

IA2: Renewable electricity – Status and opportunities

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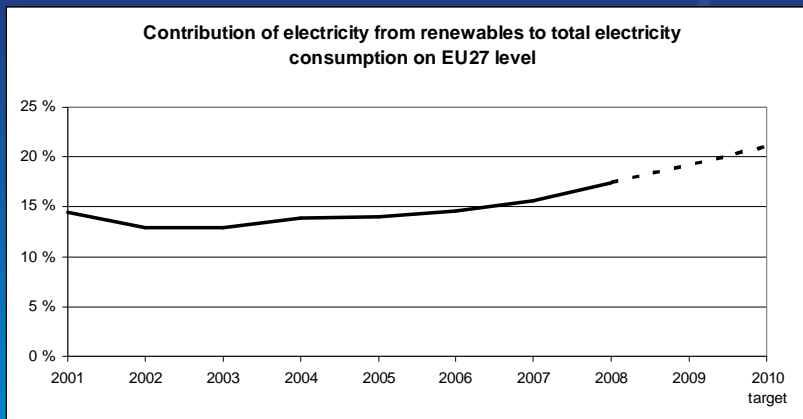
IA2: Renewable Electricity – Status and opportunities

- Status
- Opportunities
- Needs and challenges in increasing bioRES-E
 - Example countries: Finland, The Netherlands, Germany
- RD&D goals
- Summary



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Current trend in gross consumption of electricity from renewable sources in the EU



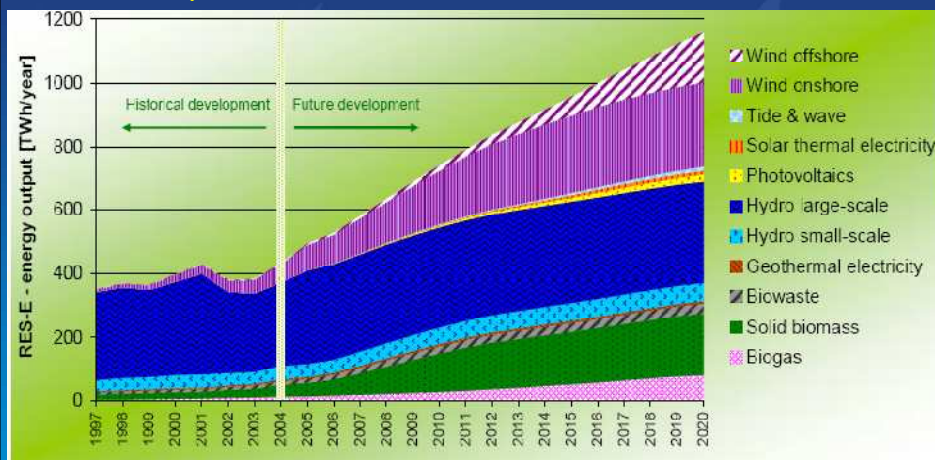
RES-E Directive(2001) target: 21 % of total electricity consumption from renewables by 2010



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BioRES-E's contribution to reaching the renewable energy target (20%) by 2020 in the EU:

34 % of electricity consumption could come from renewables, by biomass about 300 TWh(e) (45 000 MW, 25-30 € billion in investments)

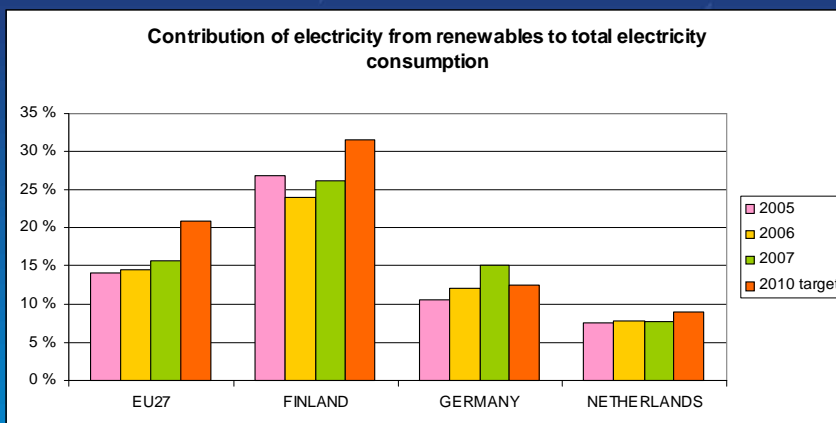


EU Commission Renewable Energy Road Map 2007



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Needs and challenges in increasing bioRES-E Example countries: Finland, The Netherlands, Germany



National Bioenergy Action Plans of the EU Member States for 2020 by summer 2010



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Features of the example countries

- Finland:
 - Wood fuels, forest industry
 - Low electricity prices have hindered investments in new technologies and in small-scale CHP plants
- Germany:
 - MSW and biogas
 - High costs for untreated biomass, undeveloped use of biomass residues and complex legislation have hindered realization of some biomass power projects
- The Netherlands:
 - Biomass co-firing in large power plants
 - Licences for some installations have been delayed, changing subsidy levels have been a concern



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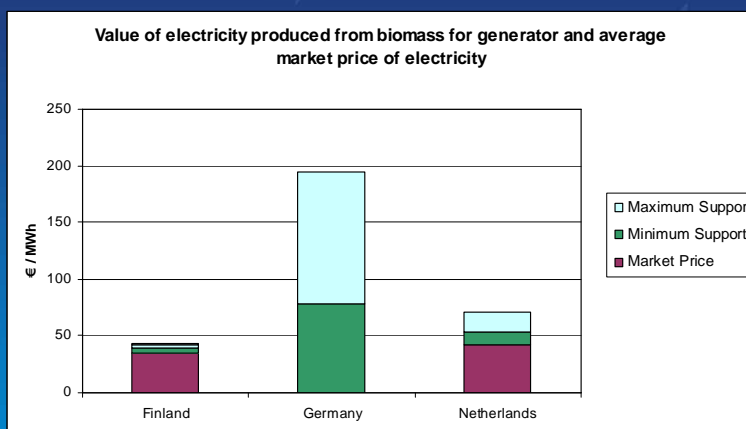
National policies and incentives vary

- Most EU25 countries have feed-in tariffs for electricity from biomass to boost bioRES-E production
- In some countries, feed-in tariffs are augmented by support for investments in bioenergy installations
- The feed-in tariff is highest in Germany, up to 21.5 €cents/kWh
- The Netherlands' tariff is also higher than the EU average, at around 10 €cents/kWh
- Finland promotes RES-E via tax and investment subsidies, feed-in tariffs soon to be introduced to wind power and biogas



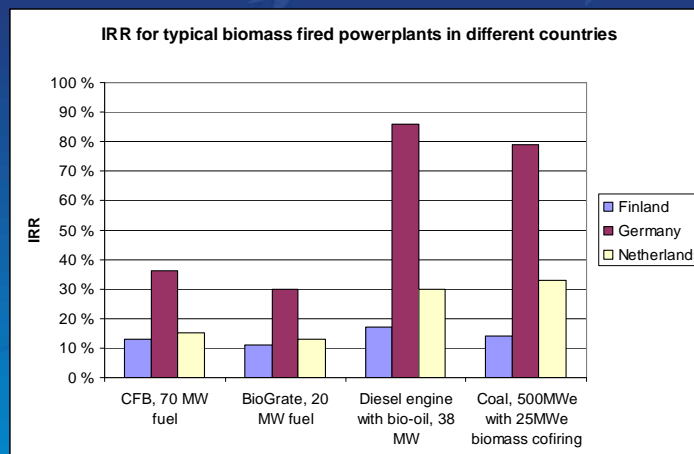
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Different national policies and incentives mean the value of bioRES-E varies from country to country



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Different national incentives mean varying profit expectations



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Different national incentives are big drivers of international biomass trade

- In Finland, the major share of biomass is used in large-scale CHP production within the emission trade sector -> the price of emission allowances and coal significantly influence the cost of biomass-based fuels
- In Germany, much of biomass is used in small-scale plants that are not included in the emission trading scheme -> feed-in tariffs determine the market price for biomass trade



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Several short and long term RD&D priorities to reach the RES-E target in a sustainable, efficient manner were identified

- Increasing biomass fuels for RES-E production in combined heat and power production (CHP) in the industrial and municipal sectors
 - Forest residues
 - Waste-derived fuels like solid recovered fuel (SRF)
 - Agricultural residues like straw
 - Annual crops
- Demonstration projects of cofiring of the lower grade fuels in large-scale CHP plants at high power-to-heat ratios needed



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Co-combustion and co-firing Straightforward way to increase bioRES-E production

- Biomass co-combustion in fluidised-bed boilers in large-scale CHP plants in the European pulp and paper and process industries
- Co-firing in conventional pulverised coal-fired power plants using higher percentages of biomass
- Co-gasification and co-firing in advanced coal plants, e.g. ultra supercritical boilers, oxy-fuel combustion and IGCC plants
- Indirect co-firing in natural-gas fired plants



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RES-E research by Bioenergy NoE partners focused on the following areas

- Building reliable, sustainable fuel supply chains based on forest, agro, and solid recovered fuels
- Biomass co-firing in utility boilers and biomass-based CHP production in fluidised-bed and high efficiency grate boilers
- Small-scale biomass-based electricity or CHP production
- Gasification and pyrolysis-oil based diesel power plants, with higher efficiencies and power-to-heat ratios than traditional steam cycle systems
- Effective and sustainable methods for gas cleaning and ash residue management



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Summary

- Meeting the 20 % target of the EU on renewable energy requires substantial growth in RES-E
- Future growth of RES-E production will come from wind and bioenergy
- National Bioenergy Action Plans of the EU Member States for 2020 by summer 2010
- The most straightforward way to increase bioRES-E production is cofiring and co-combustion
- Advanced technologies, like integrated gasification combined cycle (IGCC) plants



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