

THEME 1

BIOMASS PRODUCTION, SOURCING AND AVAILABILITY

Land use and biomass potential in Europe

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Bioenergy in Europe

5.6 EJ/yr from biomass sources

Accounts for the largest portion of RES globally and in the EU.

Biomass as an energy feedstock is derived mainly from forests and agriculture

Indirect land use change effects, feeds the food vs fuel debate

RED II on the promotion of RES prioritises the use of low ILUC-risk feedstock and unproductive and degraded land

Mandley et al 2020, EU bioenergy development in 2050

Stolarski et al 2020 Bioenergy technologies and biomass potential vary in Northern European countries

Daoglou et al 2020 Progress and barriers in understanding and preventing indirect land-use change

Main biomass resources in Europe

Crop residues



Energy crops on marginal land



Forestry residues



Methodology

Theoretical potential – Amount used = technical potential

The equation below was used to calculate the theoretical agricultural residue potential:

$$SP = A * GY * SY:GY * DM$$

where: SP = straw potential, A = Hectarage of particular crop, SY = straw yield of crop (t/ha), GY = grain yield of crop, SY:GY = ratio of straw yield to grain yield, DM = dry matter content.

Publication	Region studied	Potential land for selected bioenergy crops (ha and %)
FORBIO project	Italy, Ukraine (MUC-Marginal, Underutilized, Contaminated)	400,000 ha in Ukraine (10% or underutilized)
MAGIC project	Europe experimental sites (UST-unfavorable soil types)	Not specified
MAGIC project	Europe (marginal land in AEZ)	Miscanthus – 48% of marginal Poplar – 60%, Willow – 56%
SEEMLA project	Europe, poor & very poor soils Sites in Germany, Italy & Ukraine	44.62Mha Poplar (90%), Willow (60%)

Wood residue production

FAOSTAT woodfuel tool, 2021
Record of worldwide wood
production

Assumptions:

Sawnwood (55%)

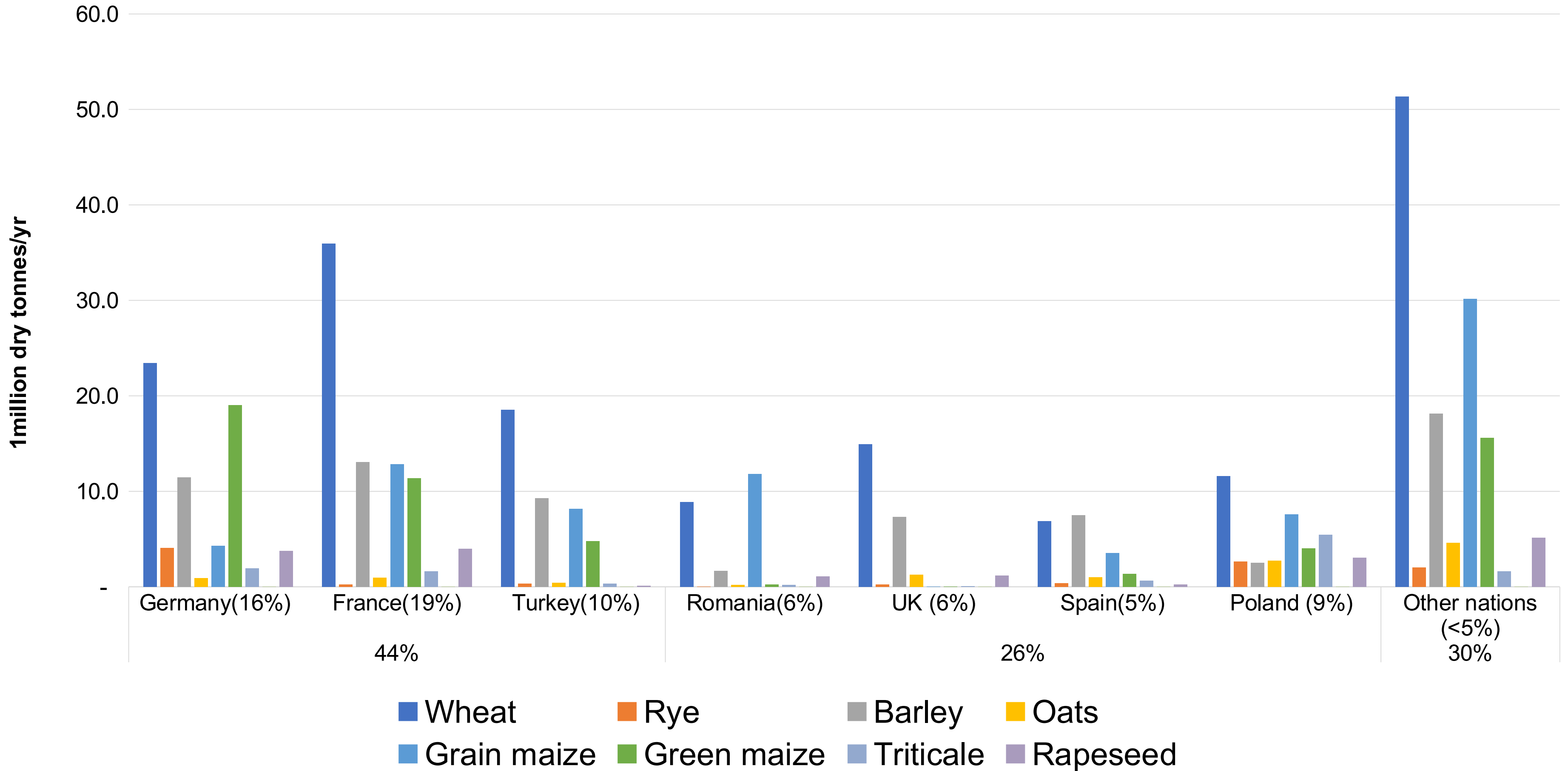
Sawdust (11%)

Chips & slabs (30%)

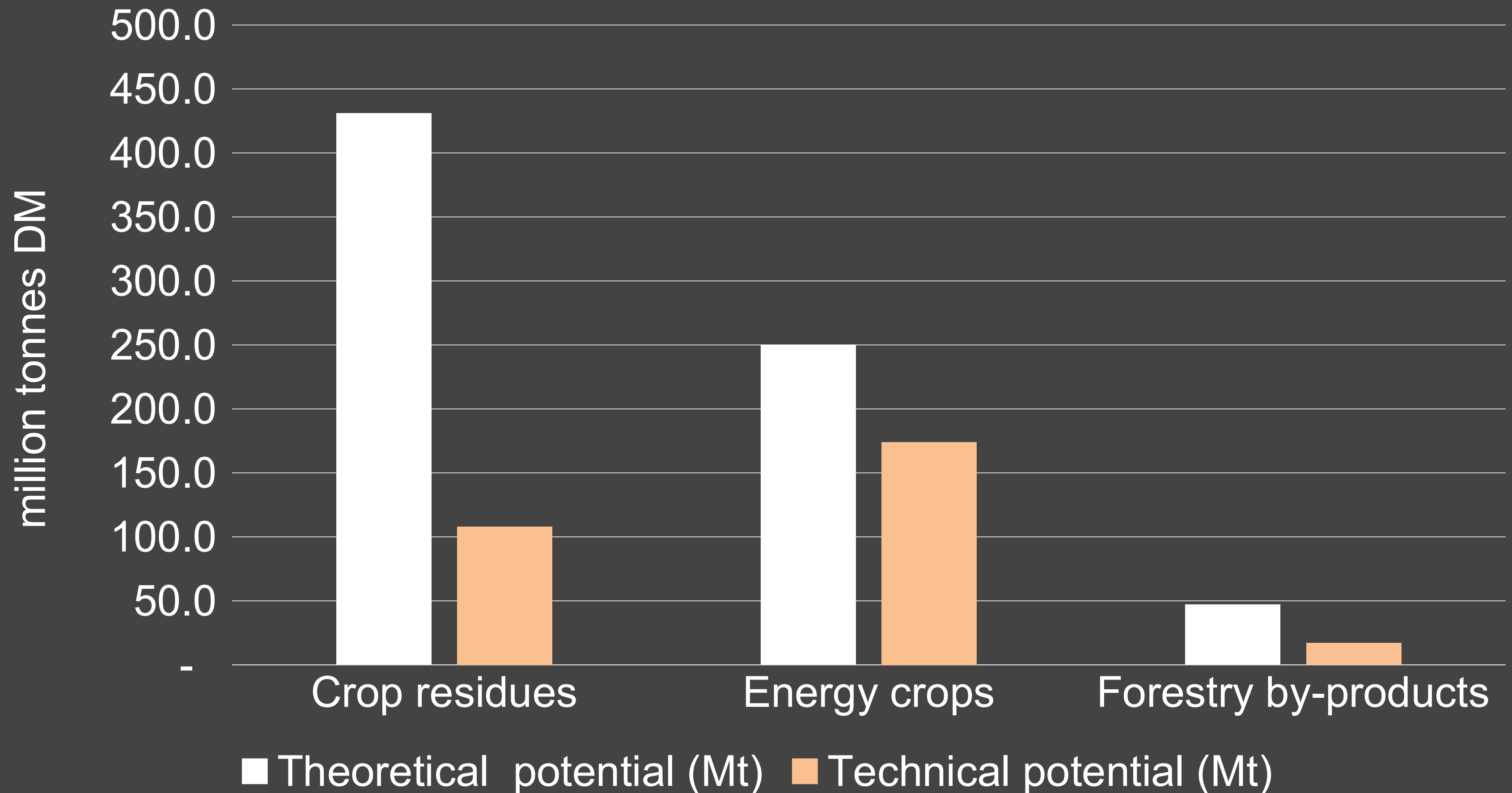
Shrinkage and other losses (4%)



Percentage contribution of states to individual crop residues production in 2022



Theoretical vs technical potential of biomass resources



Conclusions

Technical potential significantly less than theoretical due to established biomass applications

Largest amount of biomass would potentially come from energy crops planted on marginal land.

Diversification of biomass resources

