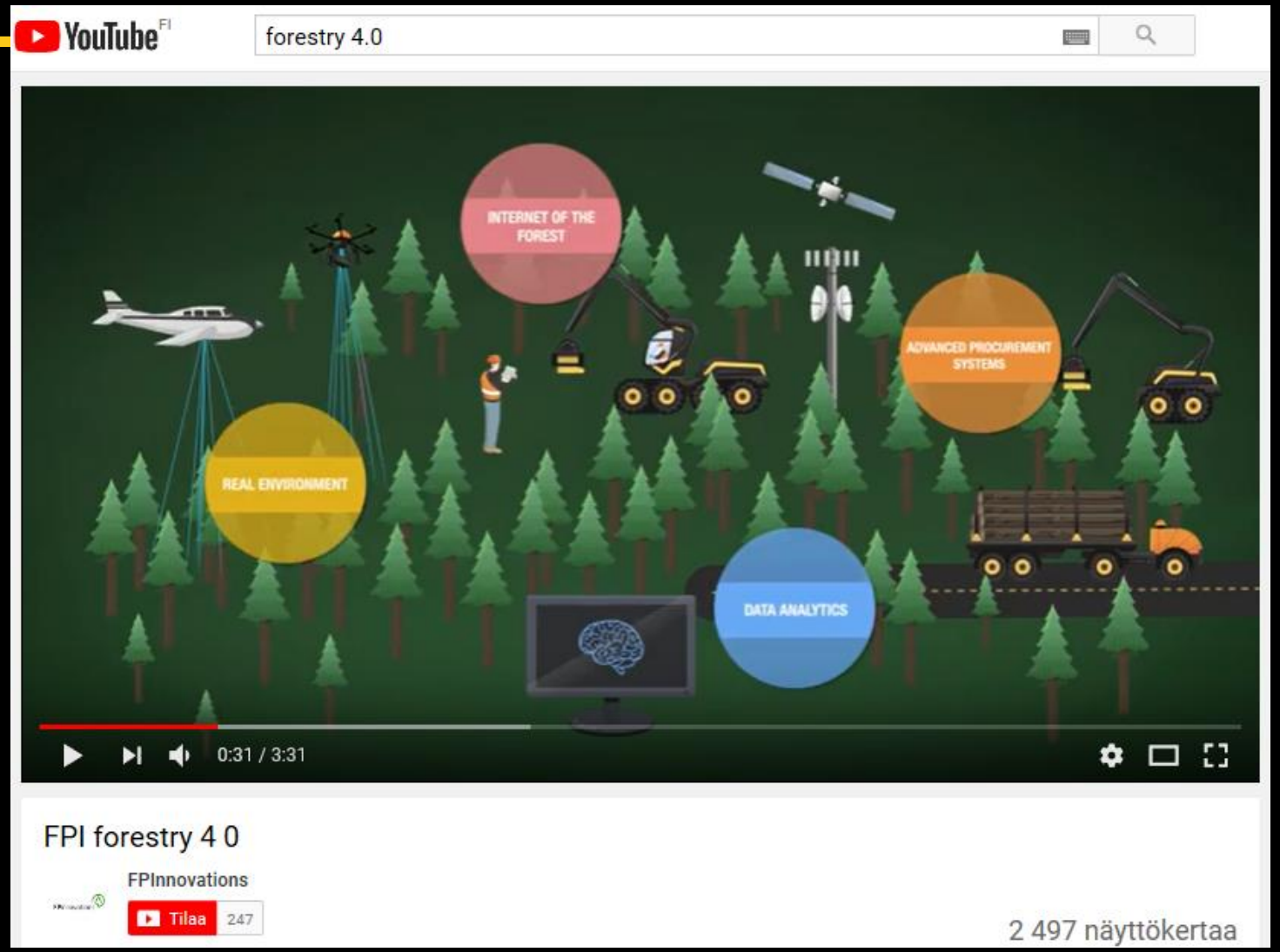
Ecosystem level

↑

Process level

↑

Product level



Source FPInnovations: https://www.youtube.com/watch?v=r4vhLQ8OEP0

Rut measurement

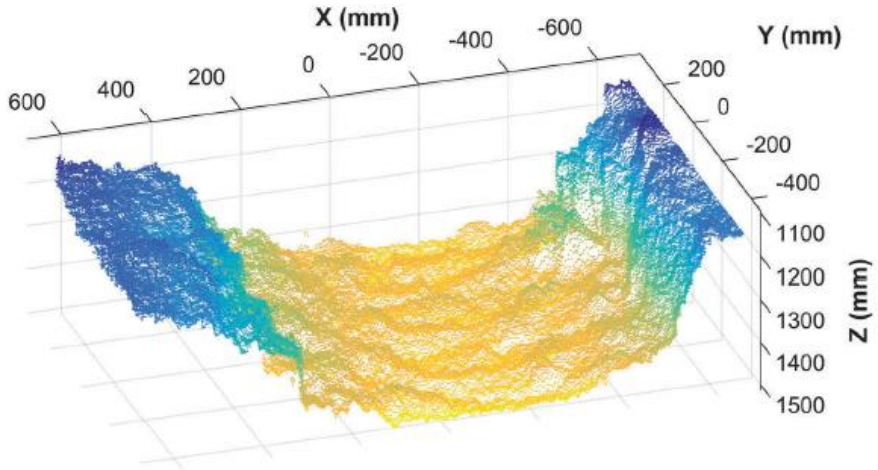


Figure 5. Soil surface profile as a 3D point cloud. The high-noise edge areas, and area with forwarder wheel have been removed.

Taylor & Francis
Taylor & Francis Group

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Time-of-flight imaging for assessing soil deformations and improving forestry vehicle tracking accuracy

Lari Melander & Risto Ritala

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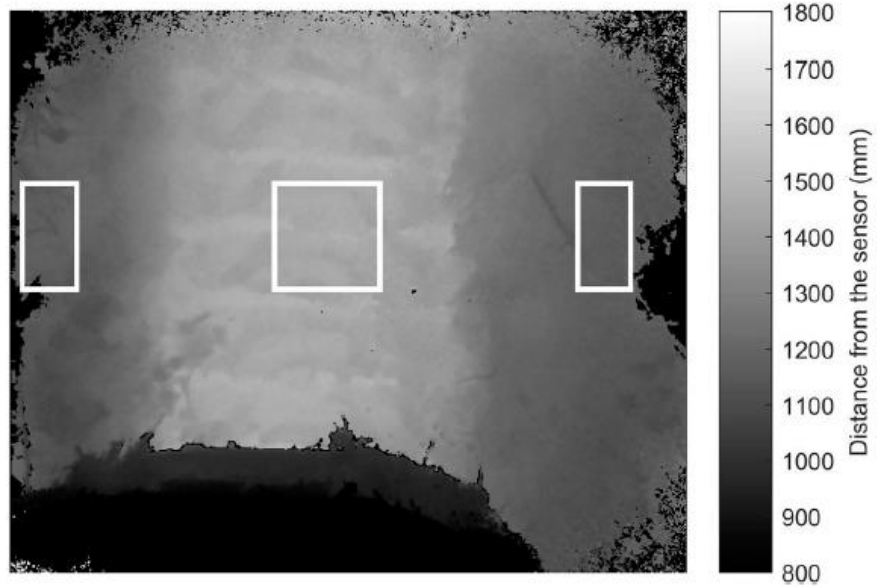
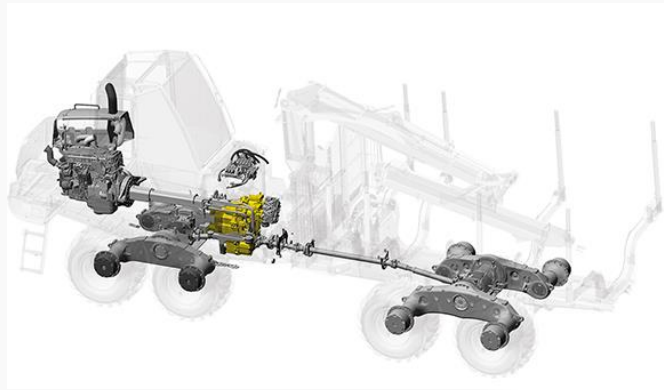


Figure 6. Depth image sections for the surface base level and rut depth measurements.

Smart Forwarder routing

Finally – Let’s save fuel in order to slow down climate change!




PONSSE
Thank You!