



Metsä Group's Bioproduct mill

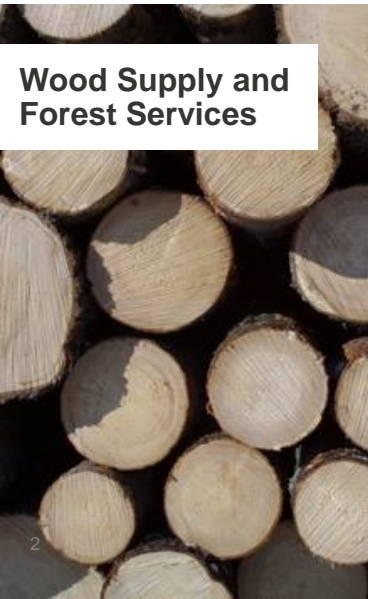
The largest biorefinery in Europe

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Niklas von Weymarn, VP for Research, Business Development
Metsä Fibre Oy (part of Metsä Group)

Leading player in selected businesses

We focus on products and services with promising growth prospects and in which we have strong competence and a competitive edge.



**Wood Supply and
Forest Services**



**Pulp and Other
Bioproducts**



Wood Products

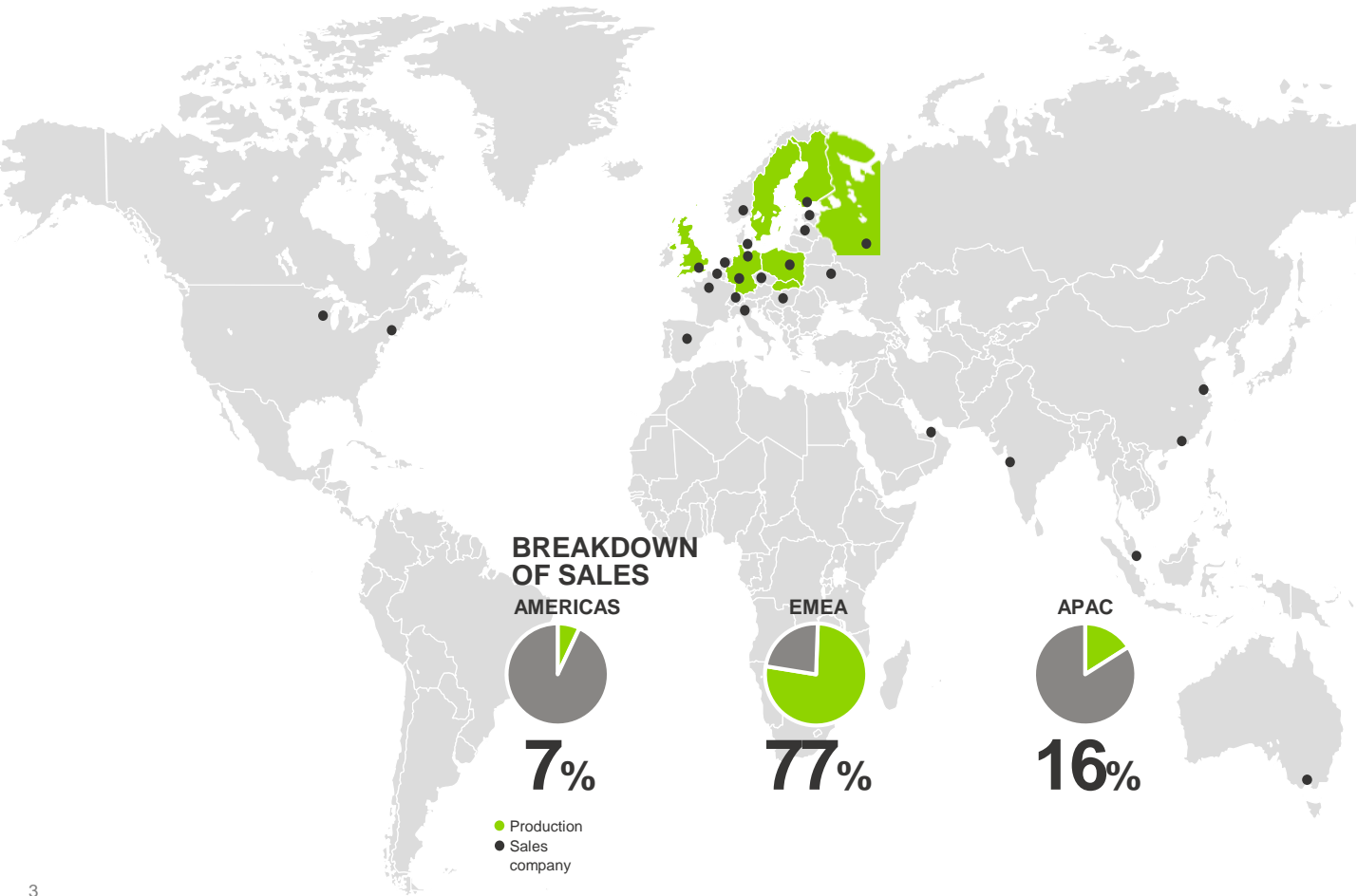


Paperboard

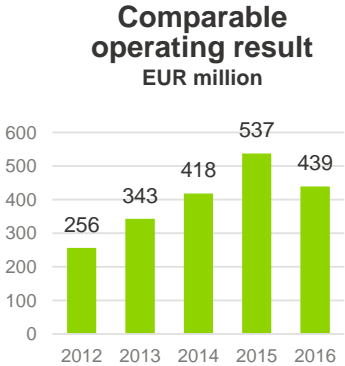


**Tissue and
Cooking Papers**

Metsä Group – Operations and sales



35
production units in
7
European countries.



Pre-requisites relevant for the forest-based industry

The wood raw material must be:

- truly sustainable (cf. role of forests as CO₂ sinks)
- certified
- traceable

The forest must also generate other services like:

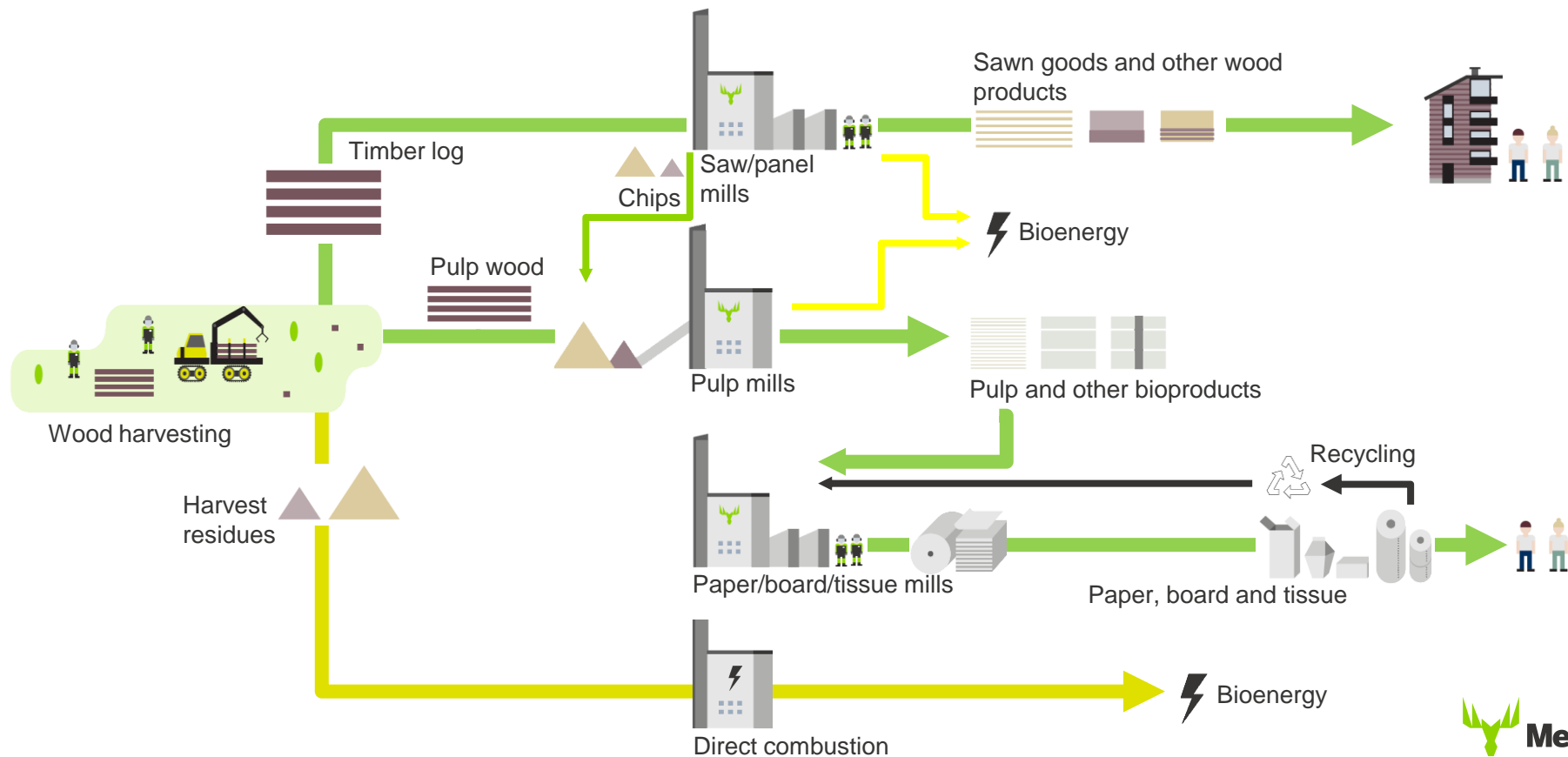
- recreational space for humans
- habitat for animals, including biodiversity

Economic factors:

- price and availability of wood
- global demand of wood-based products



Timber log demand is critical for wood procurement



Severe **global challenges**

Today

- We are consuming more than one planet can provide
- Climate change



Future

- As the population and standard of living are increasing, we will need even more food, energy, water and materials in the future

Sustainable development



Environment



Society



Economic



Growth of carbon stock, certificates & traceability of wood

Minimise local environmental footprint

First value-added-products, then bioenergy

Bioproduct mill runs on renewable energy only

New circular economy concepts

Living in industrial ecosystems

Finland: The stock of wood continues to grow

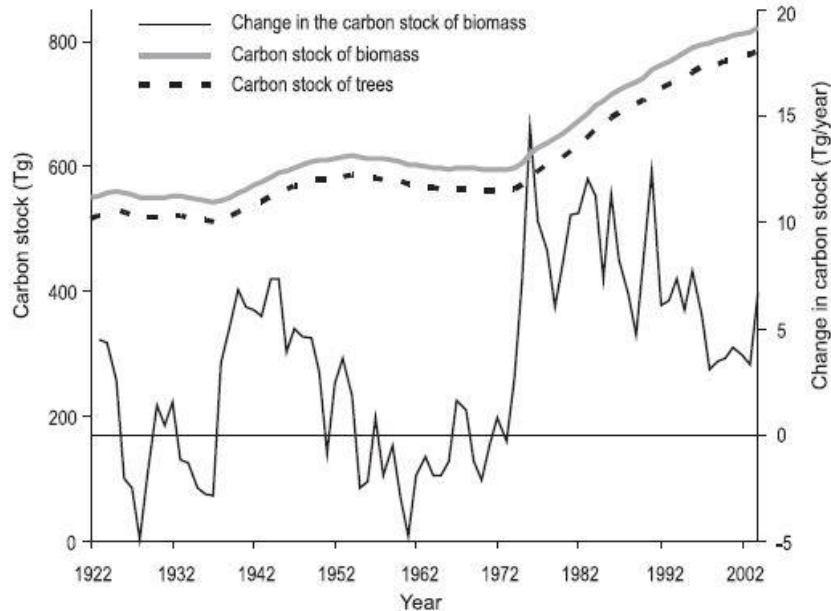


Figure 3. Carbon stock of biomass (trees plus ground vegetation), carbon stock of trees alone and annual changes in the carbon stock of biomass in Finland's forests between 1922 and 2004.

- Current tree stock in Finland is about 2.5 billion m^3 (in 1971, the tree stock was about 1.5 billion m^3)
- Current annual tree (stem) growth: 110 Mm^3
- "Loss" of stem wood in 2016: 86 Mm^3
- Stem wood out of the forest 2016: **70 Mm^3**
 - Saw and pulp mills: 62 Mm^3
 - Energy: 8 Mm^3
 - Sustainability level in terms of wood growth is **81 Mm^3**

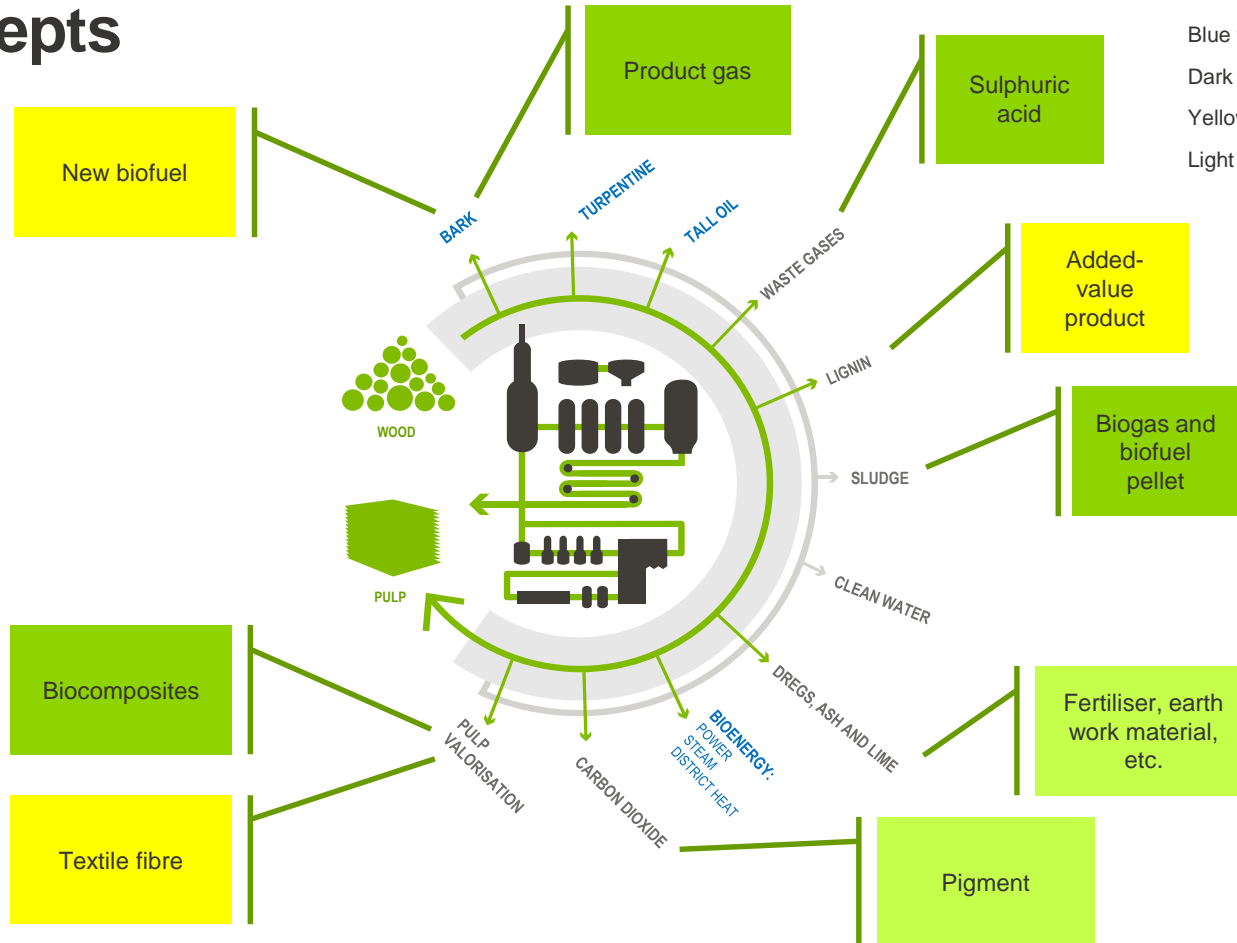
Forest industry's **biggest investment** in Finland

- In the city of Äänekoski, located in Central Finland
- EUR 1.2 billion investment
- Annual pulp production 1.3 million tonnes (old mill 0.5)
 - In addition integrated production of additional bioproducts
- Use of wood 6.5 million m³ annually (old mill 2.4)
- 2,500 direct jobs in the whole value chain in Finland (old mill 1,000)
- Main markets for the pulp: Europe and Asia
 - Sales will increase especially in China
- A unique business ecosystem will be developed at the Äänekoski industry site
- The mill was started up in Mid-August 2017



New circular economy concepts

New bioproducts



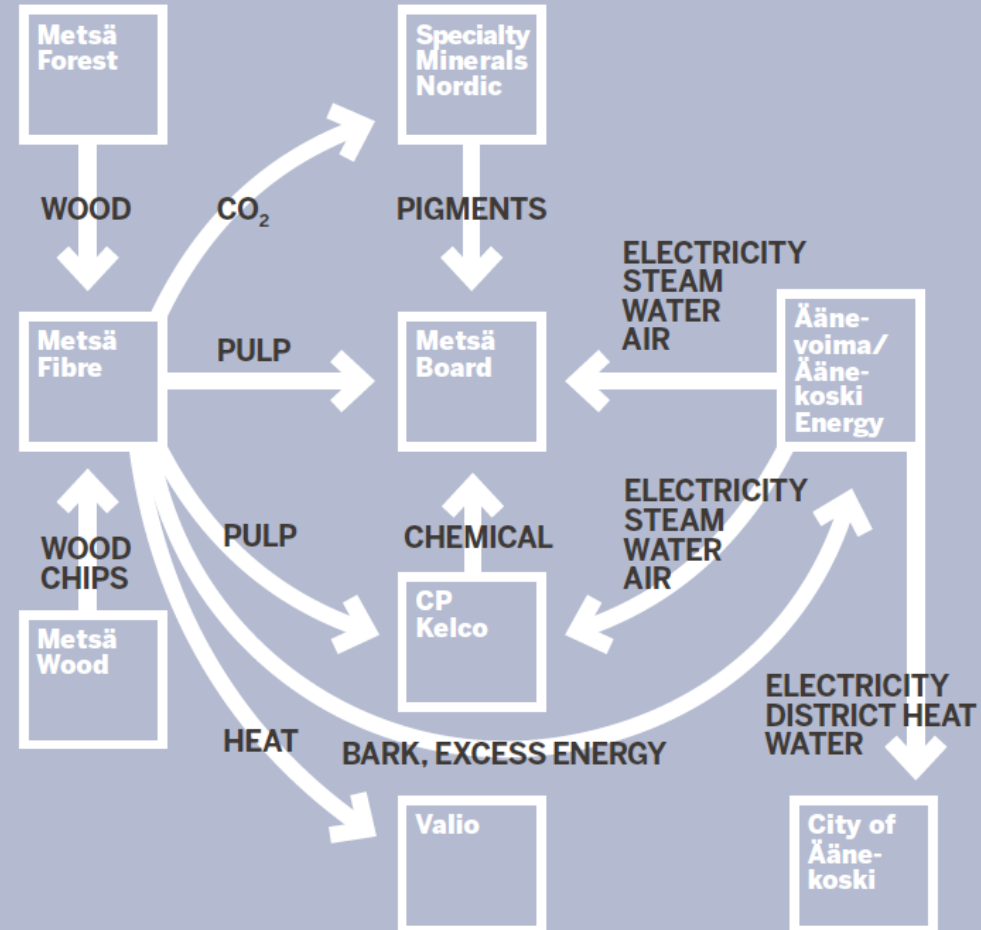
Local **business ecosystem** in Äänekoski is already today quite comprehensive



How to develop the ecosystem further by means of circular and bioeconomy?



LOCAL INDUSTRIAL ECOSYSTEM IN ÄÄNEKOSKI



Äänekoski industrial ecosystem Q3/2017

OPERATOR	PRODUCT
Metsä Forest	Industrial and energy wood
Metsä Fibre	Pulp grades Tall oil Turpentine Bioelectricity Steam District heat Bark fuel
Metsä Board	Folding boxboard
Äänevoima / Äänekosken Energia	Various forms of bioenergy
CP Kelco	Chemical made from pulp (CMC)
Specialty Minerals	Pigment made from CO ₂

OPERATOR	PRODUCT/SERVICE
Metsä Fibre	Product gas Sulphuric acid
EcoEnergy SF	Biogas (biomethane) Biofuel pellets
AGA	Oxygen
Mantsinen	Wood yard services
VR Transport & M. Rauanheimo	Pulp logistics in Finland

Potential products and partners in the future

OPERATOR	PRODUCT
Metsä Wood	Veneer
EcoEnergy SF	CO ₂
Unknown	Lignin product
Unknown	Bark product
Unknown	Biocomposite
Unknown	Textile fibre
Unknown	Unknown

<https://www.youtube.com/watch?v=9RW49gRG9KI>

Make the most of Metsä

