

Synergies in emission reductions

- **TM \Rightarrow TM + NTM**
- **One pollutant \Rightarrow Several pollutants**
- **One sector \Rightarrow Several sectors**
- **One country \Rightarrow Several countries**

A common "environmental currency" would in theory include all synergies !

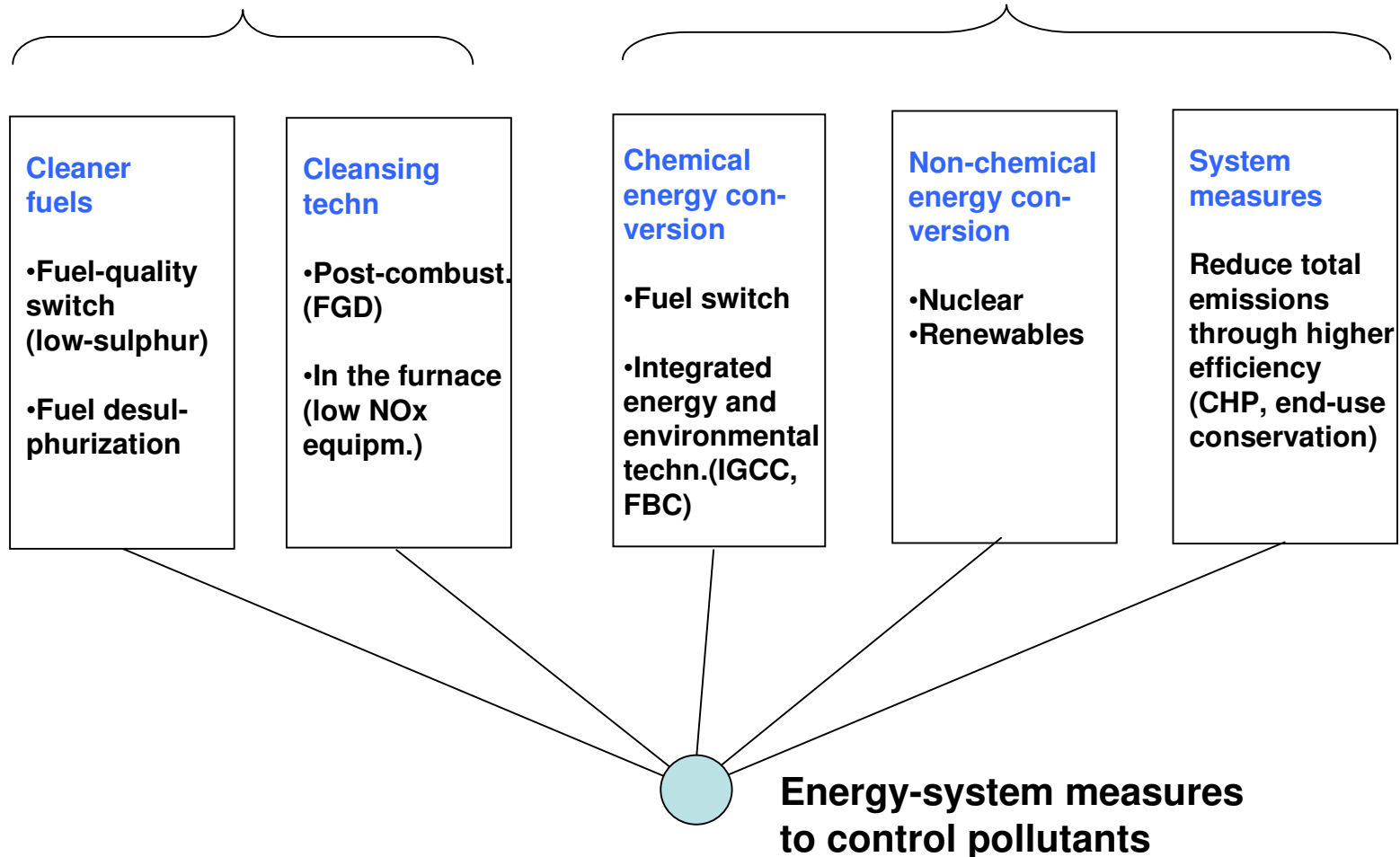
Direct and combined measures to control pollutants

Direct measures ("TM")

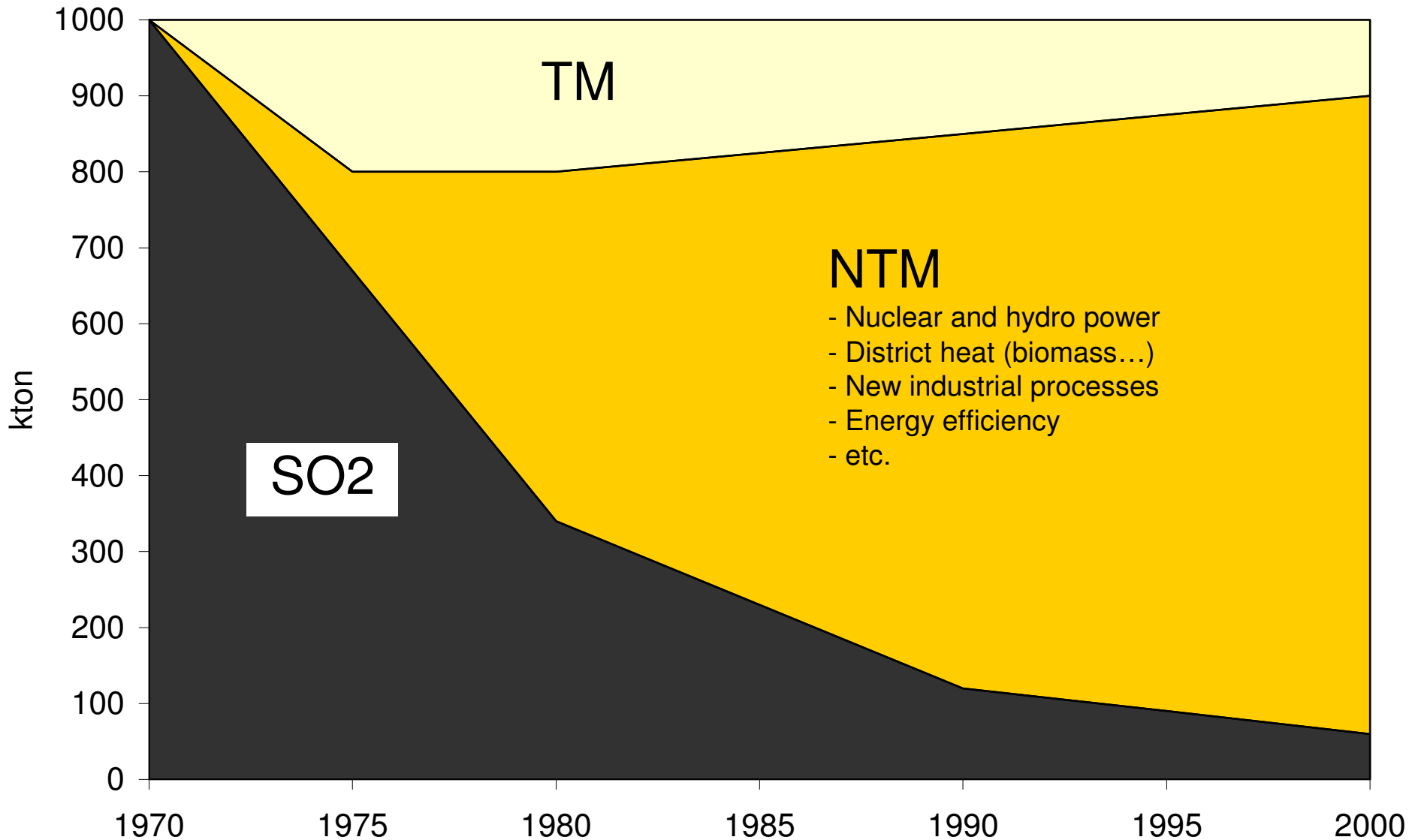
- Control pollutants

Combined measures ("NTM")

- Develop the energy system
- Control pollutants



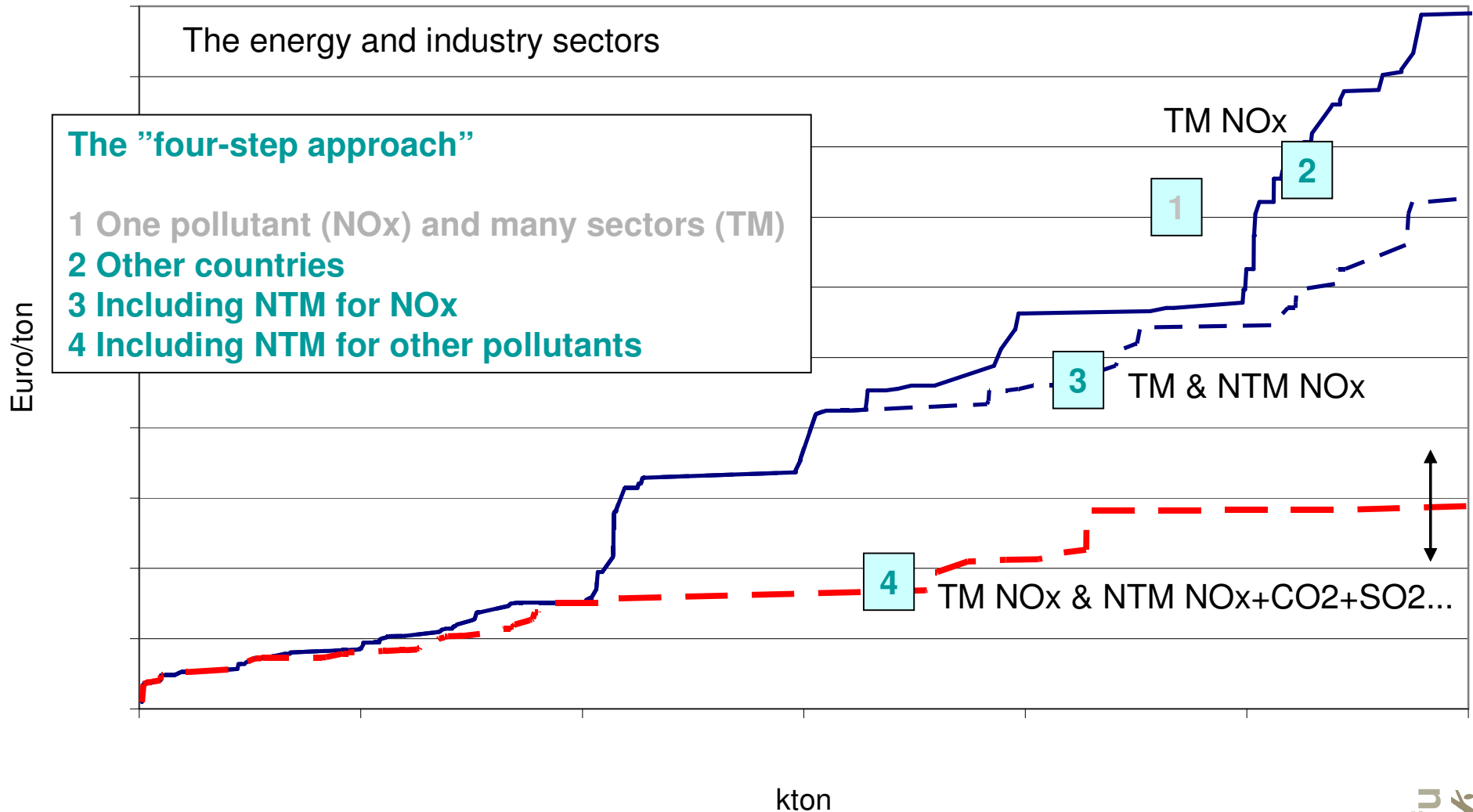
Swedish SO₂ emissions and abatements 1970-2000



Including NTM, other pollutants and other countries

- Schematic representation of NO_x in the Nordic countries

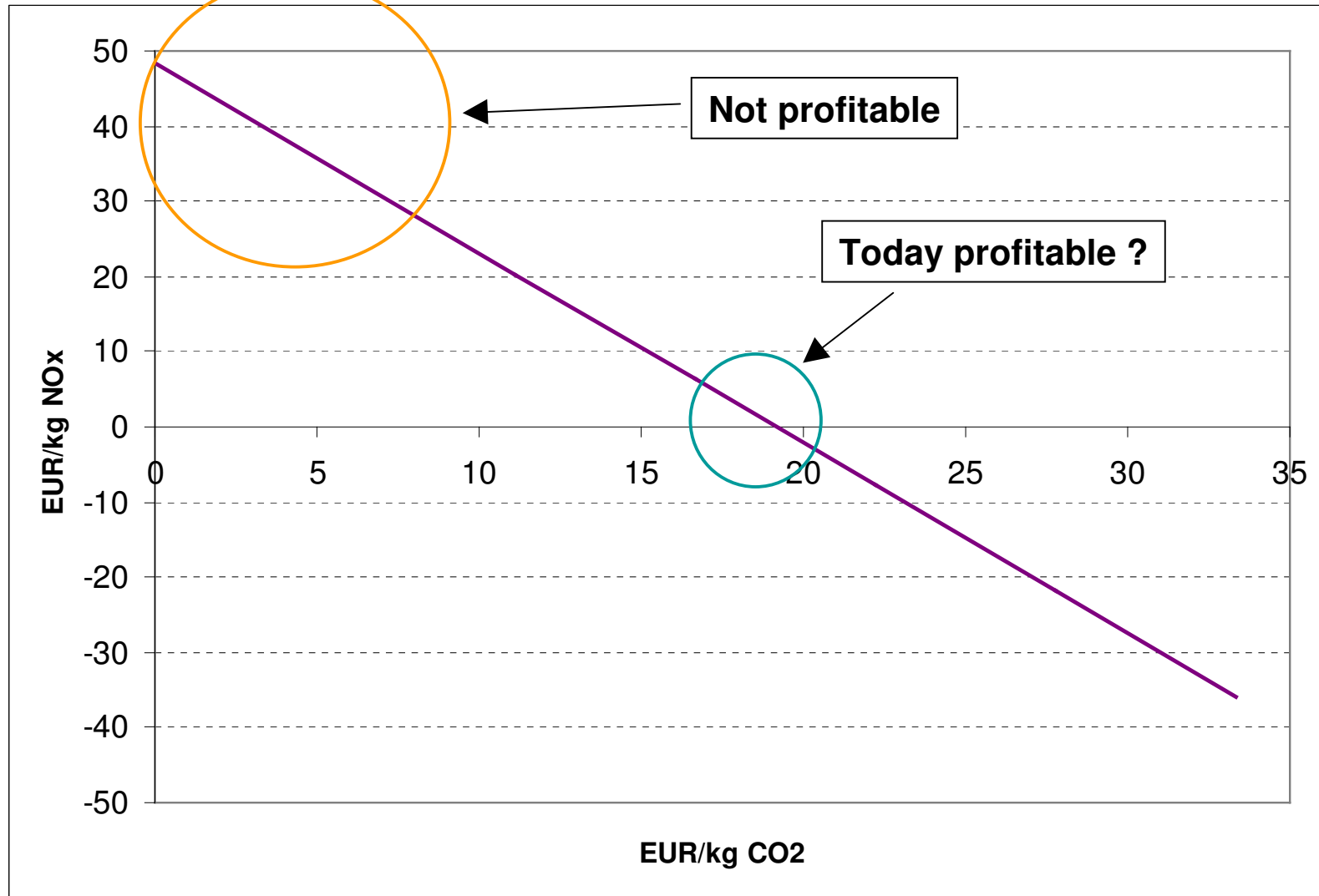
Marginal cost curve for NO_x - The Nordic countries (modified)



The influence from other pollutants ("Step 4")

A simple example : The CO2 market and NOx abatement costs

Switching from exist coal to new gas power

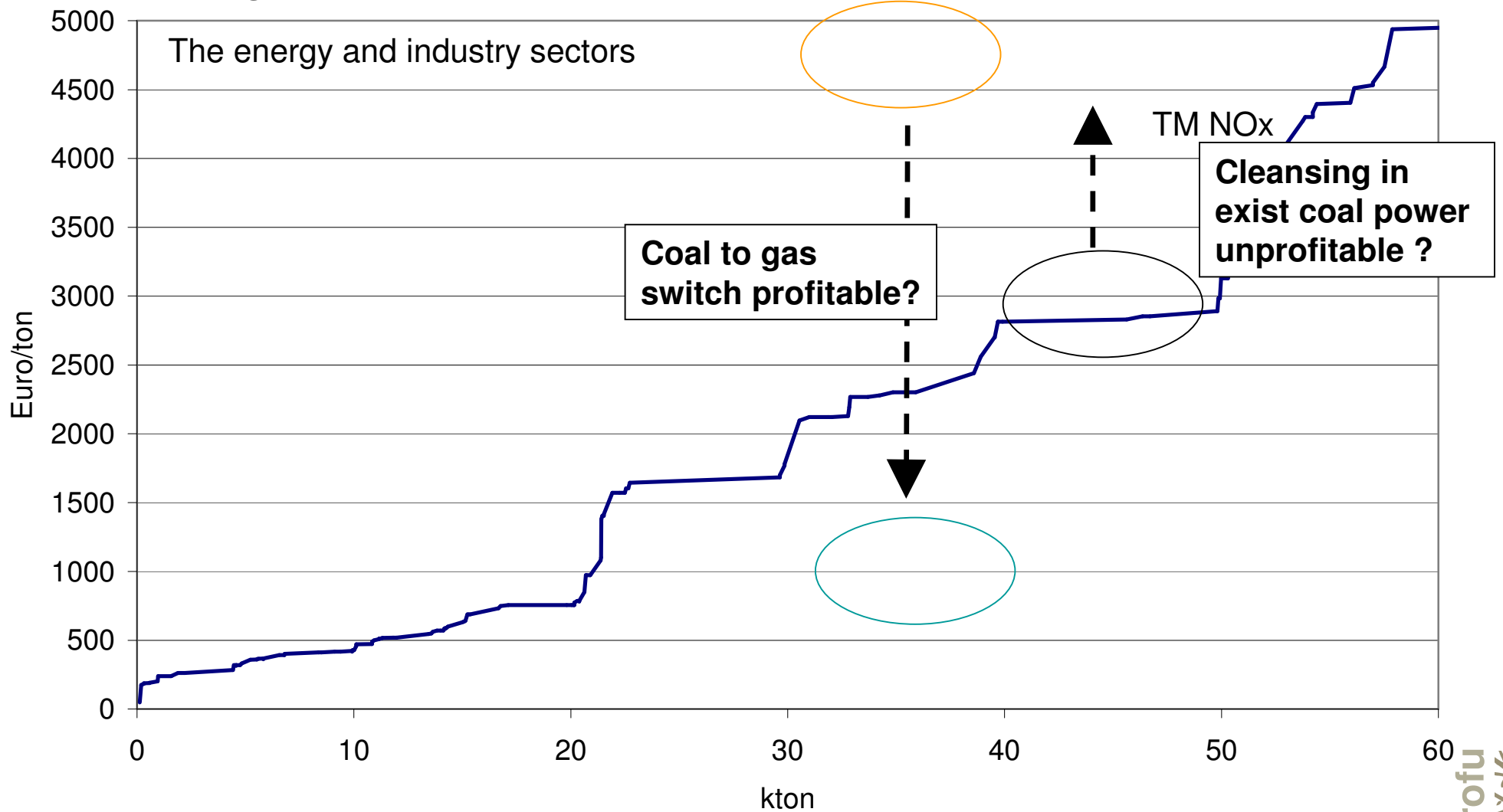


The influence from other pollutants ("Step 4")

A simple example : The CO2 market and NOx abatement costs

The order of merit may be changed !!!

Marginal cost curve for NOx - The Nordic countries (modified)



Conclusions

- **As of today, RAINS covers some synergies (e.g. time-dependent activities and GAINS) but not enough**
- **We believe that synergies should, as far as possible, be systematically included in the abatement options**

Pros : Synergies may be modeled (PRIMES, MARKAL/TIMES etc)
Better representation of the real complexity

Cons: A systematic analysis including NTM is far more dynamic (and scenario dependant) \Rightarrow Increased complexity of the analysis



