



# DEVELOPMENT OPPORTUNITIES OF FOREST AND WOOD-BASED INDUSTRY SECTORS IN LITHUANIA

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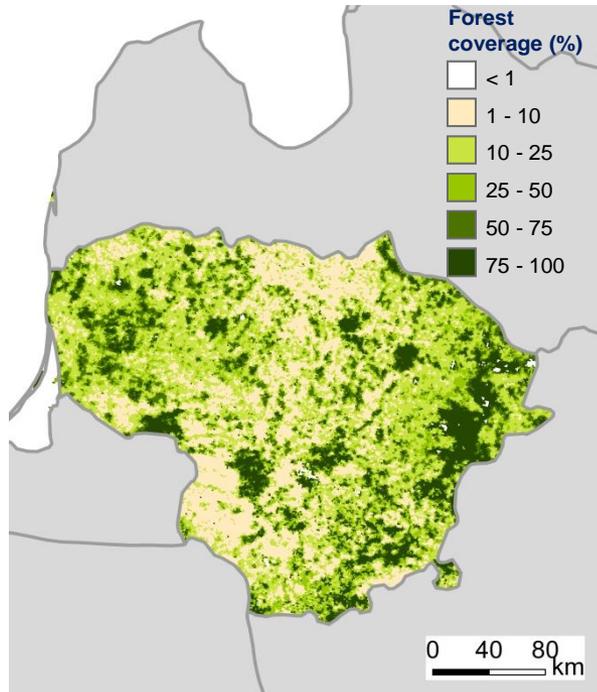
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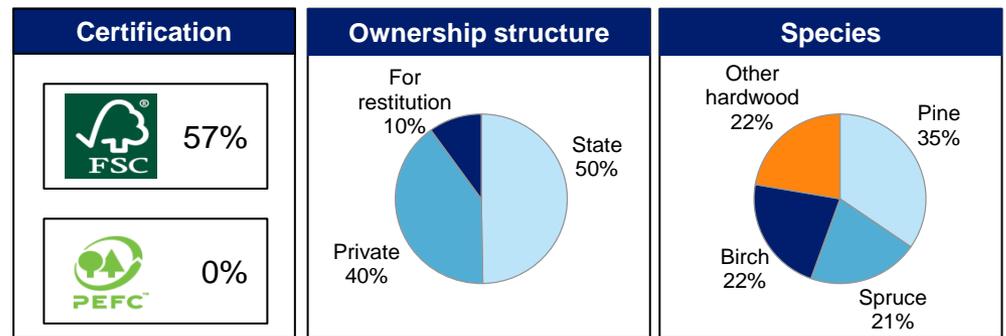
# FOREST SECTOR OVERVIEW

In 2017, 33.5% of the land in Lithuania was covered with forests. Forest coverage has increased by 2.6% points in the last 16 years.



Afforested area, mill. ha	<b>2.2</b>
Forestland for wood supply, mill. ha	<b>1.9</b>
Growing stock, mill m <sup>3</sup> sub	<b>543</b>
Net annual increment, mill. m <sup>3</sup> sub	<b>12.4</b>

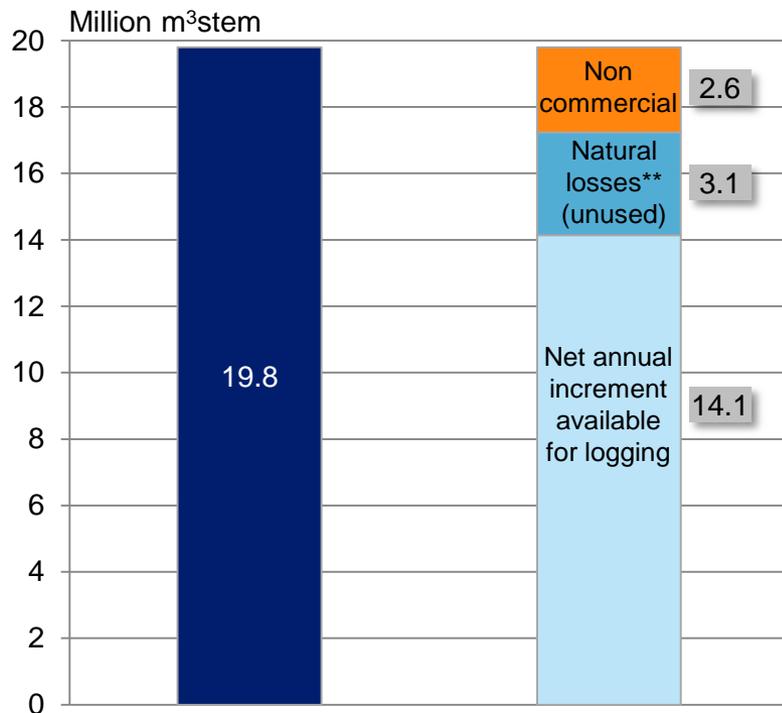
- In Lithuania, the heaviest forest coverage is in the eastern part of the country .
- Lithuanian state owns 50% of the forests, some 10% is reserved for restitution. There are some 250 000 private forest owners with the average size of holding being only 3.4 ha.
- Pine and spruce are dominating species. The volume of mature stands was 151 million m<sup>3</sup> in 2017 and the trend is increasing.
- Currently all state forest in Lithuania are FSC certified, while only 4% of private forests are FSC certified.



# FOREST INCREMENT

Gross annual increment (GAI) of forests in Lithuania is 19.8 million m<sup>3</sup>. Some 2.6 million m<sup>3</sup> is located in protected forest not available for commercial use. There is a high share of natural losses at 16% of GAI.

## Gross annual increment in Lithuania, 2007-2016



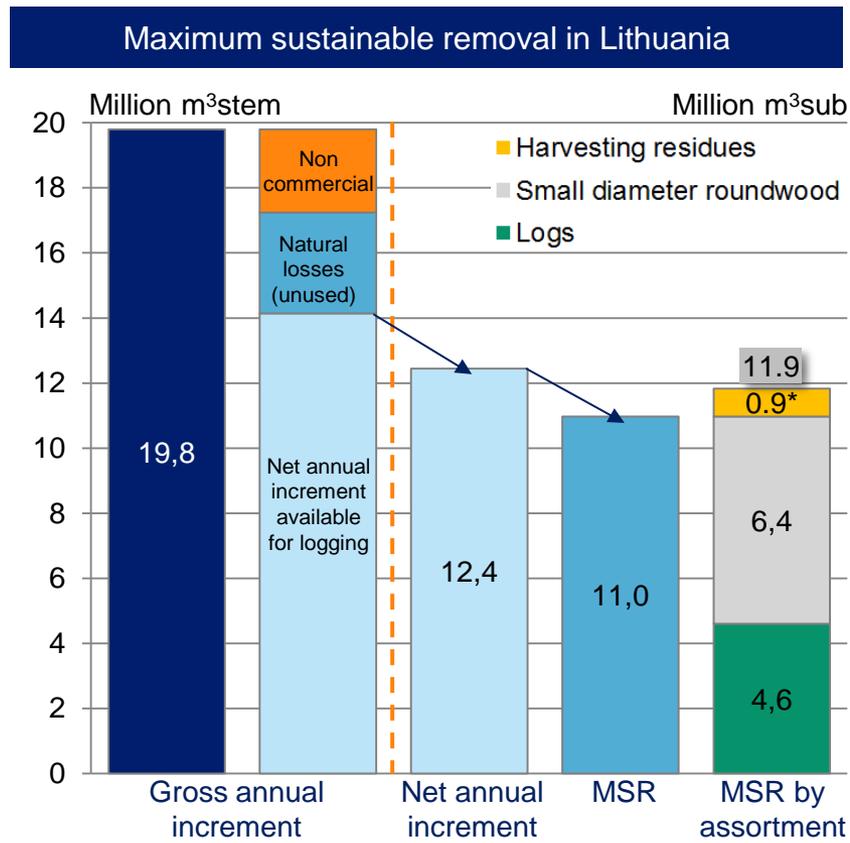
Note: only stem volume increment.  
Source: Lithuanian State Forest Service

- Annual volume of natural losses is significant, 3.1 million m<sup>3</sup>stem. In addition to this, State Forest Service estimates that 0.5 million m<sup>3</sup>stem of dead wood is harvested every year.
- Share of natural losses is typical to the Baltic states (16%), however high compared to the benchmarks of managed forests in Western Europe (9%).
- In the productive forests reserved for restitution, the GAI is 1.6 million m<sup>3</sup>stem, mostly accumulating in the forest due to lack of management. In the ongoing land reform, all forests reserved for restitution are to be transferred to state forest enterprises or sold in auctions.

\*\*Average annual losses to the growing stock during the given reference period due to mortality from causes other than cutting by man, e.g. natural mortality, diseases, insect attacks, fire, windthrow or other physical damage.

# MAXIMUM SUSTAINABLE REMOVAL

The net annual increment of exploitable forest stands is 12.4 million m<sup>3</sup>sub. The maximum sustainable removal (MSR) amounts to 11.9 million m<sup>3</sup>sub, including 11.0 million m<sup>3</sup>sub of roundwood and 0.9 million m<sup>3</sup>sub of harvesting residues.



- MSR is the maximum level of non-declining periodic removals from the forest consisting of roundwood and harvesting residues (can consist of stems, cutting residues, stumps and roots) in the medium to long term in a country.
- In Lithuania, MSR for roundwood is slightly lower than the net annual increment (~88%) due to the age class structure of the forests.

\*Removal of harvesting residues based on techno-ecological potential.  
Source: Lithuanian State Forest Service, Pöyry

# KEY ELEMENTS OF INTENSIVE FOREST MANAGEMENT

**Intensive forest management aims at efficient forest regeneration, higher yield of industrial wood assortments and shorter rotations. This leads to smaller wood supply areas, shorter transport distances and lower wood costs for the industry.**

## Key elements of intensive forest management

- **Forest regeneration**

- Active regeneration is done in order to ensure efficient and rapid establishment of a new forest generation with a desired tree species

- **Thinning of young stands**

- Competition (typically fast-growing hardwood saplings) is removed from young stands in order to give growth space for the desired trees and ensure the early development of the forest stand is fast

- **Intermediary cuttings (thinnings)**

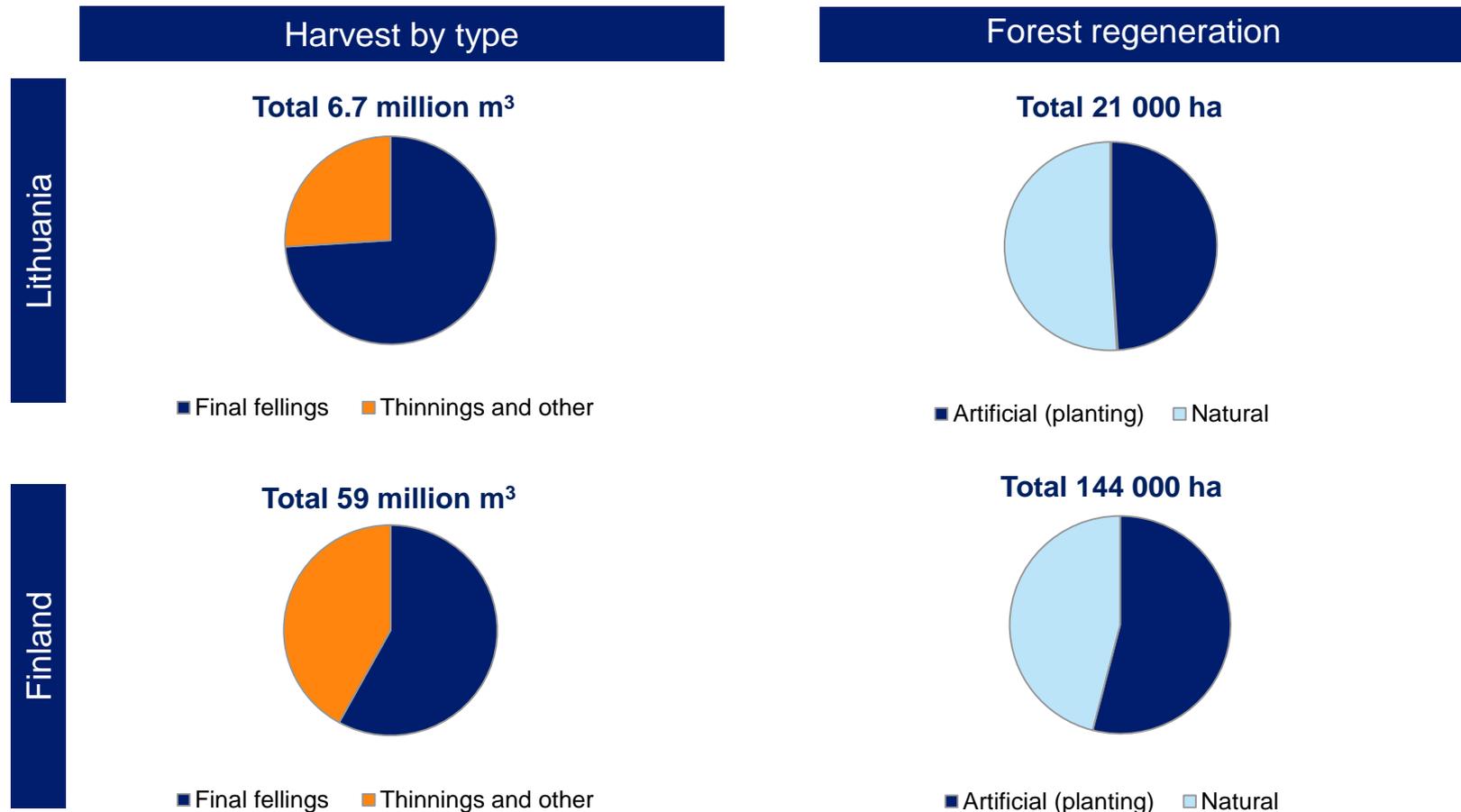
- Thinnings are typically done 2-3 times over the rotation period in order to 1) keep the spacing of the remaining forest optimal for growth and quality development and 2) generate industrial wood flow (i.e. harvest also the trees that would be otherwise lost during the rotation)

- Sufficient forest road network is a prerequisite for intensive forest management - forest areas under intensive management scheme have to be easily accessible as forest management operations are carried out several times over the rotation.

- Intensive forest management practices can be developed and implemented in alignment with FSC principles.

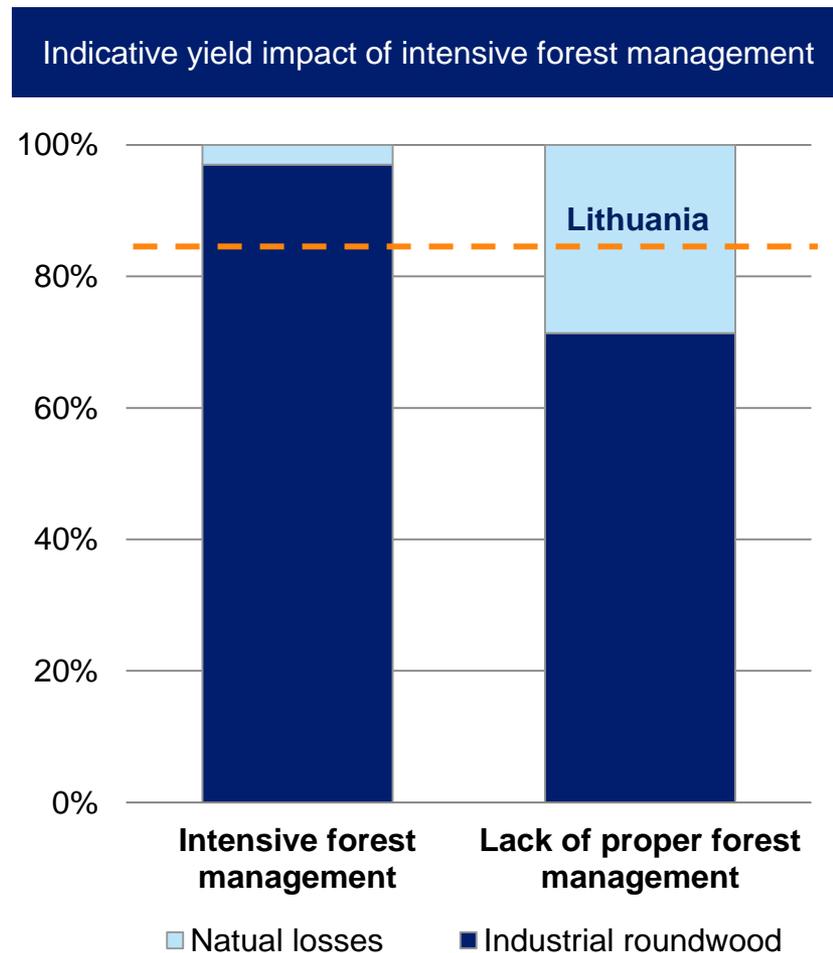
# STATUS OF INTENSIVE FOREST MANAGEMENT IN LITHUANIA

Intensive forest management practices are applied in Lithuanian forestry to some extent. When compared to Finland, there is potential for expanding the intensive management practices (especially thinnings) in Lithuania.



# IMPACT OF INTENSIVE FOREST MANAGEMENT ON MAXIMUM SUSTAINABLE REMOVAL

Intensive forest management practices lead to lower natural mortality and losses over the rotation period, and higher recovery of industrial wood assortments.



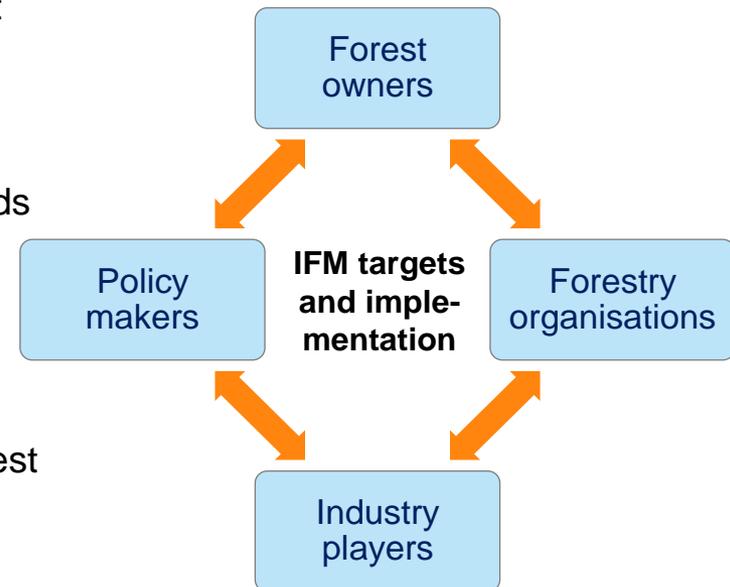
- Yield of industrial wood assortments over the rotation is 20-30% higher in intensive forest management model (e.g. forest management in Sweden) compared to forests with lack of proper silviculture (e.g. Russia).
- Current forest management practices in Lithuania probably realise some 50% of this yield improvement potential.
- Pöyry estimates that full scale implementation of intensive forest management practices in Lithuania would make it possible to increase the maximum sustainable removal (MSR) by 15% or 1.8 million m<sup>3</sup> from the current level, i.e. **from 11.8 million m<sup>3</sup> to 13.6 million m<sup>3</sup>**.
- Thinnings create immediate additional wood flow in intensive forest management, but it has to be also ensured that management of young stand is carried out by intensive management principles. With this, the increase in MSR can be realized within 10 years.

# STEPS FOR REALISING THE INTENSIVE FOREST MANAGEMENT POTENTIAL

Promotion of intensive forest management (IFM) practices is based on collaboration between policy makers, forestry organisations, forest owners and industry.

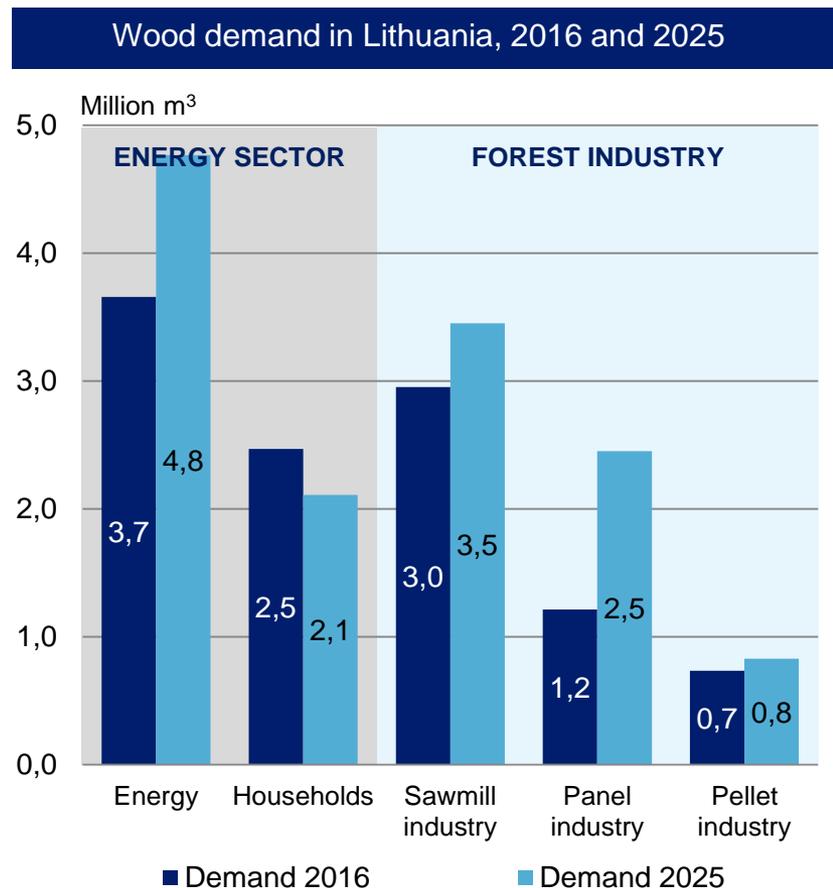
## Preconditions for realising the IFM potential

- Forest legislation and regulatory framework supporting IFM
- Practical forest management guidelines for intensive forest management cycle by tree species and site class
- Consideration of and alignment with requirements of forest certification systems
- Incentive/support schemes for IFM actions (e.g. young stands management)
- Training and awareness campaigns to private forest owners
- Introduction of IFM in the forestry education at all levels
- Training programs for forestry workers re. IFM operations
- Investment promotion by the government in the forestry, forest industry and bioenergy sectors
- Involvement of forest industry players to develop the market and demand for additional wood volumes
- Operational excellence in the wood supply and logistics chain



# CURRENT AND FUTURE WOOD DEMAND

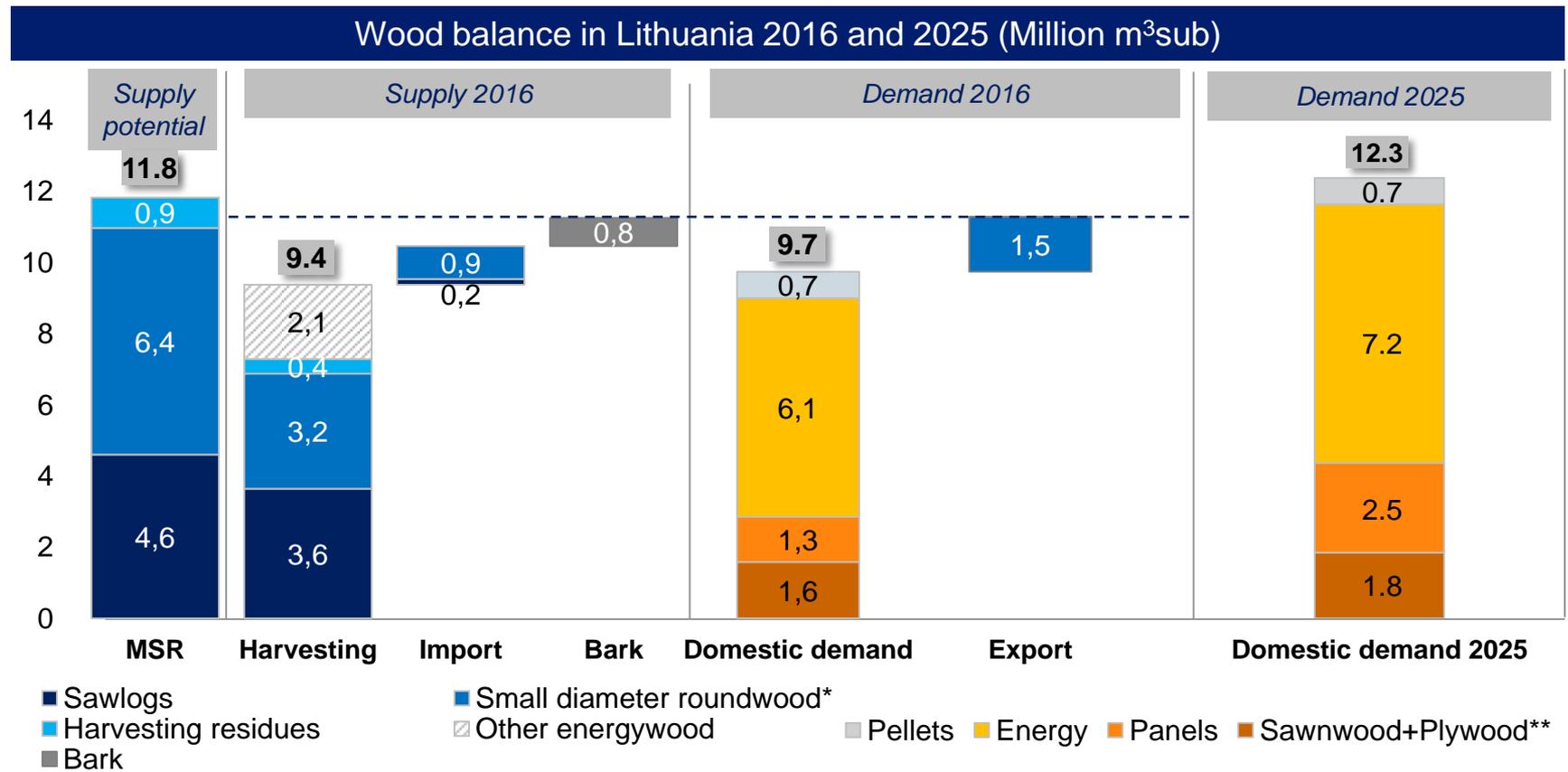
Forest industry is expected to expand in Lithuania based on planned projects mainly in the wood industry cluster. Wood demand in the energy sector is also expected to increase.



- Total wood demand in the Lithuanian energy sector (incl. households) is 6.1 million m<sup>3</sup>, while the wood demand in the forest industry is 4.9 million m<sup>3</sup>.
- Total wood demand for planned wood industry cluster projects is expected to be around 1.7 million m<sup>3</sup>.
- Additional wood demand in the energy sector comes from new capacity investments in heat and co-generation. Major share of the increase in wood demand is dependent on one project, Lietuvos Energija in Vilnius.
- Household energy wood (firewood) consumption has been declining and this trend is likely to continue in the future.
- Raw material use for pellets can further increase without additional capacity as the current utilisation rate can be increased.

# WOOD MARKET BALANCE IN 2016 AND 2025

Harvest is significantly below MSR, but when considering trade statistics and the reported demand from the industry and energy sector, the current harvesting potential seems to be close to full utilisation.



\*Pulpwood and firewood \*\*Net demand excluding by-products.

Demand: Final end use takes into account that the processing residues of e.g. sawmilling and bark is allocated to their final end uses

# CONCLUDING REMARKS



## Current harvesting levels in Lithuania are below the maximum sustainable removal

- Harvesting levels have been rather stable over time. However, **harvested volumes of logs and small diameter roundwood could be increased with respect to the maximum sustainable removal**. The harvest of sawlogs can be increased somewhat, but the highest harvesting potential can be found in small diameter roundwood .



## Intensive forest management would make it possible to increase the maximum sustainable removal by 15%

- Annual volume of natural losses is significant. **Intensive forest management practices** are being applied to some extent, however there is room for expansion.
- Increasing the outtake from forests could be achieved not only by increasing final fellings but also **with more systematic thinnings and intermediate fellings**, leading to industrial wood volume yield before the final felling and facilitating improved growth and quality of the remaining trees in the forest.
- Promotion of intensive forest management practices is based on **collaboration within the sector, training and awareness campaigns**.



## There is room for expansion of industry and energy uses of wood

- Highest economic benefits are achieved by balanced approach, based on **cascading use of wood**.
- Chips and sawdust are in high demand by the panel and pellets industries and today Lithuania imports a considerable amount of chips to secure the domestic supply.
- **Conversion of raw material exports** provide an additional wood supply potential
- In order to increase the future supply of chips, the **expansion of sawmilling operations would be an option**.

# PÖYRY SMART FORESTRY OFFERINGS

Pöyry *Smart Forestry* offerings ensure unique solutions, based on powerful analytical tools, for strategy and operations in sustainable forestry and wood/biomass supply

Pöyry's in-depth understanding of forest value chain combined with most advanced digital technologies

Service areas	Offerings
 <b>Strategy</b>	<ul style="list-style-type: none"><li>• Wood/biomass sourcing strategy optimisation</li><li>• Wood/biomass supply strategy and planning</li><li>• Forestry investment strategy and planning</li></ul>
 <b>Markets</b>	<ul style="list-style-type: none"><li>• Wood/biomass market and price forecasting</li><li>• Wood /biomass marketing strategy</li></ul>
 <b>Forest management</b>	<ul style="list-style-type: none"><li>• Optimised forest management and utilisation plans</li><li>• GIS, remote sensing and forest/biomass inventory</li></ul>
 <b>Supply chain</b>	<ul style="list-style-type: none"><li>• Harvesting, transport and logistic systems optimisation</li><li>• Road building and maintenance optimisation</li></ul>
 <b>Transactions</b>	<ul style="list-style-type: none"><li>• Forest valuation/appraisal</li><li>• Due diligence</li><li>• Transaction advisory</li></ul>
 <b>Forests and climate change</b>	<ul style="list-style-type: none"><li>• Forest carbon modelling and optimisation</li><li>• Carbon offset strategies</li></ul>
 <b>Operational excellence</b>	<ul style="list-style-type: none"><li>• Diagnostics, benchmarking and implementation</li><li>• Software solutions</li><li>• Monitoring</li></ul>



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