

FTI-CL Energy – Event Epex spot / OFATE e-world 06/02

Clean Energy Package : a new market design under construction ?

epexspot



06 February 2019

Presented To:

Office franco-allemand pour la transition énergétique
Deutsch-französisches Büro für die Energiewende



Content

1

About FTI-CL Energy

Slides 3 - 5

2

Key European regulatory changes – Clean Energy package

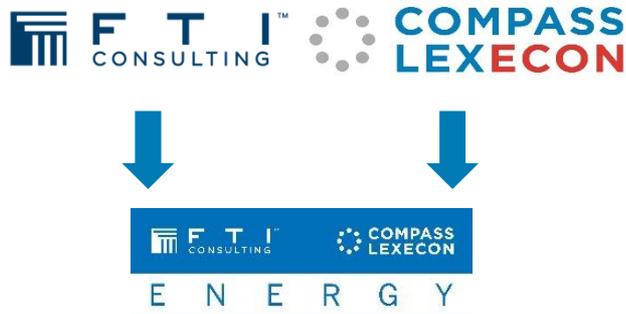
Slides 6 - 15

About FTI-CL Energy

FTI-CL Energy is the energy practise of FTI-CL and gathers senior experts across Europe

Services provided by FTI-CL Energy

- FTI-CL Energy is the cooperation of energy experts from FTI Consulting and its wholly-owned subsidiary Compass Lexecon, bringing together highly experienced economists, accountants and industry practitioners.



- FTI-CL Energy's experts support their clients on a wide range of assignments.
 - Policy and market design
 - Investment decision support
 - Energy markets modelling
 - Financial valuation of assets
 - Business model development
 - Corporate strategy design
 - Economic expertise in commercial litigations

FTI-Compass Lexecon at a glance

FCN Publicly traded – NYSE	\$1.4 BLN Market Capitalization
1982 Year founded	80 Different disciplines
4,600+ Employees worldwide	
460+ Senior Managing Directors	
2 Nobel Laureates	
10/10 Advisor to the world's top 10 bank holding companies	

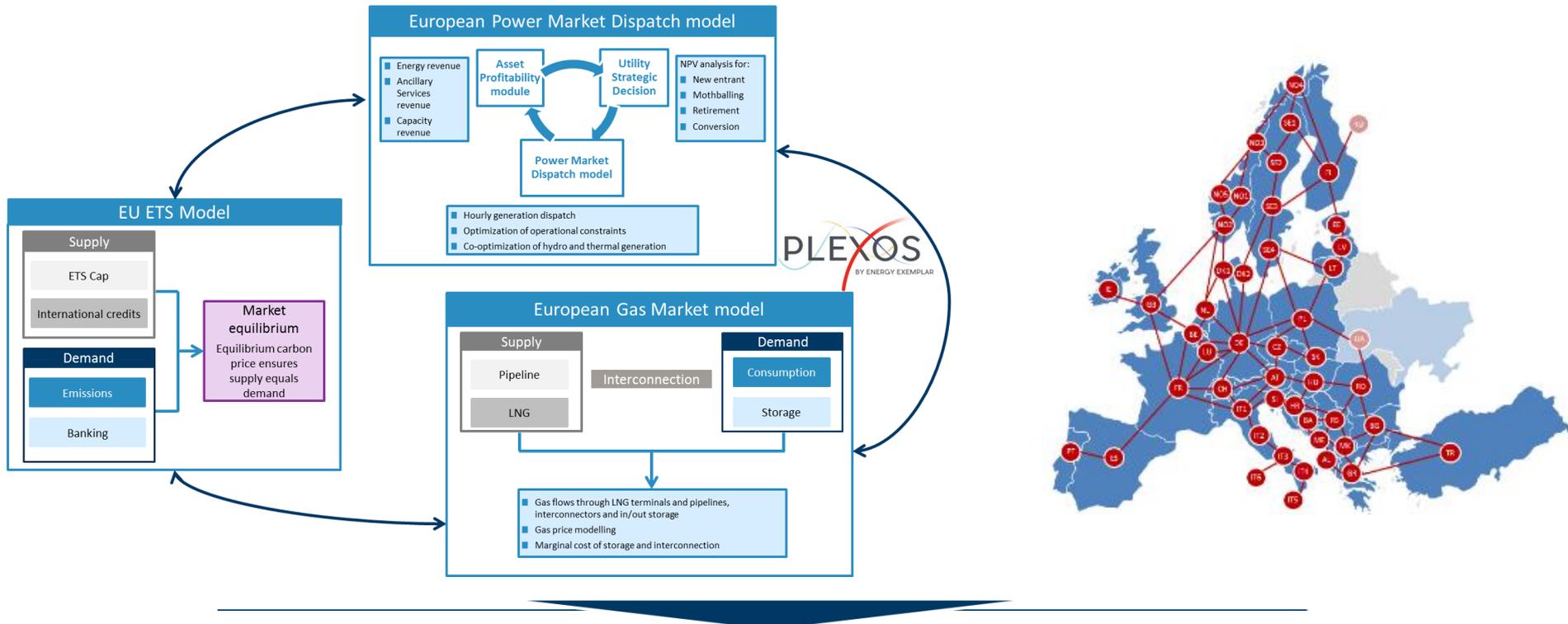
FTI-CL Energy's senior energy experts in Europe

The map shows the distribution of senior energy experts across Europe. Blue squares represent main energy offices, while dark blue squares represent other FTI Consulting / Compass Lexecon offices. Lines connect specific experts to their office locations on the map.

Jason Mann	Feng Zhao
Alaric Marsden	Lorenzo Coppi
Aris Karcantias	Fabien Roques
Robert Clover	Dmitri Perekhodtsev
Stuart Amor	Emmanuel Grand
Dora Grunwald	Yves Le Thieis
Nicholas Brooks	Blanca Perea
Martina Lindovska	Anton Garcia

■ Main energy offices of FTI-CL Energy
■ Other FTI Consulting / Compass Lexecon offices

FTI-CL Energy has developed integrated and robust proprietary models of electricity, gas and CO₂ European markets



Key European regulatory changes – Clean Energy package

The 8 legislative proposals of the Clean Energy package span over market design, governance, renewables and energy efficiency

Legislative proposals of 2016 Winter Package	New/revision	State of play	Main provisions of legislative proposal
<i>Design of the European electricity markets</i>			
Directive on the Internal Market for Electricity	Revision of directive 2009/72/EC	Political agreement on 18 Dec 2018	General market organisation, consumers' rights, clarification of role of DSOs, TSOs and NRAs
Regulation on the Internal Market for Electricity	Revision of regulation (EC) No 714/2009	Political agreement on 18 Dec 2018	Core market principles (balancing, congestion management), tariff methodologies, capacity mechanisms, RCCs, EPS
<i>Governance rules for the Energy Union</i>			
ACER regulation	Revision of regulation (EC) No 713/2009	Political agreement on 11 Dec 2018	Strengthening of ACER role to reflect stronger coordination tasks
Regulation and governance of the Energy Union	Regulation (EU) 2018/1999	OJ publication on 21 Dec 2018	Integrated national energy and climate plans covering 10-year periods with monitoring by the EC
<i>Security of electricity supply</i>			
Regulation on risk preparedness in the electricity sector	Repealing the Security of Supply directive	Political agreement on 22 Nov 2018	Coordination of methodologies for risk assessment, risk preparedness and management of crisis situations
<i>Renewable energy support</i>			
Directive on the promotion of use of renewable energy from renewable sources	Regulation (EU) 2018/2001	OJ publication on 21 Dec 2018	EU-wide target of 32% RES by 2030, cross-border support schemes, requirements for RES in heating & cooling
<i>Energy efficiency</i>			
Directive on Energy Efficiency	Regulation (EU) 2018/2002	OJ publication on 21 Dec 2018	EU-wide target of 32.5% energy efficiency by 2030, support to more accurate consumption and billing through smart meters
Directive on the energy performance of buildings	Regulation (EU) 2018/844	OJ publication on 19 Jun 2018	Renovation targets, guidance on energy performance certificates

The Clean Energy Package focusses on decarbonisation and raises deep issues

Decarbonisation

- Increase of share of renewable energy sources
- More ambitious energy efficiency target
- Emission performance standard
- Empowerment of energy consumers through more flexibility and information
- Integration of RES into power markets
- Reforms of electricity markets to provide better price signals for flexibility

Europeanisation / regionalisation

- Improvement of energy markets to achieve the Energy Union; and
- Increase in coordination in many fields:
 - Governance (role of ACER)
 - Creation of Regional Coordination Centers (RCCs)
 - Cross-border cooperation for RES support schemes and capacity mechanisms.
 - New roles of DSOs through EU-DSO

Key questions raised by the Winter Package

- How detailed should EU regulation be: should the EU concentrate on principles rather than micro manage market design?
- Lack of a coordinated energy and environment approach: ETS reform / innovation policy treated separately
- Governance: what is the right level of subsidiarity and how to address the rise of local stakeholders?

The policy mix for decarbonisation : Toward a market based level playing field or are regulation / mandates coming back?

Measure	Description	Advantages	Drawbacks	Examples	
Incentive regulation	Emissions Trading Scheme	Fixed emissions volumes, with cap and trade system	<ul style="list-style-type: none"> Efficient in finding the lowest abatement costs 	<ul style="list-style-type: none"> Uncertain carbon price, potentially limiting support to low carbon investments 	 EU ETS
	Tax / Price floor	Fixed price of emissions, levied by government	<ul style="list-style-type: none"> Predictability leading to increased low carbon investments / R&D 	<ul style="list-style-type: none"> Uncertain carbon emissions reduction Difficult implementation (acceptability, distortions, etc.) 	 Carbon Price Floor  Carbon tax
Command and control	Emissions Performance Standards (EPS)	Mandate lower emissions for every installation	<ul style="list-style-type: none"> Targeted effect on some technologies (e.g. coal) 	<ul style="list-style-type: none"> Less efficient / increases costs of emission reductions Potential stranded costs / requests for compensations 	 550 EPS  EPS
	Administrative closures	Mandate closure of high-carbon plants / factories	<ul style="list-style-type: none"> Targeted effect on some technologies (e.g. coal) 	<ul style="list-style-type: none"> Less efficient / increases costs of emission reductions Potential stranded costs / requests for compensations 	 2025 end of coal  Climate reserve
	Technology subsidies	Subsidise low/zero carbon technologies (e.g. renewables)	<ul style="list-style-type: none"> Targeted support during learning phase for immature technologies 	<ul style="list-style-type: none"> Uncertain carbon emissions reduction Potentially inefficient if cheaper technology options available 	 EU renewable targets

FTI-CL Energy actively participates to the European debate through in-depth studies on decarbonisation toolkit



Presentation

Impact assessment of a 550 Emission Performance Standard in capacity mechanisms

A study commissioned by EURELECTRIC

26 September 2017



A climate and socio-economic study of a multi-member state carbon price floor for the power sector

Executive summary

27 November 2018

Global companies call for more action

– to support a strong and predictable carbon price

We, the companies that have signed this declaration, reaffirm our intention to proactively and collectively combat climate change through our business activities.

Clear and predictable long-term carbon price signals are widely considered the most cost-efficient way to mitigate global warming and to stimulate climate-friendly decision-making of businesses and consumers. They efficiently incentivise investments in low-carbon solutions at lower cost of capital, leading to more sustainable jobs and economic growth.

A key question is whether the price signal can play a bigger role to drive additional EU efforts required to live up to the Paris Agreement.

Our companies support strengthening the EU Emissions Trading System (EU-ETS) that should be a strong driver of emission reductions. The reform package recently agreed is an important step in that direction. The pace of withdrawal of excess allowances towards the market stability reserve has been accelerated, which has increased trust in a possible allowance shortage in the mid-2020s. These steps have already shown some effect on allowance prices over the last months. This, however, cannot be taken for granted, particularly considering complex interactions to be handled (or accurately set up) between ETS and ambitious targets of the Clean Energy Package. Therefore, higher ETS prices in the short term also means increasing volatility that shows the need for additional tools to secure expectations of economic actors.

To complement the EU ETS, our companies support the introduction of a European or regional carbon price floor in the power sector and the reinforcement of cooperation between governments to introduce a carbon price signal, also in non-ETS sectors (notably transport and buildings).

'Carbon price floor' (CPF) applied to electricity generators

Pragmatically, governments could implement initiatives based on concrete models that have already proved effective and discuss their coordination at regional levels. The UK carbon price floor serves as an example as it has successfully led to carbon reductions, coal phase-out and redirection of investments in low-carbon solutions in the power sector, while at the same time adding revenue to foster the low-carbon transition.

The Netherlands seeks to introduce a similar model. Due to high interconnectivity, the group of participating countries should be extended as much as possible to make the initiative more efficient. Over time, more member states could be expected to join the coalition, and the initiatives could be integrated in the EU-ETS framework.

Our proposal

European governments, starting with a group of frontrunners, should cooperate to progressively implement a carbon price floor (CPF) in the power sector to complement an efficient EU-ETS price signal, inspired by the UK example and Dutch government research. Several renewable energy technologies are cost efficient on market terms when carbon costs are internalised in wholesale electricity prices. A multi-member CPF can assure a credible short and long-term carbon pricing signal to decarbonise the European power sector in a cost-efficient manner. It will do so by eliminating a significant layer of regulatory risk which in turn will reduce the cost of renewables.

A multi-member CPF would reduce revenue uncertainty and thereby help business models and innovation related to the technologies of the energy transition (renewables, energy efficiency, storage, etc.). With robust reform of the ETS, the ETS price would rise above the floor level, and the CPF would hence work as a back-stop against collapsing prices, while still reducing risks. A rising CPF delivers a valuable insurance to guarantee the targets will be met and paves the way to a stronger ambition in line with the Paris Agreement.

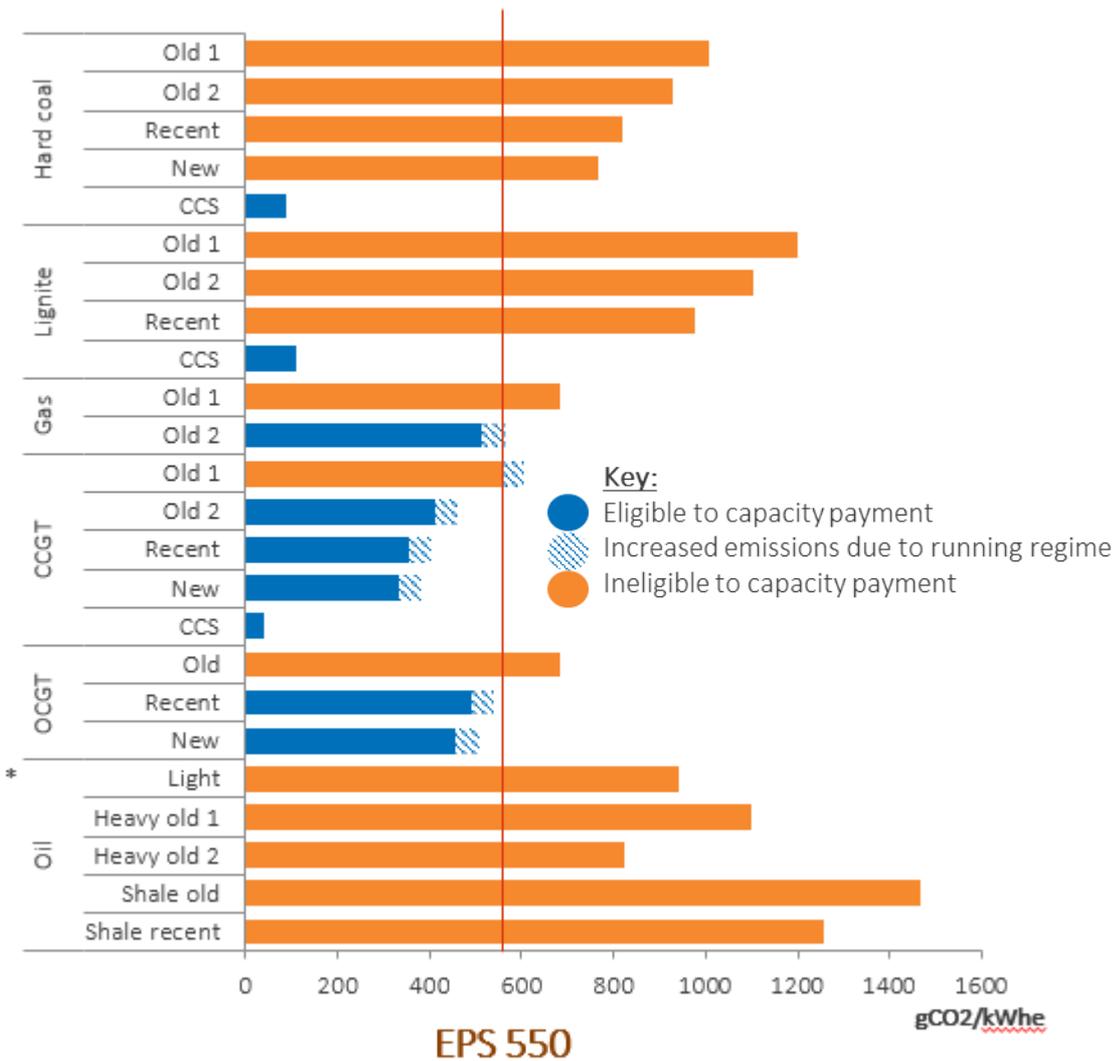
1/2

<https://orsted.com/-/media/WWW/Docs/Corp/COM/News/FTI-CL-Energy-CPF-Executive-Summary.pdf>

[https://cdn.eurelectric.org/media/2165/impact assessment of an eps 550 on cm by compass-lexecon-2017-030-0623-01-e-h-438680F8.pdf](https://cdn.eurelectric.org/media/2165/impact%20assessment%20of%20an%20eps%20550%20on%20cm%20by%20compass-lexecon-2017-030-0623-01-e-h-438680F8.pdf)

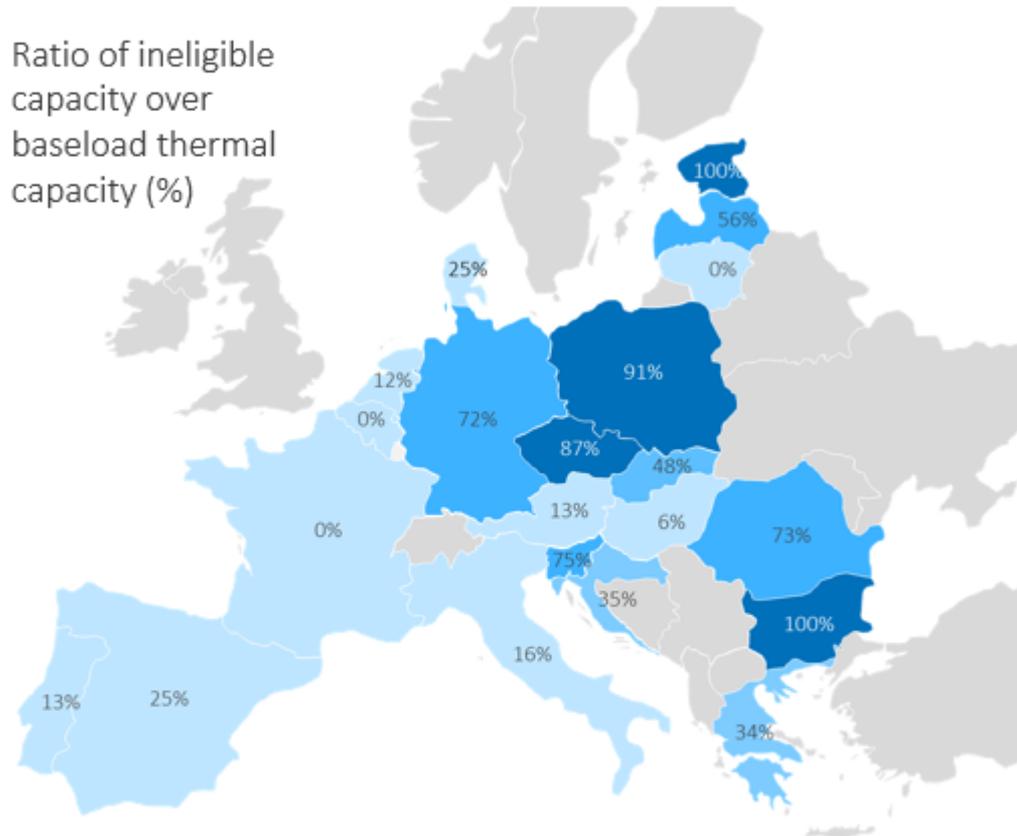
Applying the 550 EPS may have significant unintended economic and systemic consequences (Eurelectric, 2017)

CO2 emissions per technology subtypes



Uneven 550 EPS impact on thermal baseload plants

Ratio of ineligible capacity over baseload thermal capacity (%)



- 24% of baseload thermal capacity in Western Europe is ineligible for capacity payments (ranging from 0% in France to 72% in Germany)
- 41% of baseload thermal capacity in Eastern Europe is ineligible in the 550 EPS scenario (91% in Poland)

* Light oil includes turbines burning a majority of oil derivative fuels versus gas derivative fuels.

A Carbon Price Floor (CPF) would enhance the efficiency of the power sector transition (Multicient study, 2018)



■ Context: More ambitious decarbonisation is needed

- The European Commission has reaffirmed and increased its commitment to decarbonise the EU economy
- Power sector decarbonisation is key – and requires strong carbon price signals



■ The problem: The ETS reforms will not deliver sufficient investment signals

- The EU ETS CO2 price – despite the boost from recent reforms – is insufficient in the short term to drive significant coal gas switching , creates a risk of lock in of fossil plants, and does not provide a strong and credible enough signal for renewables investment in the medium to long term
- The ETS price is volatile with significant downside risk – this raises the cost of capital (WACC) and reduces access to finance
- The impact of the ETS price risk on electricity prices compounds this uncertainty – which could undermine investment at a time when clean technologies are increasingly bearing market risk



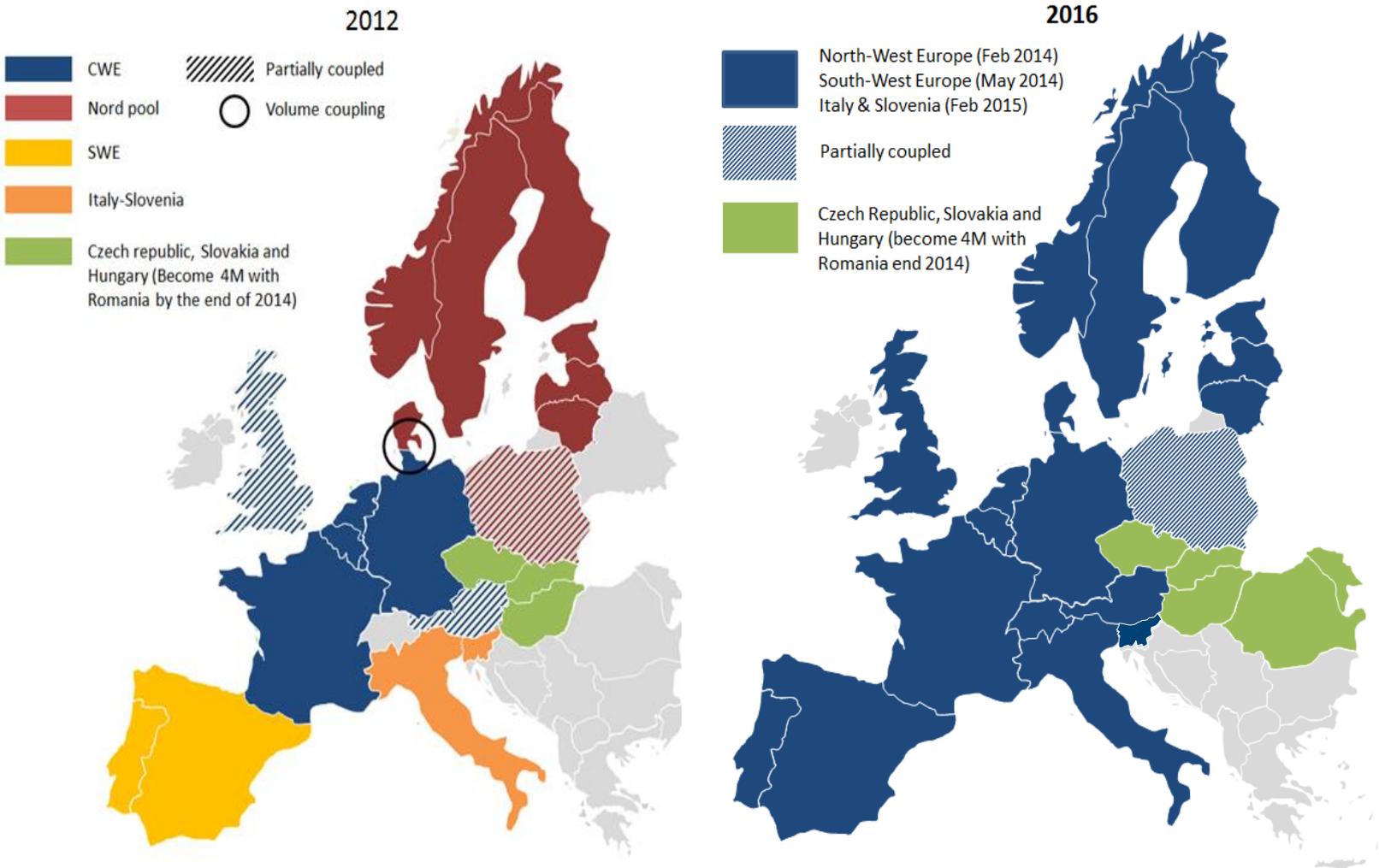
■ A Carbon Price Floor (CPF) would enhance the efficiency of the power sector transition

- CPF acts as an insurance mechanism for investors, protecting them against sudden ETS price drops caused by a significant demand/supply imbalance, and against potential weak macroeconomic conditions leading to oversupply and insufficient abatement*
- Emissions in the CPF countries could be significantly reduced in 2030, and indeed reduced across the EU as whole
- Electricity and emissions leakage through cross-border flows can be minimised by the MSR as well as complementary policy to maintain ETS demand levels, and through ensuring that the CPF zone is of a minimum acceptable size
- Renewables investment would be supported in a world where projects are increasingly exposed to merchant price risk
- A CPF would drive greater coal to gas switching, and provide a clearer investment signal to avoid lock-in of fossil plants
- Power price impacts depend on the interaction of two effects – the CPF would increase power prices to the extent and for as long as fossil fuel plants remain on the system and set market prices. This is counterbalanced by the “merit order effect”- if the CPF encourages higher renewables penetration, this shifts the merit order and lowers market prices
- Impacts on consumers and Energy Intensive Industries (EIIs) may be positive insofar as power prices are lower with a CPF
- If there were additional costs, these can be mitigated using Government revenues raised from the CPF

* The academic literature has for many years discussed the higher efficiency of hybrid price and quantity instruments like a CPF in tandem with the ETS see e.g. Newbery et al (2018), Pizer (2002), Nordhaus (2007)

Market coupling is progressing and driving price convergence

Regional markets more and more integrated



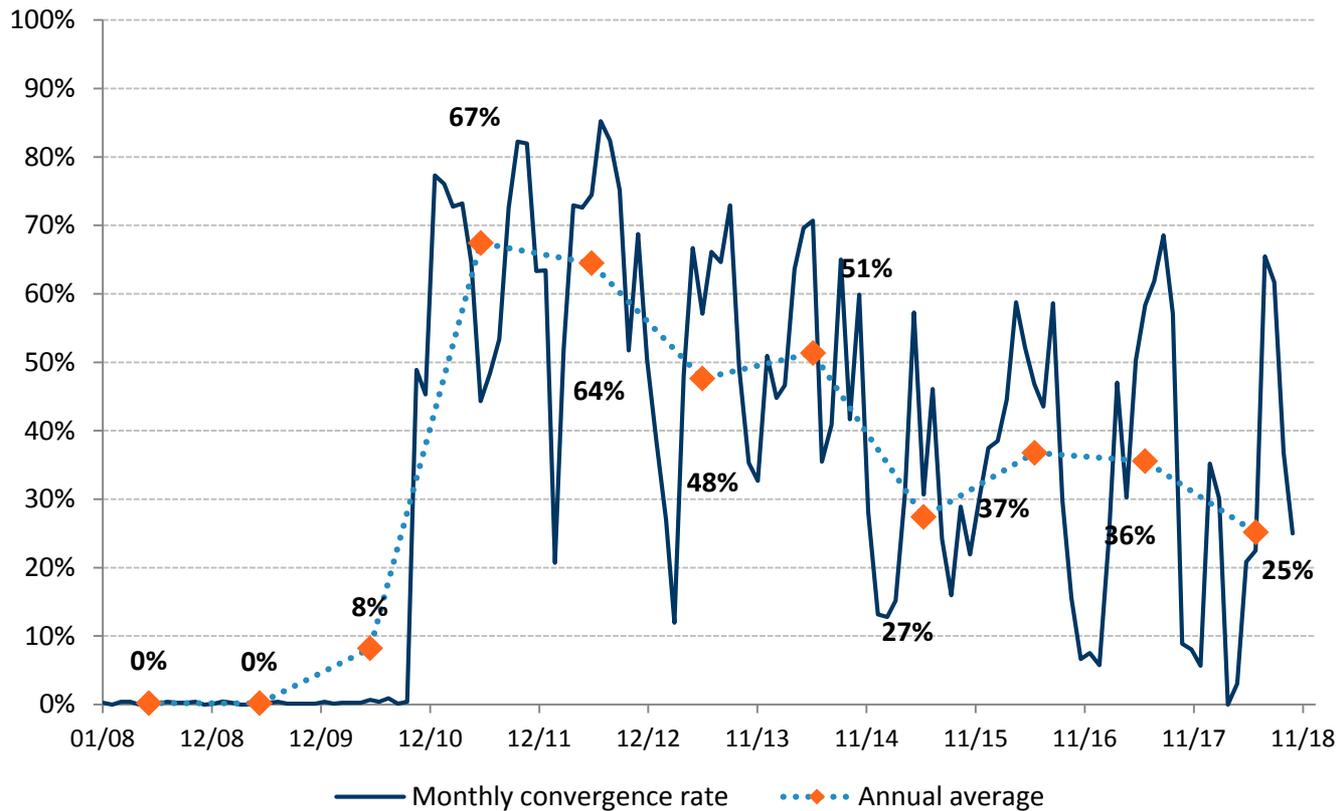
Source: FTI analysis.

Multi-Regional Coupling (MRC) is a pan-European project which aims to integrate spot electricity markets in Europe and covers an area with electricity demand currently totalling approx. 2800 TWh which accounts for 85% of the European consumption volume.

Implementation of flow based market coupling will drive further price convergence

But rising shares of renewables increasingly saturate interconnections and lead to price divergence

Monthly convergence rate* between French and German day-ahead prices

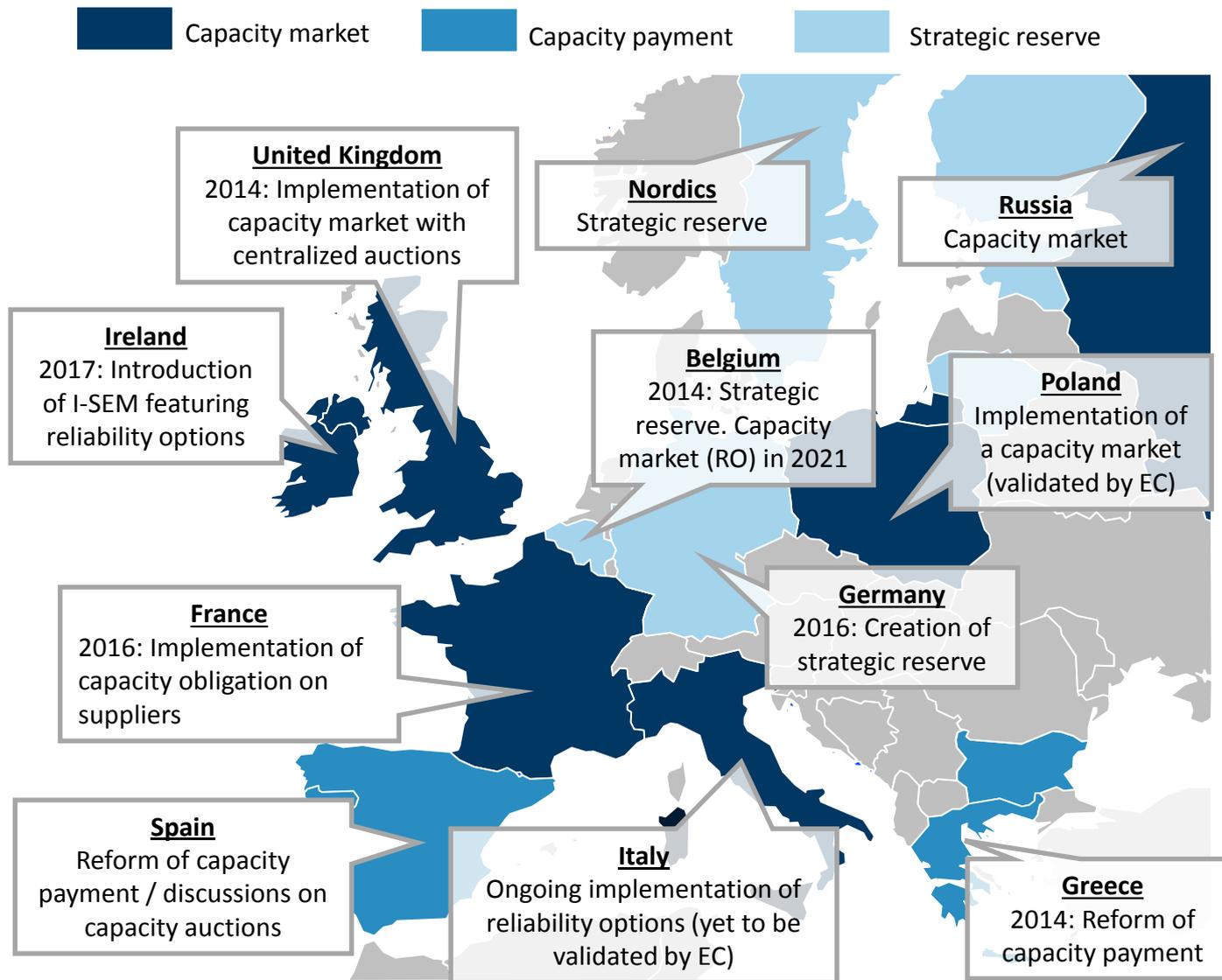


- Prior to market coupling (November 2010) prices were never equals.
- The relatively high convergence rate started to slowly decrease as the amount of intermittent renewable capacity dramatically increased in Germany.
 - Since 2010, solar PV capacities more than doubled (from 17GW to 37GW) while interconnection capacity between France and Germany remained the same.
- Further to the renewable development, French nuclear unavailability in winter 2016/17 led to low convergence level, especially during the winter months.

*Convergence rate is the percentage of hours where price difference is lower than €0.01

Data : EPEX spot

Through market design reform, capacity mechanisms are being introduced / reformed in most members states



- Ongoing reforms / discussions mark a shift toward market based capacity mechanisms
- Reforms in France, Italy, and United Kingdom share common structural (and permanent) approach
- Significant differences remain in the design of the different capacity markets
- Key issues to revolve are around cross border participation, and demand response

EXPERTS WITH IMPACT™

Yves Le Thieis (France)

Energy Practice

Senior Economist

+33 1 53 05 36 26

YLeThieis@compasslexecon.com