



Wood fuel logging prospects in Lithuania, an emphasis on sustainability and environmental requirements

Zbigneu Glazko,
Ministry of Environment
Forests department



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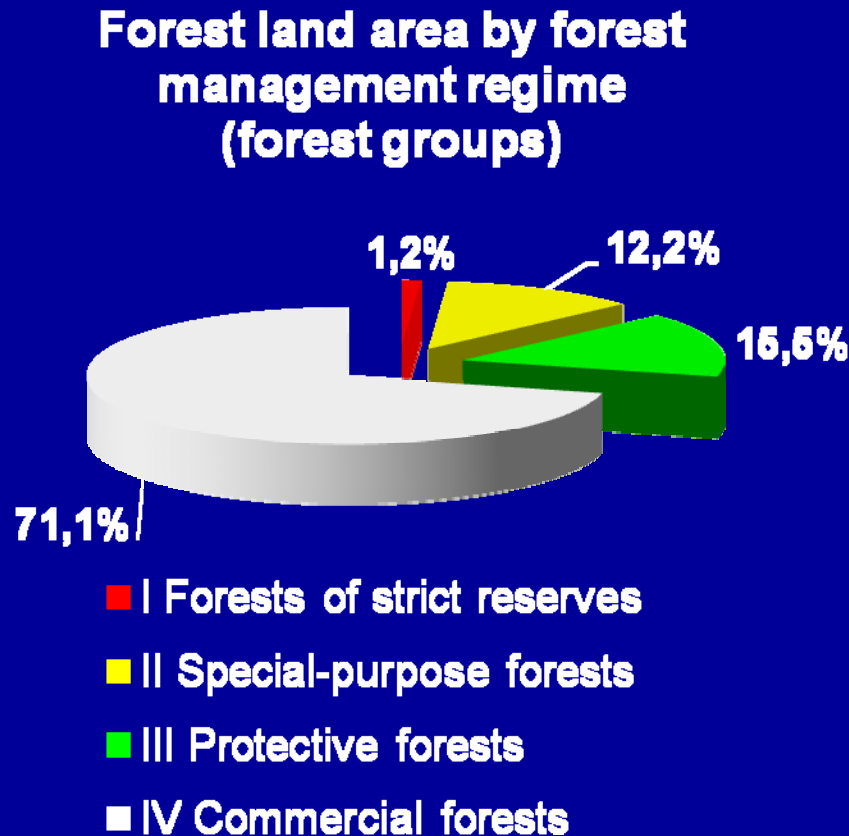
General characteristics on Lithuanian forests (1)



Forest land area, 1000 ha	2159.8
Forest cover, %	33.1
Productive forest area (stands), 1000 ha	2050.9
Total growing stock volume, mill.m ³	479.4 ± 6.2
Mean volume per ha, m ³	234.1
Gross annual increment, mill.m ³ o.b.	16.2 ± 0.2
Mean gross annual increment m ³ /ha	7.9
Average forest stand age, years	52

Data source: State Assessment of Forests 01-01-2010

General characteristics on Lithuanian forests (2)



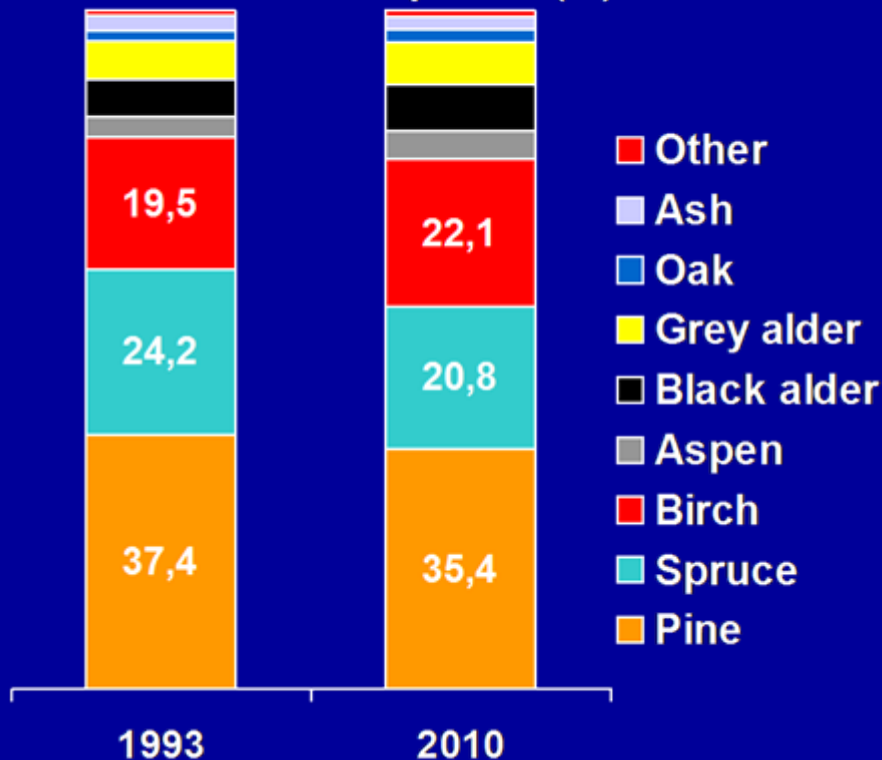
Since 1995 all the forests divided in to 4 forest groups
Special-purpose group includes recreational forests and forests for protection of ecosystems
Proportions between the groups remain more or less constant

Data source: State Assessment of Forests 01-01-2010

General characteristics on Lithuanian forests (3)



Forest stands area by dominant tree species (%)

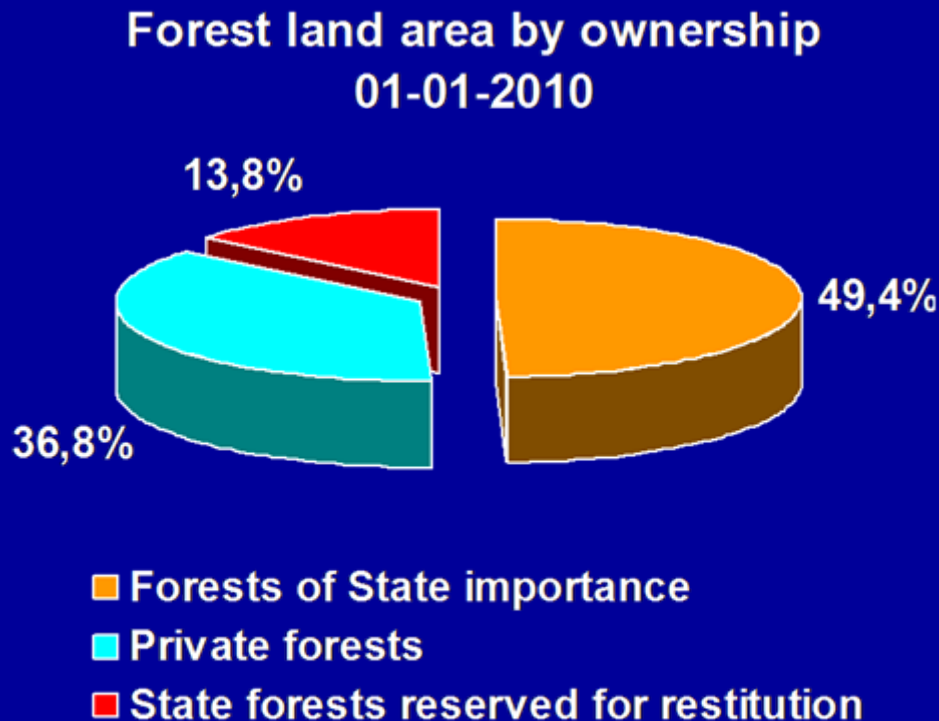


The biggest areas are covered by pine, spruce and birch stands

Decreasing of coniferous and increasing of deciduous stands can be stated in the last 20 years

Data source: State Assessment of Forests 01-01-1993, 01-01-2010

General characteristics on Lithuanian forests (4)



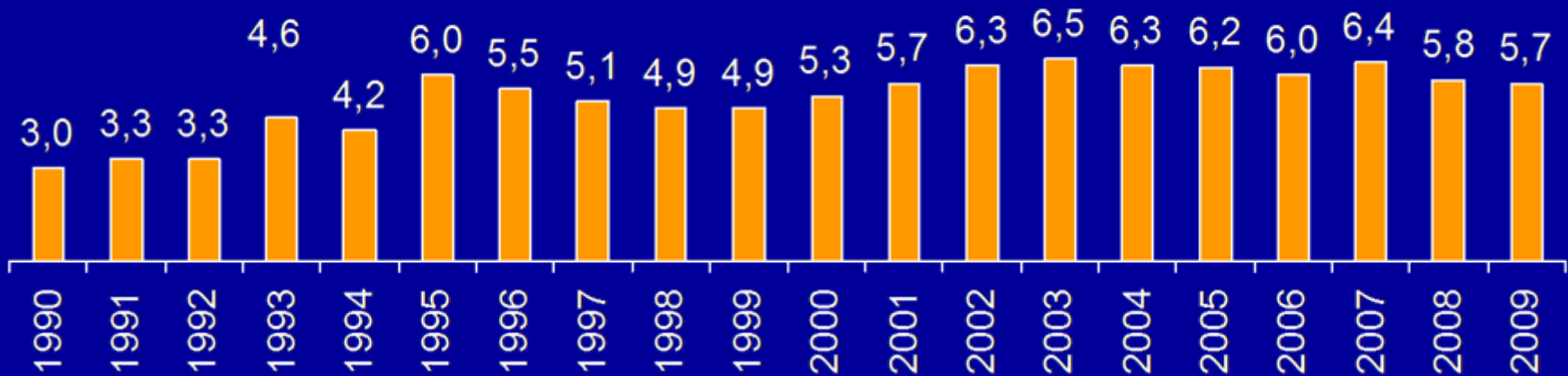
Only State and Private forests according Forest Law
Small scale private forests (3.3 ha average holding, about 240 thousand owners)
Land reform (incl.restitution) in nearly 20 years still not completed – no economic activities in state forests reserved for restitution

Data source: **State Assessment of Forests 01-01-2010**

General characteristics on Lithuanian forests (5)



Annual volumes of forest fellings (mill.m3) 1990-2009



Amounts of annually cutted wood are considerably under the gross annual increment

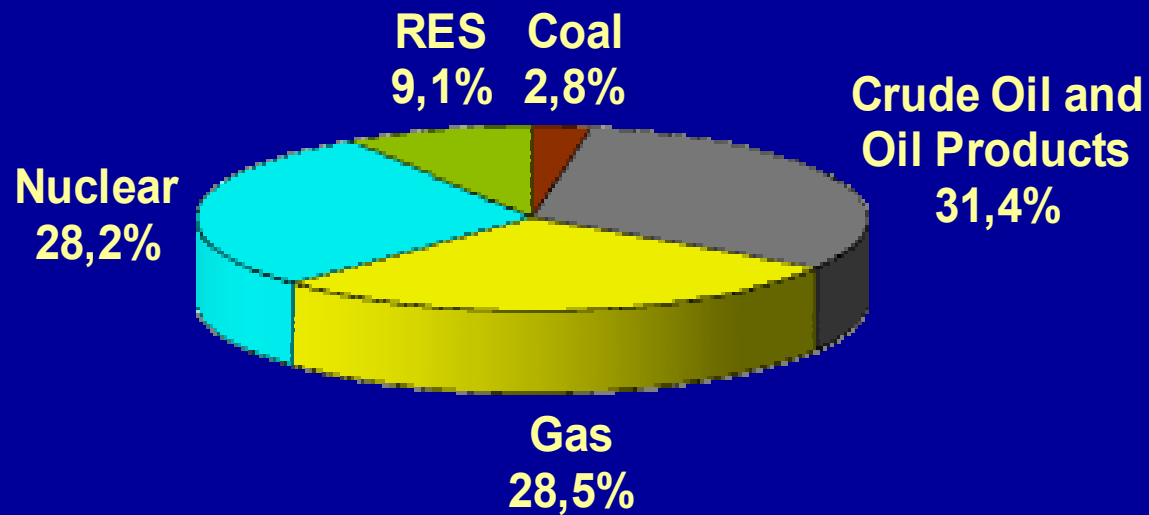
Decreasing of forest felling in last 2 years is mostly related to reduced harvestings in private forests according to market situation (low prizes etc.)

The share of renewable energy sources in the national balance of primary energy



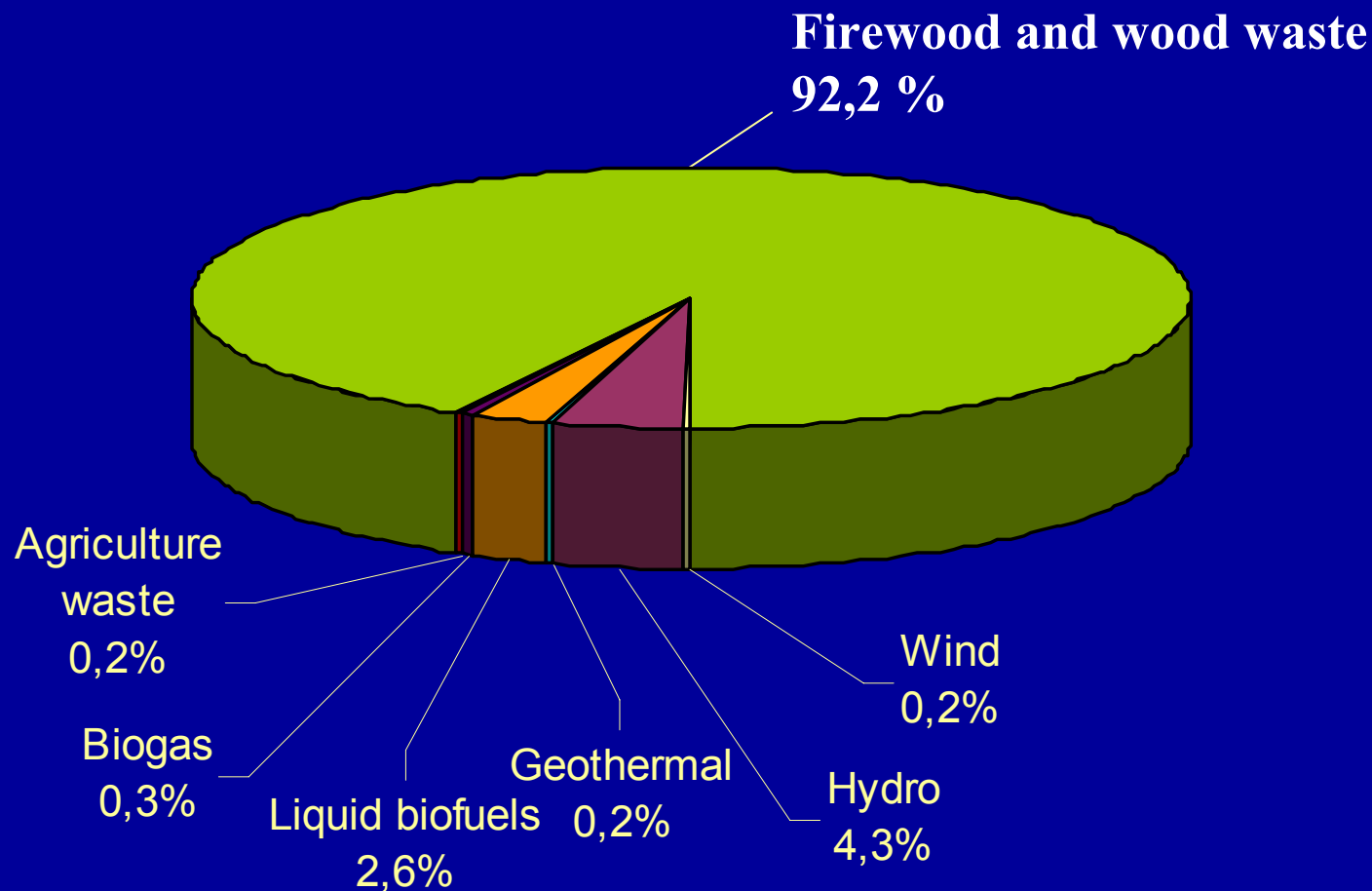
- In 2008 wood fuel comprised about 11,4 % of all national balance of primary energy (in total renewable energy sources accounted for 9,1 %), totally 3750 thou. m³ (or 735 ktoe) of wood were consumed.

Primary energy balance in Lithuania, 2008



Source: Ministry of Energy

Renewable energy consumption in Lithuania, 2008



Source: Ministry of Energy

Amount of wood fuel in Lithuania



- According to the Department of Statistics of Lithuania, in 2009 3,9 mill. m³ of firewood and wood waste were used for energy production.
- According to the State Forest Service, considering annual felling volumes, environmental and technological requirements, each year about 0,5-0,6 mill. m³ forest logging residues could be used after main fellings in state and private forests.



Wood fuel consumption in 2009

Fellings in 2009 – 5,7 mill. m³

Wood used for energy production –
3,9 mill. m³ (764 ktoe):

-1,9 mill. m³ firewood

-1,9 mill. m³ wood industry waste

-0,08 mill. m³ logging residues

Potential: 0,8-1 mill. m³ (156-195 ktoe):

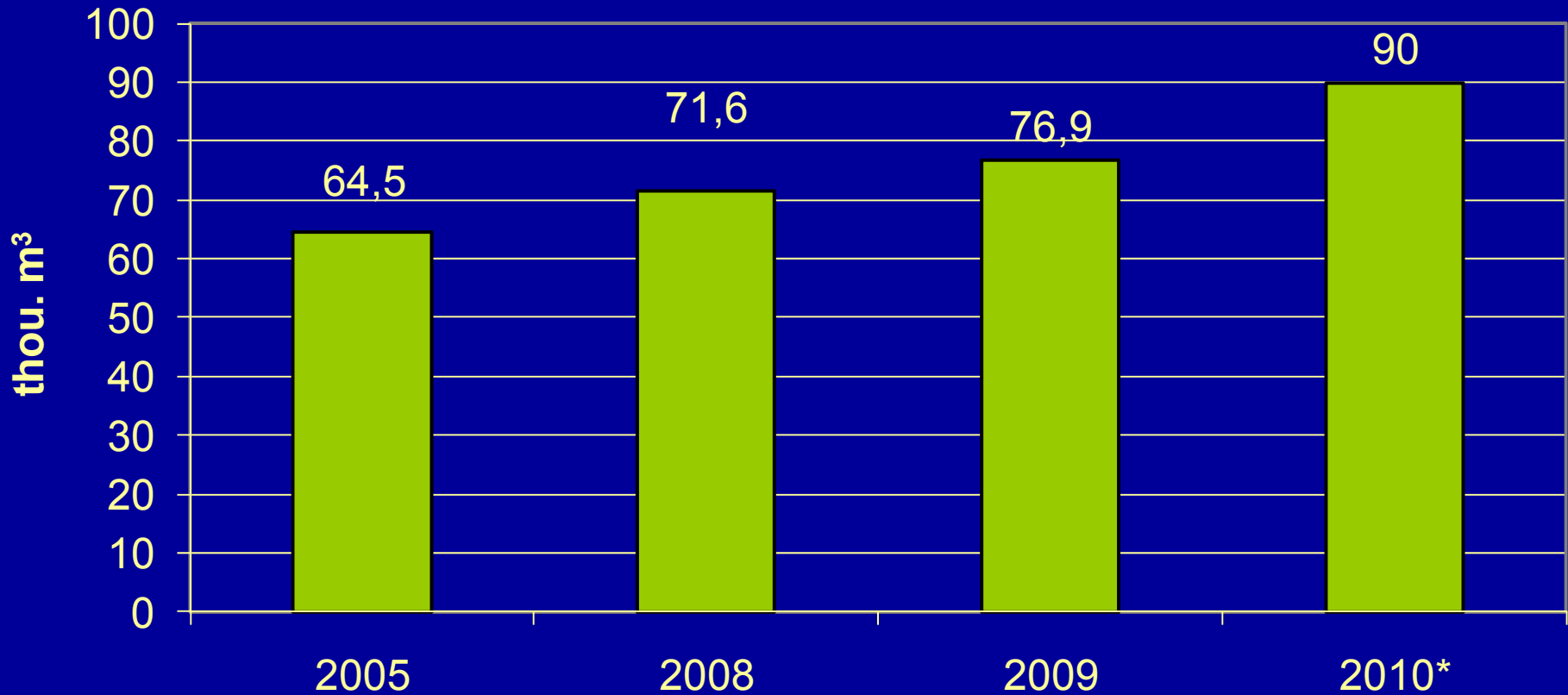
-0,5-0,6 mill. m³ logging residues from
main fellings;

- 0,4-0,5 mill. m³ firewood from grey
alder stands;

-? mill. m³ wood fuel from plantations.



Logging residues sold in state forests in Lithuania



* Planned amount

Source: Directorate General of State Forests



Market of wood fuel in Lithuania

- The panel production, which is competing for the same raw material with energy sector, capacity is growing;
- Average firewood price during I-III quarters of 2010 has grown up to 24,6% from 17,7 EUR/m³ up to 22,0 EUR/m³;
- In Lithuania, firewood market is further developing, the demand for wood fuel is growing rapidly, however resources are limited.



Forestry legislation

In Lithuania the forestry activities in state and private forests are strictly regulated and particular prescribed by legal acts

Rules on Forest Fellings



- **Order No D1-79 of the Minister of Environment of the Republic of Lithuania as of 27 January 2010 Regarding Approval of the Rules on Forest Fellings.**

The Order approved the Rules on Forest Fellings, which established main biological, ecological and technological requirements for forest felling (logging, extraction timber and forest logging residues out of the forest).



Rules on Forest Felling

forest logging residues – overground parts of stumps, treetops, branches, stems of small trees, shrubs, sawdust.



Sustainability and environmental requirements

- Areas after forest fellings must be cleared so as to create favorable terms of reforestation, rational use of forest logging residues, to ensure fire safety, to subject to sanitary forest protection rules.



Sustainability and environmental requirements

- Forest logging residues are allowed to remove from forest felling area or to load to hauling routes or to piles or to float after crashing in forest felling area.



Sustainability and environmental requirements

- It is prohibited burning of forest logging residues at forest felling area.



Sustainability and environmental requirements

- Forest logging residues can be removed from the forest felling areas only moving by hauling routes.
- During ground freeze or at dry forest sites it is allowed to carry forest logging residues without using hauling routes but must be saved vital underwood.



Sustainability and environmental requirements

- Forest logging residues are prohibited to remove from the Na, Nae, Sa, Sae forest sites and IIA group forests - Special-purpose group includes forests for protection of ecosystems (these prohibitions do not cover Curonian Spit forests with *Pinus mugo* and *Pinus banksiana* logging residues).



Sustainability and environmental requirements

- At clear forest felling area must be left at least 5 m³/ha of forest logging residues
or
additional amount of trees important for biological diversity (corresponding to the volume of carried out forest logging residues).



Sustainability and environmental requirements

- Forest logging residues for bio-fuel must be stored in places dedicated for this purpose, by the roads or hauling routes, in accordance with the fire safety and sanitary forest protection rules.



Sustainability and environmental requirements

- Stump pulling is allowed from clear felling areas located in commercial forests, which are outside the protected areas (excluding Na, Nae, Sa, Sae, U and P forest sites), while retaining vital undergrowth and ensuring soil preparation and forest regeneration conditions.



Wood ash recycling

- Detailed recommendations on wood ash recycling (“Guidelines on Forest compensatory fertilization with wood ashes”) were elaborated by Lithuanian forest research institute in 2005.



Wood ash recycling

- Guidelines on Forest compensatory fertilization with wood ashes establish main requirements for the wood ash quality, storage, using in forests and environmental requirements.



Wood ash recycling

Forest management plan is suggested for registration details such as time of application, amount and chemical composition.

To avoid the negative effects of stressful for forest ecosystems, a single rate of ash should not exceed 2.5 to 3.0 t / ha.



Wood ash recycling

Concentrations of some nutrients in the wood ash must be above certain minimum thresholds.

The concentration of heavy metals and PAHs should generally be below certain maximum thresholds.

Nitrogen should be added during the second of two recommended wood ash applications during rotation season.



Wood ash recycling

Wood ashes should be spread during springtime before plant vegetation or in the autumn.

Wood ashes shouldn't be spread closer than 50 m from the open water ponds (streams, ditches etc.) or swampy areas.



Wood ash recycling

Ash should not be fertilized in forest during the winter, with snow coating, or the spring thaw, if there is a risk that ash can get into the water courses.

In stands with dense undergrowth ash not fertilized because they are not sufficiently spread out evenly, in addition spreading may affect shrubs and young trees.



Recommendations on planting, cultivating and using of forest plantations

- Recommendations established main technological requirements for planting, maintenance and using of plantation forests and provide classification.



Conclusions

- Legal preconditions for sustainable use of wood fuel are constituted, but the forest felling residues potential is not used due to economic reasons.
- Appropriate modification of economic situation will change this condition.



Thank you for attention!

