Biomass Production and Supply
Bio diesel pathways & biorefineries

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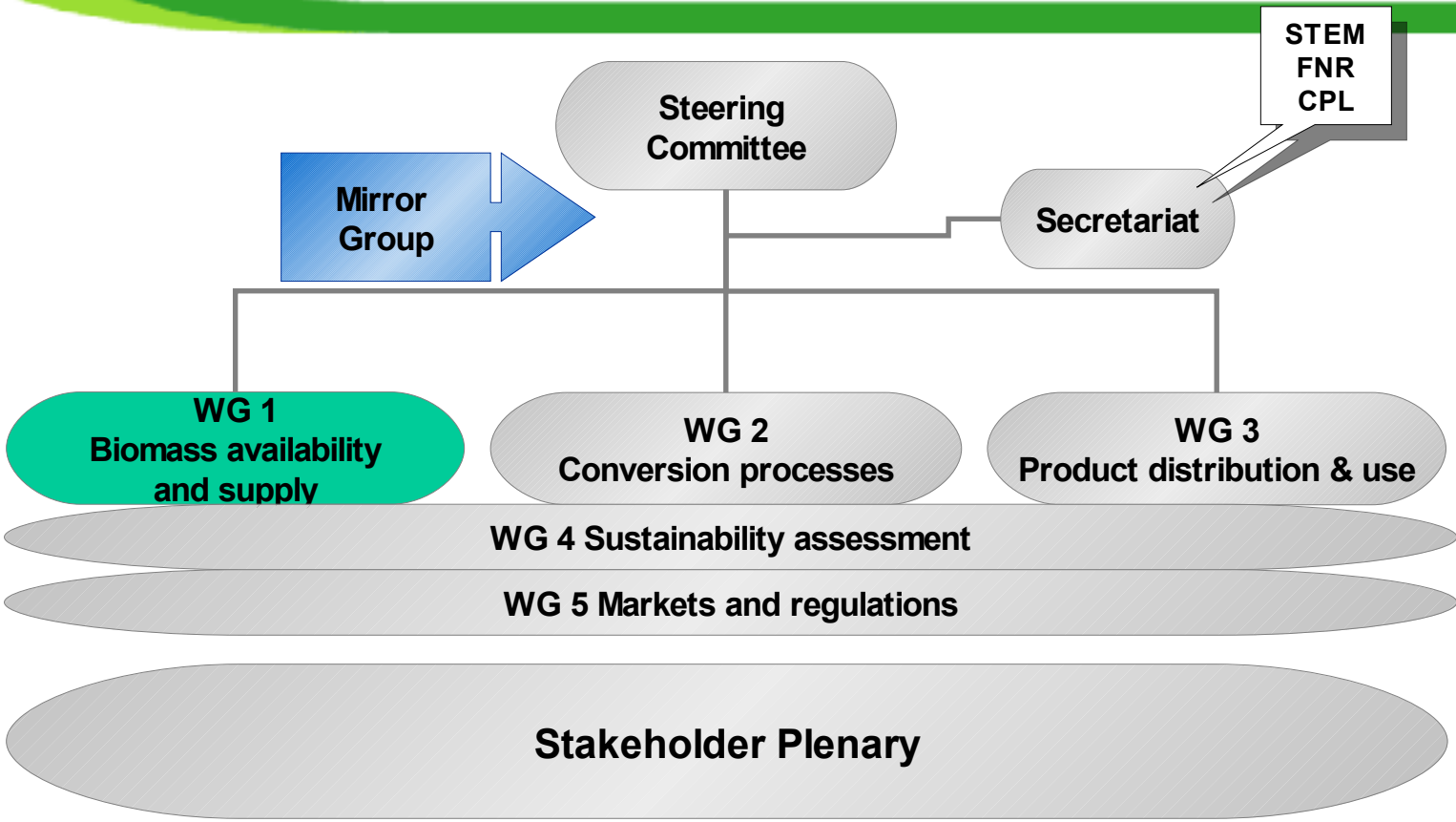
Biofuels Technology Platform Structure

Biofuels Technology Platform






Key challenges 1/2

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•**Usage of various streams of residues and wastes as raw material for biofuels** must be brought to a new level due to low utilisation rate seen today.

•Careful **assessment of the feedstock types, their fuel properties and sustainability issues** as well as **development of the logistics and the related infrastructure** to handle bulk and heterogeneous material will be required.

•New challenges faced by **lignocellulosic biomass** infrastructures both in **expanding total yields and in optimizing logistics** towards supplying new industries, including biofuels and bio-refineries should be responded.

Key challenges 2/2

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- **Development of separate collection systems, sorting, pre-treatment or even conversion technologies** that can deal with an inhomogeneous feedstock flow is thus a necessity for the use of biogenic waste as feedstock for biofuels.

- **Maximisation of energy crop yield and crop resistance** to biotic and abiotic factors, to initiate innovative cropping systems and exploitation of marginal land options is one of the key R&D&D priorities.

- Management of the **competition between different potential uses of biomass.**

- Link biomass production as an adaptation strategy to climate change by **developing sustainable land strategies compatible with the climatic, environmental and socio-economic profiles in each region.**

Key R&D&D-Priorities

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Biomass Production and Supply

- ✓**Diversification of biomass feedstock sources**
- ✓**Development and optimisation of the logistics of low dense, heterogeneous feedstock material flows by improvements both in technology and economics**
- ✓**Biomass cost- supply curves as function of the entire supply system (incl. pre- treatment and storage), time and prices (€/MWh, €/GJ)**
- ✓**Maximisation of yields of energy crops and grains, and development of more efficient methods for forest & agricultural residue collection**
- ✓**Improvement of feedstock quality in terms of lowering the moisture content of biomass feedstock and homogenisation of the material (soil removal etc.)**
- ✓**Assessment of feedstock types, for fuel properties and sustainability**
- ✓**Develop innovative cropping systems to allow efficient, bulk material production for food, feed, fibre and fuel (4F agro-forestry systems).**

Three Steps Forward

- **Step 3: Adaptation of strategy to climate change** → - Integrate into sustainable land use strategies
  - Regionalise
- **Step 2: Forest, agro and waste biomass** → - Increase total yield
  - Optimise logistics
- **Step 1: Feedstock** → - Diversify sources
  - Assess properties, sustainability and logistics
  - Develop collection systems and other technology

An industrial example 1

Bundling method for undelimbed pulp- and energy wood thinnings -optimising logistics

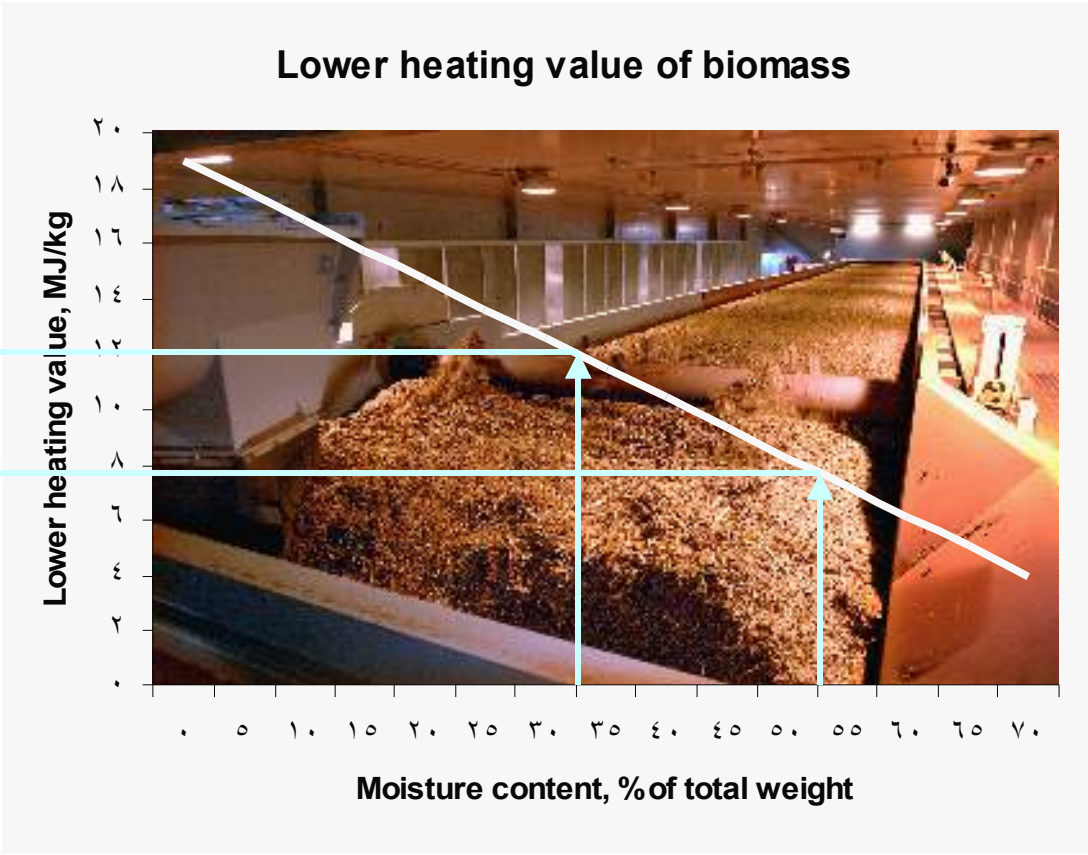
- Targets:
  - to **improve logistics by compacting the material** before forest- and road/train transportation
  - **procure pulp- and energy wood with the same machine** for pulp, energy or biofuel use at the same time
- The main challenge is to **improve the production of the prototype machine from actual 9 bundles/h to approx. 12 bundles/h**
- Timeline: prototype number 2 ready in may 2008

An industrial example 2

Biomass dryer – improving quality of biomass feedstock

UPM biomass dryer is an example of efficient **use of secondary or waste heat in a low temperature wire dryer** with advantage of **increasing heating value of wet feedstock, improving feedstock quality and lowering feedstock need**

Energy content can be increased by 20-30 % with drying



Diversifying feedstock sources 1/2

Energy crops: development of harvesting and handling technologies of reed canary grass for CHP plants

Total agricultural area 15 000 ha for reed canary grass in Finland

•Photos: PVO

Diversifying feedstock sources 2/2

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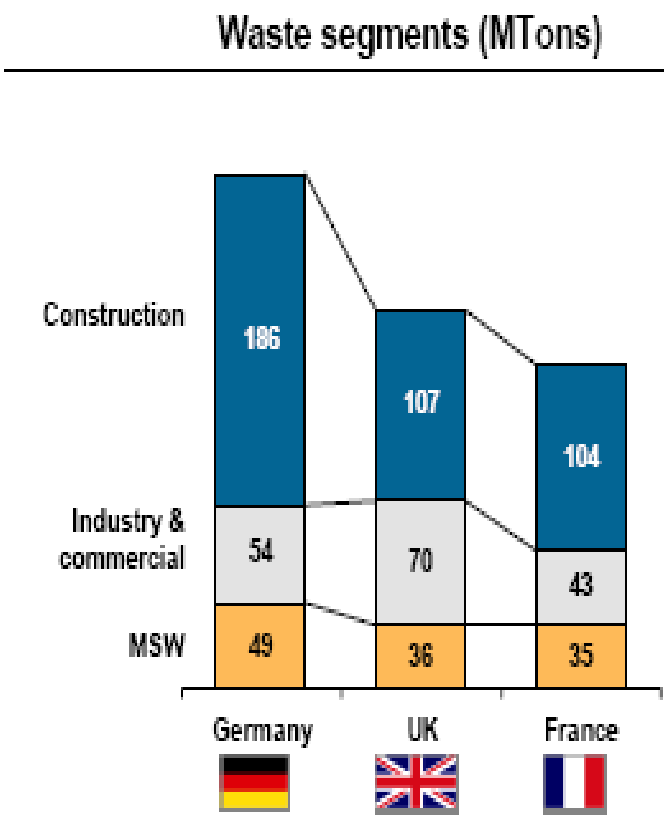
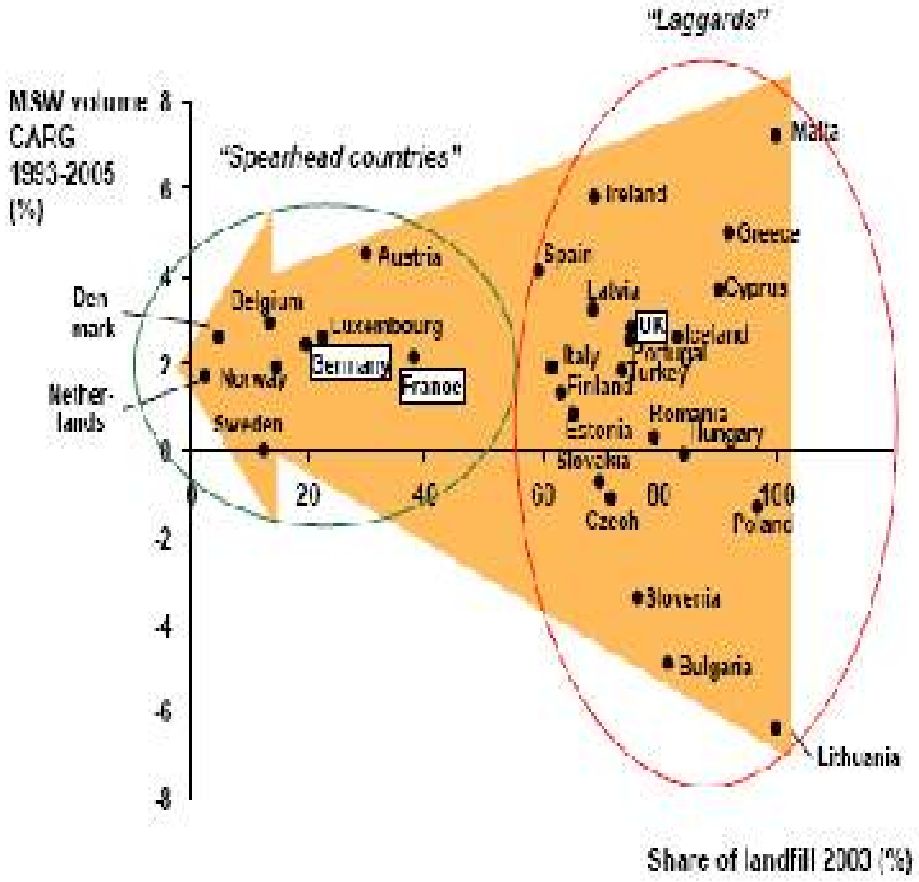
EU 1 billion t/a waste (CIW ~ 25%)





Source: BCG

Thank you!

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Summary: Three Steps Forward

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