Role of sustainable bioenergy

WWF Hungary
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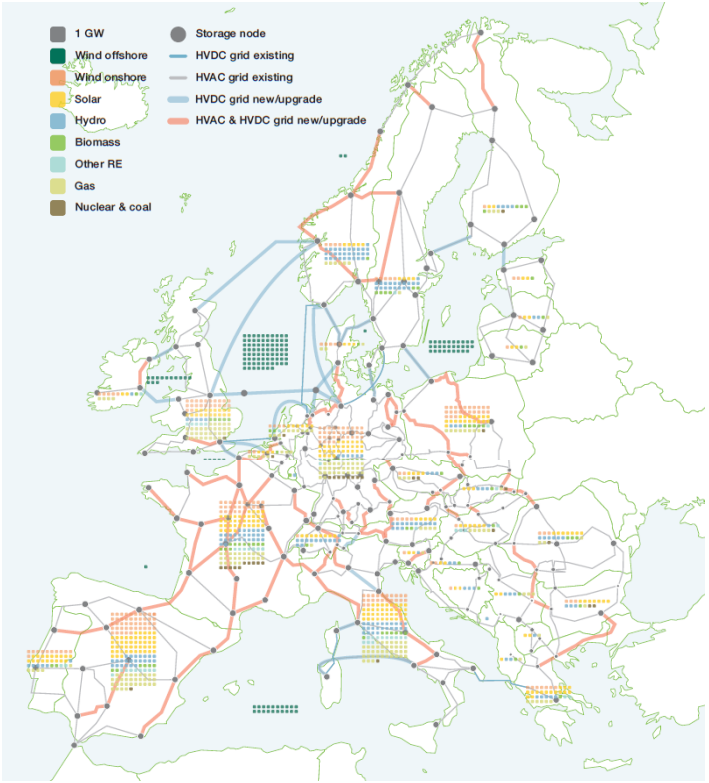
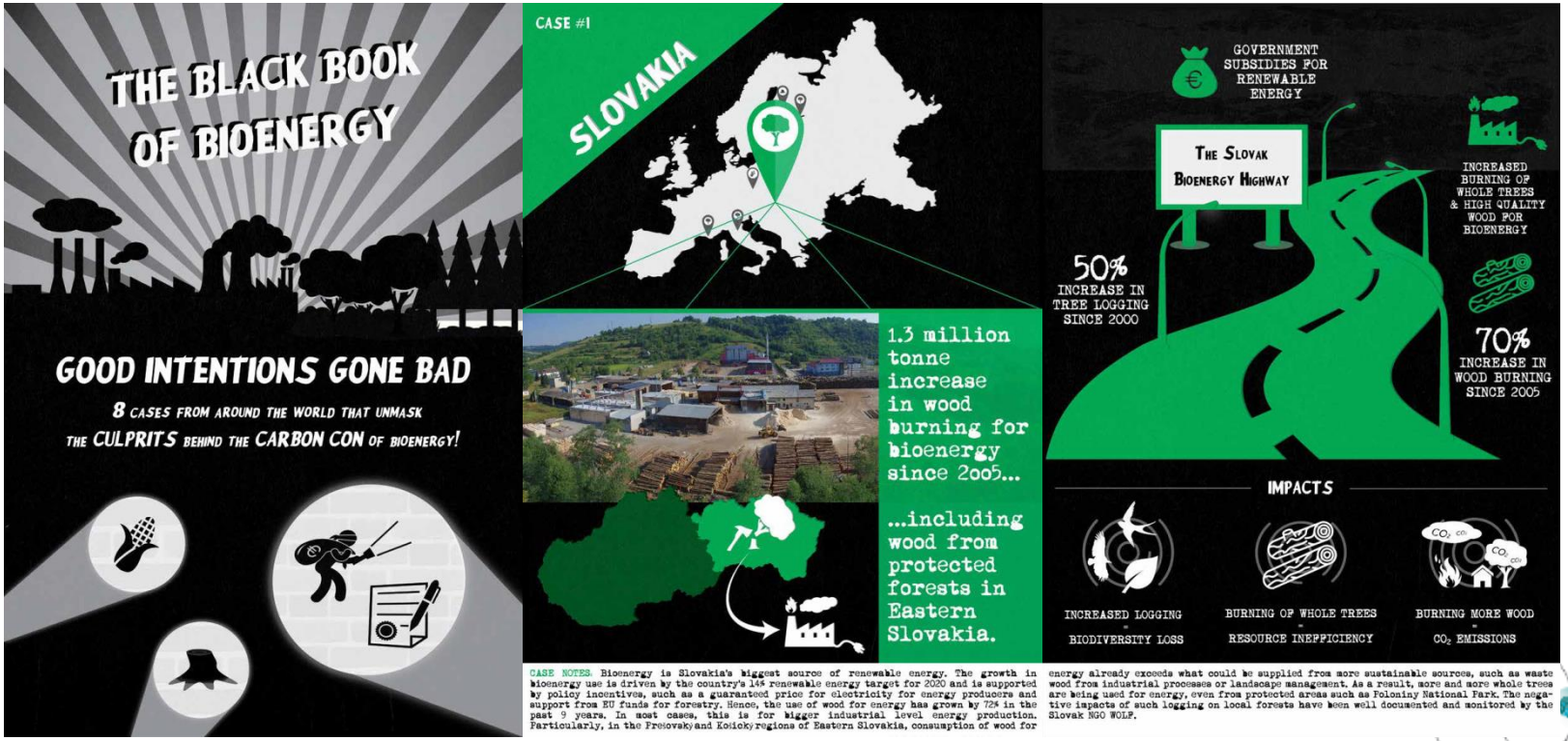
Sopron, 2017.05. 17.

Role of bioenergy



Sustainability concerns…



Source: BirdLife International. The Black Book of Bioenergy

Statements (NGO coalition, 2016)

Sustainable bioenergy **has a role to play in Europe's transition** to an energy system based on renewable energy and energy efficiency. However, to avoid serious negative consequences for carbon emissions, biodiversity and land conflicts, the EU should introduce four main **safeguards** for bioenergy use as part of the EU's 2030 climate and energy policies.

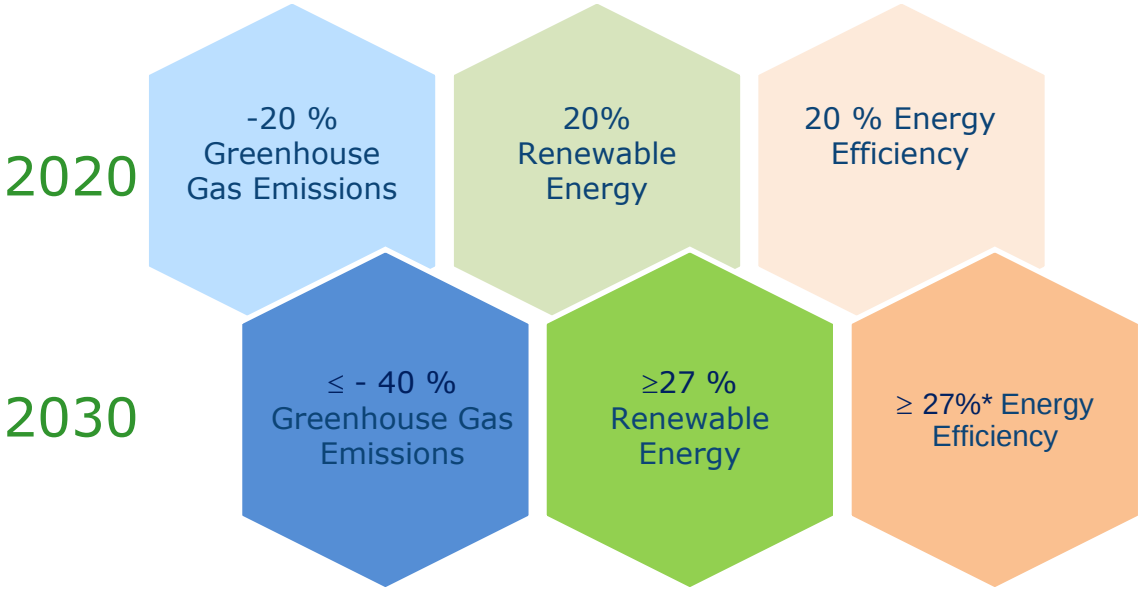
- introduce a **cap** to limit the use of **biomass for energy productio**n to levels that can be sustainably supplied;
- ensure efficient and optimal use of biomass resources, in line with the principle of **cascading use**;
- include correct **carbon accounting** for biomass;
- introduce comprehensive **binding sustainability criteria**.

Greenpeace, Transport & Environment, act!onaid, Birdlife International, Brot für die Welt, Fern, Dogwood Alliance, NRDC, Oxfam, southern environmental law center, Wetlands International

WWF: About the role bioenergy

- Focus on 1,5^{0}C pathway rather than 100% renewables
- Biomass has to play a role as a renewable resource in a more sustainable energy future…
- BUT the availaibility of sustainable biomass is limited
- SO other renewable sources like solar & wind have to play a much bigger role
- Biomass could be used when no other renewable alternative is available

Winter Package:
Climate and Energy objectives 2030



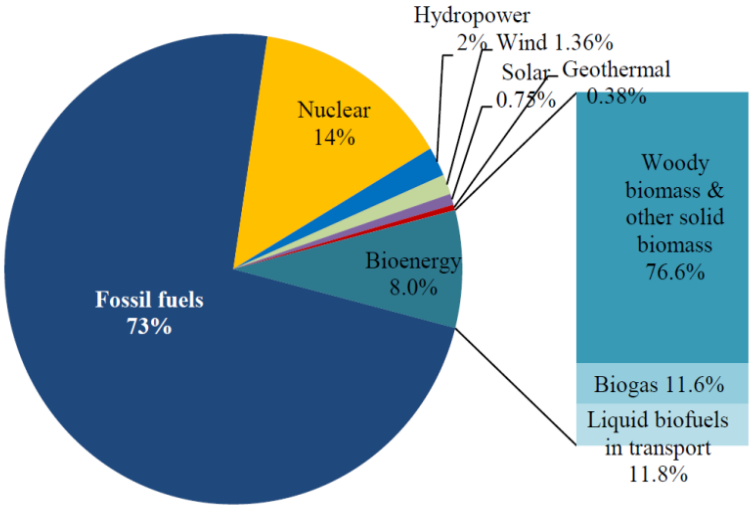
EU RED was designed to reduce GHG emission

2020	2030
20 % RES share overall	At least 27 % RES share
National binding targets for RES	Binding at EU level
Specific target for RES-Transport	No national or sector specific targets

- to promote renewable energy sources
- to deliver greenhouse gas emissions reductions as part of the EU's policy to tackle climate change

Climate change perspective!

EU proposal: Bioenergy



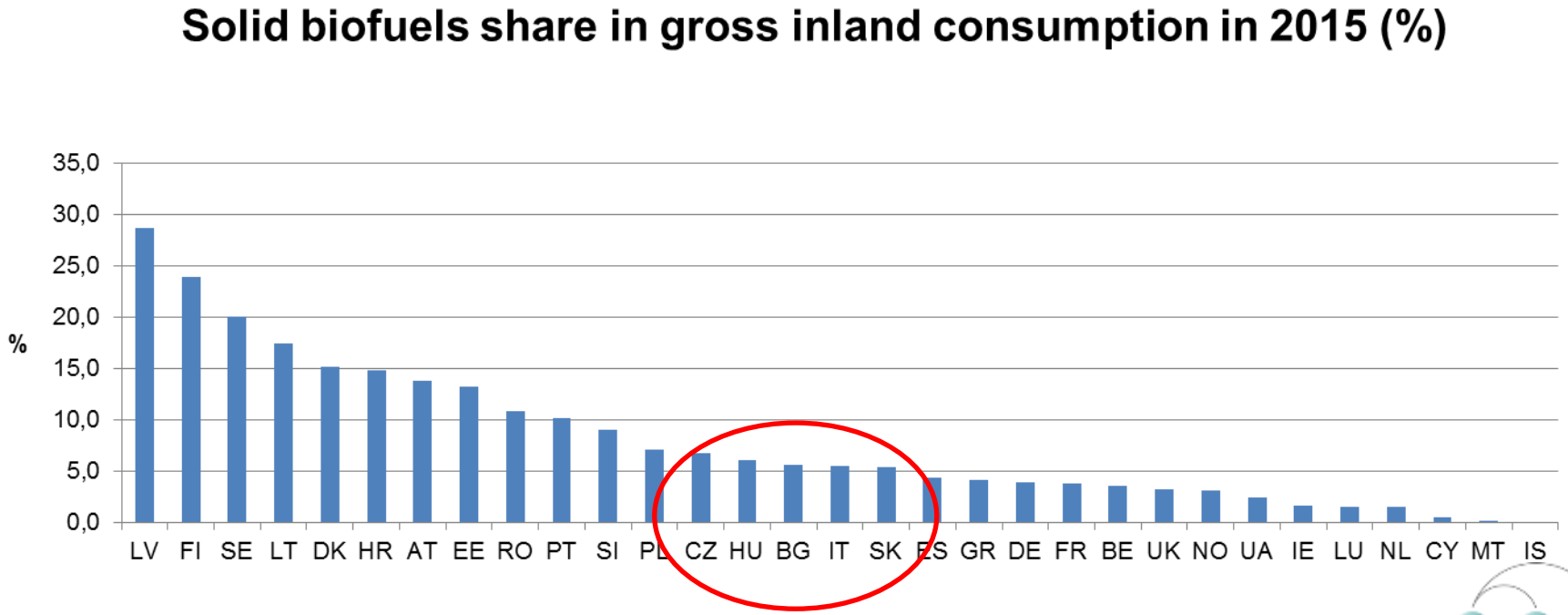
Focus on solid biomass/biogas for heat and power .

Energy security, growth and jobs, technology innovation, and climate action.

Emerging risks :

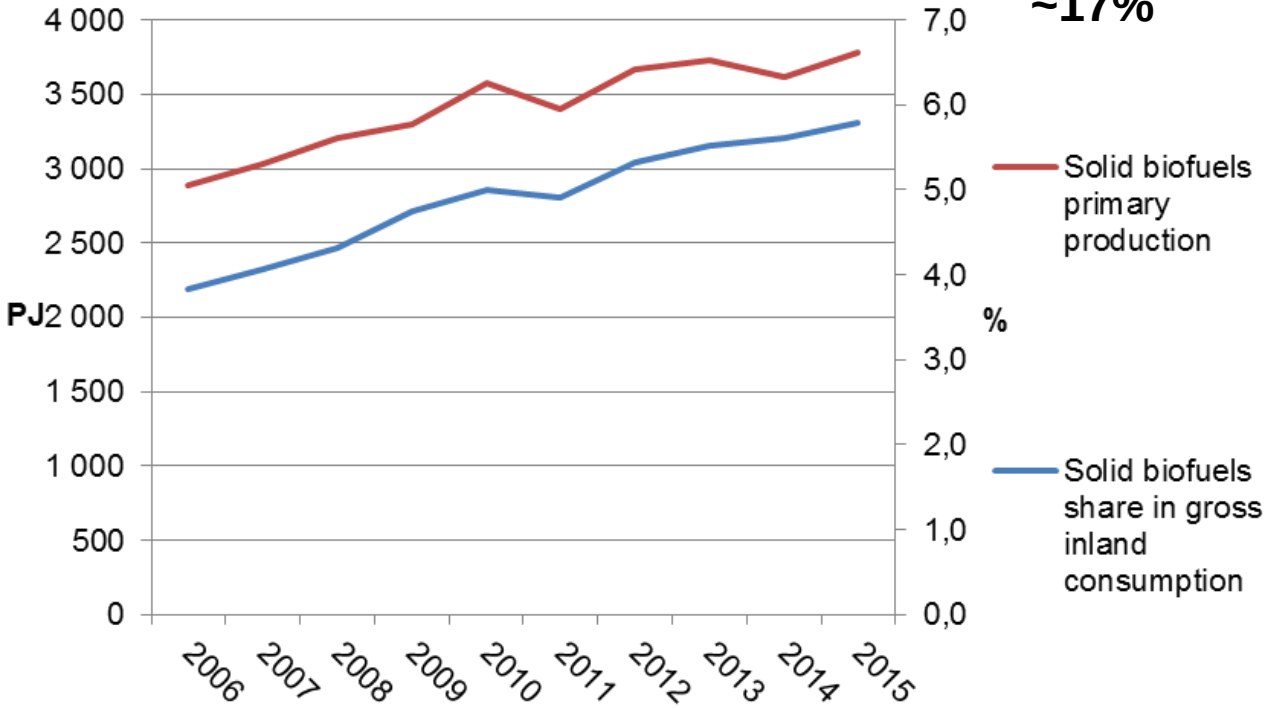
- Climate performance of forest biomass
- Environmental impacts (e.g. biodiversity, soil and air quality)
- Low conversion efficiency of biomass electricity
- Potential internal market issues costs due to diverging national sustainability schemes

Where are we now?

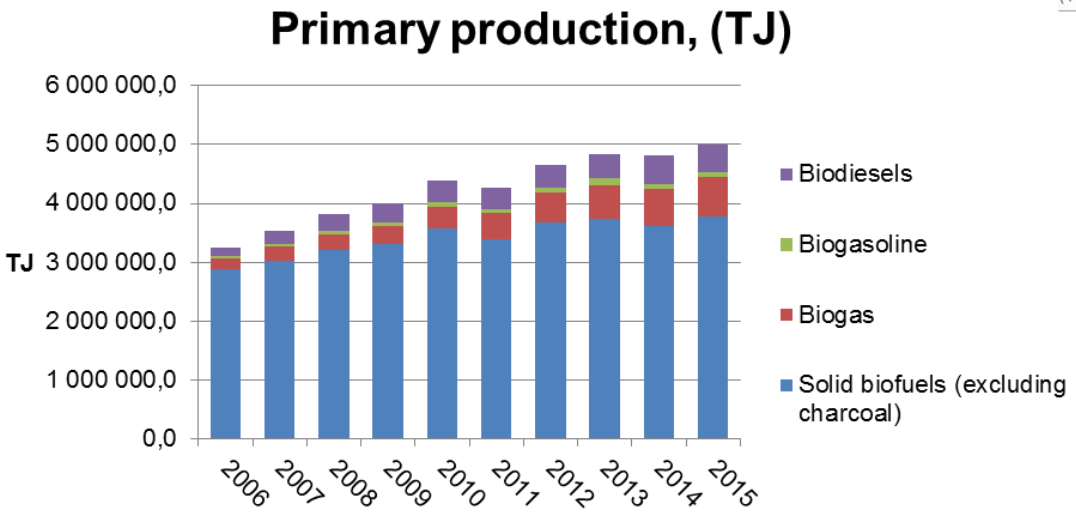


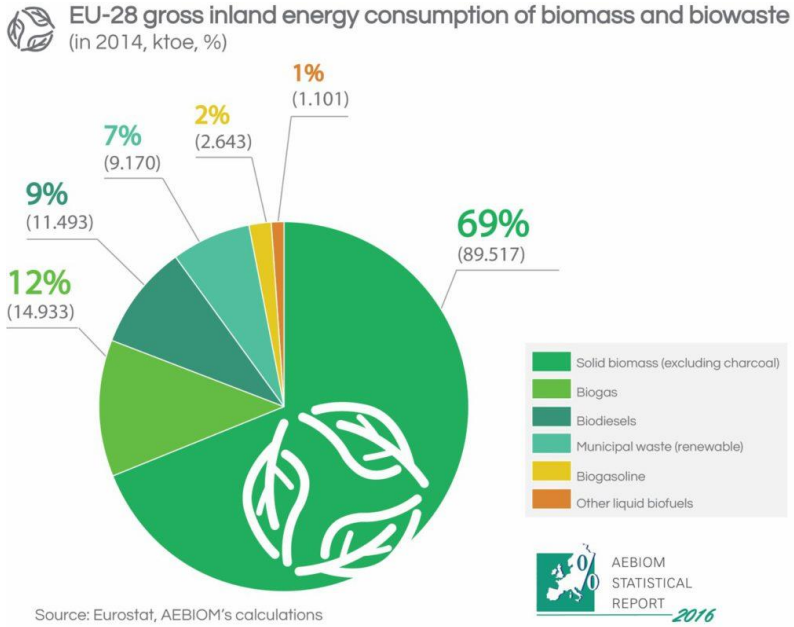
Share of solid biofuel is still significant

RES share in EU28:
~17%

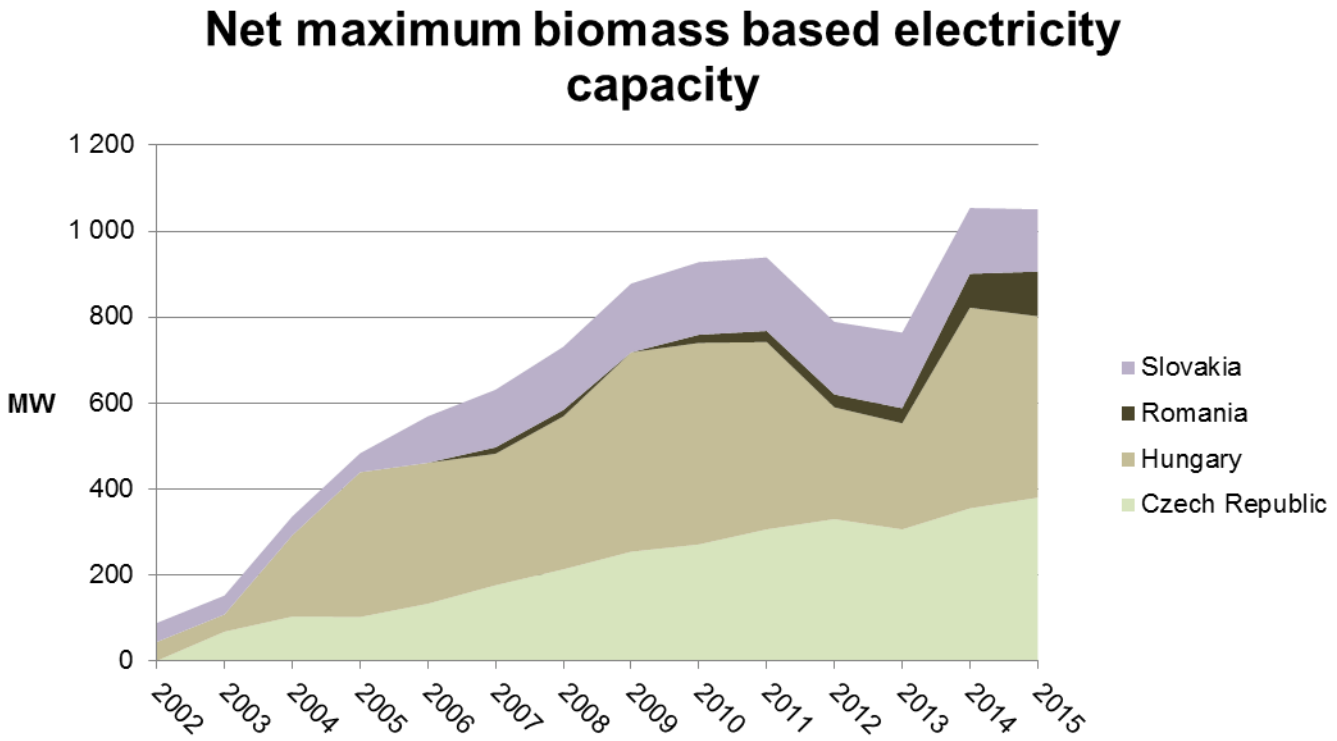


Biomass is still the single largest among biofuels



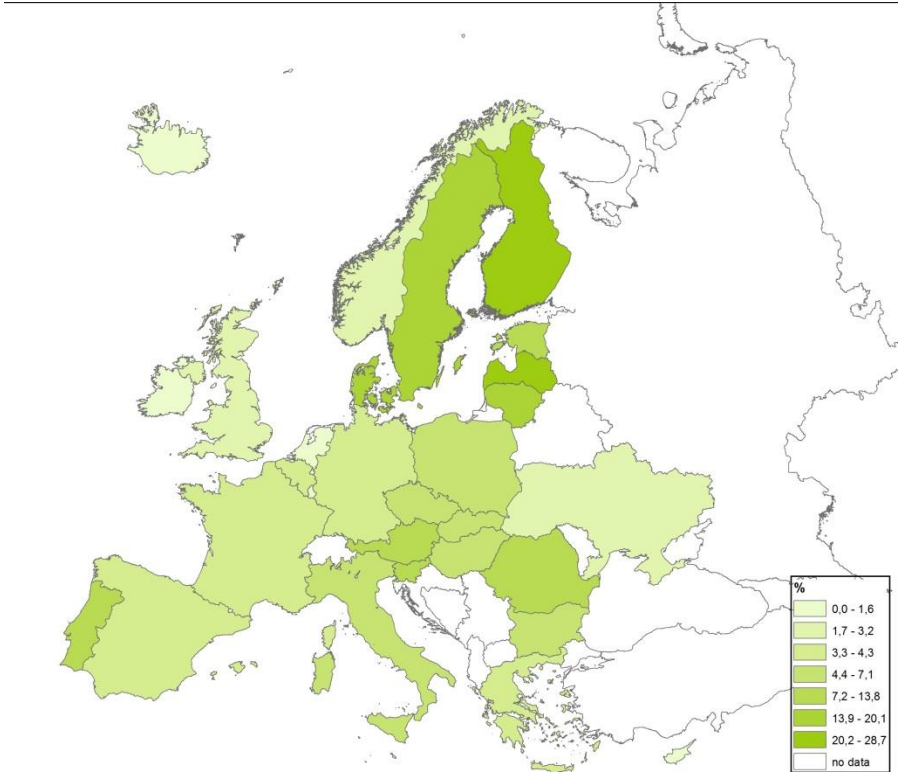


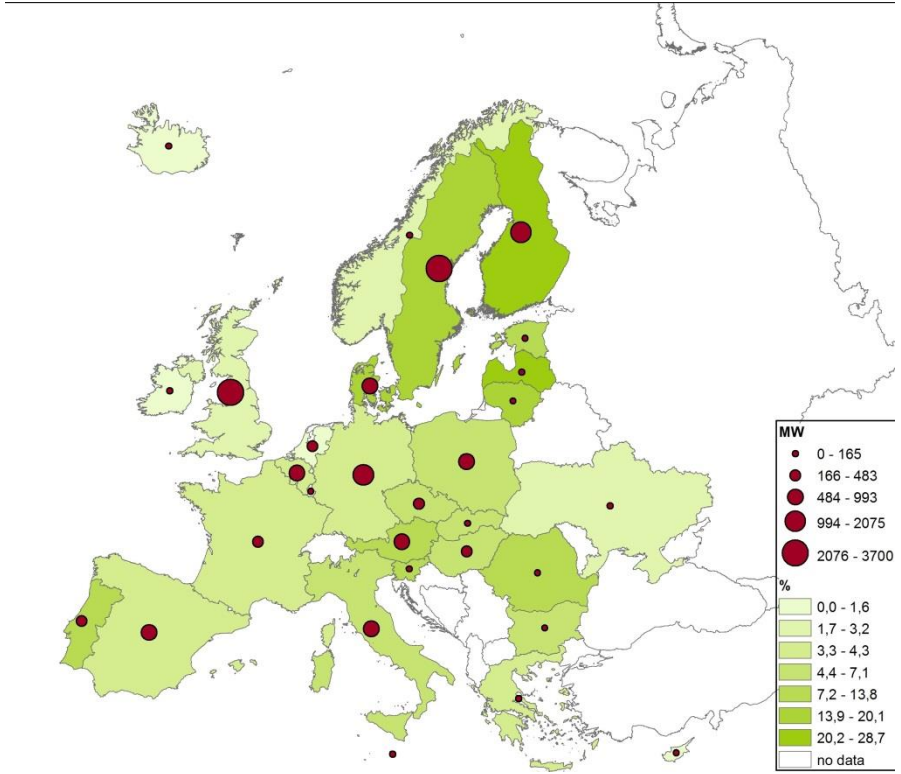
The biomass based power capacity has increased steadily



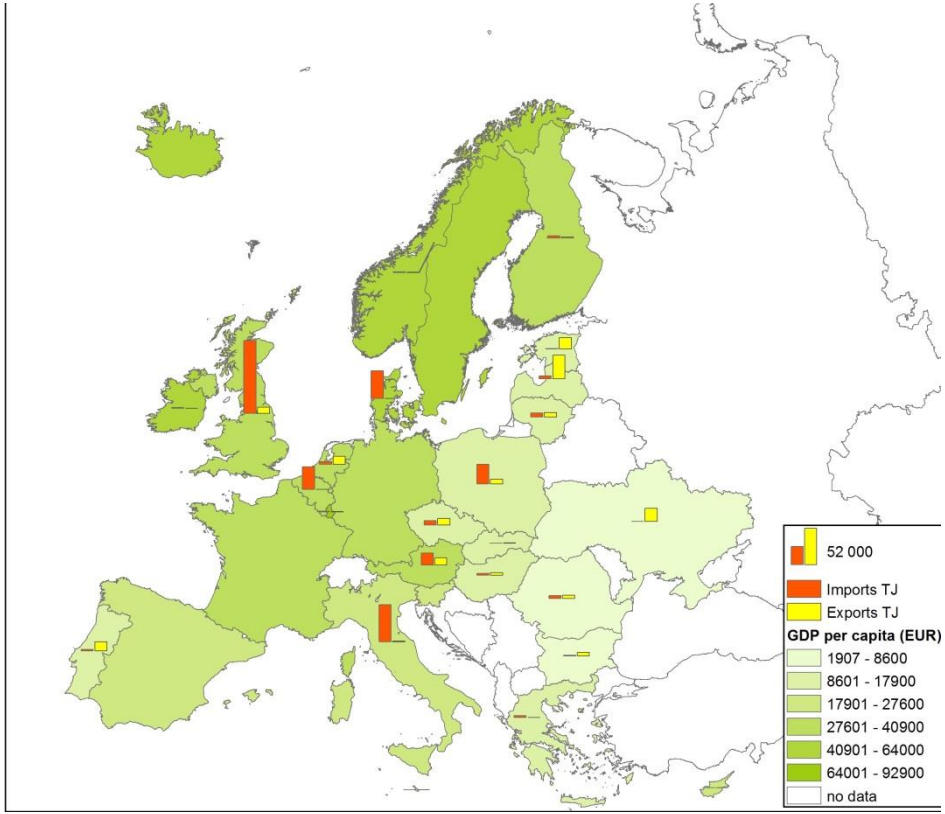
Solid biofuel share in gross inland energy consumption

and net capacity of solid biofuel electricity production





Biomass import and export in Europe



EU proposal: Bioenergy sustainability

Environmental impacts of bioenergy	• Baseline: no additional EU action • Extend existing EU biofuel criteria to biomass for heat and power (sustainability + GHG saving criteria)
Biogenic GHG emissions of forest biomass	• New risk-based sustainability criteria for forest biomass, covering forest management and forest carbon • National limits on the use of roundwood and stumps for energy production
Resource competition/ end-use efficiency	• Minimum requirement for end-use efficiency on biomass in heat and power

EU Proposal: bioenergy sustainability framework (article 26)

- *Sustainability criteria for same feedstock independent of final use*
- *End use performance criteria for biofuels, biomass and biogas*

Sustainability criteria

agri

agriculture biomass – kept/streamlined existing sustainability criteria (e.g. no-go areas) (full harmonization)

forest

forest biomass – new risk-based criteria on biodiversity and carbon management (minimum requirement, Member States can go beyond)

End-use performance criteria

GHG

biofuels/bioliquid - GHG savings increased to 70% for new installations

heat and electricity from biomass (20 MW_{fuel}) and **biogas** (0.5 MW_{el}) - new GHG saving requirement: 80% for new plants in 2021 (85% in 2026)

efficiency

Cogeneration requirement for all new bioelectricity plants (20 MW_{fuel}), 3-year transition period + exceptions for security of supply.

Sustainability concerns

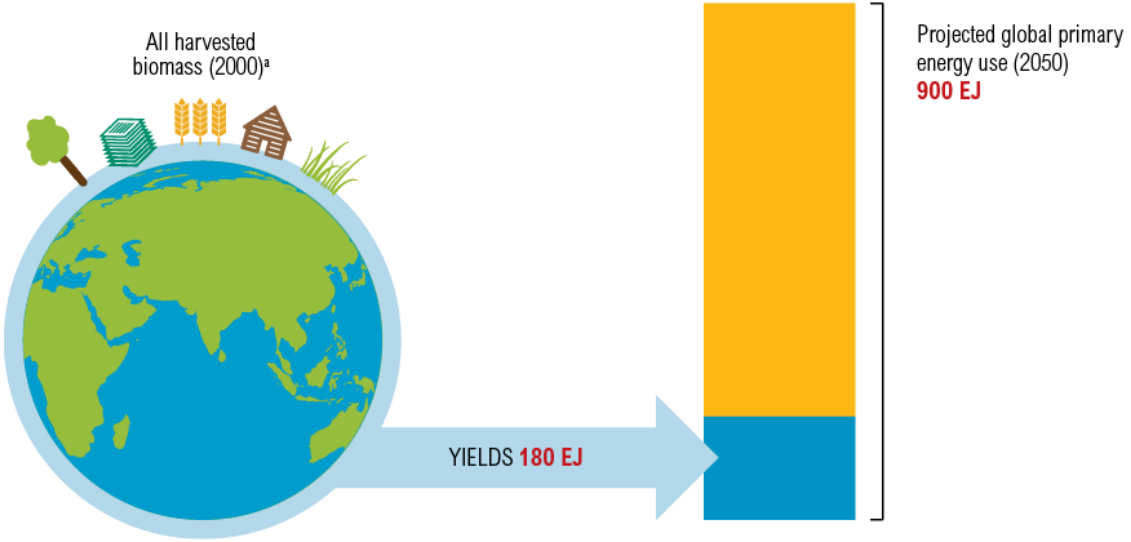
- Incentivising the dedicated use of land for bioenergy production is not optimal from a climate policy perspective – *limited incentives to suggest*
- Installations <20MW don't need to comply with sustainability criteria - risk
- Feedstocks from land with high biodiversity value / high carbon stocks don't include biomass from forests – *risk of harvesting HCVF*
- Country of biomass origin needs to have legislation on forest management and legislation on LULUCF accounting. – *enforcement risk*
- GHG emissions savings criteria (relative to fossil fuels) for all bioenergy. New electricity and heating and cooling installations: 80% threshold - *Only covers emissions from the supply chain.*

Draft viewpoints

- Comprehensive LCA for forest biomass (climate-relevant timeframe; biogenic emissions, changes in forest carbon stocks; forgone growth, ILUC)
- In the absence of that no subsidies for energy purpose harvesting of forests, or for coarse residues (stemwood and stumps) > no carbon benefit
- Sustainable forest management practices should not be regulated by the EU RED.
- In plants over 1MW in size, biomass use should only be subsidised if used in CHP plants with a high efficiency rate
- No support of “co-firing”
- Efficiency threshold - minimum efficiency standards and/or incentives for highly efficient installations (not only for new ones)
- Support the use of post-processing residues

Do we have enough biomass?

Using All of the World's Harvested Biomass for Energy Would Provide Just 20 Percent of the World's Energy Needs in 2050 (Exajoules per year)



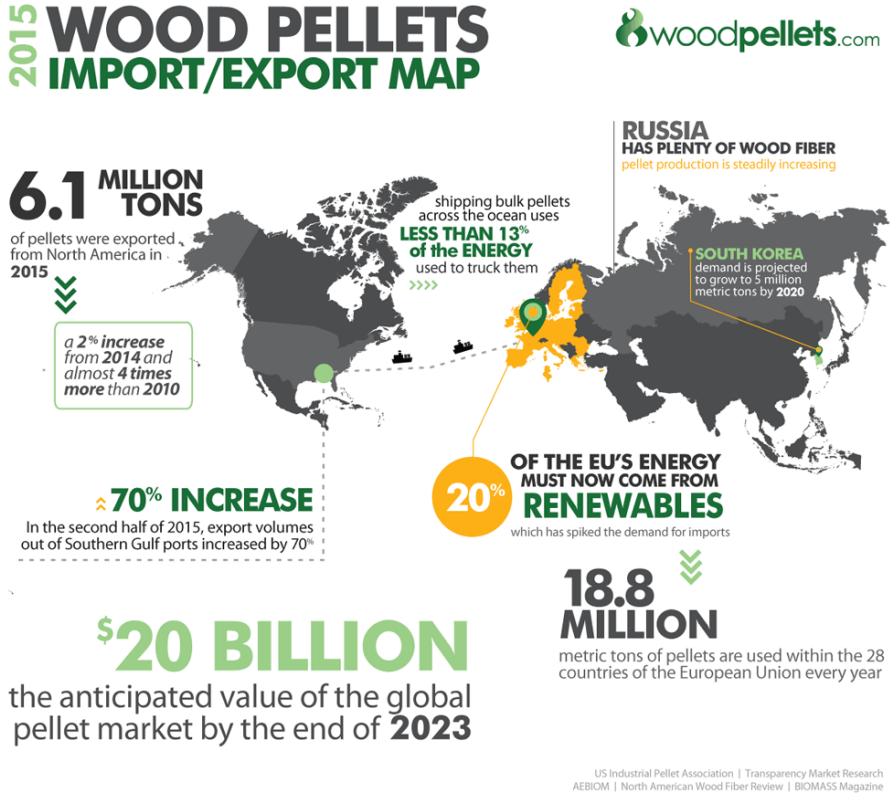
Source: Authors' calculations based on Haberl et al. (2007), IEA (2008), and JRC (2011).
Note: a. Total amount of crops, harvested residues, grass eaten by livestock, and harvested wood contained 225 EJ, but would replace only 180 EJ of fossil fuels because of conversion efficiencies from biomass to useable energy.

http://bit.ly/1K5FCSr

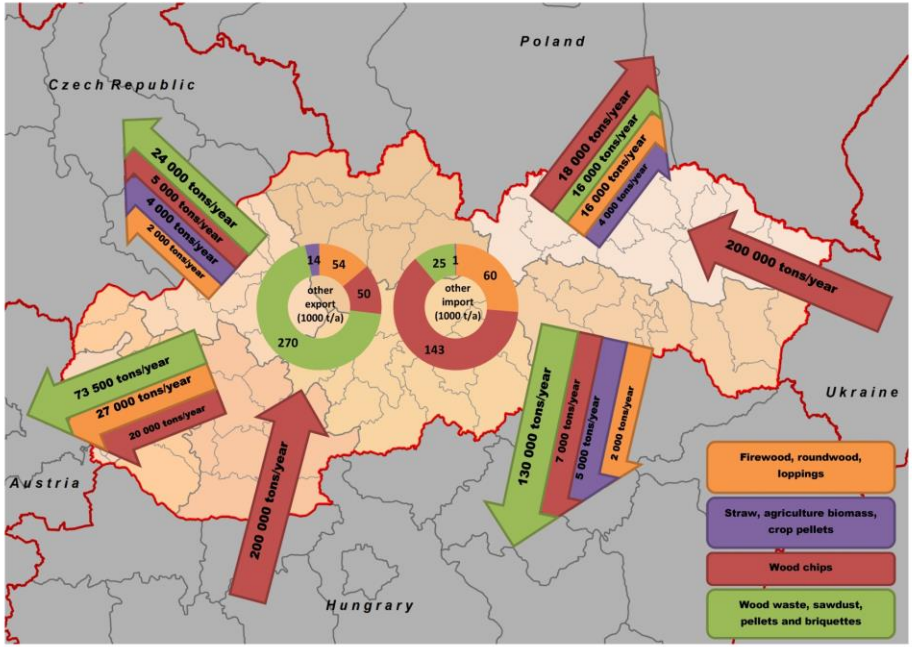
WORLD RESOURCES INSTITUTE

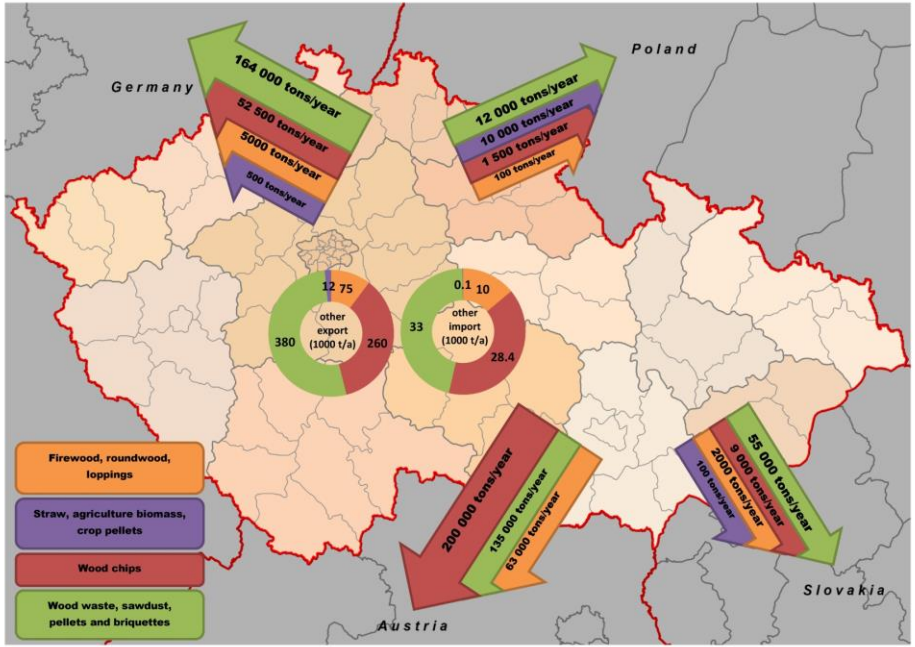
WRI, 2015

The international trade of biomass products has significantly increased

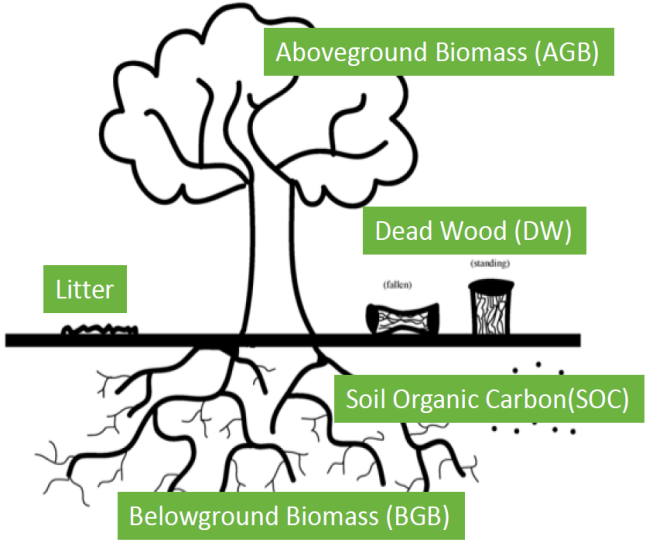


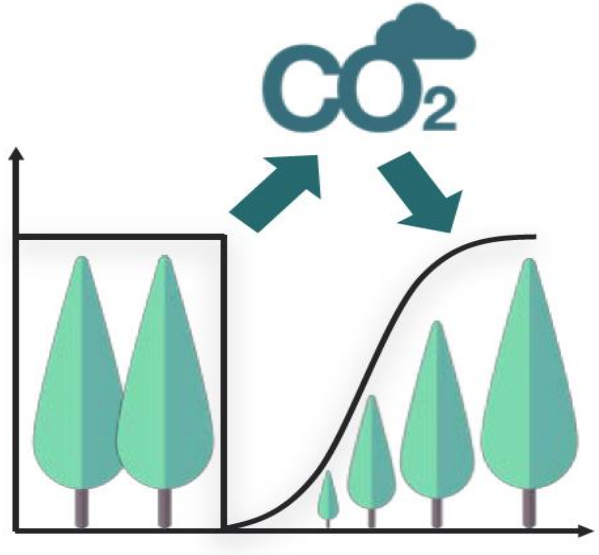
Not easy to trace regional biomass trade…





Full accounting of carbon emissions needed





Land management trade-off:

maximizing biomass productivity will decrease carbon stocks

On a 20 year calculation period forest based residues will deliver little or no reductions in GHG emissions compared to fossil alternatives. 100 year perspective 80-90% lower CO2 than fossil fuels.

Selected take aways

- Optimized use only in high efficient installations (no co-firing)
- Competition for land
- Limited availablility because of rising food/timber & carbon storage demands
- Land always has high opportunity cost
- Need for proper GHG emission accounting

Thank you!

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Sustainability should be ensured in the whole value chain, not only at site level

How and where biomass is produced

Indirect Land Use Change
Land rights
Environmental performance
Social performance
GHG performance

How and where biomass is used

Usage of biomass
Technologies
Overall GHG emission
Conversion efficiencies
Resource efficiency

Biomass resources

Residues
Comp. Fellings
Crops
Traditional
…….
…….

Supply

Electricity
Heat
Transport
Industrial fuel

Demand

Industry
Transport
Buildings

Biomass production / forest available for wood production