



Ensuring a successful contribution of European forest-based industries as a case study towards a sustainable industrial policy

EU Informal Council for European Competitiveness

Lisbon, July 21, 2007

Agenda

1. Wood and forest biomass: a key pillar of EU Energy Policy
2. Stimulating supply as important as stimulating demand for biomass
3. Potential lines of action

1. The EU has recently defined a new Energy Policy

Political context

Climate change considerations

Higher relevance of security of energy supply

Policy implications

CO₂ abatement: 20% reduction of CO₂ emissions by 2020

Energy efficiency: 20% less energy consumed in 2020 than “business-as-usual”

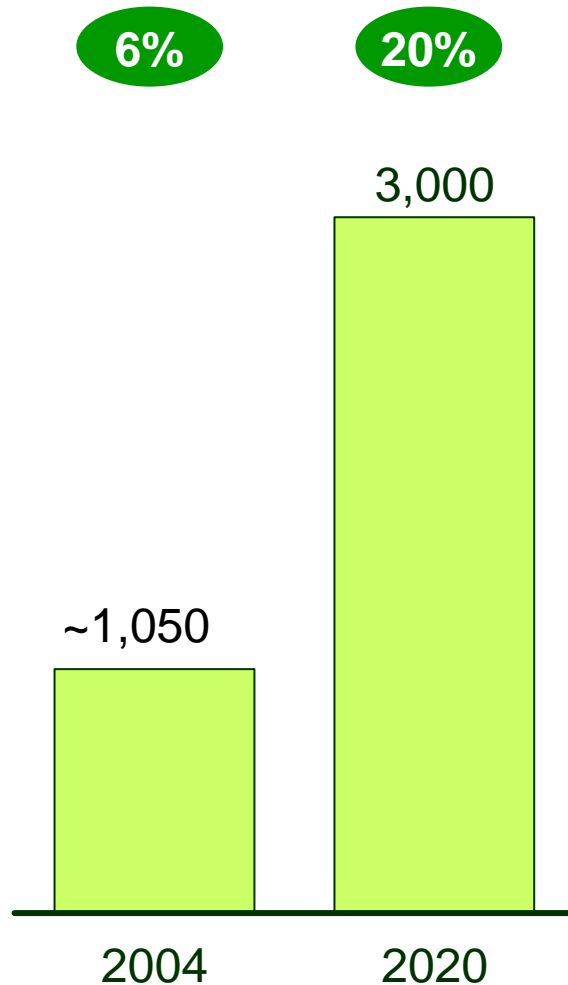
Renewable energy: 20% of consumed energy in 2020 from renewable sources

Biofuels: 10% of all transportation fuels from bio-sources by 2020 (part of renewables)

1. One of the key pillars of the new Energy Policy is the recently announced targets for Renewable Energy

TWh

● RES share of total energy consumption



Power: No sector target
(but EC roadmap suggest RES could be 34% of all power generated)

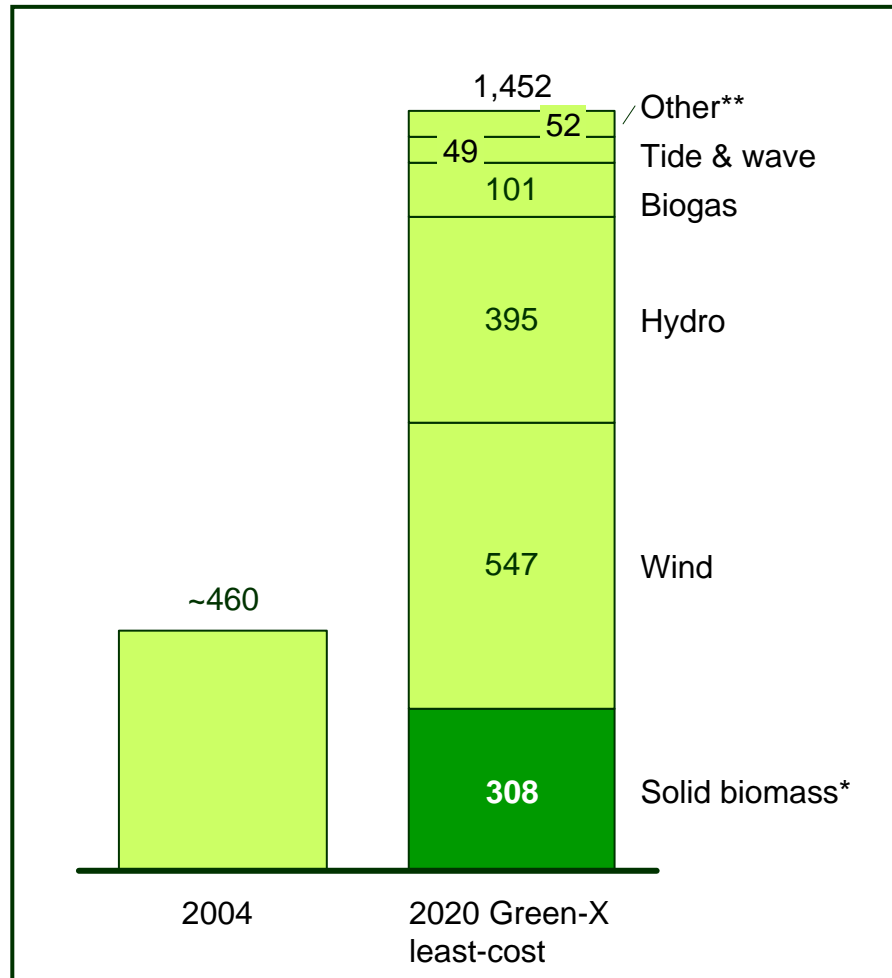
Heating & Cooling: No sector target
(but EC roadmap suggest RES could be ~18% of all heating&cooling)

Biofuels: 10% of total transportation fuels

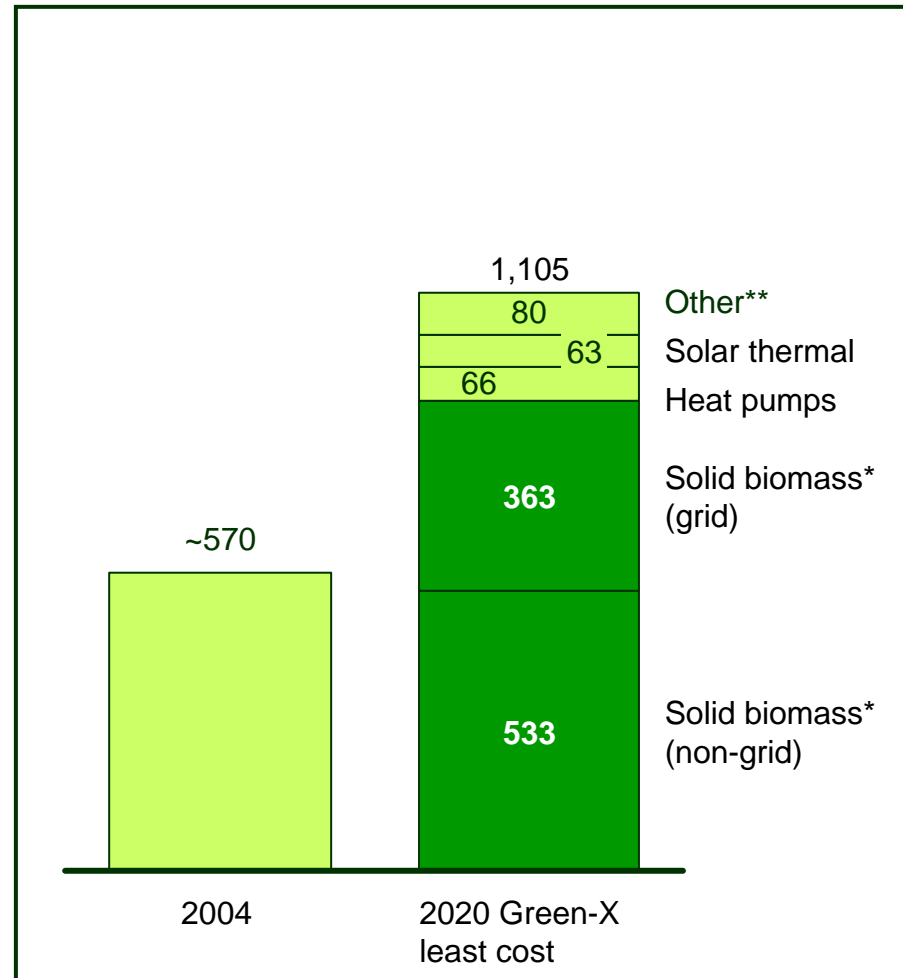
1. Solid biomass is expected to play a critical role to meet the RES targets

TWh energy output, EU-25, "Least-cost scenario"

Power



Heating & cooling



* Both forest and other solid biomass

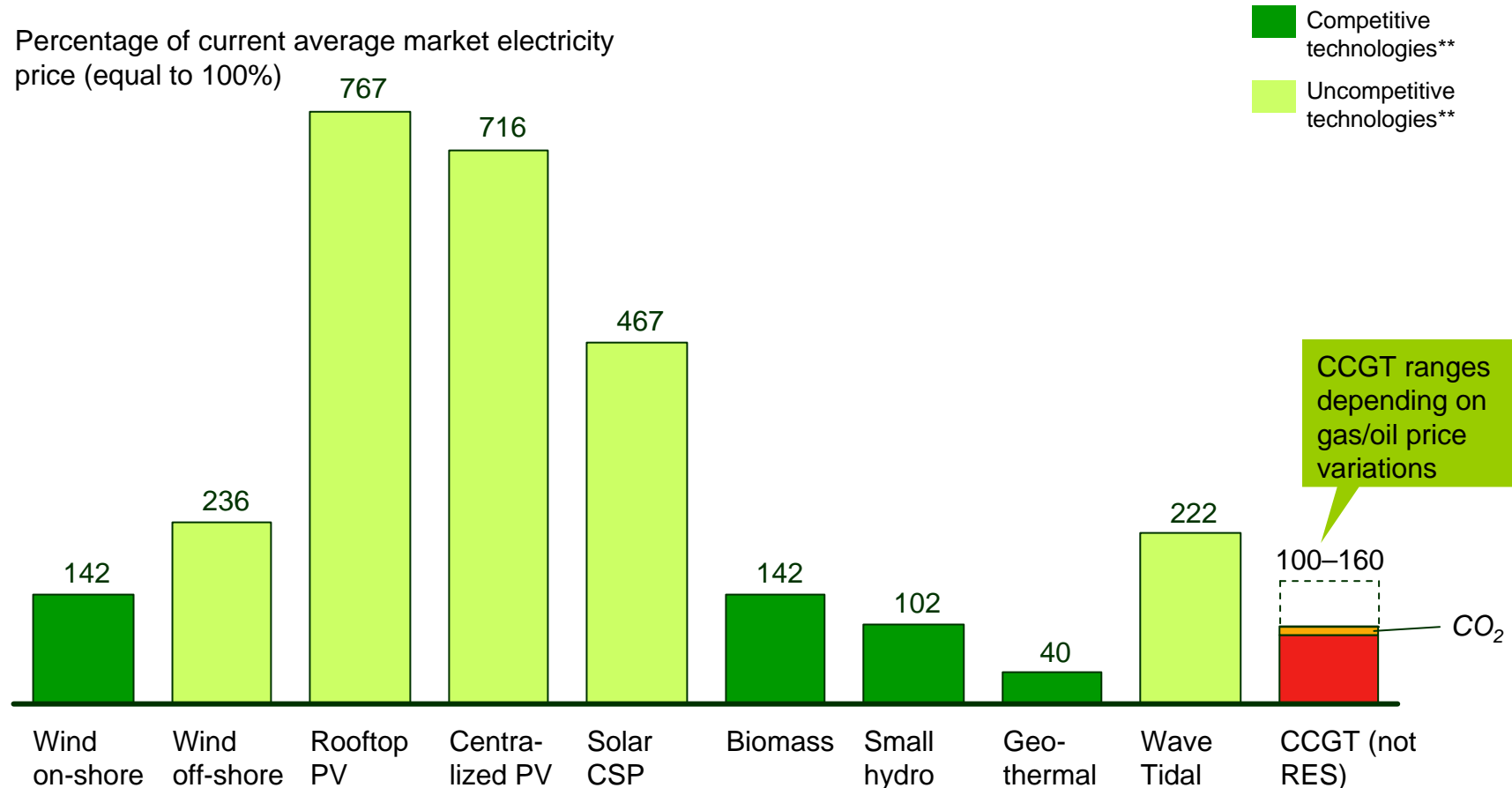
** Includes geothermal, biowaste, biogas and others

Source: Green-X economic analysis of reaching a 20% share of RES in 2020

1. Other RES technologies either have some natural capacity limitations or are not yet cost competitive

2005 full generation cost* Indexed to CCGT generation cost

Percentage of current average market electricity price (equal to 100%)



* Includes capital costs, O&M, fuel, and CO₂ cost at 20 EUR/ton; best available technology at average location

** Assuming oil prices between USD 40 to 80/bbl

Note: PV=Photovoltaic cells; CCGT=Combined Cycle Gas Turbine; CSP=Concentrating Solar Power

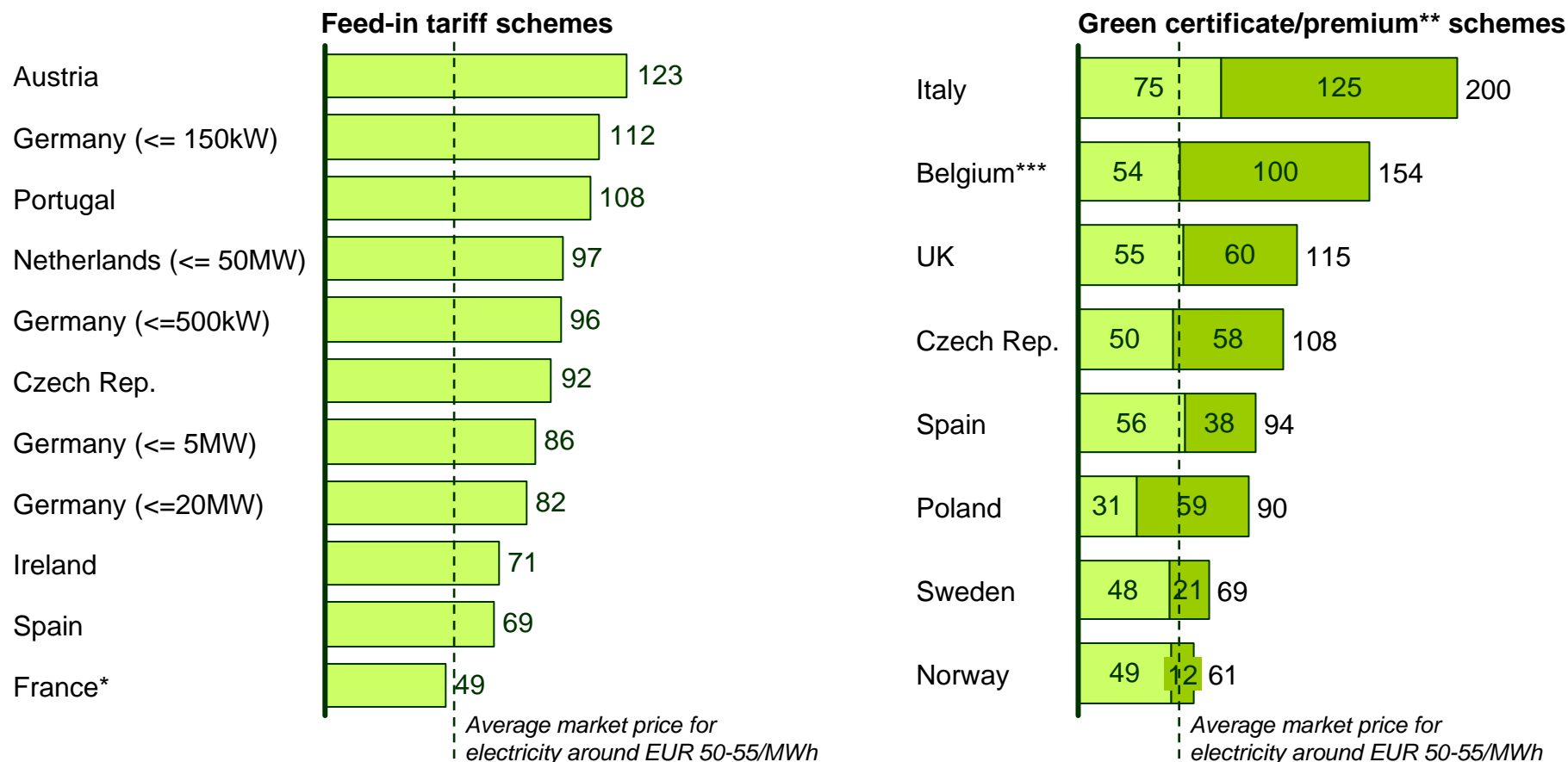
Source: Public data and client workshops; McKinsey analysis based on interviews

2. European countries have already started to stimulate demand for energy from renewable sources (though not in an harmonized way)

Current revenues from electricity generated from biomass

2006, EUR/MWh

Market price for electricity
Green certificate/premium



* France mainland

** Premiums are applicable for Czech Rep., Spain and Norway. In CR and Spain, producers can choose between selling at a regulated tariff or get a green premium on top of the market price of electricity

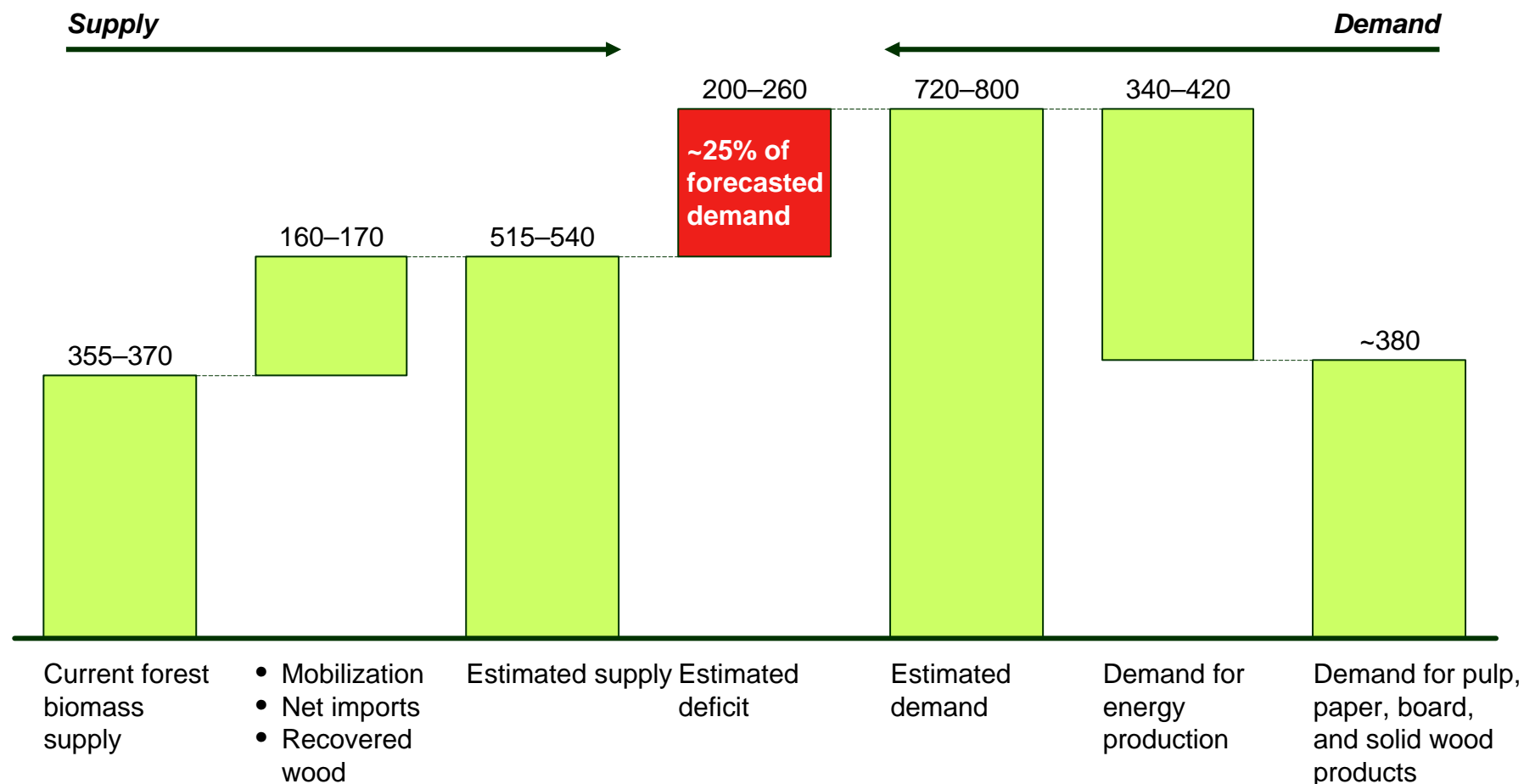
*** Average for Wallonia and Flanders to represent Belgium

Note: Finland follows none of the schemes but has a tax incentive of 7 EUR/MWh

Source: EREF; IEA; National sources

2. Current EC expectations may create a significant shortage of supply of wood/forest biomass for the overall forest-based industries

CEPI-16, wood supply and demand; million m³ (under bark); 2020

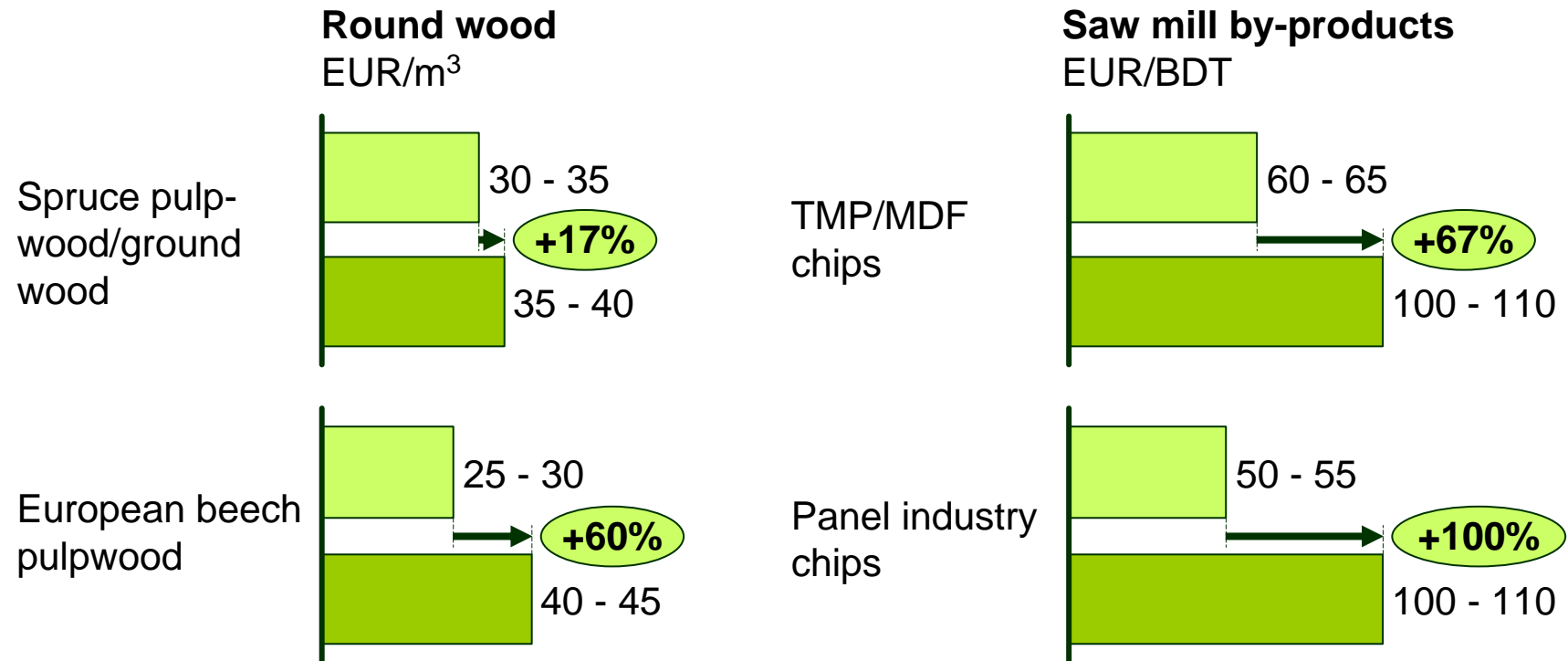


Source: Green-X model "Economic analysis of reaching 20% share of renewable energy sources in 2020"; McKinsey/Pöyry team analysis

2. Increasing demand for biomass (e.g., fresh fiber) is already helping to push prices up

German wood fiber prices

Fall 2004
 Fall 2006



Increasing demand for fuel

- Round wood used for heating instead of providing pulp wood/ground wood
- Saw mill by-products to be burned or transformed into pellets

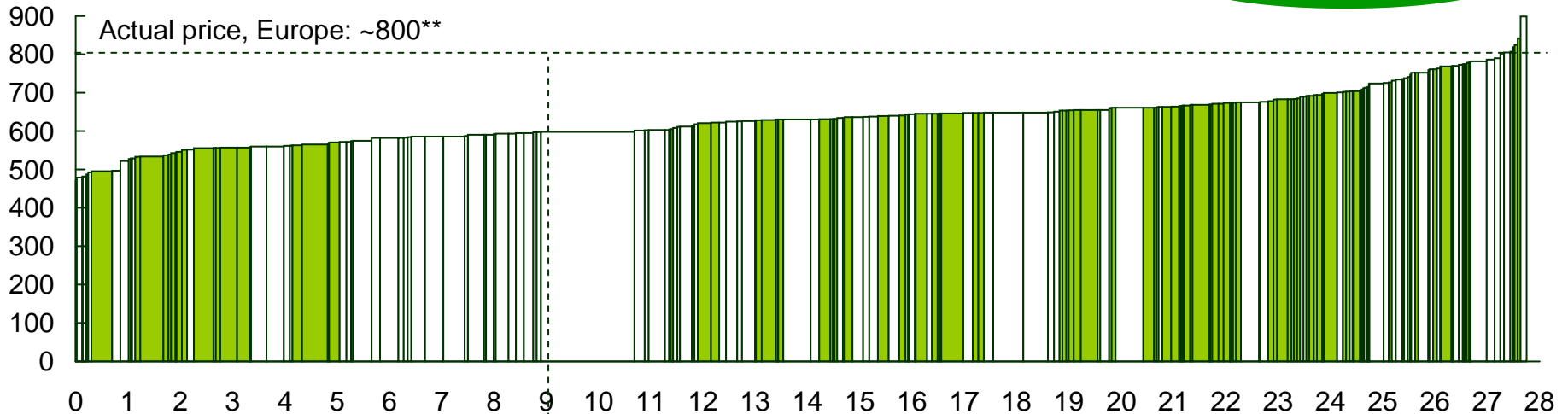
2. Under a potential shortage of supply, Europe would lose competitiveness in some paper segments

Paper segment, delivered Frankfurt, 1Q 2007; EUR/metric ton

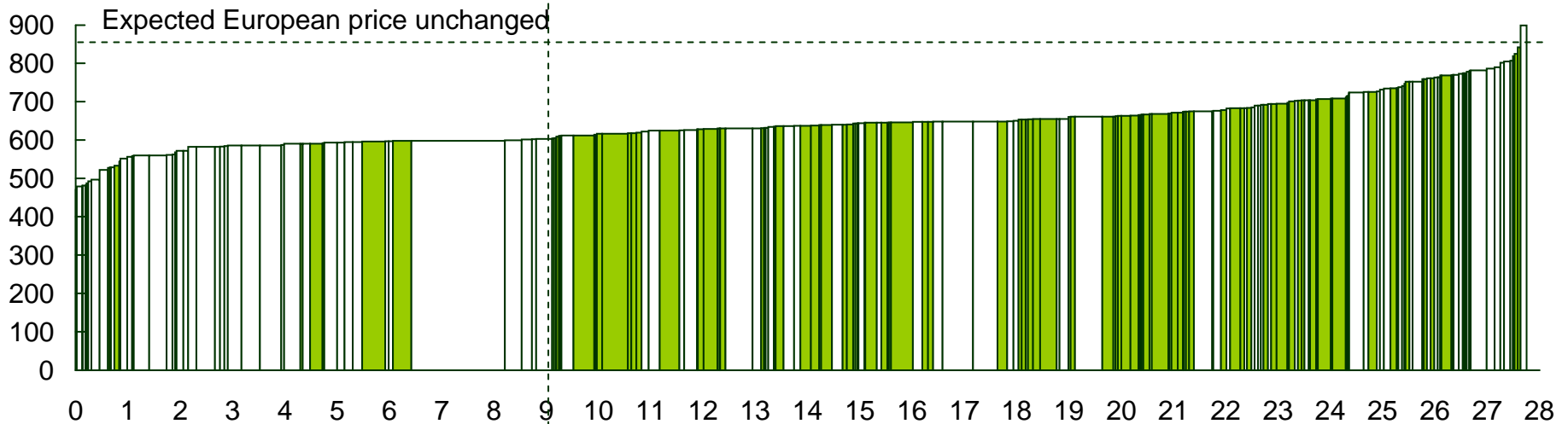
European*
Rest of World

Europe is net exporter of 2m tons

Base case



100% increase in wood costs



* EU27 plus Norway and Switzerland

** Assuming 5% discount on list price

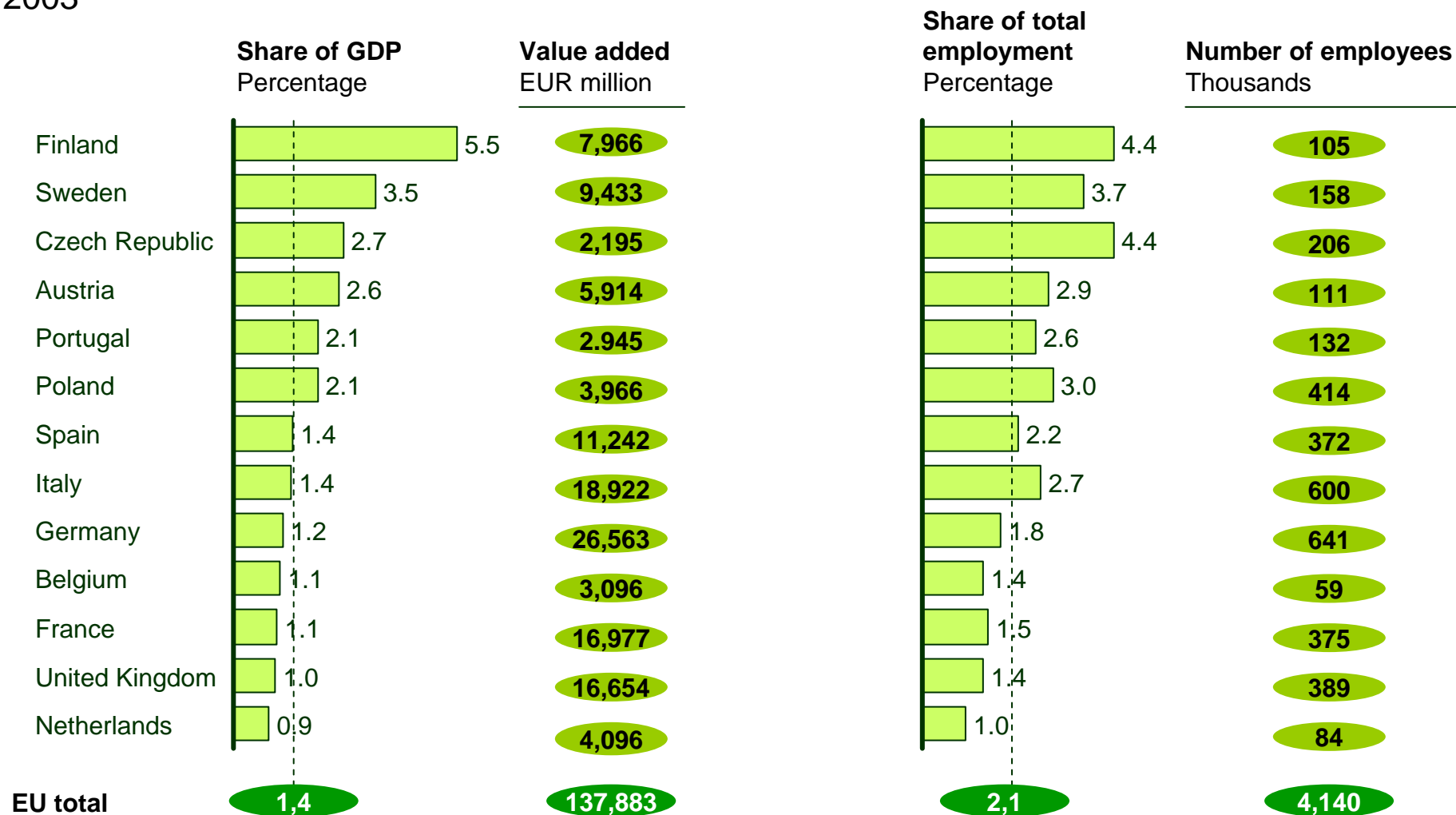
Source: RISI; McKinsey analysis

European demand

Capacity
Million metric tons

2. A potential threat to the forest-based industries* would affect a relevant force in the EU economy

2003



* Includes forestry, wood and cork products, pulp and paper and furniture. If publishing and printing were included, FBIs would account for 2.3% of GDP value added (227.883 million euros) and 3.1% of total employment (5.960 million employments)

Source: Eurostat

2. Moreover, the FBI will be a key enabler for the EU to reach RES targets

Already today a contributor to RES

Bio-energy producer

~25% of European bio-energy currently produced within the FBI

In addition, the FBI has:

The infrastructure

Biomass generation and sourcing organizations in place

The locations

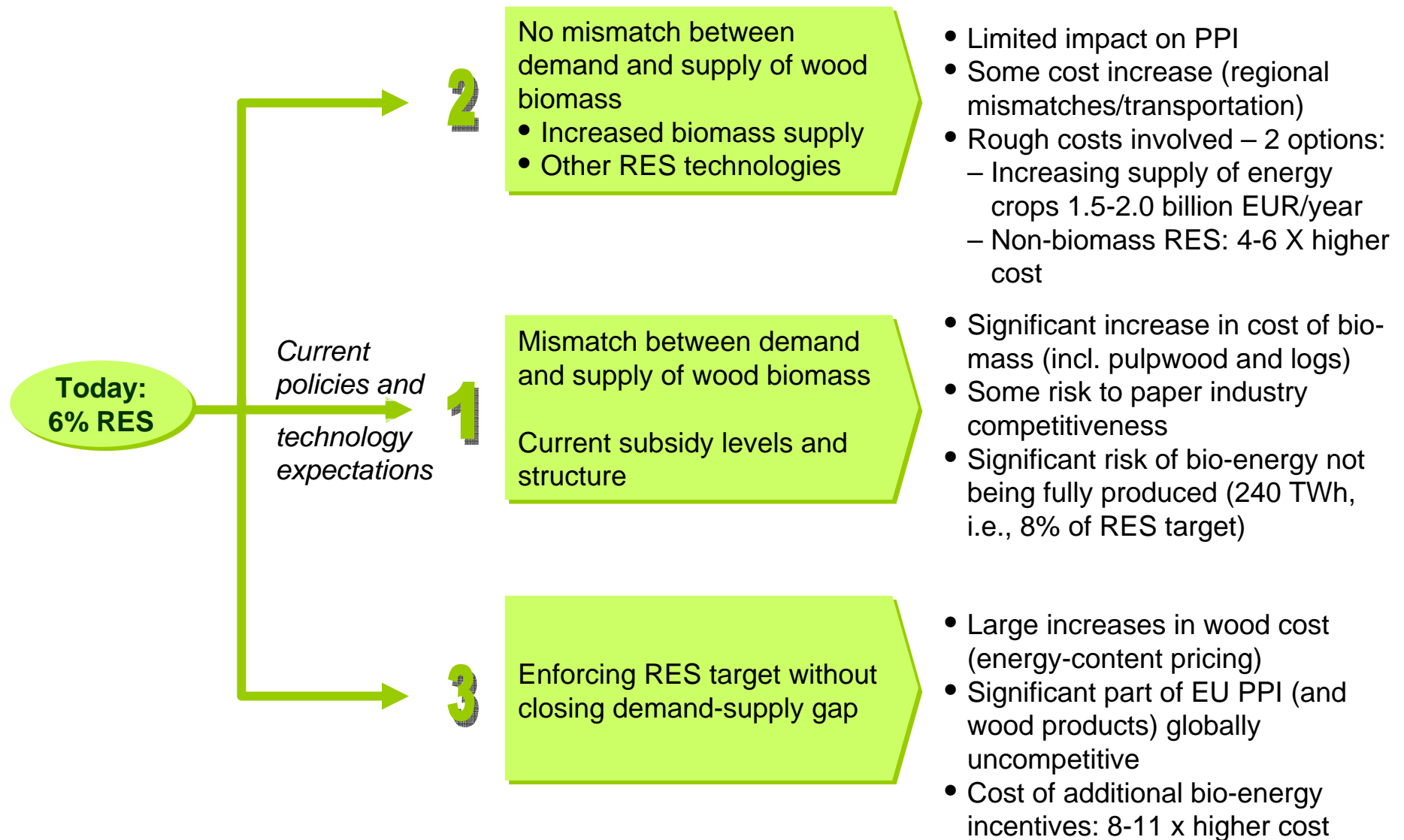
Network of installed assets that can be used

The efficiency

The highest possible efficiency of using heat

- The FBI sources almost 400 million m³ of wood today
- Chemical pulp mills have large cost advantages to produce 2nd generation biofuels
- Cost efficiency in producing wood pellets at saw mills or pulp mills
- Large installed base of Combined Heat & Power plants give generation efficiency of 85-90% (vs ~35% in coal condense plants)

3. Three main scenarios to reach 20% RES



Note: PPI-Pulp and Paper Industry; RES-renewables Energy Sources
Source: McKinsey/Pöyry team analysis

3. Critical to ensure realization of assumptions and expectations in current RES roadmap

- **Accelerate policies** to increase **energy efficiency in consumption** (20% target needs to be met)
- **Accelerate policies** to increase **energy efficiency in generation**, e.g., through stronger incentive systems for high-efficiency generation and ensuring predicted increase in CHP
- **Accelerate the development of other renewable energy sources** (e.g., wind) to take at least the share of generation foreseen in the Commissions' RES roadmap
- **Ensure implementation** of planned **land use for biomass** (10 million ha)
- **Support the development of 2nd generation biofuels**

3. To ensure enough supply of biomass, Europe will also have to significantly stimulate biomass production and imports, which will affect European agricultural and environmental policies

Examples of policy actions needed	Estimated potential Million m ³ in 2020
<p>Ensure sufficient land for energy crops and optimize the efficiency of that land</p>	<ul style="list-style-type: none"> • Ensure actions (as recommended by the EEA) to free up land for efficient energy crop production (6 million ha above what is already planned for in the EC roadmap) • Do not encourage the use of land for 1st generation biofuels <ul style="list-style-type: none"> – No import barriers for sustainably produced biofuels – No support systems for growing 1st generation feedstock • Ensure attractiveness to grow energy crops, e.g., through development of supporting financial instruments and premiering high-yield crops <p>160-250</p> <p>~20% to 30% of forecasted demand</p>
<p>Maximize mobilization and sourcing of wood in EU</p>	<ul style="list-style-type: none"> • Develop forest management practices that better use European forests potential (sustainably) • Ensure better recovery of wood, e.g., through banning land fill of recovered wood • Introduce a qualified producer responsibility for paper and packaging in the areas where it is practically feasible to recover the fiber <p>~100*</p> <p>~10 to 15% of forecasted demand</p>
<p>Actively work on increasing and facilitating overseas supplies of raw material and biomass</p>	<ul style="list-style-type: none"> • Support planting of forests outside the EU • Work to remove or reduce export tariffs on wood <p>N.A.</p>
<p>Adopt a principle of resource efficiency</p>	<ul style="list-style-type: none"> • Inline with the Waste Hierarchy <p>N.A.</p>

* Of which 70-80 already included in the estimate of wood deficit for 2020

Source: McKinsey/Pöyry team analysis

Thank you