

# Building the biorefinery business in the future: case studie of a working integrated forest biorefinery

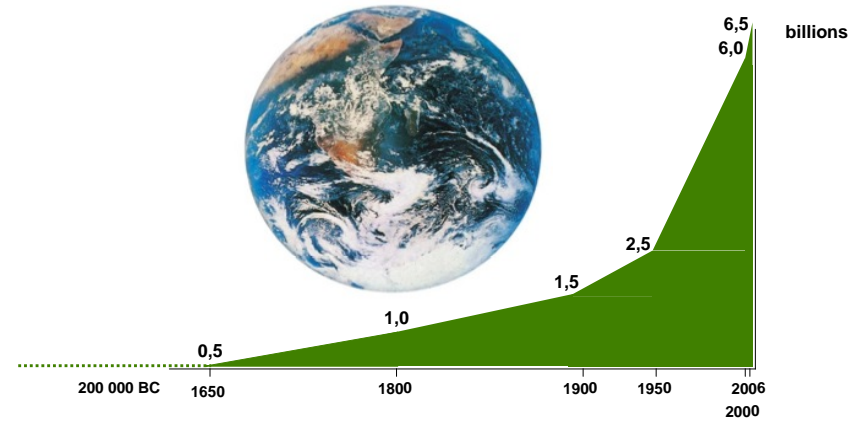
Hans Grundberg



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# Population Growth



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# The twin challenge



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"Your jeans is a poison bomb"  
(ekonominyheterna 2006)

Cotton production consume more than 11% farmer chemicals used on the earth and incomprehensible 25% of pesticides

- One pair of jeans consume
- 6600 litres water
  - 13,2 m<sup>2</sup> land
  - 0,5 kg chemicals
  - 103 different pesticides





# Biorefineries

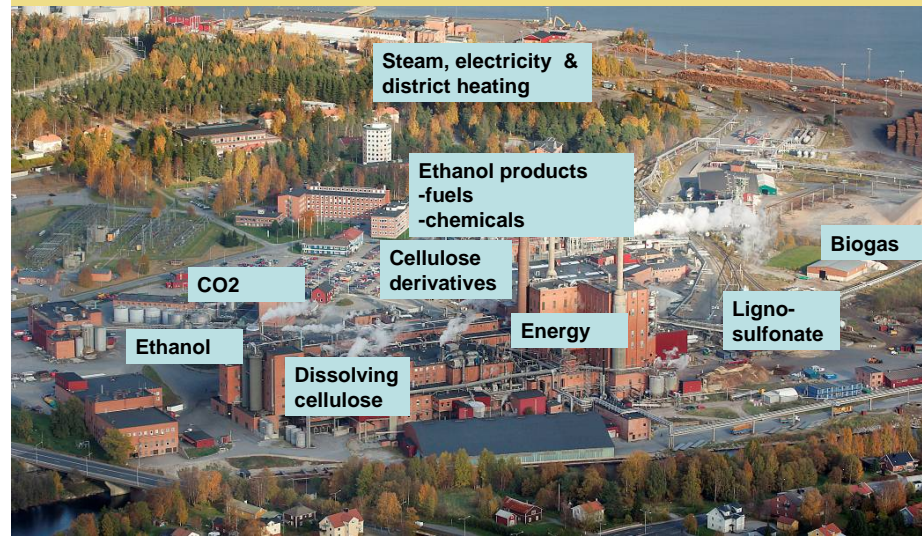
Wood, Crops, Grasses  
Forestry or Agricultural Residues  
Animal or Municipal Waste

Heat, Electricity, Fuels  
Chemicals  
Materials  
Food, Feed, Fibre

Biochemical  
and/or Thermo-chemical  
Conversion

Biorefinery research will be supported in two FP7 Themes:  
Food, agriculture and bio-technology and Energy

# The Biorefinery of Örnsköldsvik



THE BIOREFINERY  
OF THE FUTURE



# The Biorefinery of Örnsköldsvik

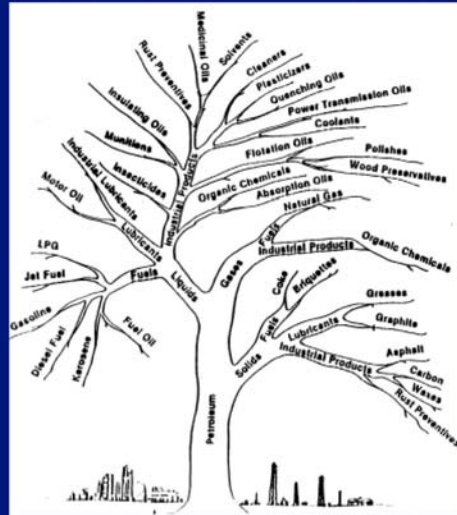


THE BIOREFINERY  
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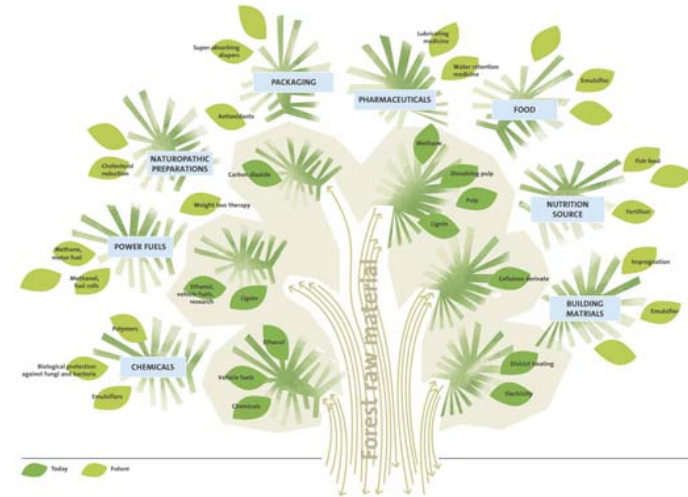


# Petroleum Refinery as Analogy

- There are specifications for over 2,000 individual refinery products
- Intermediate feed stocks can be routed to various units to produce different blend stocks
  - » Depends upon the local economics & contractual limitations



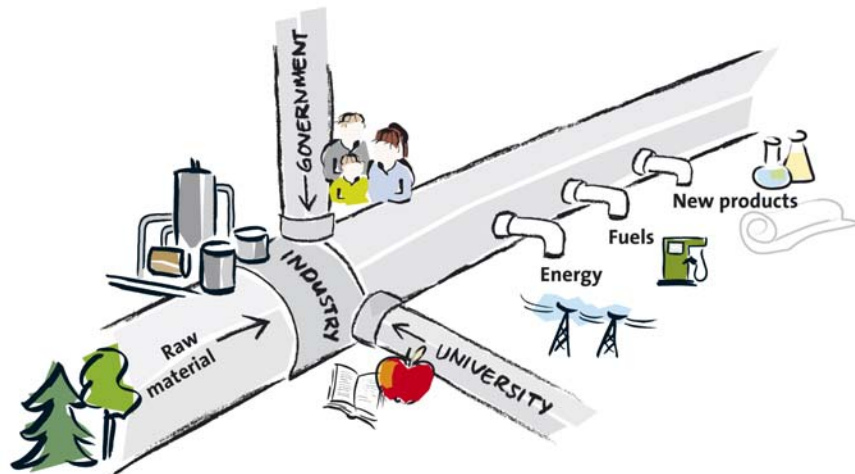
# The biorefinery of the future



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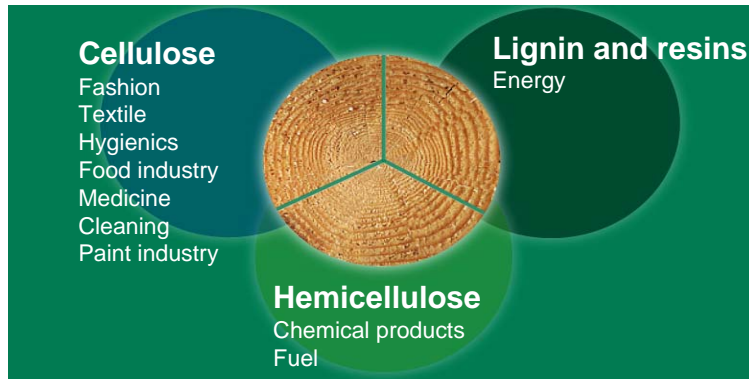
# Biorefinery Research



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# Green platform



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# Lessons learned and challenges

- Vision and Communication
- Cooperation and integration
- Entrepreneurs
- Pilot units and Research resources
- Time!
- Separation and purification processes



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