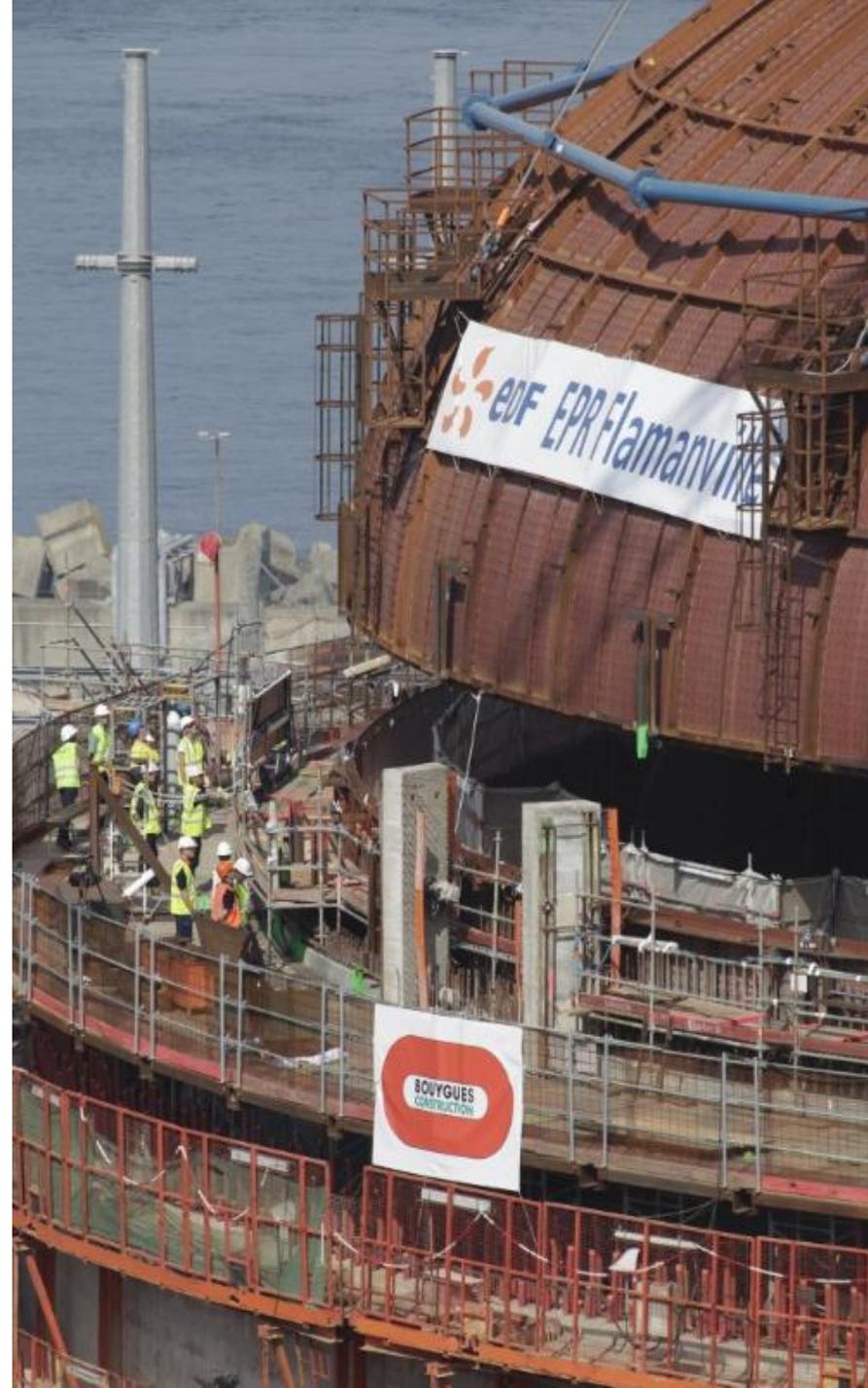




The Role of Long-term Electricity Price Guarantees in NPP Economics

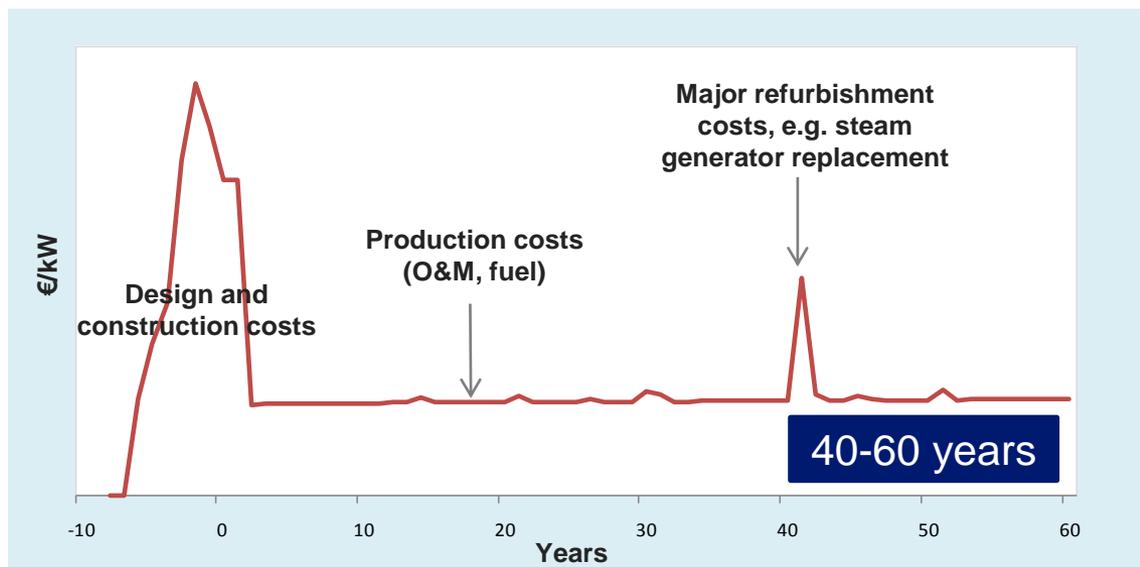
Yves Giraud
Generation Economics and Strategy Director,
EDF
OECD NEA International Workshop

Paris, 19th September 2013



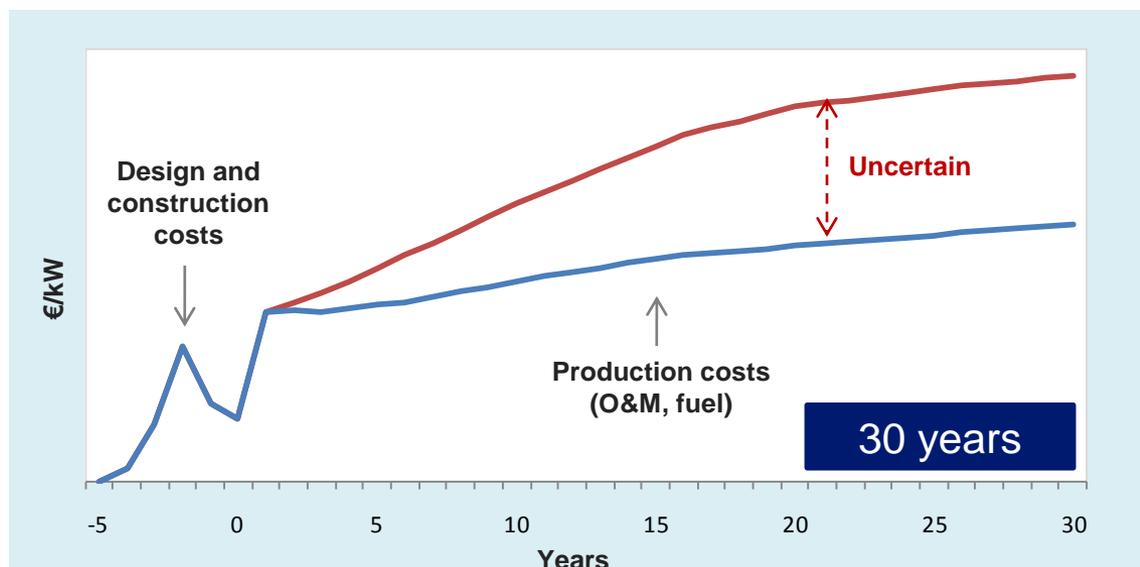
The economic profiles of nuclear and CCGT

NUCLEAR



- **Very high CAPEX** during the development and construction period
- **Regular and comparatively lower OPEX** during the operating period

CCGT*



- **Very low CAPEX** during development and construction, but comparatively higher production costs due to the significance of fuel costs
- **High and uncertain fuel and CO₂ prices** and consequently high uncertainty on future production costs

In a liberalised market, nuclear is very exposed to market price risk



Regulated tariffs

French example: comparison of regulated tariff and levelised cost of nuclear and coal (€₂₀₁₀/MWh)

Confidential

- It is often said that regulated energy markets provide a more favourable context for nuclear investment, in particular through predictable electricity prices
- Yet it is important that regulated tariffs reflect the true levelised cost of generation!

**Initial investment being levelised*

***Green tariff 'C-TLU'*

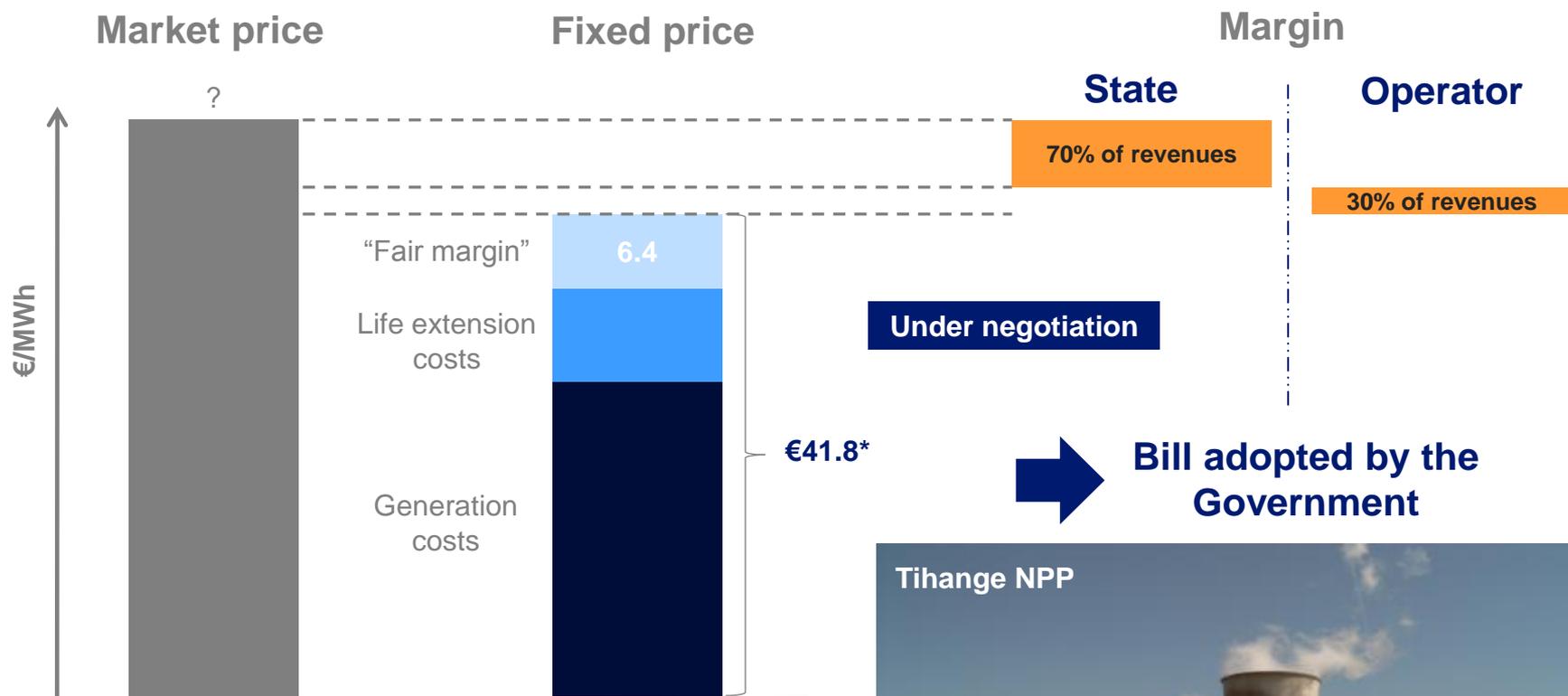
In France, the “Arenh”: What level? What uptake?



- “ARENH*” was the option retained under the “NOME Law” to stimulate competition between electricity suppliers in France, in line with EU competition rules
- EDF must provide competitors with access to ≤ 100 TWh of nuclear generation at a price reflecting the cost of its existing nuclear fleet in France
- The mechanism has two key objectives:
 - Allowing all final customers to benefit from the competitive advantage of existing nuclear
 - Enabling other electricity suppliers to have competitive offers (compared to EDF)
- ARENH is today fixed at €42/MWh, but this price does not reflect the cost of existing nuclear (e.g. *Cour des Comptes* €54/MWh between 2011 and 2025)

*Accès régulé à l'électricité nucléaire historique (“regulated access to historic nuclear electricity generation”)

Belgium: a new mechanism for securing Tihange 1 nuclear life extension?

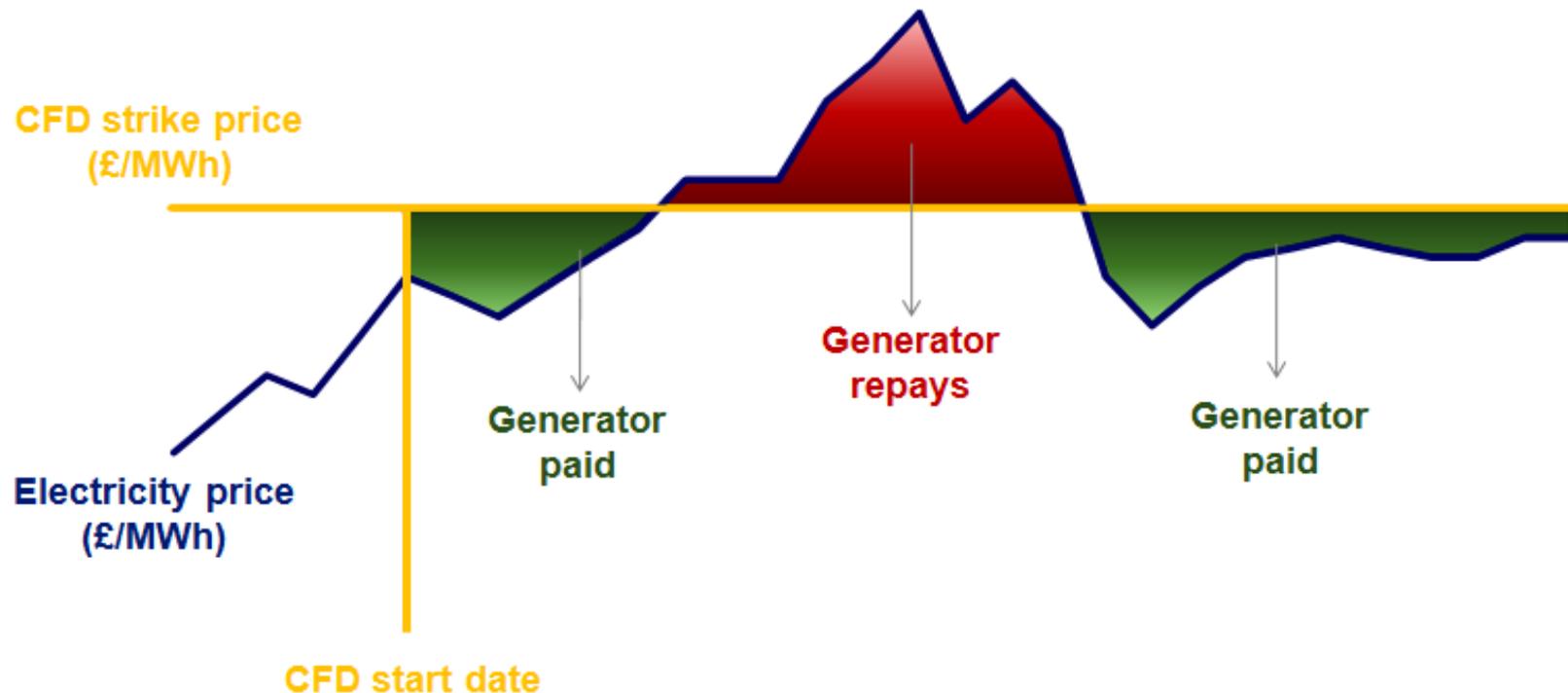


- Belgium Government is considering setting a fixed price* for electricity generated from Tihange 1
- Any revenues above this price will be split between the State and the operator by 70% and 30%, respectively



UK: the CFD is a long term contract providing price stability to both customers and investors

Illustrative impact of contracts for difference (CFDs)



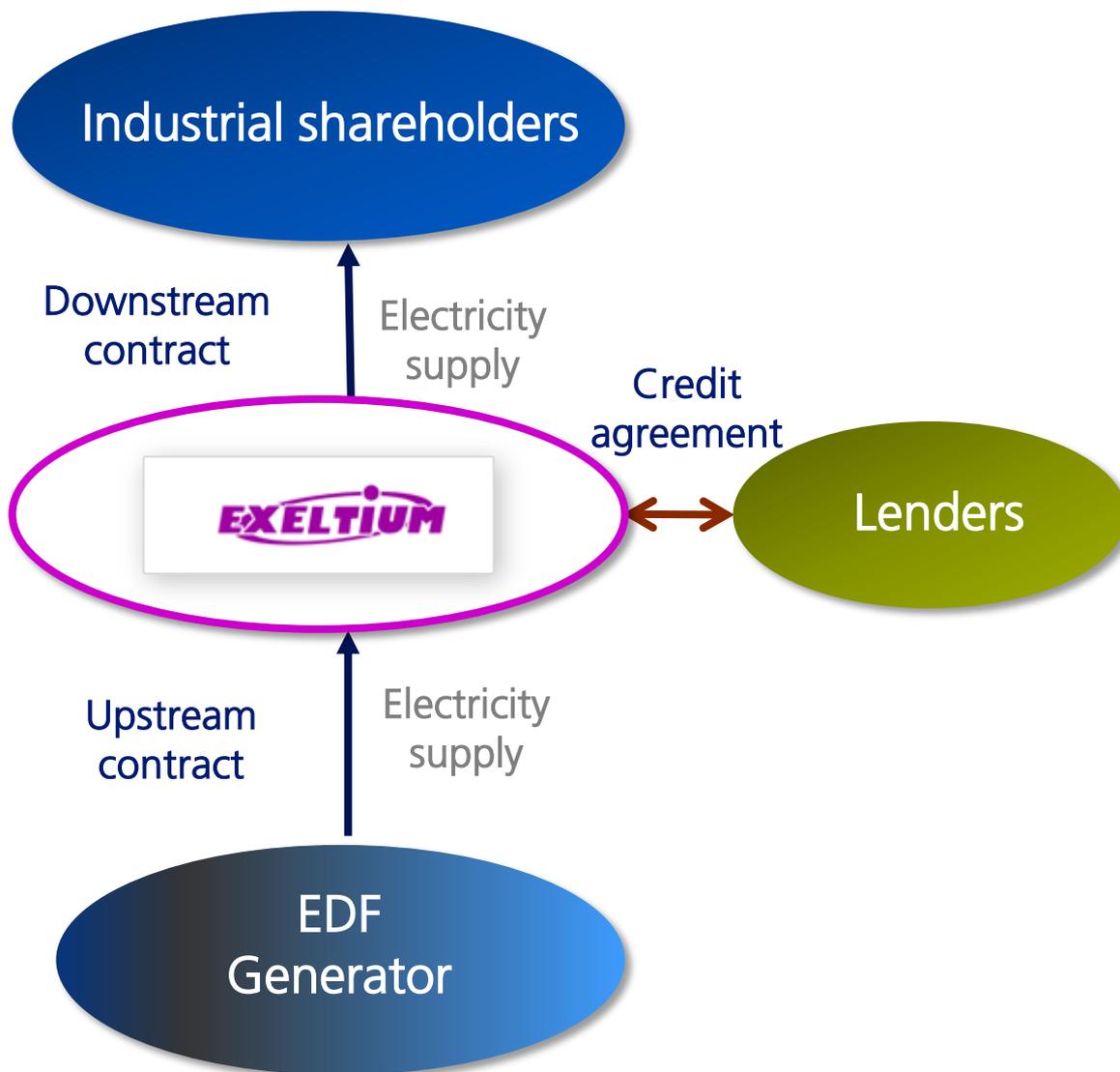
Vincent de Rivaz, EDF Energy CEO



- “There must be a balanced, stable and durable agreement on the price of the electricity generated. This price will form the basis of the contracts for difference and it will fix the price paid for each unit of electricity generated. **To be durable, this price needs to be fair and balanced for both our company and the Government.**”

*Vincent de Rivaz writing in The Telegraph,
20 January 2013*

France: long-term price visibility under Exeltium



Key advantages for EDF

- The upfront payment means that financing is available without having to consolidate a debt
- The model secures long term power purchases with large customers

Key advantages for clients

- The model secures long-term supply of electricity at a competitive price for energy intensive consumers
- Electricity prices are based on nuclear costs rather than market prices and industrial risk sharing is limited

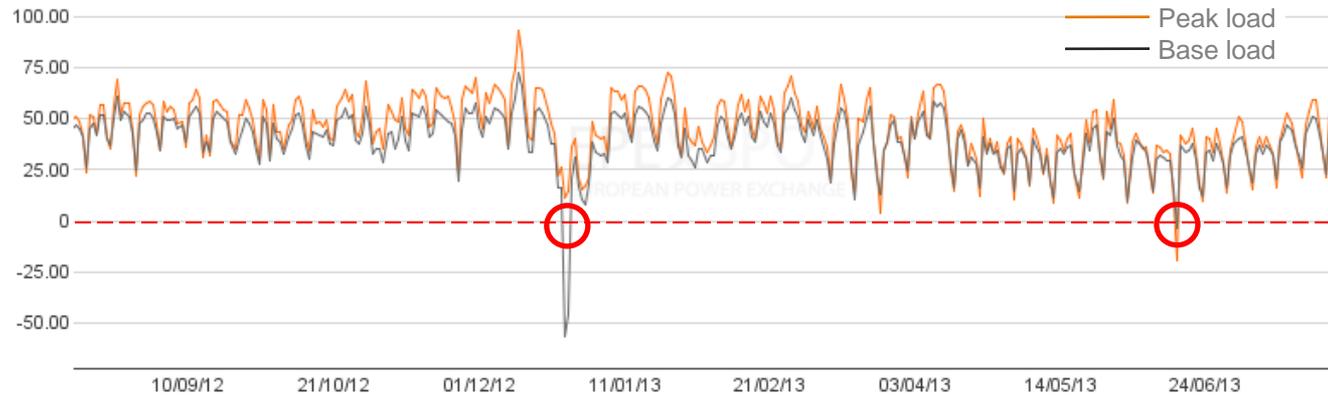
In Europe, mechanisms providing price stability must comply with competition rules



- Mechanisms providing price stability have to be compliant with EU competition rules, i.e. state aid rules, general rules relating to anticompetitive agreements and abuse of dominant position
- Exeltium was subject to examination by the European Commission under general rules relating to anticompetitive agreements and abuse of dominant position
- Elements of the UK's Electricity Market Reform package are likely to be subject to state aid examination

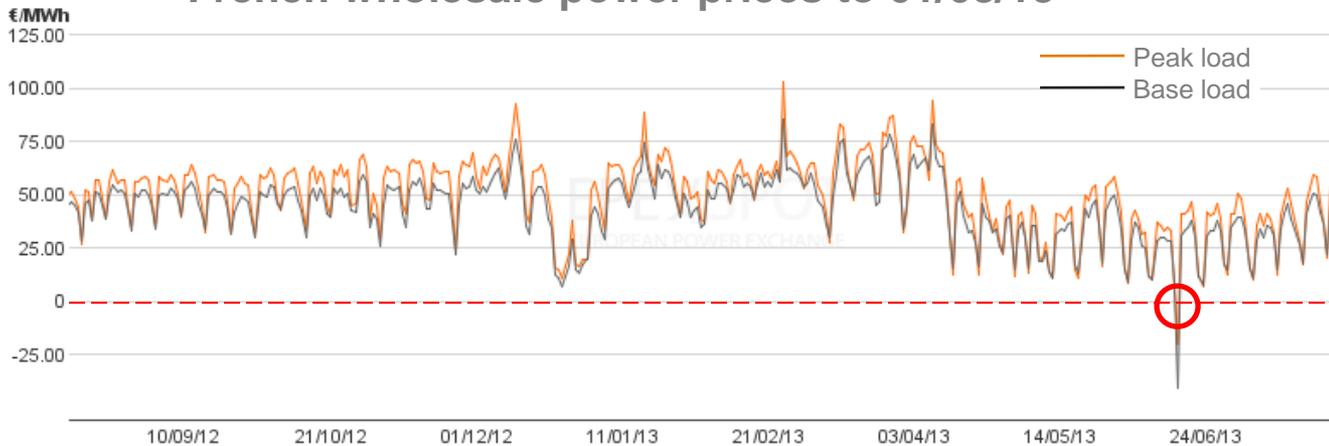
Europe: need for new market design?

€/MWh German/Austrian wholesale power prices to 01/08/13 (Phelix)



**German 1-yr forward base load*:
€39.55/MWh**

French wholesale power prices to 01/08/13



**French 1-yr forward base load*:
€43.86/MWh**



*As at 18/09/13
Sources: European Power Exchange, EDF

Conclusions



- With ~10 to 20 years of experience behind us since market opening, we now have a good understanding of deregulated energy markets
- We know how to open up a mass market to competition, but what still need to master is securing investment in generation
- We need to maintain the wholesale market, but if we continue to develop significant amounts of renewable generation, the market will not work and redesign will be necessary