



HYDRO

# New prices for energy as a result of the CO<sub>2</sub> regime?

**Rønnaug Sægrov Mysterud**  
**Market Analysis**

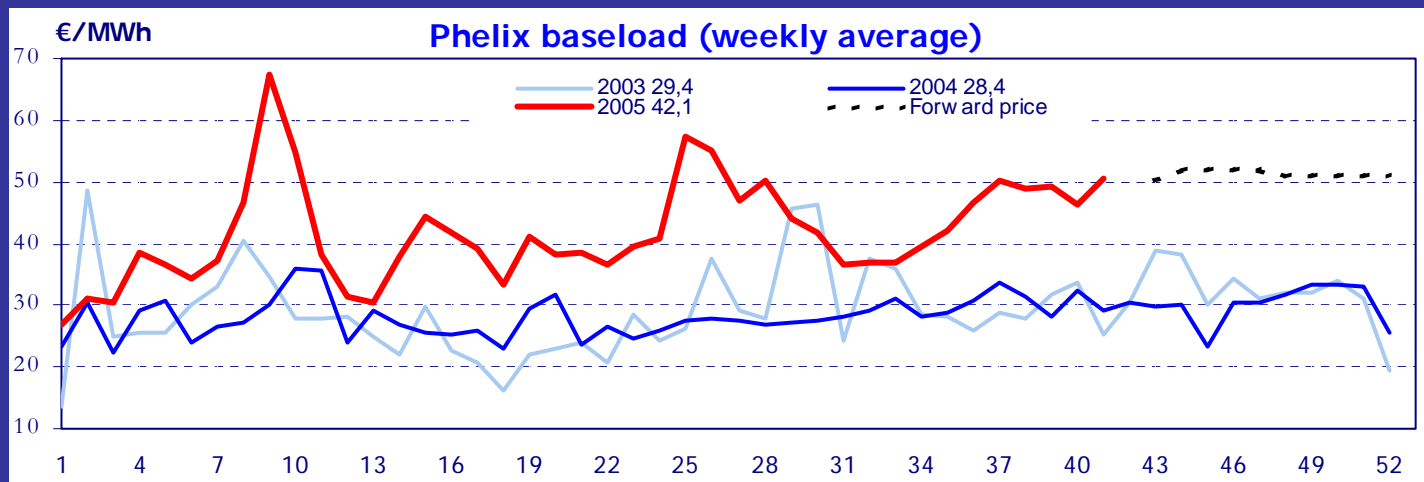
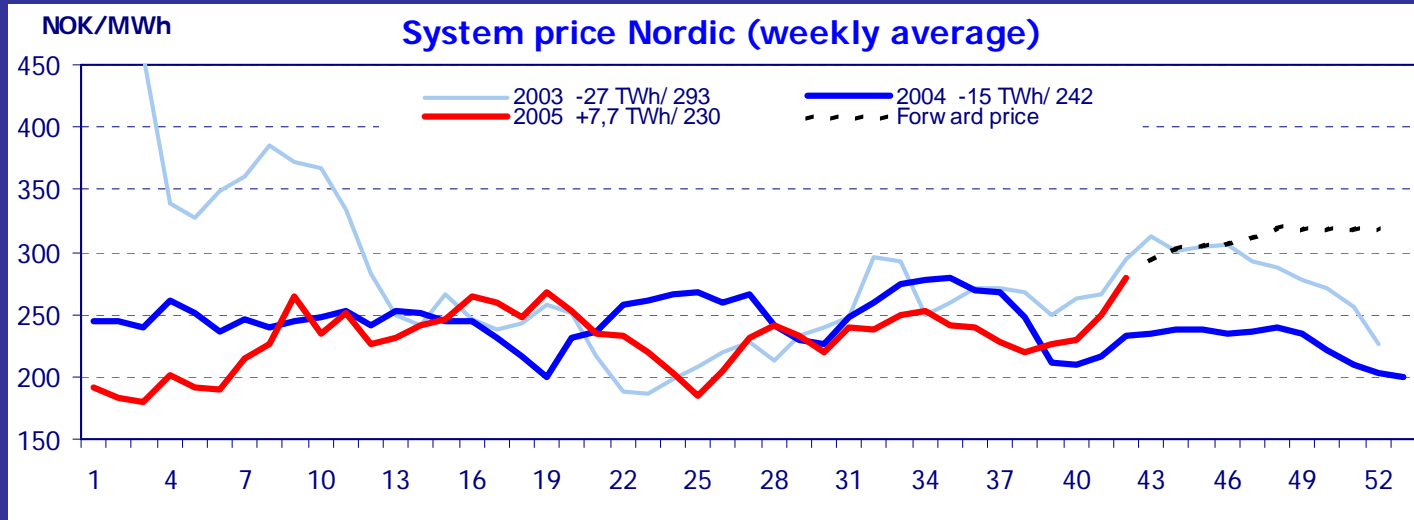
Hydro Oil & Energy

2005-10-19

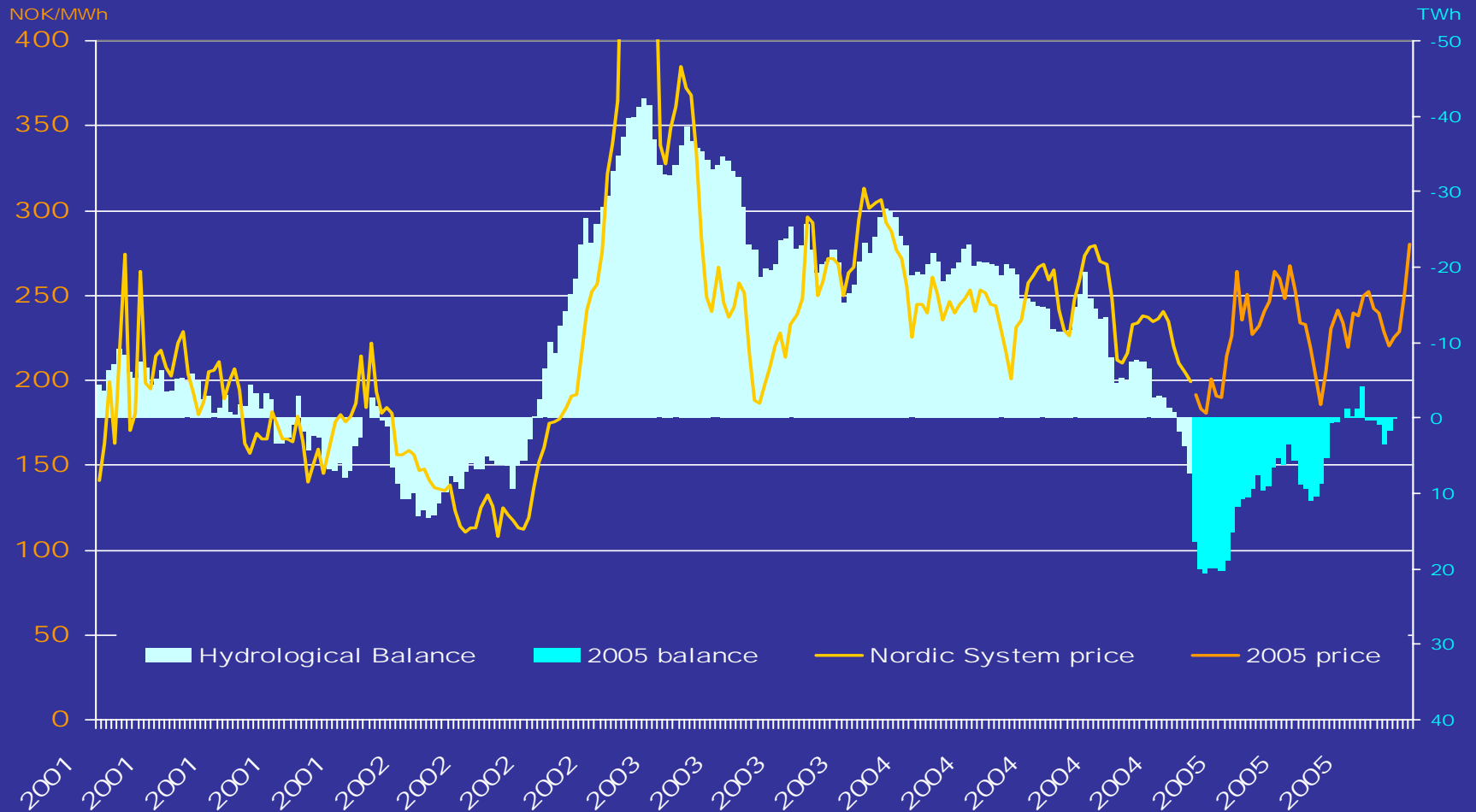
# Electricity prices at new levels

- **Tighter power balance -> Coal and gas power more dominating**
- **High fuel prices -> Higher marginal cost on coal and gas power**
  - Strong increase in 2003 and still high
- **Introduction of CO2-market in 2005 -> Even higher marginal cost on coal and gas power**
  - CO2-cost included in electricity price
  - Electricity price stronger connected to fuel prices

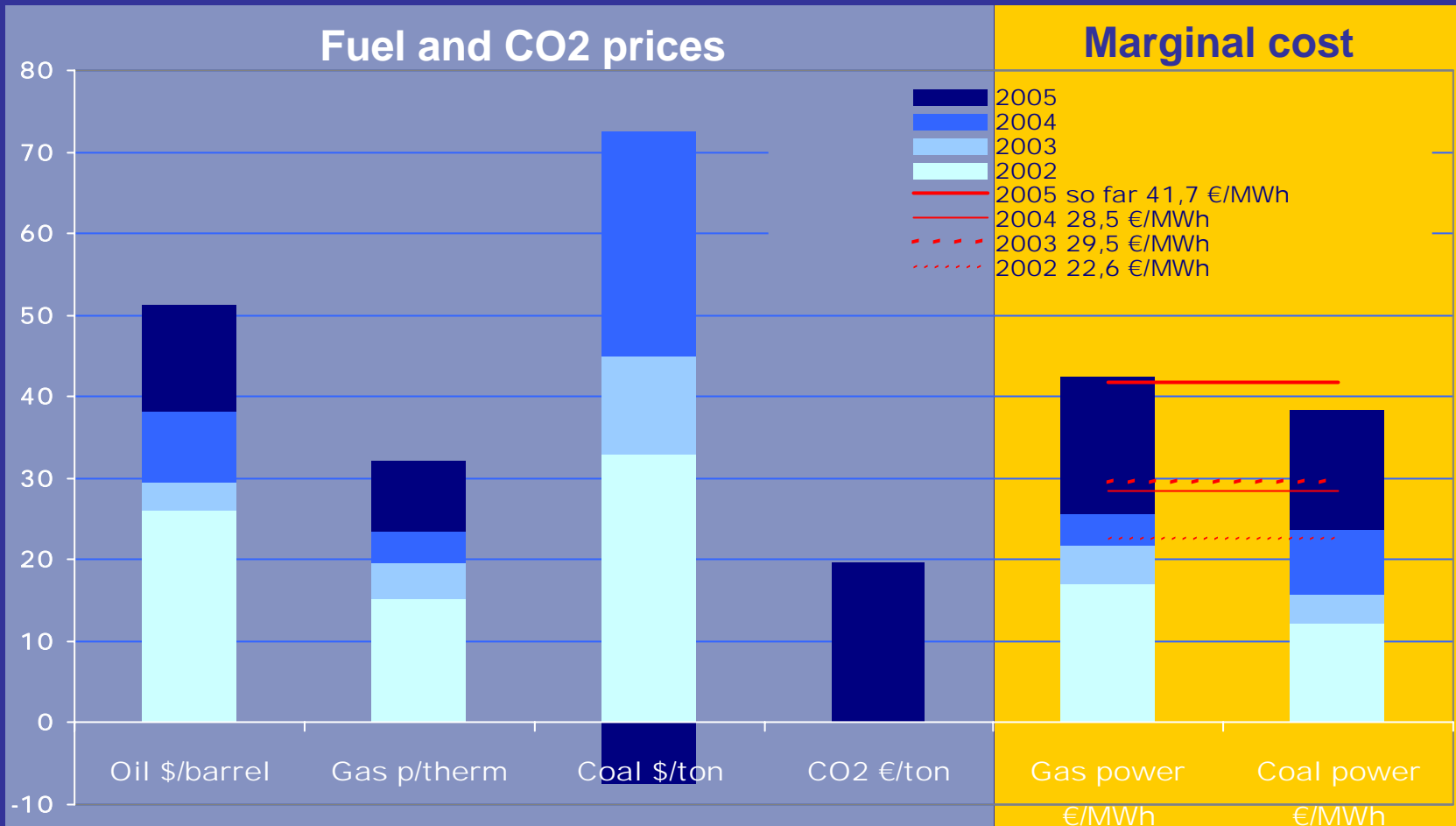
# Electricity prices



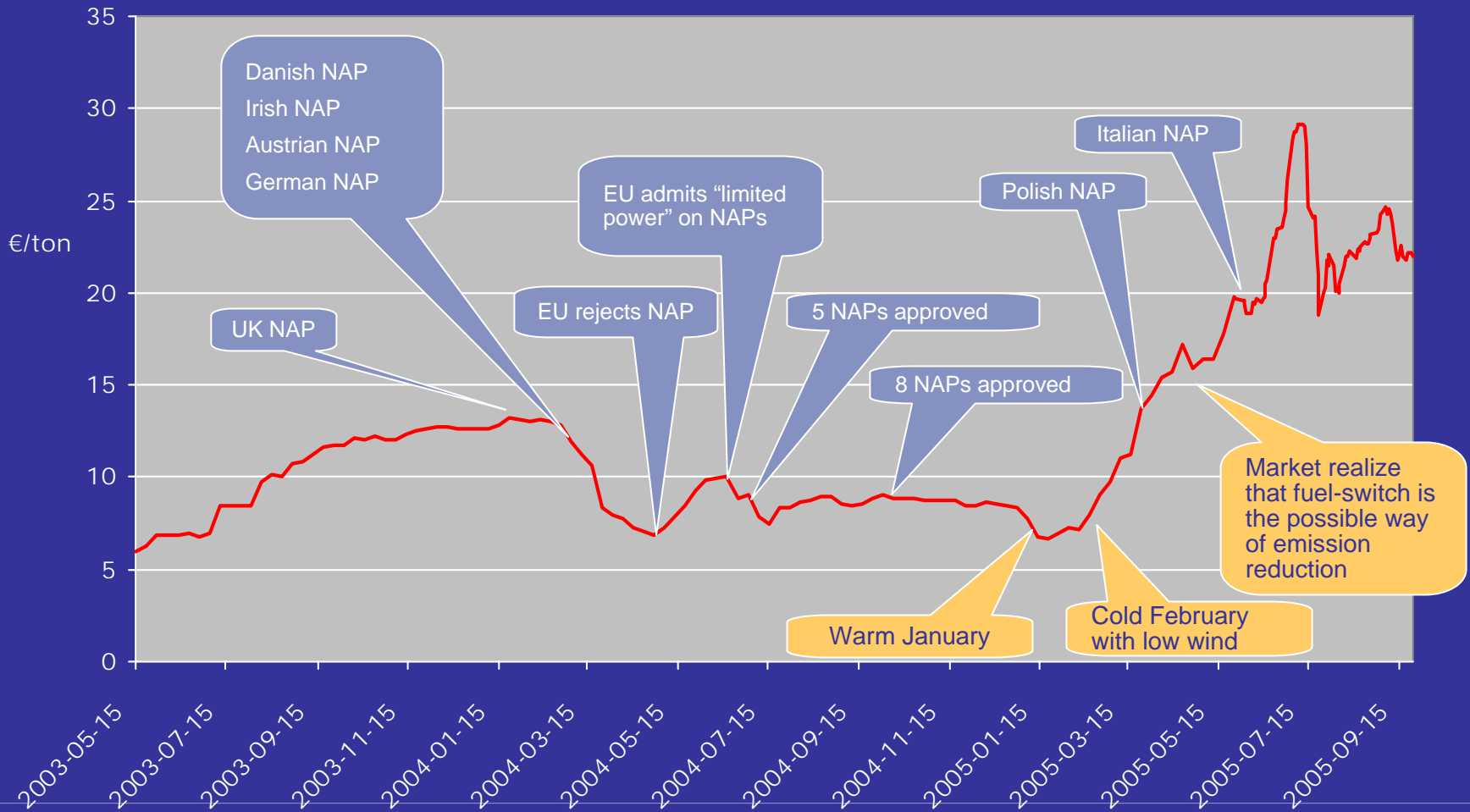
# Hydrological balance and system price Nordic



# Fuel prices, marginal costs and German electricity price 2002 - 2005



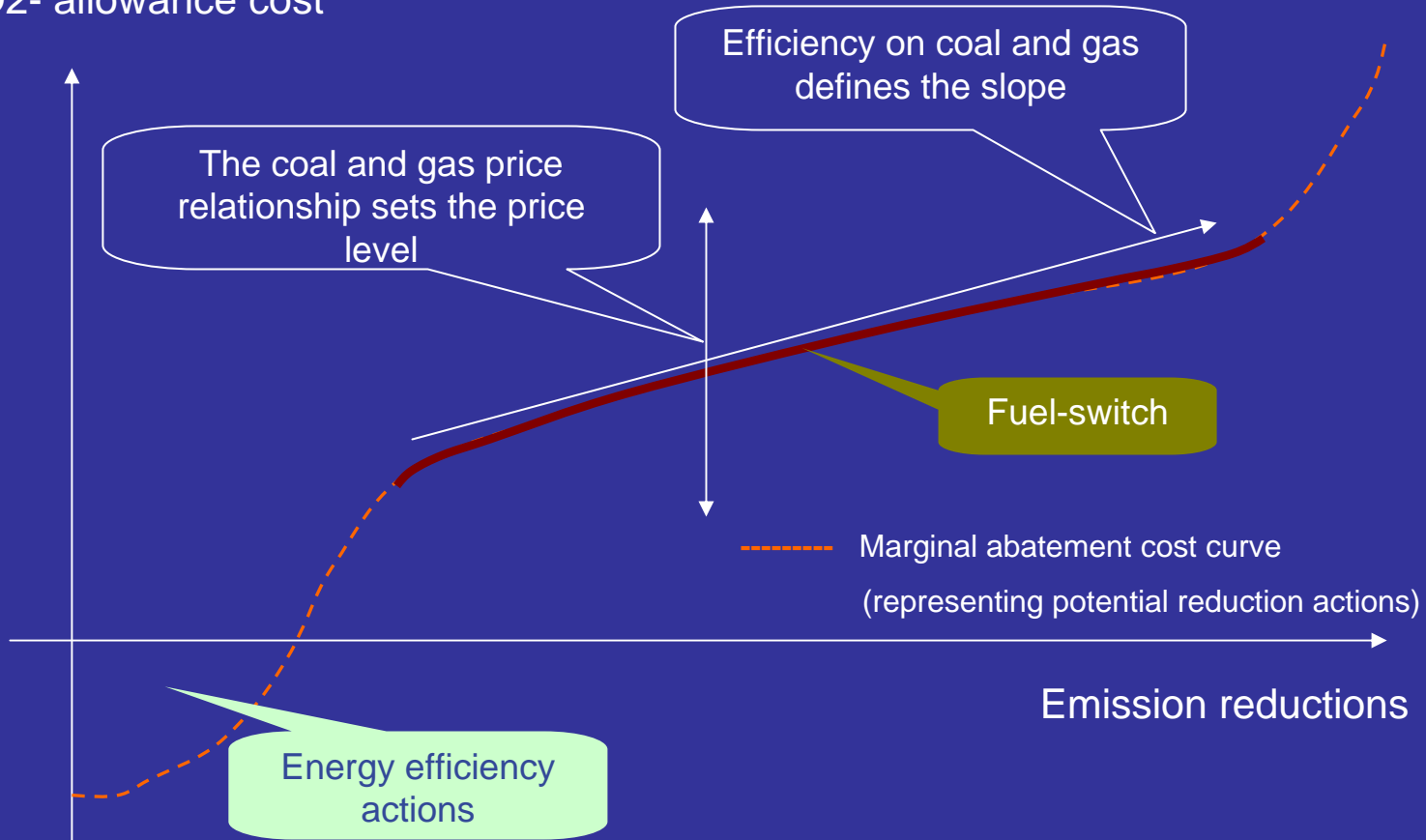
# CO2-quota price development, politically driven and fundamentally driven



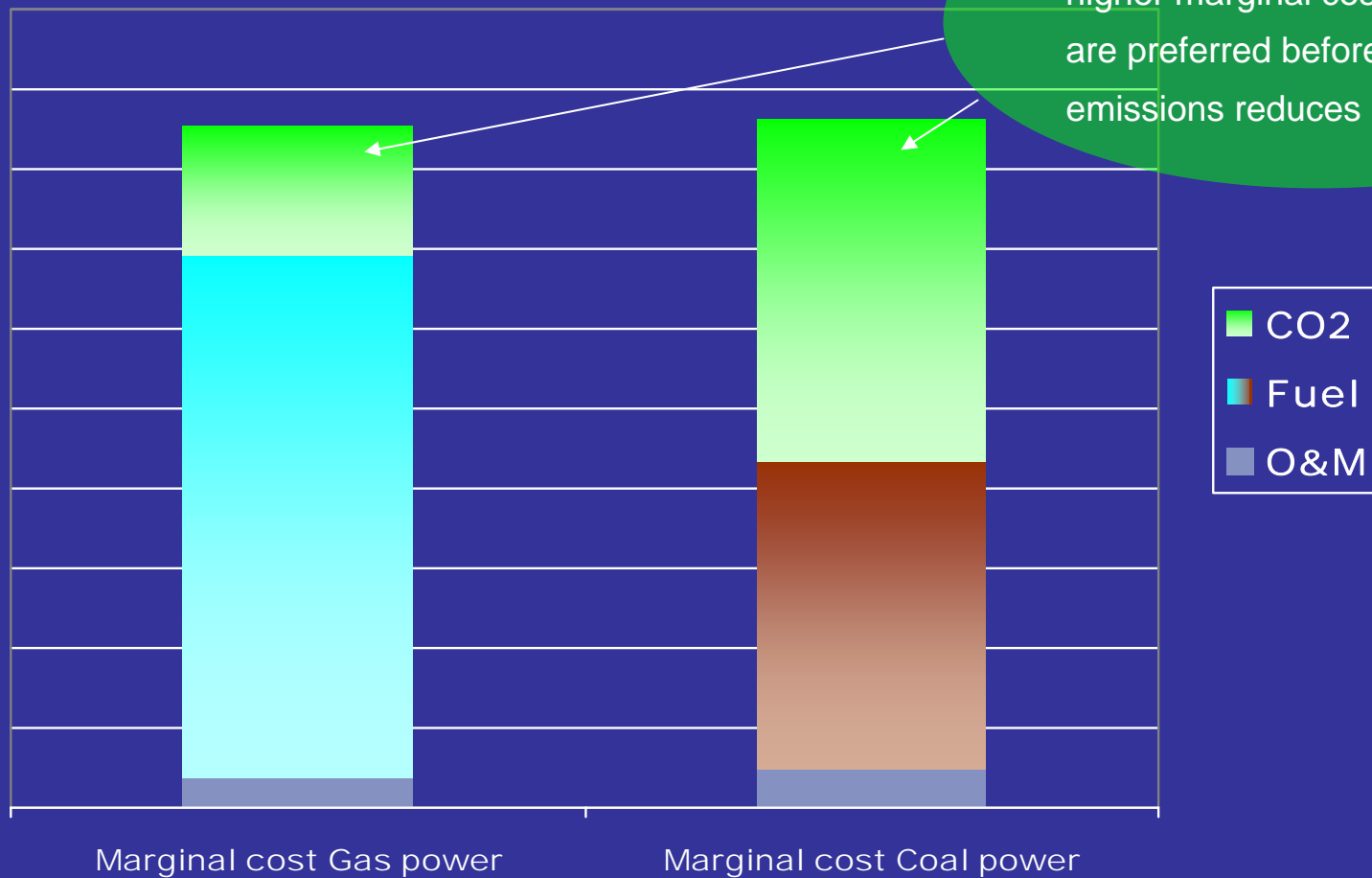
NAP = National Allocation Plan

# CO2-price and marginal abatement costs

CO2- allowance cost



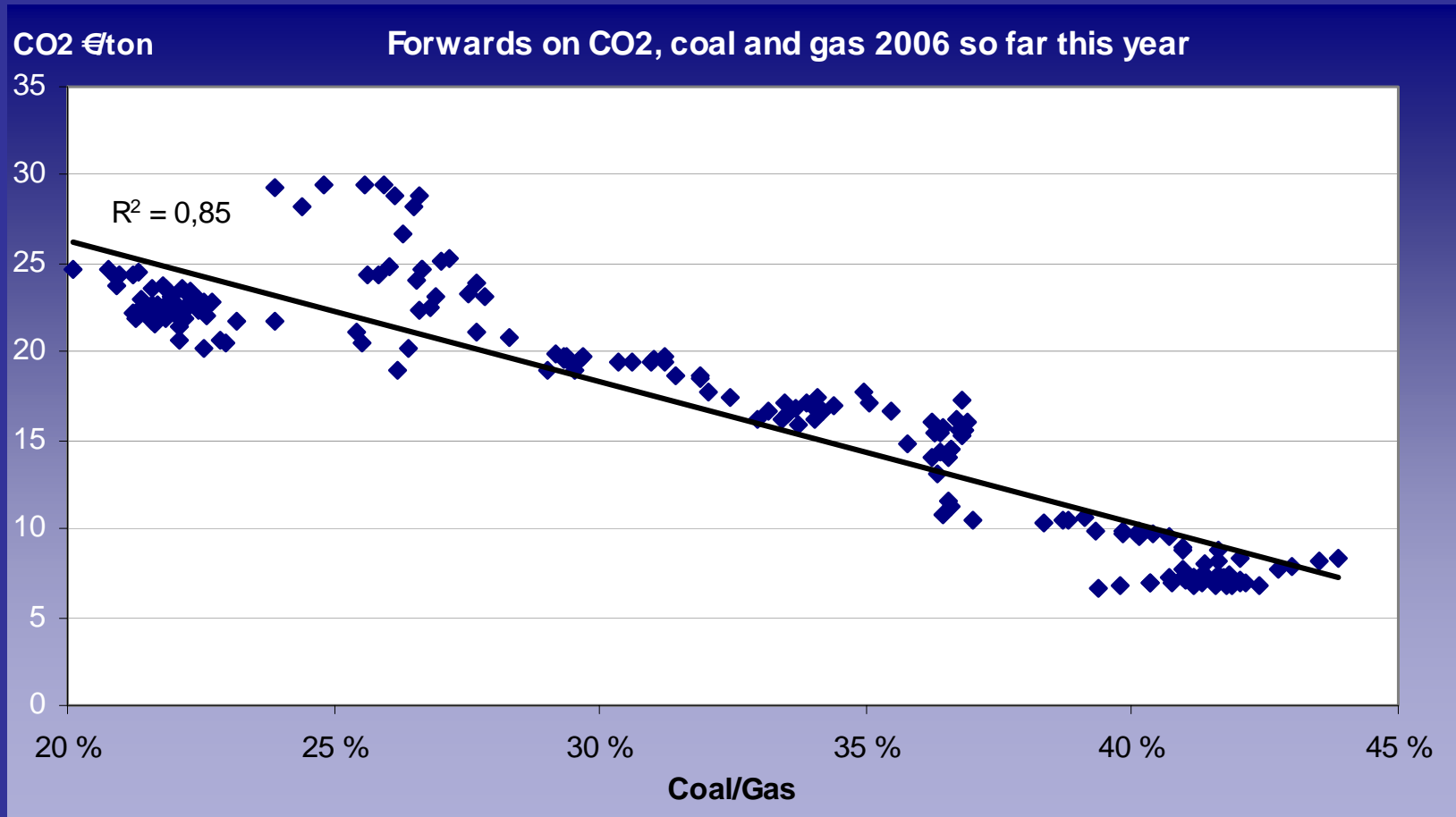
# CO2-price and fuel-switch theory



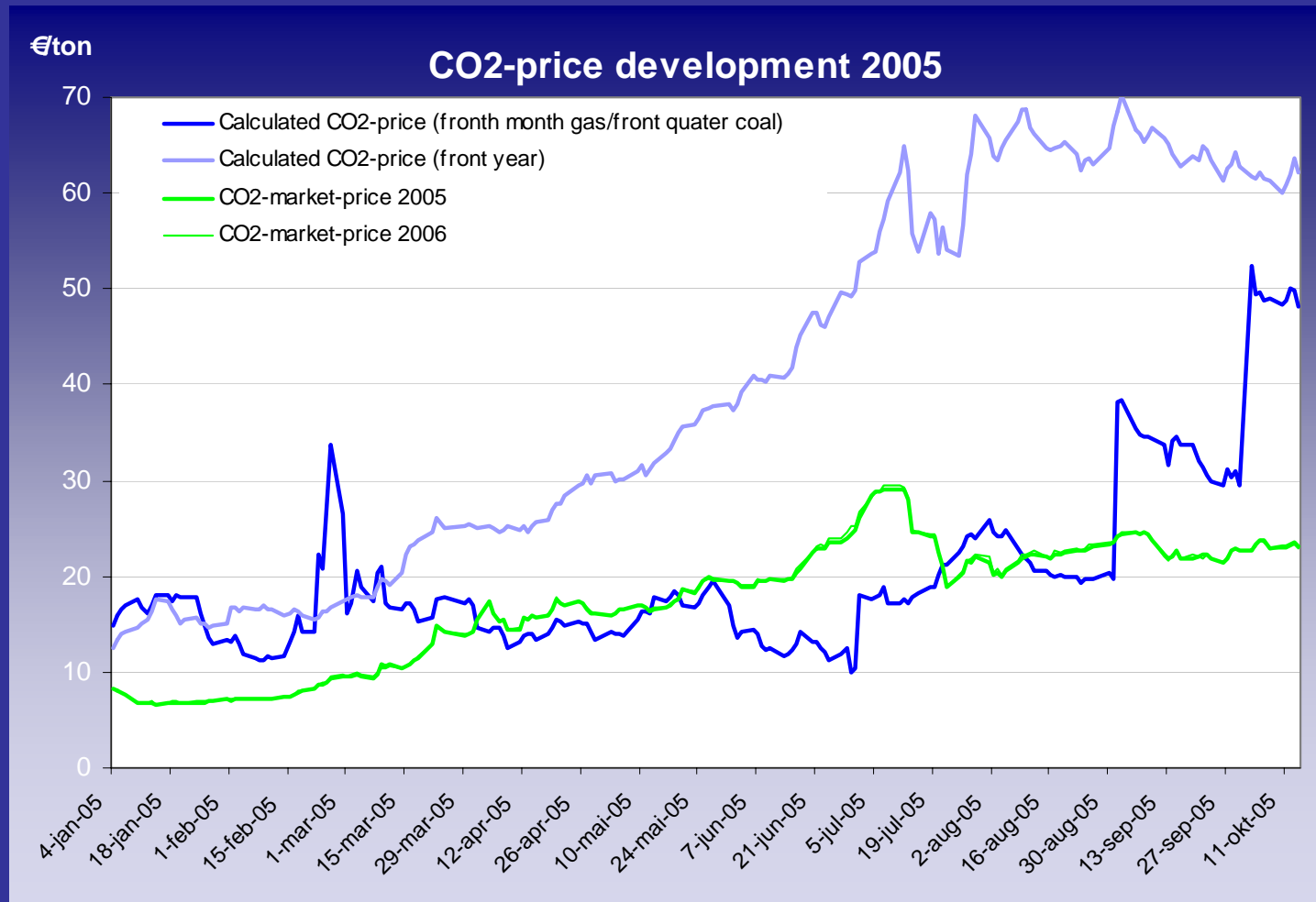
Coal power emits roughly twice as much CO2 as gas power

Gas has 2/3 the CO2-content of Coal, but gas power units have higher efficiency

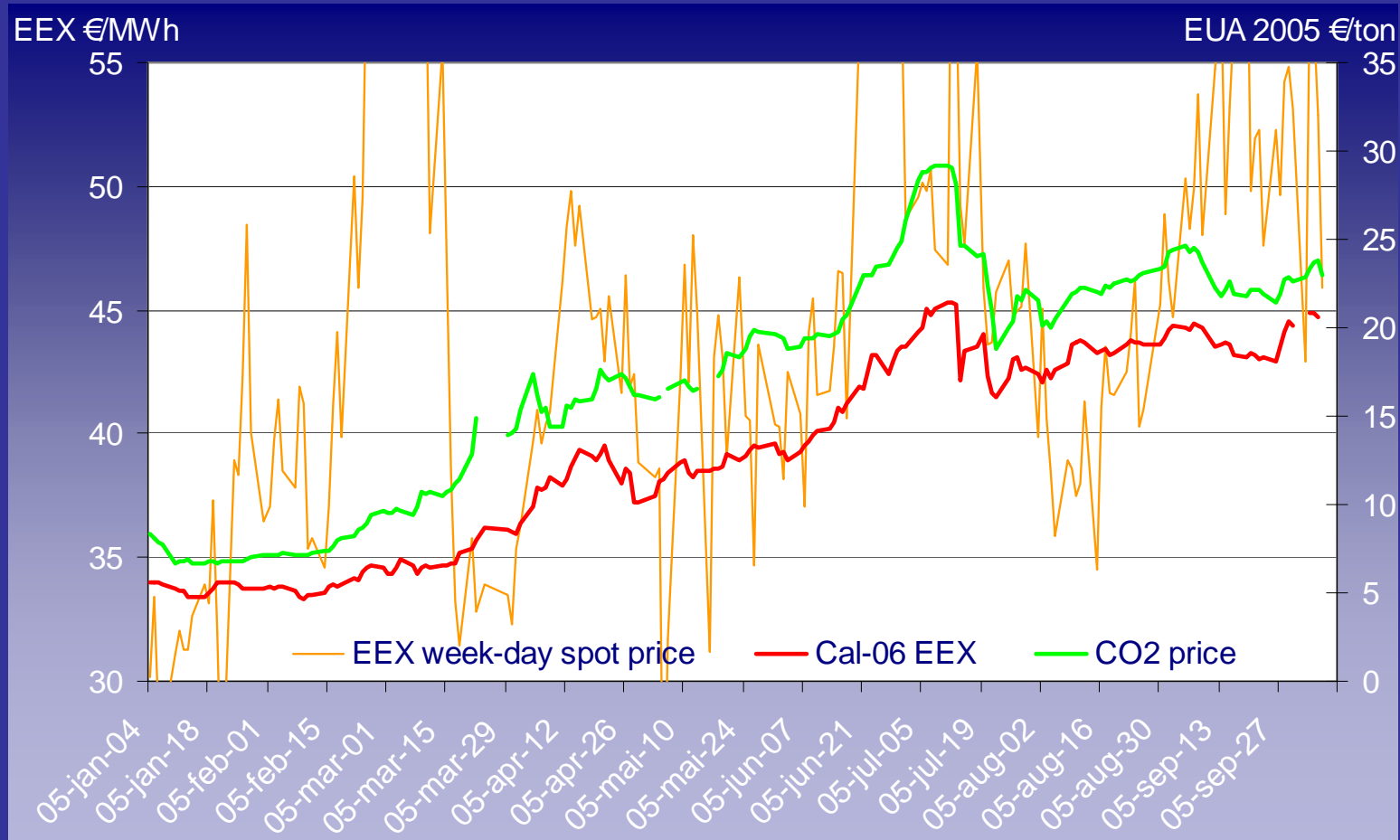
# Coal and gas drives the CO2 price



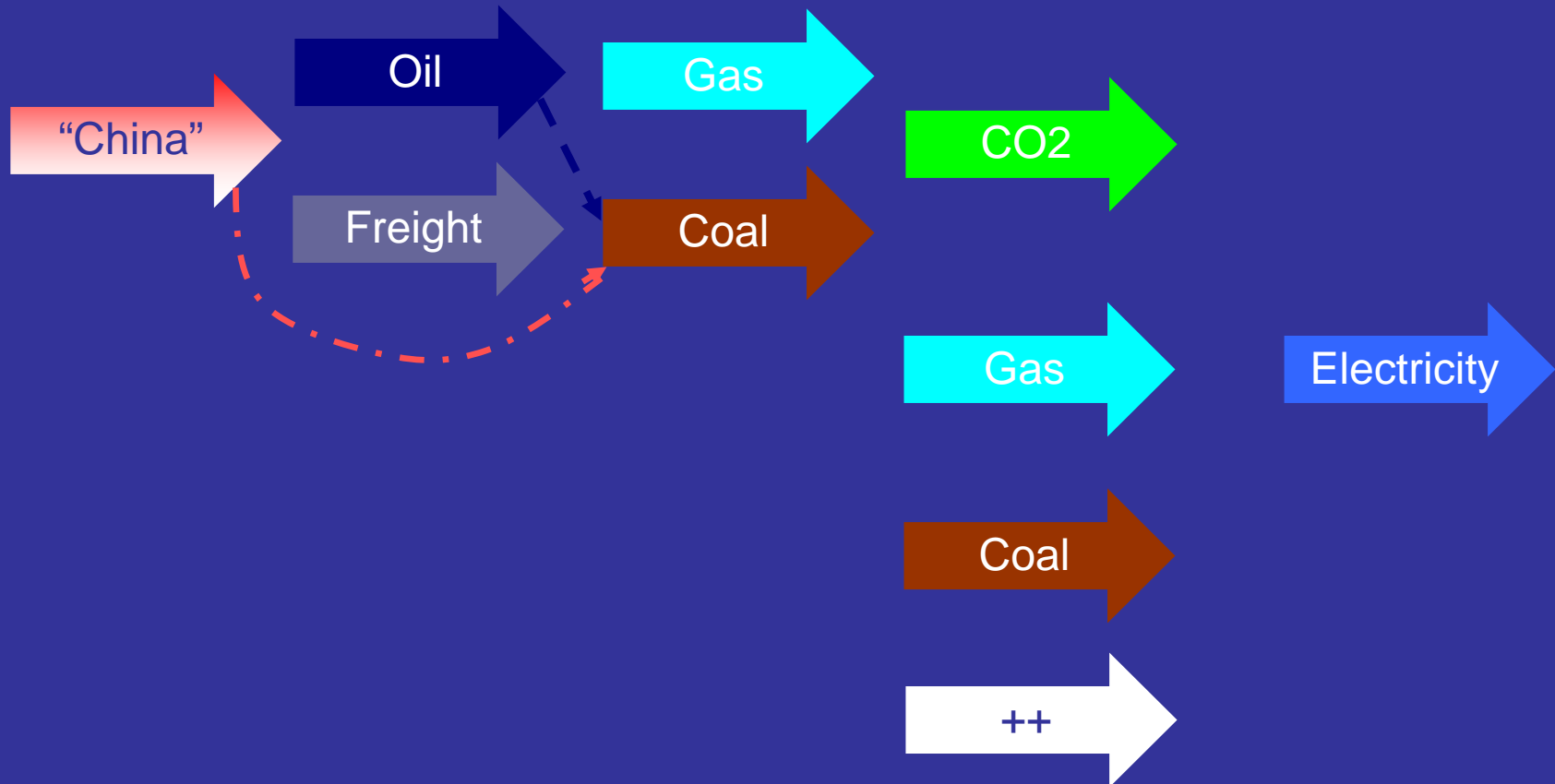
# CO2-price based on market prices on coal and gas



# CO2-price development and electricity prices



# Electricity price stronger connected to fuel markets



# Conclusion

- **CO<sub>2</sub>-cost addition to electricity price dependent on need for coal and gas power**
  - Nordic area: Coal is at the margin in dry and high consumption periods
  - Germany: Coal at the margin off-peak hours and gas at the margin in peak hours
  - Higher effect in Germany, but increasing in Nordic area due to tighter power balance and stronger connection to the Continental electricity markets
  - Approximately 10 €/MWh of the delivered spot price so far in Germany of 41,7 €/MWh in 2005 is due to CO<sub>2</sub> cost only.
- **European electricity prices stronger connected to global fuel-markets by the CO<sub>2</sub>-market**

# Marginal cost on coal and gas versus electricity price

