Lappeenranta University of Technology, Finland

SUSTAINABLE DEVELOPMENT IN THE UTILISATION OF BIOENERGY

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Presentation at the University of Stellenbosch, South Africa
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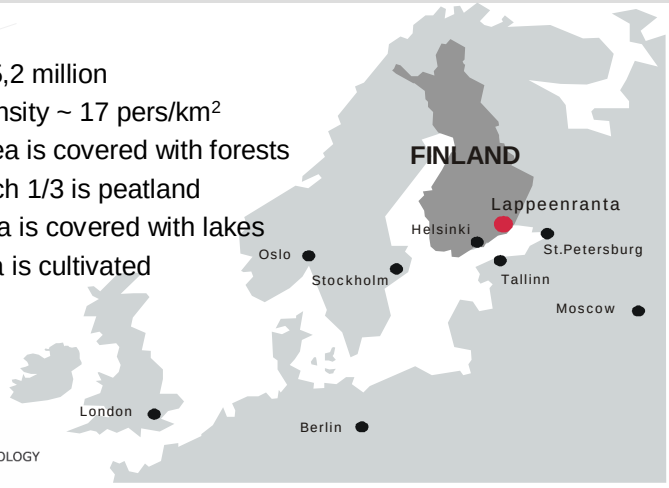
Finland

§ Population ~ 5,2 million
§ Population density ~ 17 pers/km^2
§ 68% of the area is covered with forests
§Out of which 1/3 is peatland
§10% of the area is covered with lakes
§ 9% of the area is cultivated



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Lappeenranta University of Technology, LUT

- University of technology and business
- Founded in 1969
- 900 staff members
- 10000 students
- Budget 2006: € 62 million

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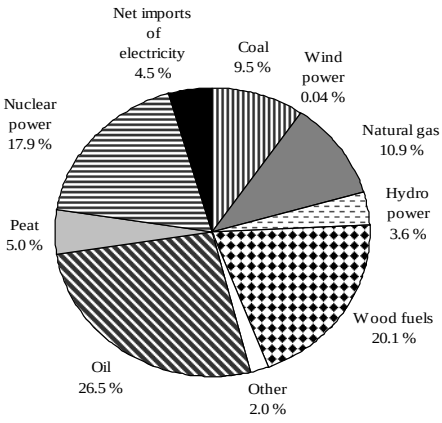
Biomass in the Finnish Energy Supply

- In 2005, the total use of primary energy 1 366 PJ
  - Share of renewable energy sources 25%
  - Share of bioenergy 20%, target 38% by 2020
  - Wood covers over 80% of renewable energy



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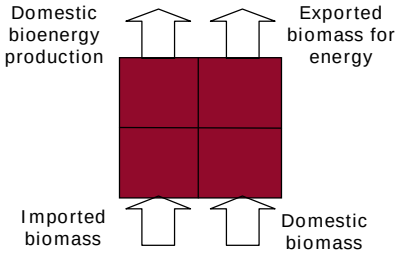
Background for the Project

- In Finland:
  - There is great potential for using and exporting wood biomass and peat for energy
  - Bioenergy is already widely used
  - Forest industry has a significant role in the economy
  - There are 350 000 private forest owners



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Research project : Sustainable Development in the Utilisation of Bioenergy

- Funded by Tekes, Finnish Funding Agency for Technology and Innovation
- Duration 6/2007-12/2008
- Research Consortium
  - Lappeenranta University of Technology
  - (METLA) Finnish Forest Research Institute
  - (VTT) Technical Research Center of Finland
  - Copernicus Institute of Utrecht University, the Netherlands

International collaboration: IEA Bioenergy Task 31 and Task 40

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Aims of the Project

- To determine:
  - Possibilities for sustainability in the utilisation of bioenergy in Finland today and in the future
  - Possibilities to apply national and international sustainability criteria in the Finnish bioenergy markets
  - Possible needs for development of the criteria from the Finnish point of view
  - Finnish expertise and role in developing sustainable international bioenergy markets

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Increasing Pressure Towards Bioenergy Utilisation

- Climate change
- Exhausting energy sources

⇒Increasing demand towards various biomasses
⇒From local product to global commodity
⇒Negative environmental side effects
⇒Sustainability criteria
⇒Certification

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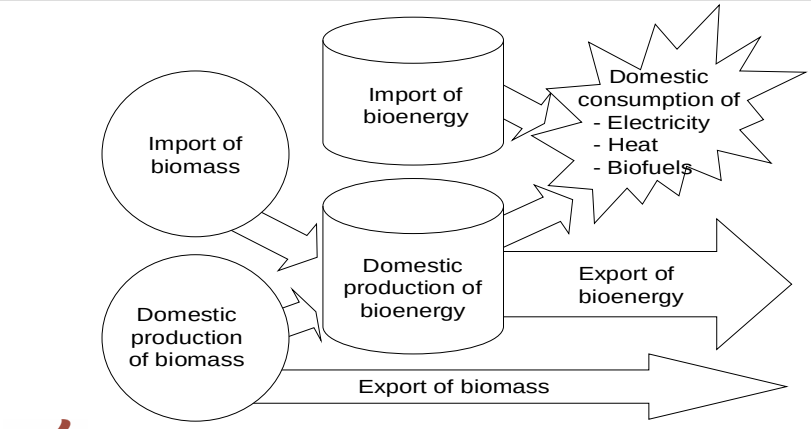
Biomass and Bioenergy Flows



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Selected Sets of Sustainability Criteria

1) Two sets for agricultural biomass
   - Roundtable on Sustainable Palm Oil (RSPO)
   - Roundtable on Responsible Soy (RTRS)
2) Two forest certification schemes
   - Forest Stewardship Council (FSC)
   - A national application, Finnish Forest Certification System, for forest biomass FFCS)
3) Two initiatives for biomass for energy raw material
   - Meta Standard (MS)
   - the Dutch Criteria for Sustainable Biomass (CSB)
4) Two proposals for bioenergy and biofuels
   - a German Sustainability Standards for Bioenergy (SSB)
   - Finnish Swan Labelling for Fuel (SLF)

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Qualitative Analysis

	RSPO	RTRS	FSC	FFCS	MS	CBS	SSB	SLF
Trade Flows								
- Import	X	X	X	X	X	X	X	X
- Domestic production	X	X	X	X	X	X	X	X
- Domestic consumption	-	-	-	-	-	-	-	X
- Export	X	X	X	X	X	X	X	X
Sustainability Criteria								
- Legal obligations	X	X	X	X	X	X	X	-
- Economic criteria	X	X	X	X	X	X	X	X
- Environmental criteria	X	X	X	X	X	X	X	X
- Social criteria	X	X	X	X	X	X	X	-

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Conclusions

- Current systems ”built on” the existing, previous systems
  - ⇒ Little innovative thinking
  - ⇒ Focus of the current sustainability criteria set on primary production
  - ⇒ Relatively little attention to the processing, utilization and trade issues
- Criteria should cover the entire value-added chain including comprehensive environmental and social impacts of bioenergy production and utilisation
- Intensive effort: from sustainability criteria to the practical implementation

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