Measures of climate change mitigation in the LULUCF sector in the context of EU legislation

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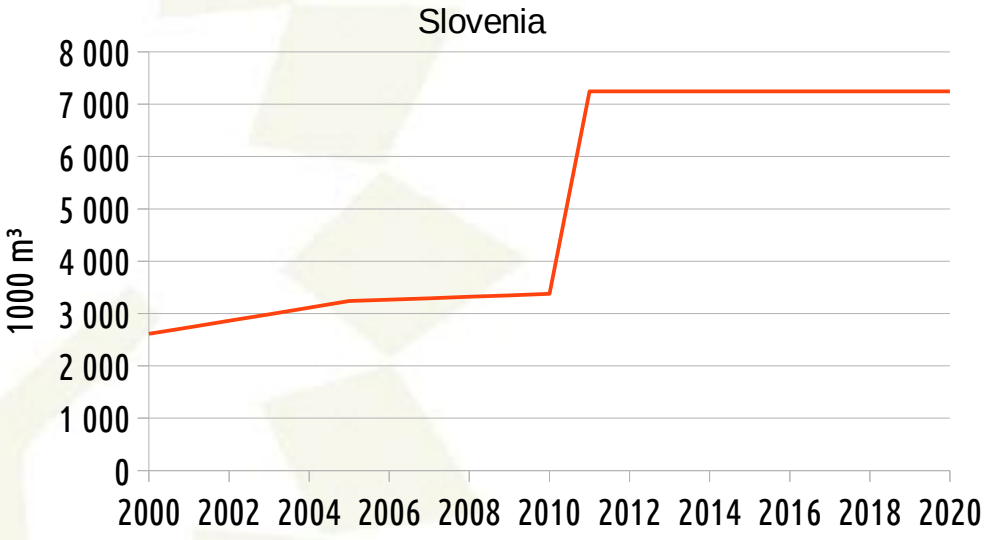
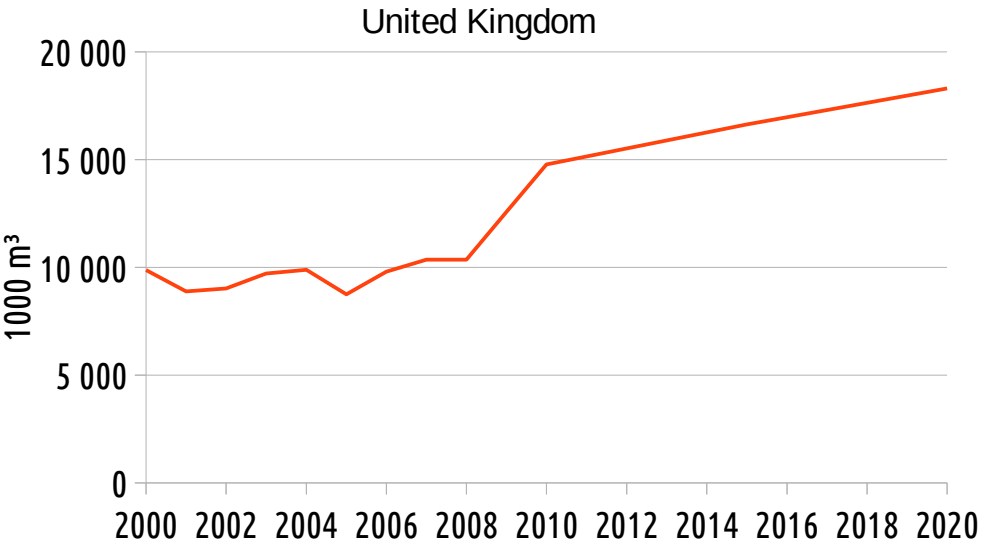
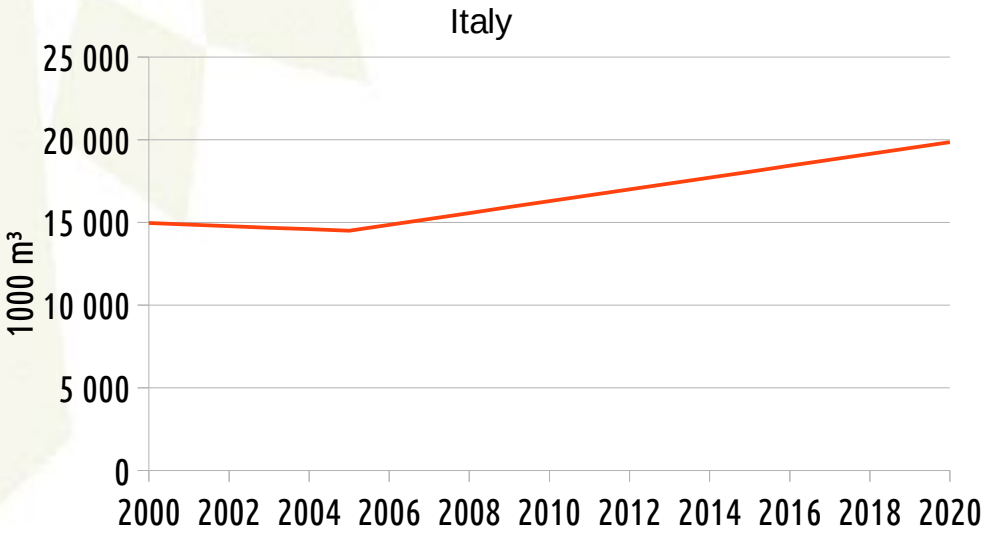
Climate policy targets in LULUCF sector

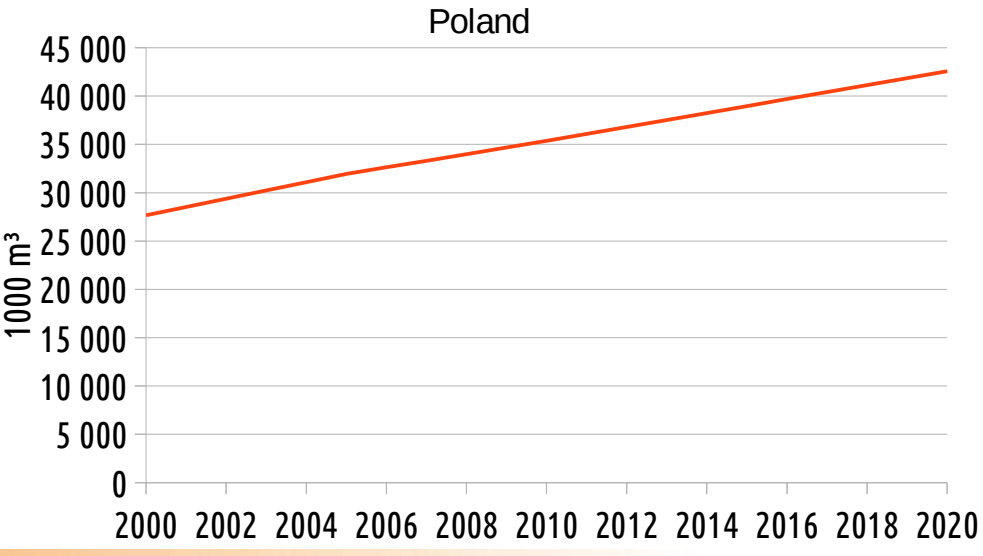
- 2013-2020, the Kyoto protocol second commitment period:
  - forest management – forest management reference level *(subject of technical corrections, not very dangerous as far as can be recalculated)*;
  - cropland, grassland and wetland management – voluntary reporting, no targets yet;
  - **preamble of COUNCIL DECISION (EU) 2015/1339 of 13 July 2015 – LULUCF sector should be net sink of the GHG emissions;**
- 2021-2030, EU Effort-sharing 2030 & LULUCF *(2016/0230(COD) & 2016/0231(COD))*:
  - forest land – new forest management reference level based on management intensity in 1990-2009 *(extracted wood vs. accessible wood, growth conditions and species specific)*;
  - cropland and grassland management – net emissions should be smaller than average in 2005-2007;
  - voluntary targets for wetland management and no targets settlements;
  - gross-net method for afforestation and deforestation (removals due to afforestation should compensate emissions due to deforestation);
  - **net sink rule for the forest management, cropland and grassland management, afforestation and deforestation**.

How serious are the forest management reference levels

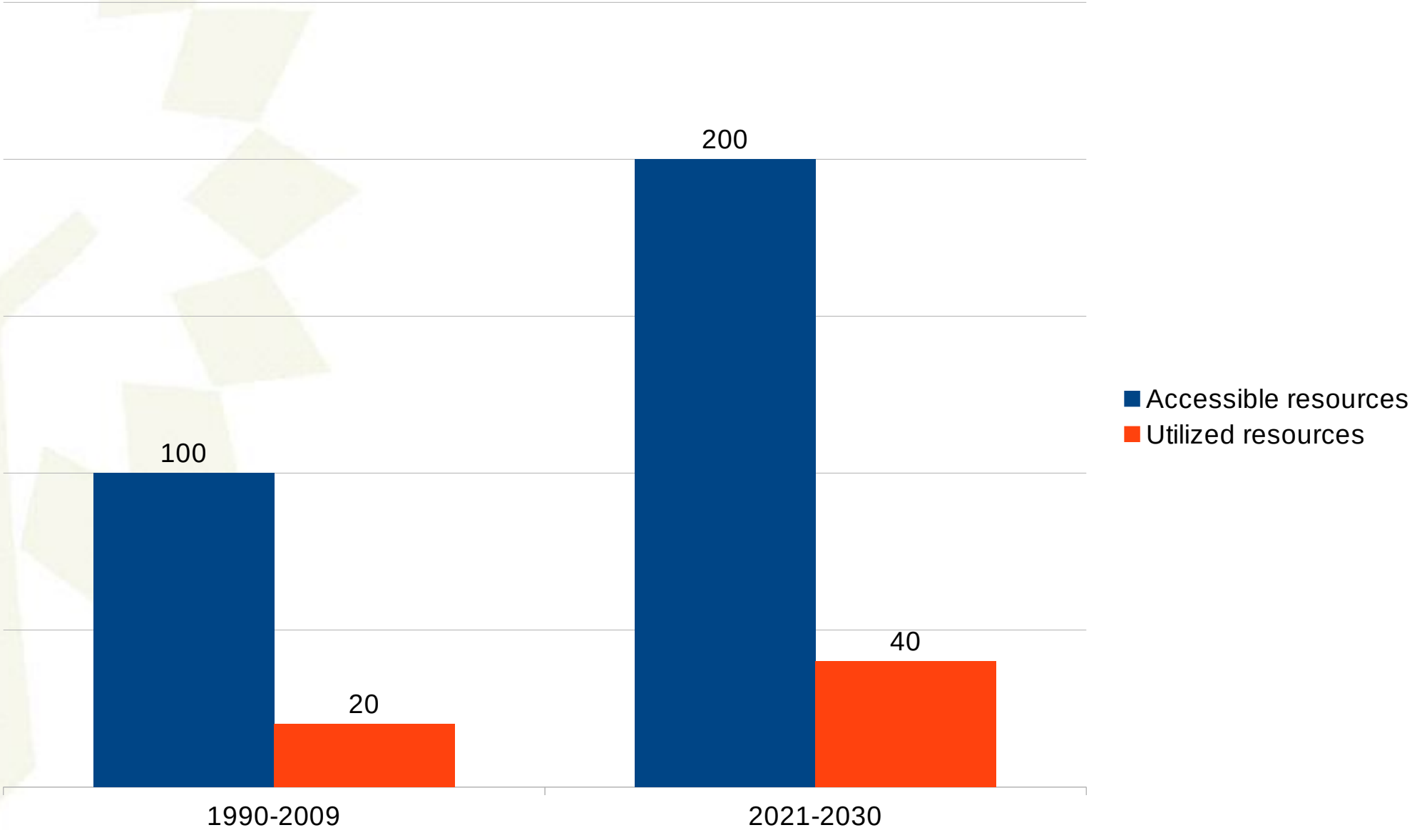




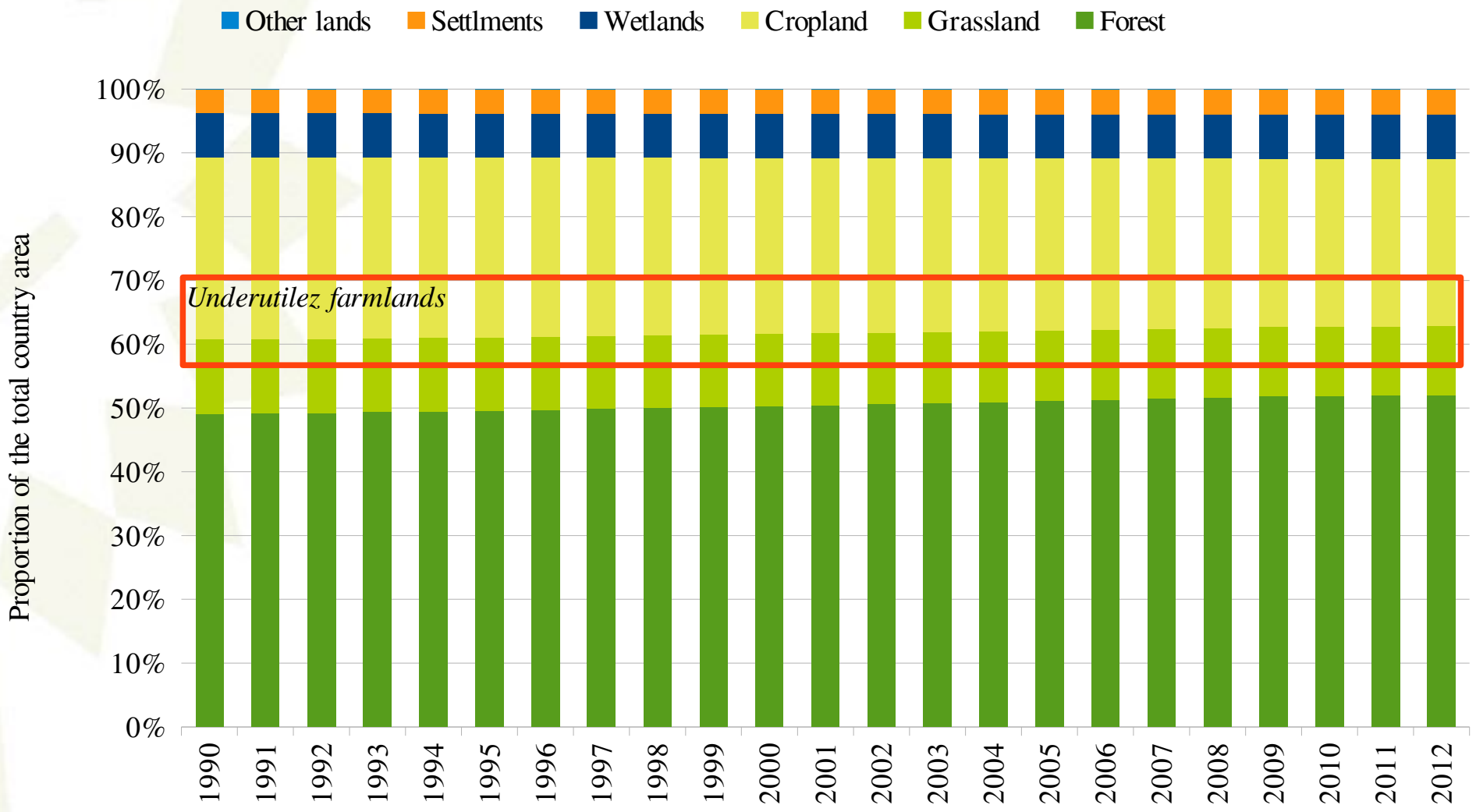




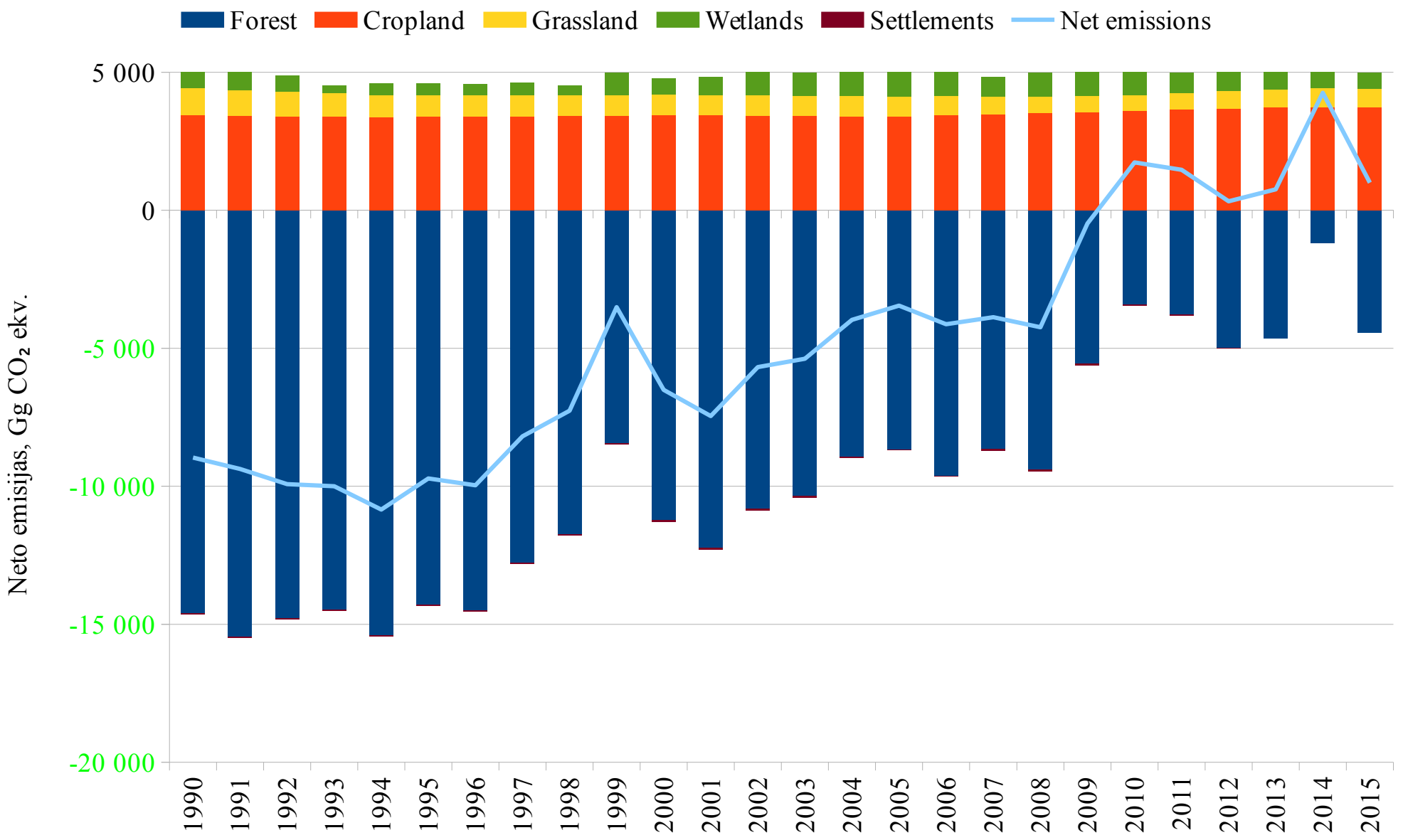
Principles in new forest management reference level



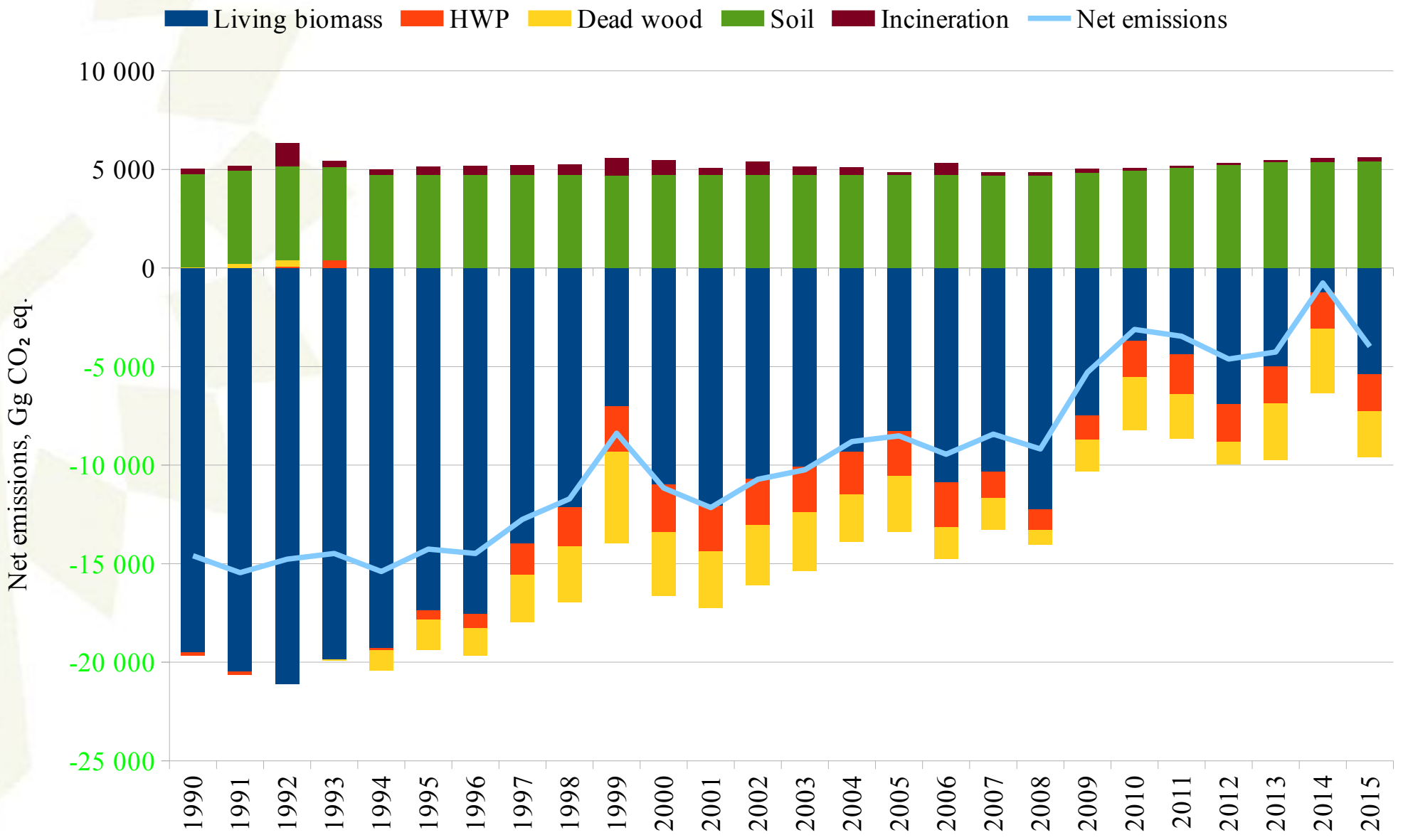
Land use in Latvia



Greenhouse gas emissions in LULUCF sector



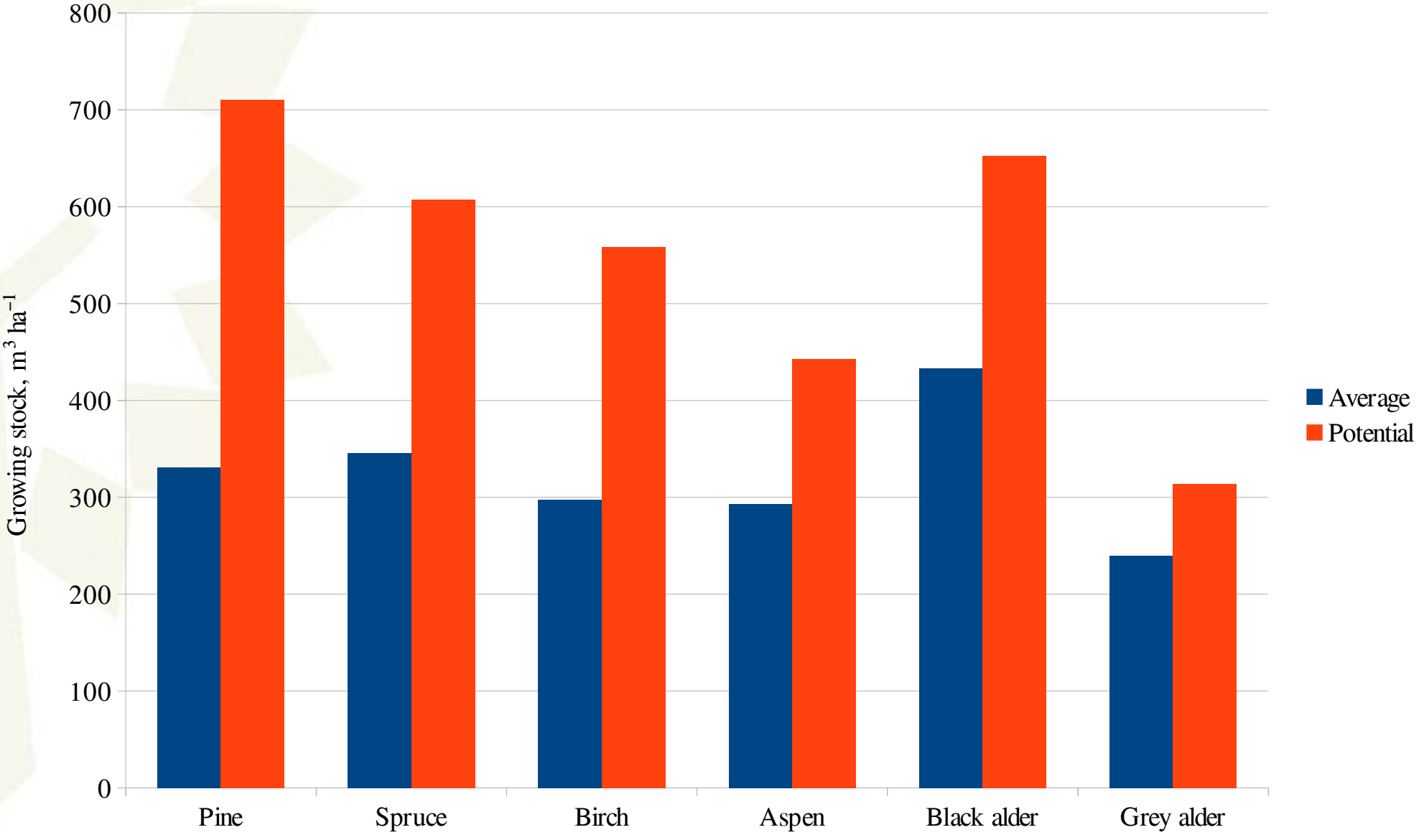
Greenhouse gas emissions in forest lands



What actions & tools are available

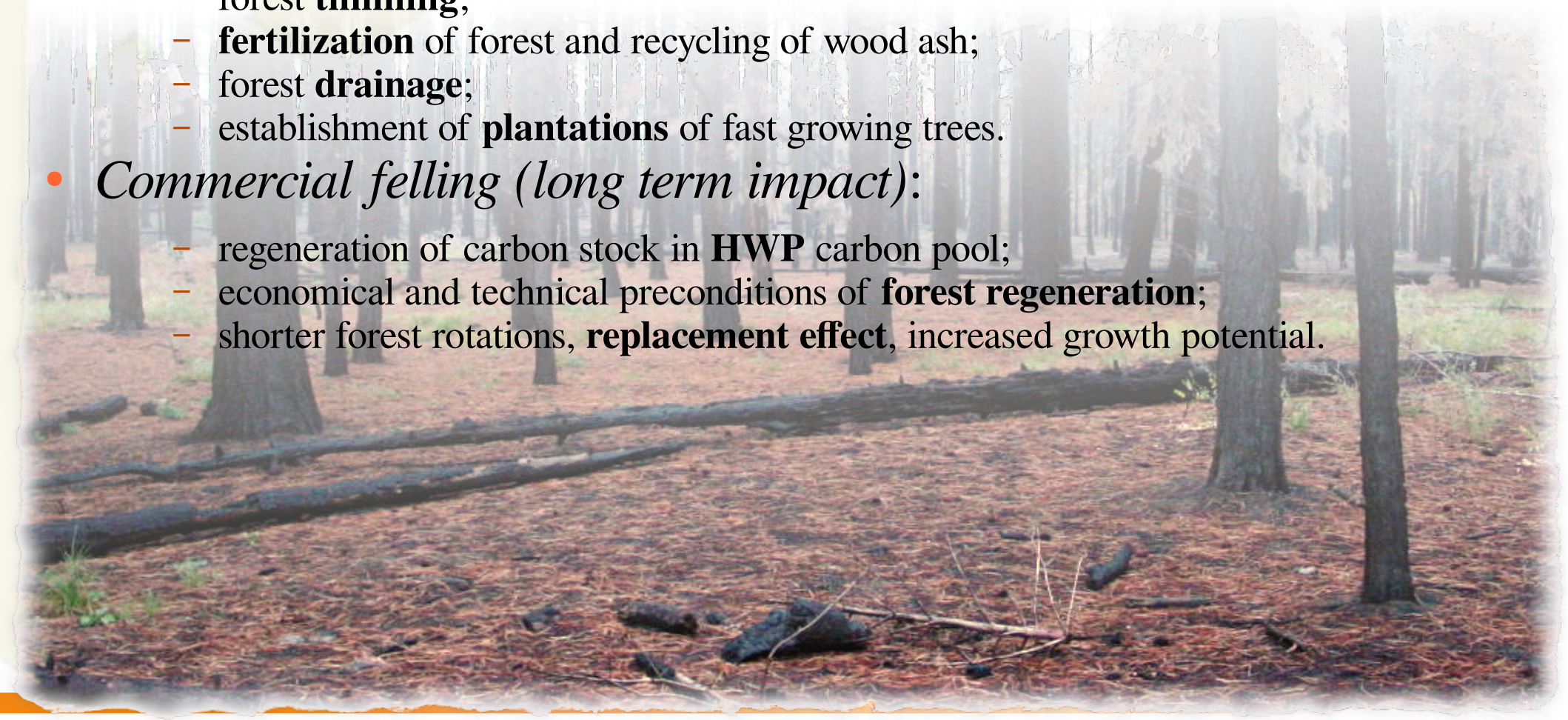
- Forest land:
  - **actions –** more efficient utilization of wood, reduced mortality, higher increments, afforestation;
  - **tools –** common agriculture policy, business driven measures;
- Cropland and grassland management:
  - **actions –** management of organic soils, short rotation coppice crops, higher yields;
  - **tools –** common agricultural policy;
- Wetland management – no actions needed.
- Settlements:
  - **actions –** reduced deforestation, more efficient use of existing infrastructure;
  - **tools –** deforestation tax for private and state projects, compensating afforestation.

Potential and current growing stock in Latvian forests at final felling age



Measures that can contribute to increase of CO_2 removals in forest land

- Measures with *direct positive impact* on CO_2 removals:
  - **afforestation**;
  - purposeful forest **regeneration**;
  - forest **thinning**;
  - **fertilization** of forest and recycling of wood ash;
  - forest **drainage**;
  - establishment of **plantations** of fast growing trees.
- *Commercial felling (long term impact)*:
  - regeneration of carbon stock in **HWP** carbon pool;
  - economical and technical preconditions of **forest regeneration**;
  - shorter forest rotations, **replacement effect**, increased growth potential.



Afforestation

- Reduction of husbandry production in 90^{ths} led to abandonment or extensive use of the most of pastures and considerable area of cropland.
- About **400 kha** ***(17 %)*** of farmlands would not be necessary for crop production.
- Establishment of **200 kha of poplar/salix plantations** would increase harvesting stock by 5 mill. m^3 during 20 years, additional CO_2 removals **3.7 mill. tons CO_2 annually**.
- **Afforestation of organic soil would reduce emissions in cropland and grassland to "0".**

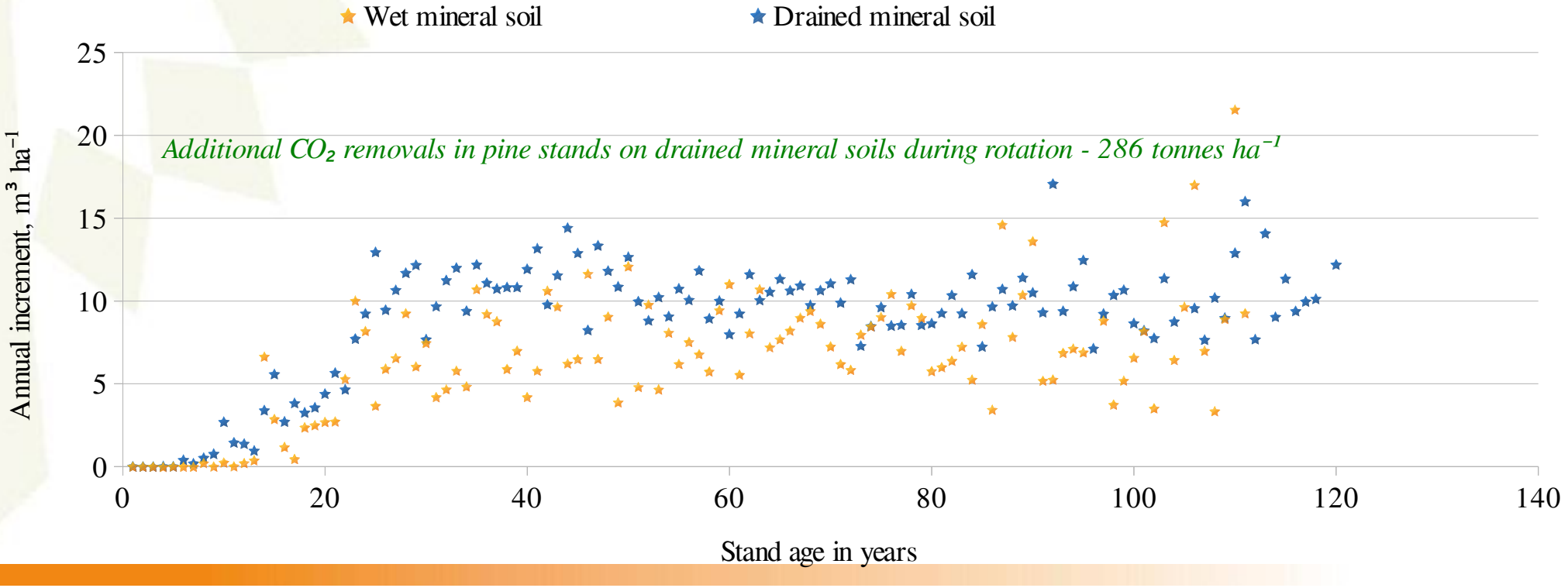
Choices for management of residual farmlands

EU subsidies, no real added value or extensive, costly production

Investment with high rate of revenue

Forest drainage

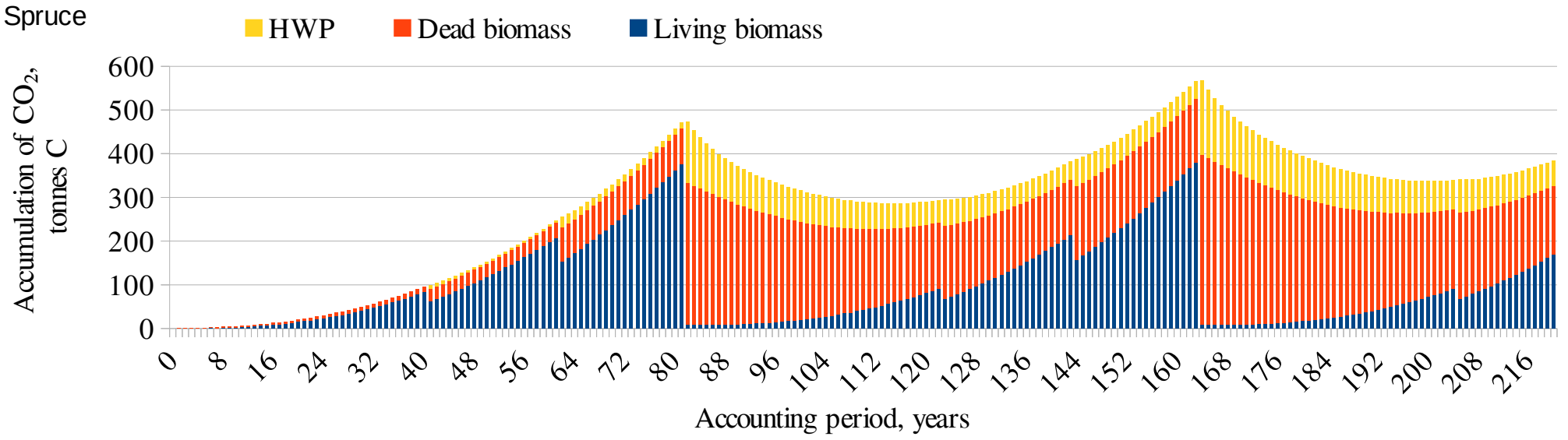
- Additional CO_2 removal on drained mineral soil is 3.3 tonnes ha^{-1} annually, on organic soils – 2.7 tonnes ha^{-1} annually *(soil emissions might be under- or over-estimated)*.
- The potential of forest drainage in Latvia – additional removals of **1483** Gg CO_2 annually.

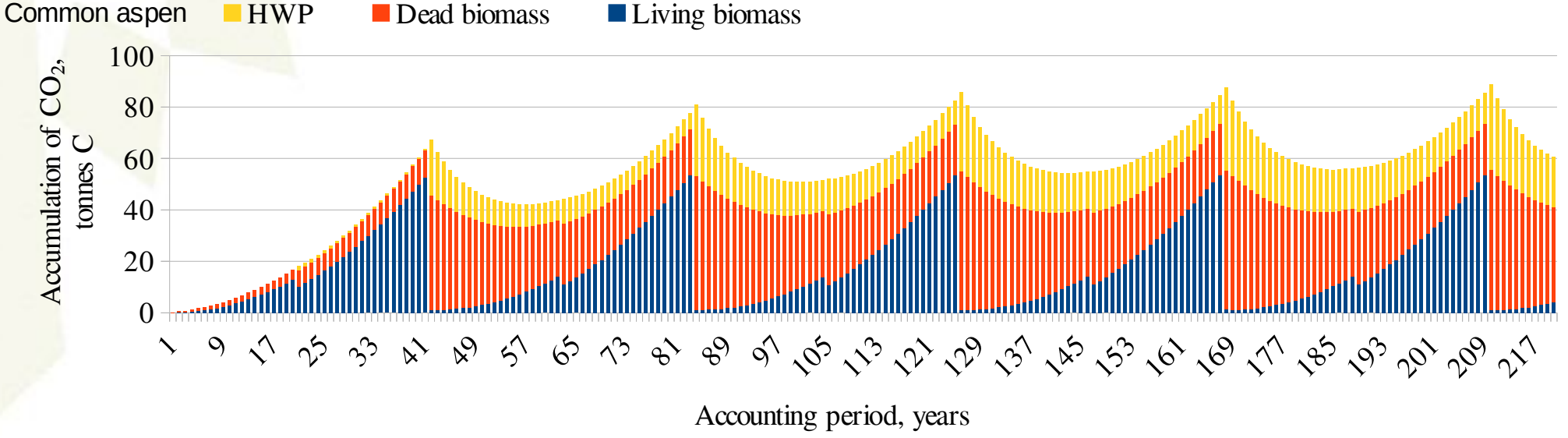


Forest regeneration

- Additional CO_2 removals in living biomass due to breeding effect is **50 tonnes ha^{-1} of CO_2 removals** per forest management cycle.
- Direct impact of **breeding** can reach **103948 Gg CO_2** in 75 years or **138 Gg CO_2** annually.

Another aspect of forest regeneration – selection of species

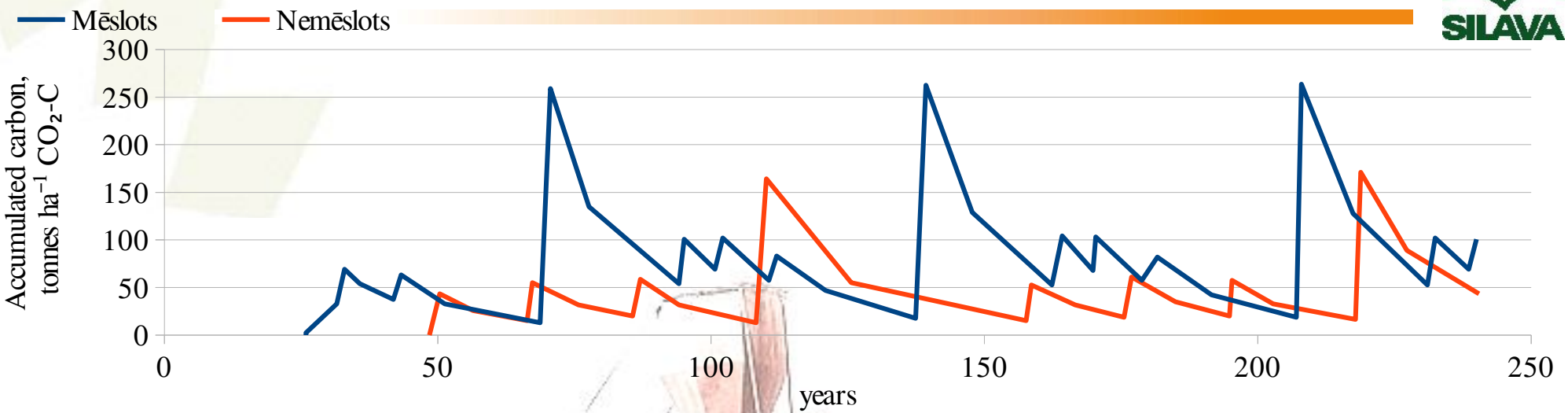




Forest thinning

- Secures continuous CO_2 removals in forest stands.
- Improves health of forest stand and reduces risk of natural disturbances.
- Increase carbon stock in HWP *(10-15 % of total removals in HWP)*.
- **Contributes to replacement of fossil fuel *(15-20 % of the total)*.**
- **Contributes to additional CO_2 removals in living biomass *(in spruce and pine stands 110 Gg CO_2 annually)*.**

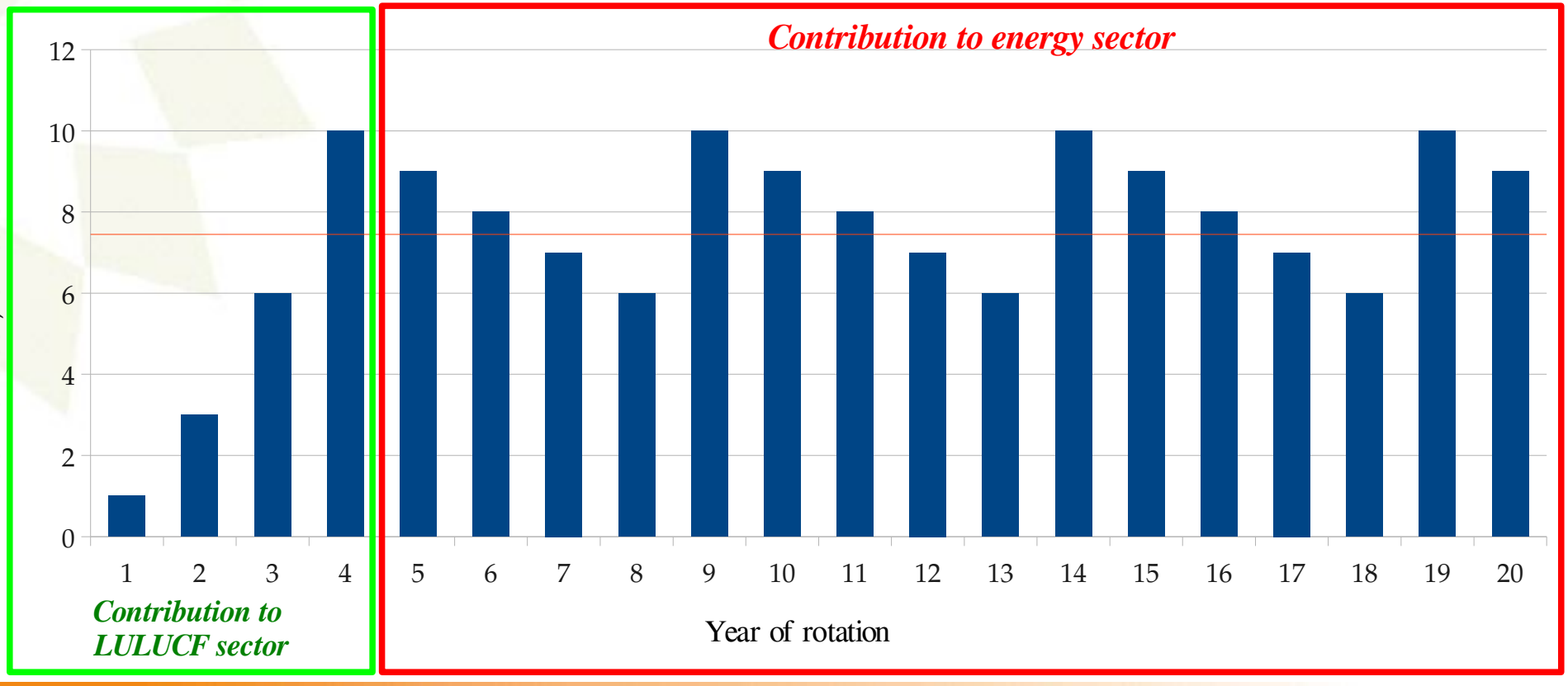
Forest fertilization & ash recycling



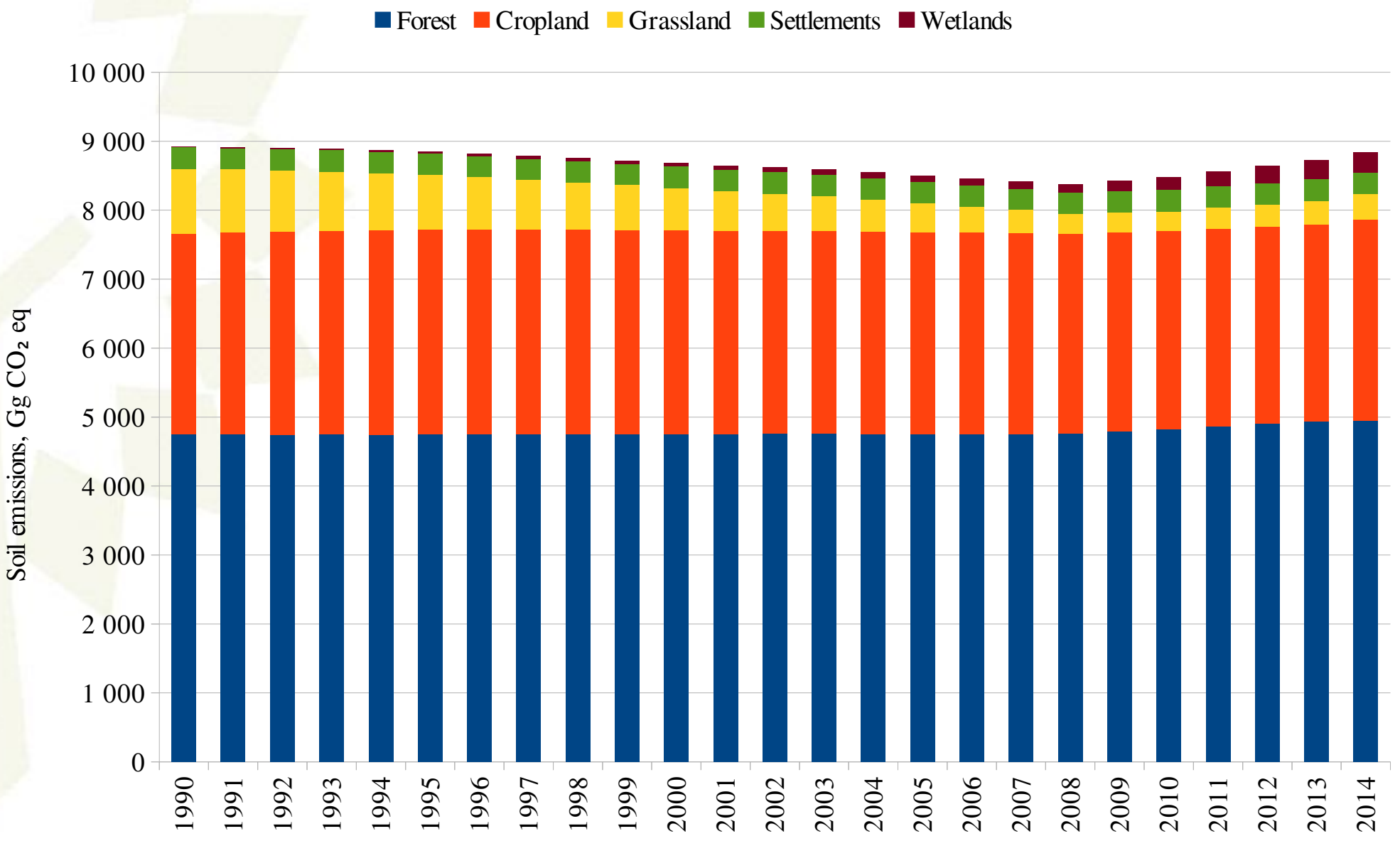
- In 240 years fertilized forests removes twice more CO_2 than control stands.
- In Latvia theoretical potential of forest fertilization is additional removals of **1.2 mill. tonnes** CO_2 annually.

Forest plantations & woody coppice crops in fields and buffer zones

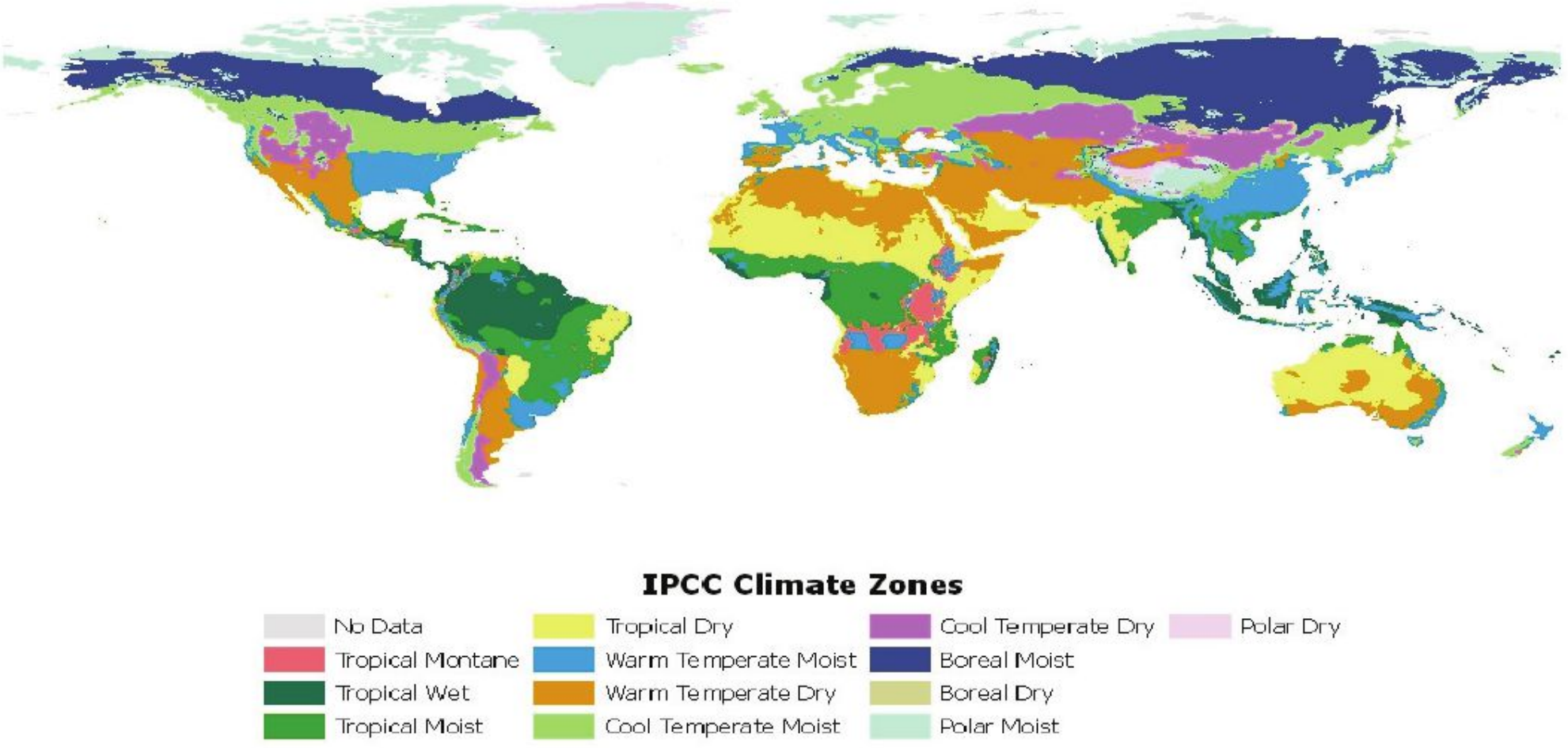
- Short rotation, the highest possible yields, utilizes residual nutrients *(as buffer zones and as recipients of sludge and ash)*.
- Willow plantation in **80 years replace 960 tonnes ha^{-1} of CO_2 emissions *(0.4 mill. tonnes CO_2 annually in 30000 ha)***.



Impact of organic soils on emissions and measures in cropand and grassland



IPCC map of default climate zones & soil emissions



Knowledge needed

- Real estimates for impact of certain climate change mitigation measures.
- Emission factors for organic soils and wet / drained mineral soils.
- Better understanding of land use – where are about 0.4 mill h of farmlands not used for crop production.
- ***Education of stakeholders, adaptation to new, more diverse business models.***


Thank you for attention!