



The Potential for Biomass Co-firing with Coal in EU27

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Context

- EU target for electricity from renewable energy sources (RES-E) at 21% in 2010 in EU27
National differentiated targets
- EU target for renewable energy at 20% in 2020
National differentiated targets
- Bioenergy considered a key option



Why biomass co-firing?

Co-firing is the simultaneous combustion of two or more fuels in the same plant in order to produce one or more energy carriers

- Efficient way to convert biomass to electricity
Bio power typically 25%, coal power 35% or higher
Impact on conversion efficiency from low levels of biomass co-firing seems to be modest
- Low-cost option
In the lower range compared to other RES-E options
- Near-term option



Aim

To assess the near-term technical potential for biomass co-firing with coal in existing coal-fired power plants in EU27
- and compare it to EU RES-E targets

The potential is estimated as the maximal amount of biomass that can be co-fired in the existing coal fired power generation systems in the EU member states and the corresponding electricity production



Result - Technical biomass co-firing potential

- The technical potential for RES-E from biomass co-firing with coal in EU27 amounts to approx. 50-90 TWh/year which requires a biomass supply of approx. 500-900 PJ/year.

For comparison:

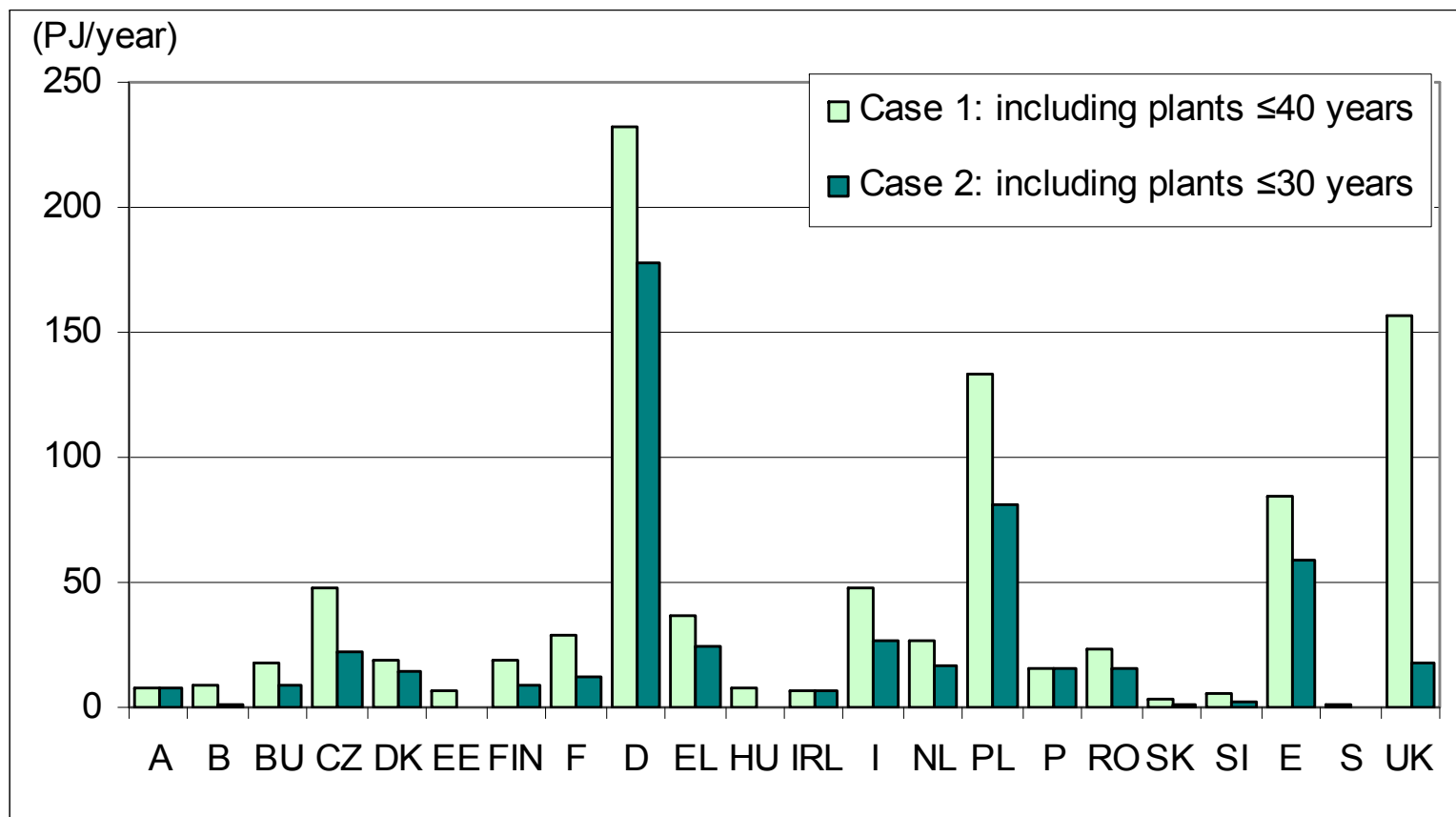
EU27 RES-E production in 2005: 498 TWh
of which 80 TWh is biomass based

EU27 Primary production of biomass for energy
in 2005: 3400 PJ



Result

The technical potential demand for biomass from co-firing with coal





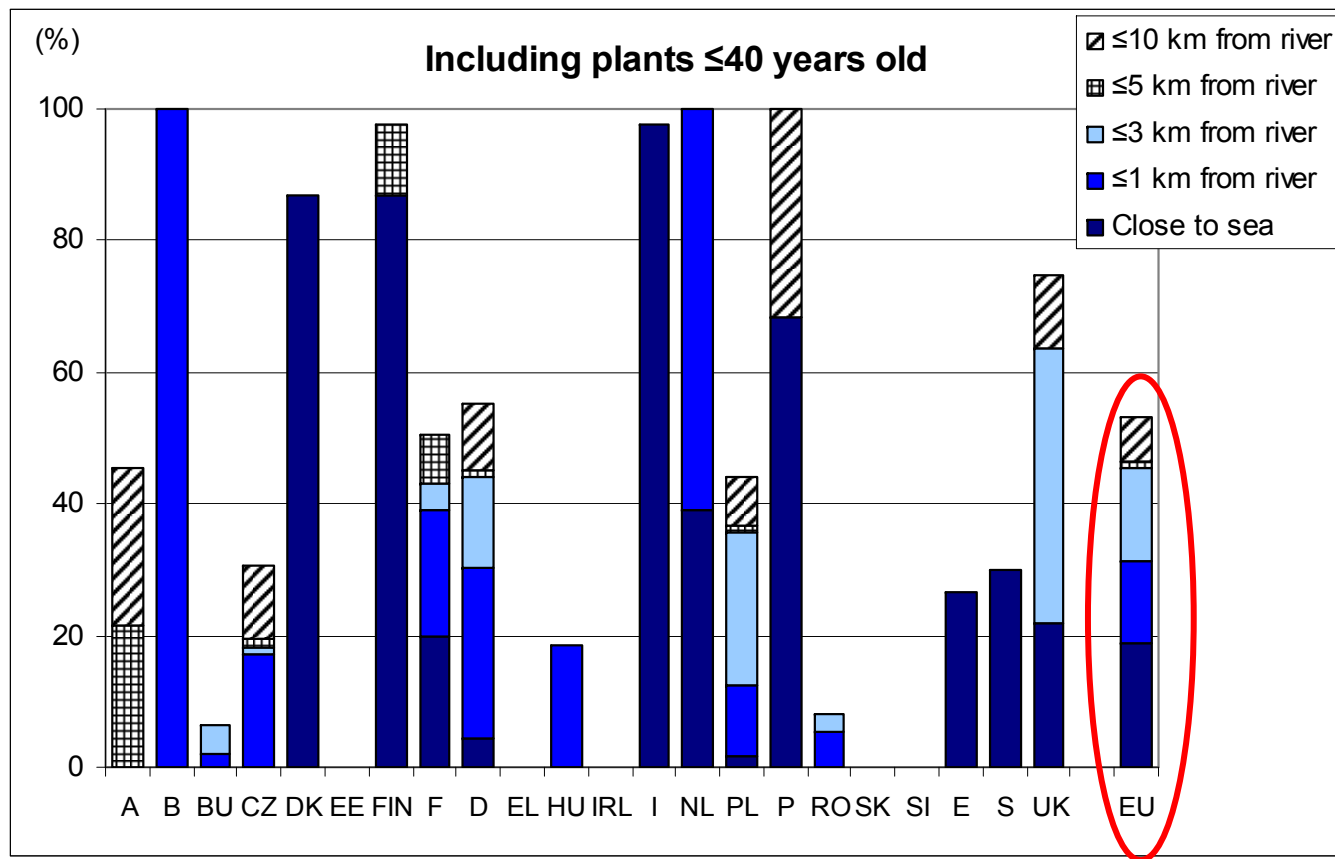
Result - the potential demand for biomass

- The technical potential biomass demand from co-firing with coal in EU27 corresponds to roughly 10% of the estimated biomass supply potential in EU27 for 2010.
- On a country basis the potential biomass demand from co-firing is considerably smaller than the national biomass supply potential in 2010 in all EU27 MS and it is also smaller than the supply potential for waste only.
- Compared to the present primary production of biomass the technical biomass co-firing potential is substantial for several countries.



Result – import possibility

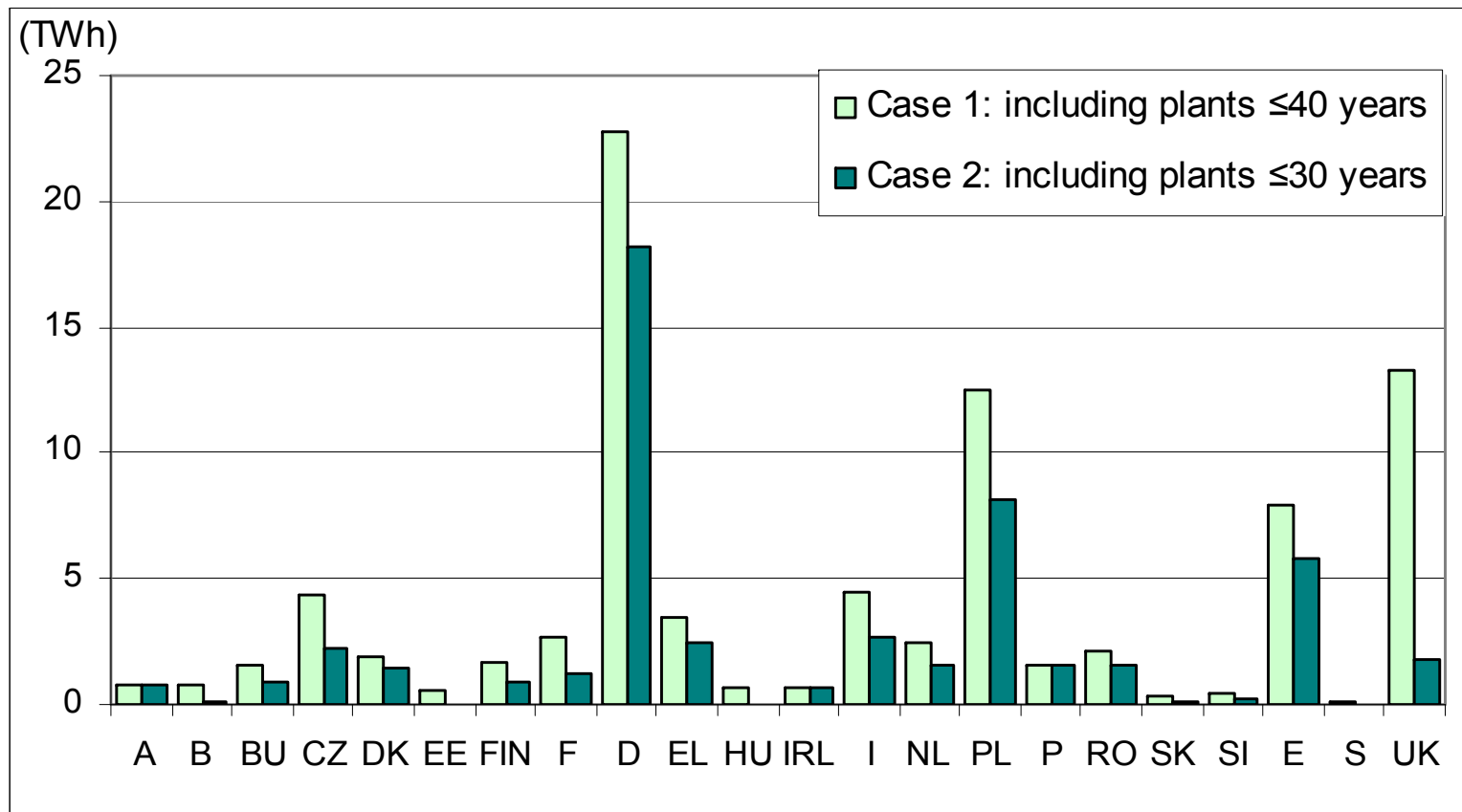
Share of the estimated potential biomass demand from co-firing that is located by the sea and close to navigable waterways





Result – RES-E production

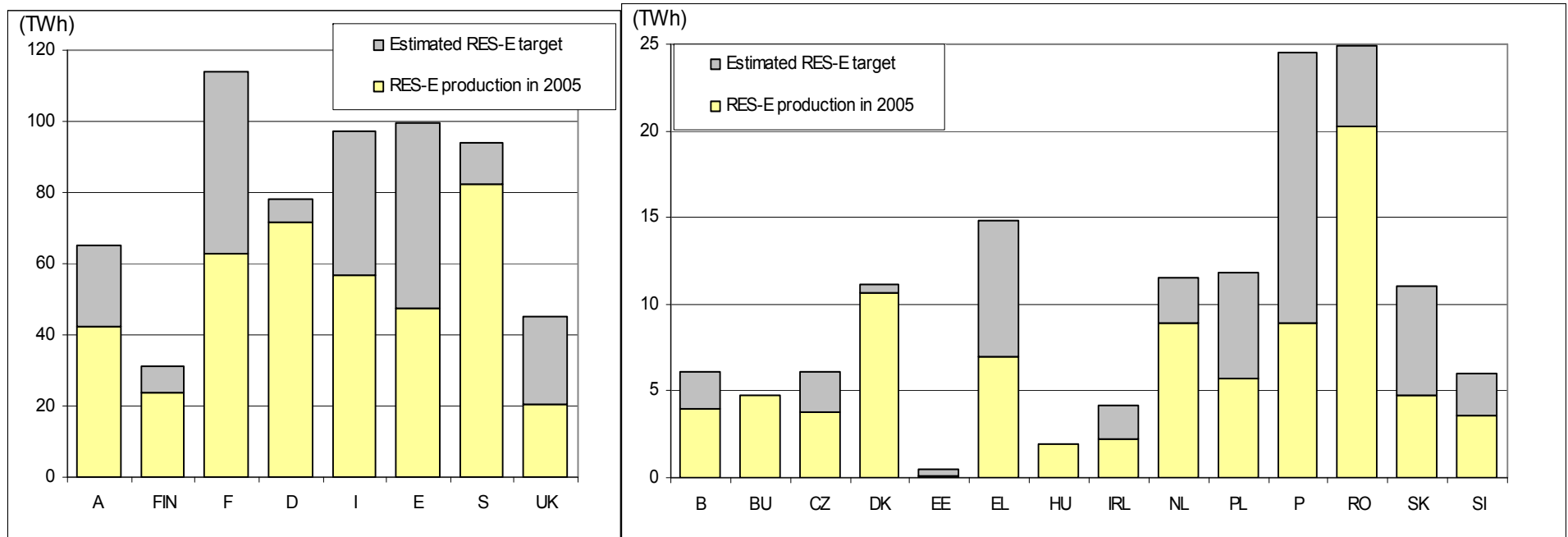
The technical potential for RES-E from biomass co-firing with coal





Result

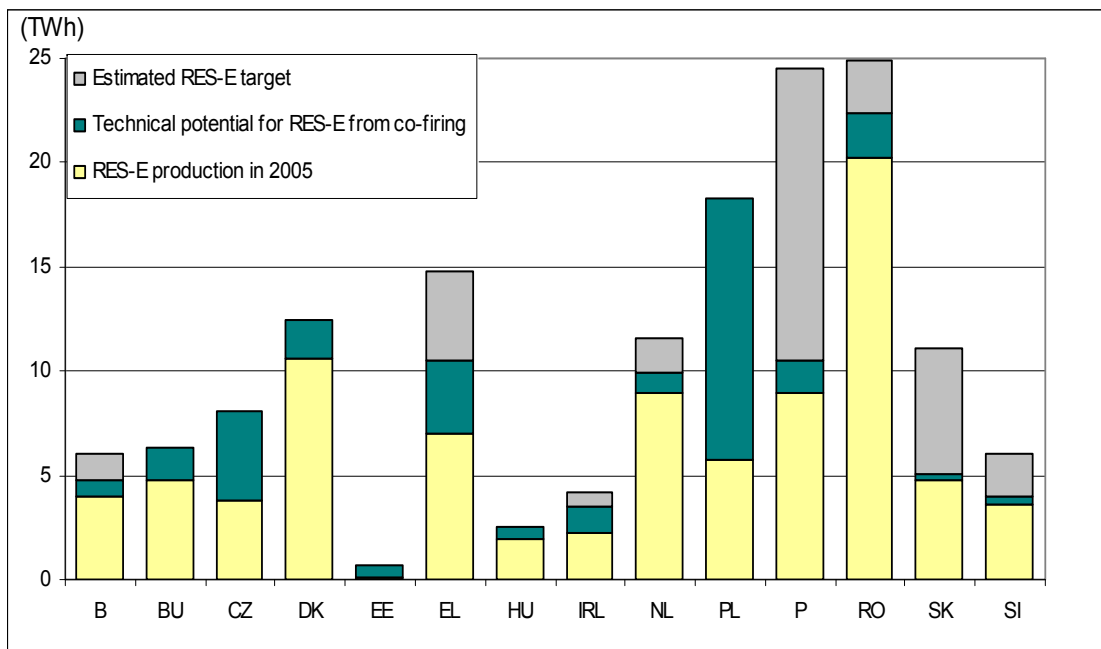
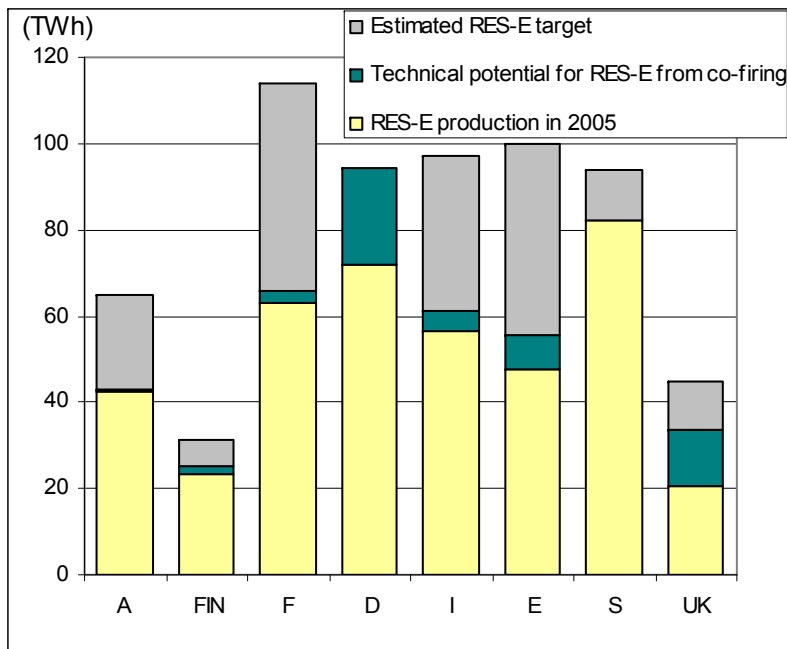
2010 RES-E target and present RES-E production





Result

2010 RES-E target, present RES-E production and technical biomass co-firing potential (≤including plants 40 years old)





Result – Comparison to RES-E target

The contribution from the estimated co-firing potential to the remaining amount of RES-E needed to meet the RES-E target for 2010 in EU27 is about 20-30%

However, for some countries (e.g., Germany, Poland, Denmark, the Czech Republic) the possible contribution is large enough to fill the gap (excess).

Chalmers power plant Database

Thermal coal fired power plants in EU27



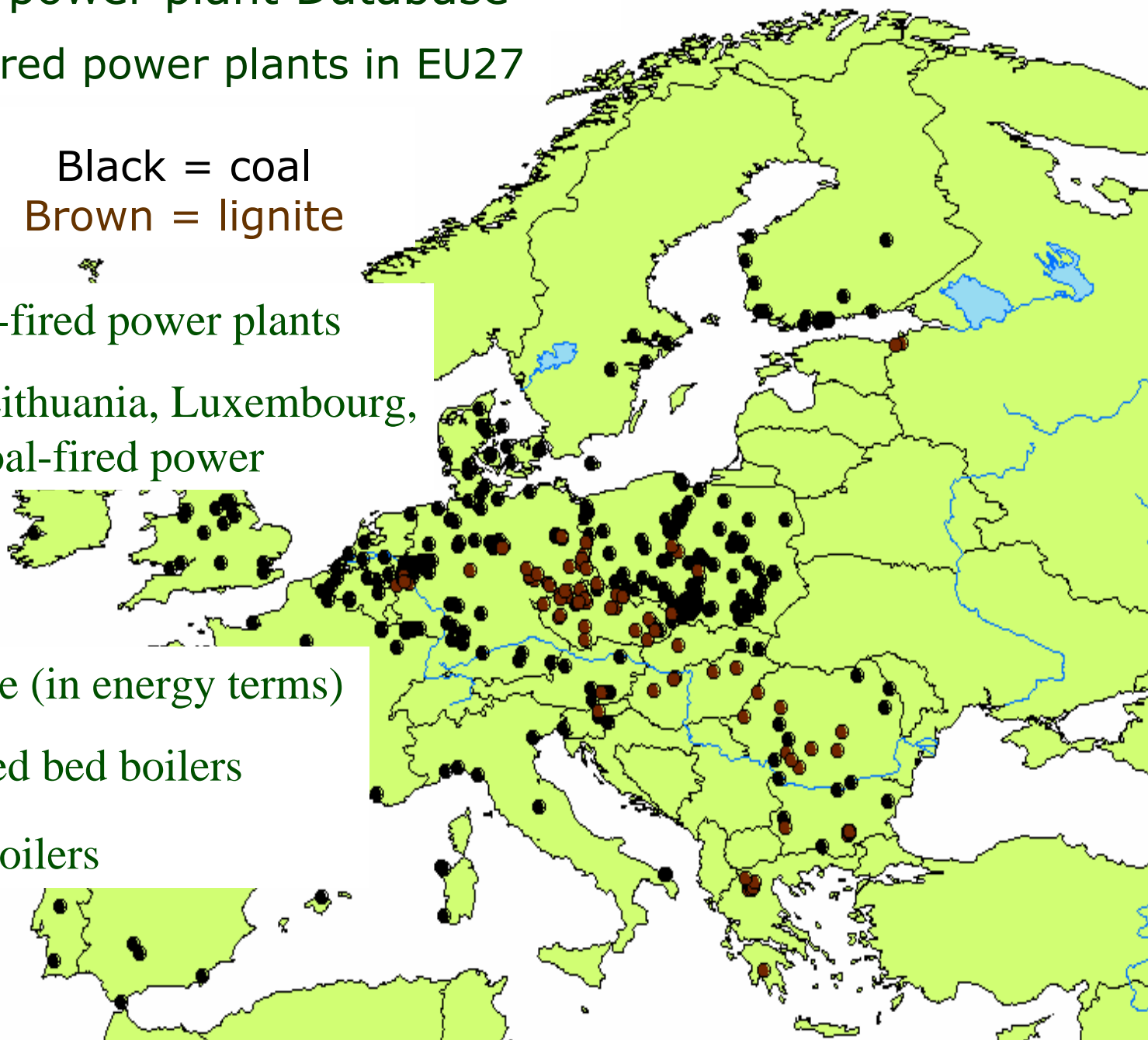
Black = coal
Brown = lignite

About 1 000 coal-fired power plants

Cyprus, Latvia, Lithuania, Luxembourg,
and Malta lack coal-fired power

The biomass share (in energy terms)

- 15% in fluidised bed boilers
- 10% in other boilers





Conclusions

- Biomass co-firing with coal might contribute substantially to the RES-E development in EU27
- There is an important biomass import possibility but also a possibility to link the biomass use to domestic lignocellulosic short rotation crops
- The prospects for biomass co-firing with coal is influenced by:
 - technology development within the area of co-firing,
 - availability and cost of biomass having suitable quality
 - the implementation of policies and
 - the development of carbon capture and storage



Thank you for listening!