

# European Energy and CO<sub>2</sub> Policy after the Economic Crisis

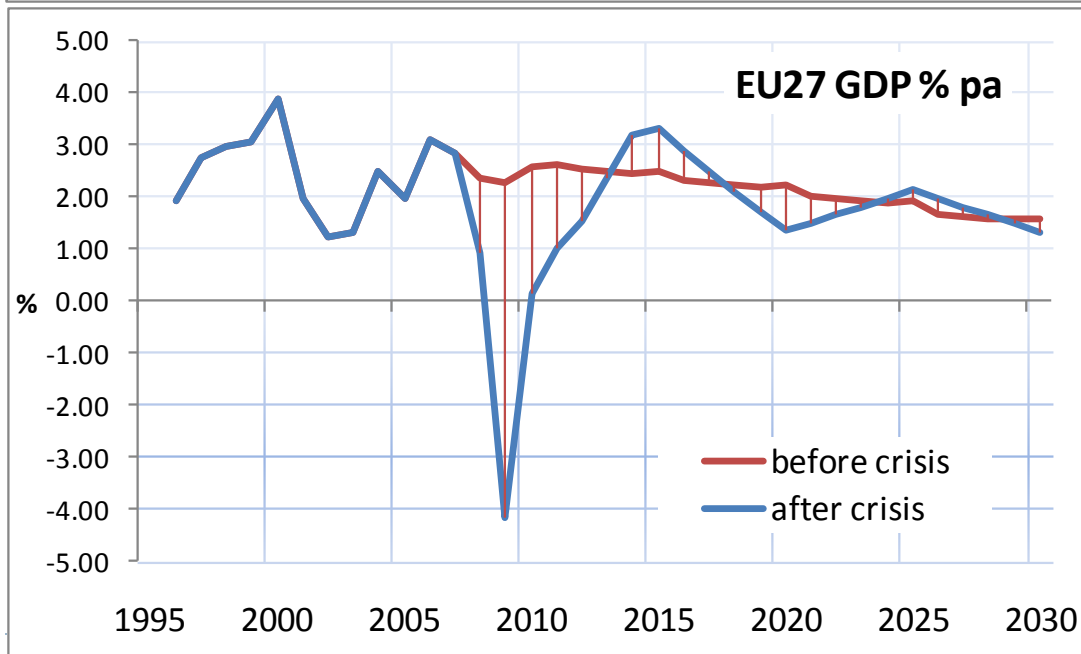
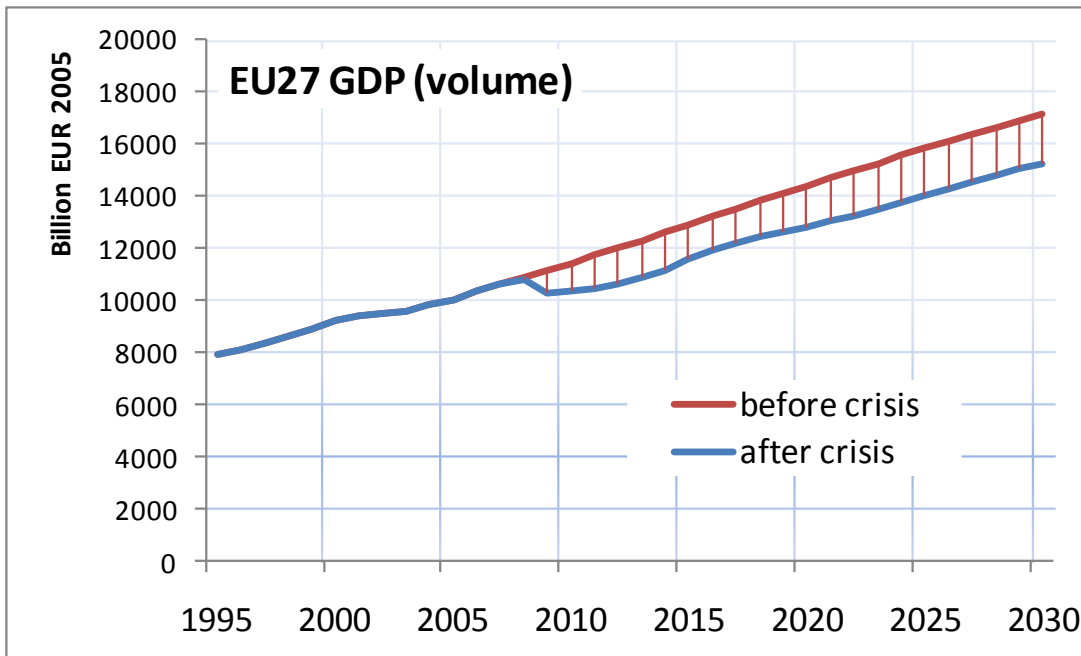
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E3MLab – National Technical University of Athens

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# Overview

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- ▶ The economic crisis has significant downscale effects on energy consumption and carbon emissions
- ▶ The Climate Action and RES policy package of the EU (the 20-20-20 policy) has been defined before the crisis
- ▶ By using the PRIMES and GEM-E3 models, E3MLab is currently updating the energy-economy scenarios by including the effects of the crisis and the post-crisis economic developments
- ▶ The first results show that some new issues ought to be considered in the policy agenda



## Baseline 2009 vs. Baseline 2007

- Shaded area corresponds to permanent loss of real GDP
- Economic recovery after the crisis enables higher productivity gains, allowing faster growth rates between 2014 – 2018
- However, not enough to compensate for the losses
- Growth rate convergence in the long term

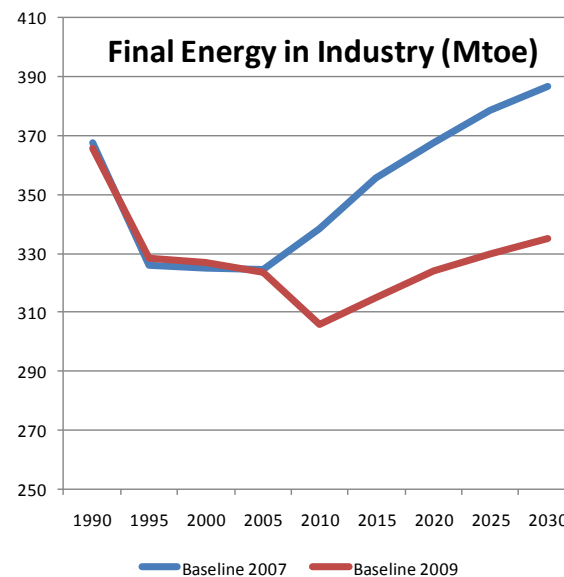
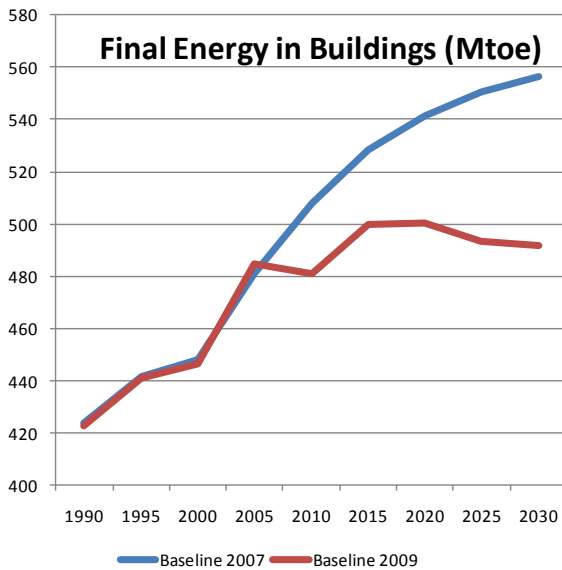
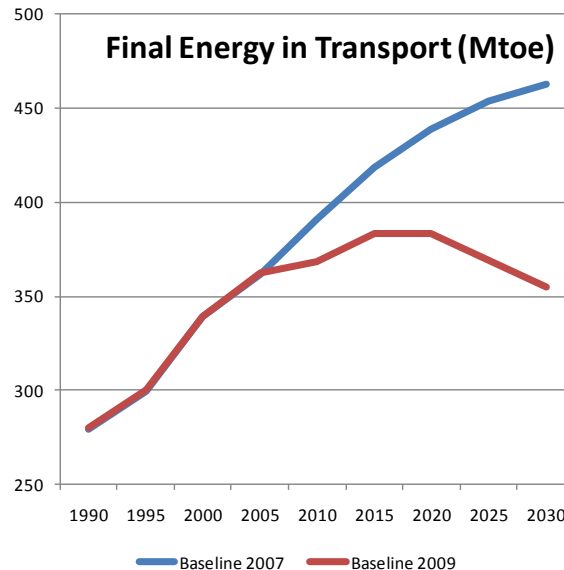
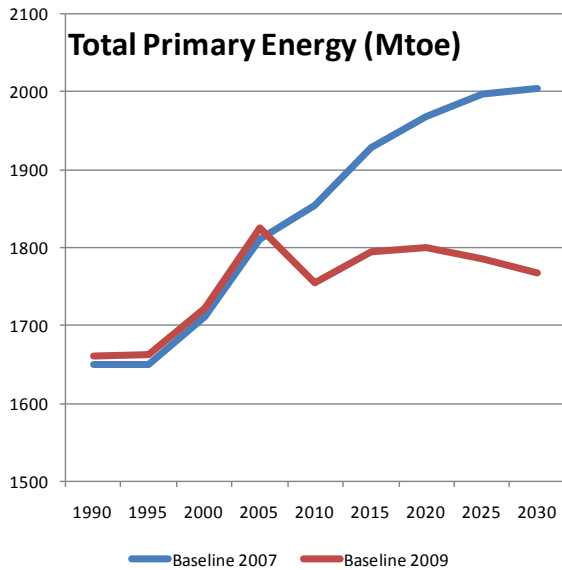
## ▶ Different policy context

- ▶ Baseline 2007 was reflecting business as usual trends incorporating rather weak policies for climate, energy efficiency and RES
- ▶ Baseline 2009 incorporates policies adopted up to Spring 2009
  - ▶ New EU ETS binding cap, including auctioning for getting allowances
  - ▶ A series of energy efficiency directives and regulations (buildings, lighting, appliances, ...)
  - ▶ Regulation on cars (specific emissions)
  - ▶ Strong RES supporting national policies
  - ▶ CCS demonstration plants
  - ▶ Nuclear revival in some countries (despite continuation of banning by others)

## **Baseline 2009 vs. Baseline 2007**

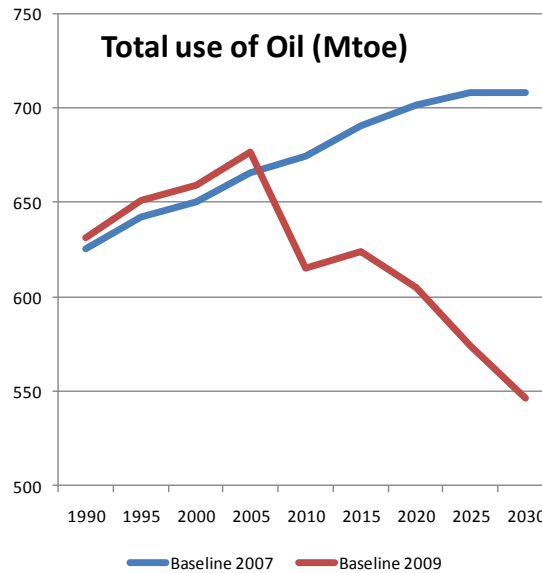
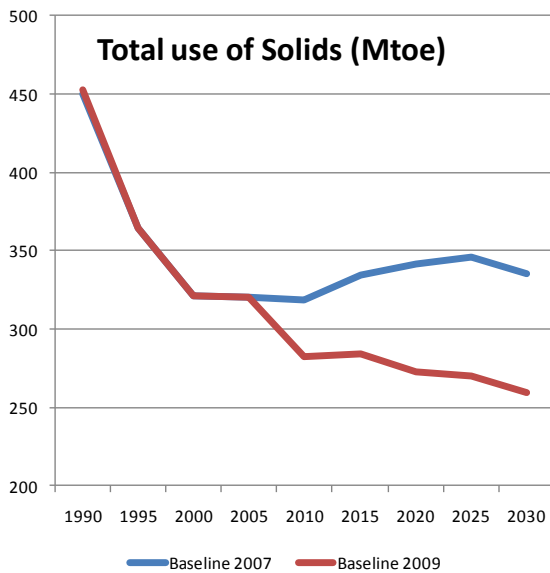
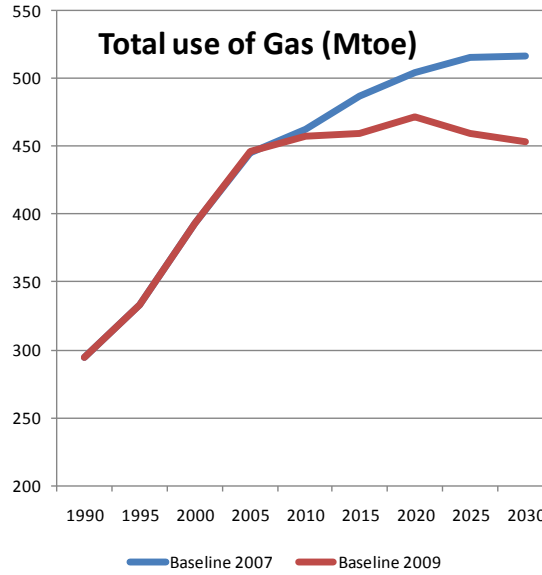
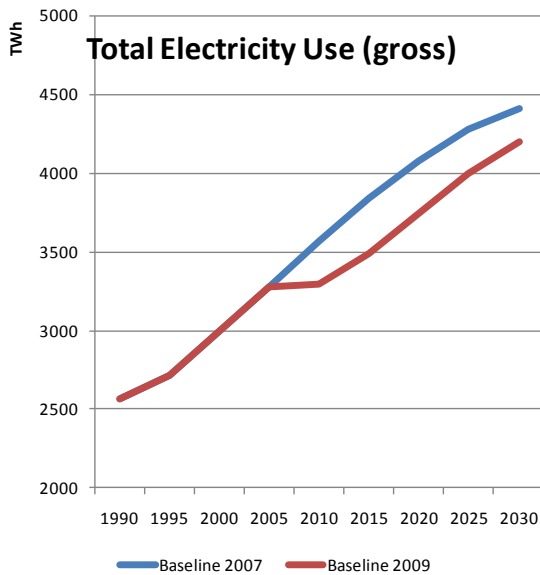
World energy prices are expected to increase in the period post crisis

The Baseline 2009 scenario involves a projection showing oil prices reaching 100 \$/bbl (in constant money) before 2030



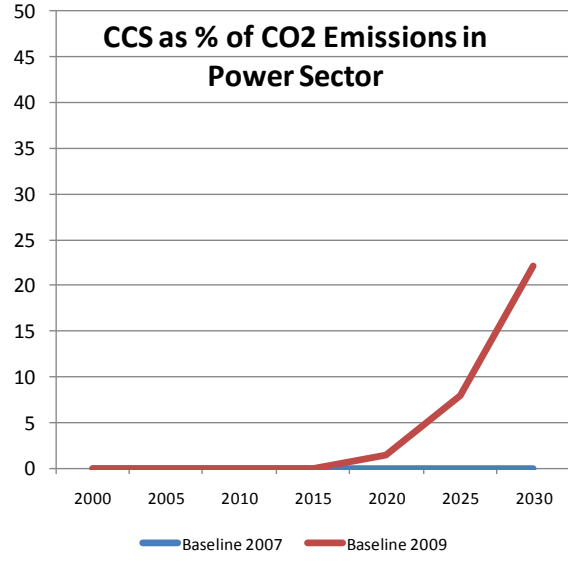
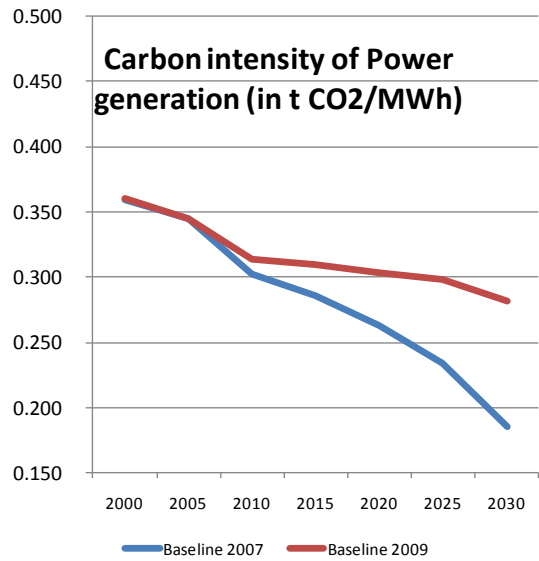
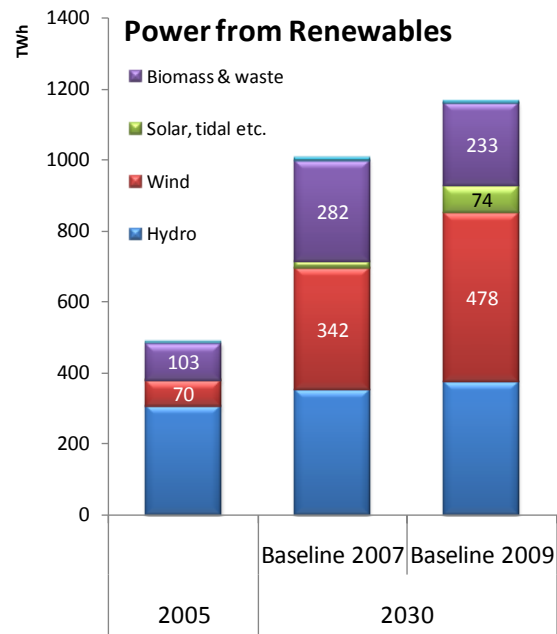
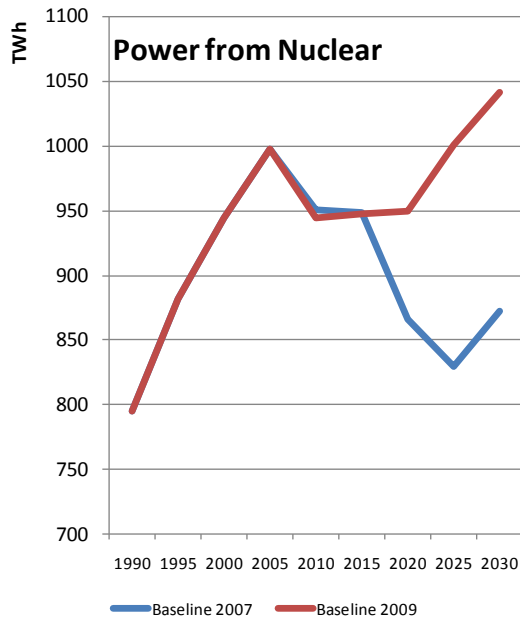
## Baseline 2009 vs. Baseline 2007

- Energy requirements are found reduced between 8 and 15% from Baseline 2007
- Obviously, the differences are not only due to the crisis but also to policies
- Total primary energy do not increase relative to 2005 in the Baseline of 2009
- Important reversal of past trends in transportation



## Baseline 2009 vs. Baseline 2007

- Demand for electricity slows down during the crisis period but its growth rate recovers post crisis (avg. growth 1% pa)
- Oil demand downturn starts during the crisis and continues owing to new efficient cars
- Gas demand is lower than expected in 2007, but gas overall preserves a significant market share
- Coal and lignite re-emergence, expected in 2007, is cancelled owing to higher RES and nuclear

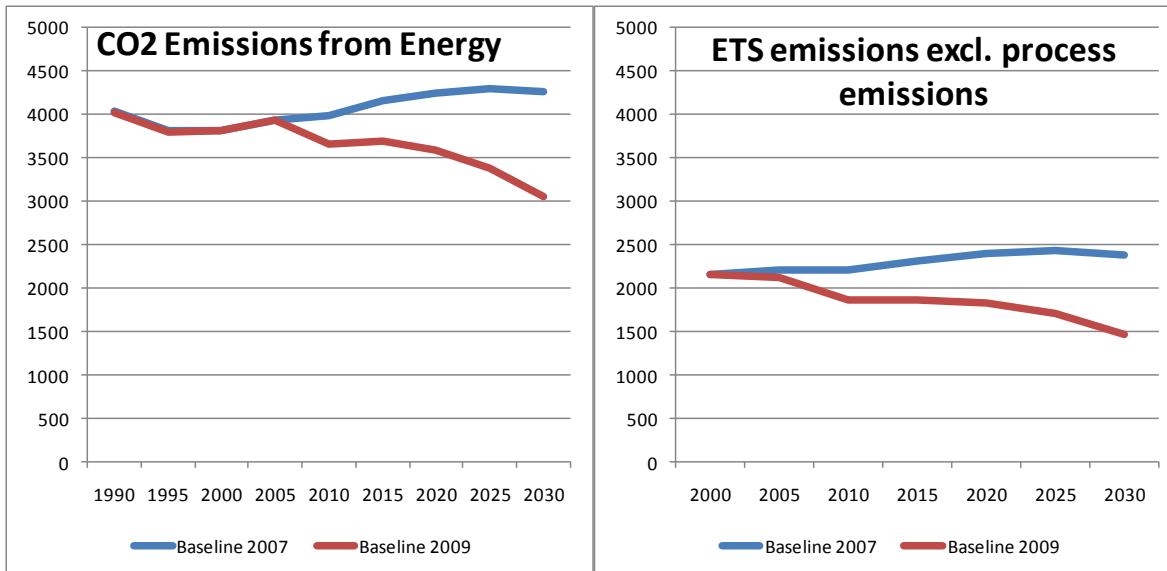


## Baseline 2009 vs. Baseline 2007

- The policies favouring RES, nuclear and CCS contribute to decarbonization of power generation
- Power generation from nuclear is slightly larger in 2030 compared to 2005, but significantly higher than projections in 2007 (Germany and Belgium are assumed to pursue phase-outs)
- The new projection involves 50 GW of new solid fuel plants equipped with CCS

## ▶ ETS

- ▶ The projections of 2009 ensure that ETS emissions (plus limited use of CDM credits) just meet the ETS cap
- ▶ Carbon prices clearing the ETS market are found 20 €/t CO<sub>2</sub> in 2020 and 30 €/t in 2030
- ▶ These prices are significantly lower than the estimations performed end 2007 for the Climate and RES policy package (40-50 €/t)



## Baseline 2009 vs. Baseline 2007

- CO<sub>2</sub> emissions from energy decline continuously in the Baseline 2009 projection
- However, additional policies are needed to meet ambitious targets, as those envisaged for Copenhagen
- RES formal target (20%) is not met in the Baseline 2009 (between 14 and 16%)

# Policy Discussion

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- ▶ The economic crisis has significant downscale impacts on energy demand, including demand for electricity, compared to projections two years ago; the impacts extend over the entire projection period
- ▶ Demand for energy is expected also to reduce as a result of a series of bottom-up actions promoting energy efficiency
- ▶ A series of state-driven bottom-up policies are deployed to support RES (subsidies), nuclear (indirect support) and CCS (e.g. subsidies, mandatory)
- ▶ Consequently, as the ETS caps remain those decided before the crisis, the EU ETS clearing prices are expected to stay in a range clearly lower than 30 €/t CO<sub>2</sub> until 2030, which is much lower than those anticipated two years ago

# Policy Discussion

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- ▶ Despite electricity demand decline, the power sector will need acceleration of investment
- ▶ Higher investment is needed for the following reasons:
  - ▶ old and inefficient power plants will need to decommission even prematurely, entailing stranded costs to companies,
  - ▶ the RES target is clearly ambitious and massive capital intensive investment has to be undertaken far beyond business-as-usual,
  - ▶ power grid infrastructure requires higher investment, relative to baseline, in order to operate the RES (30 -35 % of power generation in 2020),
  - ▶ companies must start investing in advanced low carbon technologies, such as nuclear, CCS, off shore wind etc. in order to comply with ambitious targets for the period close to 2030
- ▶ The long term will look more optimistic for company sales, as electricity demand will start rising sharp again because it is likely to replace fossil fuels in final energy demand, including transportation.
- ▶ Is the above possible, without further state support?

# Policy Discussion

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- ▶ The range 20 – 30 €/t CO<sub>2</sub> until 2030 is insufficient to justify large scale restructuring investment, as needed by ambitious climate action policies; this concerns advanced RES technologies, new nuclear, large scale CCS, etc.
- ▶ The uncertainty surrounding ETS prices combined with uncertainty about electricity demand is likely to induce postponement of power generation investments
- ▶ Under these circumstances, pursuing the targets for RES implies increasing state support policies; state intervention will be also required for ensuring large scale CCS and new nuclear investment

# Policy Discussion

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- ▶ State intervention in the energy market of the EU is expected to increase significantly
- ▶ The basic concepts of the EU internal energy market liberalization are likely to be under threat
  - ▶ First because of various new forms of state-aid situations driven by national governments, since expect the EU ETS all other supportive policies stay at national jurisdiction
  - ▶ Second because the portion of the power market that will be under competition without any form of state intervention will be shrinking over time, and is likely to reach a share less than 30% by 2030 (according to our analysis); the rest of the market will involve activities protected by the state in one way or another
- ▶ Of course other forms of competition may emerge

Thank you for your attention

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