Potential and limiting factors of biomass energy – Estonian experience of Short Rotation Forest

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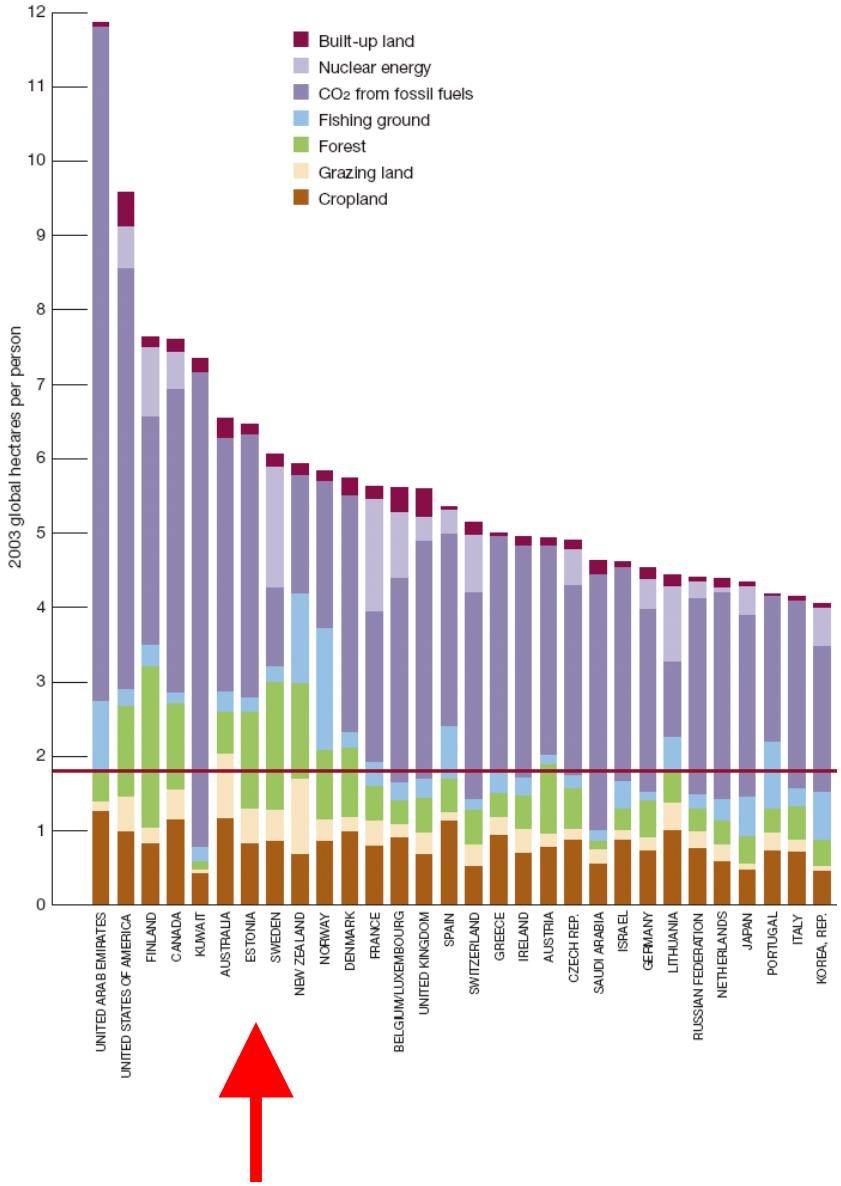
Ecological footprint

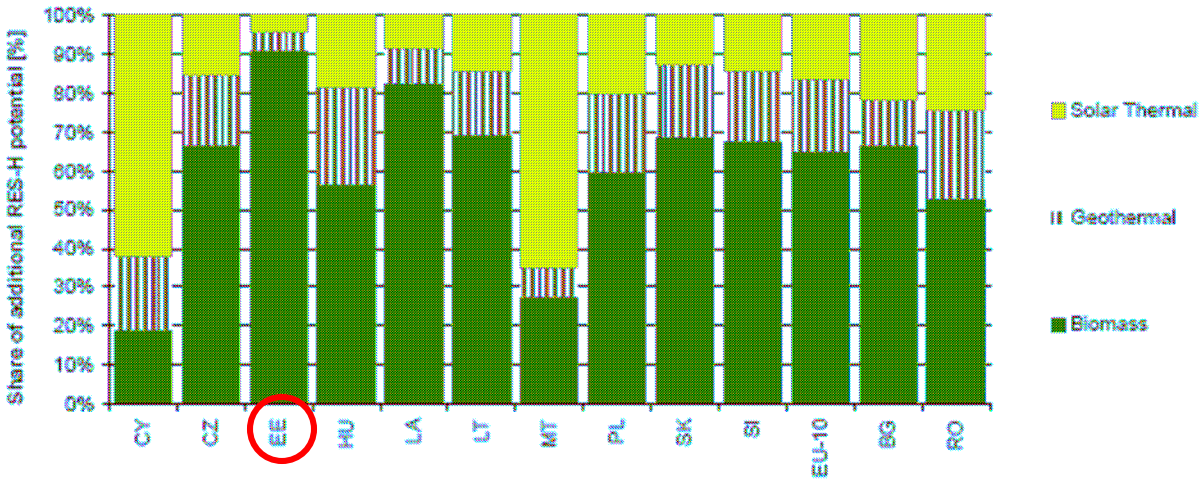


Fossil Fuel CO_2 (global ha per person)

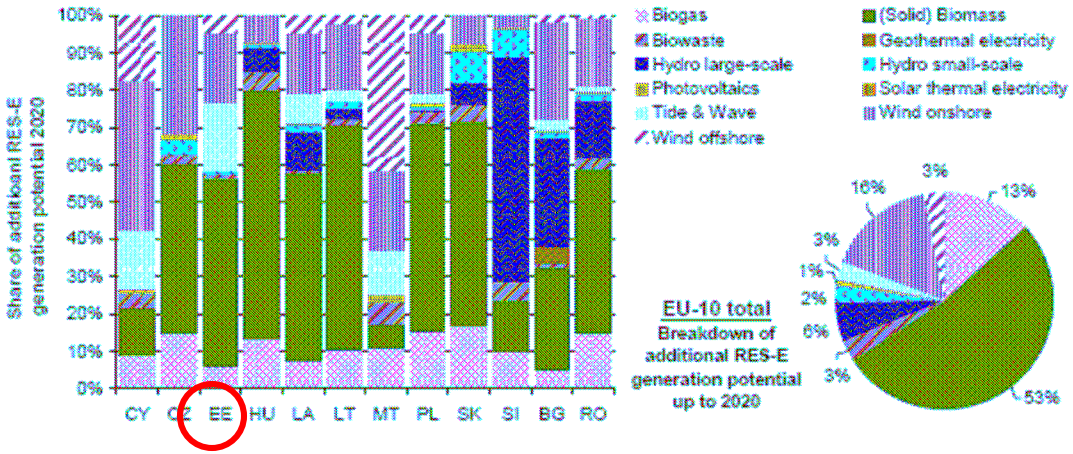
- United Arab Emirates 9.06
- Kuwait 6.38
- USA 5.66
- Canada 4.08
- **Estonia 3.53**
- Saudi Arabia 3.43
- Australia 3.41
- UK 3.21
- Denmark, Greece 3.17
- Finland 3.07
- ….
- Germany 2.45

Source: Living Planet Report 2006

Potentials?



Share of the total additional realisable potential of RES-H in 2020 for EU-10 Member States & Bulgaria, Romania



RES-E as a share of the total additional realisable potential in 2020 for the EU-10 & Bulgaria, Romania – by country (left-hand side) as well as for total EU-10 (right-hand side)

Source: Ragwitz et al. 2005,
Forres 2020 report

Potentials?

Total area
45 227 km^2

Arable land area in 1970s
ca 14 000 km^2

Agricultural parcel register 2005
12 310 km^2

Agricultural area support 2004
8 039 km^2

Potentials?

Mowed hay

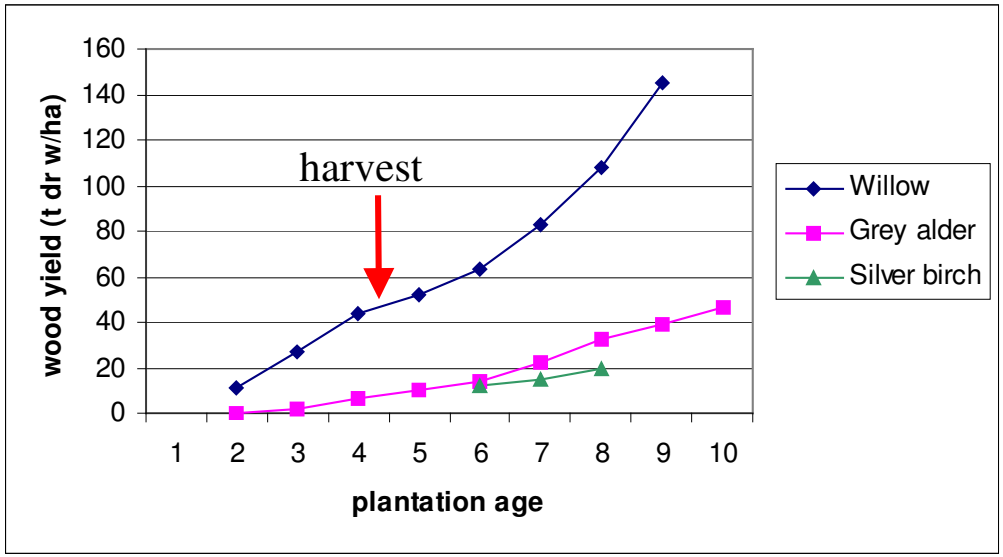
Special herb crops

Special wooden plant crops

Production potential of Short Rotation Forest

Depends on:

- plant species
- plantation age



Willow (*Salix*) plantation production with good nutrient supply may exceed 10 t dr w ha^{-1} y^{-1} in Estonian conditions

Production potential of Short Rotation Forest

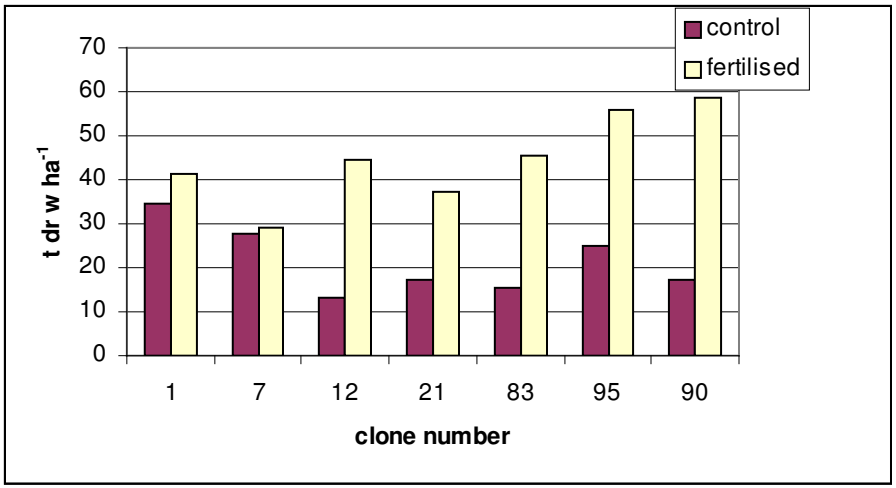
Depends on:

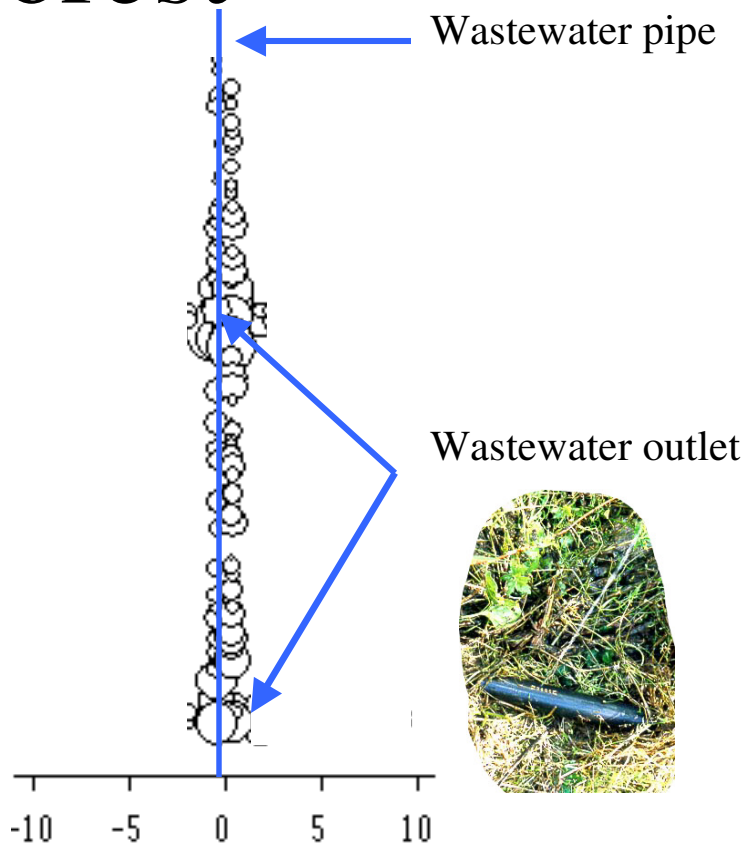
- plantation size
- planting material suitability to local climate conditions

Production potential of Short Rotation Forest

Depends on:

- water availability
- nutrient supply

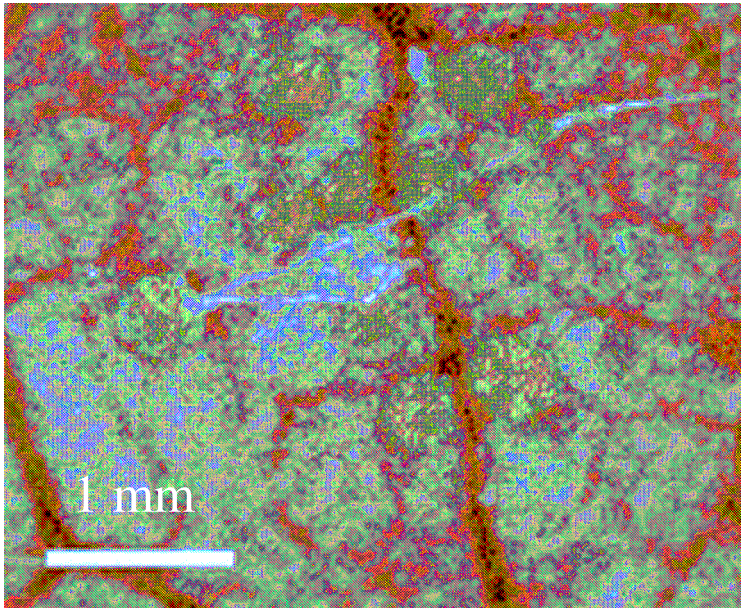




Production potential of Short Rotation Forest

Depends on:

- pathogens, grazing



Leaf rust

Production potential of Short Rotation Forest

Depends on:

- weed competition

Non-technical barriers of Short Rotation Forestry

- Cutting supply system poorly developed
- Lack of local planting material

Non-technical barriers of Short Rotation Forestry

- High planting costs

Planting costs (excl. cuttings) in Sweden

Year	In £ ha-1 Actual	In £ ha-1 Real terms based on 1992 value	Real yearly cost reduction in %
1988	320	390	31
1989	230	270	11
1990	220	240	12
1991	200	210	36
1992	140	140	9
1993	110	120	0
1994	110	120	

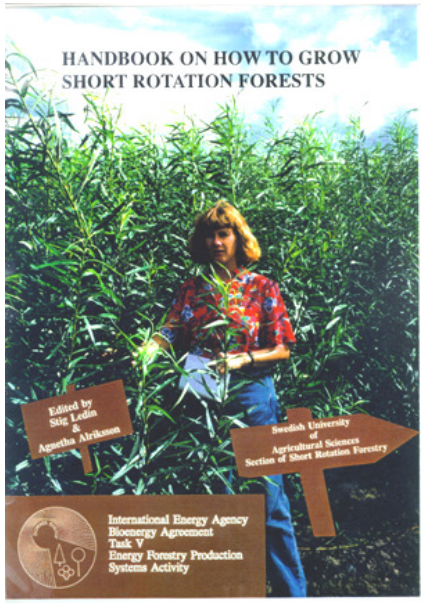
Source: Rosenquist, H., Dawson, M. Biomass and Bioenergy 2005

Non-technical barriers of Short Rotation Forestry

- Fertilisation with sludge and wastewater in SRP not regulated

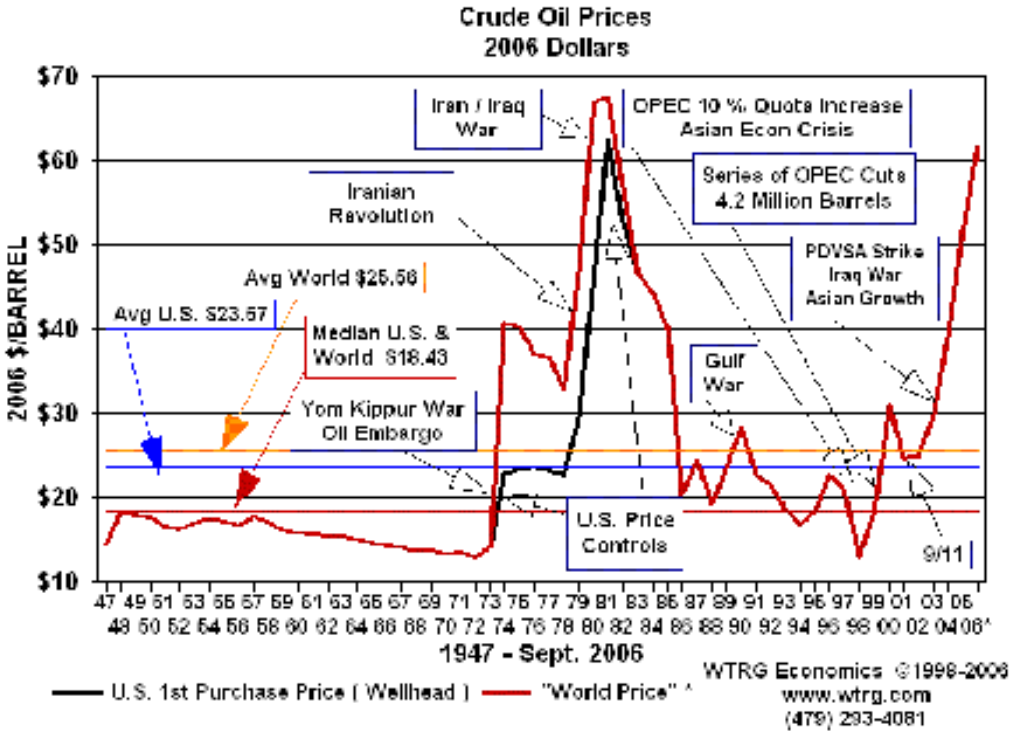
Non-technical barriers of Short Rotation Forestry

- Subsidies lacking
- energy crop support if consumers exist from 2007
- planting support from 2009
- Shortage of know-how among farmers



Non-technical barriers of Short Rotation Forestry

- Market uncertainty makes investment decision difficult



Perennial SRF`s imply a long-term commitment for farmers and only can be implemented under a stable agricultural policy which tunes in with such commitments

Th. Verwijst, IUFRO Officeholder, 2006, NorthSea BioEnergy

Technical barriers of Short Rotation Forestry

- Absence of suitable harvesting equipment

Current situation 2007. Bulgaria

- Uncertain land usage possibilities make long-term investments impossible

Current situation 2007. Poland

- Shortage of knowledge about the grazing and poor weed control can destroy young plantations

Current situation 2007. Estonia

- Lack of domastic planting material may results in the poor quality of received planting material and causes high investment costs

Thank you for attention!

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