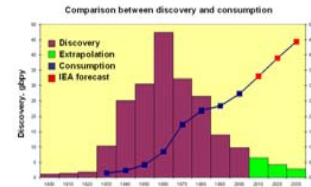
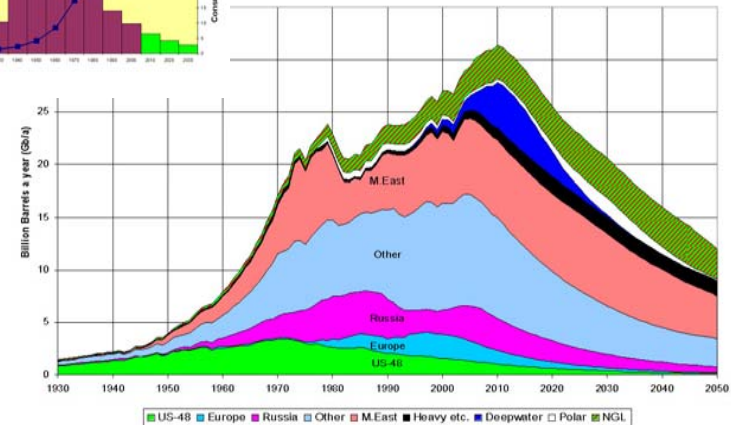


Sustainable transports with sustainable biofuels

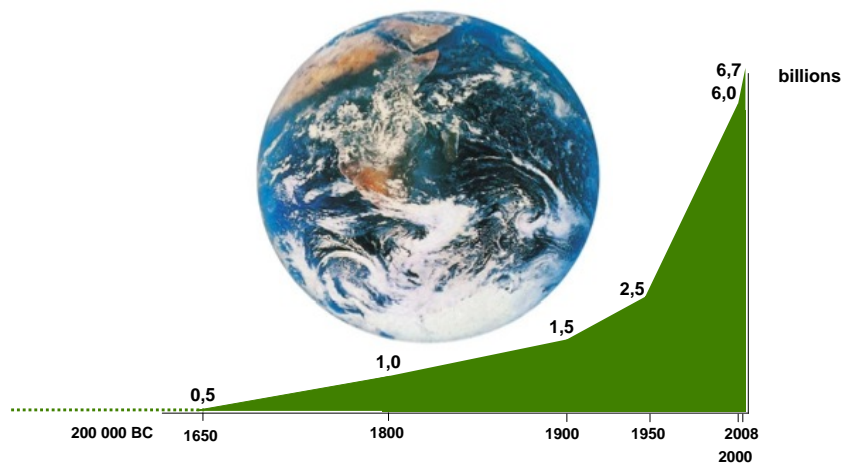
Lena Nordgren
2009-01-13



Peak Oil?

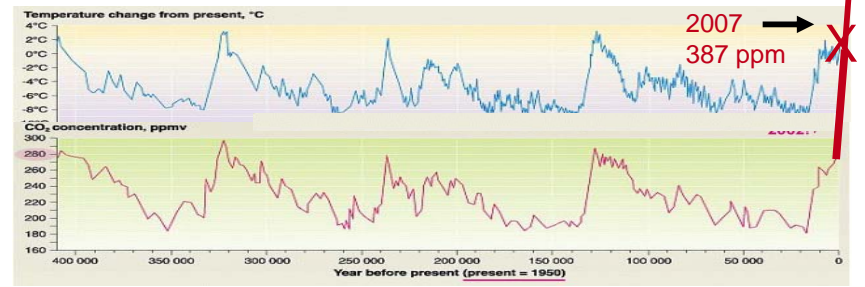


Population growth



Climate and CO₂ have varied over time!

Last 400 000 years from "the Vostok Ice Core"





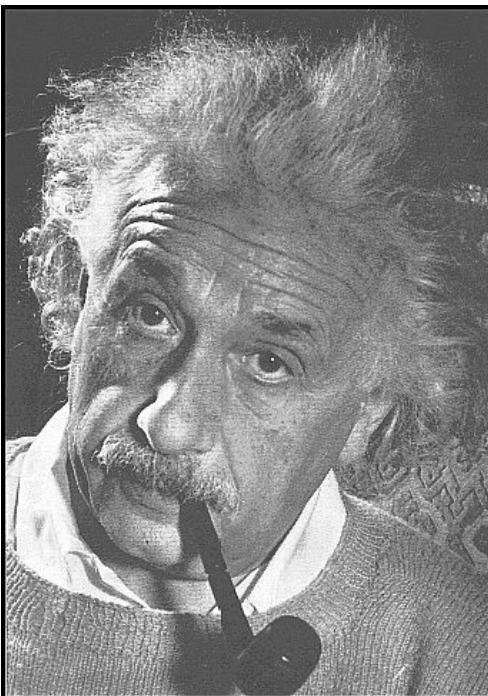
Increased transports



What to do with transports?

Reduce Oil Dependency & Fossil CO₂

- Curb the growth for transports
- Increase energy efficiency, dramatically
- Large systems shift towards sustainable renewable fuels



"We need a new way of thinking, to solve the problems caused by the old way of thinking"

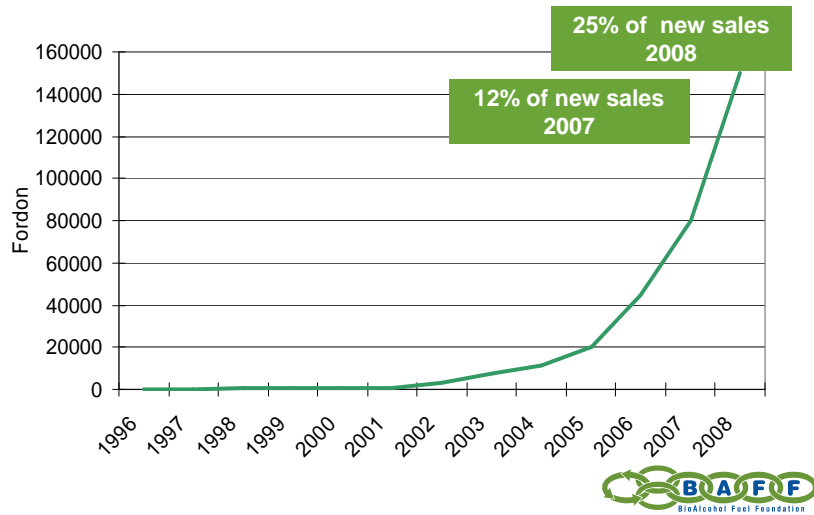
Albert Einstein



A Systems Approach



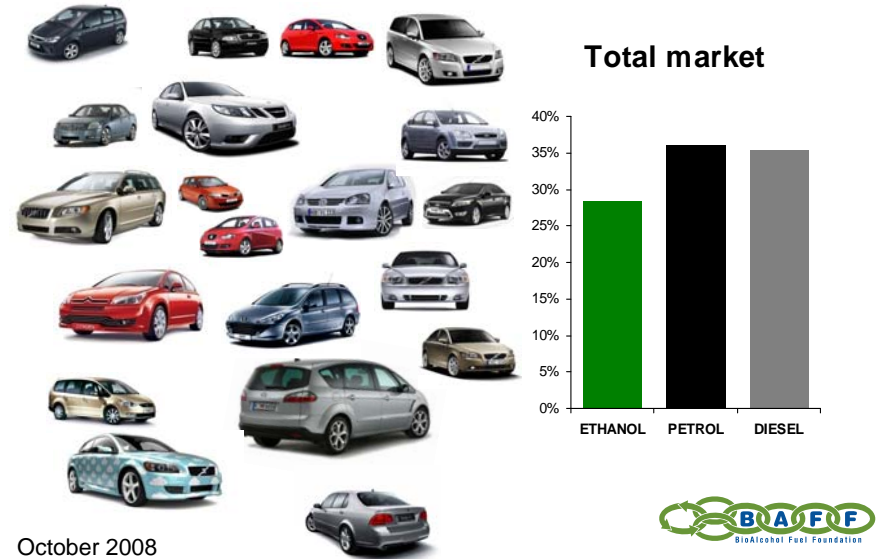
Flex-fuel development in Sweden



2005-03-04/LN



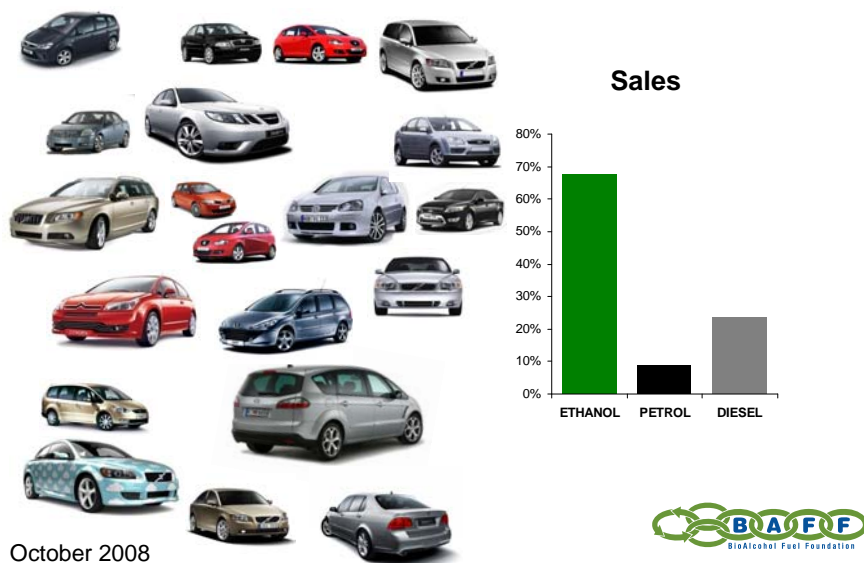
Total Swedish market October 2008!



October 2008



When the customer can choose!



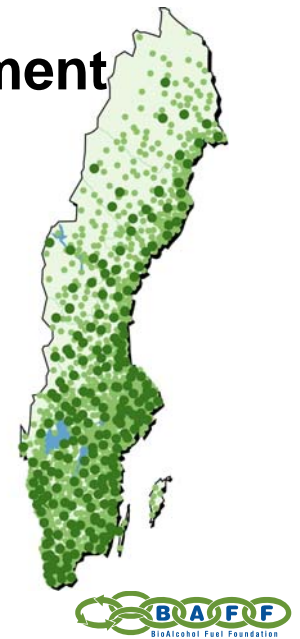
October 2008



A dynamic development

It took ten years to open the first 100 filling stations with E85.

The last 100 stations opened in the past three months.





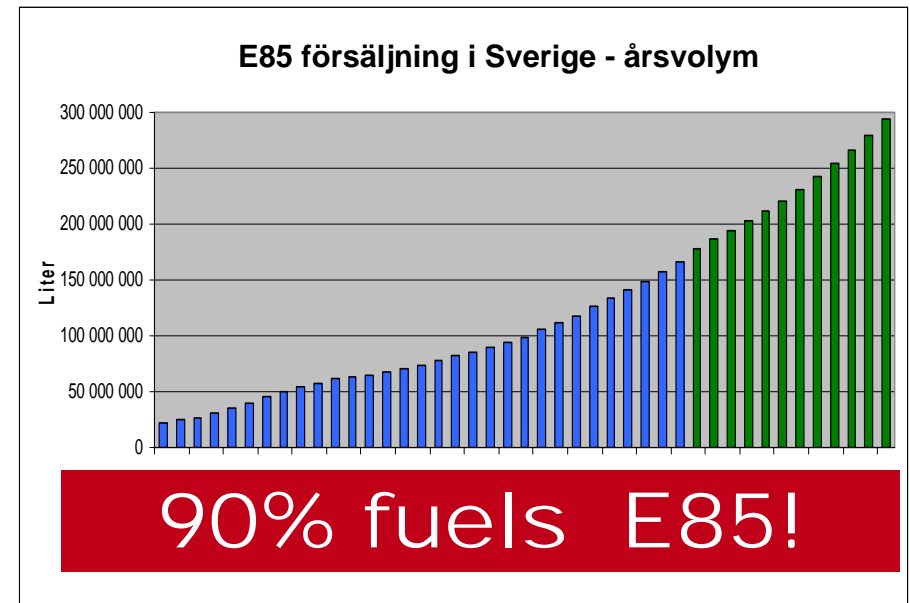
E85

1300

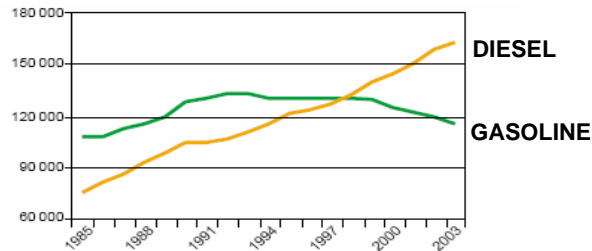
Filling stations today

2600

Filling stations 2009



Diesel use increases rapidly in Europe



Not enough diesel globally



650 ethanol buses in Sweden





Diesel engine as efficient with ethanol as diesel

Euro 5 and EEV

9-litre diesel engine
Scania EGR
270 hp, 1200 Nm

Thermal efficiency
Ethanol up to 43%
Diesel up to 44%



CO₂ emissions

(g/passenger-km)

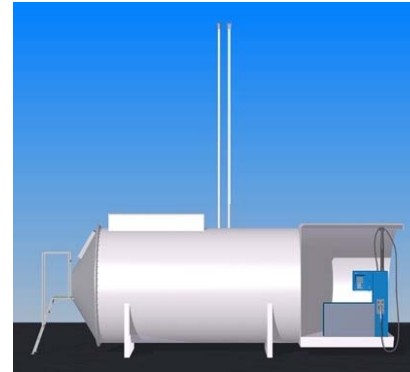




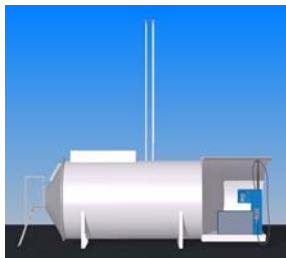
Ethanol for heavy vehicles



Infrastructure ED95

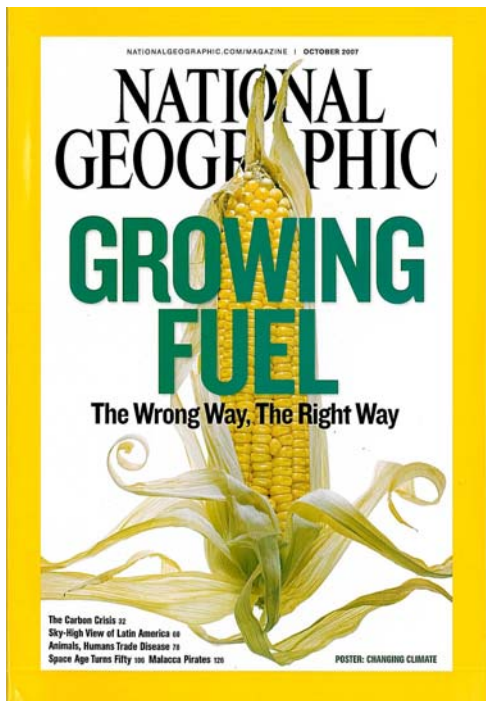


Infrastructure ED95 England



Ethanol in diesel engines



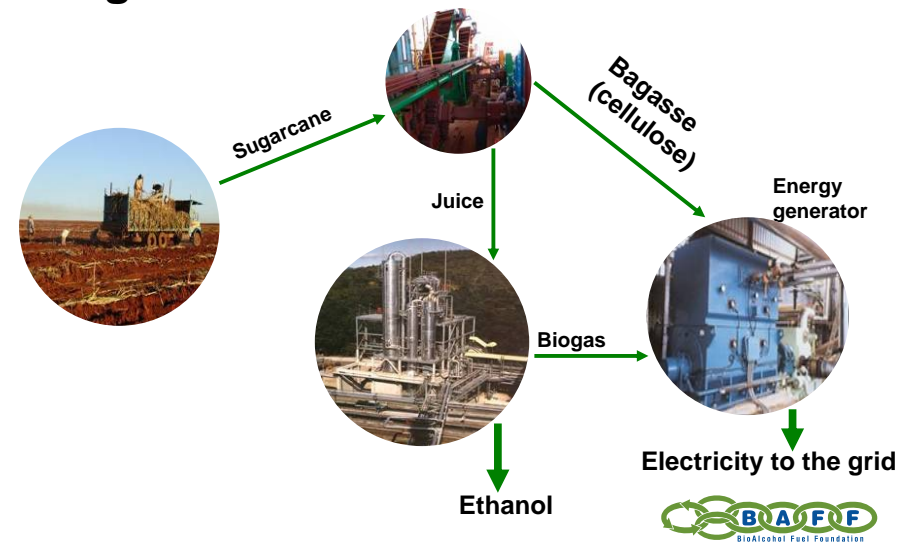


BioFuels are controversial

- Can be done Wrong!
- Can be done Right
- Difference between BioFuels & BioFuels
- Difference between Operators & Operators



Most common feedstock is sugarcane



UNICA ↔ BAFF

SEKAB ↔ Suppliers in Brazil



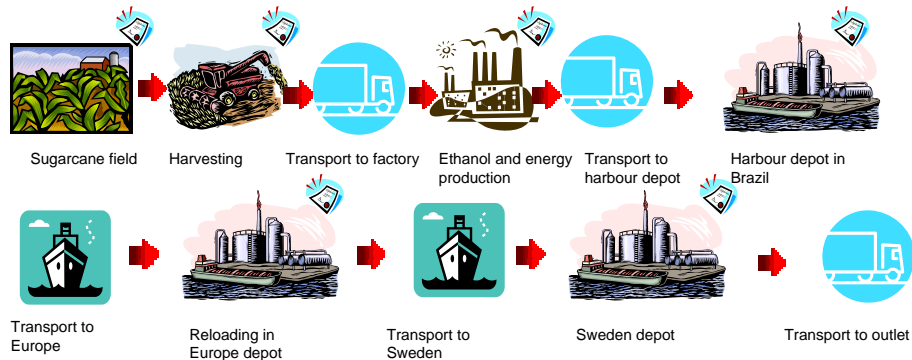
Sustainability criteria



- Net reduction of fossil CO2 at least 85%
- Commitment to increase mechanical harvesting
- Zero tolerance to child labor
- Labor rights and working conditions (Forced labor, Health & Safety, Wages, Freedom of association)
- Implementation of UNICA:s environmental protection program
- Zero tolerance of deforestation of rain forest
- Full traceability of all physical flows from field to wheel



Ethanol Chain of Logistics



Verified Sustainability Criteria's

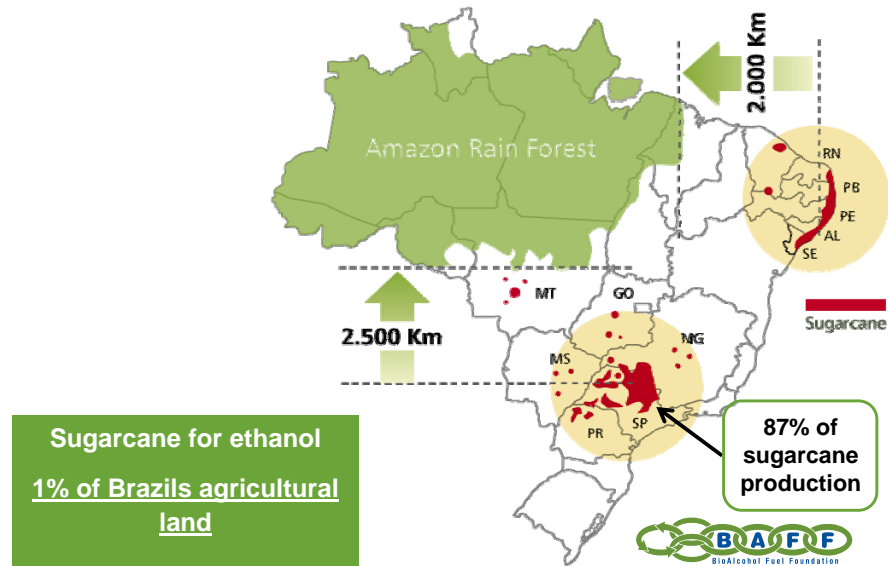
Traceability from field to wheel



Food vs biofuels

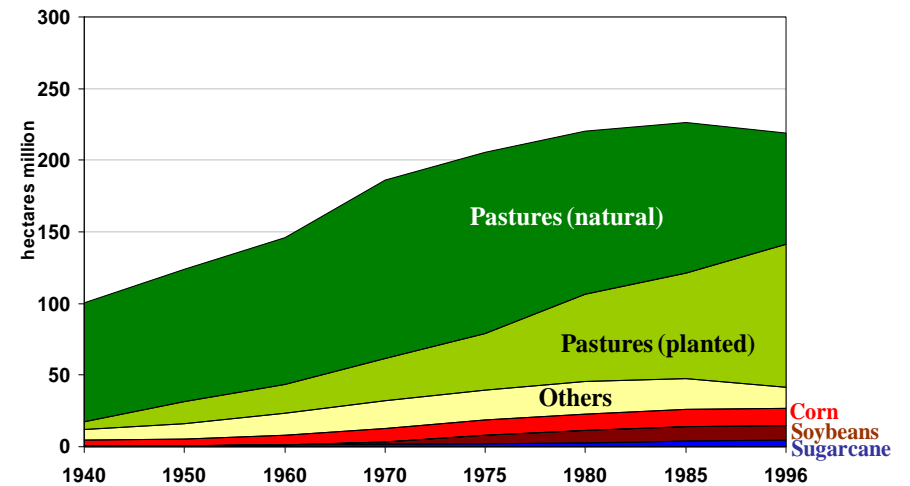
1. Do not distinguish between the different feedstocks in use!
2. Do not distinguish between countries with under- or fully utilized land
3. Ignores the new big challenge of the XXI century: Climate Change.
4. Ignores the impact of oil shortage and dramatically higher oil prices
5. Ignores the impact from oil on food prices. Transports and fertilizers
6. Ignores the benefits that BioFuels can provide for the developing countries

Sugarcane production in Brazil



Sources: NIPE-Unicamp, IBGE and CTC

Present landuse in Brazil



Source: Brazilian bovine flock → IBGE, Pesquisa agropecuária municipal. Accessed 12/09/2007; Bovine flock and pasture areas in São Paulo → Annual Report of the São Paulo State Government, 2006. Economic Information. São Paulo: Instituto de Economia Agrícola, v.37, n.4, p.91-104, abr.2007.



Cellulose great opportunities



R&D Pilot Plant - Cellulose



Feedstock + cellulose

Litre ethanol per ha/year

Corn + stover	3.000 +1.500	4.500
Wheat + straw	2.000 +1.000	3.000
Sugarcane + bagasse	8.000 +4.000	12.000



SWEDEN 2030

- 5 Million cars
 - 1600 litre/year
- ➔
- 8.000.000 m3 ethanol /year

Grain	4.000.000 ha
Sugarcane	1.000.000 ha
Sugarcane + cellulose bagass	650.000 ha
+ Current hybrides	450.000 ha
+ Plug-in hybrides	200.000 ha





The biggest
threat to
humanity,
is not the evil of
the bad persons.

*It is the passivity of the
good ones!*

Martin Luther King



Thank You!

www.BAFF.info

lena.nordgren@BAFF.info

