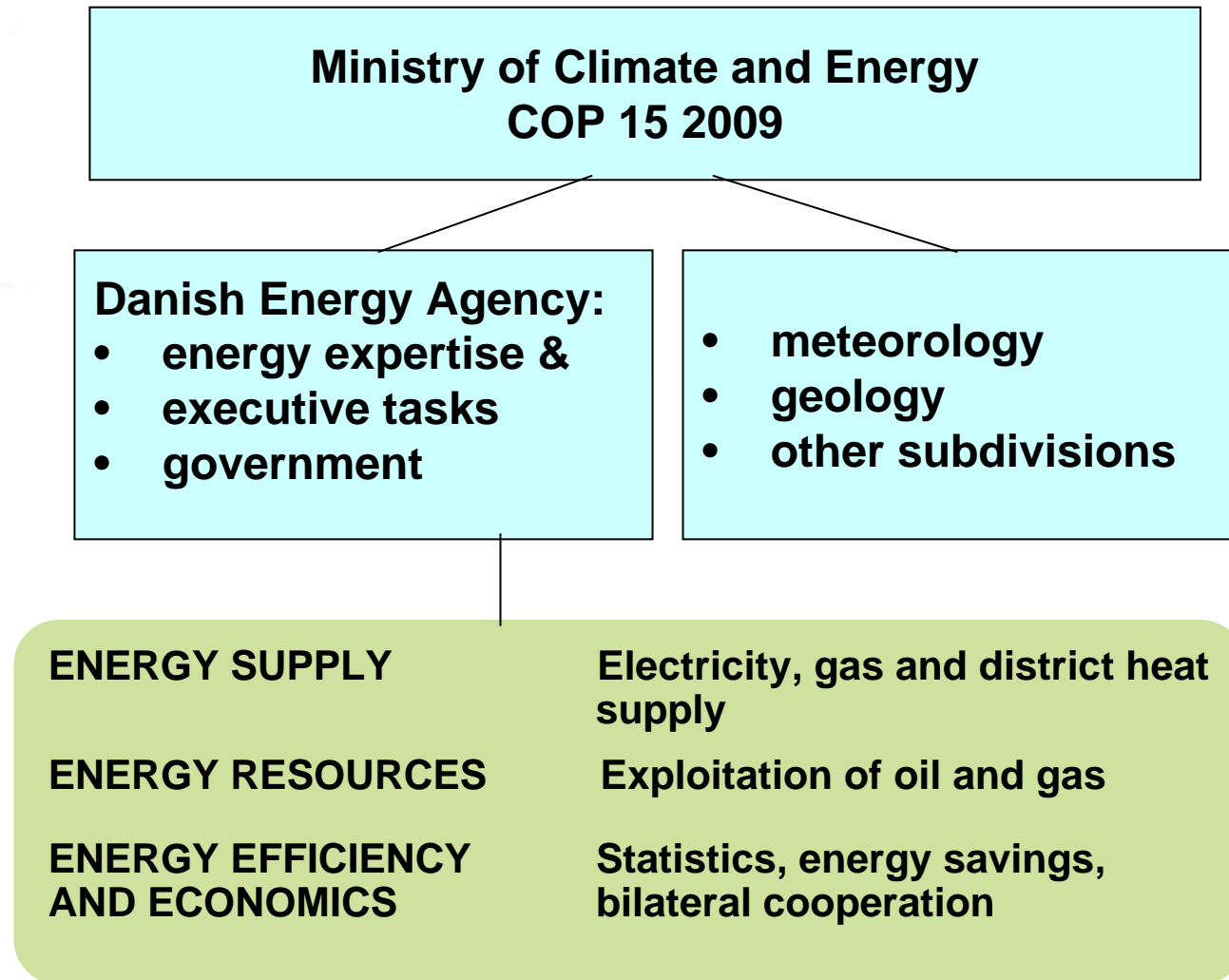


Implementation of EU Climate & Energy Strategy in Denmark

Salzburg 15 September 2008
Ture Hammar

Organisation of the Danish Energy Agency - 2008



Implementation of EU Climate & Energy Strategy in Denmark

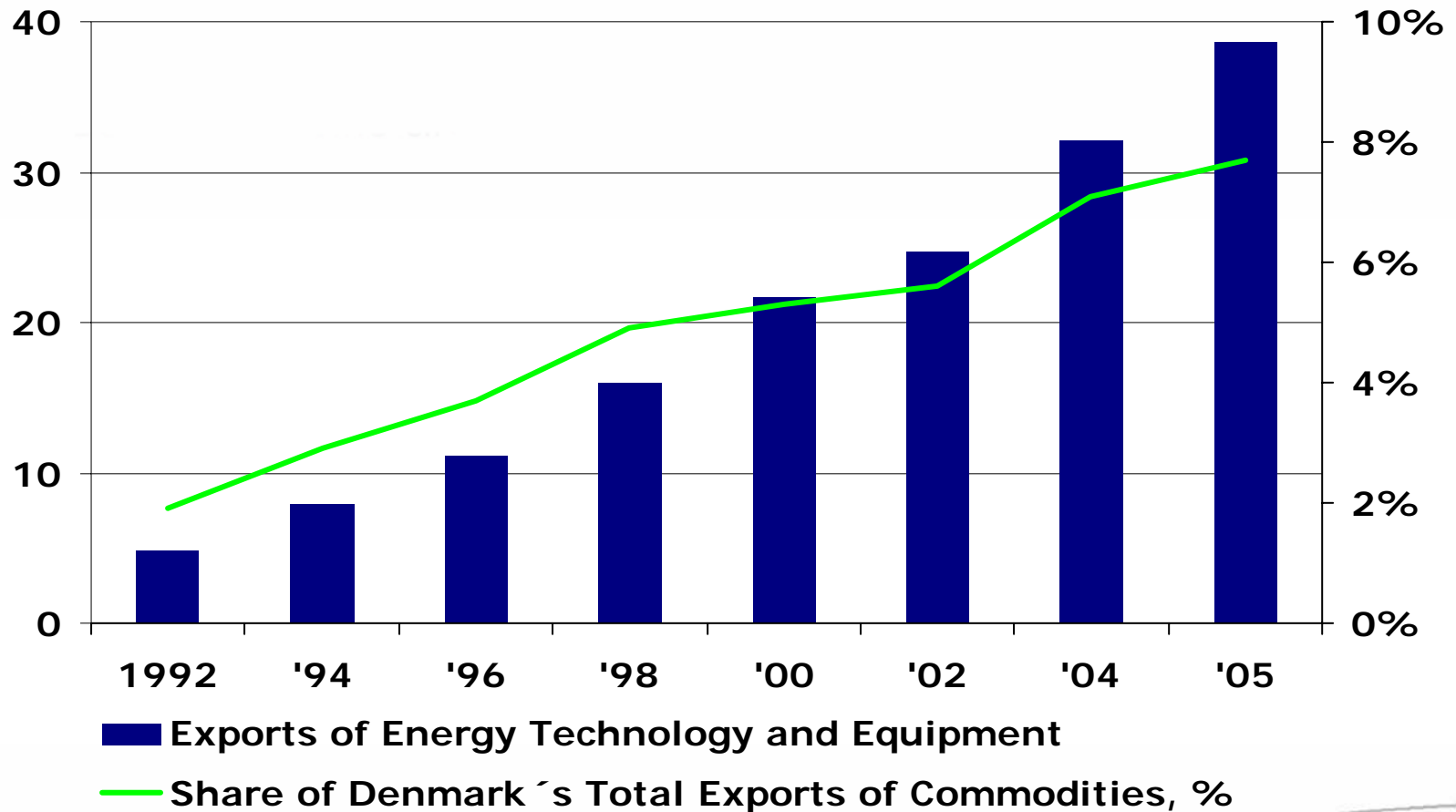
- Overview Danish tradition
- EU approach to energy policy 2020
- Energy efficiency
- Renewable energy
- Fueling transport
- Regulating GHG emissions
- Strategy for energy technology

Danish tradition

- Oil crises & shocks 1973/74 & 1979/1980
 - Depend on 93% imported oil + 6% coal = 99%
- Introduction of all types of strategic measures
 - Energy strategy tradition started
 - Continued since more or less, emphasis shifting
 - Energy security, economy, environment
- Today leading in
 - Energy efficiency (energy per GDP)
 - Combined Heat & Power & District Heat
 - New renewable electricity
 - Export of sustainable energy technology
- Strategies and consensus-building continue

Exports of Energy Technology and Equipment

Billion DKK, Current Prices



EU process

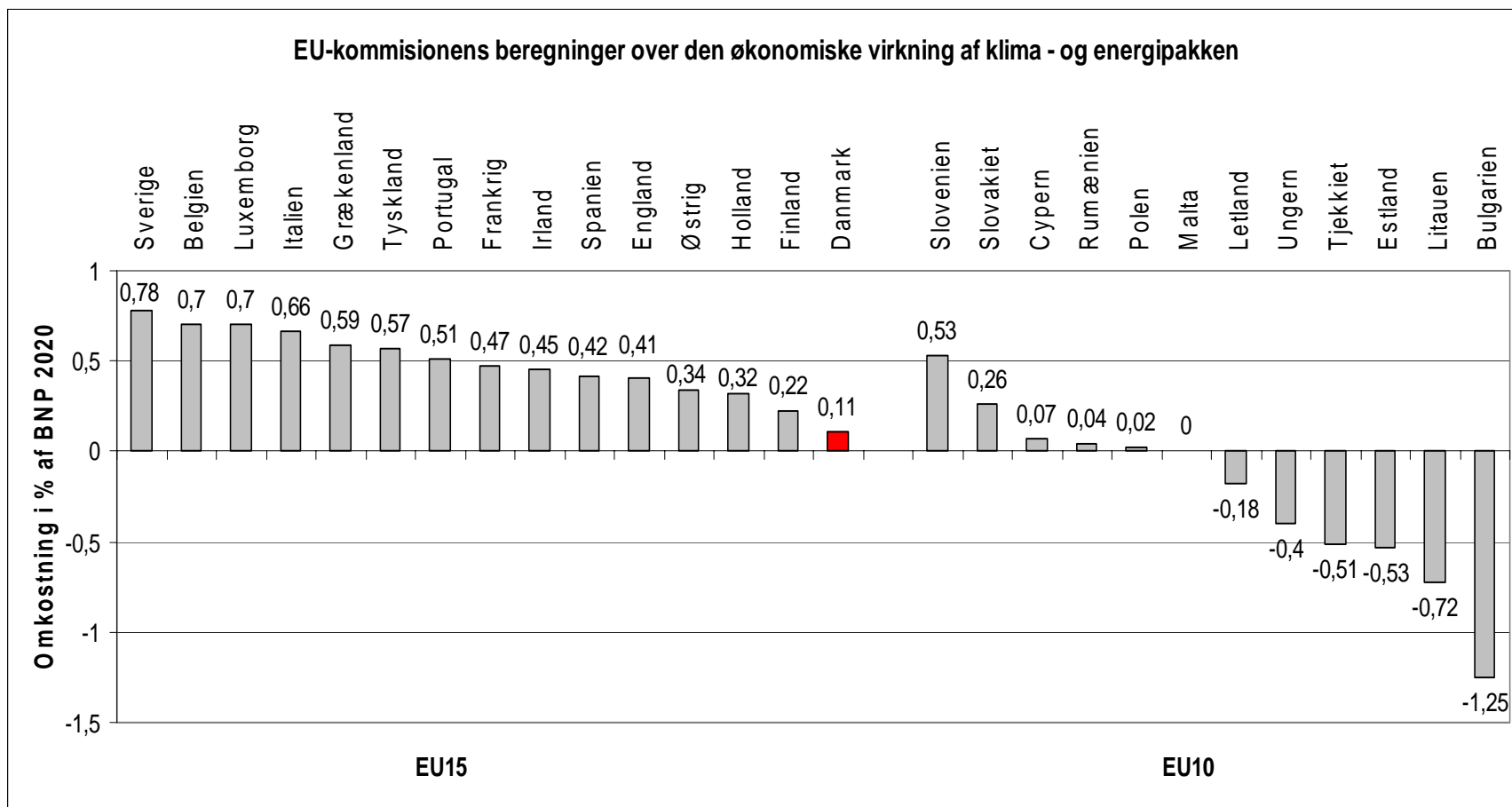
- Coal & steel & Euratom
- Oil crises met at national level
 - Nuclear
 - Coal & lignite
 - Dash for gas (and oil!)
 - RES
 - Energy efficiency here and there (and not!)
- Energy charter 1990
- Rio 1992
- Kyoto 1997
- New energy policy 2006-2008
 - Danish contribution October 2006
 - Energy policy strategy March 2007
 - Climate & Energy Package 2008

EU 2020 targets & new package

- Energy Policy targets 2020
 - Energy efficiency 20%
 - RES 20% & biofuels 10%
 - GHG reduction 20/30%
 - Strategy for energy technology (SET plan)
- Climate & energy package
 - Strong effort needed
 - Implementation measures on EU & national level
- Parallel national follow up
 - Fulfilling Kyoto obligations
 - Envisage new energy security & price situation

EU climate & energy package

Relative economic burden %GDP 2020



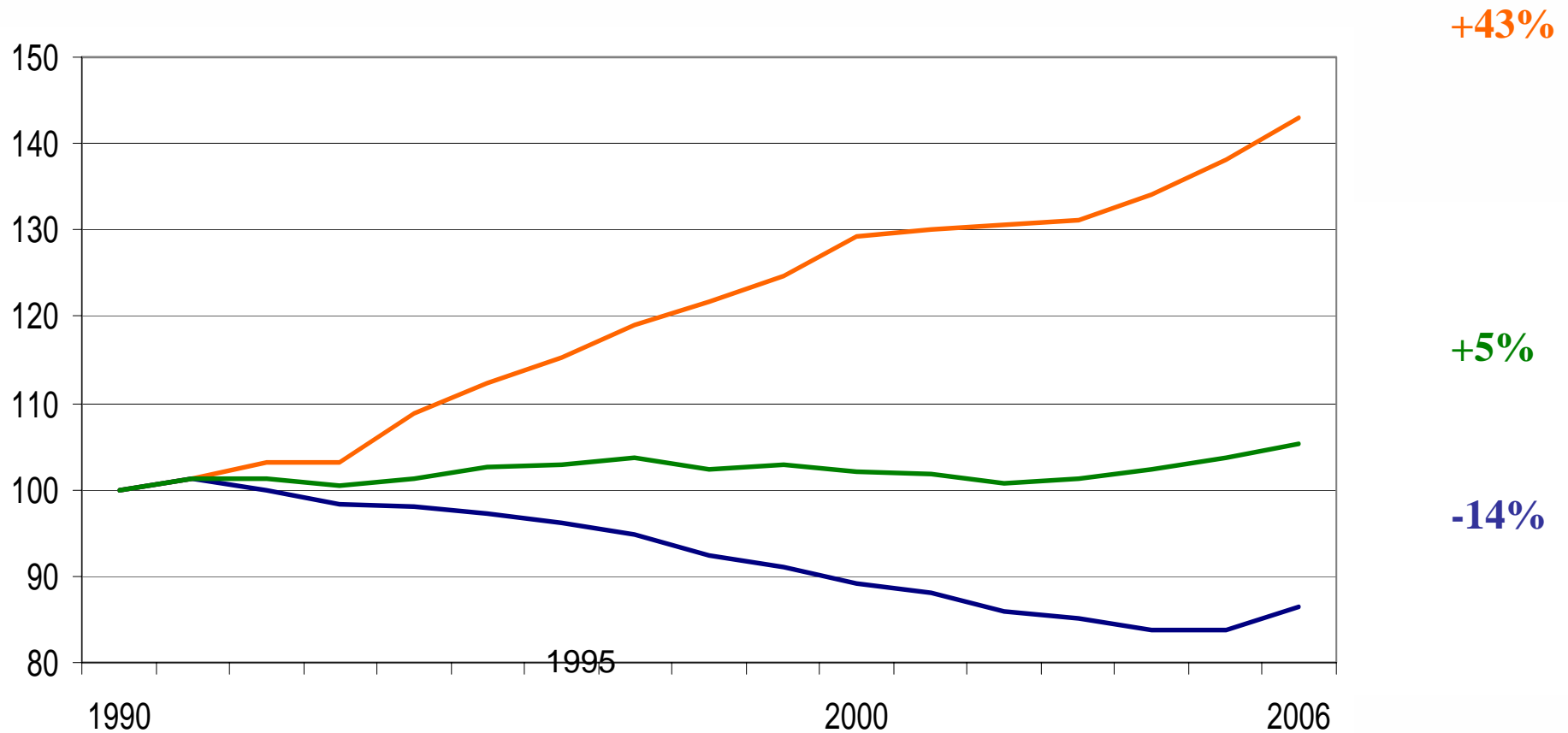
Energy efficiency EU efforts

- Targets included in National Energy Efficiency Plans (NEEAPs)
- Efficient Products
 - Eco design strengthening & speed up
 - New eco-design products (windows, walls, etc.)
 - New label system
 - International effort (IPEEC & 4E)
- Buildings
 - Revised & stronger EPB directive
- Efficient transport
- Impact from GHG quotas & energy taxation

Energy efficiency Danish efforts

- National targets strengthened
 - Absolute goal: + 2% 2012 + 6% 2020 compared to 2006 level
- Electricity & products
 - Electricity Saving Trust
 - 'Curve breaker' commitments
 - Campaign synergy with labelling etc.
 - Pro-active internationally (4E & eco-design)
- Buildings
 - New centre for buildings saving (clearinghouse?)
 - New building code & certification/labeling scheme
- Efficient transport
 - Electric cars & 2nd generation biofuels
- CHP & District Heating

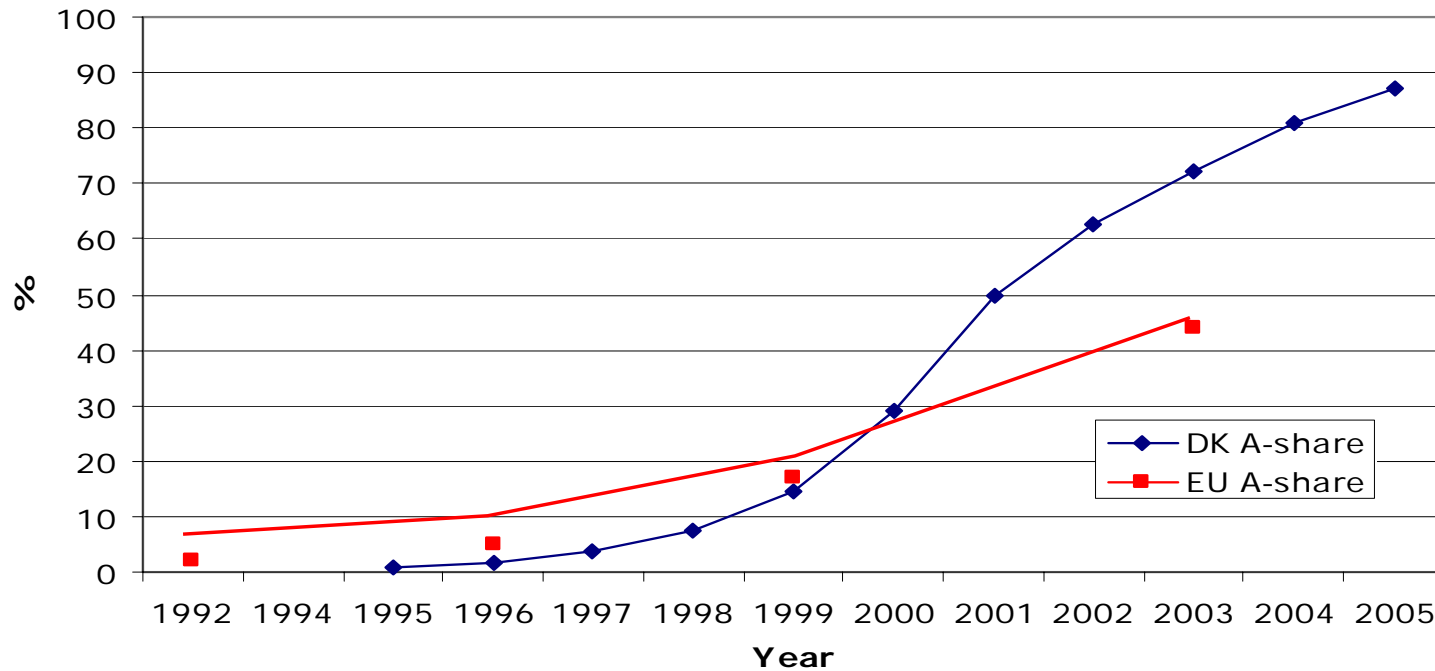
GDP & energy consumption



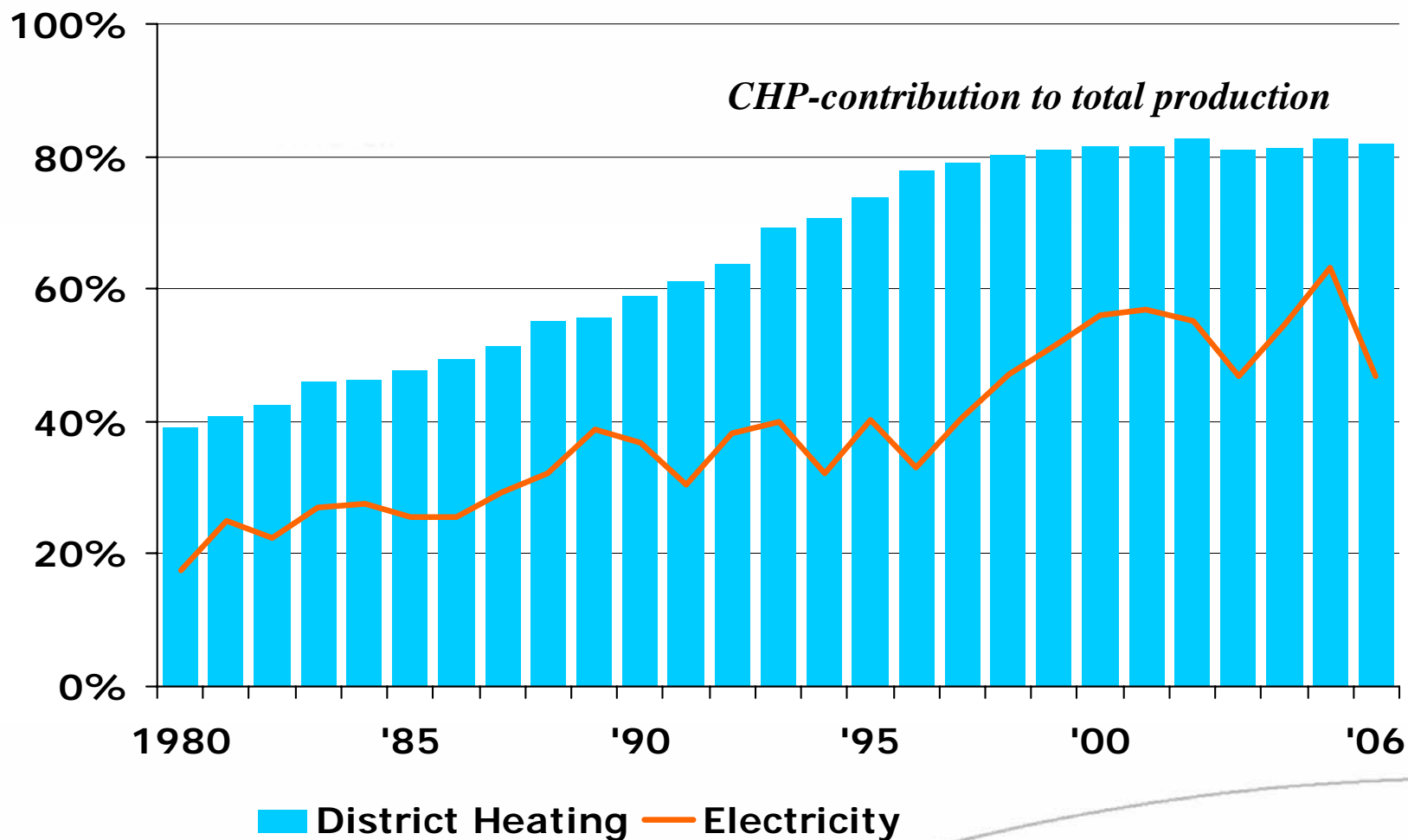
— GDP, fixed prices — CO2-emissions, adjusted — Gross energy consumption, adjusted
3 reasons: 1) CHP/DH, 2) Renewables energy, 3) Energy savings

Labelling & campaigns & commitment go together

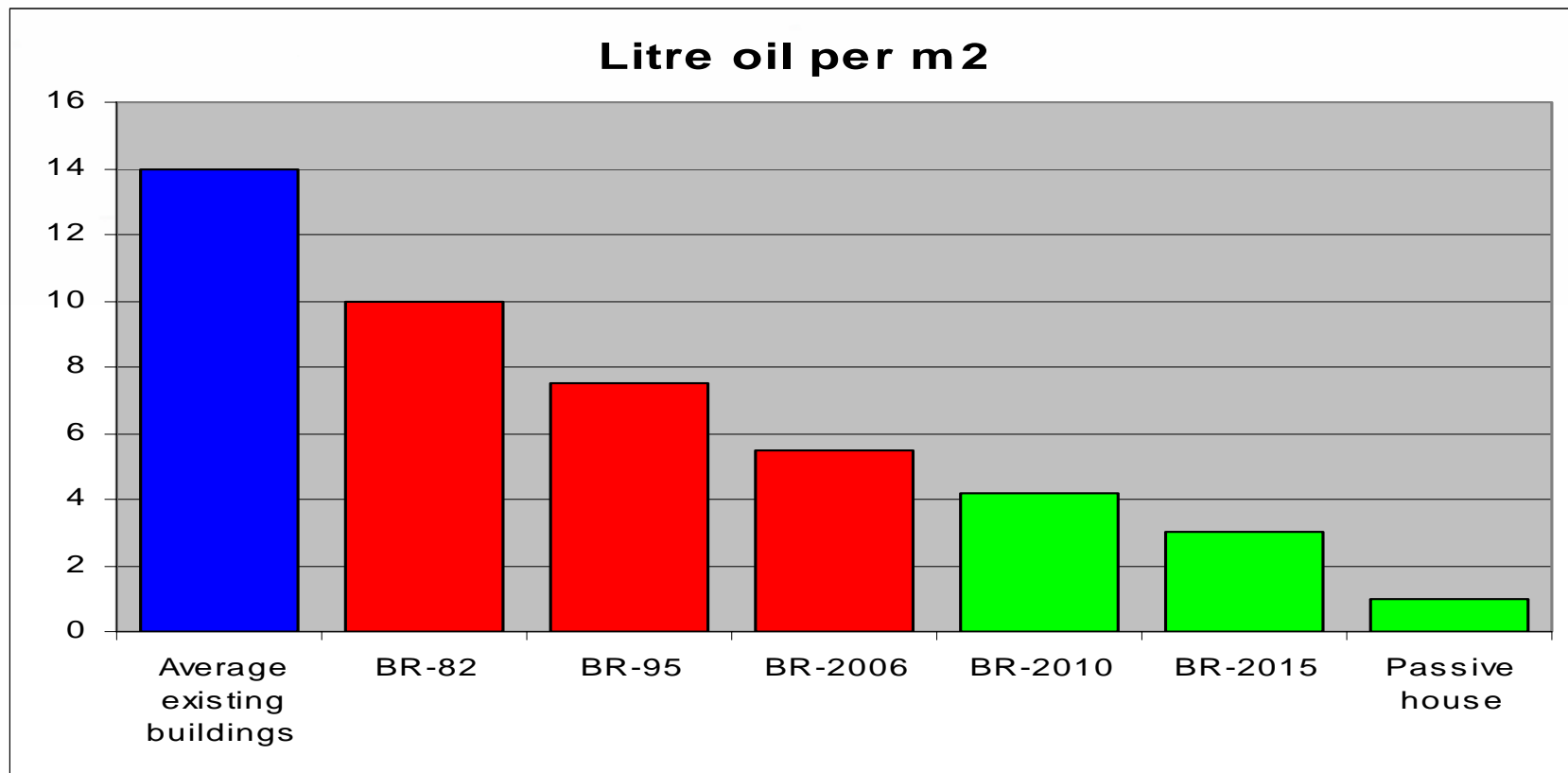
Market share of A-labelled cooling appliances in the EU and DK



Combined Heat & Power Production



New Building Codes



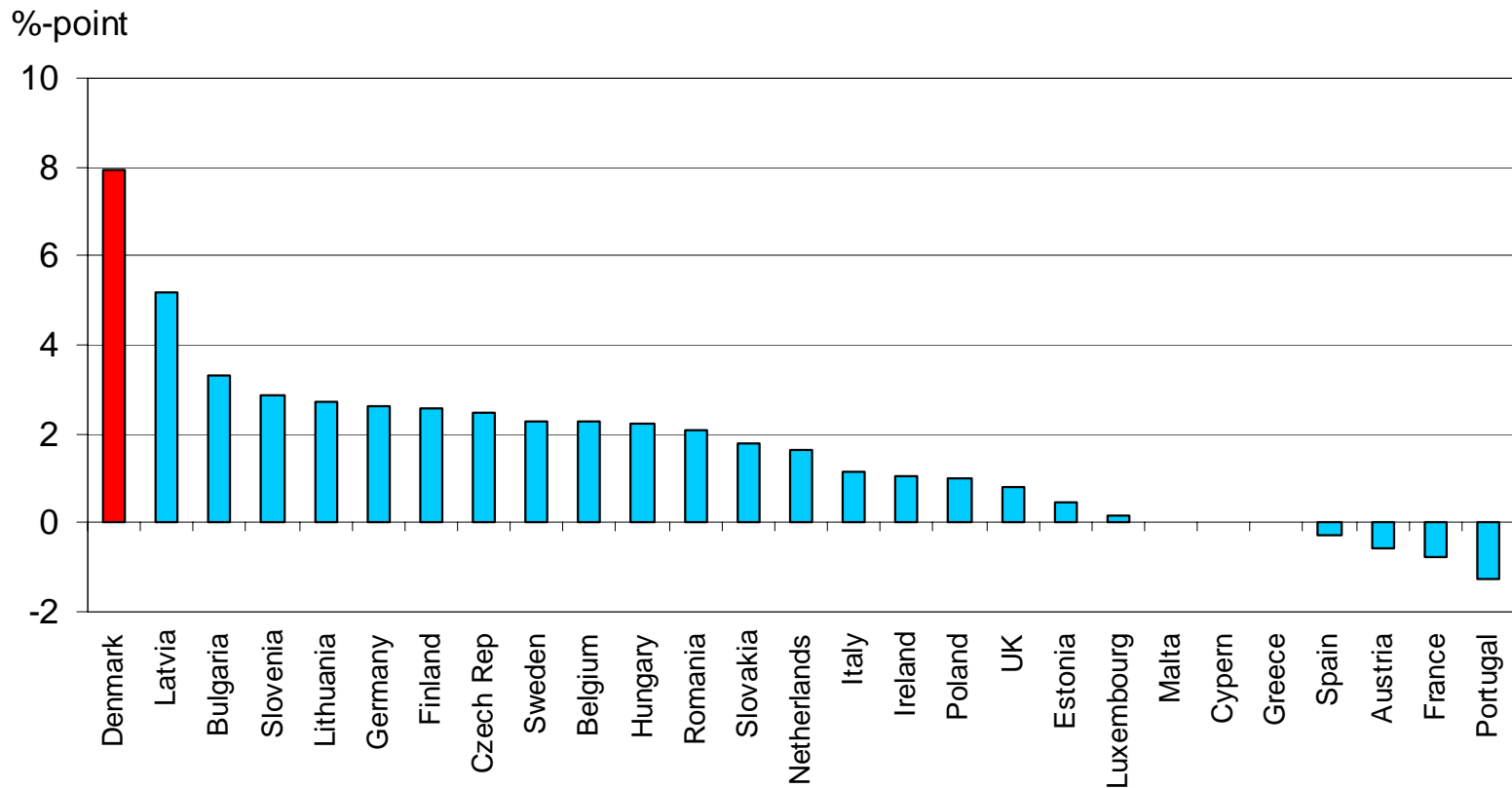
- Reduce energy demand with 25-30 % from 2000.
- The codes will be tighten again in 2010 and 2015.

EU renewable energy directive

- New directive for RES under negotiation
 - Distribution of MS mandatory targets totaling 20% 2020
 - Monitoring of targets
 - Regulation of trade of Guarantees of origin
 - Bio-fuel target of 10%
 - Sustainability criteria for biofuels

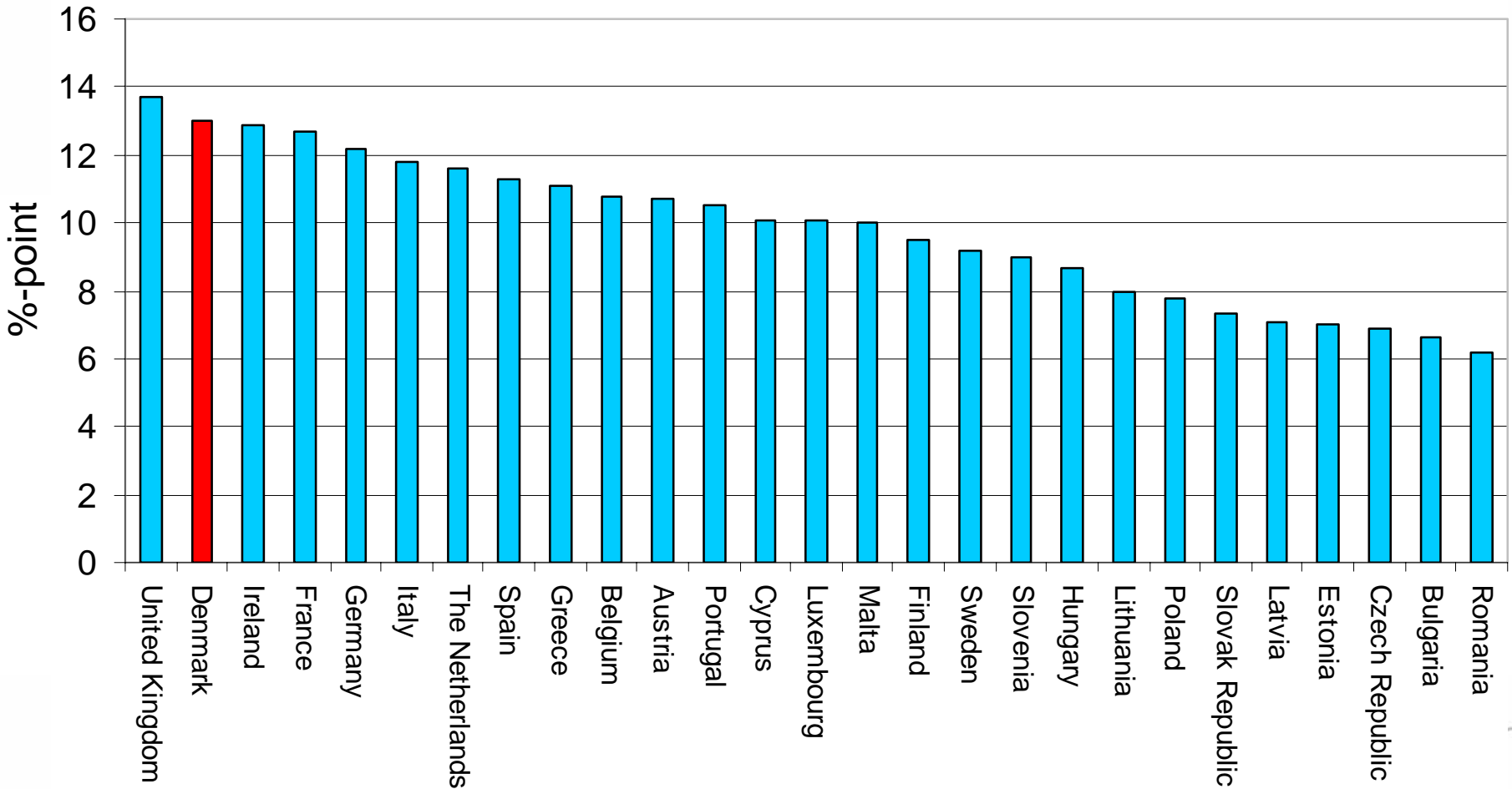
The development of RES in EU

Development in the share of RE in EU member states, 1997-2005 (% of gross energy demand)

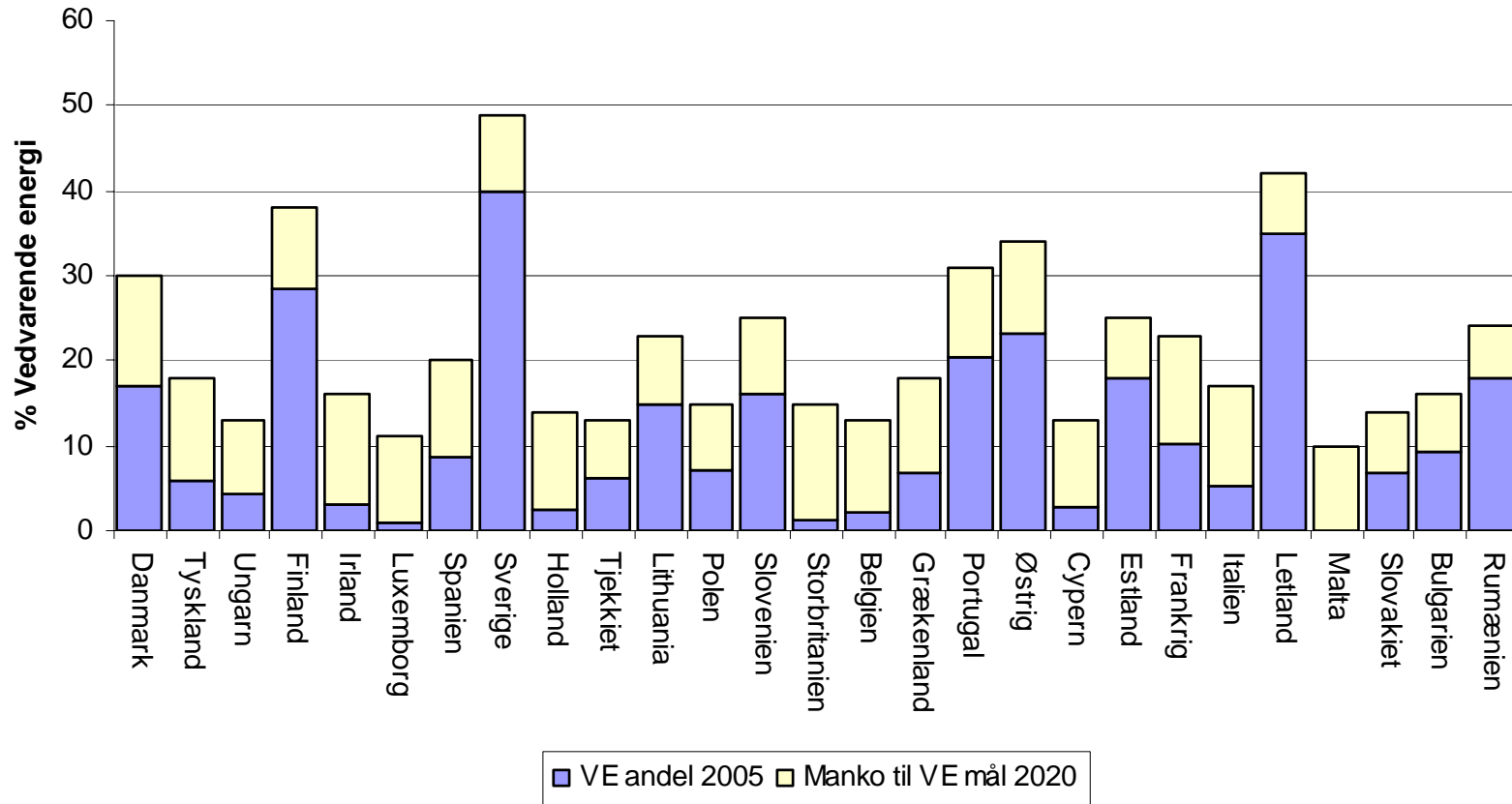


Proposed RES increase target by EU

Increase in RES of final energy demand



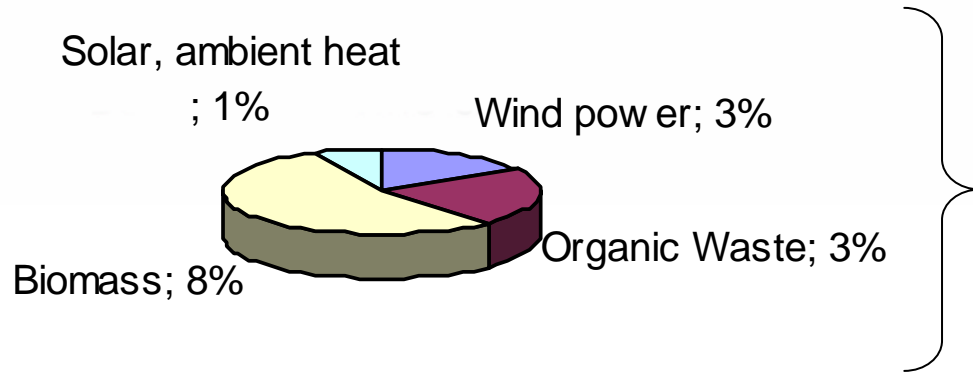
Burden sharing RES



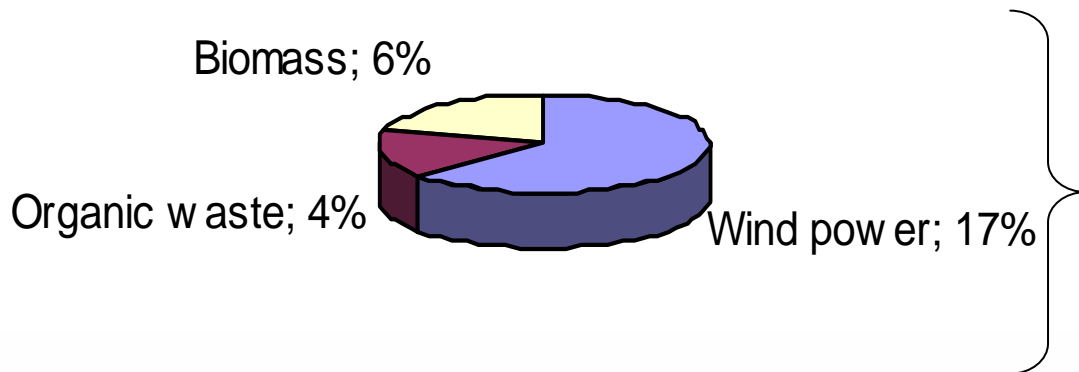
Renewable energy directive

- Danish position
 - Best performing EU member state
 - Consensus agreement on RES until 2012
 - OK with 30% commitment 2020
 - Trade efficient and flexible, must not jeopardise national commitments
 - Danish biomass can be fully utilised in CHP production, and cars driven by renewable electricity is 3-4 times more efficient than biofueled cars.
 - Danish proposal to allow renewable electricity to fulfill 10% target – accepted?

Types of Renewables in Denmark

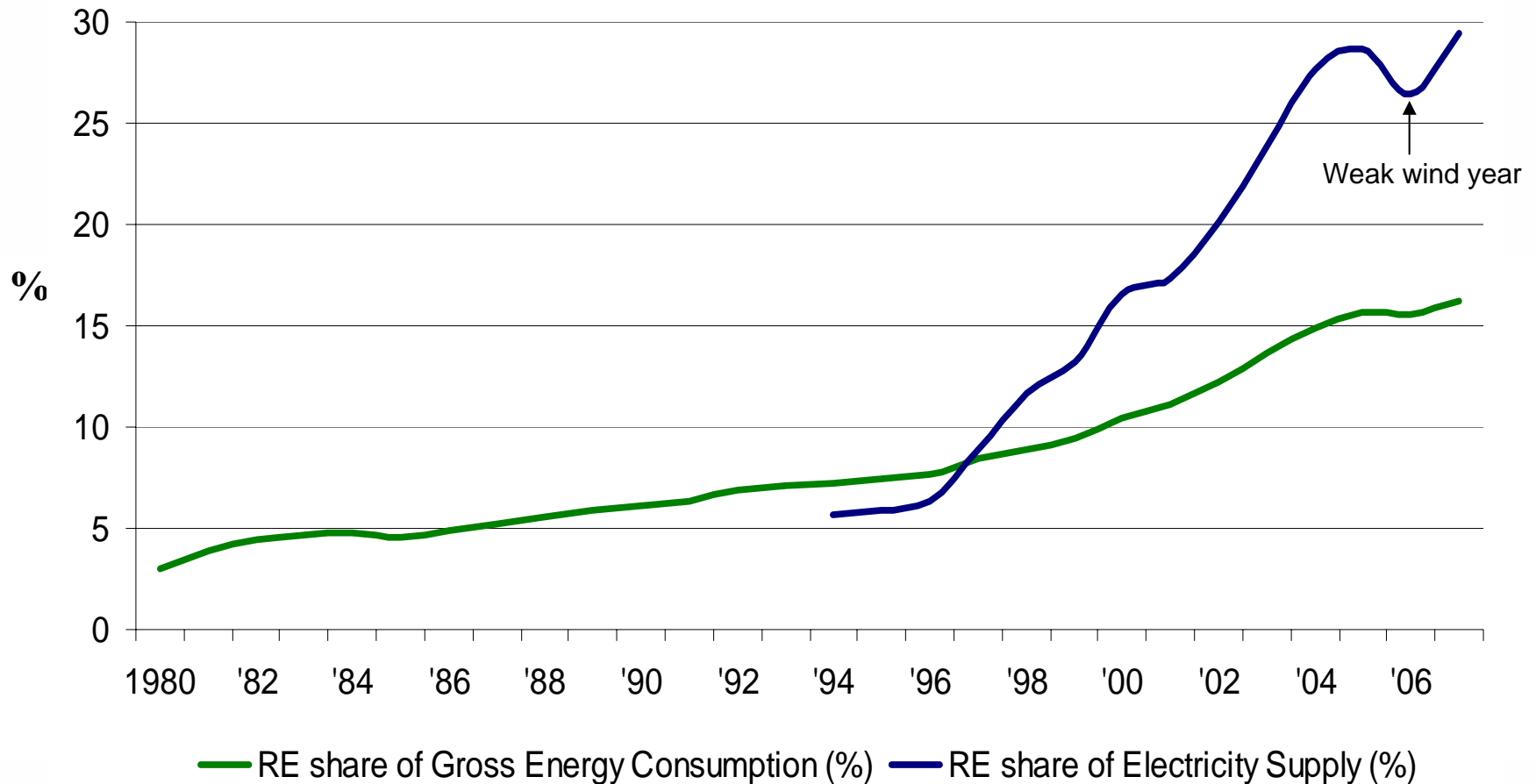


Share of Gross Energy Consumption:
15½ % by 2006
(share doubled in 10 years)



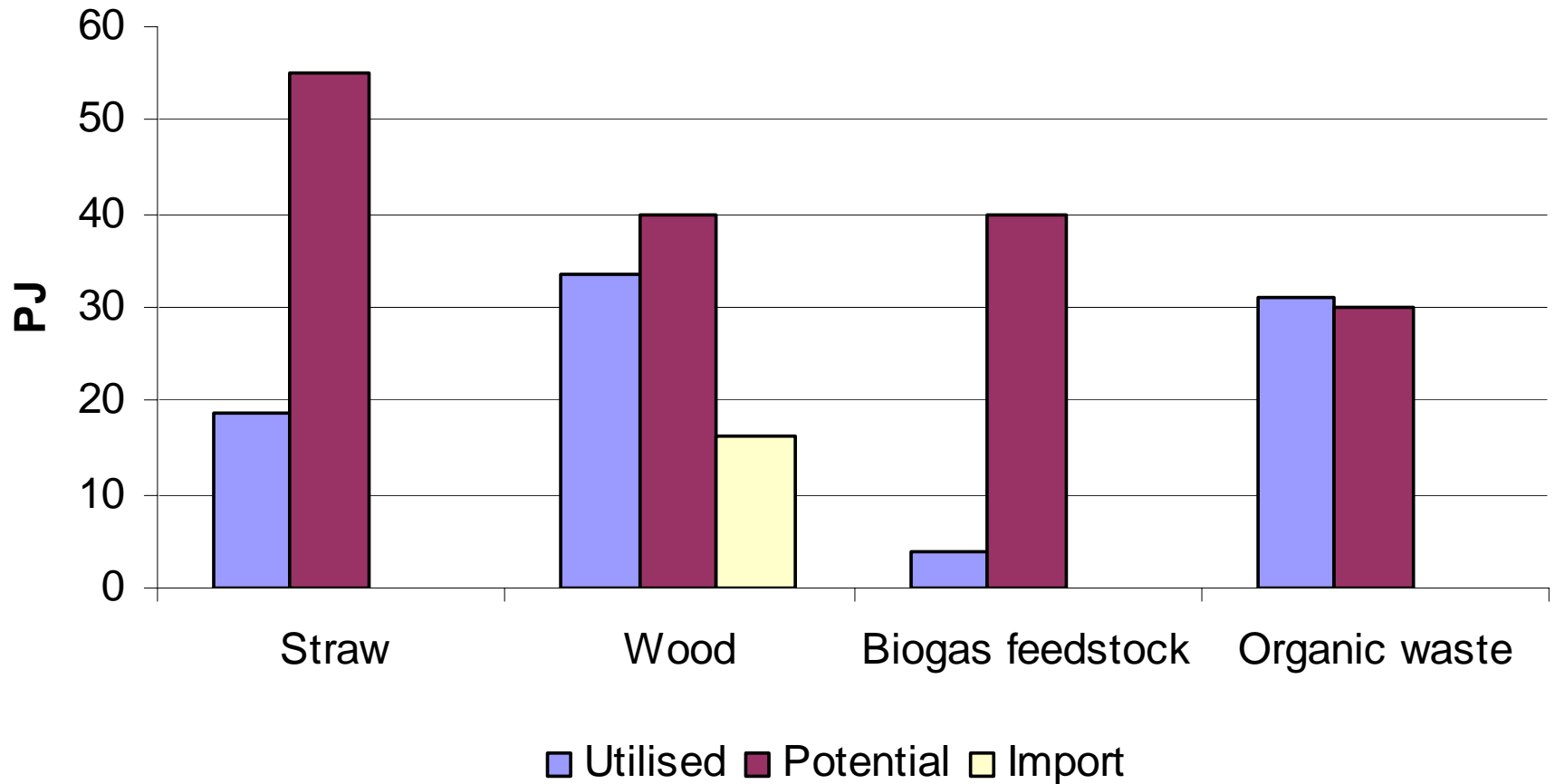
Share of Electricity Supply:
26½ % by 2006
(share tripled in 9 years)

Renewable Energy in Denmark



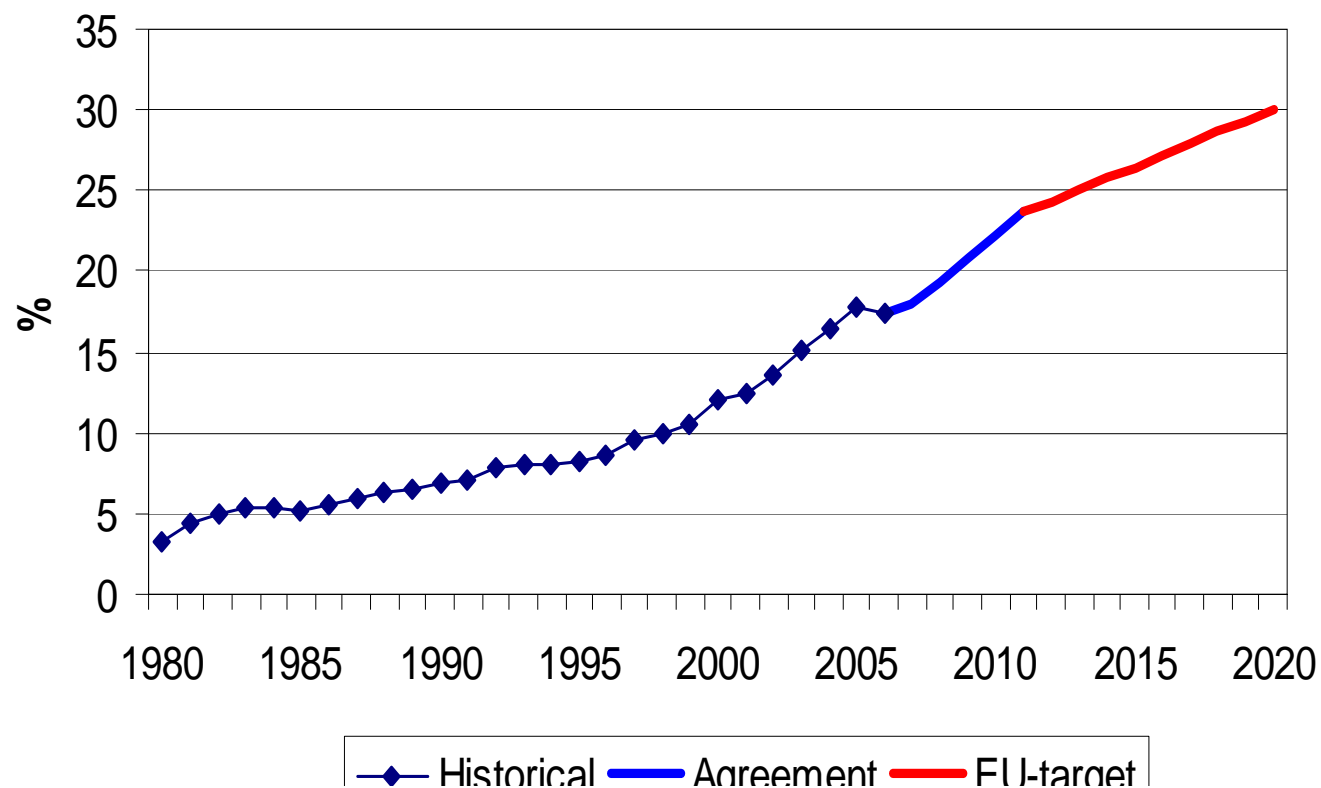
➤ Highest contribution to electricity from **new** renewables in EU

Danish Biomass Resources - 2006



Development of RES in DK

RES share of final energy demand



Annual growth, average, %

1993-2001: 0,6

2001-2006: 1,0

2007-2012: 1,3

RES-contribution of Agreement

Increased RE-share of gross energy consumption

Waste in central power plants	0.2 %
Biomass at central power plants	1.2 %
Bio gas	0.3 %
Heat pumps	0.1 %
Land wind turbines	0.1 %
Fee changes (CO₂-fees and NO_x-fees)	0.4 %
Bio fuels and RE in transport sector	1.1 %
2011 TOTAL	3.4 %
Offshore wind turbines in 2012	0.6 %
2012 TOTAL	4.0 %

Additional RE-share of energy consumption: 4.0 % by 2012

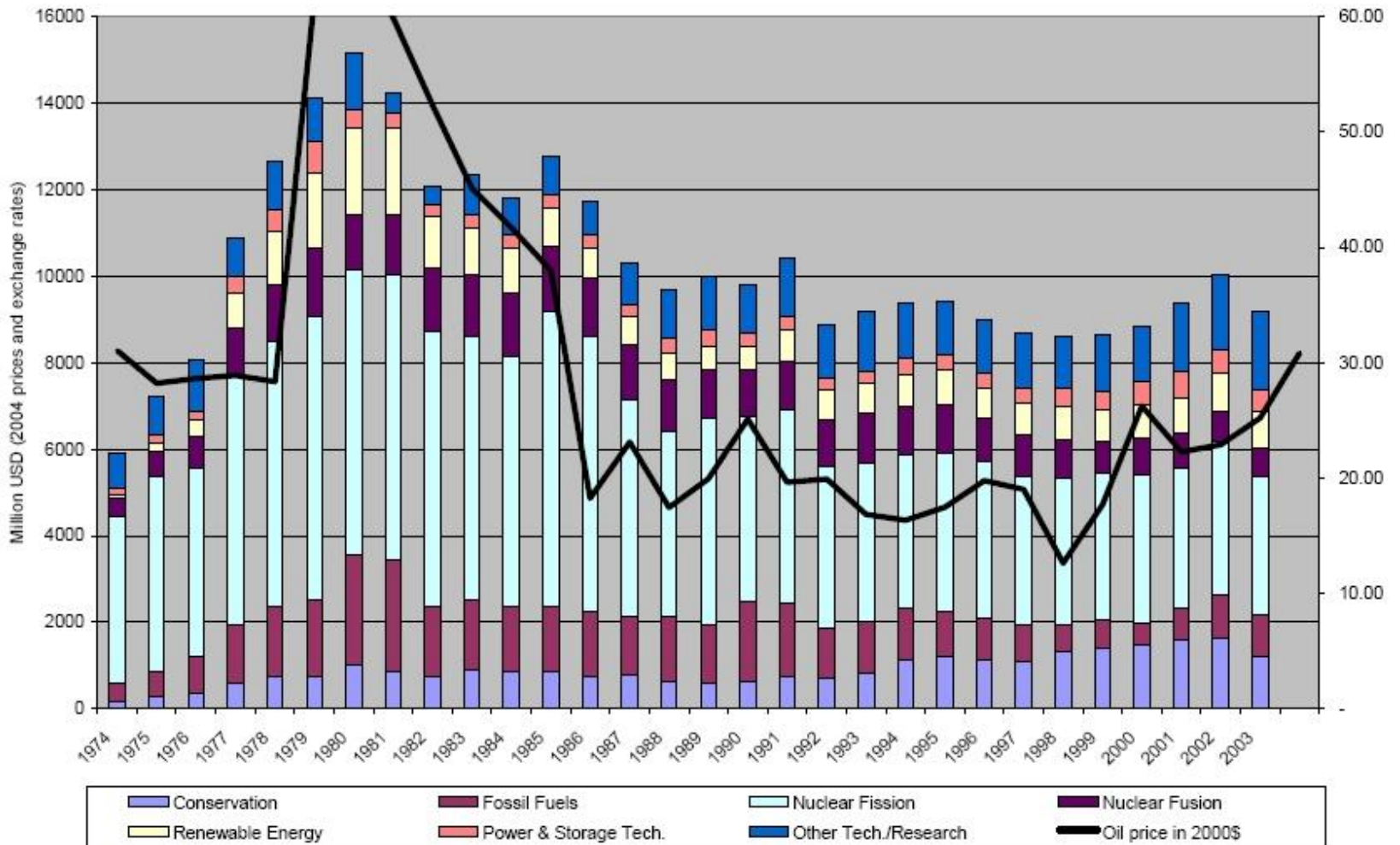
EU revised ETS directive & new carbon storage directive

- Revised directive for ETS under negotiation
 - Underlying GHG target 20% or 30% 2020
 - Cover 2013-2016
 - MS quotas transferred to EU quotas
 - ETS to be expanded to more sectors
 - Auctioning to substitute free quotas
 - Exemptions for competitive problems (carbon leakage)
- New directive on carbon storage
 - Handles storage of CO₂ in connection to CCS

SET plan

- New joint strategy for energy technology
 - Combines research, technological development, demonstration & innovation
 - Includes programmes as FP7, IEE2, CIP, Structural funds
 - Focus on technology priorities as wind, CCS, smart grids, 2nd generation biofuels, energy efficiency, solar, etc.
 - New high level strategy group
 - New alliance of research institutions
 - New industrial initiatives
 - EU infrastructure plan
- Danish position
 - Proactive support
 - Matches new Danish programme EUDP

Figure B: R&D expenditure in IEA countries and oil price 1974 - 2004



Source: OECD report, 2006

Technology Map for the SET-Plan

