



POWER CHOICES

Pathways to carbon-neutral electricity in Europe by 2050

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EURELECTRIC**

UN-ECE, 16 November 2009



CEO Declaration

18 March 2009

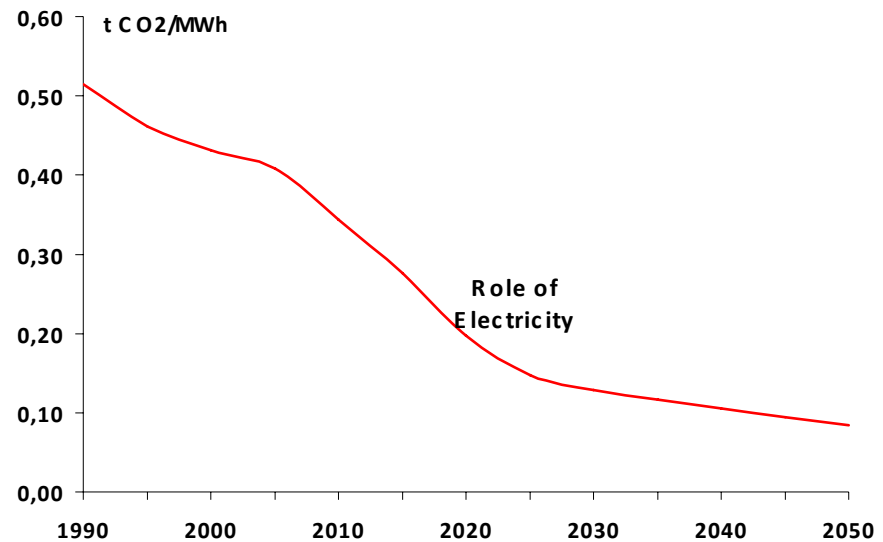


- 1. Carbon-neutral power in Europe by 2050**
- 2. Cost-efficient, reliable supply through an integrated market**
- 3. Energy efficiency & electricity use as solutions to mitigate climate change**



EURELECTRIC studies

2007 - Role of Electricity:
EU 50% reduction target.
CO₂ from power reduces
from 0.45 to 0.10t CO₂/MWh



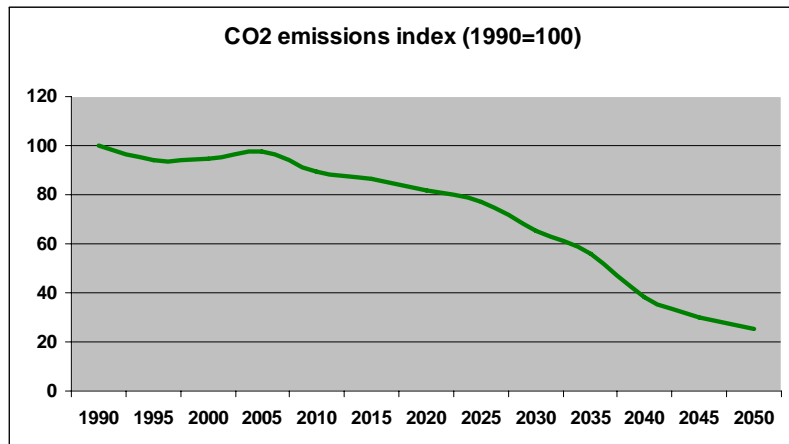
2009 - Power Choices:

- Review the 2007 study, aiming at *carbon-neutral power by 2050* under an EU target of -75% GHGs
- Investigate needed technology development, costs & regulatory framework



Carbon-neutral power drives deep GHG cuts

75% GHG cut EU-wide



POWER CHOICES SCENARIO

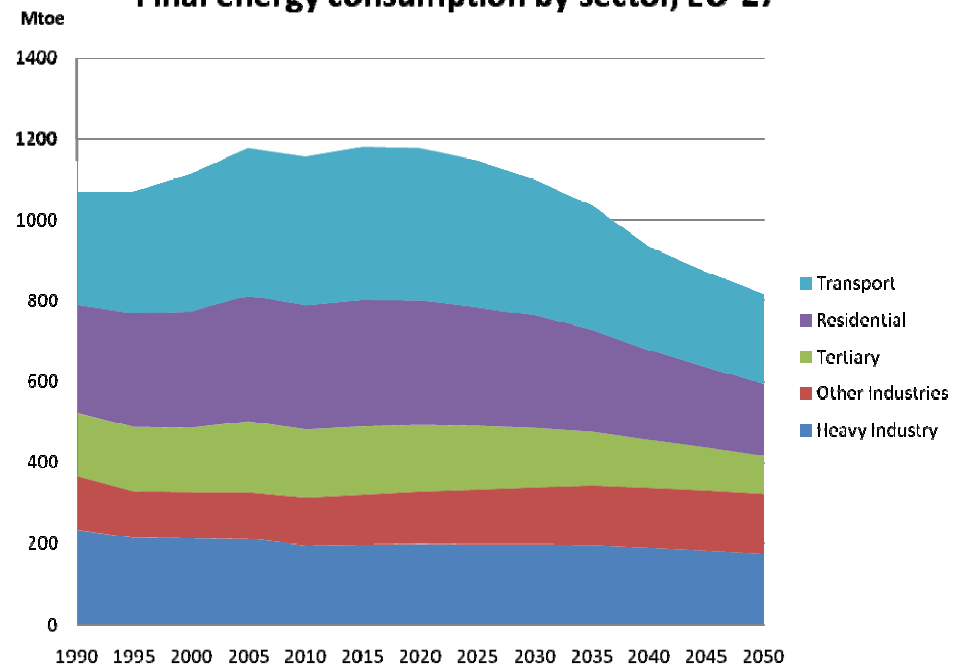
- 75% GHG cut across whole EU economy
- CO₂ price applied uniformly to all sectors
- Power becomes major transport fuel
- All power generation options available (with CCS commercially available as of 2025)
- Major policy push in energy efficiency
- No binding RES target post-2020
- CO₂ price is the only driver for low-carbon generation post 2030



Decrease in energy demand



Final energy consumption by sector, EU-27



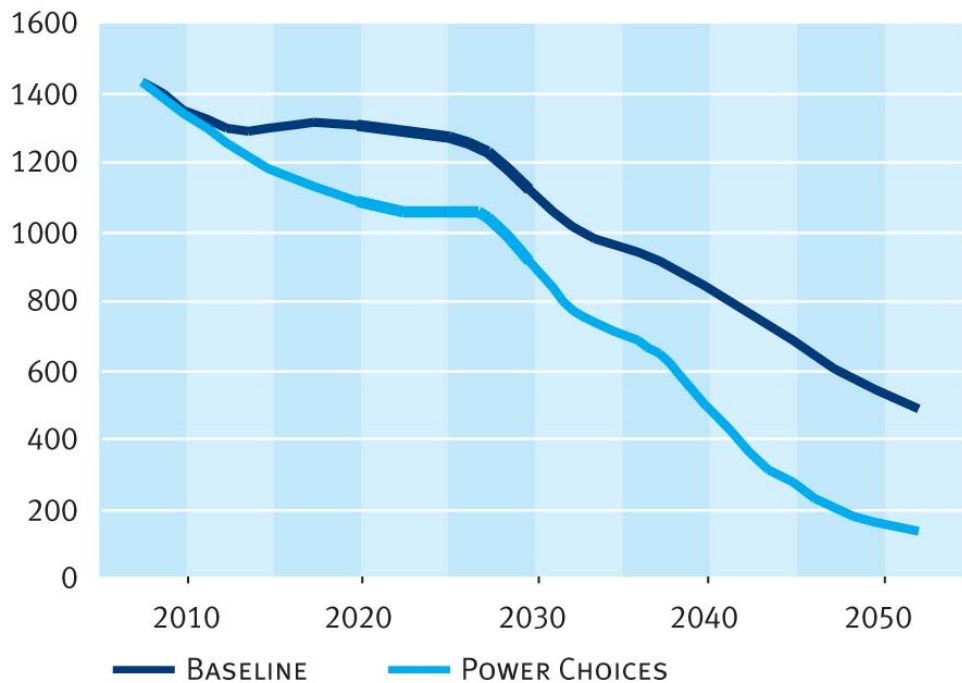
➔ Paradigm shift to efficient electric technologies

➔ More electricity = less energy



Carbon emissions from power fall by 90%

CO₂ EMISSIONS (IN Mt CO₂)



Deep emission cuts
take place between
2025-2040.

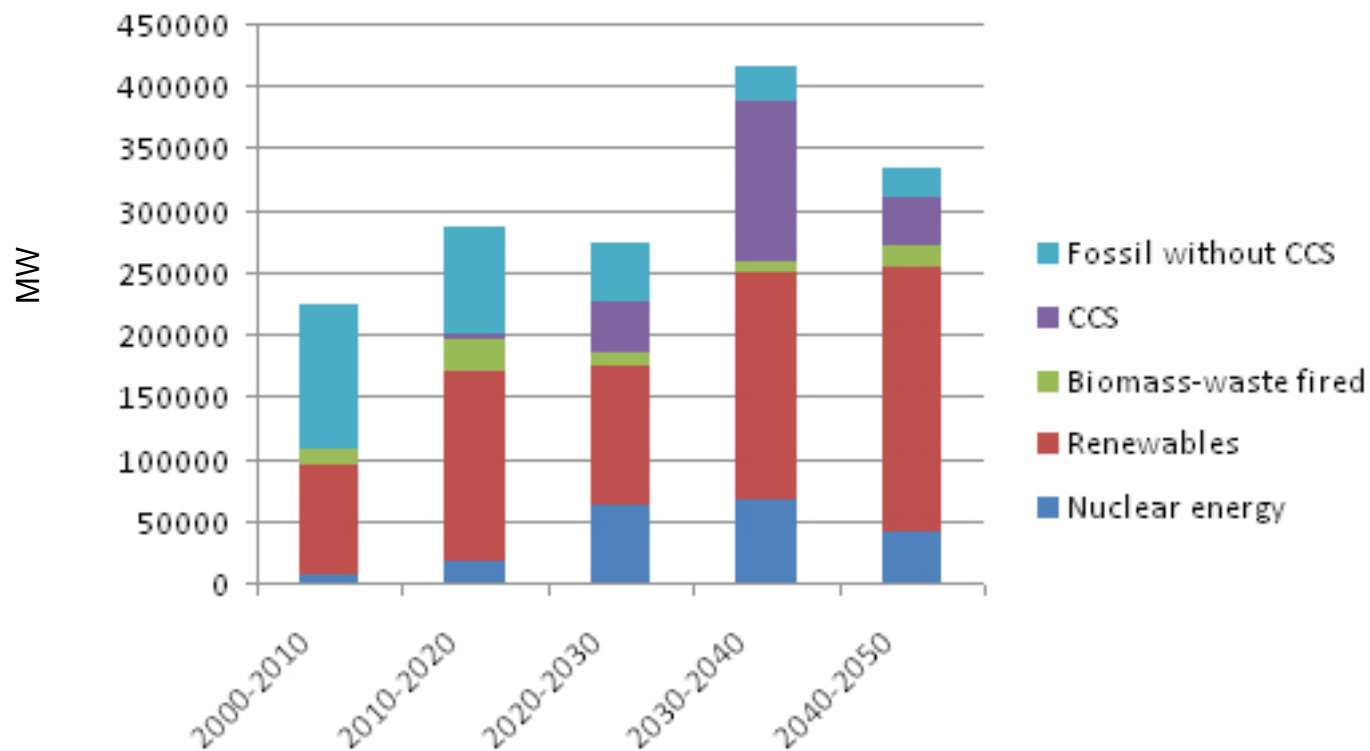
But investments are
needed NOW!

NOW: 1423 MtCO₂
2050: 128 MtCO₂



Investment is starting NOW

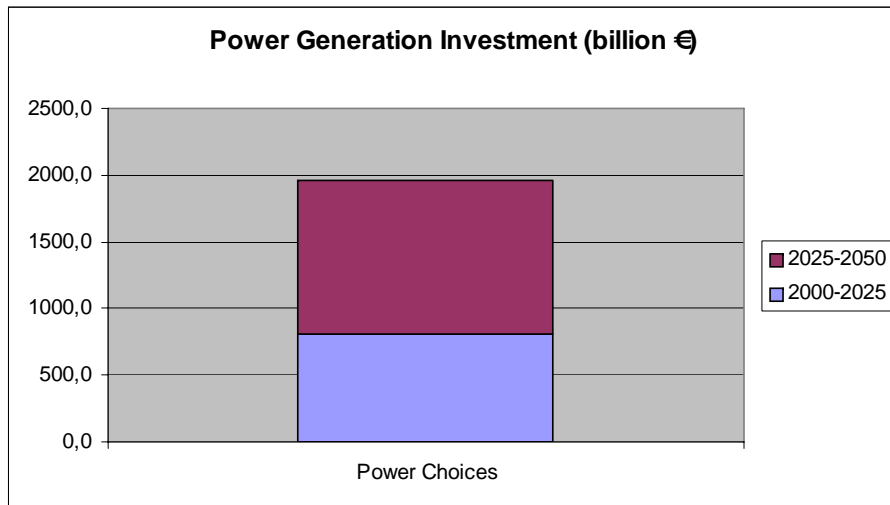
Net investment in generation capacity



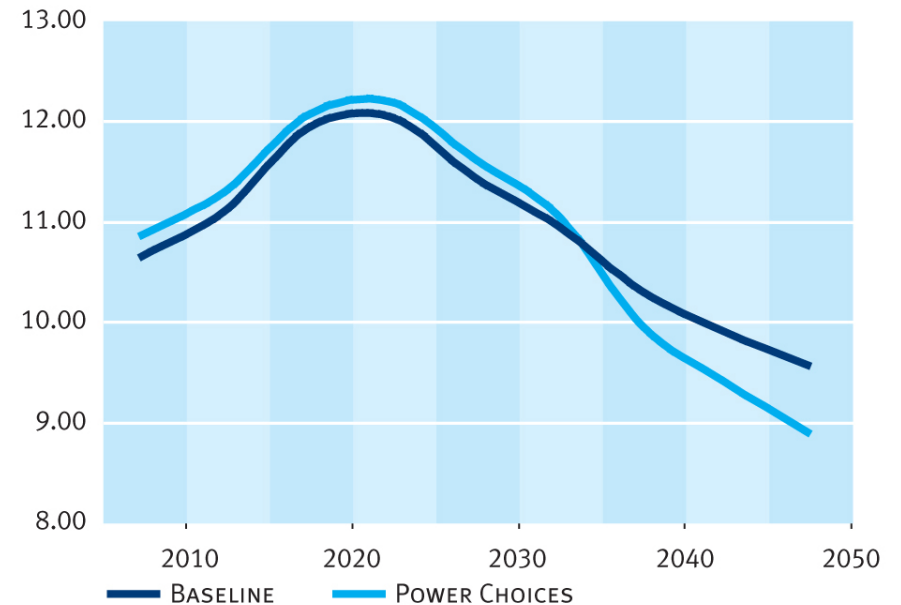


Significant investments... ... but a reasonable cost for society

Investment needed in power generation by 2050: € trillion



TOTAL COST OF ENERGY AS % OF GDP





What if...

Nuclear phase-out reversed



CCS delayed to 2035



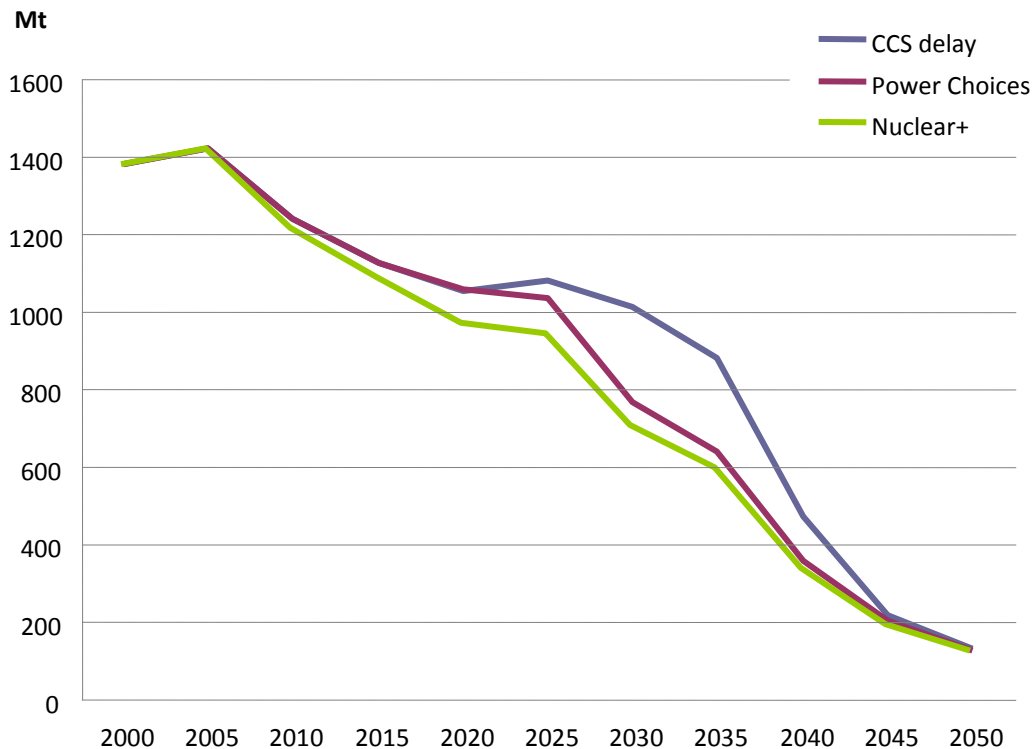
1/3rd of onshore wind power not built





All technologies are *really* needed

CO2 emissions from power, EU-27



- **10-year delay of CCS = delayed reductions from power & whole economy!**
- **More nuclear = more rapid reduction curve**
- **1/3 onshore wind not built = more CCS & nuclear. Off-shore too expensive to fill gap**



Key outcomes

- **EU carbon-neutral power by 2050 is realistic**
 - ➔ **-75% GHG on whole economy can be reached**
- **All power generation options needed**
- **Electrification of the demand side essential**
- **Significant investment but at acceptable cost to society**
- **The major CO₂ reductions in power are achieved from 2025 onwards**
- **CCS delayed &/or nuclear phase-out = risk**



Policy recommendations

CO2 reductions

- Support CO₂ market to deliver cap at least cost
- All sectors to internalise cost of GHGs
- Promote an international agreement on climate

Technology choices

- Enable the use of all low-carbon options for power generation
- Encourage public support for modern energy infrastructure: onshore wind, CCS, smart grids...

Cost

- Significant investment cost but reduction in share of GDP
- Recognise that cost of technology deployment differs substantially across the EU

Demand-side

- Facilitate electrification of road transport and spatial heating & cooling
- Major policy push in energy efficiency



Thanks



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of Athens



Verband der
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