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EUROPEAN BIOMASS ASSOCIATION

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Bioenergy in Sweden and potential for the future in Europe.

Gustav Melin

Stockholm, 1 October 2011

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About AEBIOM
European Biomass Association

SVEBIO

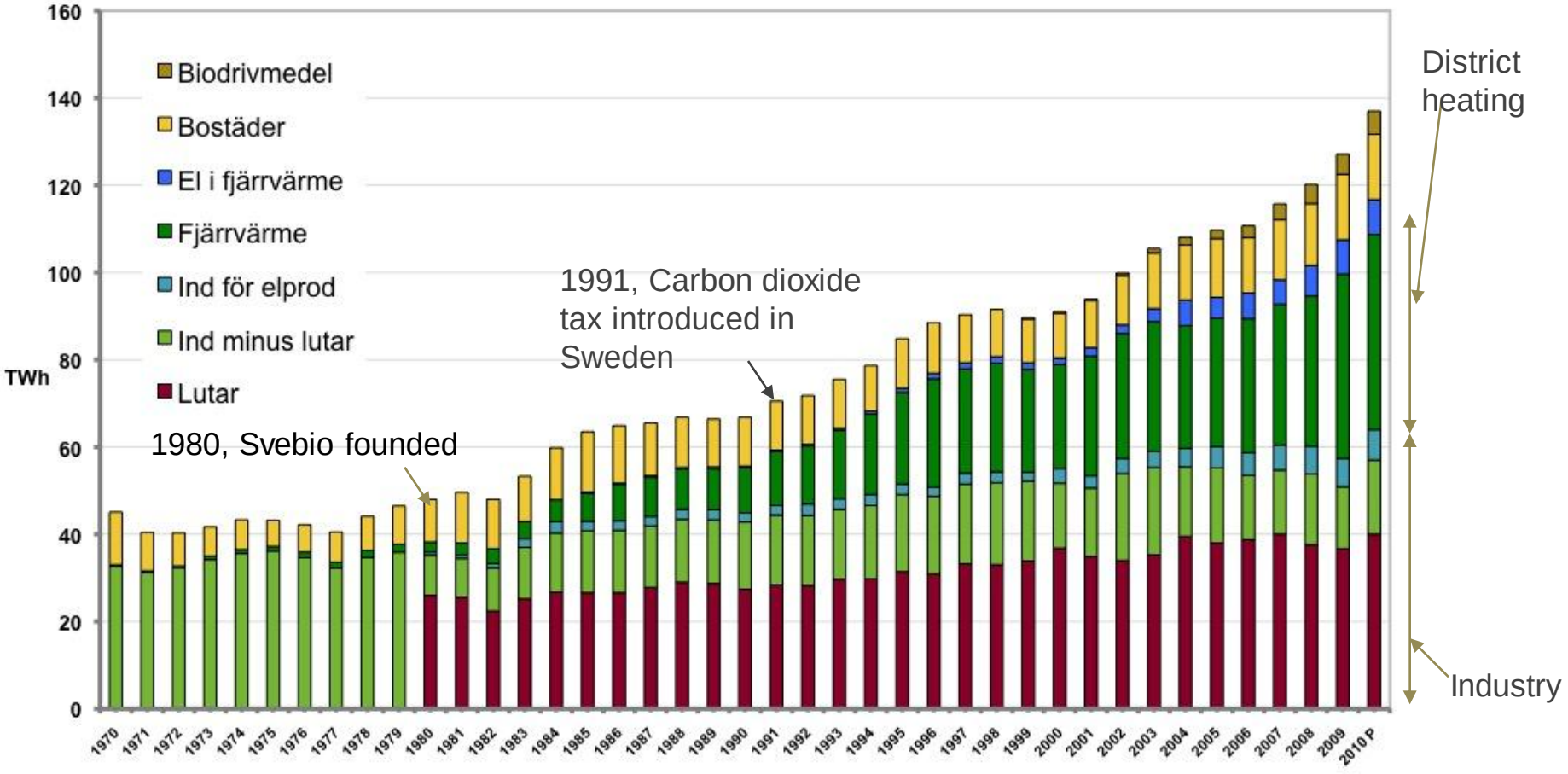
Swedish Bioenergy Association founded in 1980

Interest organisation for companies and private persons

Almost 300 member companies are producers, users, manufacturing firms, consultants and service companies etc.

- **Mission:**
  - **To increase the use of bioenergy in an economically and environmentally optimal way.**

Use of Bionergy in Sweden
1970-2010p (TWh)



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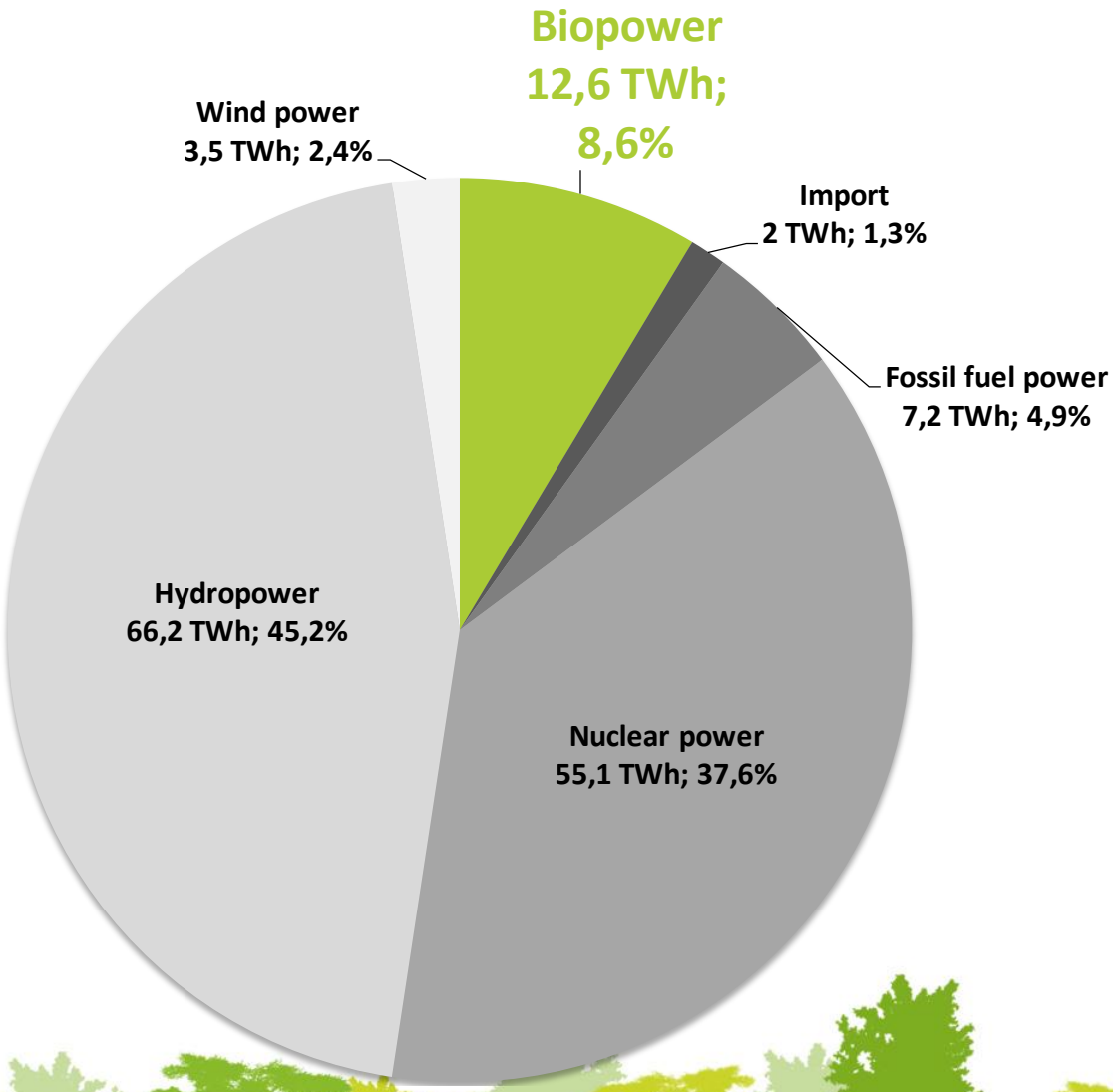
Electricity production 2010



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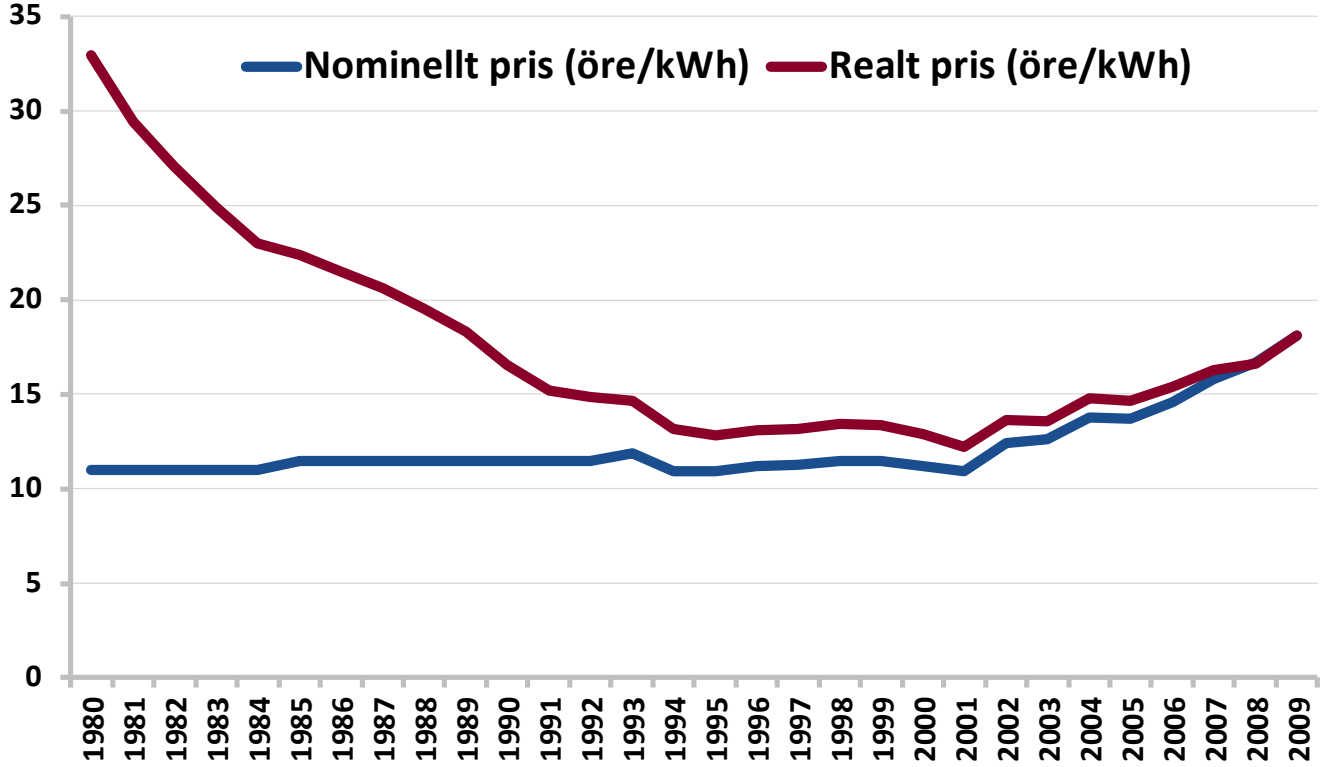
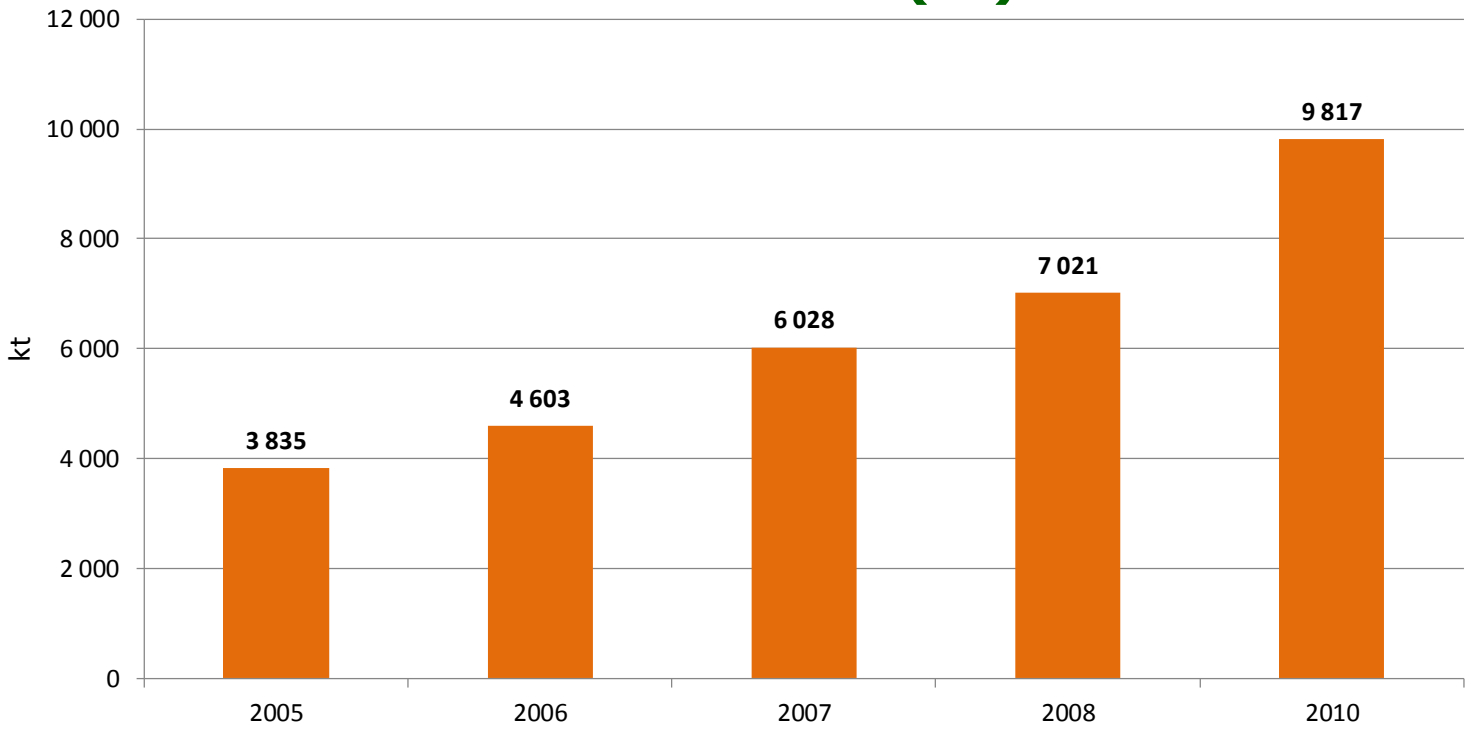
Wood chip prices in Sweden

prices in öre/kWh - same as Euro/MWh times 1,1



Trädbränslepriserna i Sverige (hela landet) sjönk kraftigt realt under tjugo år, men sedan 2001 har de stigit enligt statistik från Energimyndighetens prisblad 1993-2009 (skogsflis till värmeverk). Siffrorna från tidigare år bygger på egna erfarenheter och muntliga meddelanden.

Total consumption of pellets in EU27 in 2010 (kt)



Source: Pro Pellets Austria; Pelletsatlas, 2009

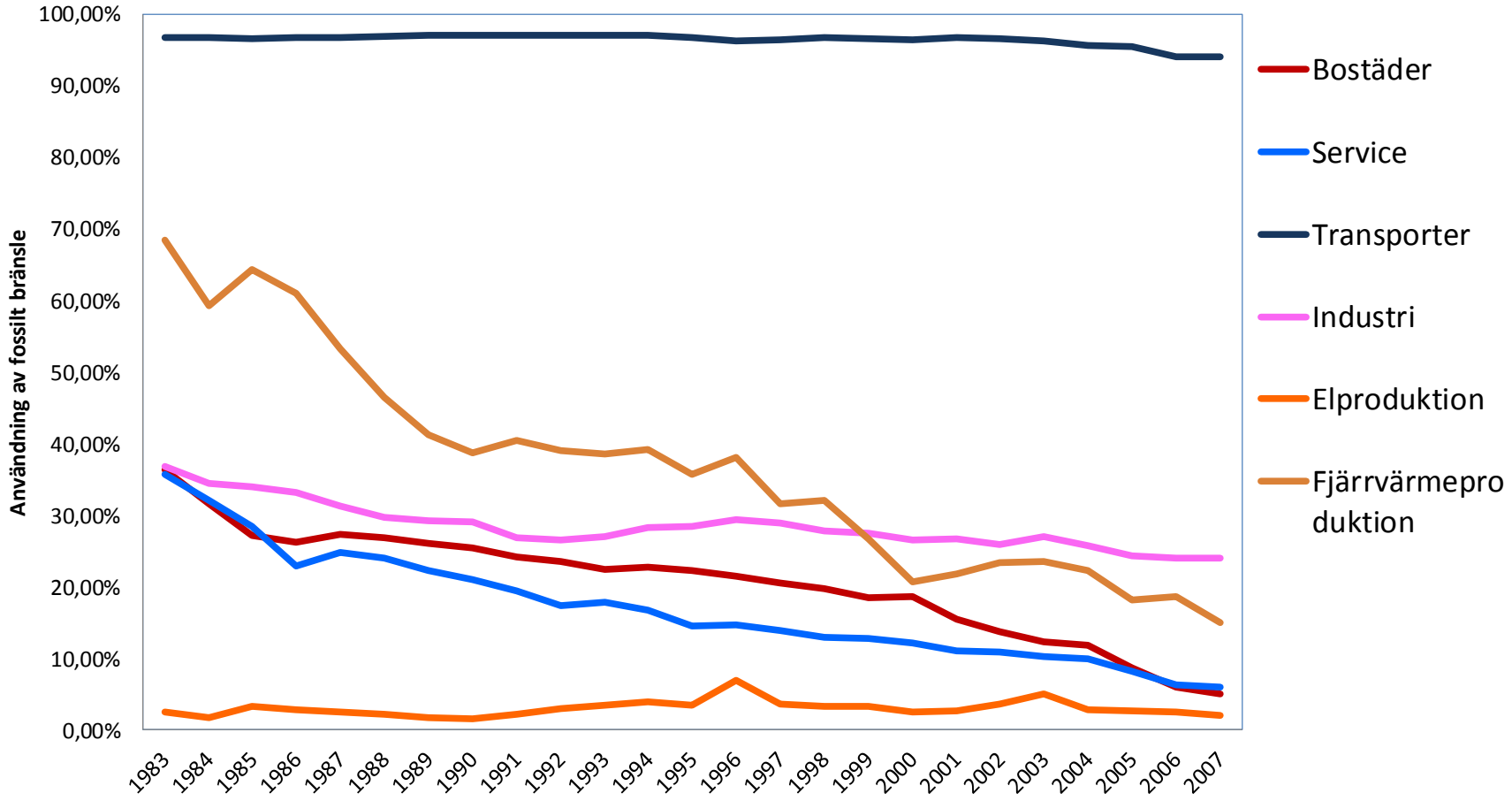
Replace oil almost half the cost

Burner size 5 – 50 MWth

Several suppliers

Today approx. 0,75 € euro/$ USD
Crude oil approx.103 USD/Barrel, One barrel is 1,7 MWh energy, this corresponds to € 218 per tonne pellets (4,8 MWh). Price of pellets delivered to industry customer in port €125 inland €150.

Share of fossil energy in different sectors in Sweden 1983-2007



Andel fossil energi inom olika sektorer i Sverige, 1983-2007.
Källa: Energimyndigheten, Energiindikatorer 2009, SCB

210.000 m³ bioethanol

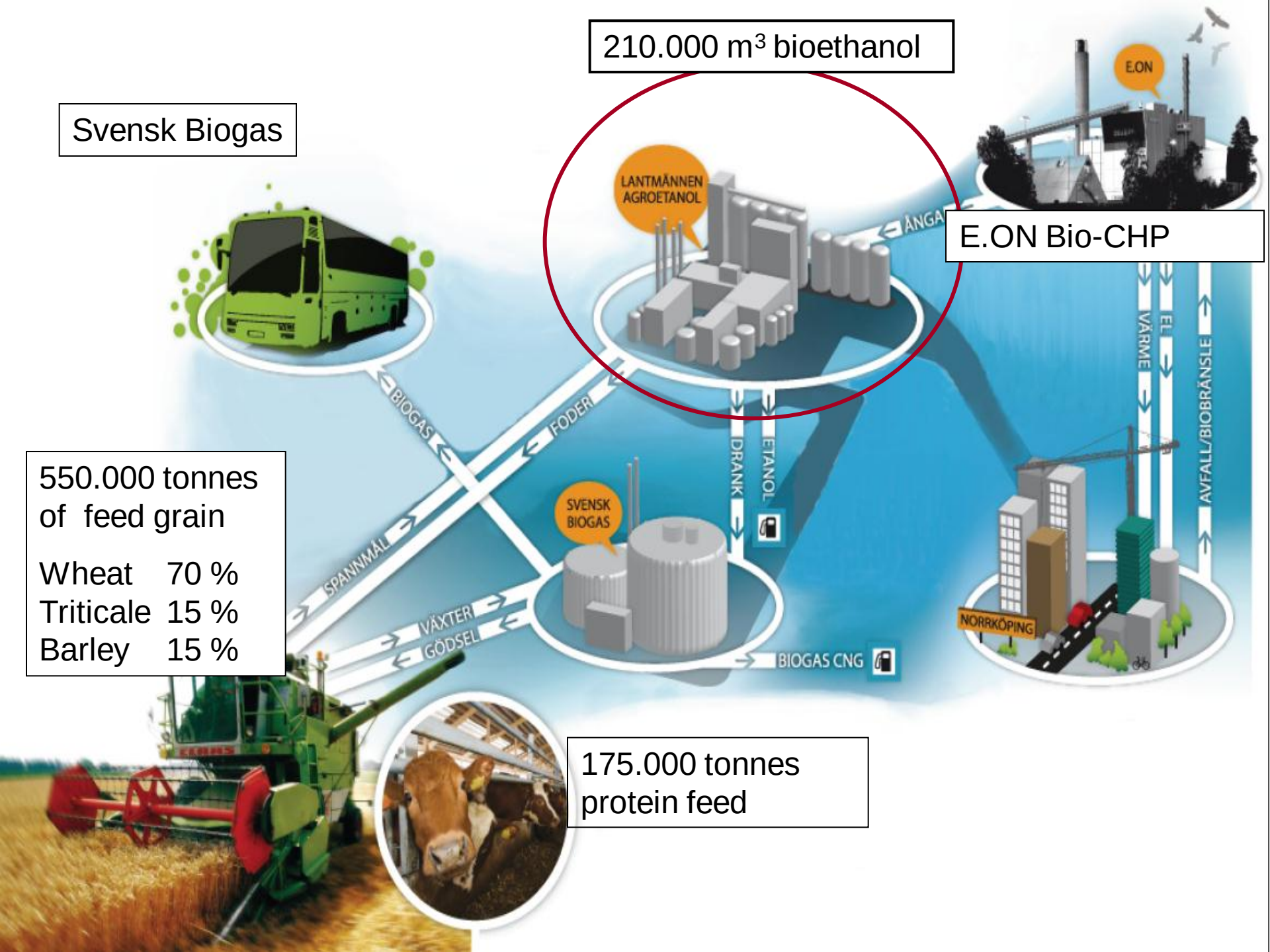
Svensk Biogas

E.ON Bio-CHP

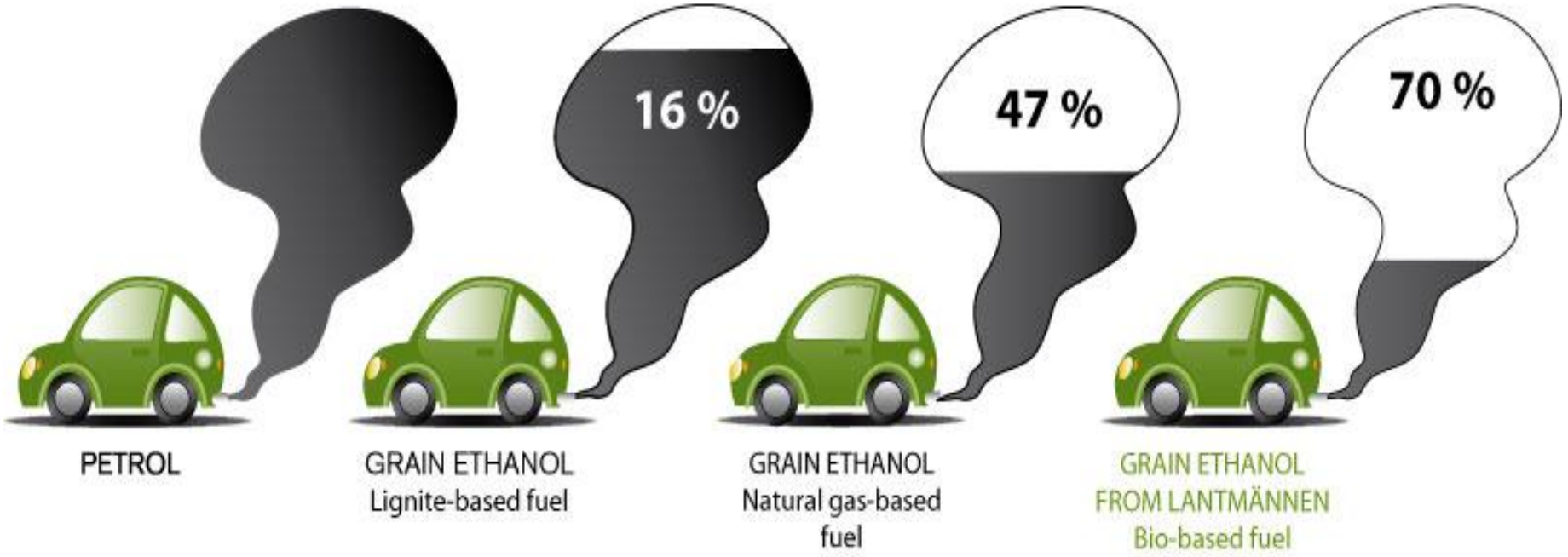
550.000 tonnes of feed grain

Wheat 70 %
Triticale 15 %
Barley 15 %

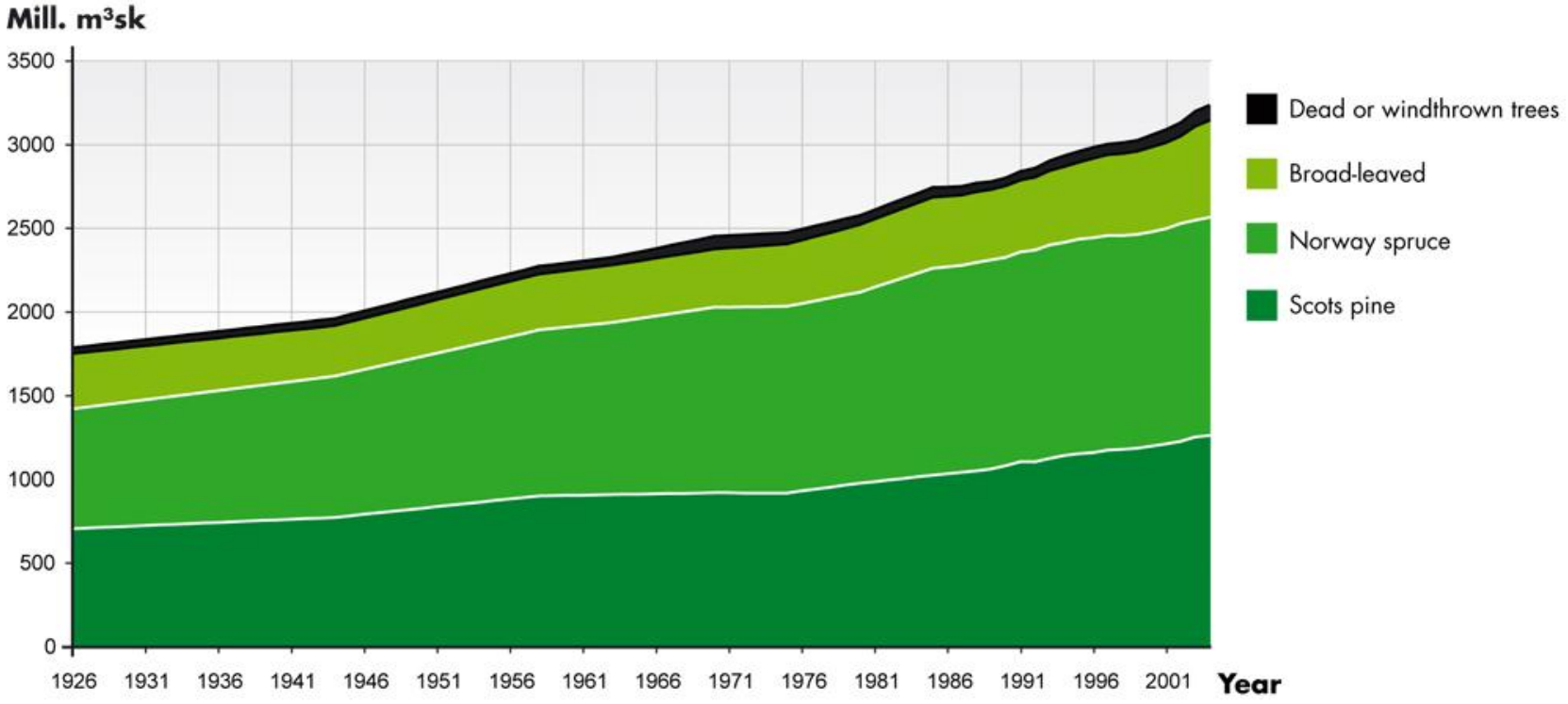
175.000 tonnes protein feed



Life cycle GHG reduction from Lantmännen Agroetanol's ethanol

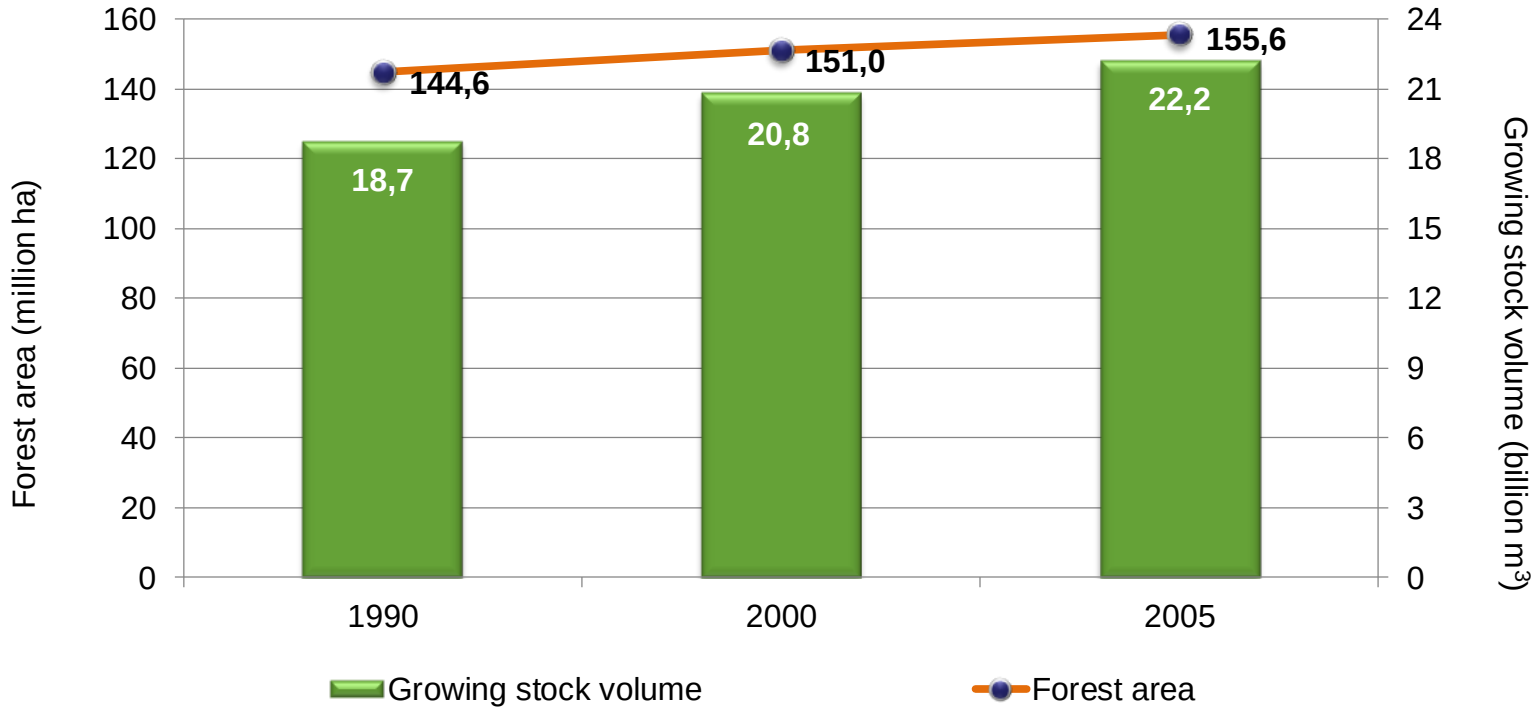


Total standing volume of round wood in Swedish forest from 1924



[1] Excl. high mountains, restricted military areas, urban land and water surfaces.
Millions cubic metre standing volume (stem volume over bark from stump to tip)
Source: National Board of Inventory

Forest area (million ha) and growing stock volume (billion m3)



Source: Rautinen A. and al.

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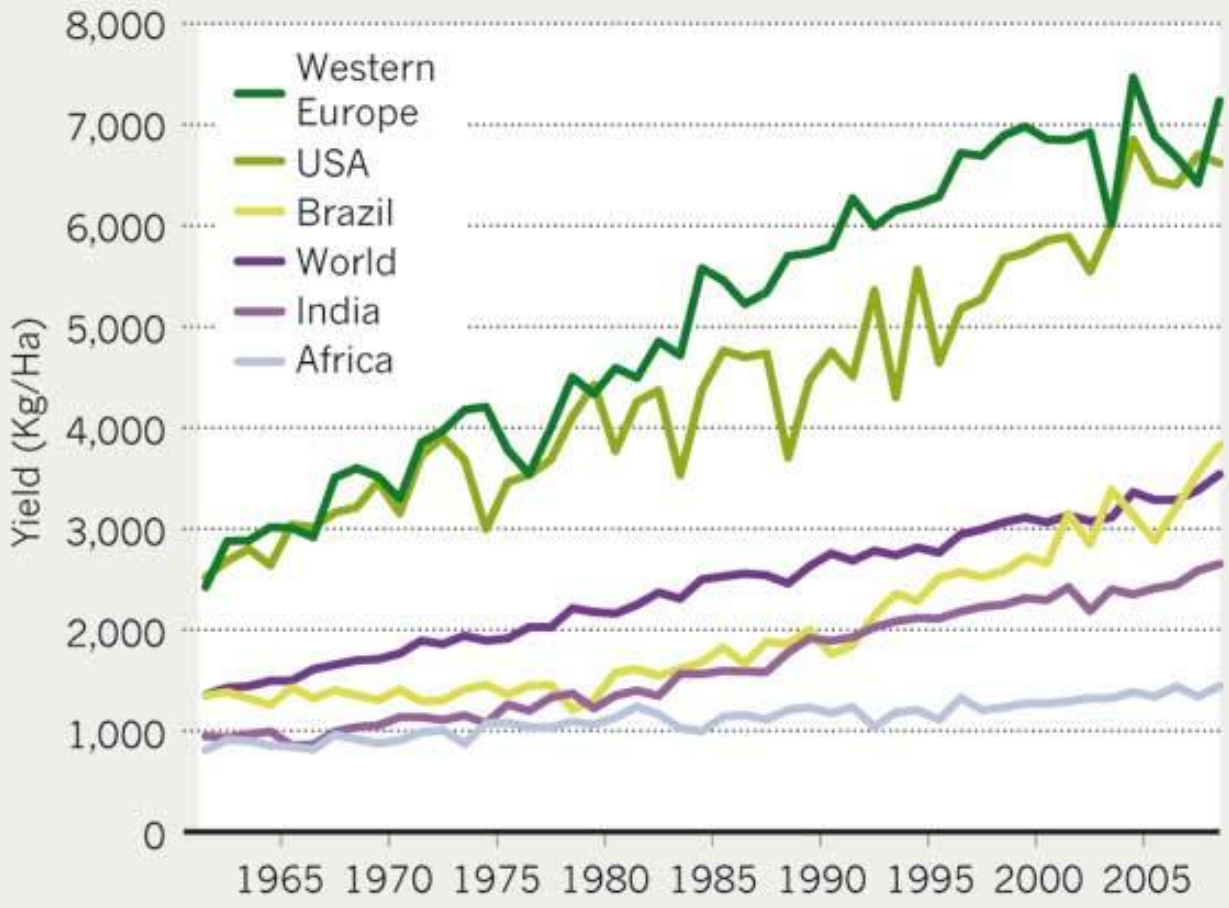
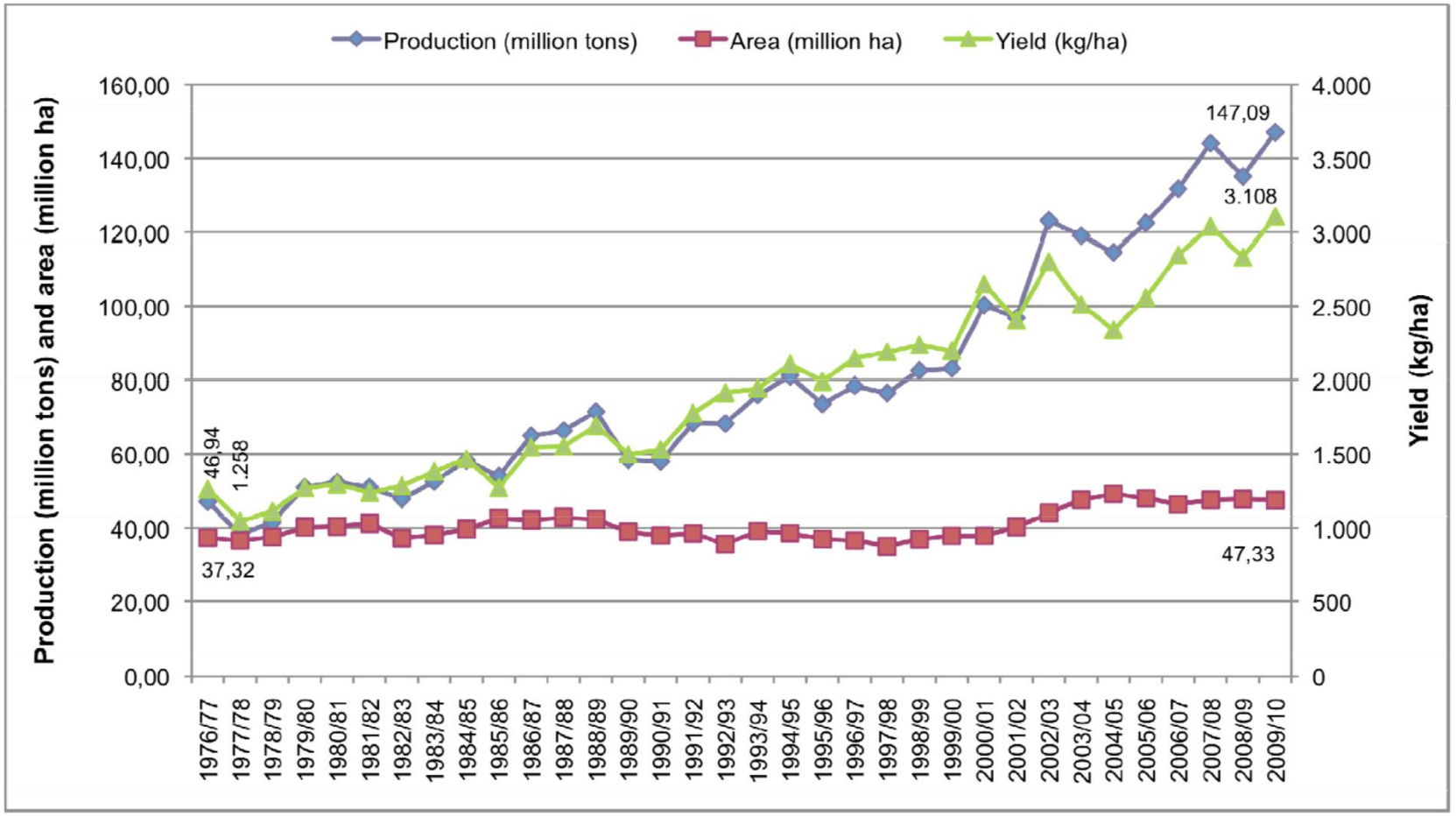
THE AFRICA LAG

The green revolution largely bypassed Africa, where cereal crop yields have barely improved in 50 years.



Embrapa
Estudos Estratégicos
e Capacitação

Grains: Production and Area (1975/2010)



Source:after CONAB.

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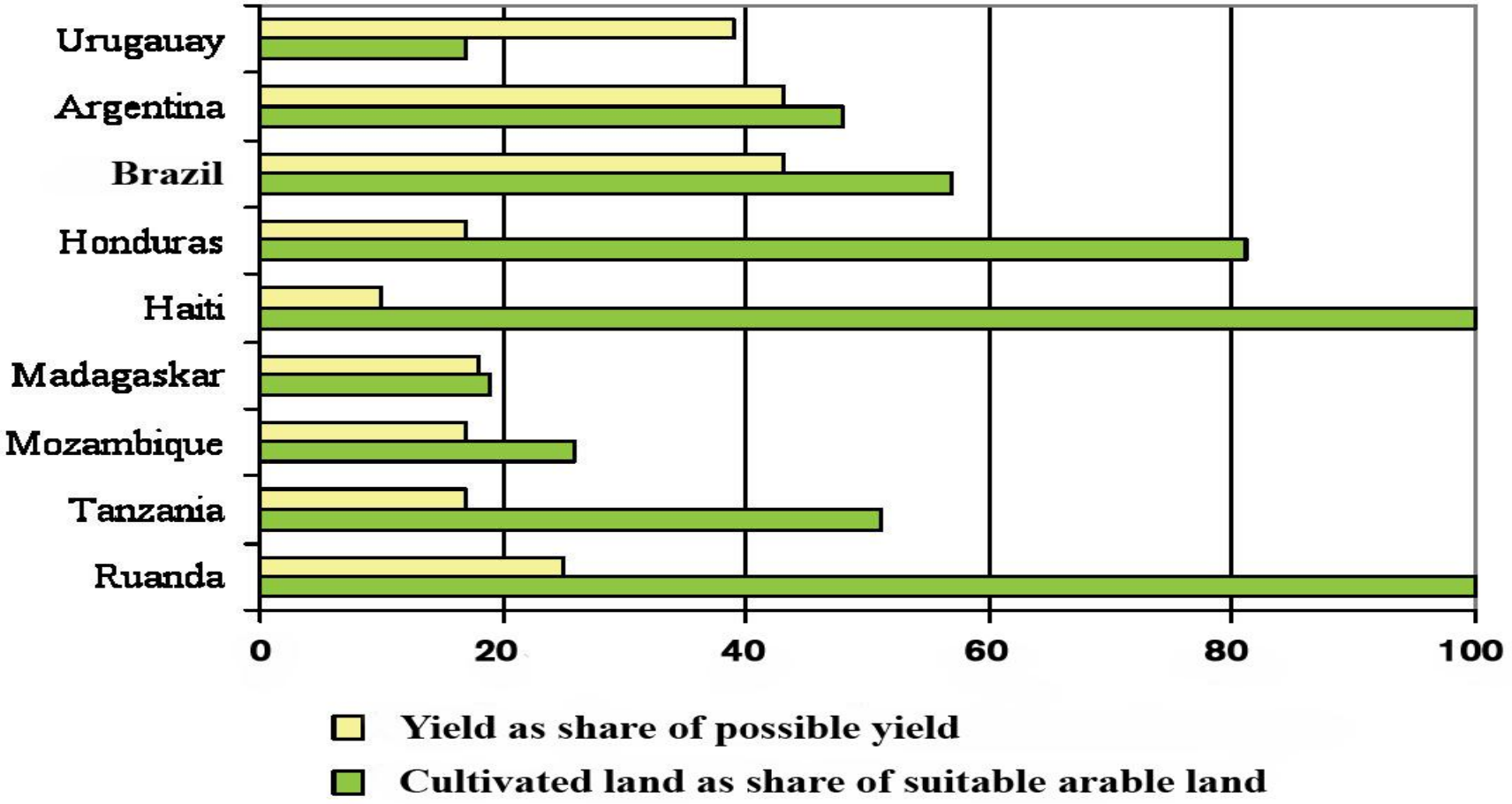
Cultivated land as share of total suitable arable land and yield as share of possible yield. selected countries in Africa and Latin America.



Global trends – How we see the world

- There is enough land and biomass available for powerful expansion of both food and energy production. Demand must come to make production possible.
- Fossil fuels get more expensive and damaging
- Biofuels get cheaper and LCA improves.
- Biomass for energy can bring investments, work and wealth to rural areas and poor countries.

The Swedish CO2 tax, basic design

- Introduced in 1991, gradually increased tax rate
- Paid in relation to CO_2 emissions on each type of fossil fuel (carbon content)
- *Full* tax on heating and motor fuels
- *Reduced* tax rate for industry, due to risk for carbon leakage
- ”Tax shift” – increasing CO_2 tax and reducing direct income taxes

A simple and cheap system

- **Low administrative costs for tax authorities and operators**
  - A CO2 tax can easily be added to an existing energy tax system
  - Administrative costs for Swedish Tax Administration is 0.01 % of total revenues for energy and CO2 taxes
- **No need to measure actual CO2 emissions from each installation**
  - Tax rates per unit (ton, litre) fuel based on basis of average carbon content
  - E.g.: CO2 tax for petrol = 2.323 kg/l x 0.103 €/kg = 0.24 €/litre

”Green Tax Shift” – regardless of colour of government

1990/91 ”the big tax reform”
-Lowered income and labor taxes – 6 billion €
-CO2 tax and VAT on energy 0,3 + 1,6 billion €
-Investment aid for biomass CHP

Green tax shift 2001 – 2006
-1,5 billion € tax shift, raised environmental taxes, cut in income taxes, focus on low incomes

Policy 2007 – 2010
-Increased environmental taxes by 0,5 billion €
-Lowered income taxes by 7 billion €, focus on working people

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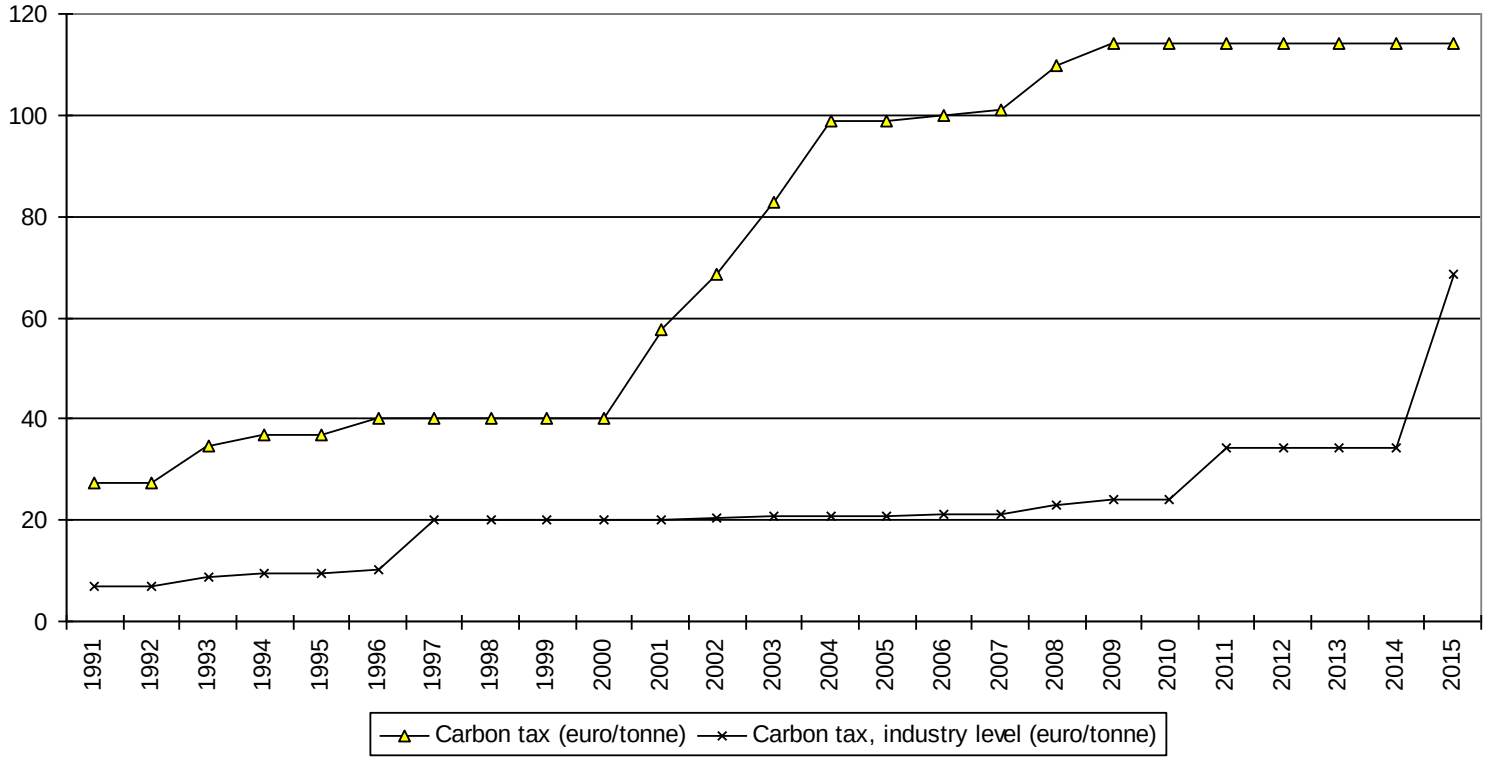
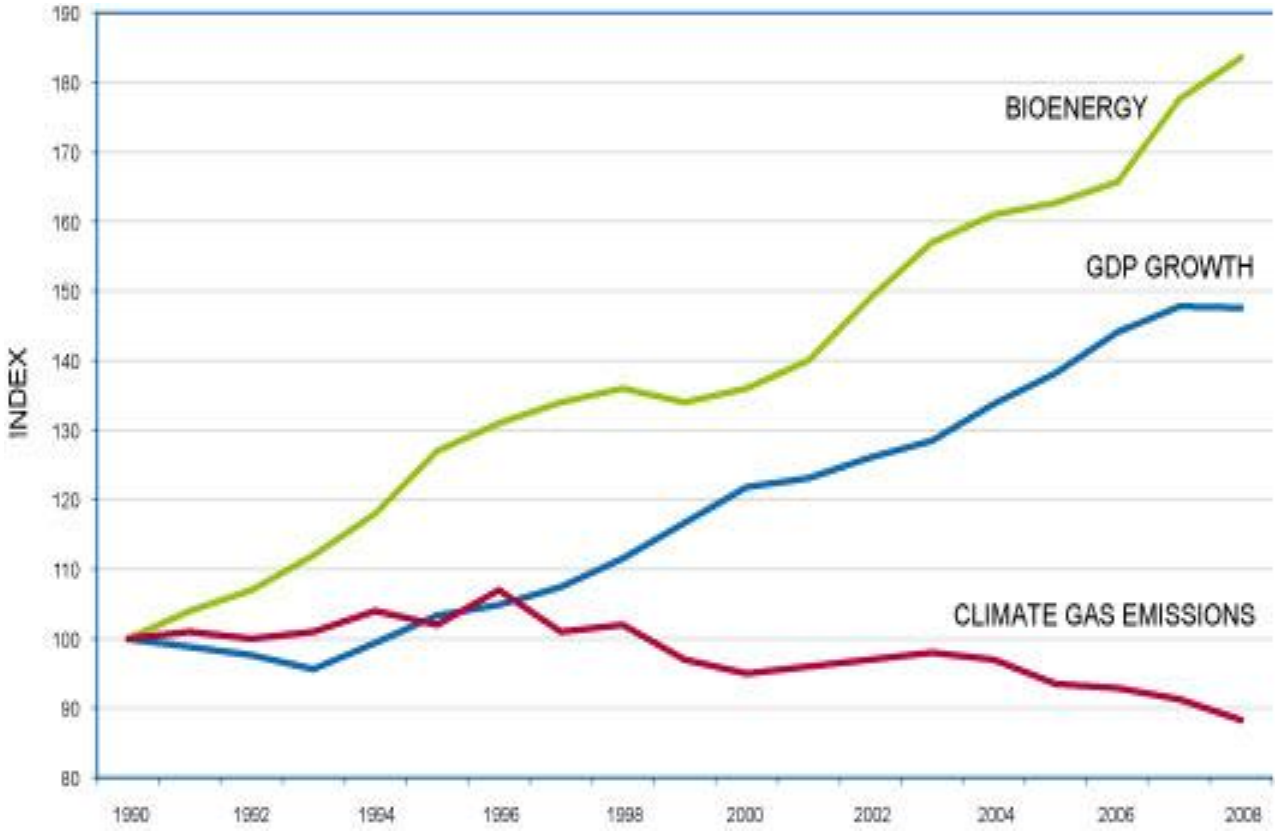
CO2 tax gradual increase since 1991



Economic Growth and Carbon Reduction



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Lessons learned about CO_2 tax...

- A CO2 tax is easy to administer and it gives results!
- Households and companies are free to choose the measures best for them – and every one acts
- Announce tax measures long ahead, to give time for adjustment.
- Tax revenues can be partly used to adress distributional consequences.
- Support measures may be necessary for a limited time, to help households and businesses with adjustment.

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Thank you for your attention

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