A system perspective on industrial energy efficiency

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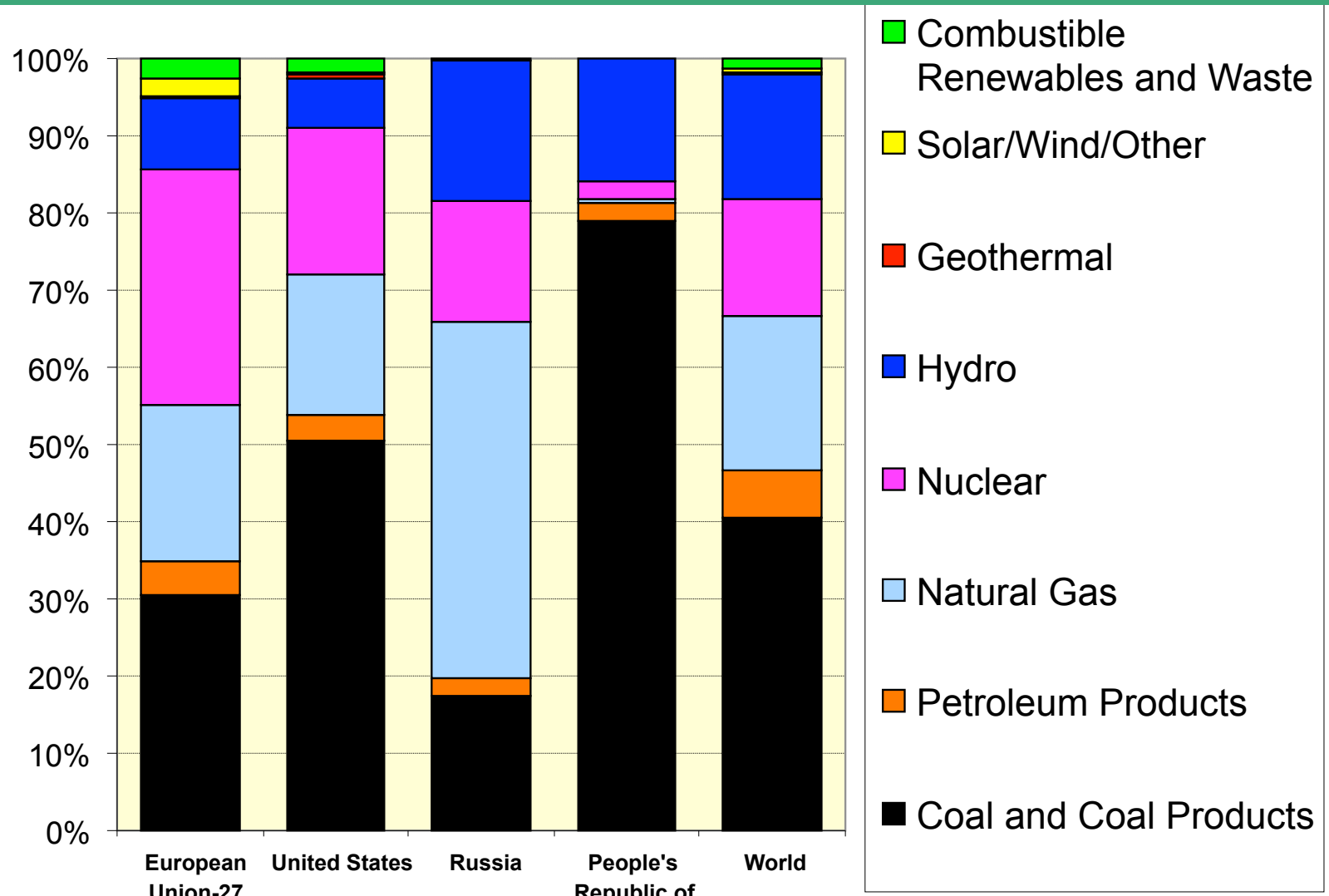
Main focus:

A system perspective on energy use and energy supply

Production of electricity



Louise Trygg

HOW EUROPE PRODUCES ITS ELECTRICITY

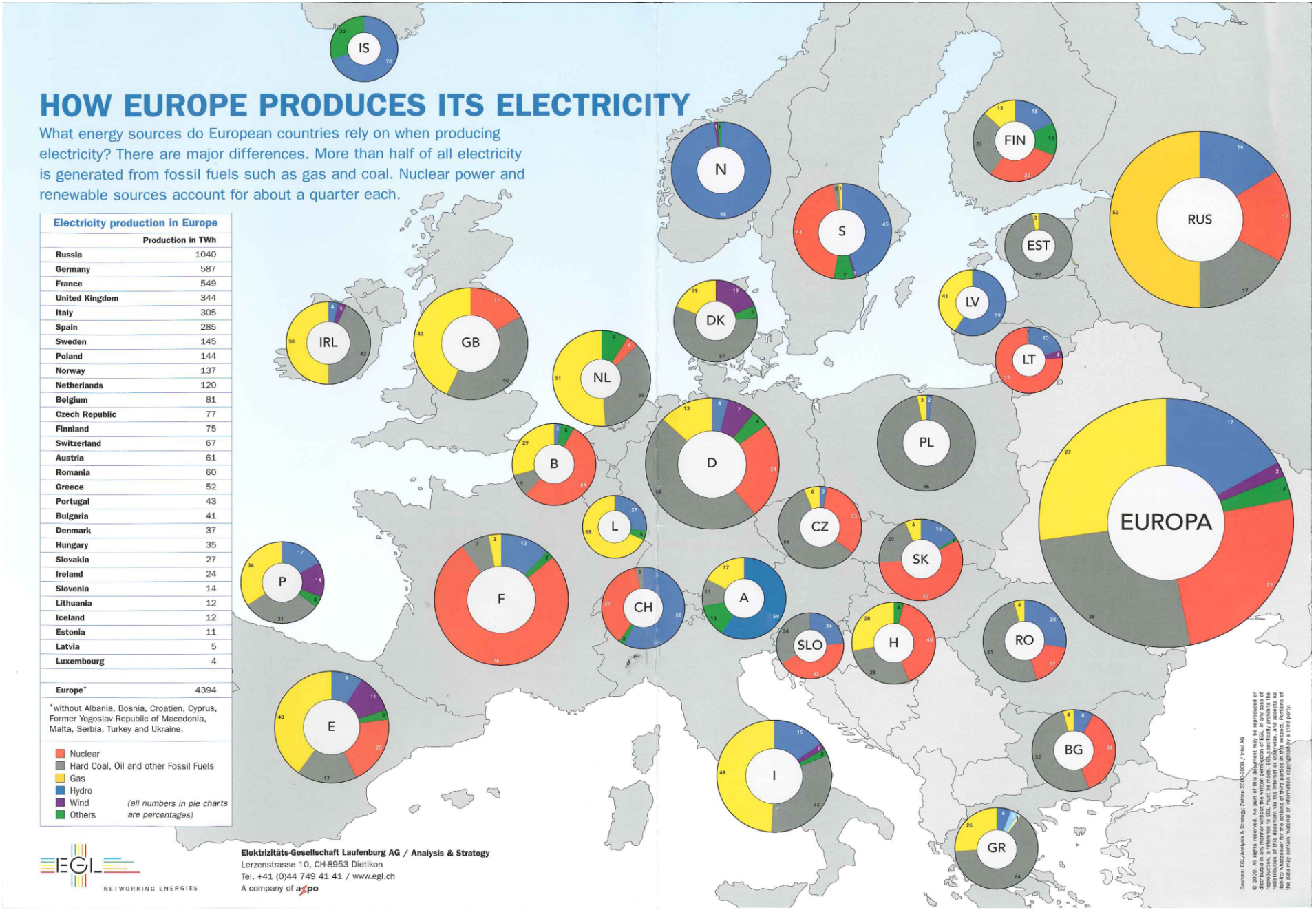
What energy sources do European countries rely on when producing electricity? There are major differences. More than half of all electricity is generated from fossil fuels such as gas and coal. Nuclear power and renewable sources account for about a quarter each.

Electricity production in Europe	Production in TWh
Russia	1040
Germany	587
France	549
United Kingdom	344
Italy	305
Spain	285
Sweden	145
Poland	144
Norway	137
Netherlands	120
Belgium	81
Czech Republic	77
Finnland	75
Switzerland	67
Austria	61
Romania	60
Greece	52
Portugal	43
Bulgaria	41
Denmark	37
Hungary	35
Slovakia	27
Ireland	24
Slovenia	14
Lithuania	12
Iceland	12
Estonia	11
Latvia	5
Luxembourg	4
Europe*	4394

*without Albania, Bosnia, Croatien, Cyprus, Former Yogoslav Republic of Macedonia, Malta, Serbia, Turkey and Ukraine.

Nuclear
Hard Coal, Oil and other Fossil Fuels
Gas
Hydro
Wind
Others

(all numbers in pie charts are percentages)



Elektrizitäts-Gesellschaft Laufenburg AG / Analysis & Strategy
Lerzenstrasse 10, CH-8953 Dietikon
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A company of axpo

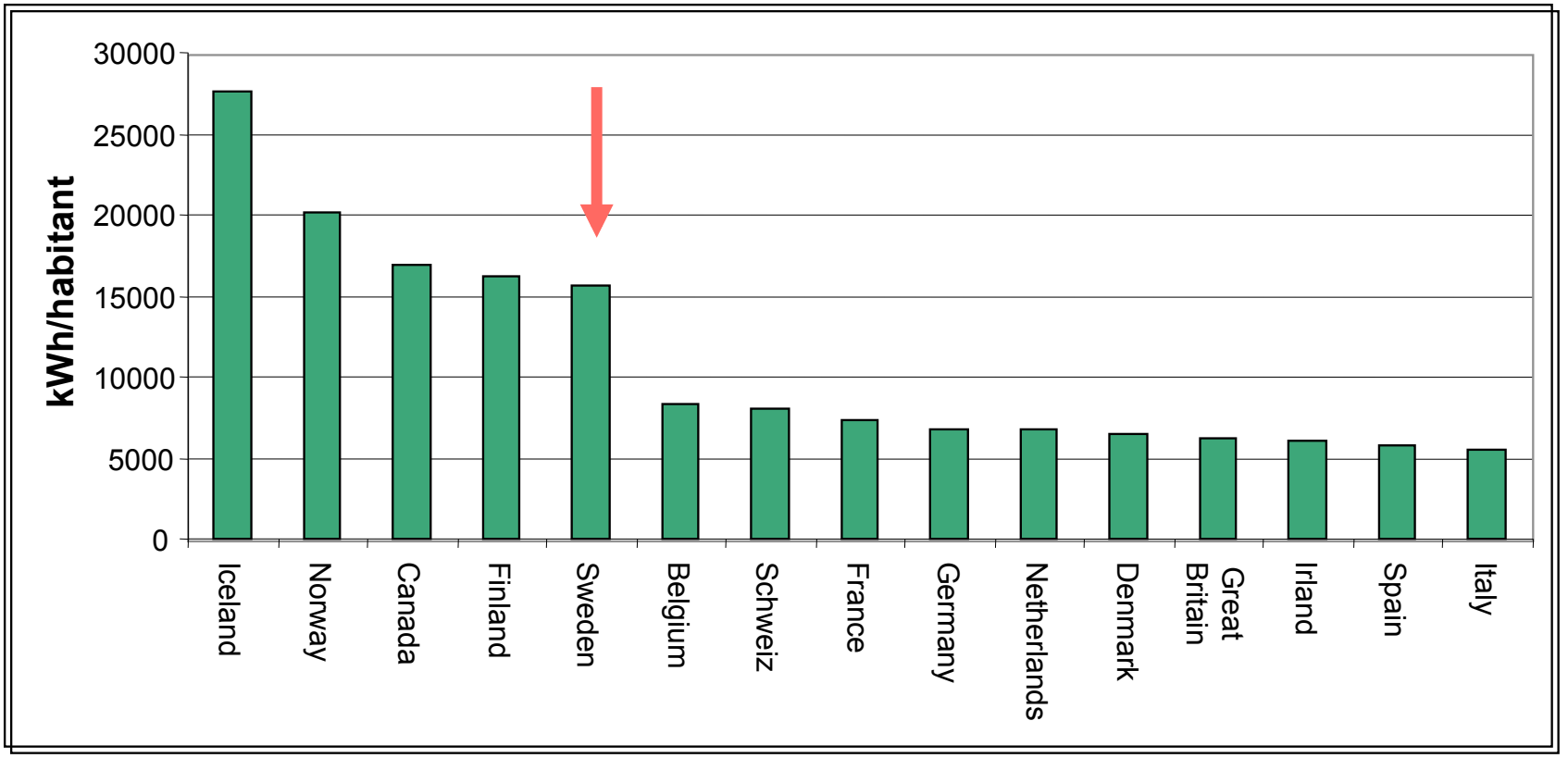
EGL NETWORKING ENERGIES

Accounting for electricity according to marginal coal condensing production

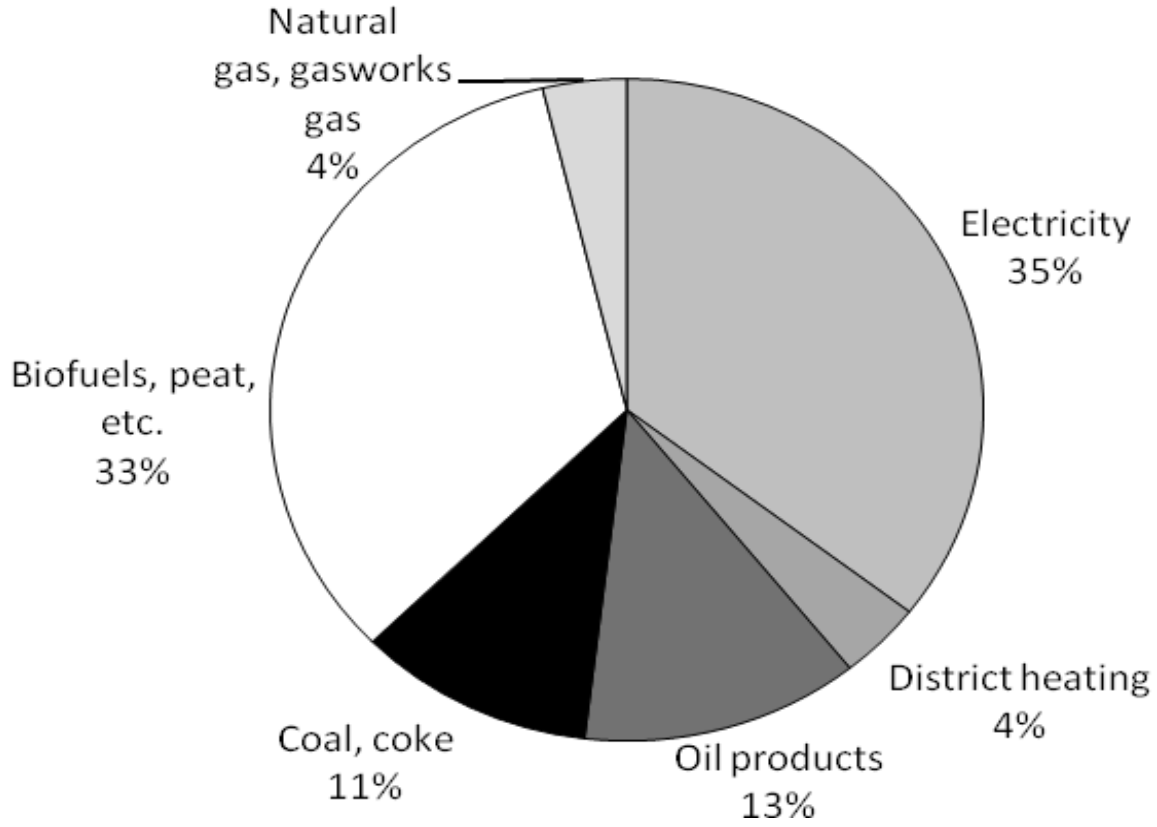
1 kWh el ⟶ 1 kg CO_2

1 kWh oil ⟶ 0,3 kg CO_2

Use of electricity in some countries

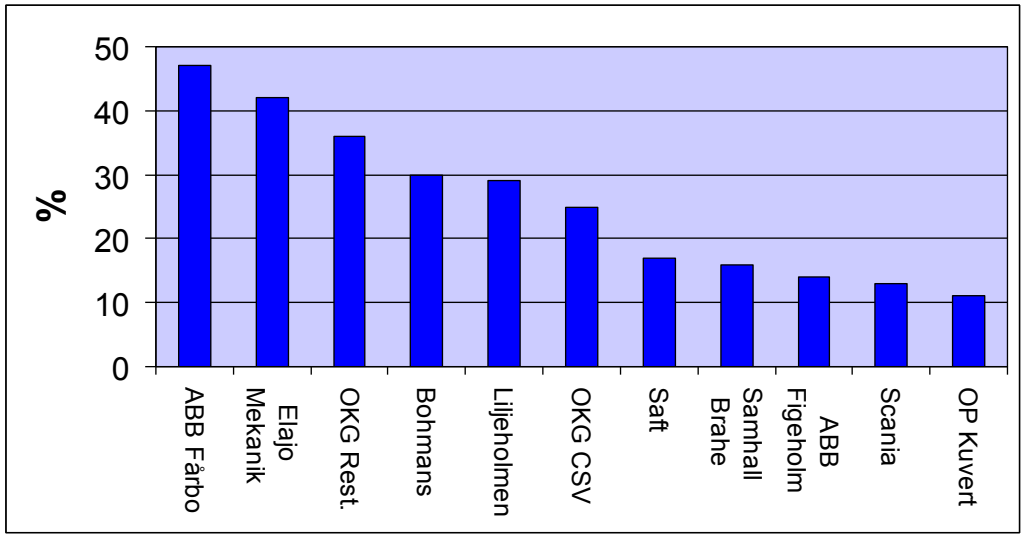


Industrial energy use in Sweden



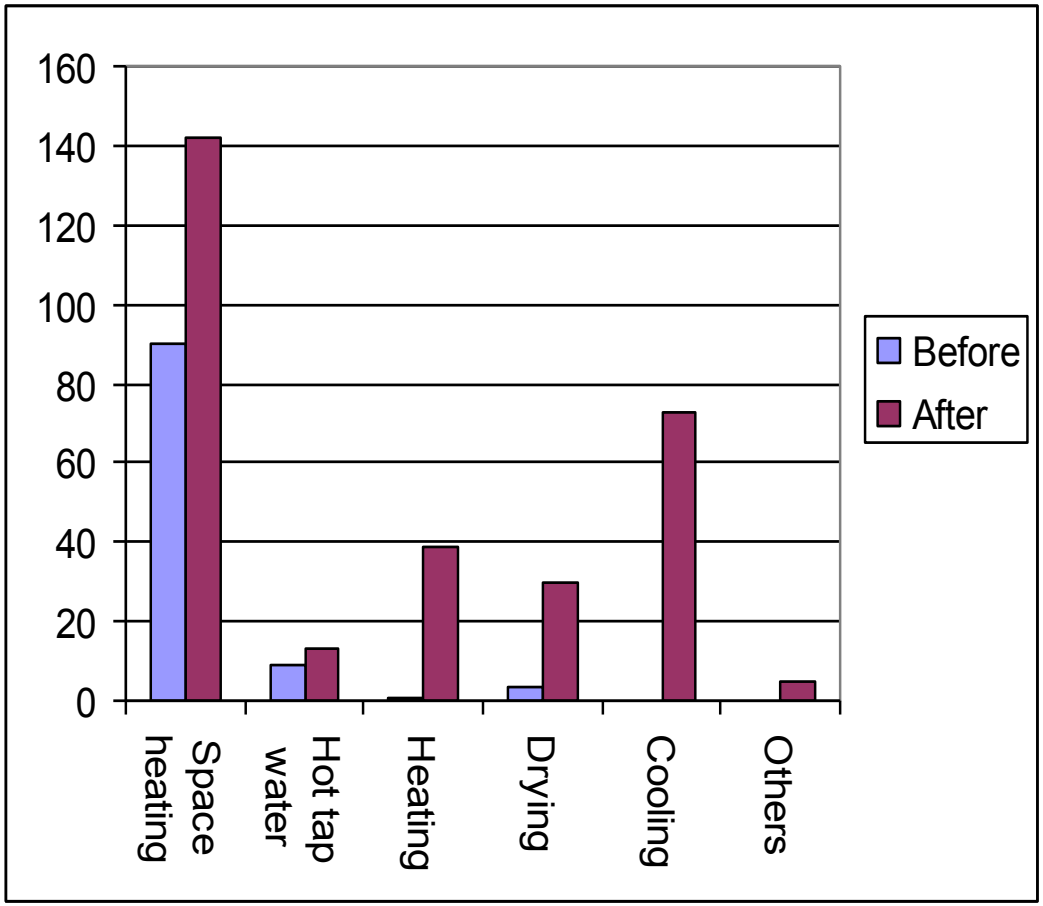
Example of some concrete measures

- More efficient use of electricity
- Converting from electricity to district heating or other fuel
- Use of surplus heat
- Reducing use of electricity when no production is ongoing



Use of electricity when no production is ongoing

Increased use of district heating in separate processes



Result for 34 SME:
200 GWh ⇨ 196%

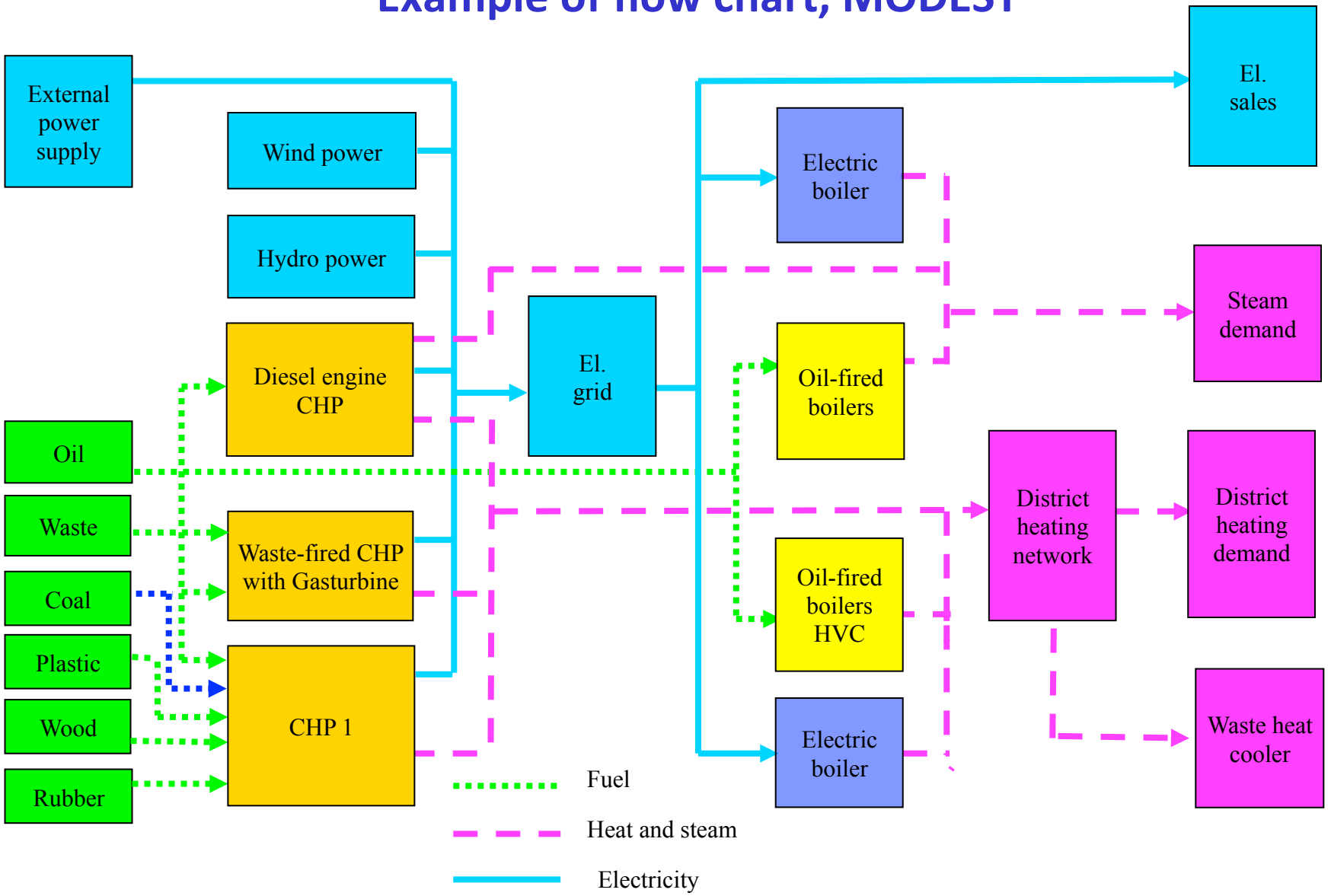
Reduced global CO_2:
112 000 tonnes/year

Heat co-operation and resource effective systems - symbiosis between industry and energy utility

MODEST

Model for Optimisation of Dynamic Energy System with Time-dependent components and boundary conditions

Example of flow chart, MODEST



Many good examples, but how do we make it happen?

Conclusions

- Make energy issues a vital part of the agenda
- Full support from top management
- Management is as important as technology
- Share good examples