

Bioenergy: a problem or a solution

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clean energy sources will increase bio energy

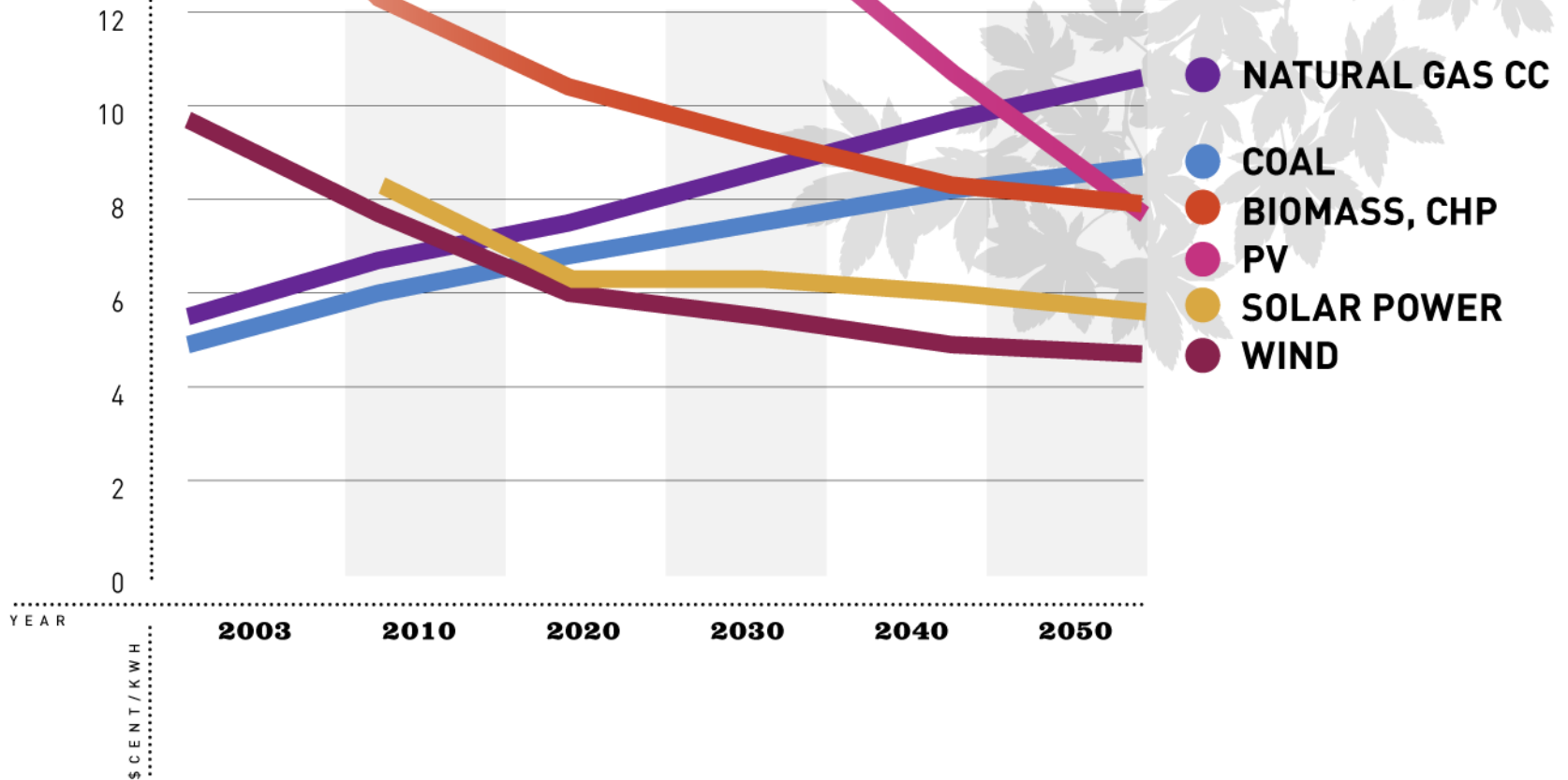


figure 6.13: global: development of primary energy consumption under the two scenarios

(‘EFFICIENCY’ = REDUCTION COMPARED TO THE REFERENCE SCENARIO)

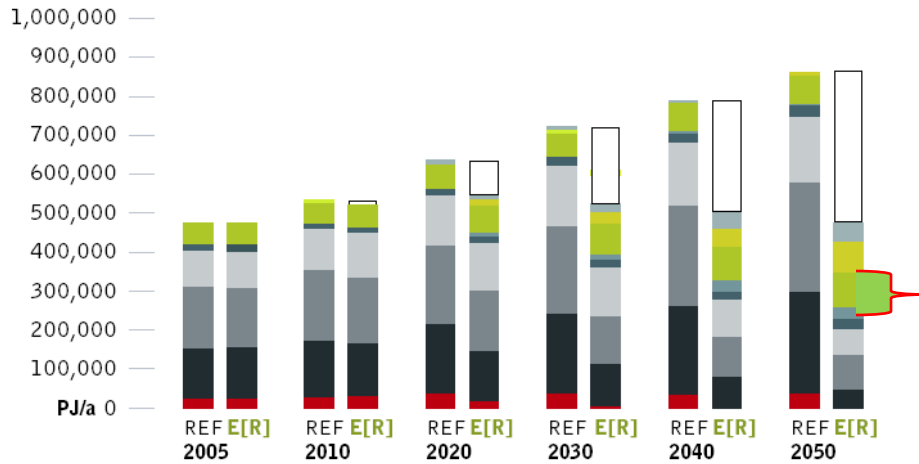
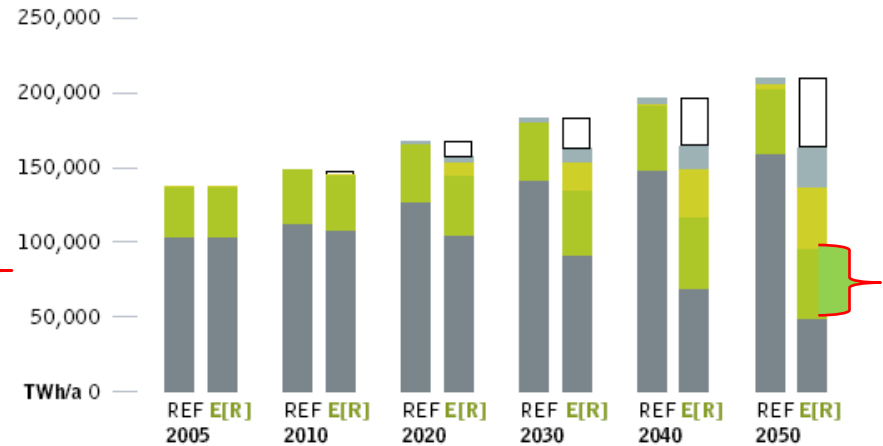


figure 6.11: global: development of heat supply structure under the two scenarios

(‘EFFICIENCY’ = REDUCTION COMPARED TO THE REFERENCE SCENARIO)



- 'EFFICIENCY'
- OCEAN ENERGY
- GEOTHERMAL
- SOLAR
- BIOMASS
- WIND
- HYDRO
- NATURAL GAS
- CRUDE OIL
- COAL
- NUCLEAR

- The potential of bioenergy is significant but it is conditional to many ethical and practical dimensions

Ethical dimensions of the bioenergy

- The consequences of bioenergy production to
 - Fair distribution of the benefits and costs of production
 - Ownership and tenure rights, participatory rights and access to justice of local and indigenous people
 - Food production
 - Biodiversity and ecosystem balance
 - GHG emissions and climate impact

The climate impact of bioenergy

- The carbon-neutrality of bioenergy is based on the conditional fact, that the net impact to the atmosphere should remain neutral in the medium term, ie the emissions are absorbed by the continuously grow of the biomass
- IPCC: "Emissions of CO₂ from biomass fuels are estimated and reported in the Agriculture, Forestry and Land Use sector"
- Carbon-neutrality is conditional to the carbon accounting rules of forestry and land use
 - Current rules in UNFCCC and Kyoto Protocol do not fully guarantee this, new REDD also includes potential loopholes
 - RSPO sertificate currently ignores this

Biofuels booming

- Greenhouse gases (GHG) and high prices for fossil fuels have increased the interest
- EU and national renewable targets to replace transport fuels further push the interest
- Raw materials: Palm, rapeseed (canola), sunflower, soya, jatropha, algae, waste ...
- Palm oil a leader, major investments planned
- Increasing pressure for large scale production in tropical areas

Production of raw materials in tropical areas causes

- Forest and peat land destruction
- Logging
- Drainage and burning
- GHG emissions
- Loss of biodiversity
- Competition for land
- Threatening food production
- Increased inequality between rich and poor
- Human rights violations

Indirect land use change (ILUC)

- GHG reduction is main justification for interest in biofuels and for public policies supporting biofuels
- Substantial GHG emissions through land-use changes arising from biofuels production
- Research increasingly indicates that these GHG emissions can outweigh any savings from using biofuels
- ILUC emissions must be included in EU and national renewable targets

Research on biofuels

- VTT Technical Research Centre of Finland: Assessing the sustainability of liquid biofuels on evolving technologies
- Conclusions: Biofuels can have remarkably negative climate and environmental impacts
- Extremely challenging or impossible to create functional criteria for sustainable bio fuels production
- <http://www.vtt.fi/inf/pdf/tiedotteet/2009/T2482.pdf>

Research on biofuels

- EC report on biofuels
http://ec.europa.eu/dgs/jrc/downloads/jrc_biofuels_report.pdf
- Conclusions: Indirect land use change could potentially release enough GHG to negate the savings from conventional EU biofuels (page 11)

Research on biofuels

- Bringezu et al. 2009. UNEP. Towards sustainable production and use of resources: Assessing Biofuels.
http://www.unep.fr/scp/rpanel/pdf/Assessing_Biofuels_Full_Report.pdf
- Science based-policies recommended e.g: to promote energy from residues /waste rather than from energy crops

Case study: Southeast Asia

- Tropical forest destruction is responsible for 20% of greenhouse gas (GHG) emissions in the world
- Indonesia is the world's third largest producer of greenhouse gas emissions
- Forest destruction is the main cause for Indonesia's GHG emissions

Case study: Southeast Asia

- Palm oil and pulp production are the main drivers of deforestation in Southeast Asia
- Plantations established in forest areas to log the forests for timber to fund first years before the first palm oil crop
- The clearing of rain forest and peat land area is driven by the growing demand for palm oil
- There is growing interest to use palm oil as raw material for fuel

Palm oil production booming

- In 20 years 3x more plantation area
- 90% of production in Southeast Asia
- In Indonesia more than 22x more land area, increase by over 2100% in 20 years
- Most of palm oil still used in food and cosmetics industry
- Growing demand of palm oil for fuel

Local impacts of palm oil production

- More production by large scale enterprises
- Companies work in both palm oil and pulp business
- Increased number of conflicts every year
- People are violently driven away from their land and homes
- According to Indonesian legislation the local communities own their land but despite of this the same areas are given to palm oil corporations to establish plantations

Local impacts of palm oil production

- Cheap labor force brought from other areas
- Local communities achieve no benefits: Lack of groundwater, toxic chemicals use as fertilizers poison environment, forest fires cause environmental and health problems
- Environmental problems
- GHG emissions

Sustainable palm oil production?

- Virtually impossible in large scale
- Roundtable on Sustainable Palm Oil
- GHG emissions caused by land use change are not included in criteria and will not be included in becoming years
- RSPO standard can not be used for measuring the GHG balance of palm oil based bio fuels

Sustainable palm oil production?

- Overestimated capacity of waste lands
- http://www.gaiafoundation.org/documents/Agr_ofuels&MarginalMyth.pdf
- More water, fertilizers and funds needed for improvements in yields
- http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB30.pdf

Neste Oil's impact

- Porvoo 1 in 2007, 170 000 MT/a
- Porvoo 2 in 2009, 170 000 MT
- Singapore in 2010: 800 000 MT
- Rotterdam in 2011: 800 000 MT
- Total capacity 1,94 MT
- In 2011 Neste Oil will need over 2 million MT of raw materials for NExBTL
- Singapore and Rotterdam will be world's largest biofuel refineries and located in core areas of palm oil industry

Research

- VTT Technical Research Centre of Finland: Assessing the sustainability of liquid biofuels on evolving technologies
- Especially pays attention to the indirect land use change caused by the use of palm oil as fuel
- The use of palm oil as fuel is growing the demand of palm oil and increases the pressure to establish plantations to rain forest areas

Research

- Center for International Forestry Research
CIFOR
- The impacts and opportunities of oil palm in Southeast Asia: What do we know and what do we need to know? (2009). Sheil, D.; Casson, A.; Meijaard, E.; van Noordwijk, M.; Gaskell, J.; Sunderland-Groves, J.; Wertz, K.; Kanninen, M
- <http://www.cifor.cgiar.org/Publications>

Urgency and need for real solutions

- UN estimates that virtually all Southeast Asian rain forests will be vanished by 2011 if the growth in demand of palm oil continues
- Orangutans estimated to become extinct in 5 to 15 years
- There is no time to wait to find alternative raw materials
- Palm oil must not be used as raw material for fuel

Urgency and need for real solutions

- Contemporary research proves that the growing demand raw materials for fuel is putting more pressure to establish new plantations to rain forest and peat land areas
- Palm oil hasn't been used much as raw material for fuel and now the demand is about to increase immensely
- No palm oil should be used for fuel as the GHG emissions are worse than the ones from fossil fuels

Urgency and need for real solutions

- No palm oil based fuels to be subsidized as environmentally friendly
- To reduce emissions resources must be focused on more energy efficient cars and improvement of traffic and transport infrastructure and logistics
- Real solutions must be subsidized, for example waste based fuels and energy efficiency

Sustainable future of biofuels

- More efficiency in ALL technologies within the transport sector
- Strict efficiency standards for cars
- Phase-in of electrical drives

<http://www.energyblueprint.info/>

figure 6.12: global: transport under the two scenarios
(‘EFFICIENCY’ = REDUCTION COMPARED TO THE REFERENCE SCENARIO)

