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A logger's best friend

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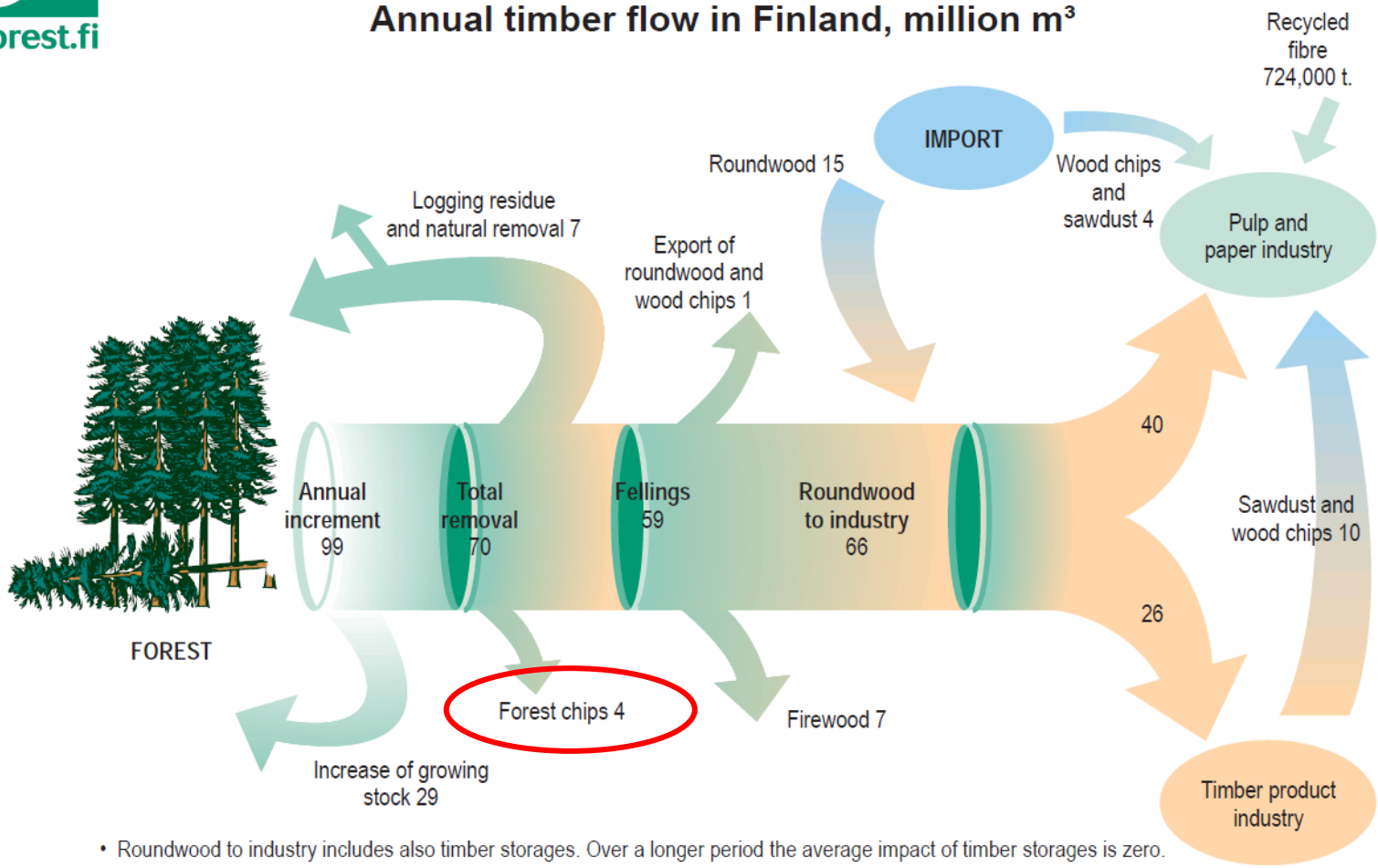
Annual timber flow in Finland, million m³



- Roundwood to industry includes also timber storages. Over a longer period the average impact of timber storages is zero.
- Source: Statistical Yearbook of Forestry 2009, Finnish Forest Research Institute; Finnish Forest Industries Federation, 2009.

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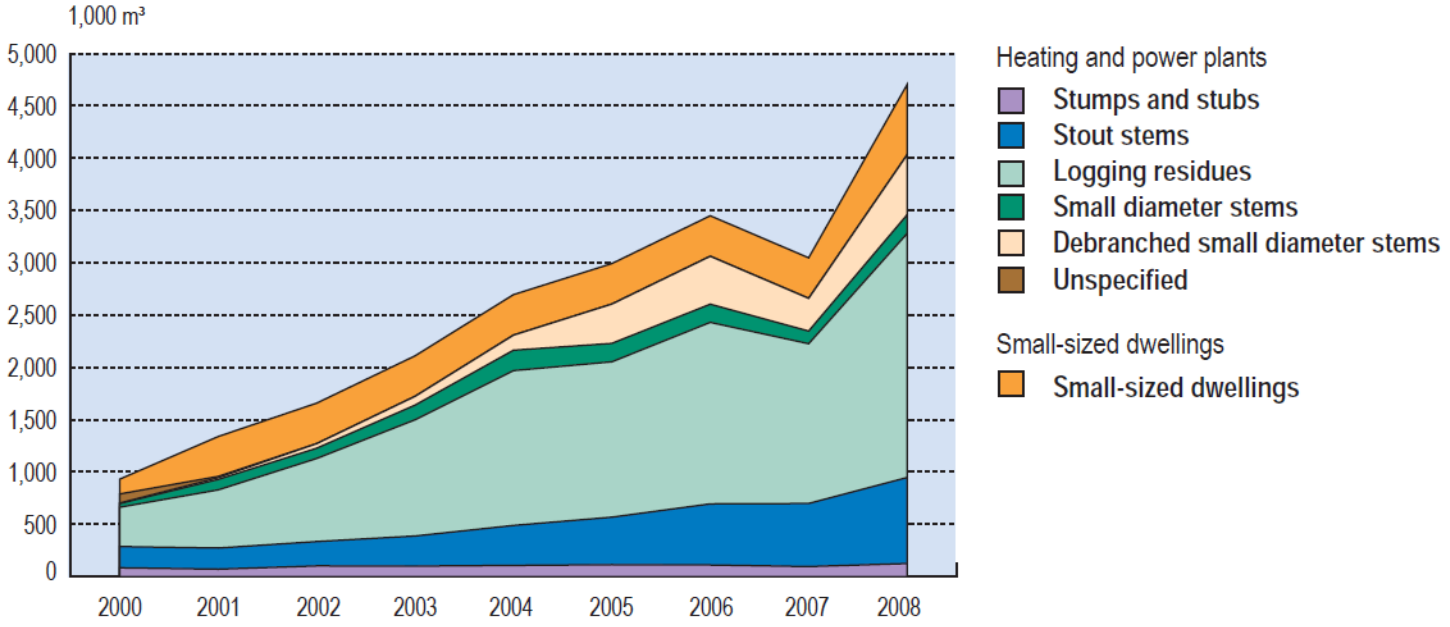
Use of forest chips and its raw materials 2000-2008



- The use of forest chips has almost sextupled during the 2000's. Finland's goal is that in 2010 the annual use is five million cubic meters and in 2015, eight.
- Felled stout timber is made into forest chips, if it has such faults that it cannot be used as timber or pulp wood. Such a fault can be decay, for example.
- Source: Finnish Statistical Yearbook of Forestry 2009, Finnish Forest Research Institute.

Targets for using forest chips set in Finland's National Forest Program:
2010: 5 Mm3 (10 TWh)
2015: 8 – 12 Mm3 (16–24 TWh)

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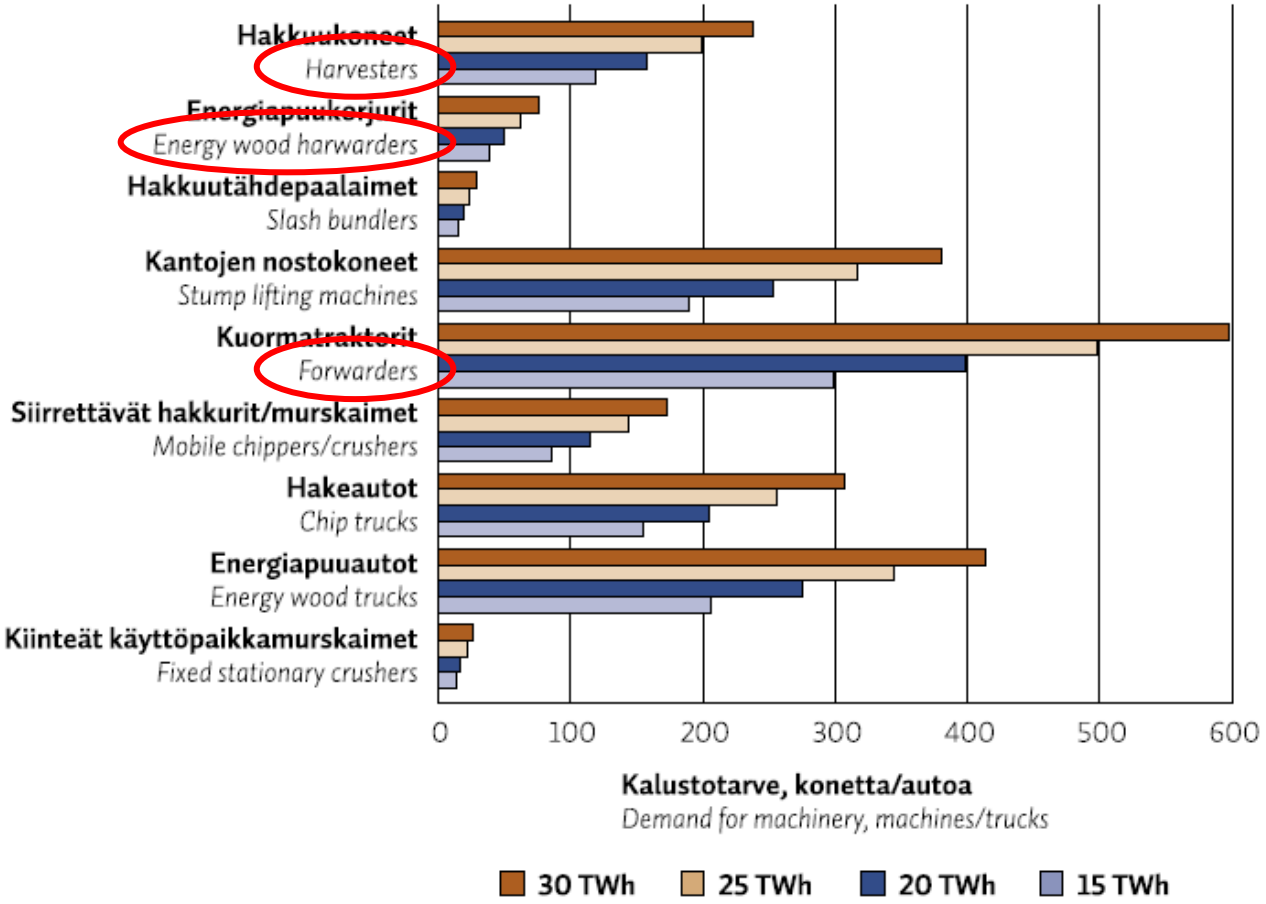
Forest chip production equipment demand – Finland 2020



source: Metsätehon Katsaus no. 41, 2009

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But.....

- Finland is currently using less wood as fuel than planned
- Reason: low price of non-renewable sources
- Finnish wood fuel is 2x more expensive
  than coal shipped from Kazakhstan & Australia.
- Peat & coal have very low price of CO_2-emission rights.
- Power plants are deliberately distorting competition?

And.....

Finland: Professor says bio-hype steering forestry in wrong direction

Hämeen Sanomat, 23 Sep 2010, p.11:-

According to Professor Matti Kärkkäinen (who is retired from the University of Joensuu), Finland's forestry is being steered in the wrong direction by bio-hype. The care of young trees is neglected and valuable forests are harnessed to produce cheap wood for fuel. Kärkkäinen wants Finland to utilise the best properties of Nordic softwood and to grow quality wood. According to Kärkkäinen, burning wood is favoured through emission trading, energy taxation, and felling subsidies. Kärkkäinen estimates that also a lot of wood that would be suitable for commercial use must be burned if the targeted 13.5mn cubic metres of energy wood is to be achieved.

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Supply chains of forest chips – Finland

Systems where chipping is done at a plant

- at short trucking distances (< 50 km) transport of loose residues is more competitive than bundling of residues
- centralised chipping suitable for big industrial plants using large volumes of forest chips

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Supply chains of forest chips – Finland

Systems where chipping is done in the forest / at a landing

- productivity of in-woods chipping depends strongly on forwarding distance
- if forwarding distance is >250 m, chipping should be done at landing
- suitable when plants can not undertake chipping at the plant
- competitive at large distances (high truck load volume) & where availability of forest fuel is low

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Currently based on

- wheeled Cut-To-Length
- small wood harvesting technology
- slash & stump collecting technology

- high productivity
- mechanised silviculture for young forests

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Ponsse Bioenergy harvesting technology – starting points

- No purpose-built energy wood harvesting equipment required
  - practical & simple solutions, based on wheeled CTL
  - all Ponsse Bioenergy products are ‘add-ons’ or attachments
  - customers should get additional user-value out of standard harvesting & forwarding equipment

- Integrated harvesting
  - combined harvesting of energy & industrial wood
  - profitable harvesting of energy wood from young forests
  - profitable harvesting of pulpwood from first thinning

- Improved utilization-rate of existing harvesting equipment
  - same machines for tending of young forest & regeneration harvesting of small-diameter trees
  - changing business conditions
  - additional income for harvesting contractors

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- Harvesting – MULTI-STEMMING
  - efficient technology for harvesting small-diameter trees
  - mechanised silviculture for young forest
- Forwarding – VLA & BTS
  - flexibility in transportation of industrial & energy wood, stumps
  - logging residue collection, compression & off-road transport
- Forwarding & trucking – LOAD SCALE
  - same machines for tending of young forest & regeneration harvesting of small-diameter trees
  - new measuring method for timber & energy wood
- Dealer & customer solutions – CHIPPING & BTS
  - chipping at the stump / on-site or at roadside / landing

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Multi-stemming: PONSSE EH25 & H-series

Solution for productive harvesting of
undelimbed or partially delimbed pulpwood & energy wood:

PONSSE EH25 energy wood harvester head

- no feeding or delimbing required
- base carriers:
  S, M & L harvesters, small excavators, forwarders, PONSSE BuffaloDual

PONSSE H53e (H5), H6, H7, H8 harvester heads

- with/without minor accessories
- base carriers:
  wheeled & tracked harvesters, PONSSE BuffaloDual (H53e, H5)
- integrated harvesting = pulpwood + energy wood

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PONSSE EH25

PONSSE BuffaloDual + EH25

PONSSE BuffaloDual + PONSSE EH25:

- work as real combi machine, harvesting & forwarding at the same time
- trees would be harvested, incl. branches
- depending on tree-height,
  trees can be cut in half & loaded as tree-parts

PONSSE BuffaloDual + EH25

PONSSE BuffaloDual + EH25

PONSSE H-series heads + multi-stemming

PONSSE H-series heads + multi-stemming

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Multi-stemming

pulpwood

integrated harvesting
= pulpwood + energy wood

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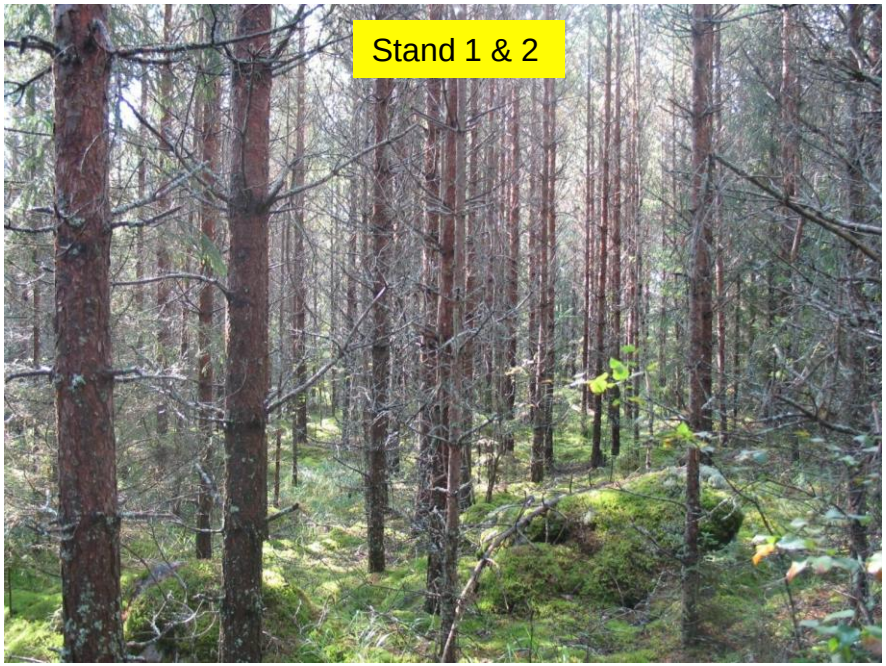
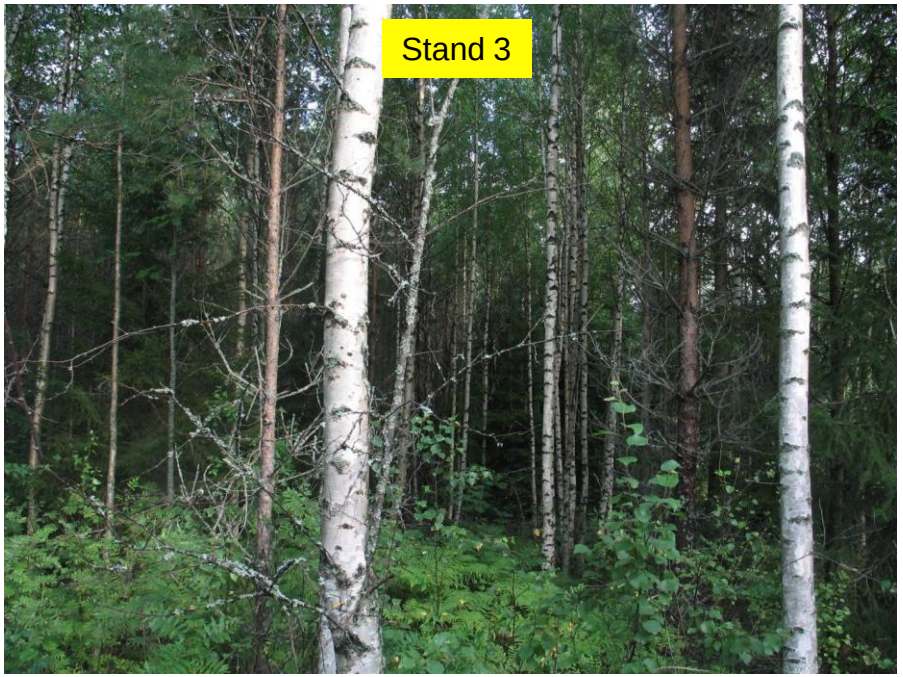
Multi-stemming – Metsäteho research 2008





harvester = PONSSE Beaver

harvester head = PONSSE H53e

2x operators: many years experience, but only couple of months with multi-stemming

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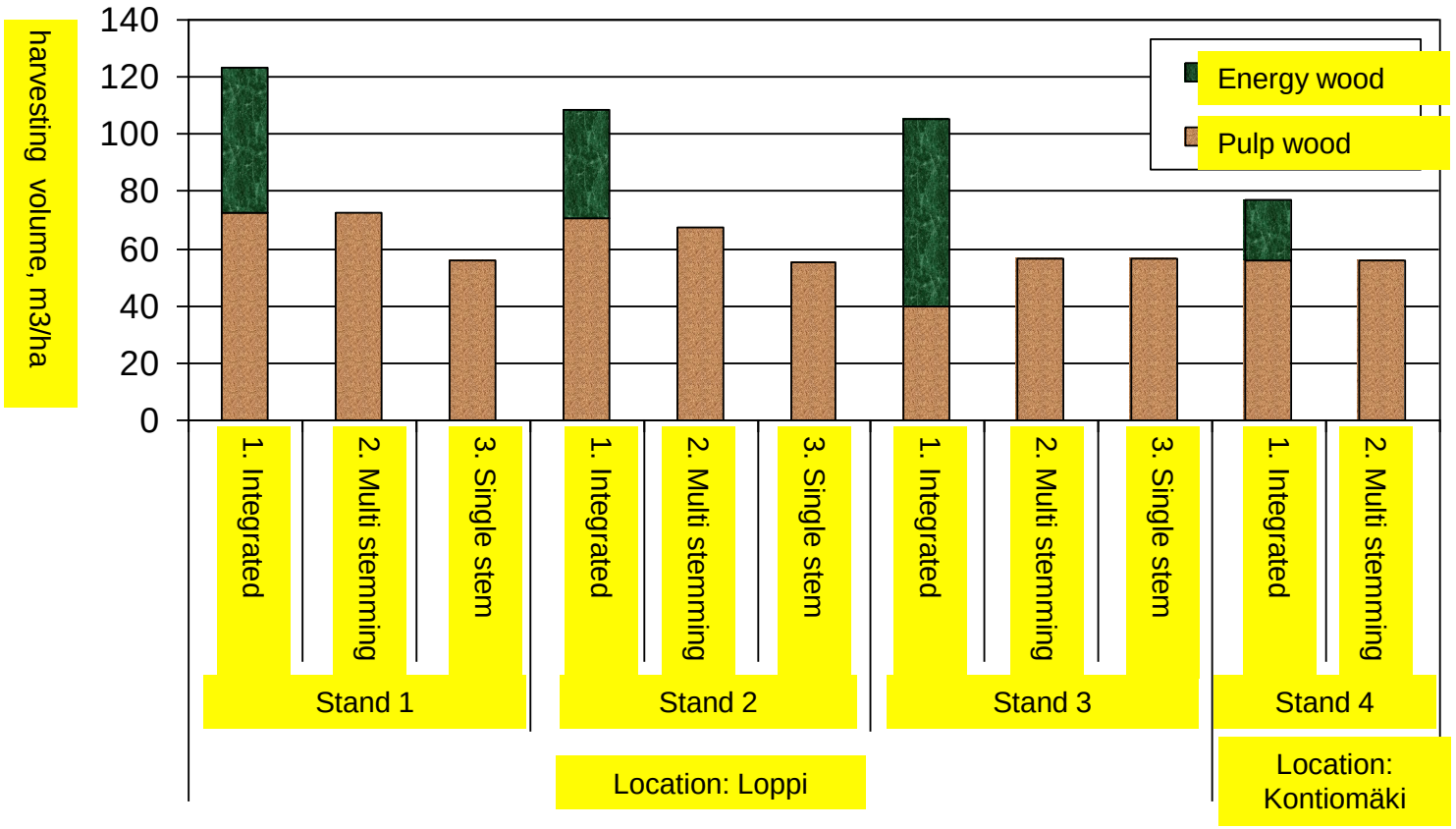
Multi-stemming – Metsäteho research 2008



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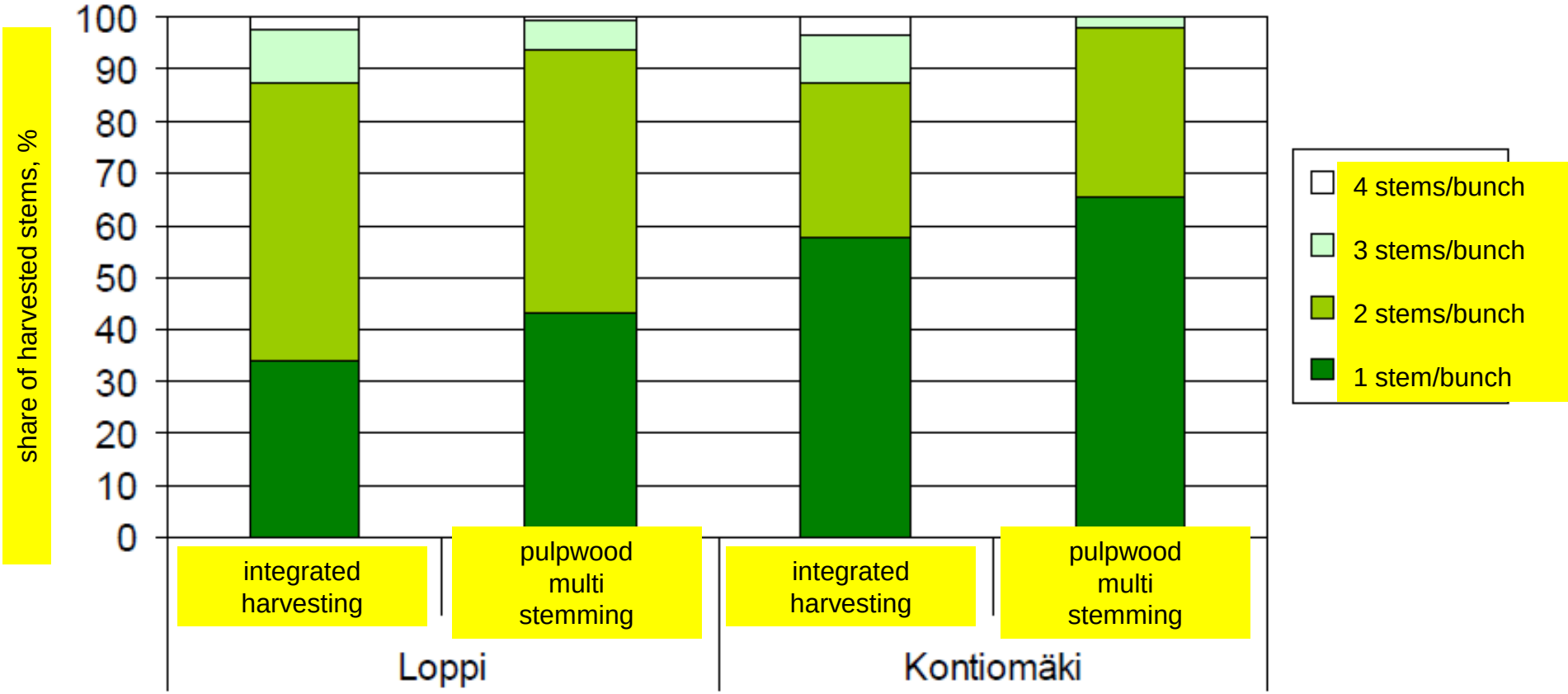
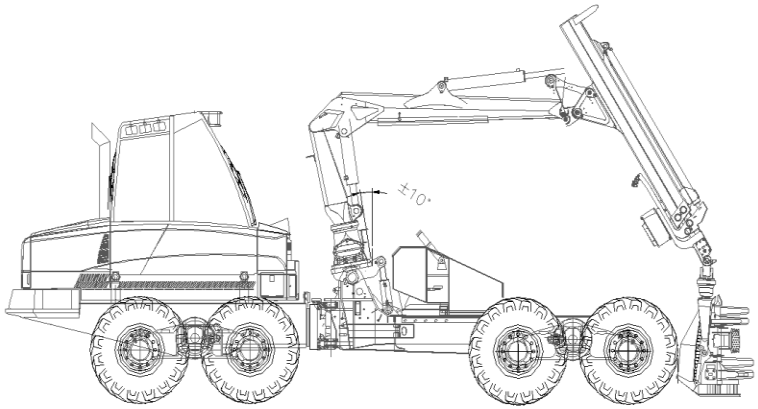
Multi-stemming – Metsäteho research 2008

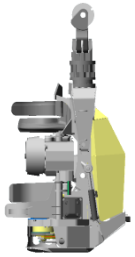


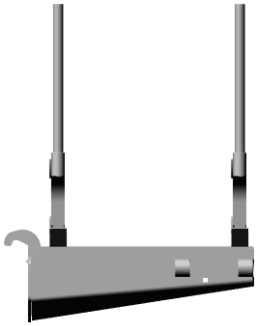
PONSSE BuffaloDual + H53e

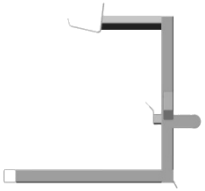
PONSSE BuffaloDual + H53e (H5) & multi-stemming:

- work as ‘Dual’, first harvesting & later forwarding
- trees would be felled & processed in bunches
- depending on tree-height, trees can be cut in half,
  which will involve delimbing of the first half due to the feeding action
- possibility for so-called integrated harvesting:
  harvesting pulpwood & energy wood

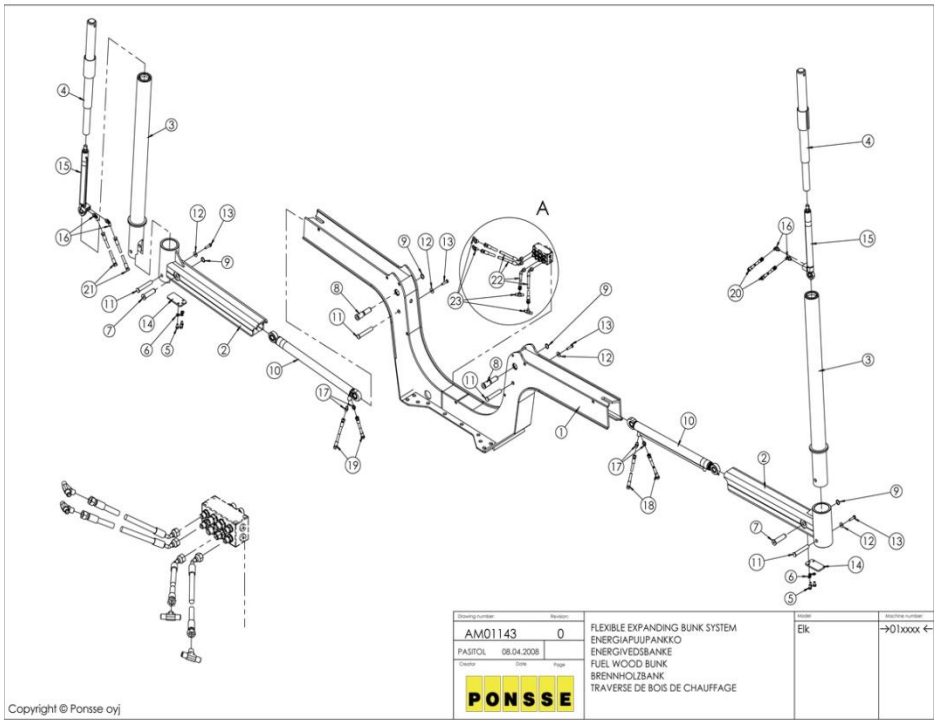








PONSSE VLA
Variable Load Area



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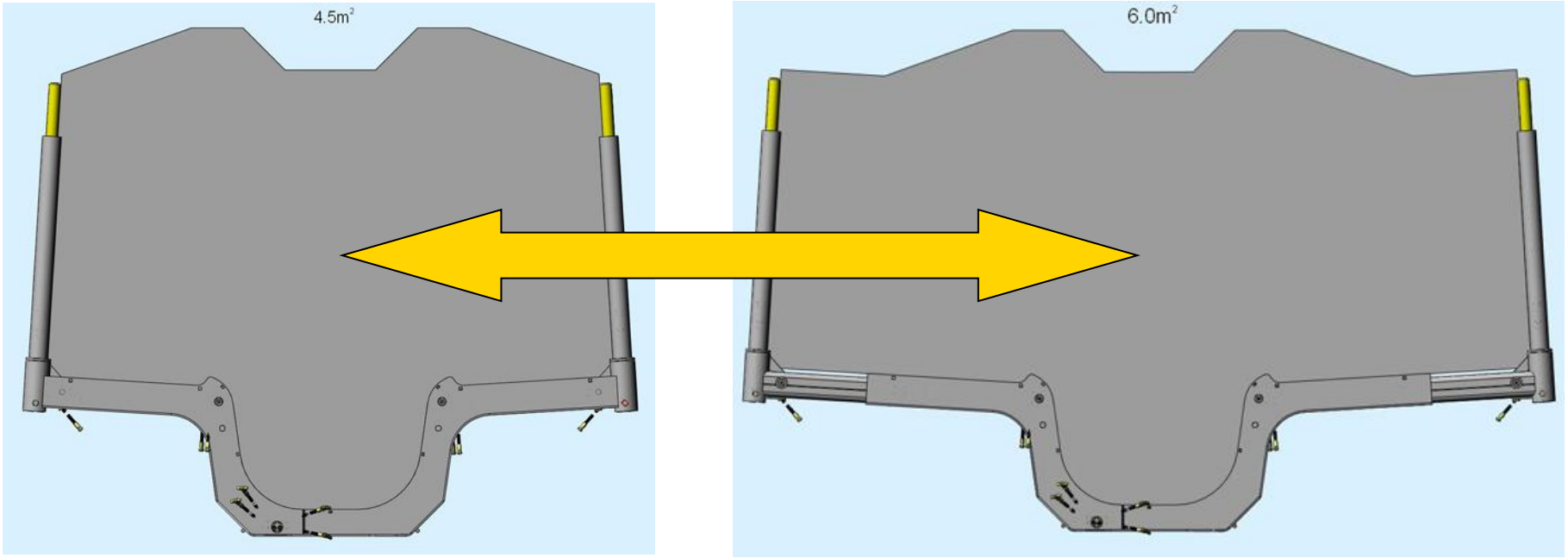
PONSSE VLA
mechanically or hydraulically



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PONSSE VLA
Variable Load Area

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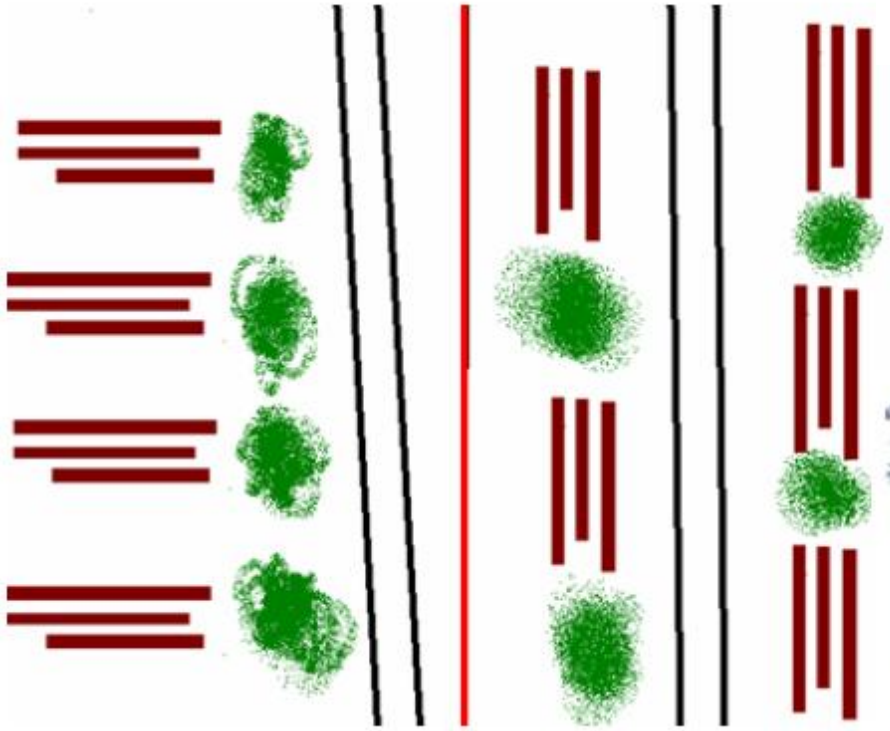
Slash piling & round wood harvesting



“single side method”

“two side method”

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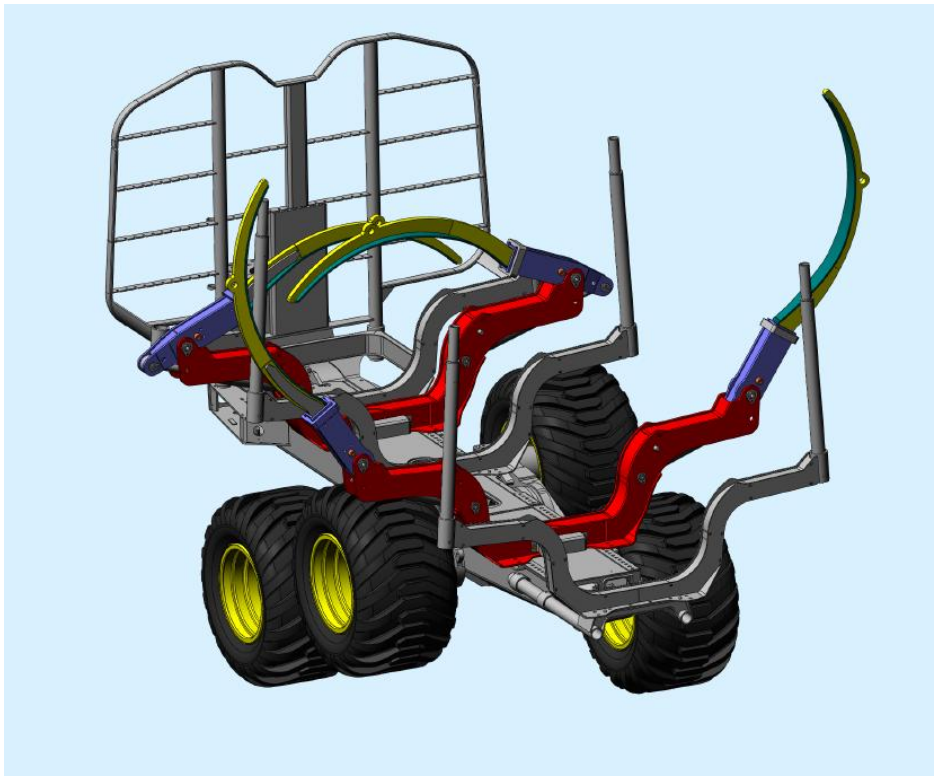
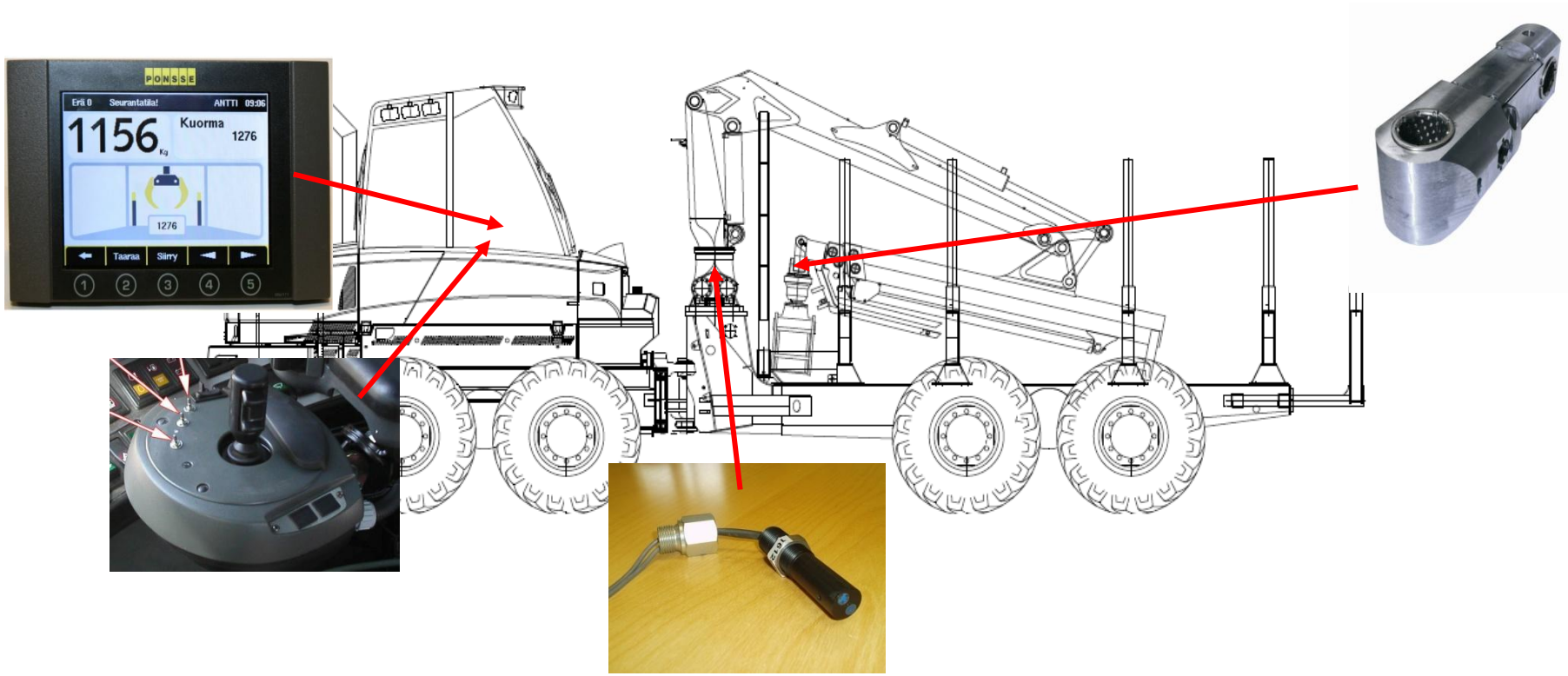
PONSSE BTS
Brush Transportation System



PONSSE stump forwarding

PONSSE LoadOptimizer



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PONSSE BIOENERGY HARVESTING TECHNOLOGY

Dealer & customer (purpose-built) solutions

Brush Transportation System – Sweden

Brush Transportation System – North America

Mobile chipping – Nordic Countries, Baltics, Germany

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Stump forwarding – Finland

Ponsse bioenergy harvesting technology

- No purpose-built energy wood harvesting equipment required
- Integrated harvesting
- Improved utilization-rate of existing harvesting equipment

Ponsse bioenergy harvesting technology
is with/without modifications,
likely to be suitable in e.g. South Africa!

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