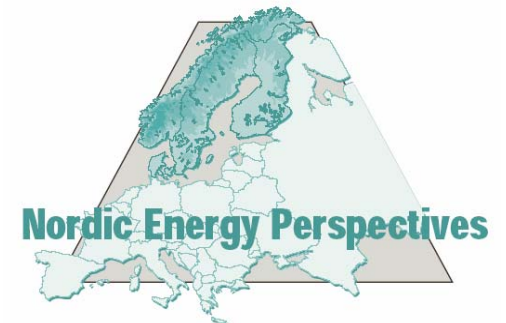


Perspectives on the implementation of the EU climate and energy package

Bo Rydén

Profu



EU targets and directives



- **CO₂ (ekv.) reduction – 20% target to 2020**
- **Renewable energy – 20% target to 2020**
- **Energi efficiency – 20% target to 2020**

Energy scenarios:

- **Reference case**
 - existing policy instruments (incl. EU ETS: 20-25 EUR/t)
- **EU 20-20-0 and 20-20-20 to 2020**
 - incl. the above 20%:s targets
 - primary energy weighting of nuclear power = 1



Conclusions for the Nordic energy system

- the stationary energy systems (i.e. excluding transports)

The renewable target + EU ETS, gives a >20% CO₂ reduction.

40% CO₂ reduction in the Nordic energy system in the 20-20-20 case...

... EU's targets for renewables and efficiency have significant CO₂ impact

The "balance" between the targets is not optimal in a Nordic context !

- The targets for renewables and energy efficiency are "tougher" than the CO₂ target...

... but in **the EU** (and including transport), the "balance" is more even

Nordic electricity production is more or less CO₂-free year 2020

Renewable energy will increase by around 130 TWh from 2005 to 2020

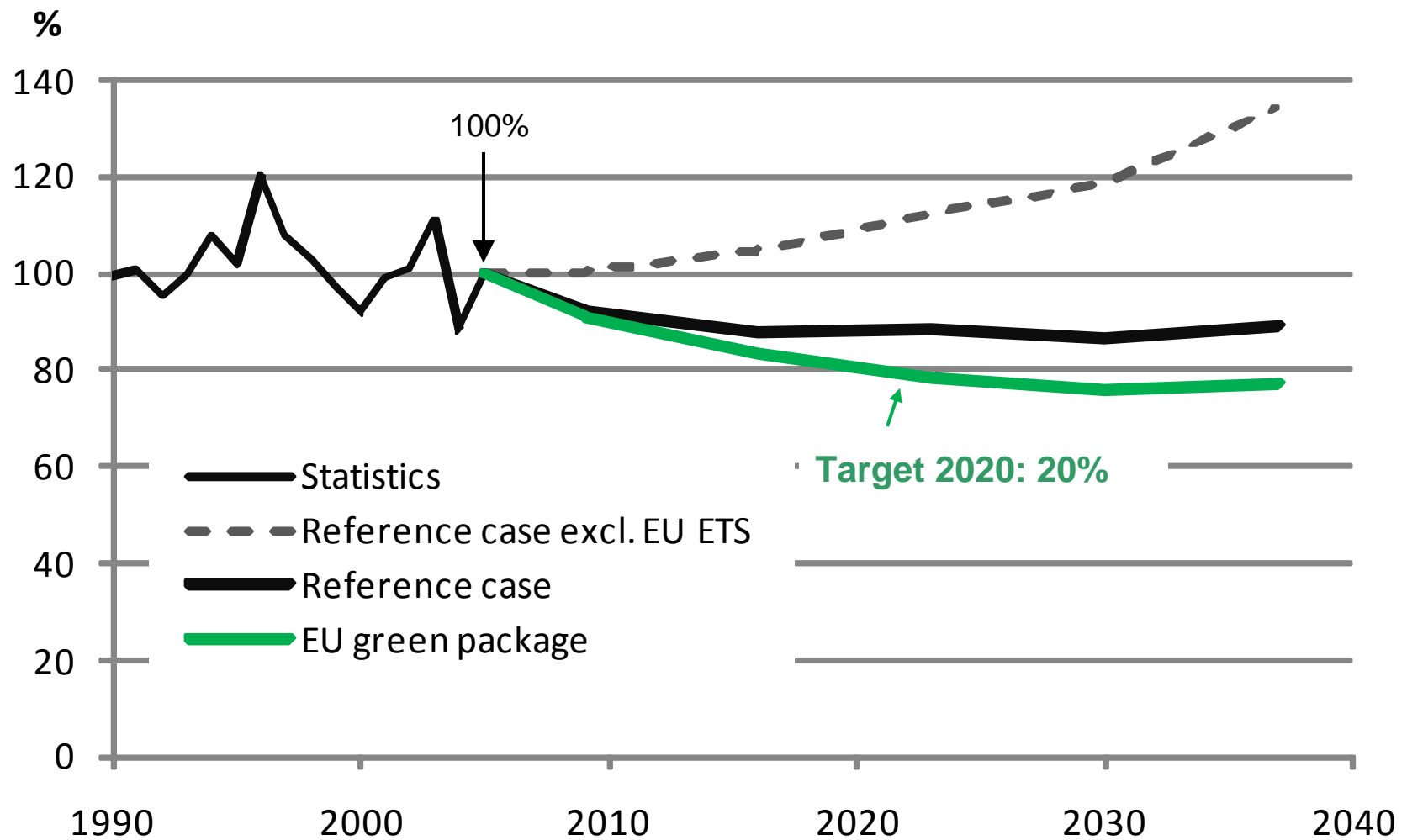
Energy efficiency will play an important role to 2020...

... and is a key CO₂ measure in the EU



CO₂ emissions in the Nordic energy system

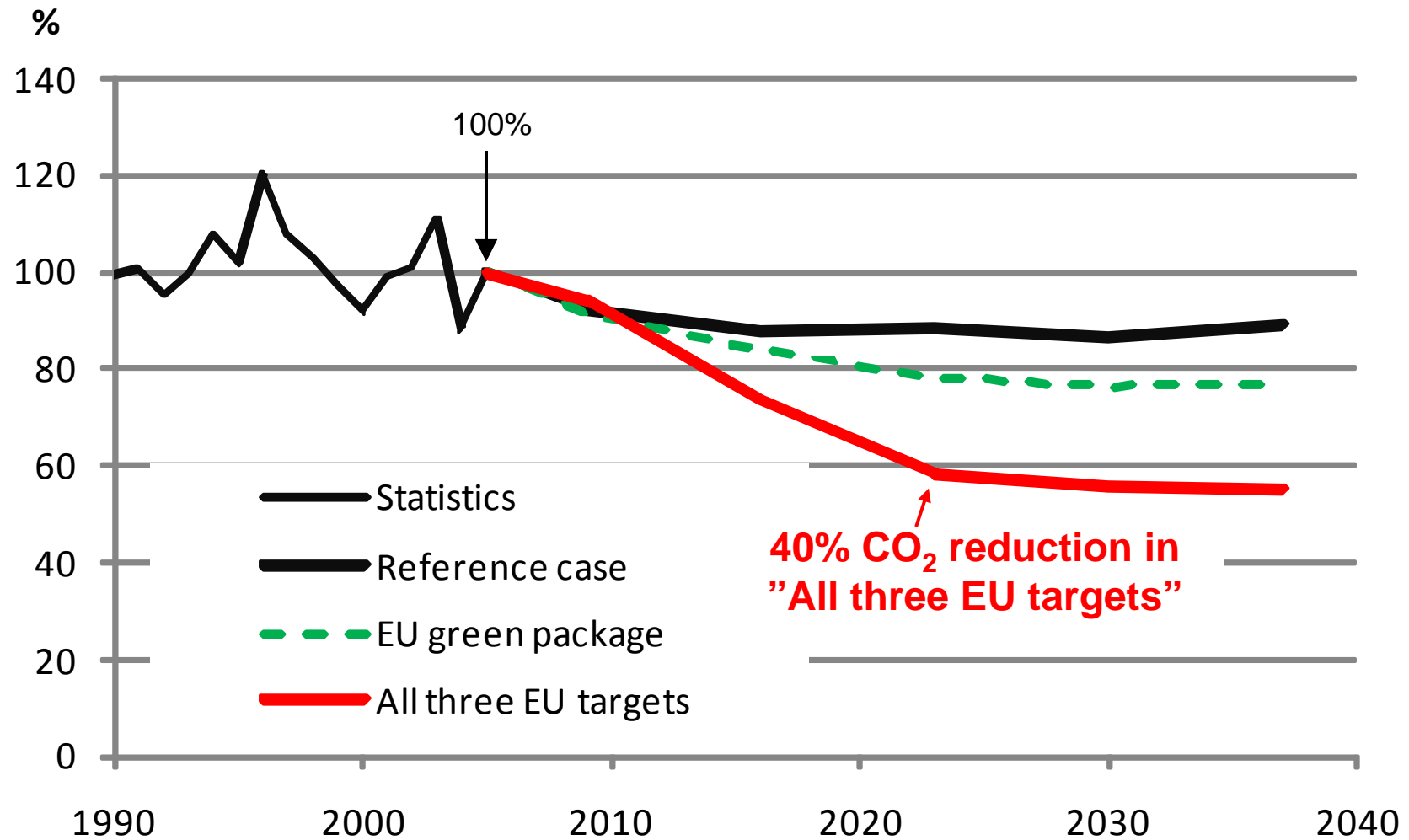
The emissions compared to the 2005 level



Note! Transport sector emissions not included

CO₂ emissions in the Nordic energy system

The emissions compared to the 2005 level



Note! Transport sector emissions not included

Perspectives on the Nordic GHG emission reductions

- for the stationary energy systems (and transports)

40% CO₂ reduction in the Nordic countries in the “20-20-20” case

The EU's targets for renewables and efficiency have significant CO₂ impact

A large share of the emission reductions is in the **trading sector**

- The Nordic countries become (large) net exporter within the EU ETS

The commitments in the **non-trading sector** require **additional incentives**

- Especially within transports

The NEP project highlights:

Measures that transfer the responsibility from the non-trading sector to the trading-sector are important

- electric vehicles (may contribute to the commitment in the non-trading sector with up to 25%)

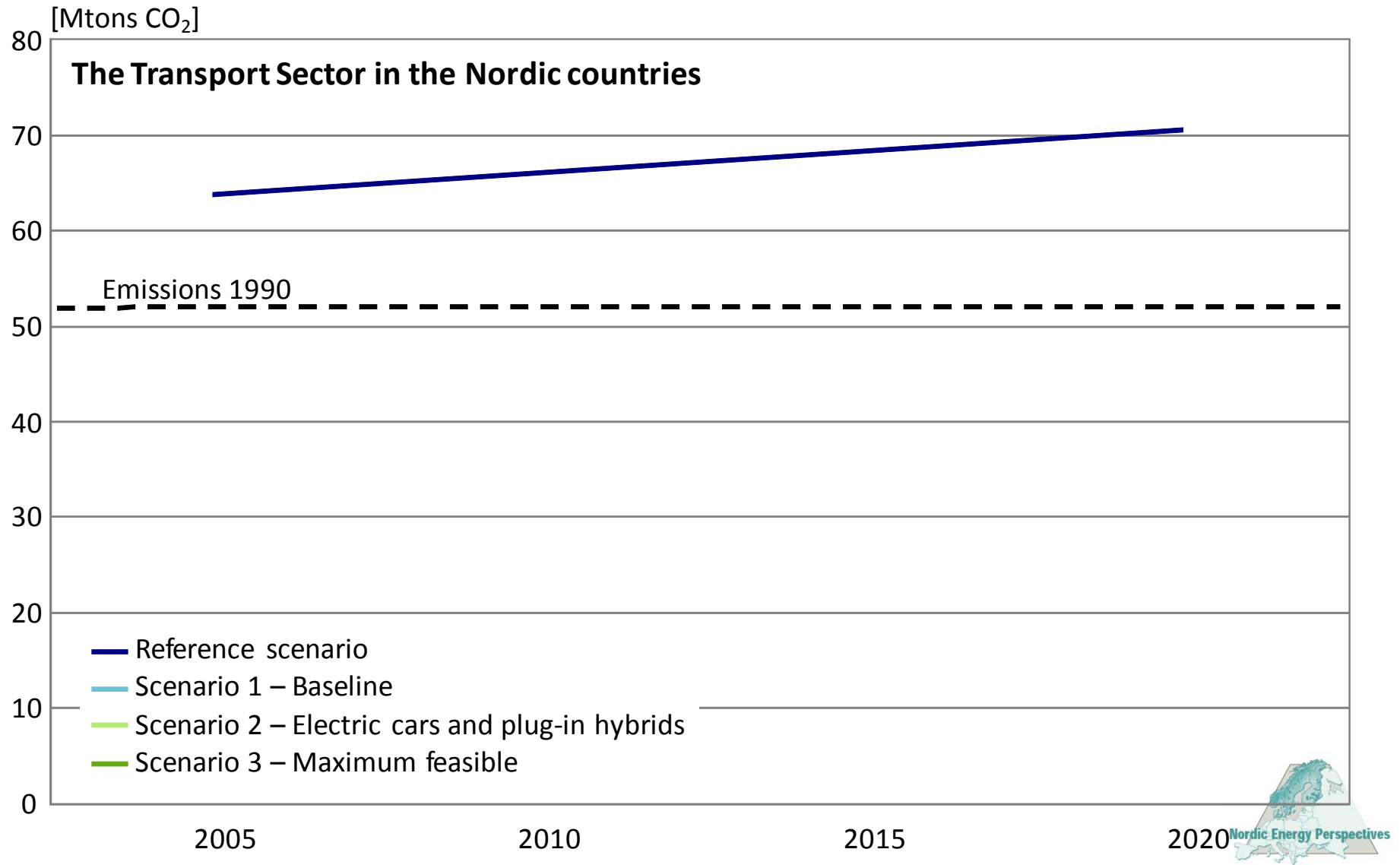
It is also important to seek measures that may reduce more than one greenhouse gas at the same time

- For example: waste incineration, biogas (e.g. from manure)

(The non-CO₂ gases are included in the commitment of the non-trading sector)

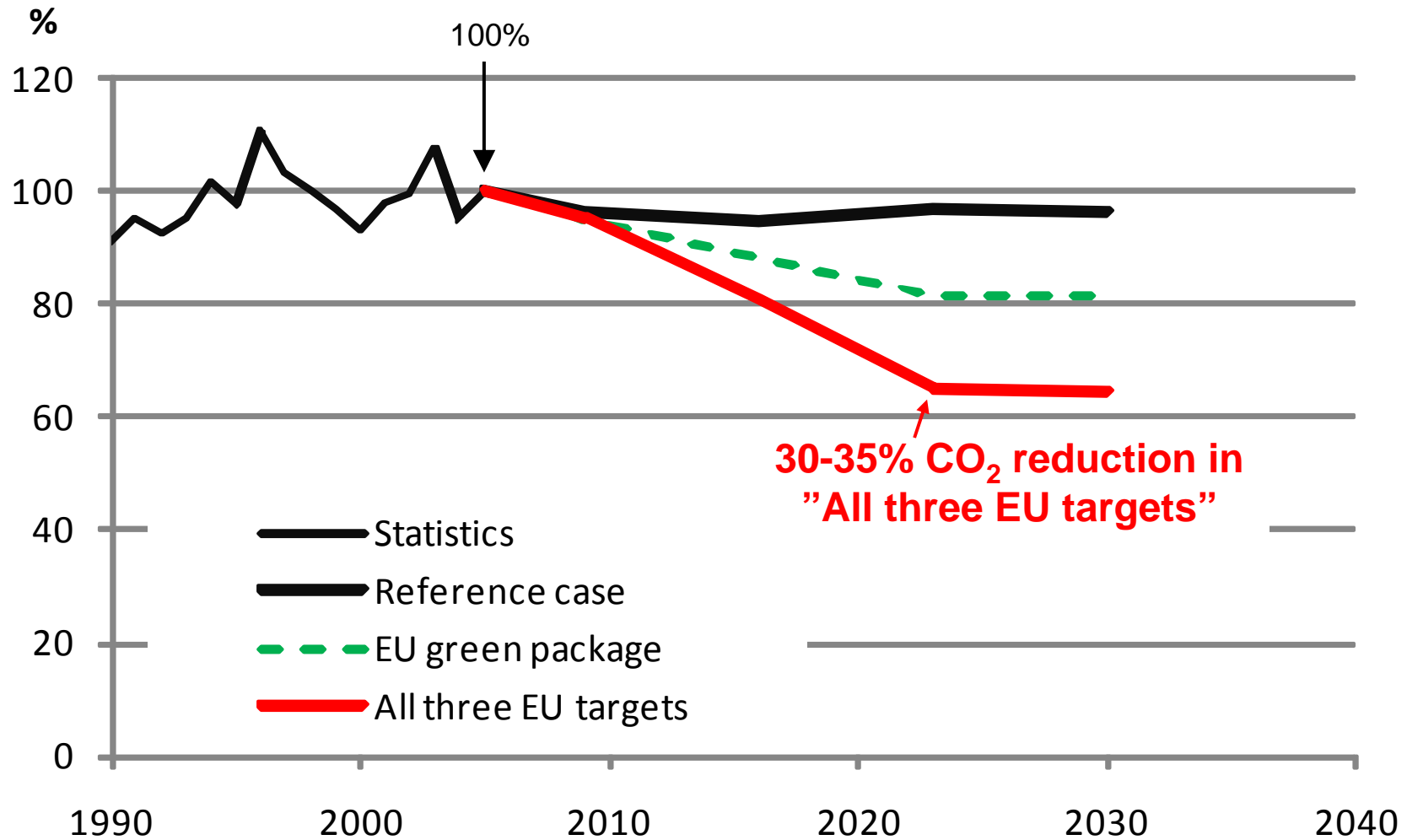
CO2 emission reduction scenarios for the transport sector

- Approx. scenarios



CO₂ emissions in Nordic energy and transport

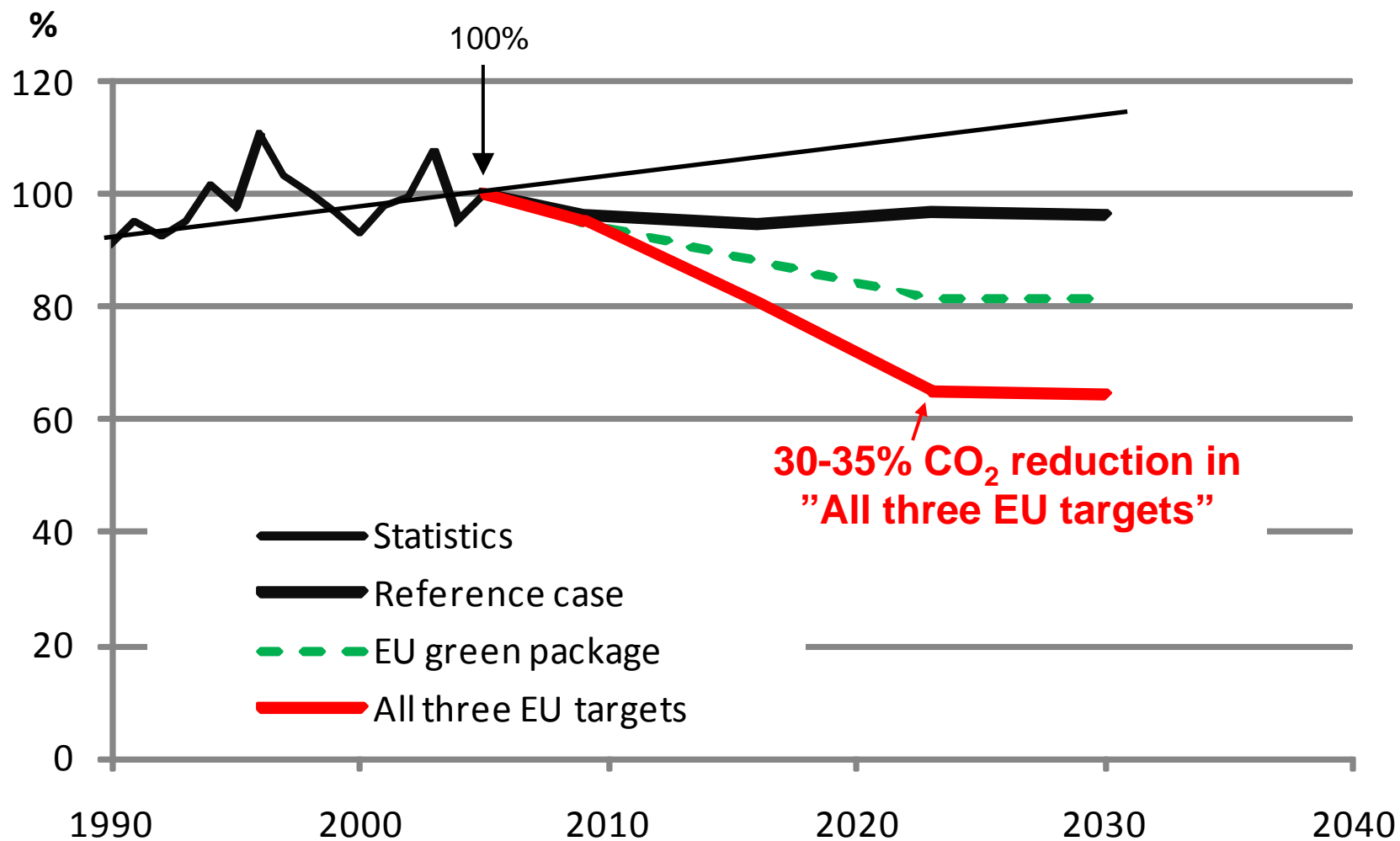
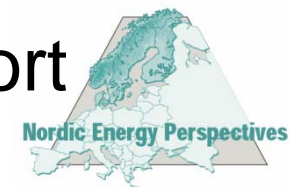
The emissions compared to the 2005 level



Transport sector emissions is included

CO₂ emissions in Nordic energy and transport

The emissions compared to the 2005 level

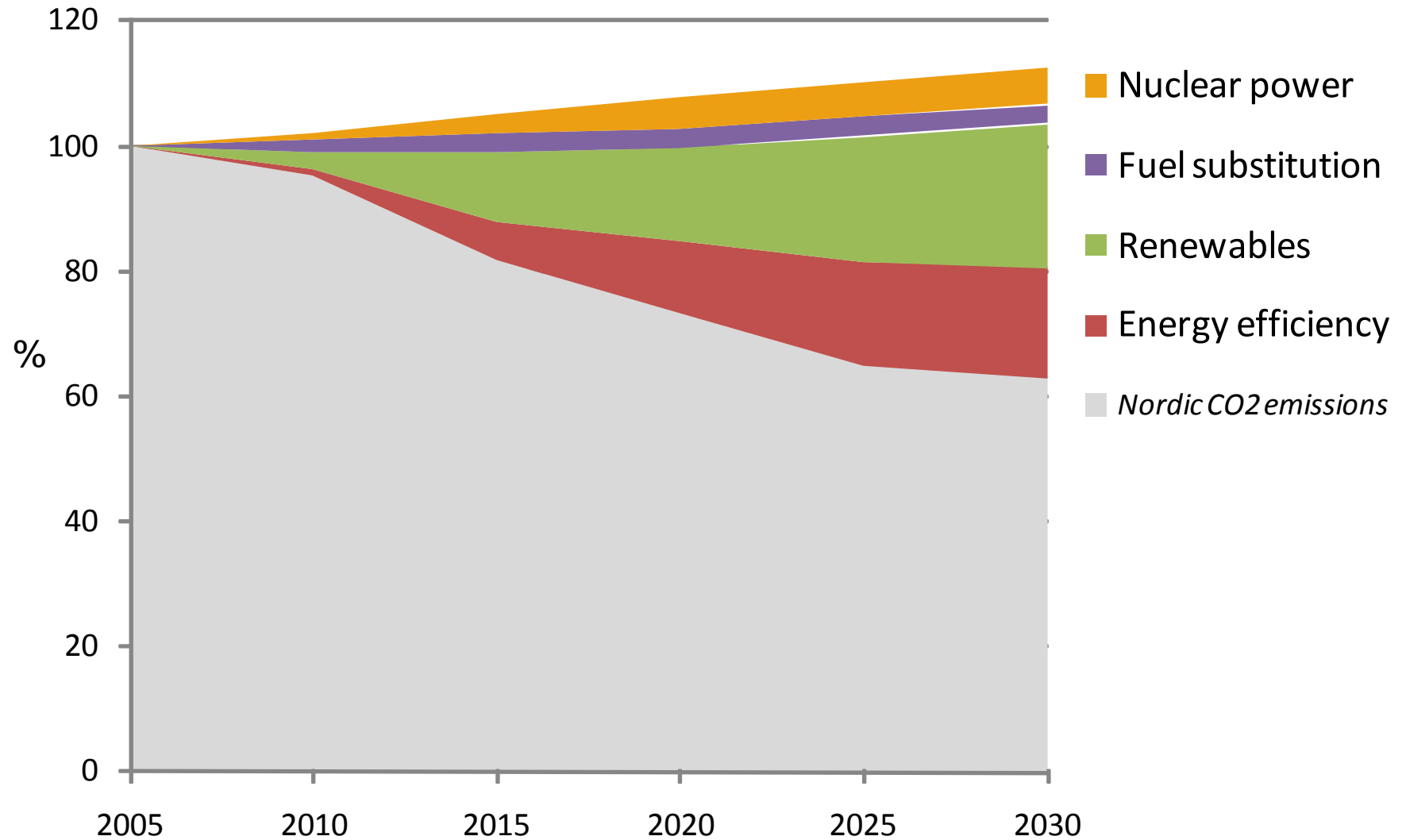


**30-35% CO₂ reduction in
"All three EU targets"**

Transport sector emissions is included

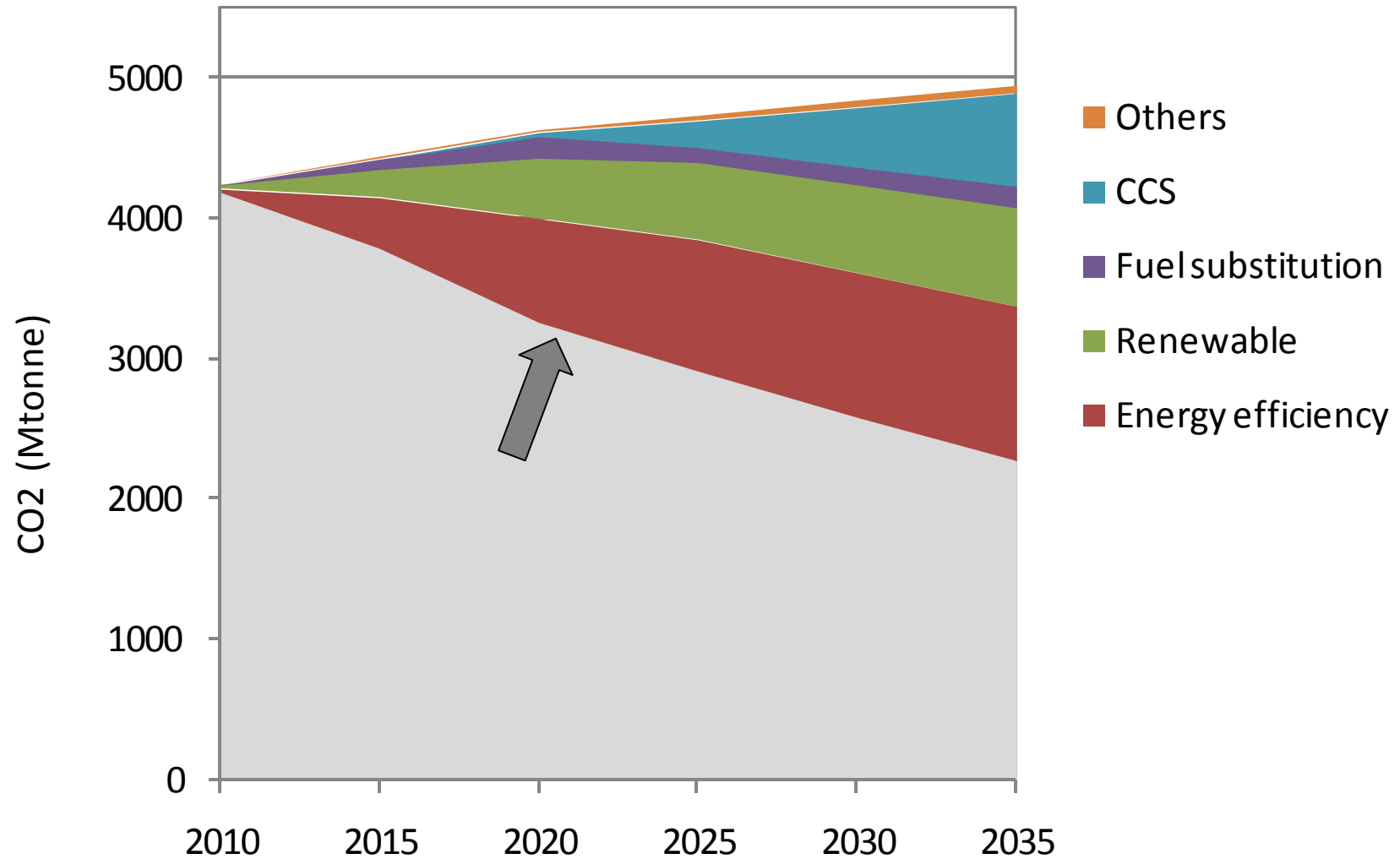
CO₂ abatement measures in the Nordic countries

The emissions compared to the 2005 level



CO2 emission reduction measures – a "low CO2 scenario"

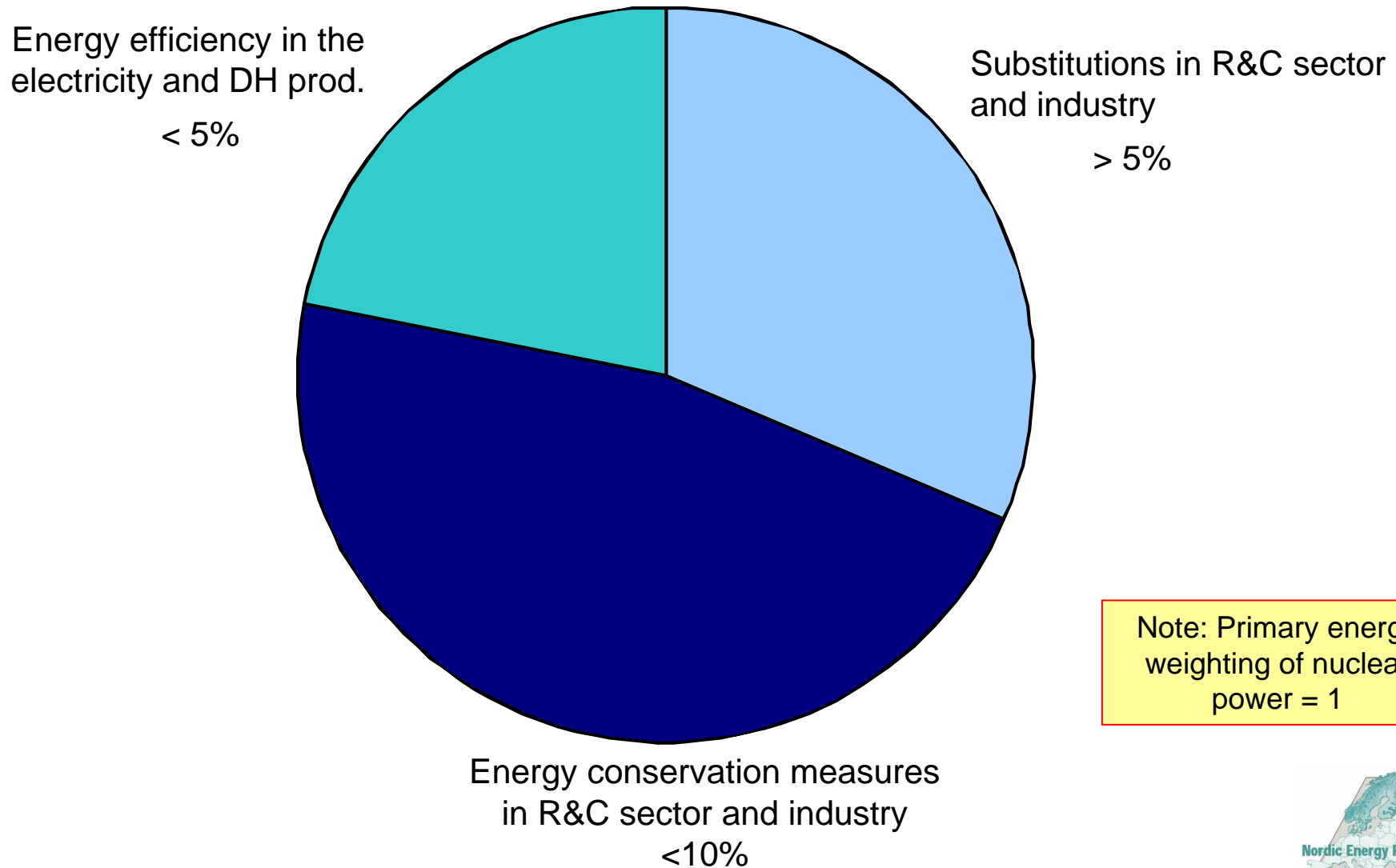
- From the project: Pathways to Sustainable European Energy Systems



Preliminary results

How is 20% energy efficiency achieved?

- Measures in the entire energy system

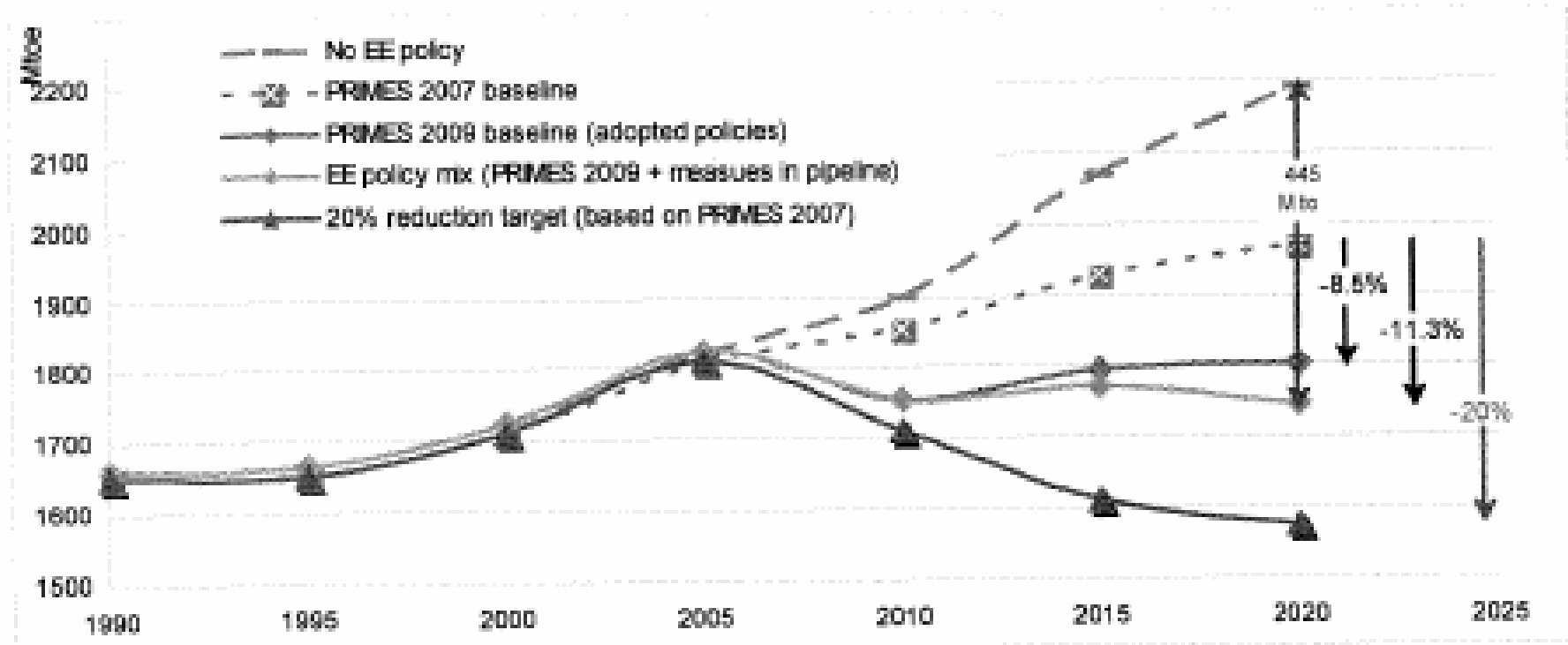


Note: Primary energy weighting of nuclear power = 1



Binding target: 20% energy efficiency

"The EU Commission intends to propose a binding target" (draft for a new Action Plan)

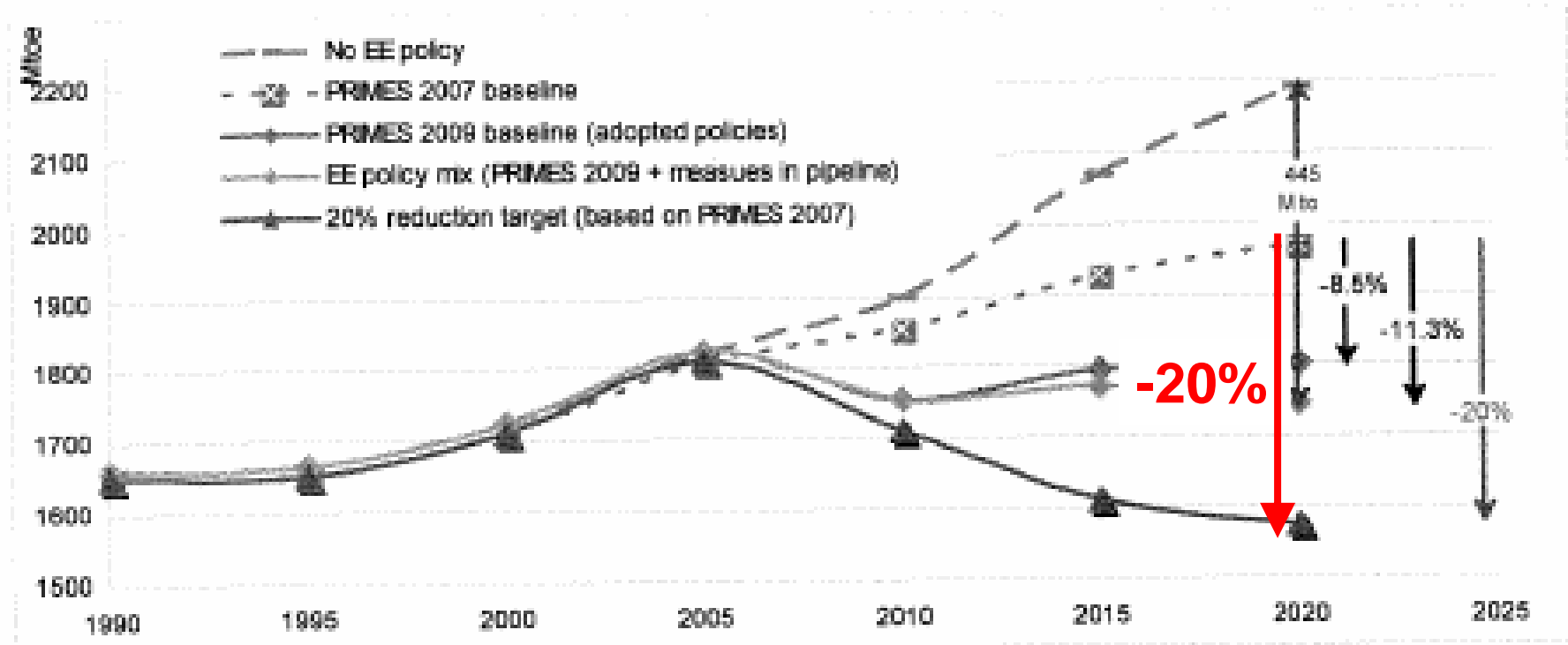


Development and projection of Gross Inland Energy Consumption for EU by 2020



Binding target: 20% energy efficiency

"The EU Commission intends to propose a binding target" (draft for a new Action Plan)

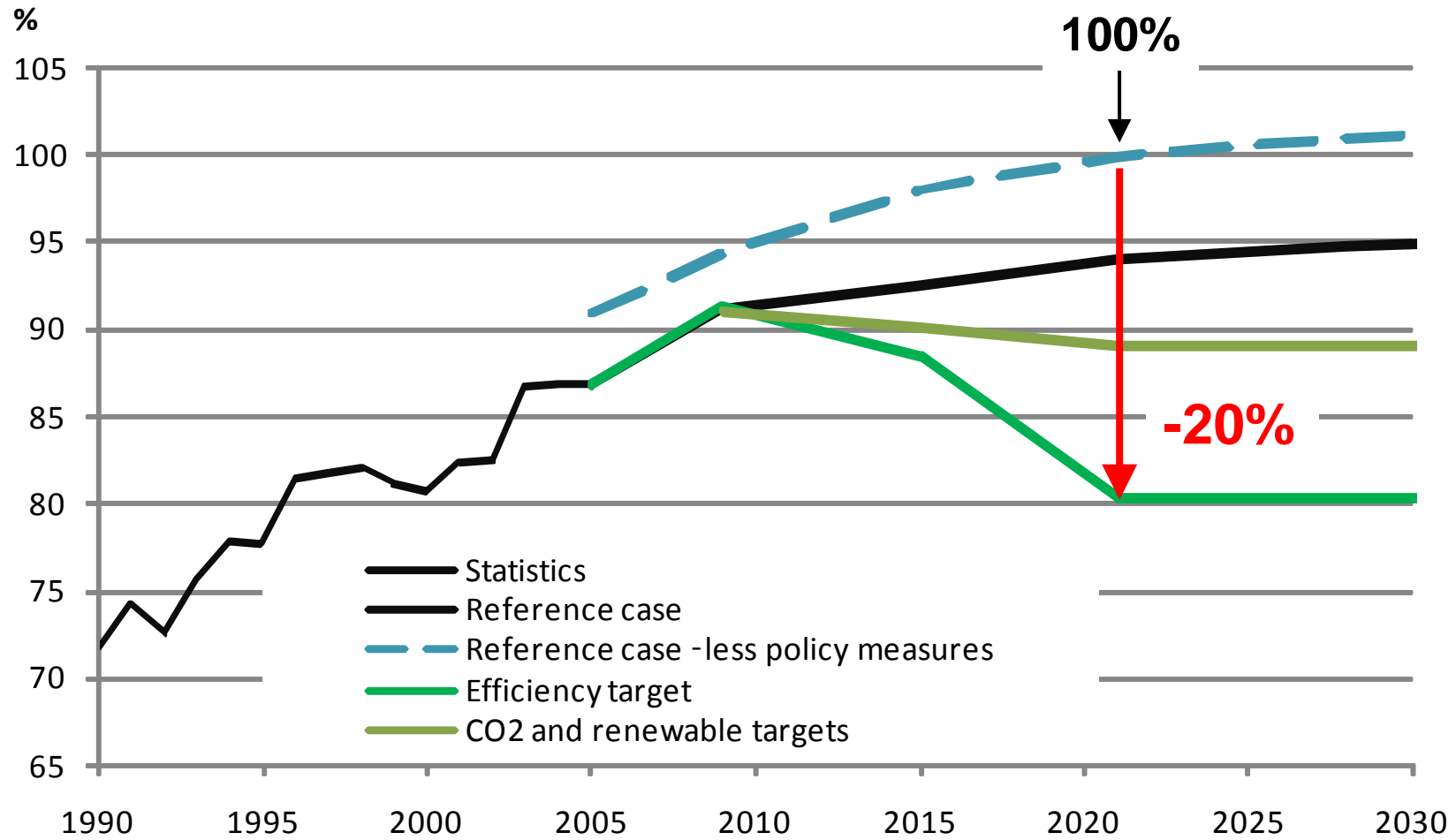


Development and projection of Gross Inland Energy Consumption for EU by 2020



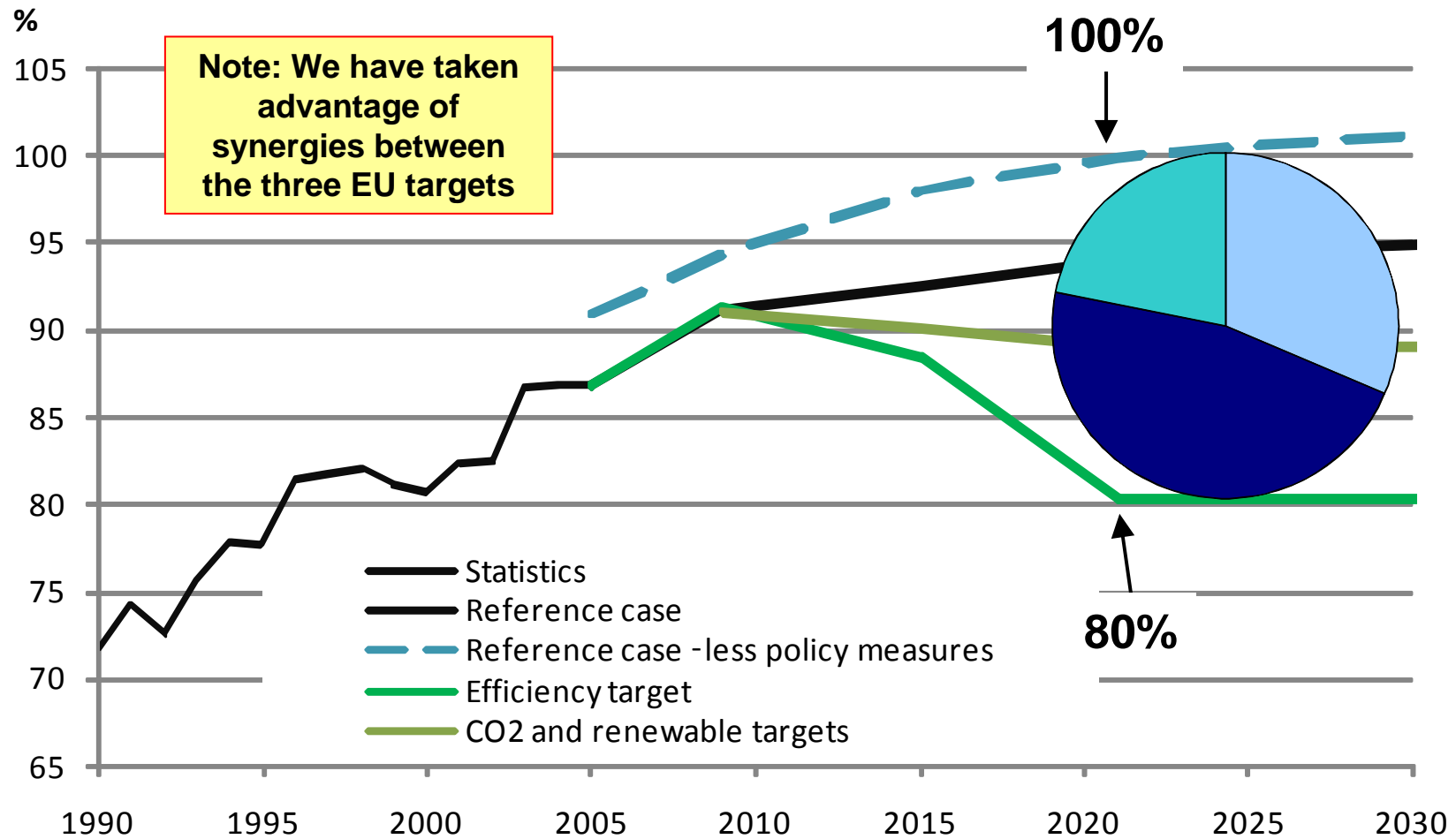
How is 20% energy efficiency achieved?

- Calculations within NEP



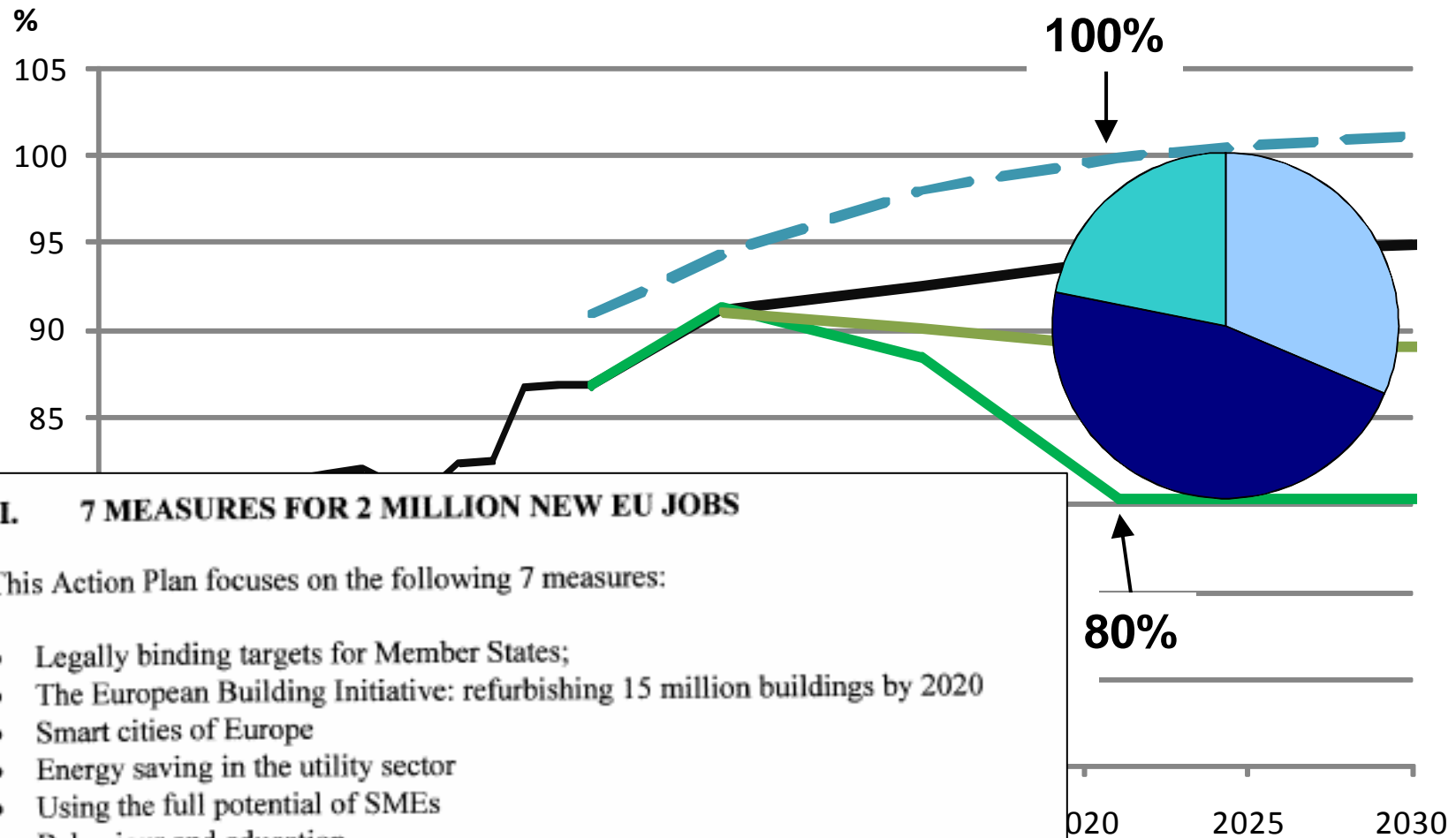
How is 20% energy efficiency achieved?

- Calculations within NEP



How is 20% energy efficiency achieved?

- Measures mentioned in the draft for a new EU Action Plan



II. 7 MEASURES FOR 2 MILLION NEW EU JOBS

This Action Plan focuses on the following 7 measures:

- Legally binding targets for Member States;
- The European Building Initiative: refurbishing 15 million buildings by 2020
- Smart cities of Europe
- Energy saving in the utility sector
- Using the full potential of SMEs
- Behaviour and education
- International cooperation

Perspectives on an efficiency target for 2020

- i.e. a 20 percent primary energy efficiency target for 2020

It is important to formulate a policy that generates equivalent incentives to efficiency measures in the **entire energy system**
...at the energy conversion side as well as at the energy end-use side

The trading sector should be included

- since it is associated with cost-efficient efficiency measures

Enable the option of burden-sharing between sectors

It is important that the responsibility of measures can be transferred between sectors if cost-efficient, e.g. electric vehicles, heating pumps, district heating...

The **balance between policy instruments dedicated to energy efficiency and other policy instruments (CO₂ and renewables) is important**

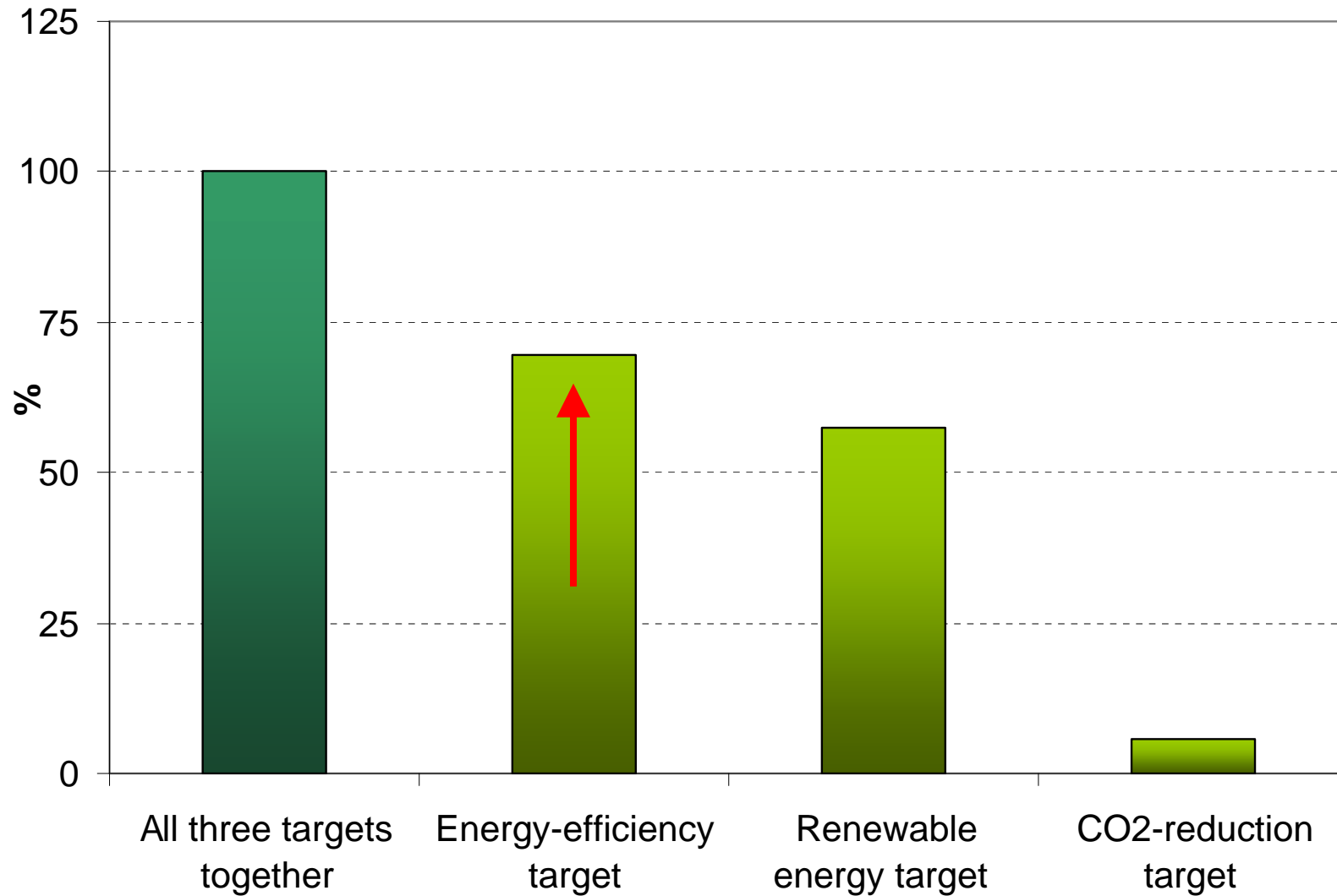
...in order to utilize all synergies that exist between the different policy goals.

The choice of primary energy factors is decisive for **nuclear power**

But also for wind power, industrial waste heat and ambient heat (solar, geothermal)

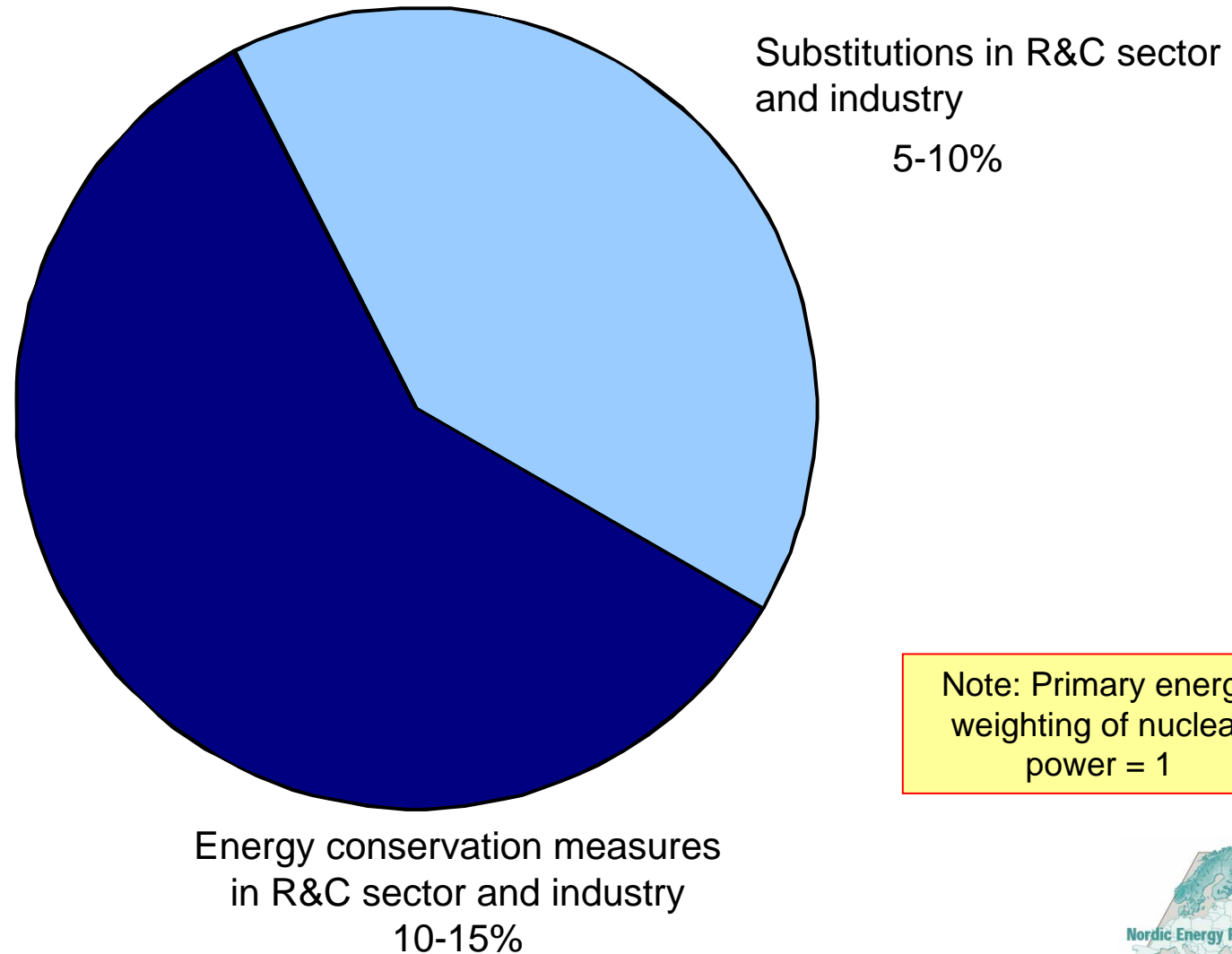
The ranking in cost of the three policy goals

- compared to the cost in a reference case



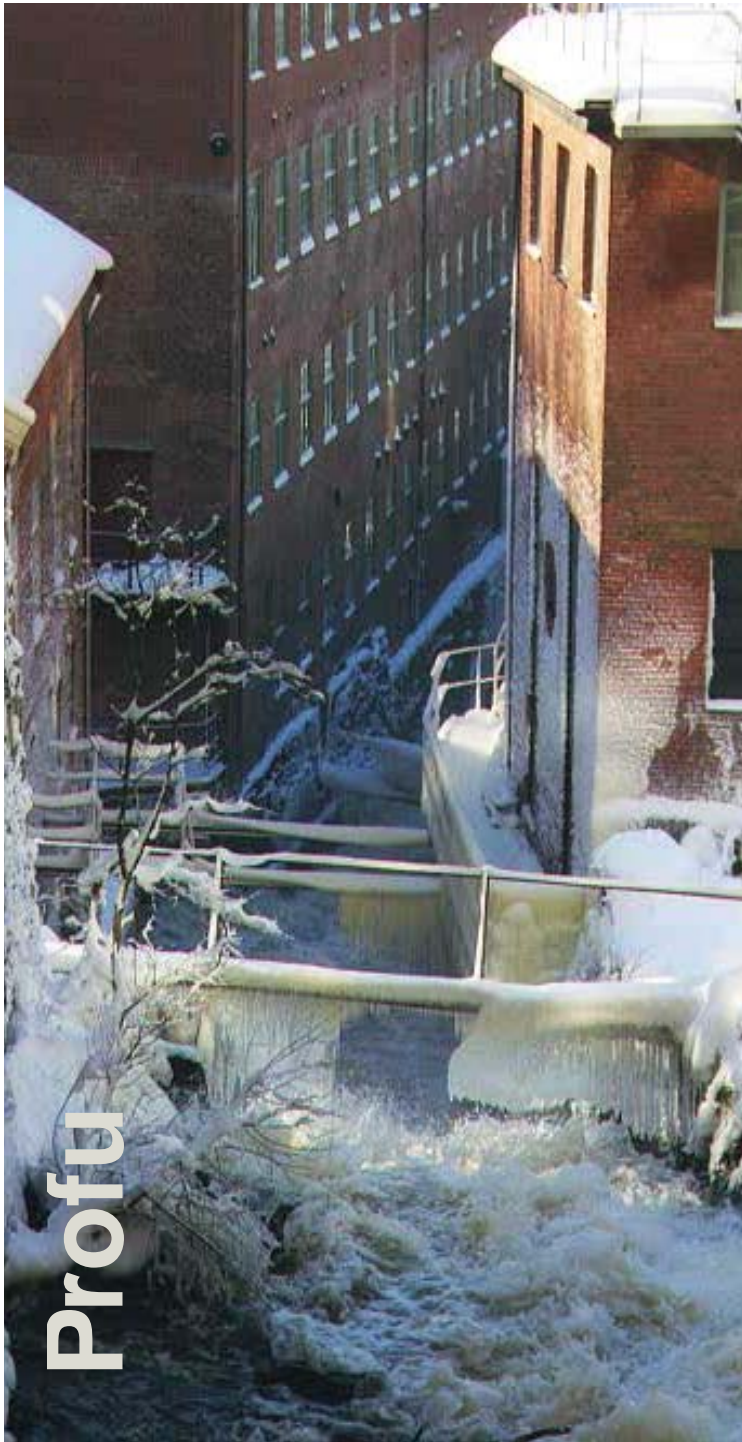
How is 20% energy efficiency achieved?

- Alternative diagramme



Note: Primary energy weighting of nuclear power = 1





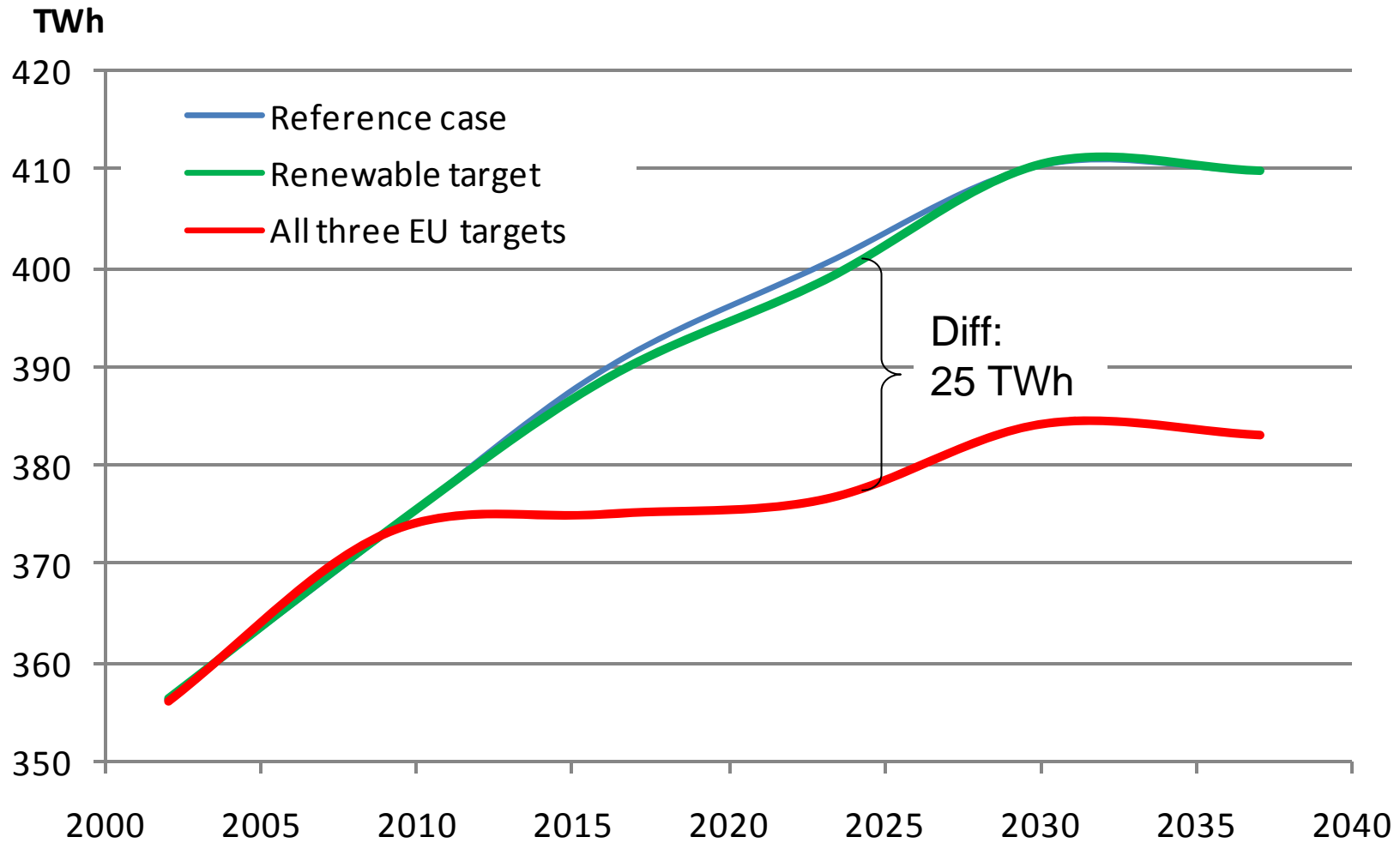
Thank you!

More information:
www.nordicenergyperspectives.org



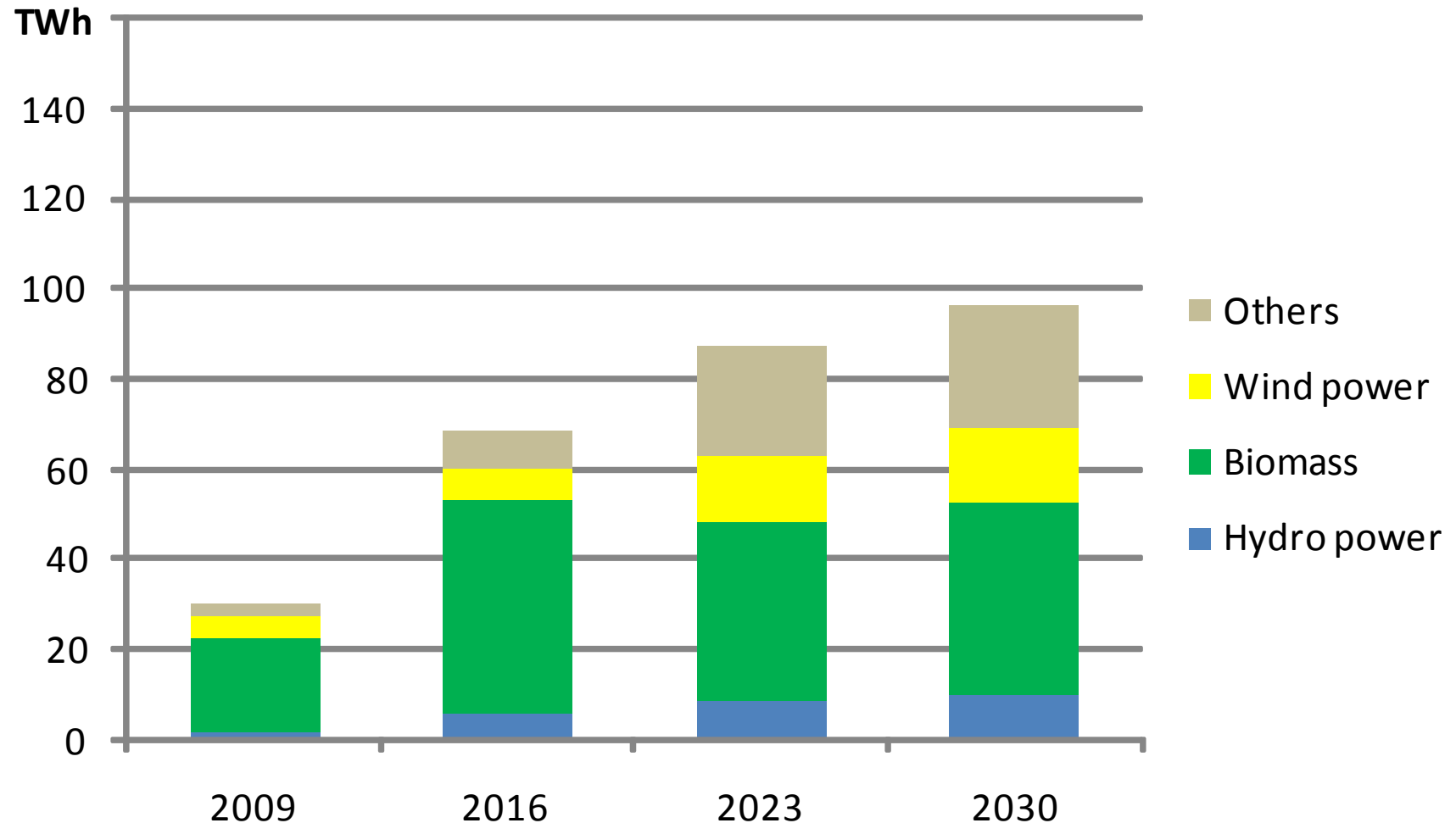
Electricity demand

- Several cases: sum of the demand in the Nordic countries



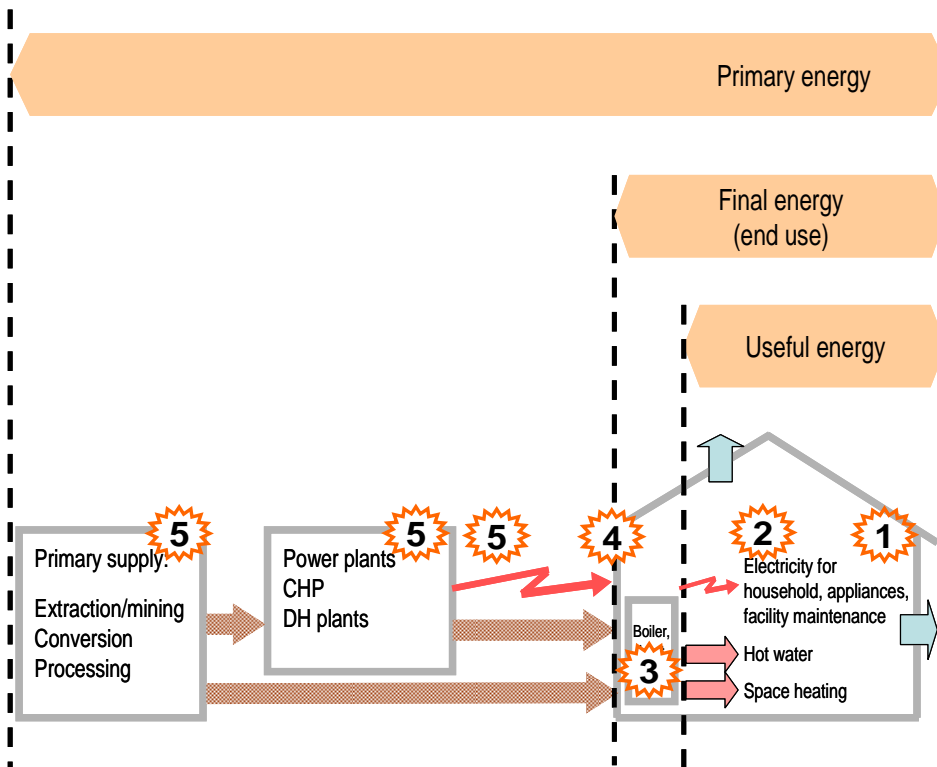
EU 20-20-20 to 2020 – Nordic countries

- Increase of renewable energy from 2005



Note: the renewable goal is fulfilled also when non-renewable fuels decrease – not only when renewable energy increase. “Double effect” when the energy efficiency goal leads to more heat pumps.

Energy efficiency:
How much should be included?



Possible components when adding up energy efficiency results:

- 1** Better insulation, better control systems
- 2** Better appliances
- 3** Better boilers, better heatpump COP etc
- 4** Decreased primary energy due to converting to other heating systems in the houses
- 5** Better efficiency in energy transformation (new/better generation, more CHP, new/better distribution)

Calculation of potentials for efficiency improvement

Insulation, appliances etc in the Swedish building sector

Final energy (end use). From the Swedish ESD action plan

