

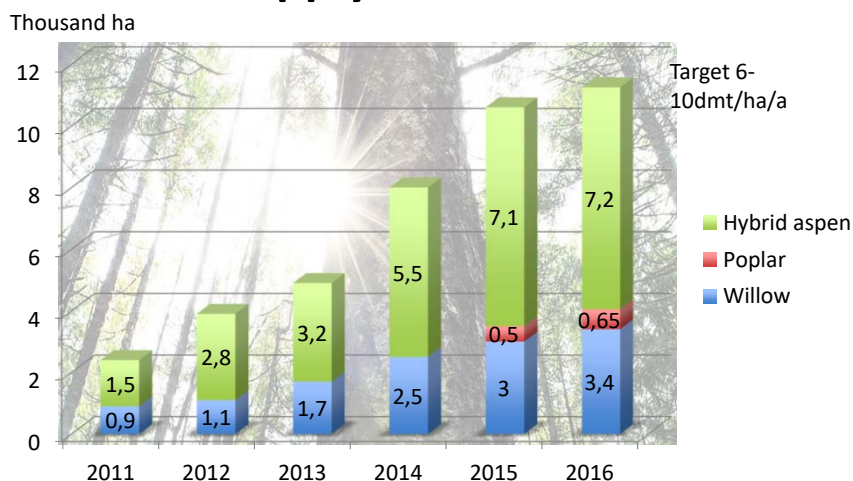
*Experience in growing of woody  
biomass from plantations - R&D and  
practice*

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**Biomass as a raw material will play a key role in  
new bio-based economy**

But who comes first – demand or supply?

## Plantations for Woody Biomass Supply in Lithuania



## Willow (Salix) plantations

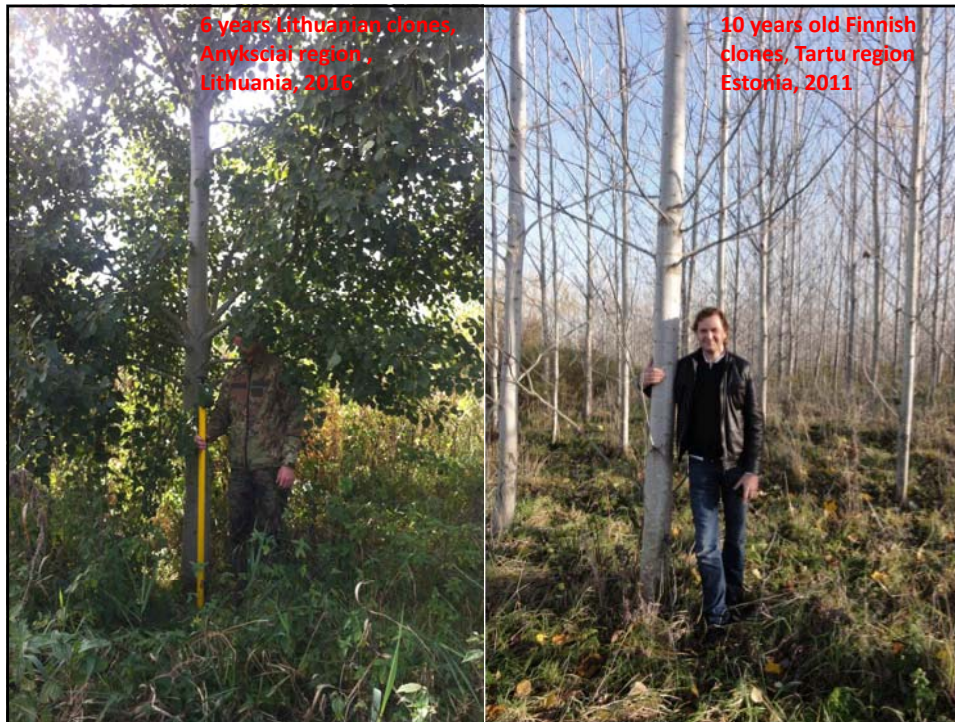
- First plantations established more than 10 years ago
- Initially establishment costs compensated through RDP measures
- Initial experience was not successful – lack of knowledge, limited infrastructure and market
- Since 2013 only German investor establishes 500 ha of new plantations annually with clones from Swedish breeding program

## Hybrid aspen plantations

- Breeding program initiated 30 years ago
- Identified potential through technology platform – 7 years ago
- Started as R&D project (for micro-propagation and seedling growing) by Euromediana company
- Market supported through RDP afforestation measure – over 7 thousand ha area is established
- Lithuanian, Swedish, Finnish and Latvian clones planted
- Rotation – 15-20 years, yield – 20-25 cub m/ha/a
- Discontinued in late 2015 due to policy changes

## Lithuania leads in hybrid aspen plantations





## Poplar plantations

- Started as R&D project (by SLU, Swetree and Euromediana funded by EU Eurostars program)
- Over 30 poplar clones from Italy, Sweden and Germany tested, 6 different types of seedlings tested
- 5-6 year rotation, density 1600 plants/ha, targeted yield 10 dmt/ha/a
- Diversified sales market
- Vulnerable to climate change/droughts

## Poplar plantation establishment

establishment



1 year



2 year



3 year



## Waste as fertilizer

- Plantations established on marginal/less suitable for agriculture land have lower yields
- Municipal water treatment sludge and biomass ashes can be used as fertilizers to compensate shortage of nutrients and improve yields
- There is no solution on the final usage/treatment of sludge
- The size of established biomass plantations is sufficient to utilize all the sludge for their fertilization
- Additional revenues may be ensured to biomass growers from phytoremediation services

## Towards biosolid's fertilization

- EU funding allowed to modernize water treatment facilities – after anaerobic digestion 85% of country's sludge is being dried and granulated
- Municipal water treatment sludge "bio-char":
  - 90-95% dry matter
  - 60-65% carbon
  - 5%N and 2%P
  - No pathogens
  - Heavy metal content – according EU Sludge regulation
- Sludge "bio-char" has transportation, spreading and very important "no-smell" advantage

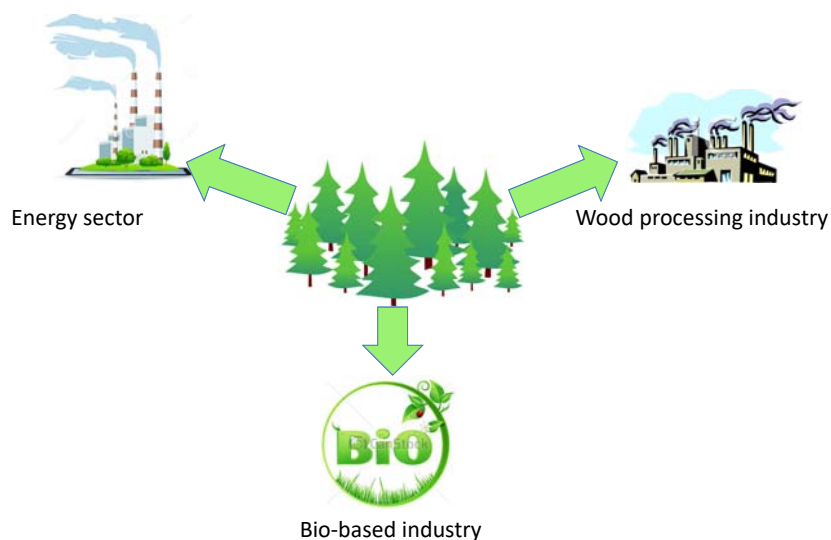
## How to fertilizes growing plantations?

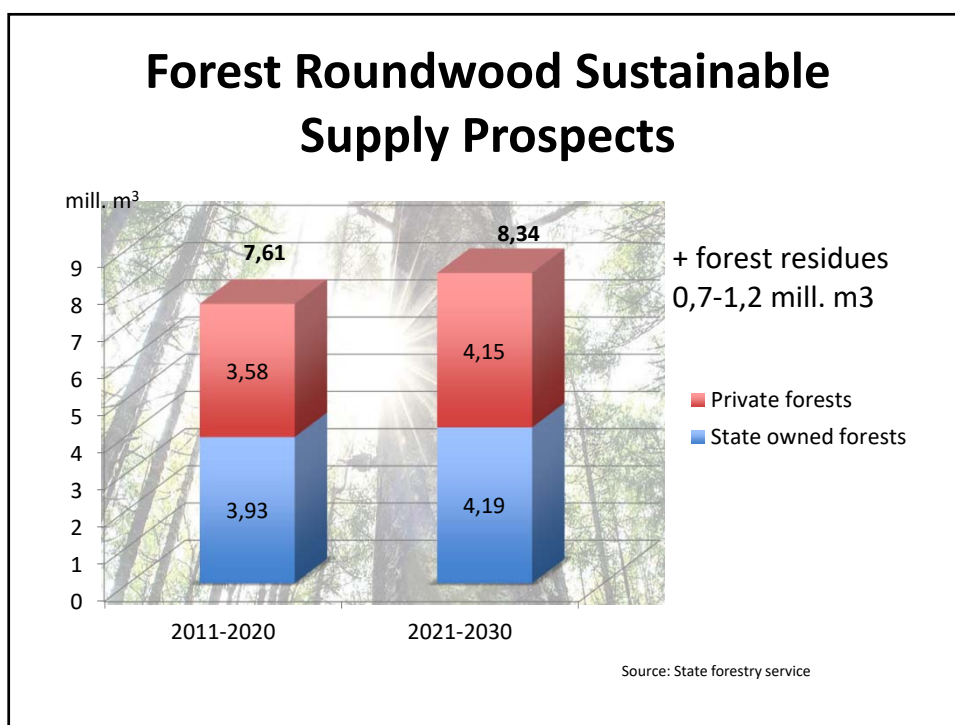
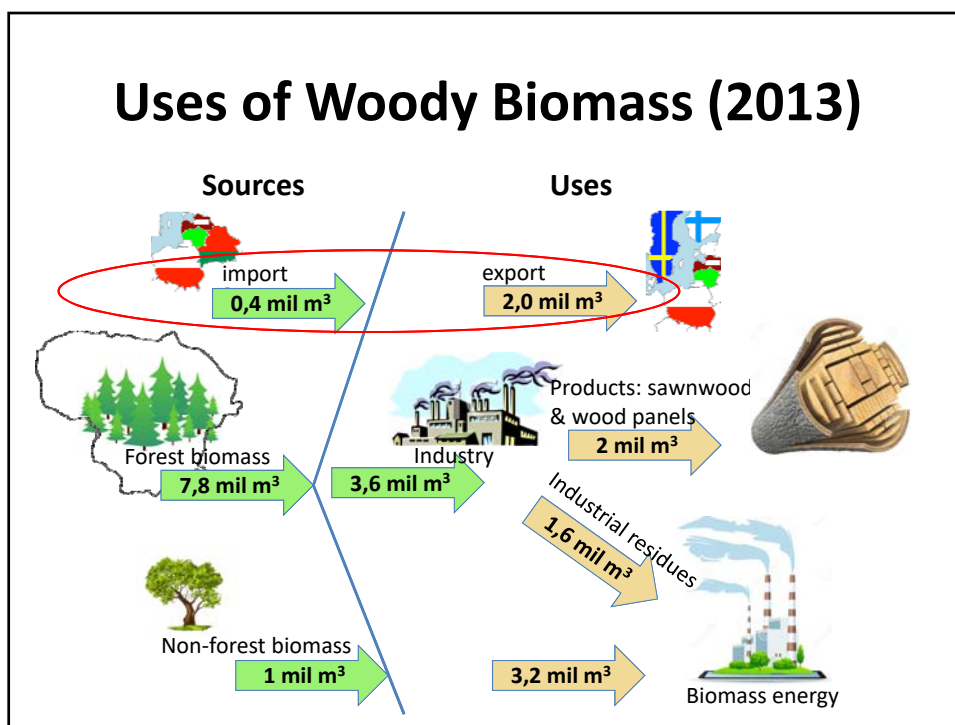


## Prospects for biomass plantations are unclear

- New, unknown culture to farmers
- No infrastructure
- Long rotation
- High initial investment, cash inflow after 4-5 years
- Economy of scale is needed
- High harvesting and transportation costs
- Low prices
- Demand is weak and prospects unclear

## Demand for Woody Biomass?



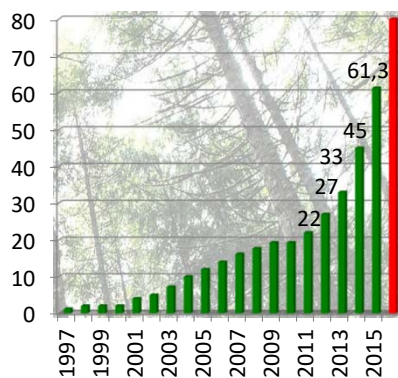




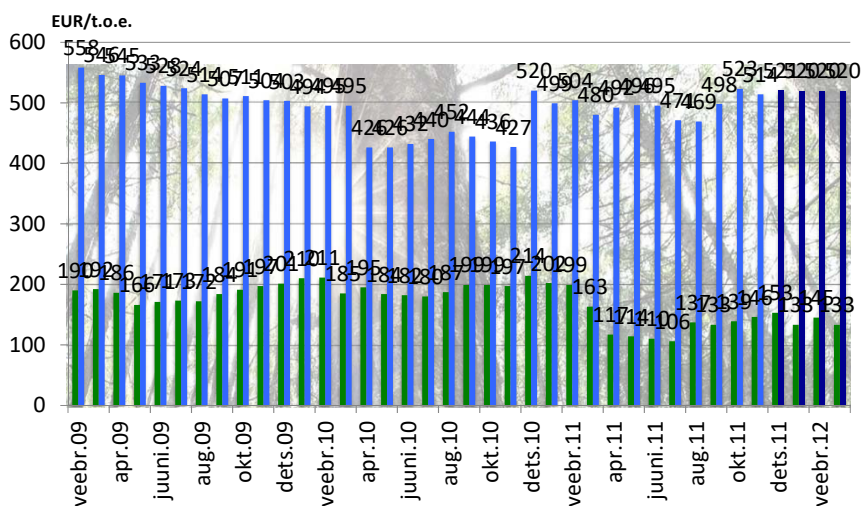
## Biomass Energy Prospects

- Background – heating sector
- Sufficient biomass resources to be 100% green in heating sector including CHPs
- Government “addicted to” imported natural gas
- Climate change impact
- No ambitious targets - the only biomass to energy project under consideration – Vilnius CHP – **potential additional usage of biomass 0,8 mill. m<sup>3</sup>/a**

Biomass share in centralized heating supply, %



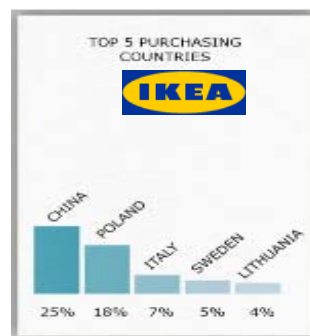
## Biomass vs. natural gas prices



Source: Lithuanian heat suppliers association

## Wood Processing Industry Prospects

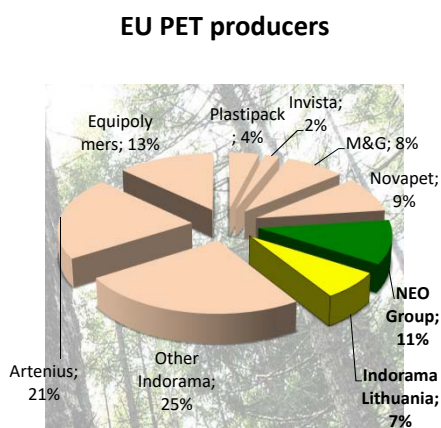
- Background - vertically integrated wood based panel and furniture industries
- The key driver – cooperation with IKEA:
  - fifth place in the total IKEA's purchases list (with 4% of total purchases)
  - second place for woody biomass material sourcing to IKEA products
- Investment into new wood based panel and furniture cluster under consideration **may require additional 0,5-0,7 million m<sup>3</sup> wood resources by 2019-2020**



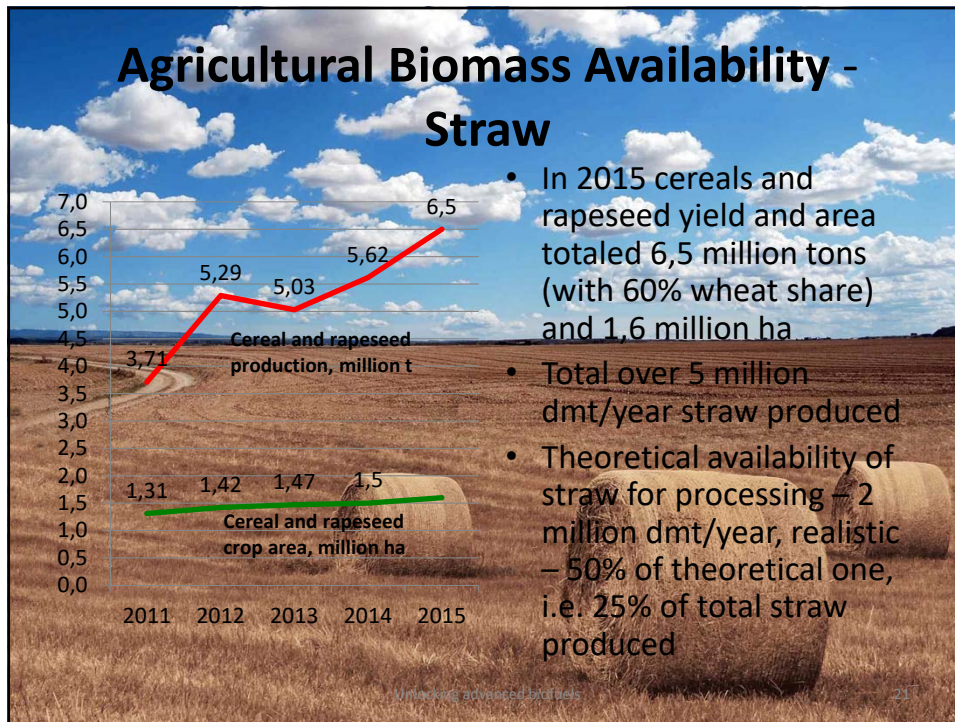
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## Future of Bio-based Industry in Lithuania may be in ...

- **Advanced biofuels:** very much policy dependant and under heavy pressure of oil prices
- **High value added bio-plastics (PET) value chain:**
  - Based on abundant agro biomass residues (straw) plus 10-15% woody biomass input
  - Lithuania's production totals 18% of total EU PET market



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## What is Needed For Further Development

- Biomass availability (in place)
- Technology (may be imported)
- Business case (difficult in competition with oil, but may be driven by market leaders policy)
- Policy (local and EU level)
- Funding (not available)
- View of society (knows too little)
- Industry/market (in place)

## Next step

- Project ADVBIOFUELSBSR is being developed for Interreg Baltic Sea region program financing (concept already approved)
- The aim of the project is to initiate sustainable transport fuel - advanced biofuel from abundant local biomass and/or waste streams - production in Baltic Sea Region (BSR) countries - Lithuania, Latvia and Estonia – with assistance Danish and Swedish partners

Thank you for attention  
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