Transitioning to Net Zero: Challenges and Opportunities for the European Electricity Sector

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Shaping the world by connecting markets to optimise global resources

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ICIS - Helping some of the world's largest organisations make sustainable business decisions

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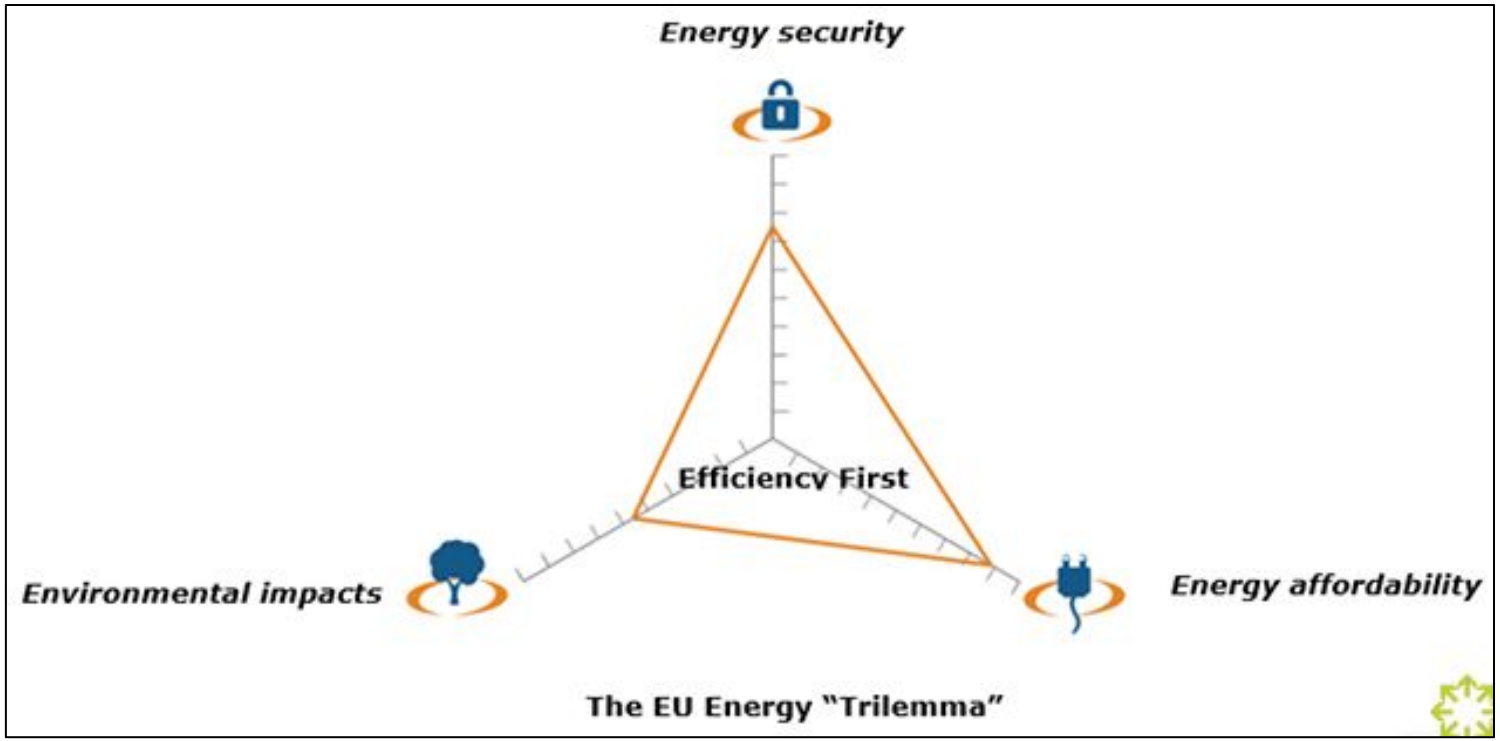
Challenge 1 – Weathering the current storm

Are we letting a good crisis go to waste?

- The ongoing energy crisis is sending shockwaves to markets, regulators and policy makers, and end-users.
- Given the strong social impact of high energy prices, policy makers have rushed to implement non-market support measures – inframarginal generators' revenue capping, and end-users price caps.
- However, are we not running the risk of extending the crisis by not reducing demand fast enough, and by penalising investors in low- or zero-carbon technologies?



The European energy trilemma in action

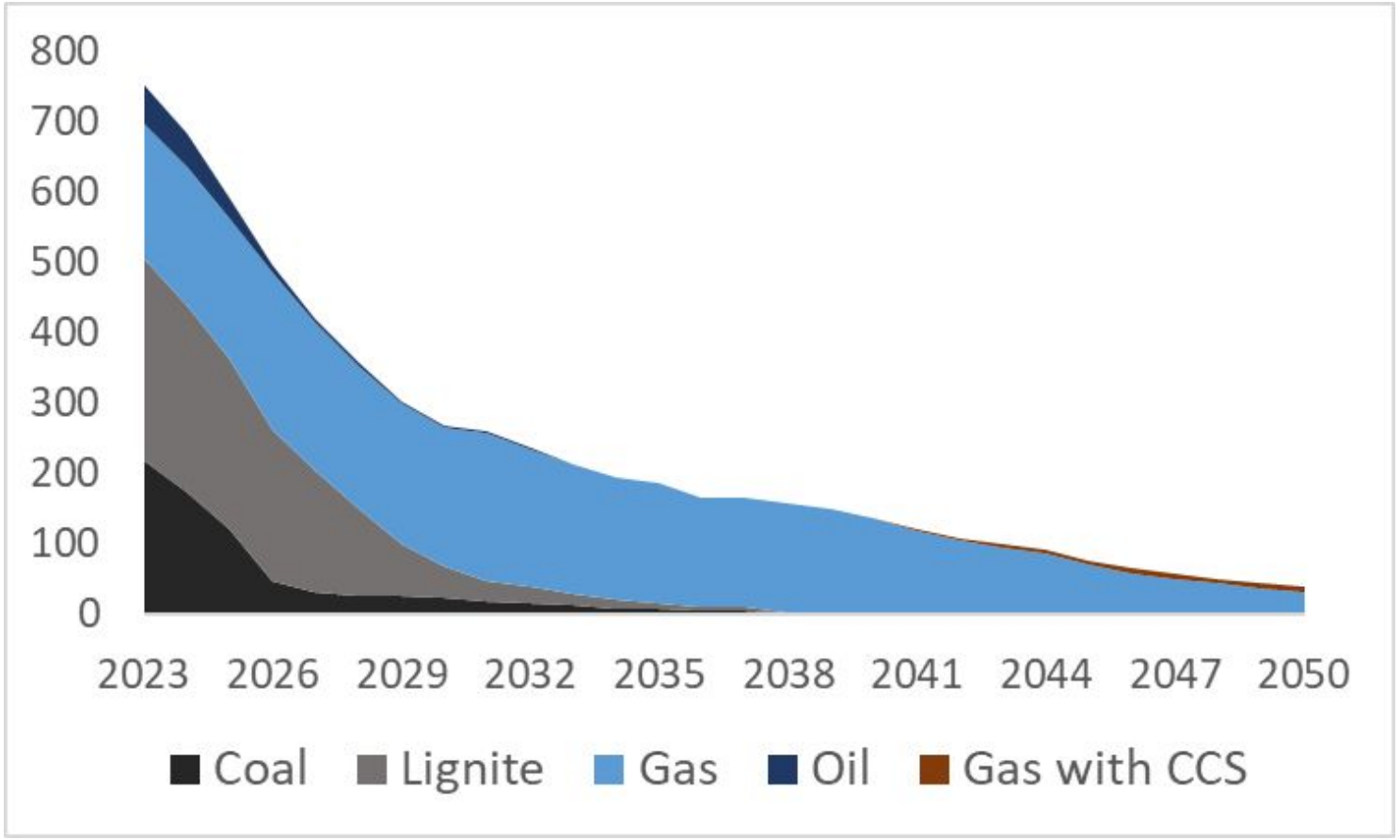
Challenge 2 - How do we *reach* Net Zero?

Policy interventions vs. free market-driven economics

- 1) Through policy - driven decarbonisation – support for new technologies and through managing the supply-side of EU's carbon market, which then ensures market-driven decarbonisation through carbon pricing.

- 2) Through fully market - driven decarbonisation – predominantly through shocks, such as the current market turmoil. However shocks are (relatively) short-lived and random in nature.

- Decarbonisation impossible without a concerted policy push. Energy market good at short-term optimisation, but hopeless at setting strategic long-term objectives.

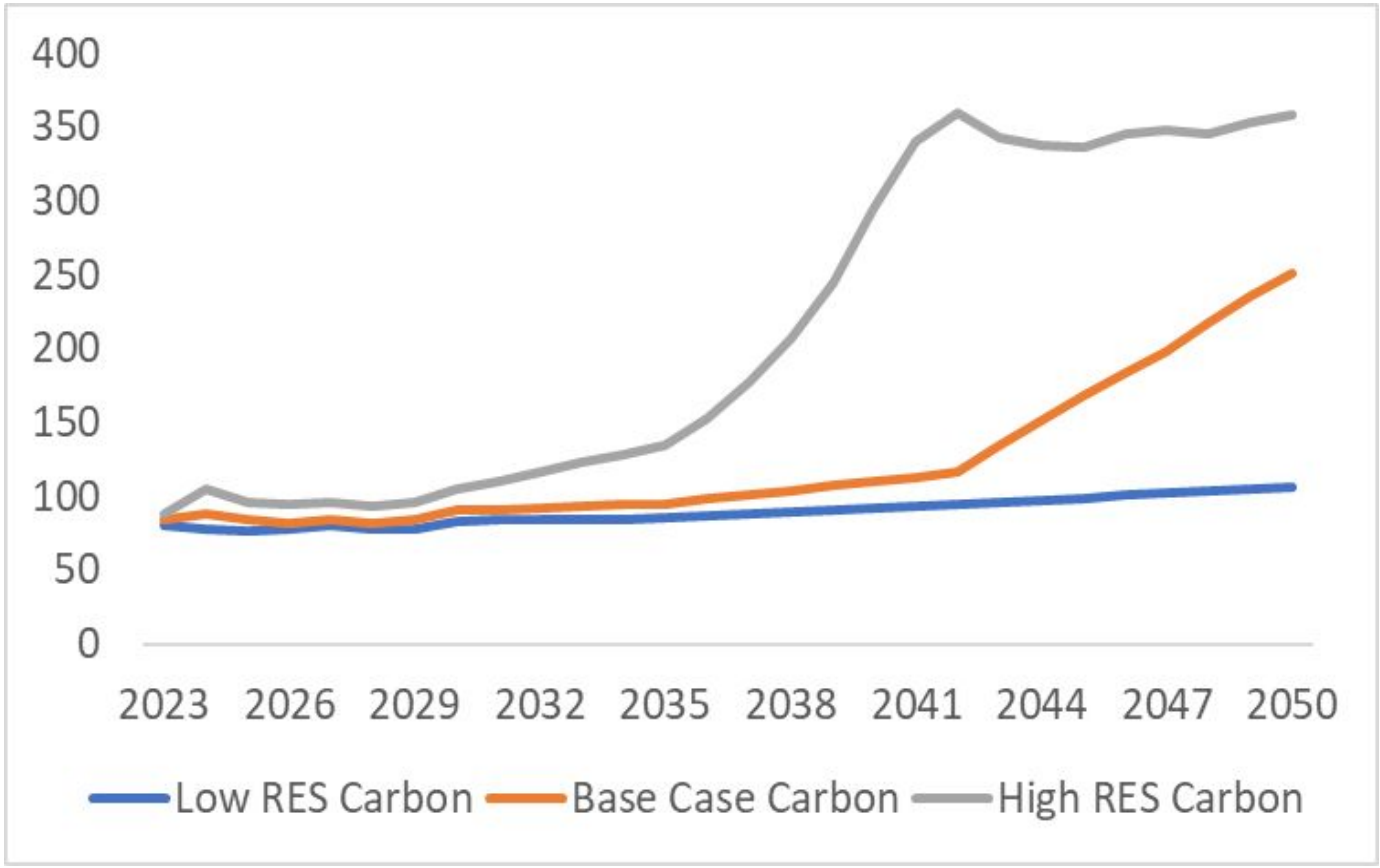


ICIS European emissions forecast, mtCO2

Challenge 3 – the cost of decarbonisation

Sky-high carbon prices + non-market support for renewables to 2050?

- Marginal pricing in the energy markets means that – at constant renewable technology investment costs - increasingly higher carbon prices will be needed to crowd out the last remaining bits of efficient fossil-fuel fired generation.
- The challenge of renewable cannibalisation: revenues of solar PV plants hit as more solar gets installed on the system.
- This means further hikes in carbon prices would be necessary, or continued government support for technologies like solar.

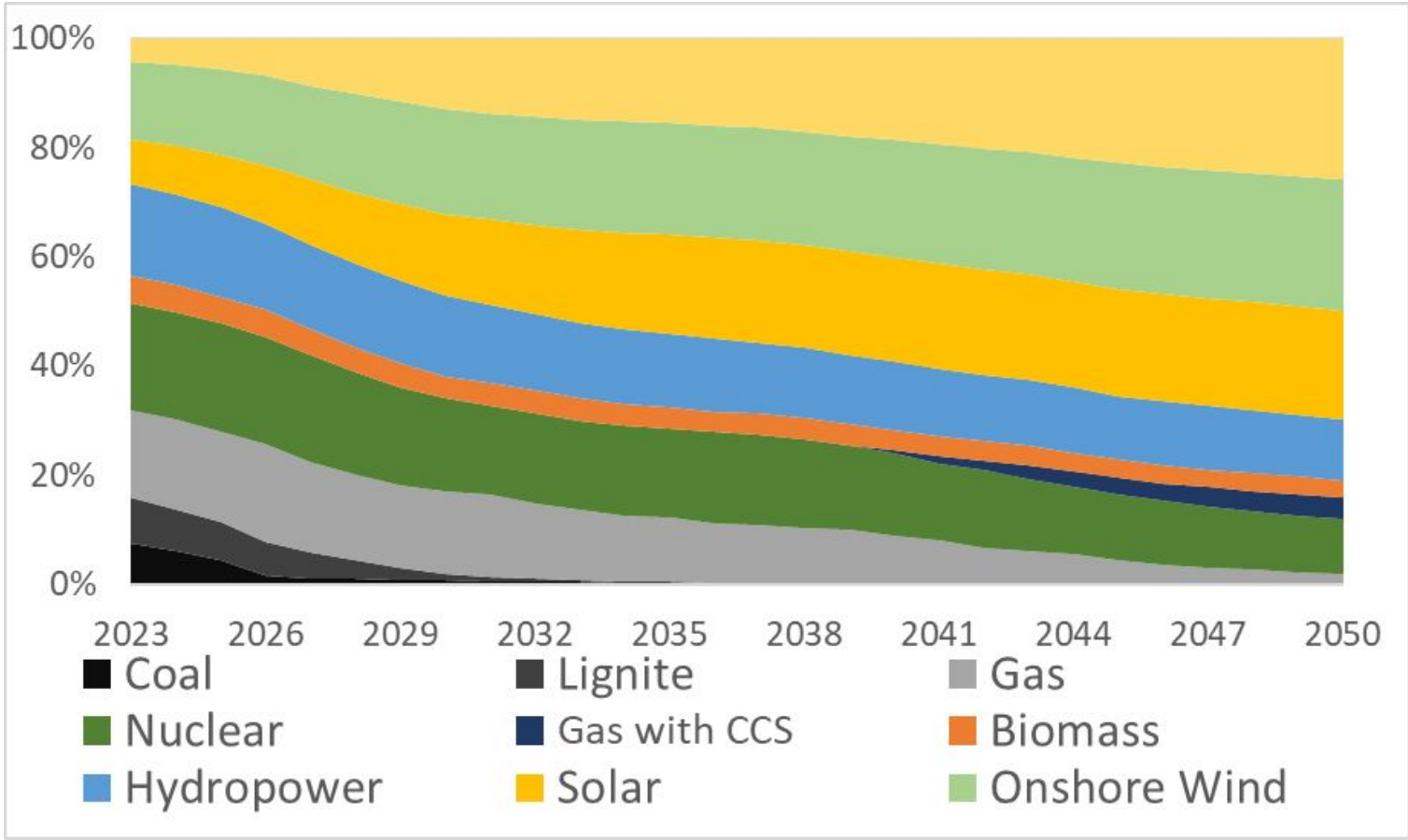


ICIS EU ETS carbon price, €/tCO2

Opportunity 1 – Will we harness technology?

Revolutionising supply

- Will renewables cost decreases be steeper than projected? If so, this would mean lower CO2 price is needed in the longer term;
- Will the cost profile of emerging technologies improve dramatically and bring them to economic parity with established technologies?
- Energy storage to improve the economics of renewables;
- Hydrogen used as partial storage in times of cheap electricity;
- Will negative emission abatement become realistic with technologies like biomass CCS?

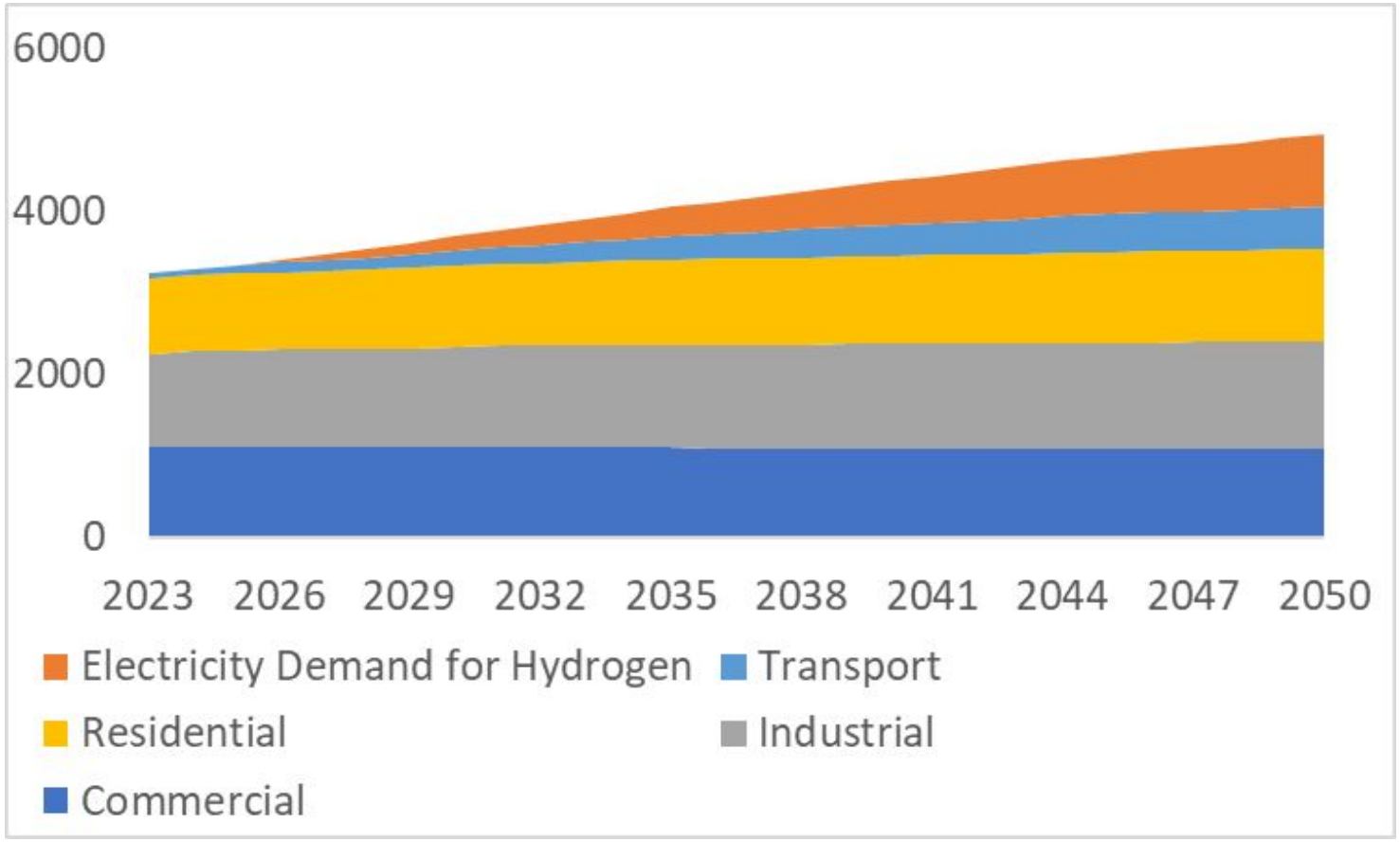


ICIS European power generation mix – shares of different technologies, %

Opportunity 2 – Flexible demand emerging

Price-sensitive demand to help stabilise power systems

- Huge potential growth in electricity demand needed for the production of hydrogen through hydrolysis.
- What will be the economics of hydrogen given currently very high CAPEX and running costs?
- Will we see hydrogen power generation (peakers)?
- Hydrogen to be produced when power prices are at low or zero levels, smoothing demand shape.
- Transport and industrial sector electrification to drive demand increase.



ICIS European power demand projection, TWh

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THANK YOU!

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