EU Integrated Electricity Market seminar

The implications for the Single Electricity Market

Sponsored by

ERNST & YOUNG

Quality In Everything We Do

Thursday 1st September

Chartered Accountants House, Dublin

www.energyireland.ie

The practicalities of implementing an effective and efficient European Electricity Market

Mark Copley

entsoe

Reliable Sustainable Connected

Overview

- About ENTSO-E
- The vision – a single market by 2014
- The current state of play
- Ongoing work
  - Regional Market Integration
  - Developing Network codes
- Challenges ahead
- Concluding remarks

The European Network of Transmission System Operators for Electricity

- **ENTSO-E Represents 41 TSOs from 34 countries**
  - **532 million citizens served**
  - **880 GW net generation**
  - **305,000 Km of transition lines managed by the TSOs**
  - **3,200 TWh/year demand**
  - **380 TWh/year exchanges**

entsoe

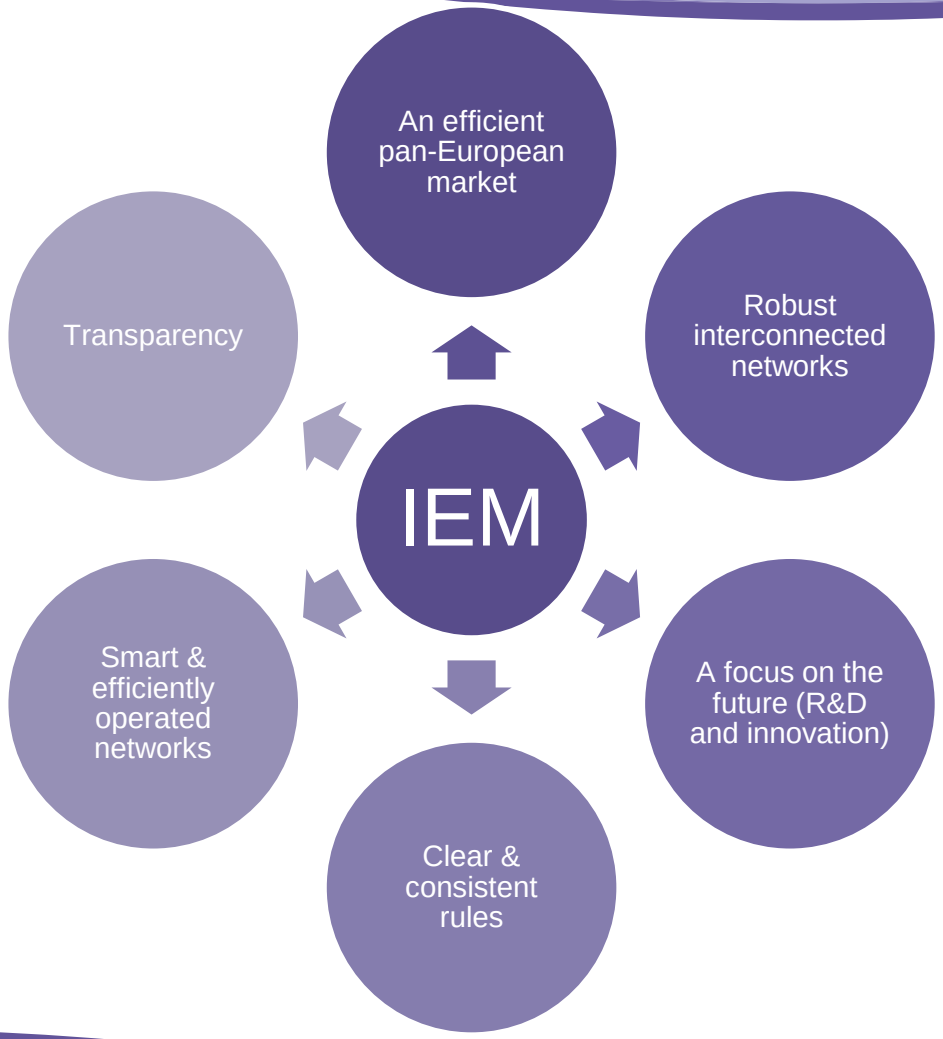
The Vision

It is our priority to remove all barriers to the internal energy market so that energy can flow freely everywhere in the EU. The single European energy market must become a reality for all businesses and consumers by 2014.

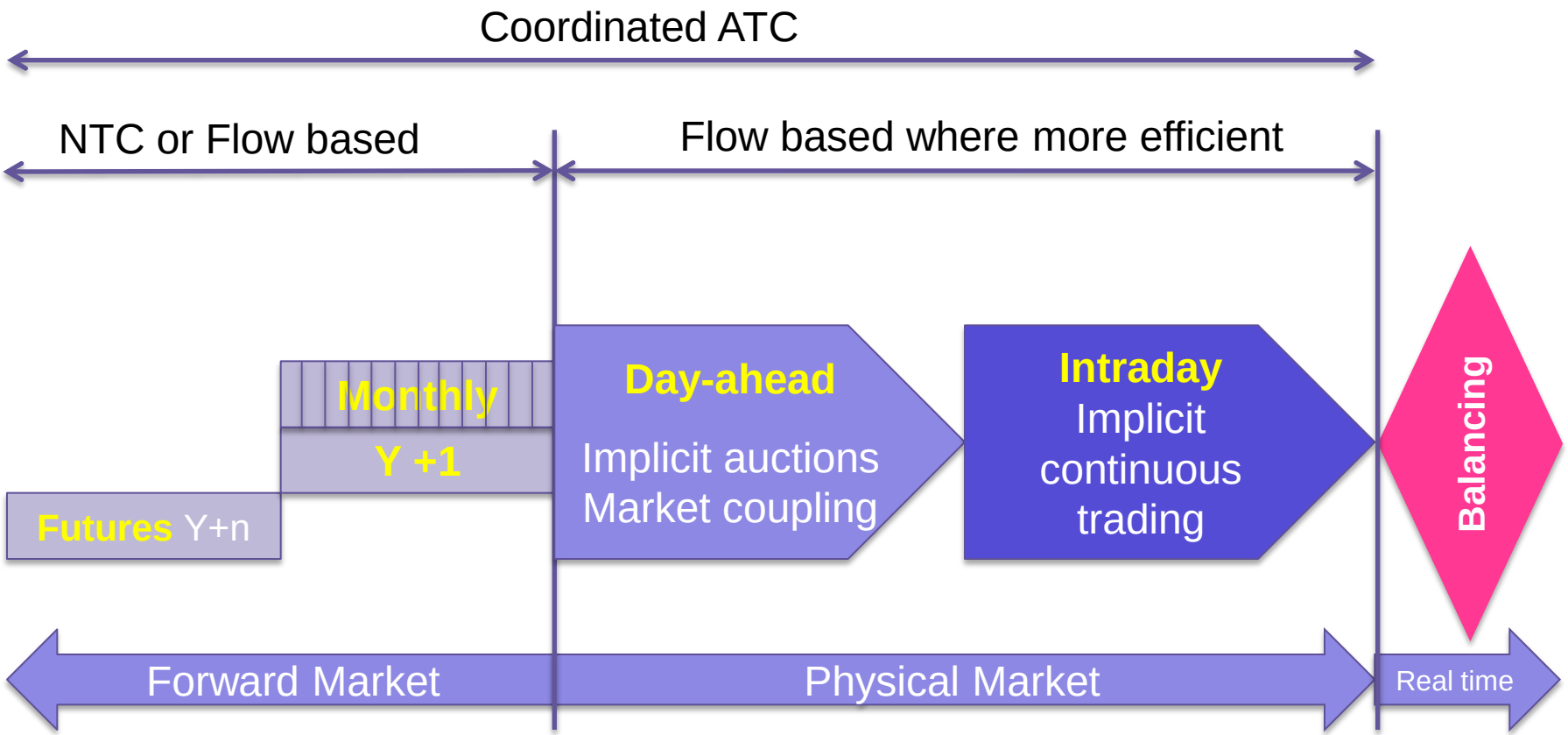
Commissioner Oettinger

entsoe

Creating a European market



A Common Market Model in .. 2014



Progressively built from very different starting points

UK-NL cable

April 2011

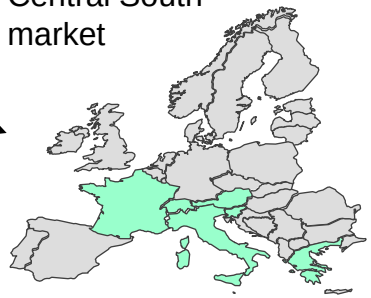
Central West & Nordic markets

Nov 2010

Baltic market

South West market

Central South market



entsoe

Supported via legally binding, robust network codes

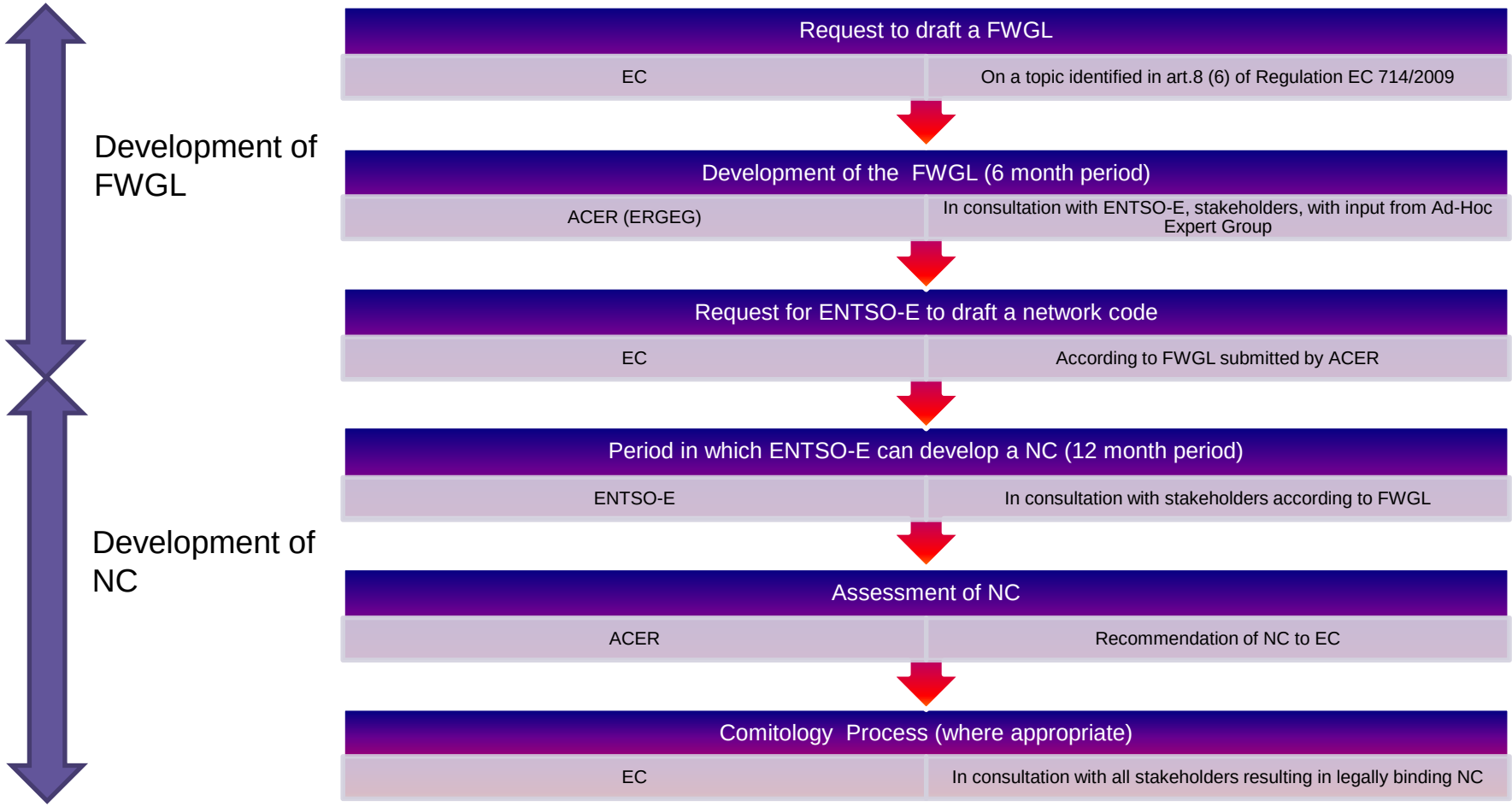
Markets	System Development	System Operations
Capacity Allocation & Congestion Management code	Network code on generator connection	Network code on operational security
Network Code on balancing	Network code on DSO & industrial load connection	Network code on operational planning & scheduling
		Network code on load frequency control & reserves

Legally binding network codes are:

- **A means to deliver the Target model.**
- **An opportunity to clarify and harmonise connection rules.**
- **A basis for ongoing coordinated system operation.**

➢ **An important process which we need parties to engage in.**

Developed, consulted on and becoming law within tight timescales



entsoe

Challenges for ENTSO-E

Expanding existing projects

- Developing day-ahead coupling
- Trialing intra-day designs
- Progressively expanding coverage

Creating network codes

- Which clearly explain rules
- Are developed with stakeholder buy-in
- And strike the right balance with national law.

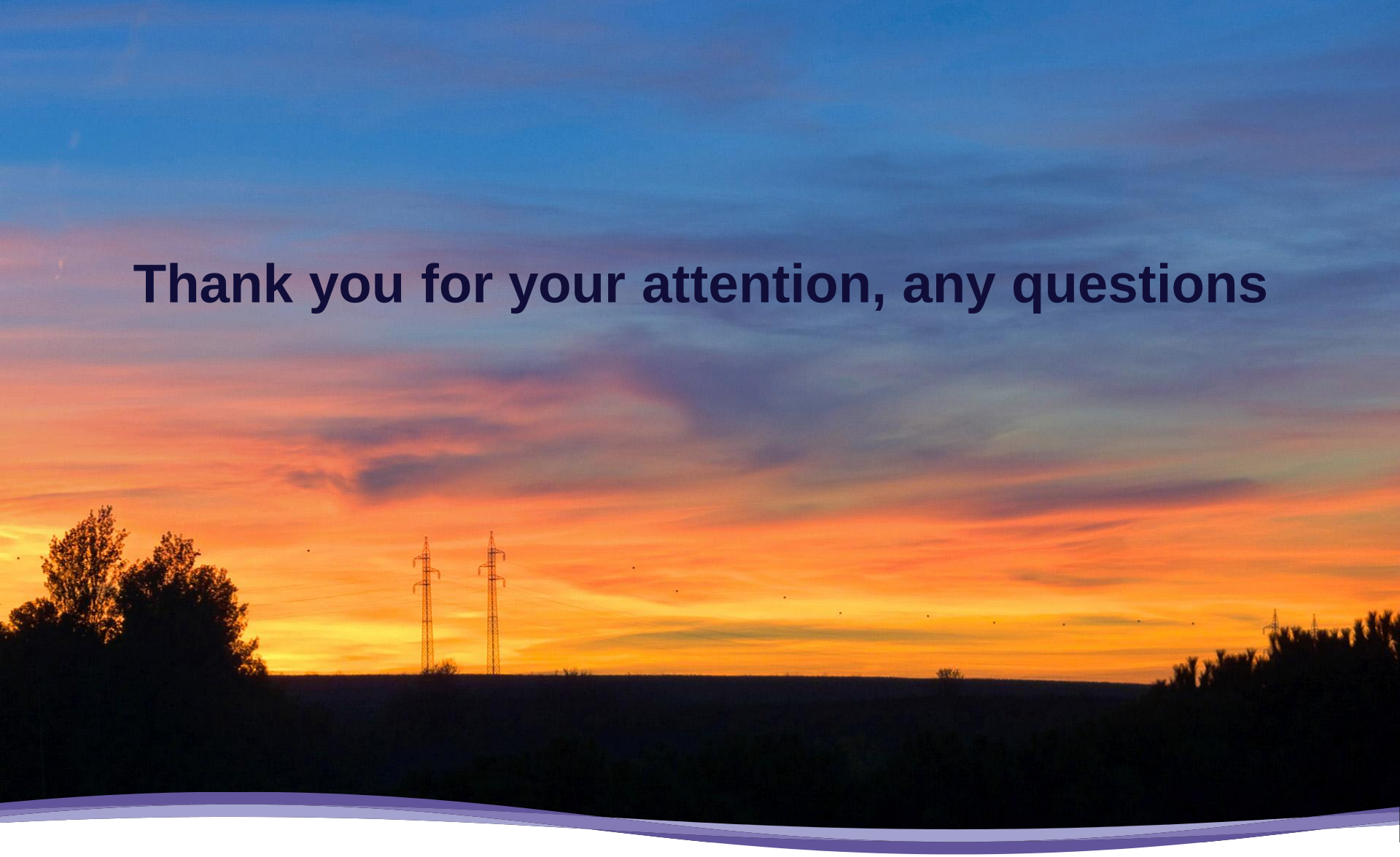
Focusing on forwards and balancing

- Developing rules for long term markets
- Effective cross border balancing

entsoe

Concluding Remarks

- **ENTSO-E has a significant role to play in creating a European market.**
- **Our activities will influence all stakeholders in all parts of Europe.**
- **Delivering a competitive internal energy market in 2014 is a significant challenge.**
- **Which will only be achieved with the assistance of and engagement with all stakeholders.**
- **Hence, we welcome views and urge you to get involved.**



Thank you for your attention, any questions

entsoe

Reliable Sustainable Connected

ofgem Promoting choice and value
for all gas and electricity customers

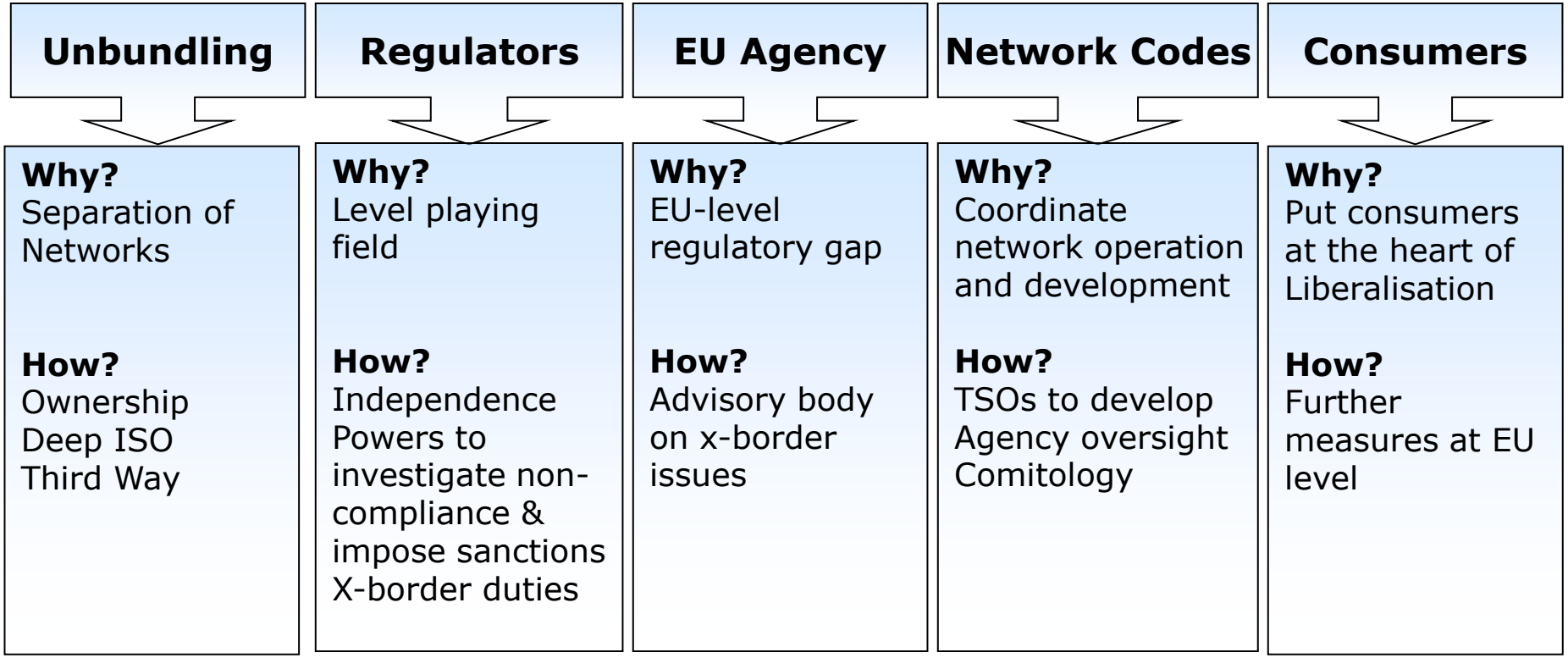
The FUI regional market initiative: Project overview

Olaf Islei
Senior Manager, European Strategy
Ofgem

Agenda

- Regional initiatives – shifting landscape
- Completing the internal electricity market
- FUI region draft workplan 2011-2014

The Third Package

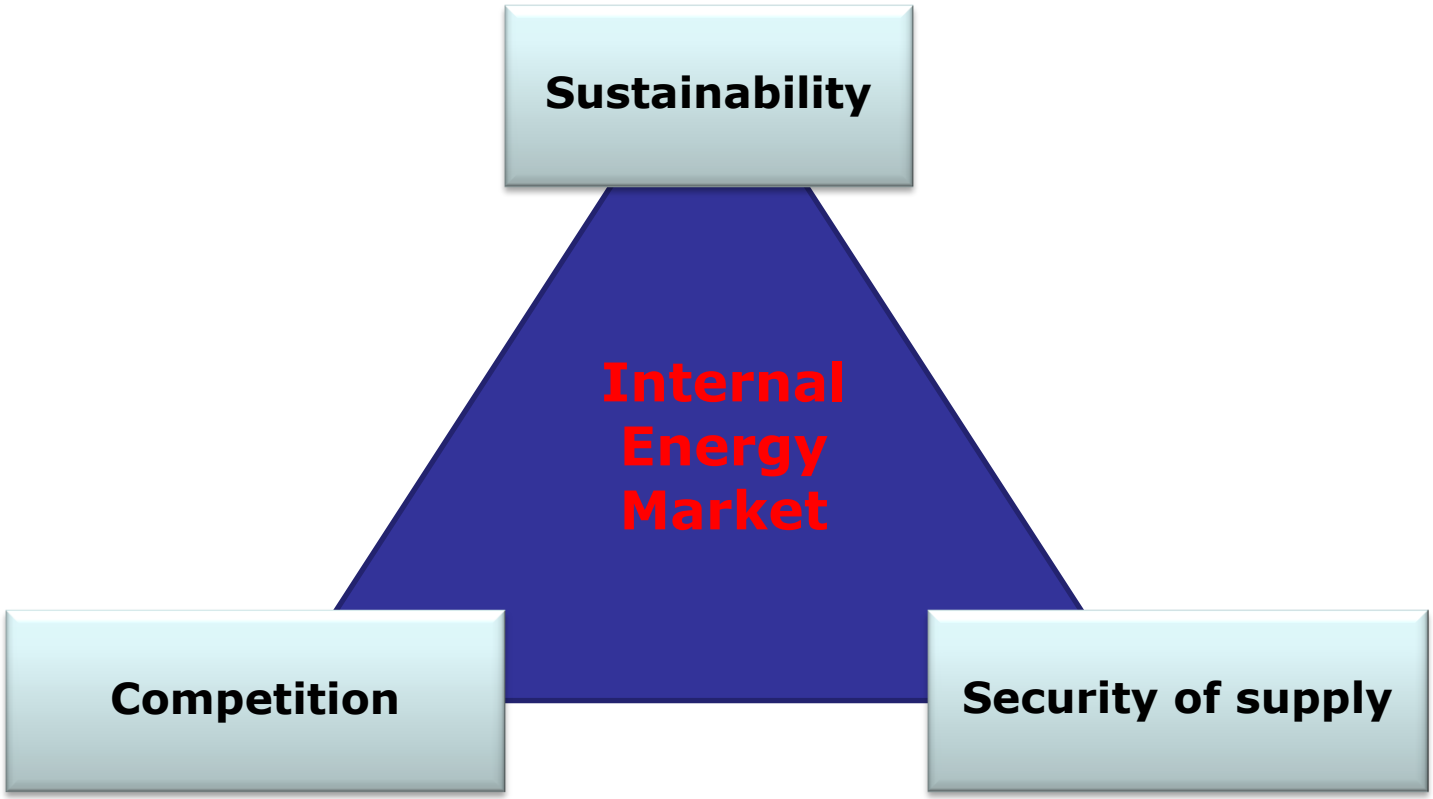


A cross-border regulatory framework by 2014

Regulation of cross-border trade

- Cross-border duties
- ACER
- ENTSO-E
- Network codes
- Target models for cross-border trade

Common challenges

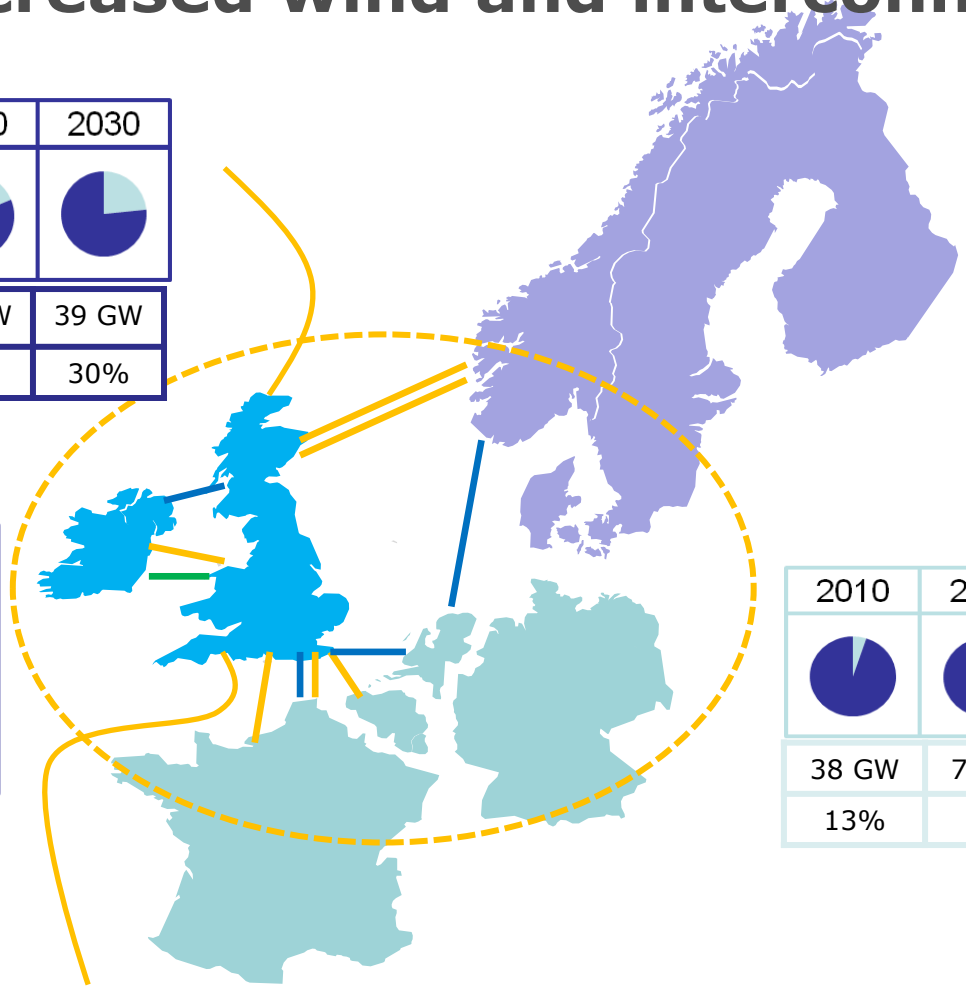


Increased wind and interconnection

2010	2020	2030
8 GW	29 GW	39 GW
8%	24%	30%

2010	2020	2030
5 GW	8 GW	11 GW
8%	11%	15%

Excluding Norway



2010	2020	2030
38 GW	77 GW	112GW
13%	20%	26%

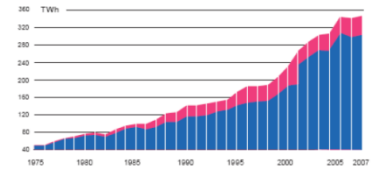


Figure 6: Historical evolution of electricity exchanges within UCTE *(blue)* and with third countries *(red)*

Source: UCTE

CURRENT STATUS

Regional Initiatives Structure

ACER – overall coordination

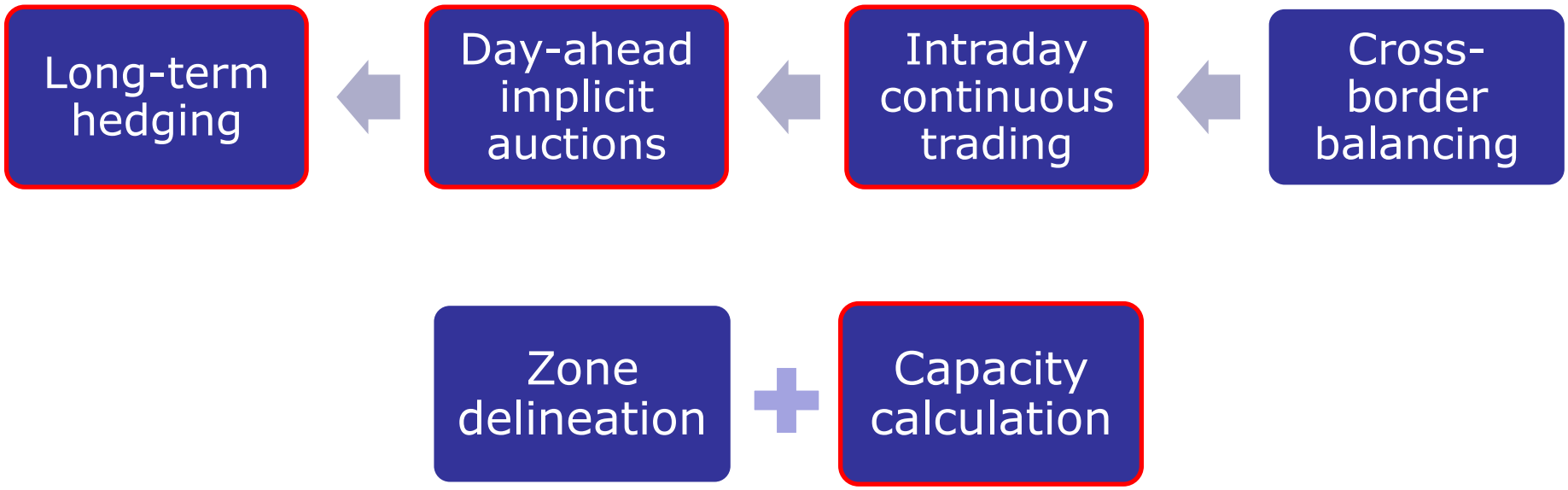
FUI Regional Initiative
Regional coordination

Regional coordination committee	Implementation Group	Stakeholder Group
Regulators and Ministries	Regulators and TSOs	Regulators, Ministries, Cion, TSOs, PXs, Generators, Suppliers

Completing the internal electricity market

- **February 2011** - Energy Summit of the European Council
  - The internal market should be completed by 2014
- **July 2011** – ACER adopts FG on Capacity Allocation and Congestion Management (CACM FG)
  - Core elements of European target model for cross-border trade
- **September 2011** – detailed ACER roadmap to implement target models by 2014
- **September 2012** – ENTSO-E finish CACM Network Codes

CACM FG target models



Focus of ACER roadmaps – Regional and Pan-European (i.e. 2014 target)

Regional evolution

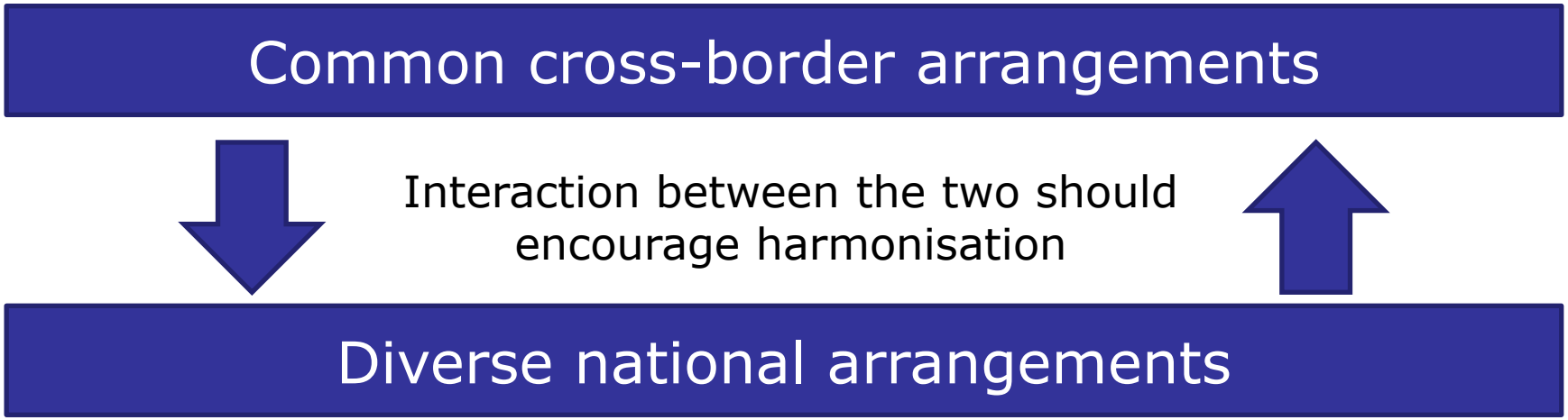
FUI region

Day-ahead market coupling

Intraday trading

Long-term auctions

The European layer



FUI Region draft workplan

GB-NWE day ahead	• Q4 2011 – select GB hub • Q2 2012 – market coupling over IFA • Q4 2012 – North-West European price coupling
GB-NWE intraday	• Q4 2012 – NWE intraday interim solution • Q4 2014 – NWE intraday target model
GB-SEM day-ahead	• Q2 2012 – Develop options for market coupling • Q4 2012 – SEM regulators decide preferred option • 2014-16 – implement target model
FUI LT auction coordination	• Q3 2011 – TSOs implement quick wins • Q4 2011 – NRAs develop detailed roadmap • Q3 2013 – Implement target model

Conclusion

- The European target models explained in the ACER Framework Guideline
- Regional and European roadmaps to achieve the 2014 target date on the ACER website

  http://www.acer.europa.eu

- An estimation of the cost of implementing CWE market coupling and EMCC is approximately €36 million

EU Integrated Electricity Market

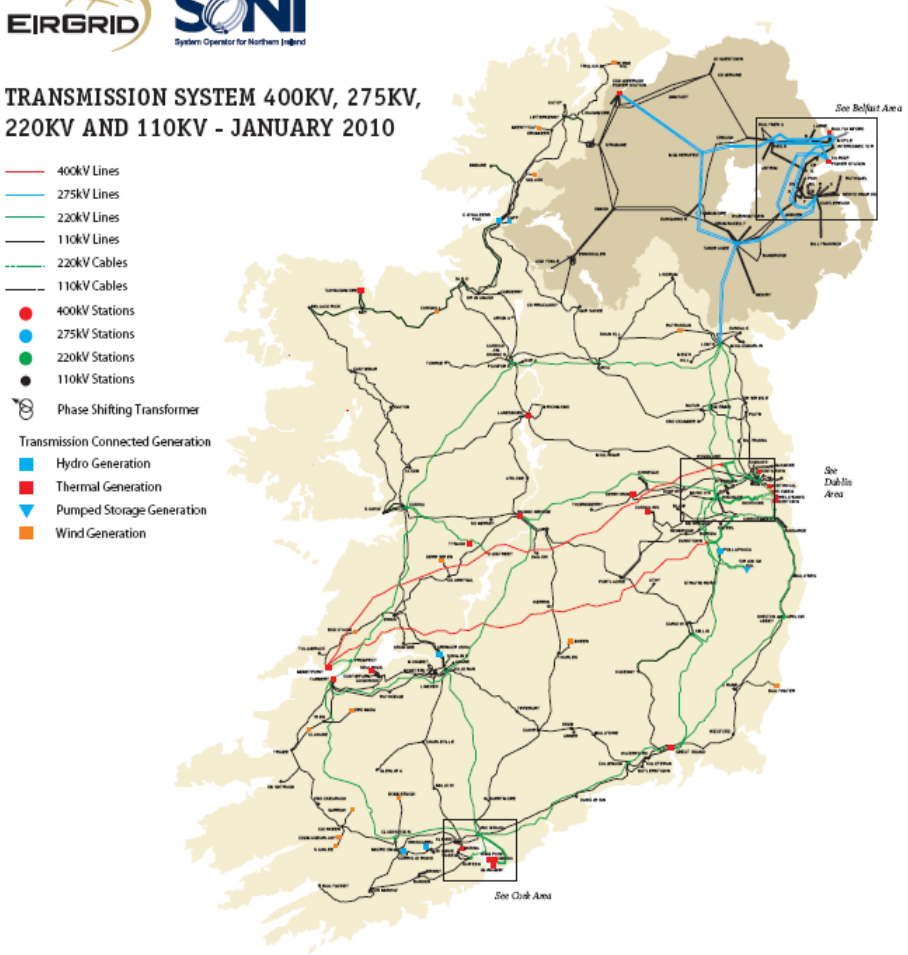
The Market Operator's perspective on the new market arrangements

David Stevens

Manager, SEMO Market Development

2 SYSTEM OPERATORS

EIRGRID SONI System Operator for Northern Ireland



3 GOVERNMENTS – IE, NI & UK

Northern Ireland Executive

2 REGULATORY AUTHORITIES

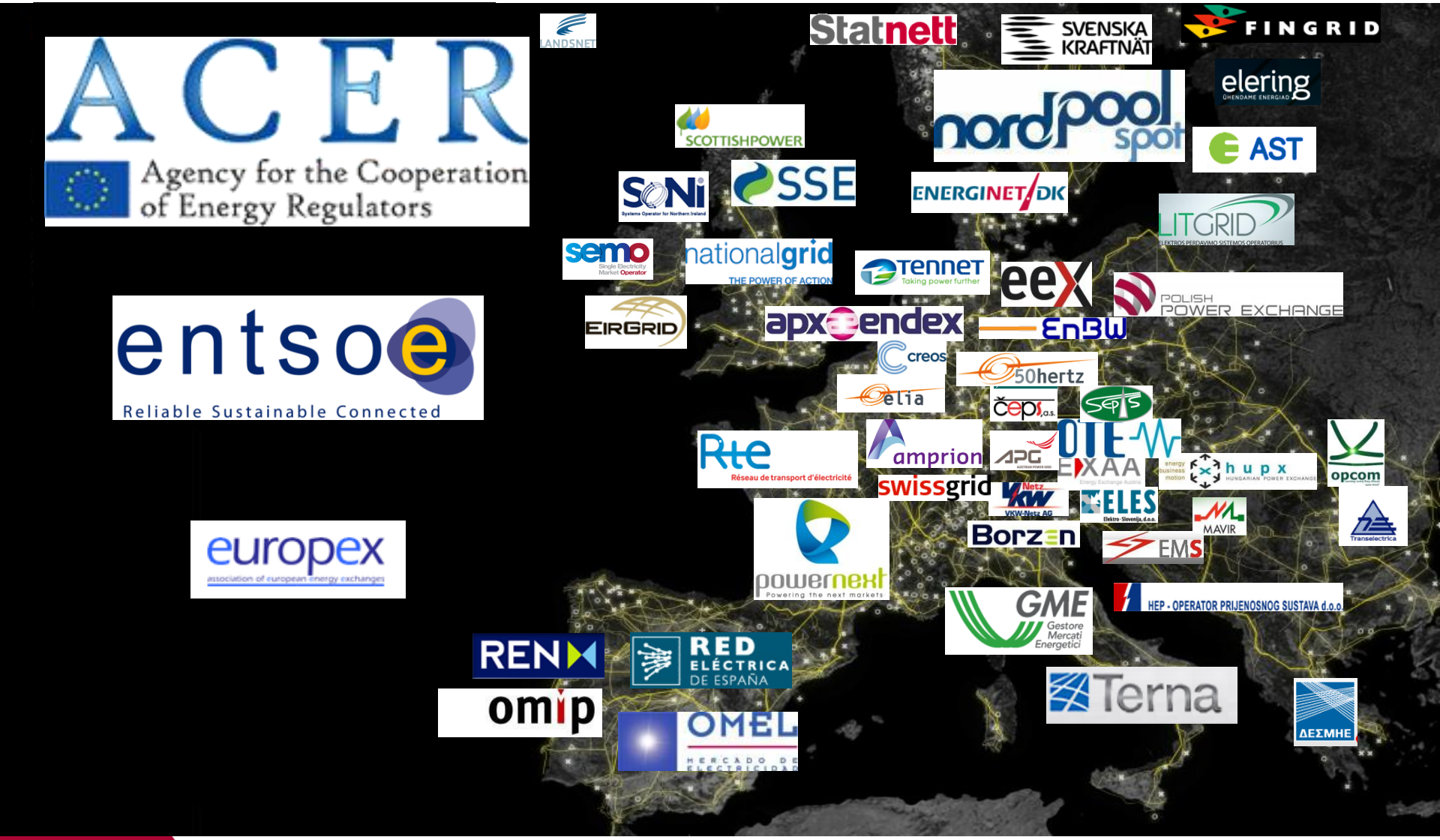
Utility Regulator ELECTRICITY GAS WATER

CER Commission for Energy Regulation An Coimisiún um Rialáil Fuinnimh

1 SINGLE ELECTRICITY MARKET

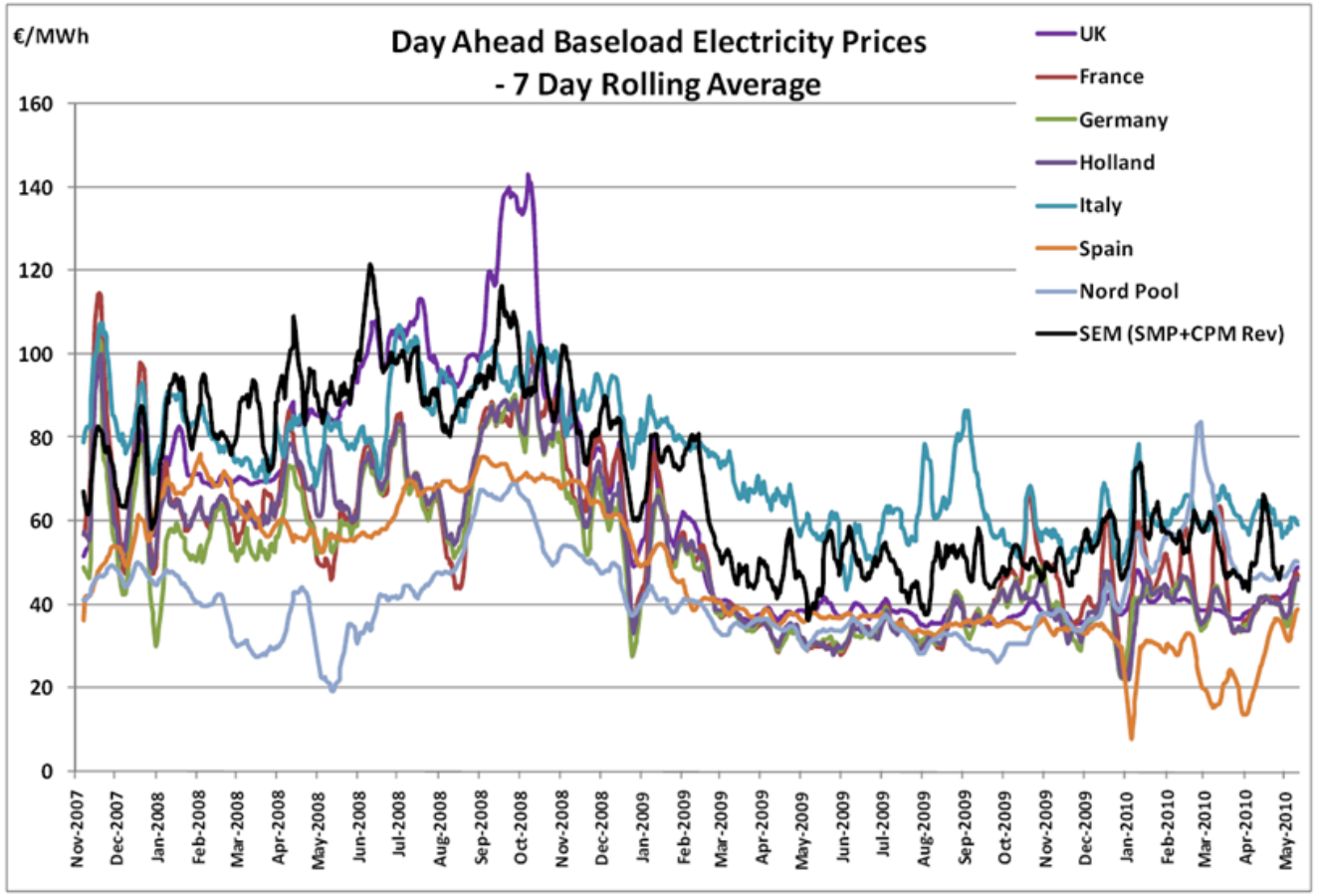
semo Single Electricity Market Operator

Playing field is considerably bigger now…



…however, benefits of enhanced trading arrangements are considerable.

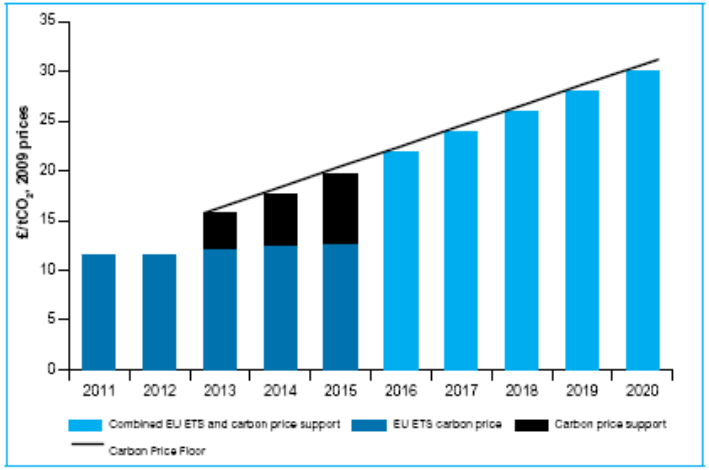
Why couple? An integrated marketplace promotes greater competition.



Source: Bloomberg, RAs

… for the benefit to all consumers across the EU.

The UK is reviewing energy policy to ensure security of supply of low carbon generation



…we need to be mindful of this when considering coupling options.

Achieving SEM required the highest amount of coordination and cooperation

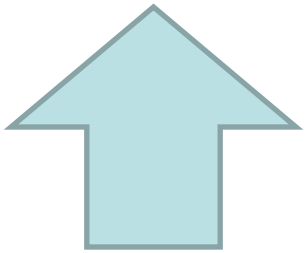
	Volume Coupling	Price Coupling	Market Splitting	Single Market
Entities doing Pricing	Multiple Entities	Single Entity	Single Entity	Single Entity
Entities doing Clearing & Settlement	Multiple Entities	Multiple Entities	Single Entity	Single Entity
Inter Area Congestion	Multiple Prices	Multiple Prices	Multiple Prices	Single Prices
Example	SEM-BETTA	CWE	Nordpool	SEM

Increasing coordination necessary

Achieving SEM required the highest amount of coordination and cooperation

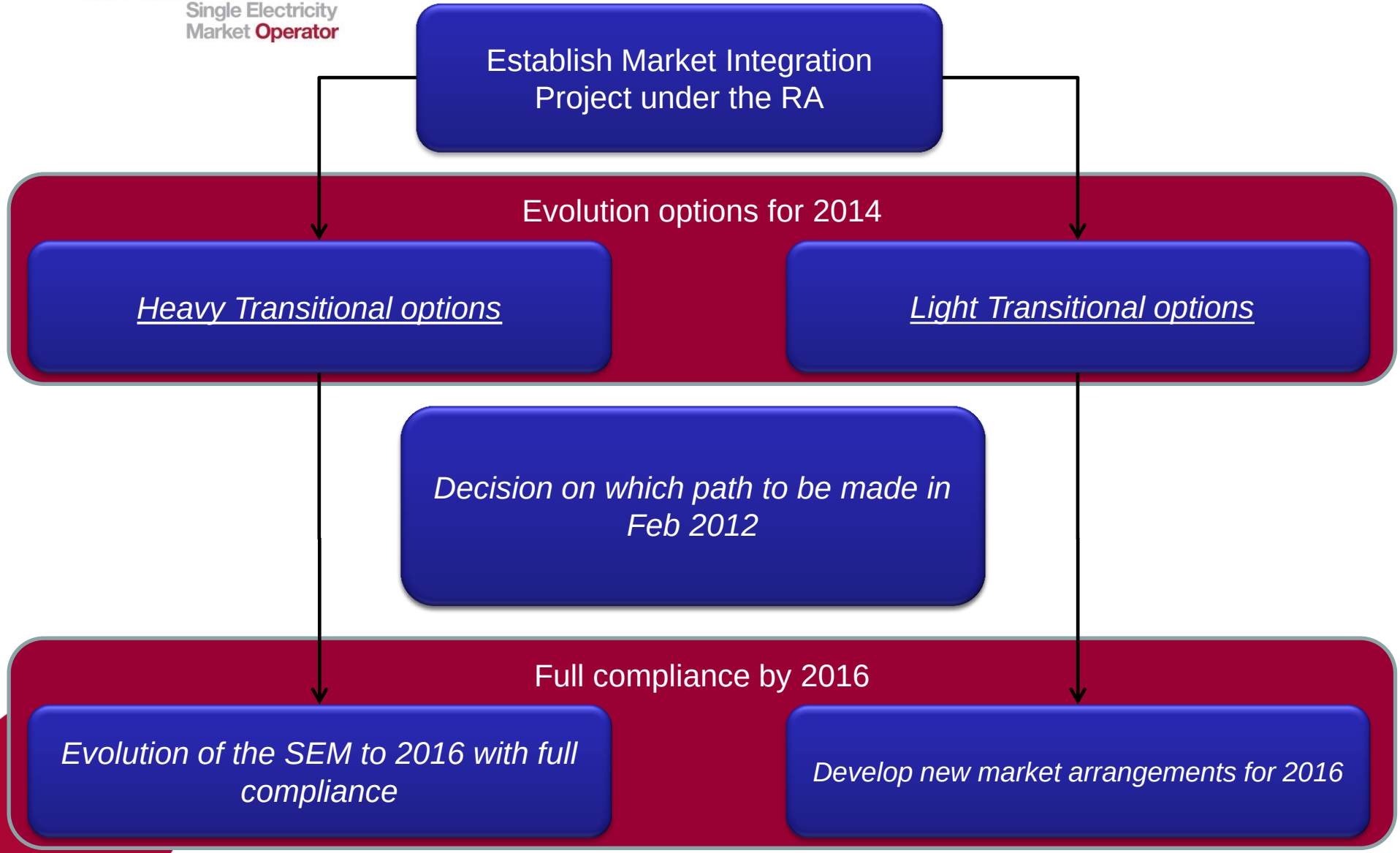
	Volume Coupling	Price Coupling	Market Splitting	Single Market
Entities doing Pricing	Multiple Entities	Single Entity	Single Entity	Single Entity
Entities doing Clearing & Settlement	Multiple Entities	Multiple Entities	Single Entity	Single Entity
Inter Area Congestion	Multiple Prices	Multiple Prices	Multiple Prices	Single Prices
Example	SEM-BETTA	CWE	Nordpool	SEM

Increasing coordination necessary

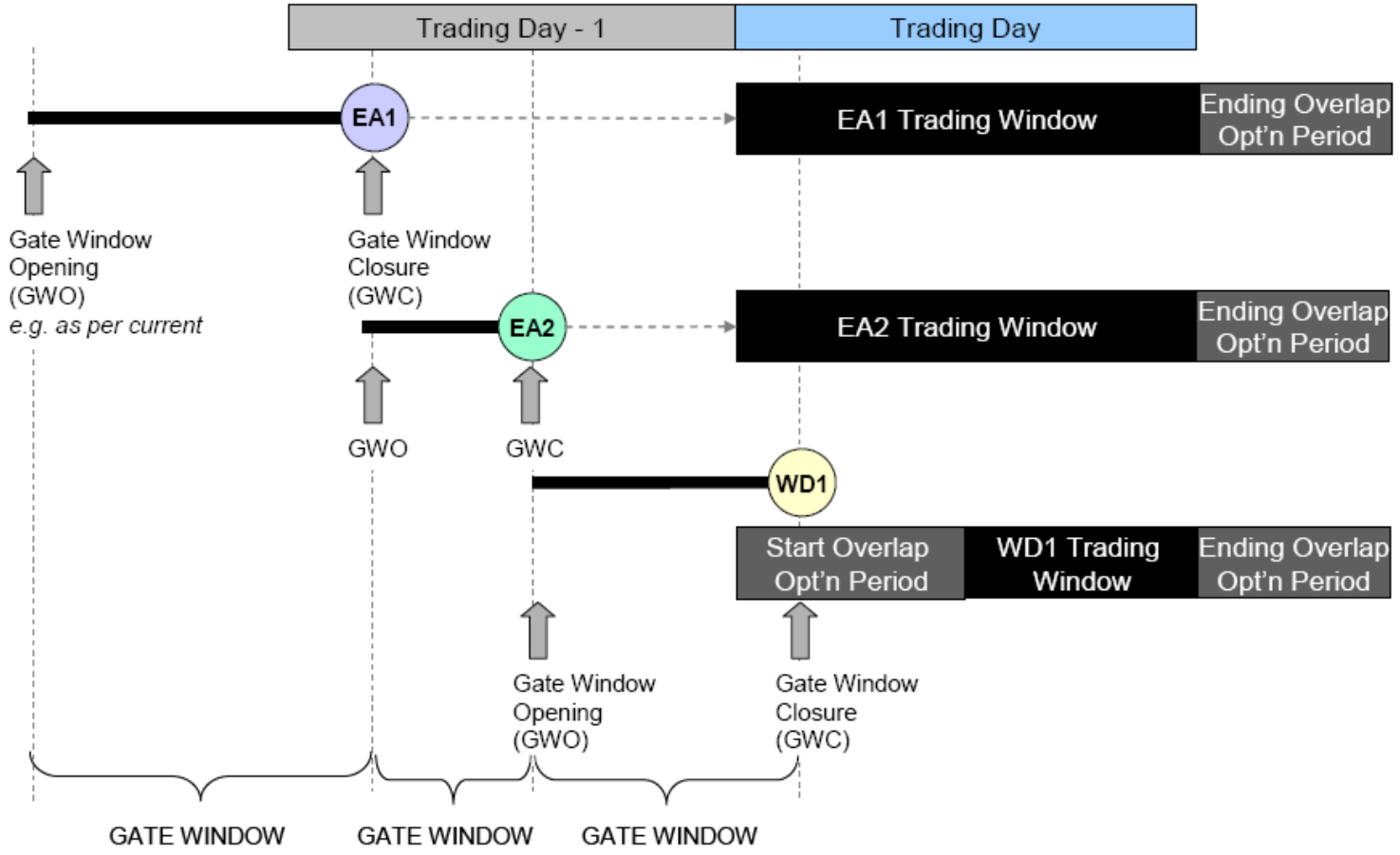


Capacity Allocation and Congestion Management Framework Guidelines states that Price Coupling is the preferred model

The Evolution of SEM - Workplan



Intraday Trading (IDT) is part of the bigger picture and is an



The Evolution of SEM - Workplan

INTRA DAY TRADING (IDT)

GB-SEM Border	Responsible	Deadline
Implement Intraday trading on SEM-GB interconnectors	PXs/TSOs/FUI/Regulators	Mid 2012
Develop options to deliver CACM FG target model, a consultative process	TSOs/MO	End 2012

SEM with IDT and Target Model

Stage	Long Term	Day Ahead	Intra-day	Balancing	Settlement
SEM	Renewables and Legacy Contracts	Indicative Price and Quantities Physical IC Nominations	Implicit Auctions	SO-SO Trades Imperfections	Local
Target Model	Bilateral and Nominations	Single Price Coupling	Continuous Implicit	Balancing TBC	Local
Gap	No Physical Nominations for Price Makers	No Firm Day Ahead Price and Quantities	Not Continuous	TBC	OK

Market Operators Perspective

- **Aligning SEM with the Target Model will be challenging from an implementation perspective; however, there may be many ways in which we can achieve this.**

Cost. Accuracy. Timeliness.

- Cost of options needs to be weighed against benefits.
- Accuracy: options need to comply with Network Codes.
- Timeliness: transitional arrangements “may” be in place by 2014 and do not extend beyond 2016 for full TM compliance.

This is the beginning of a process that will see the SEM evolve through 2014-2016

- **We are eager to fully understand Industry Stakeholders perspective**
- **Initial opportunities will occur:**
  - Today
  - Bilateral meetings in CER offices on 8th Sept 2011
  - Bilateral meetings in NIAUR offices on 9th Sept 2011
  - Further engagement in Oct 2011
  - In response to RA consultation in Jan 2012

All components of the menu need to be complimentary …

Implicit Intraday Auctions

-O-

Day Ahead Price Coupling

-OO-

Forward Capacity Allocation

-OOO-

Implicit Continuous Intraday

Interconnectors in the new market arrangements

Paul McGuckin

1 September 2011

- Role of interconnectors
- Current and future capacity allocation
- Target model
- Coupling in SEM

Role of interconnectors

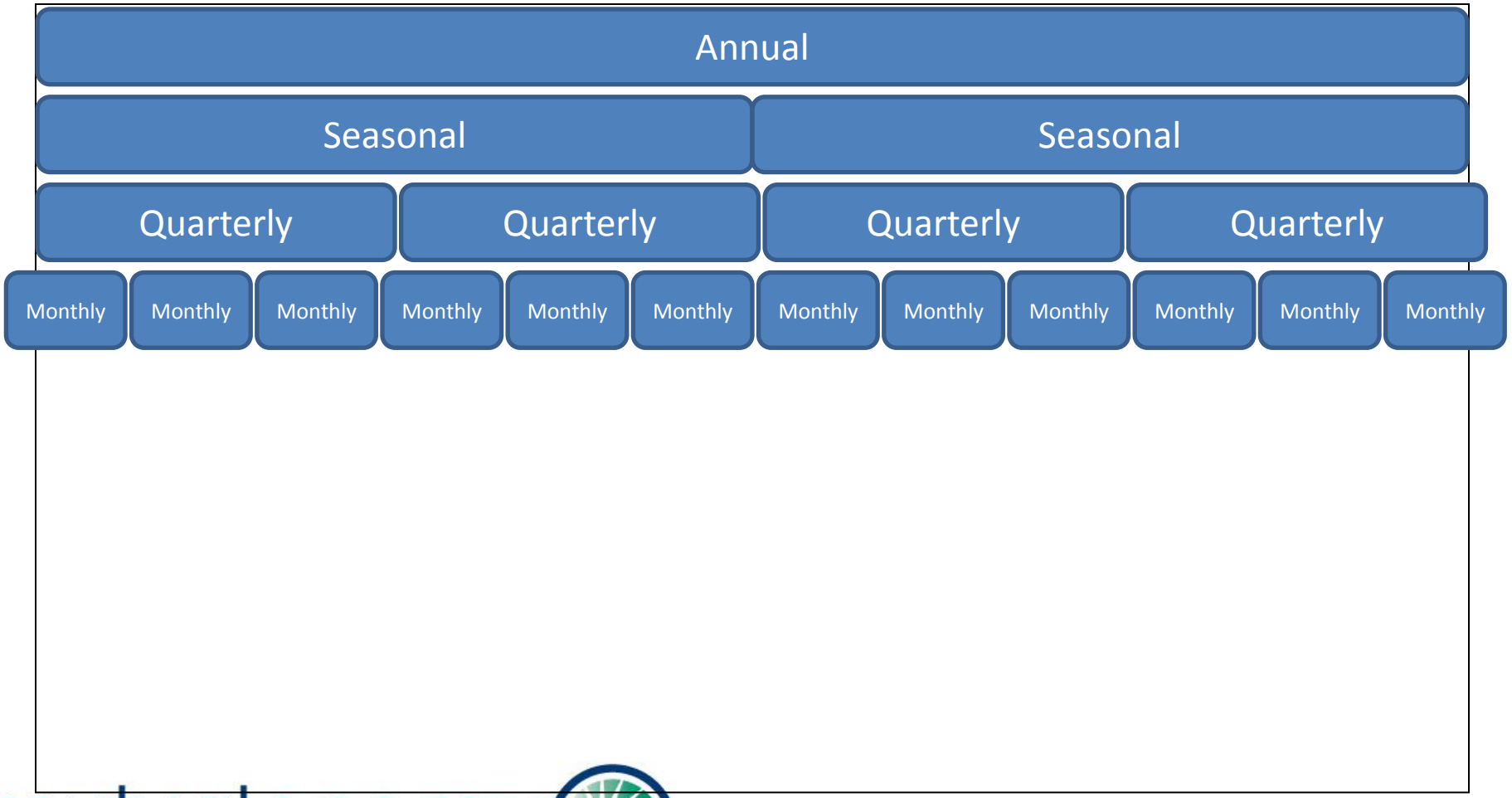
- Physical link between two markets
- Allows traders to sell power (generally) from higher priced market to lower priced market
- Interconnector owner typically allocates interconnector capacity through explicit auctions
  - All of these statements hold true under new arrangements
- Framework guidelines envisage implicit capacity allocation
  - Interconnector owners can't do this in isolation

Role of interconnectors

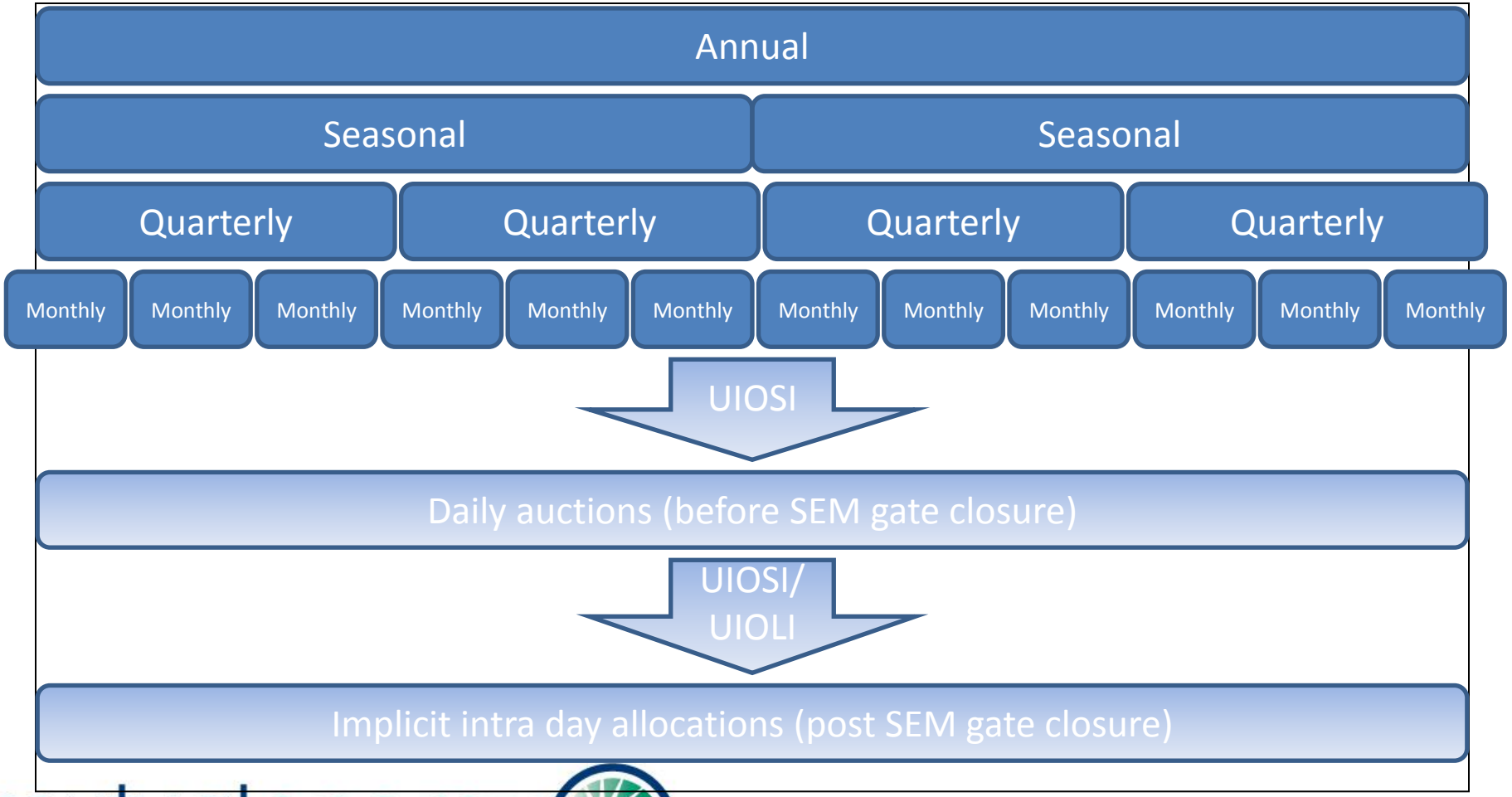
- Physical link between two markets
- Allows traders to sell power (generally) from higher priced market to lower priced market
- Interconnector owner typically allocates interconnector capacity through explicit auctions
  - All of these statements hold true under new arrangements
- Framework guidelines envisage implicit allocation
  - Interconnector owners can't do this in isolation

Market arrangements are key

Moyle current explicit auctions



Near future developments



Target model

- Upcoming SEM developments are a significant move toward European compliance but still leave SEM short of CACM FG
- Key change for interconnectors in how capacity is allocated
- SEM intra-day modification involves implicit allocations but this is very different to both continuous intra-day trading and implicit day-ahead market coupling
- SEM evolution (or revolution?) required
  - Needs to be compatible with neighbouring market

SEM requirements for coupling

- Day-ahead prices
  - Coupling takes place at day-ahead stage
  - SEM is ex-post market so currently no day-ahead price
- SEM power exchange involvement
  - Power exchange algorithm takes all bids/offers and allocates capacity in most efficient manner
  - Liquidity
- Firm capacity
  - Party providing firmness must be able to deliver

Impact of coupling

- Most efficient allocation of capacity at day-ahead
  - More “participants” in SEM
  - Capacity allocated to lowest prices
- Interconnector flows should be maximised
  - Moyle load factor 70-90% within past year
- Should see some price convergence

Optimum interconnection

- Integrated market requires/envisages significant new interconnection
- Price convergence reduces value of interconnector
  - Diminishing returns versus significant build cost
- Probable cost recovery through TUoS
- Consumer benefit must outweigh cost

Summary

- Substantial progress being made towards alignment with European requirements
- Still lots of work required to make SEM compatible with CACM FG
- Interconnectors can help deliver benefits for consumers if market arrangements are appropriate
- Need to consider optimum level of interconnection

RED ELÉCTRICA DE ESPAÑA

Integration of the Spanish electricity market into the new European market

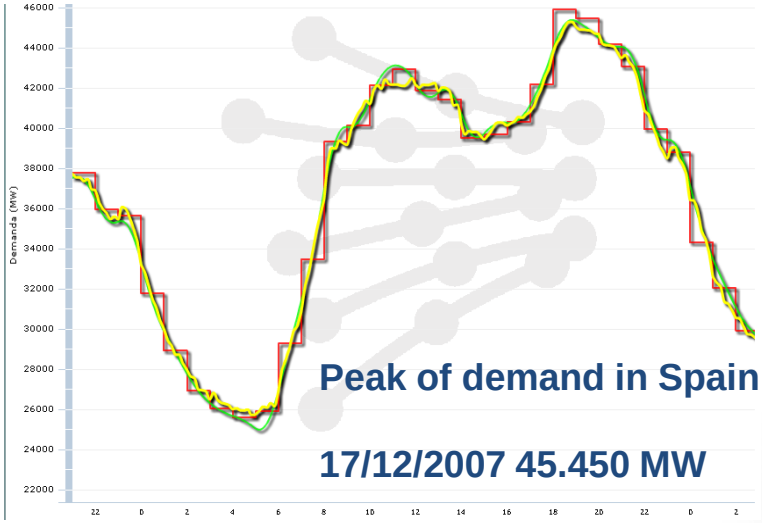
ESTER PEREGRINA
Market Advisor REE

EU INTEGRATED ELECTRICITY MARKET SEMINAR
Dublin, Thursday 1 September 2011

1. The Spanish Electrical system
2. The MIBEL market
3. Integration of MIBEL into the IEM
4. Transparency and information management
5. Conclusions

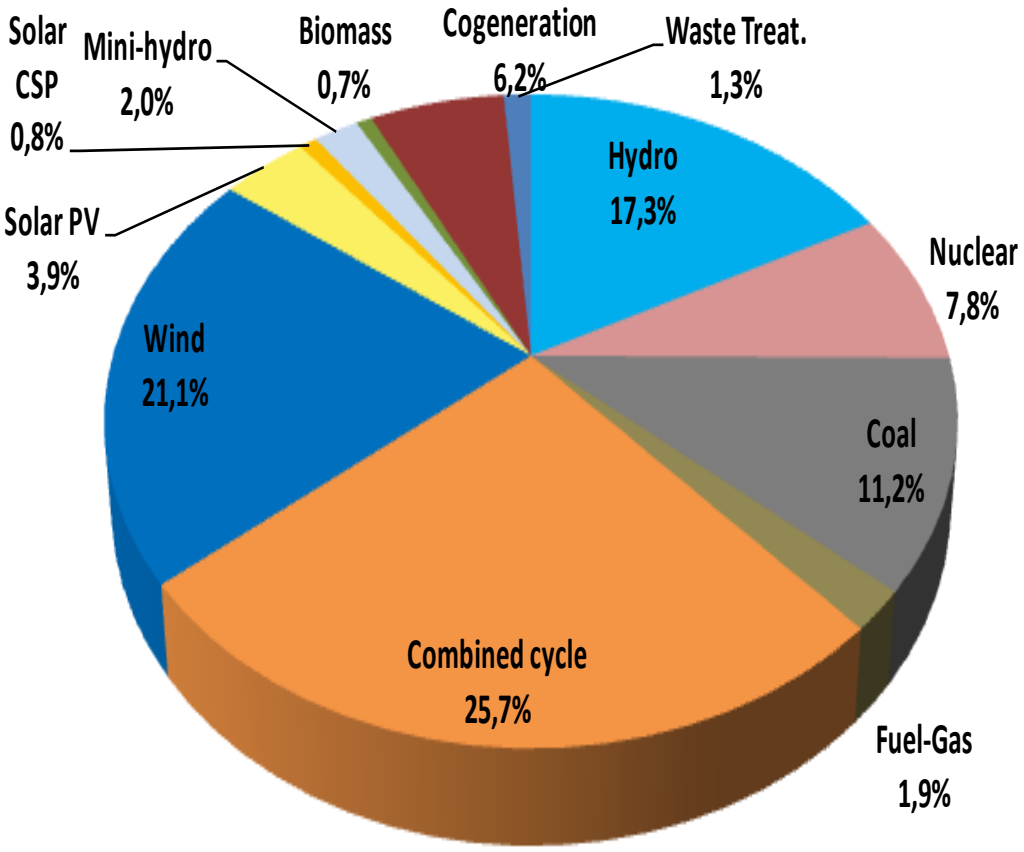
REE as Spanish Transmission System Operator

- REE established in 1985 as the first company in the world exclusively dedicated to transmission and system operation
- Footprint: Spanish mainland, Canary and Balearic Islands, Ceuta and Melilla
- Assets: nearly 39,000km of HV transmission lines, 4,600 busbar connections and 73,000 MVA of transformer capacity
- Control Centres: two for System Operation and one for Renewables
- Share capital: 80% free float, rest public



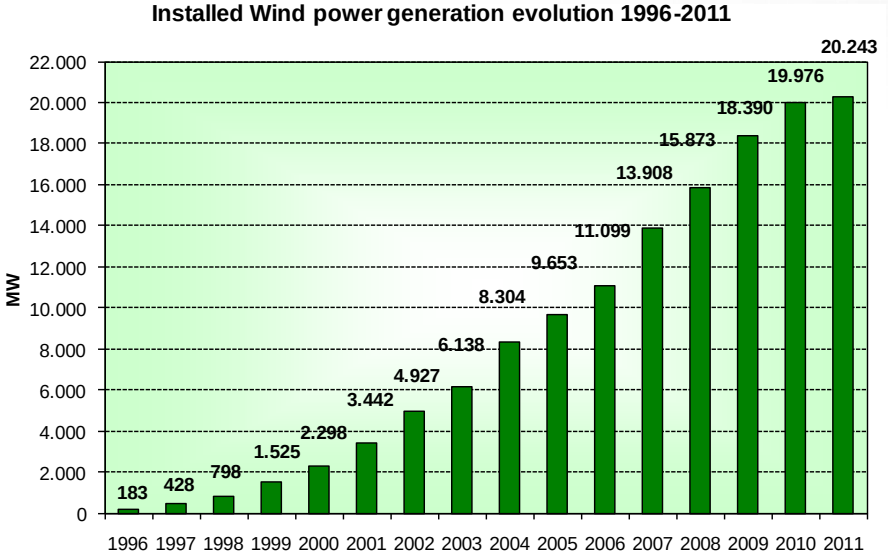
Generation mix and installed capacity in Spain

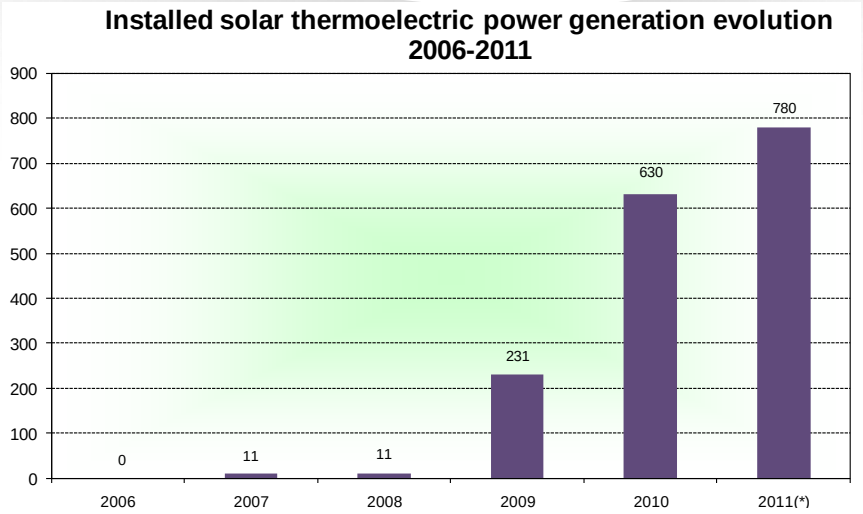
May 2011

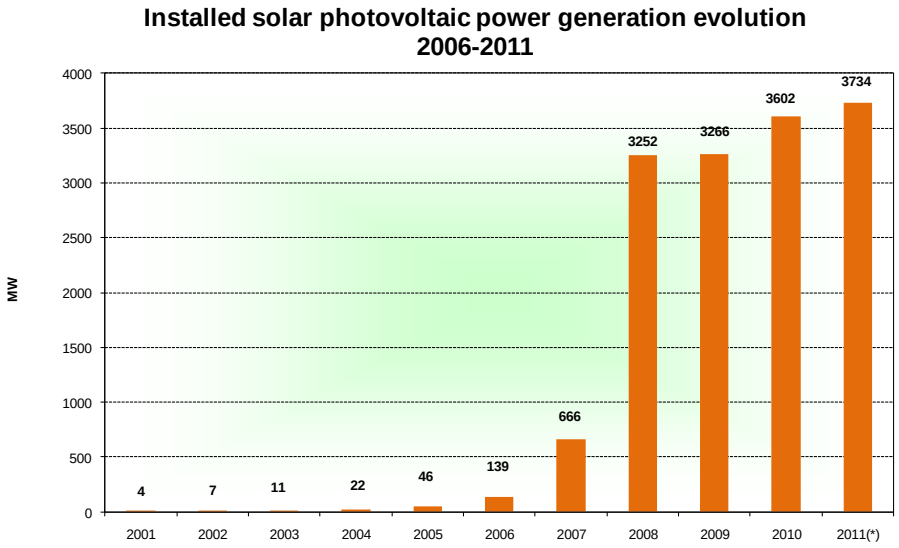


Technology	MW	%
Hydro-power	16.657	17,4
Nuclear	7.455	7,8
Coal	10.789	11,3
Fuel-Gas	1.849	1,9
Combined cycles	24.720	25,8
Total (ordinary regime)	61.470	64,0
Wind power generation	20.243	21,1
Solar PV	3.734	3,9
Solar CSP	780	0,8
Biomass	684	0,7
Special regime hydro	1.965	2,0
Cogeneration	5.946	6,2
Waste treatment	1.204	1,3
Total (special regime)	34.556	36,0
Total	96.026	

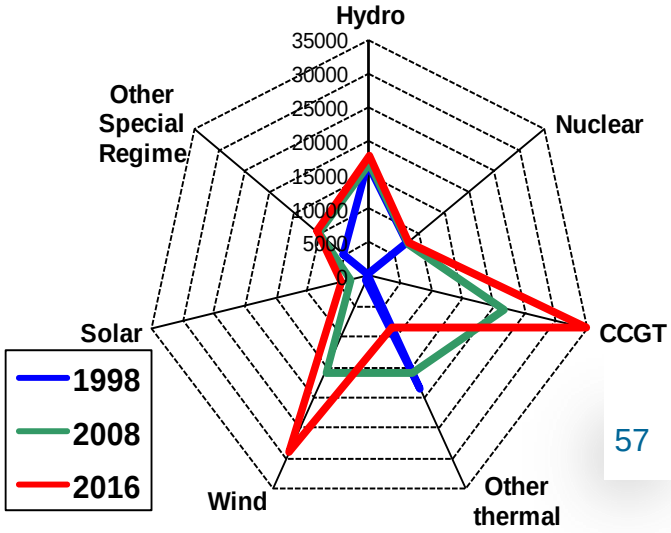
Evolution of installed capacity in the Spanish System



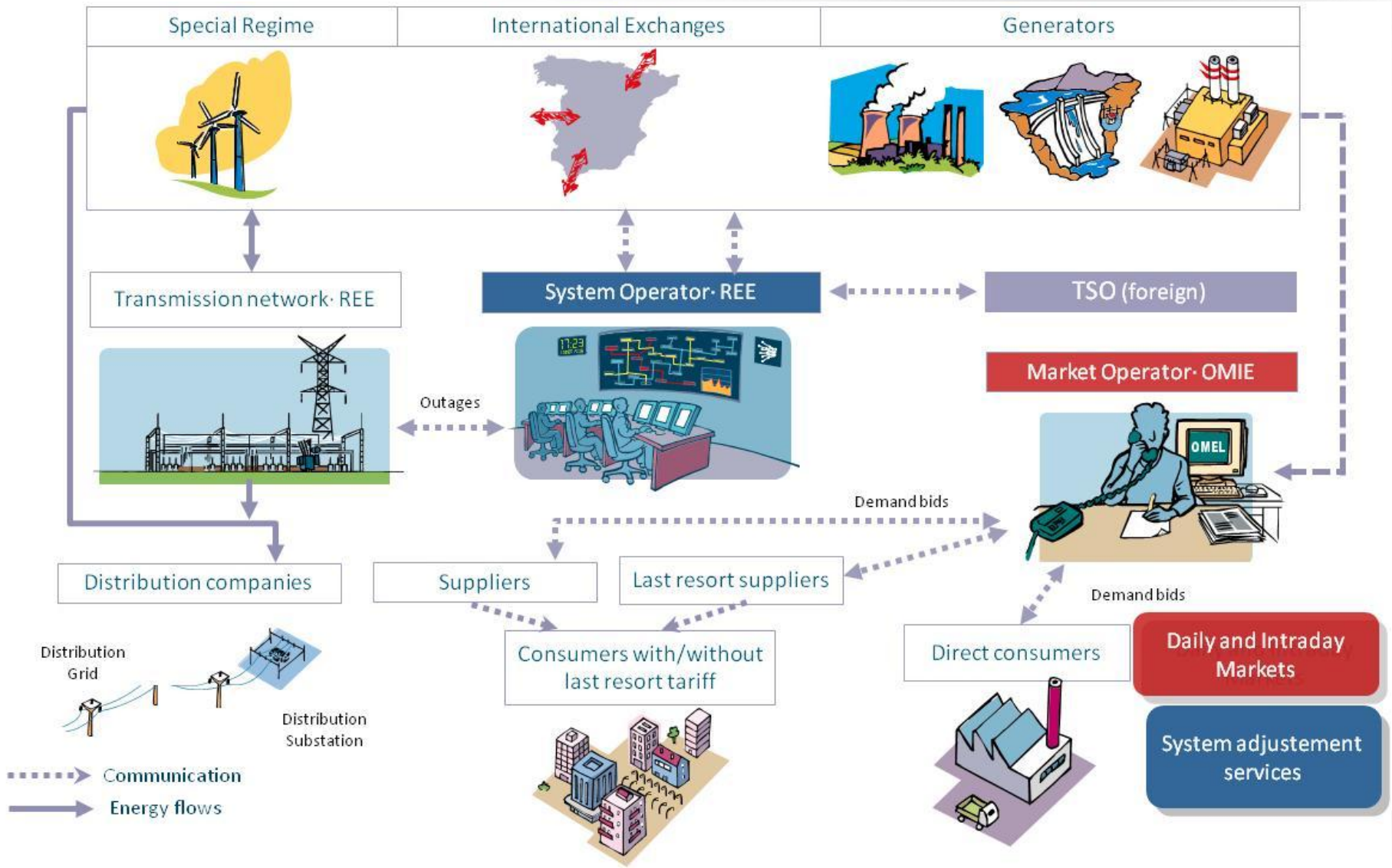




Foreseen evolution of the generation mix



Spanish electrical system organization



System Operation challenges

- **Variety of generation technologies**
  - **Energy mix more intermittent and less manageable**
- **Insufficient cross-border capacity of the Iberian peninsula**
- **Spanish load demand:**
  - **Depending on:**
    - **Meteorology**
    - **Labour-day/Holiday**
    - **Week day**
    - **Year time**
  - **Still increasing and continuously changing**

Accumulated increment 1996-2010 = 74%

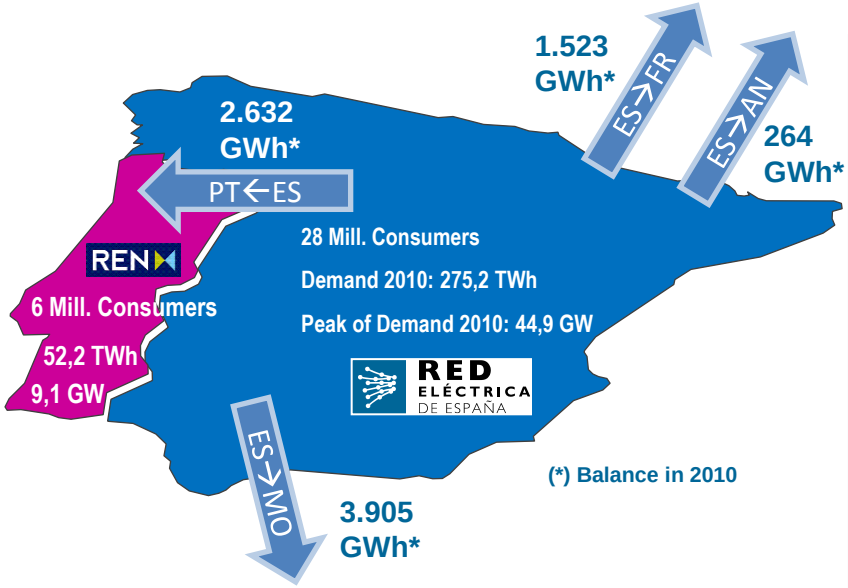
Increment period 2000-2010 = 33%

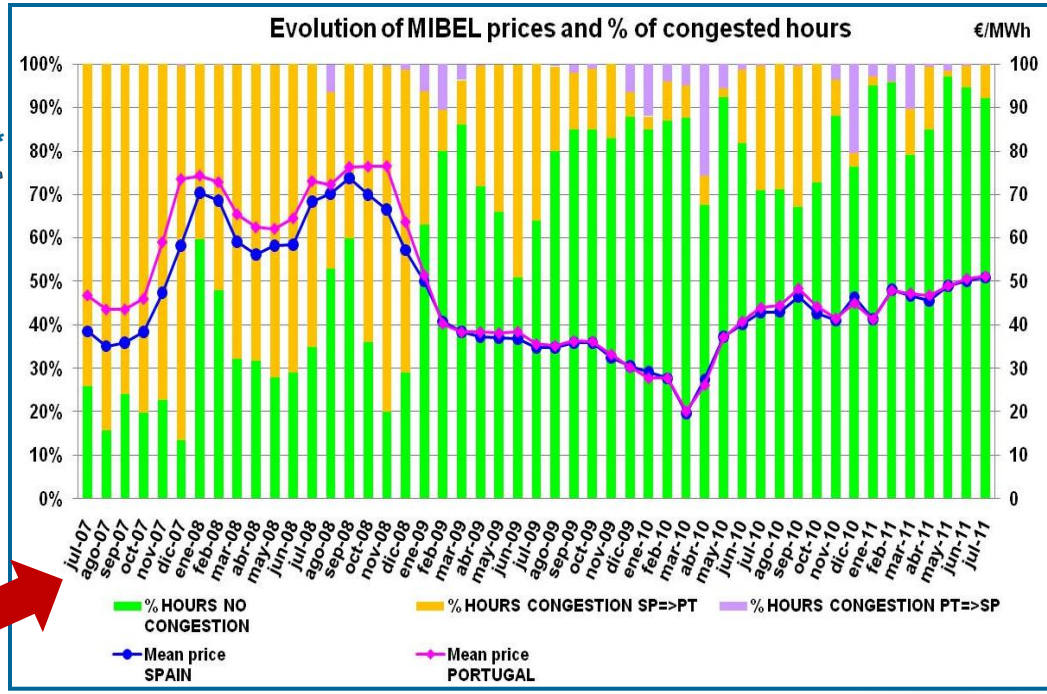
- **CECRE (REE Control Centre for Renewable) and RESCC (companies') facilitate the integration of special regime generation and in particular RES in the System Operation**

1. The Spanish Electrical system
2. The MIBEL market
3. Integration of MIBEL into the IEM
4. Transparency and information management
5. Conclusions

MIBEL: 4 years of Iberian market

- Since July 2007, **MIBEL** is a single electricity market between **Spain** and **Portugal** that manages **day ahead** and **intraday markets**:
  - One Power Exchange (OMIE), one Derivatives Exchange (OMIP), two TSOs (REE & REN) and a single Council of Regulators
  - **Market Splitting** if congestion occurs at **Portuguese-Spanish border** → two price zones
  - **79%** of the **hours** with **single price** in the DA market (average value in 2010)

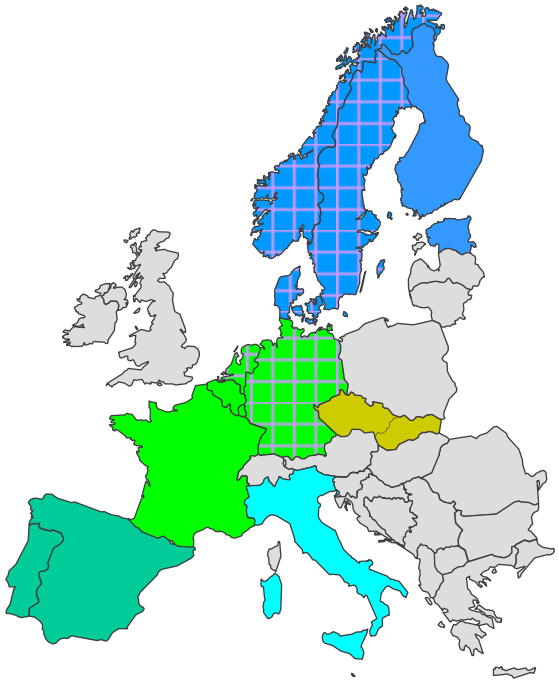




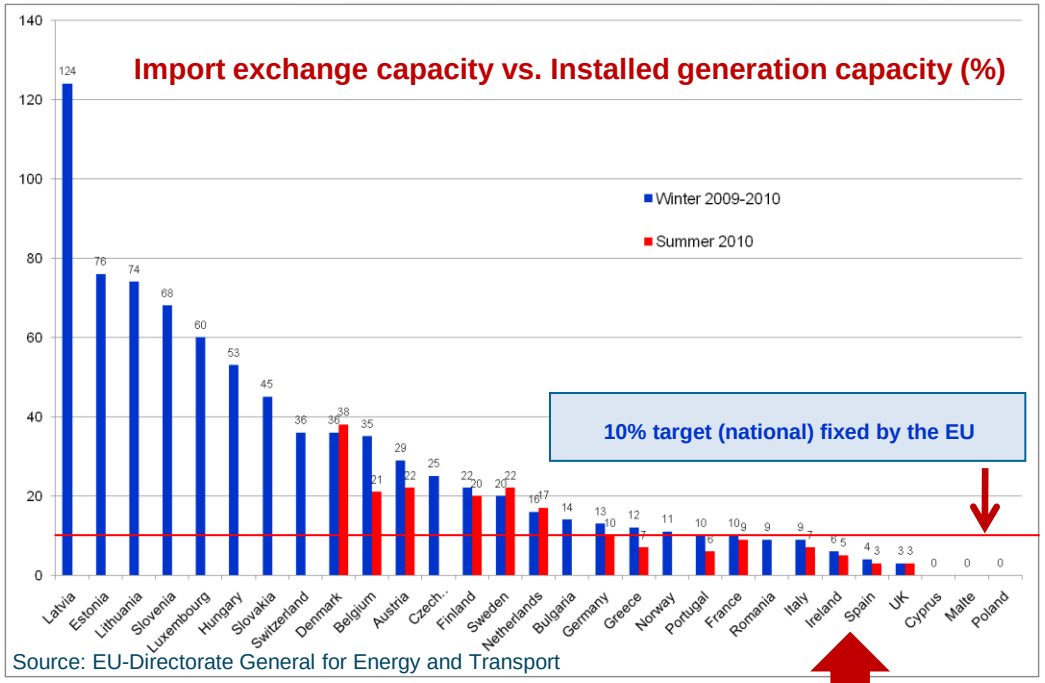
Increase of hours without congestion
Convergence in prices

The MIBEL in Europe

- **2011 outlook of regional markets coupled in the day-ahead timeframe**



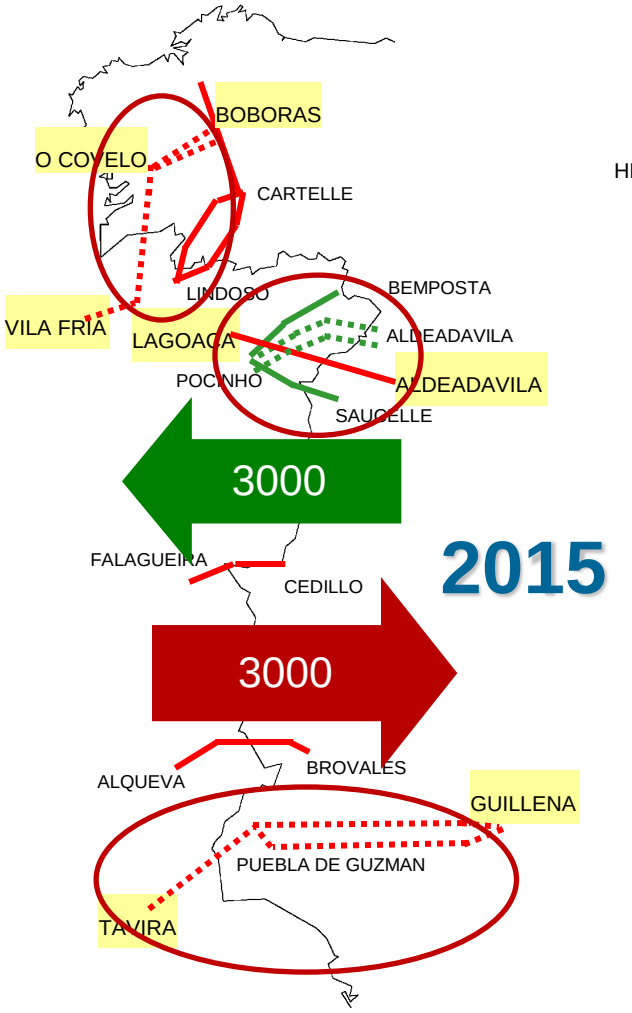
Regional Markets coupled in DA		
	Nordic countries+ Estonia	Market splitting
	CWE	Price coupling
	EMCC	Tight Volume coupling
	MIBEL	Market splitting
	Czech Rep.+ Slovakia	Price coupling
	Italy + Slovenia	Market splitting (several price zones)



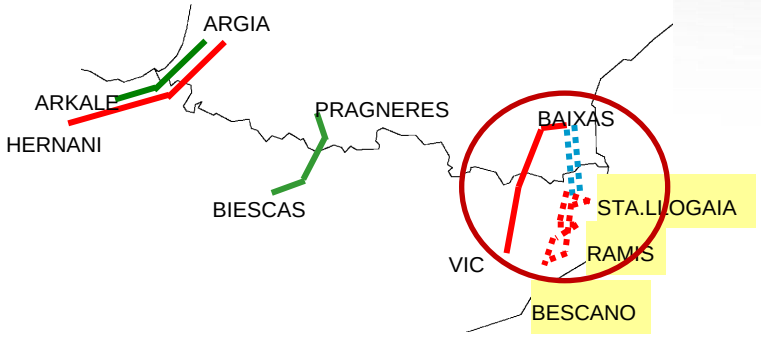
Need to increase the NTC in the France-Spain interconnection (interconnection MIBEL – rest of Europe)

Interconnection development within MIBEL

NTC Evolution 2014-2015



2015



2014

2800

2600

"the connection and evacuation of renewable sources, mainly wind, hydro and solar in the Iberian Peninsula, is one of the most important investment needs in the South-Western and Center-South region of Europe"

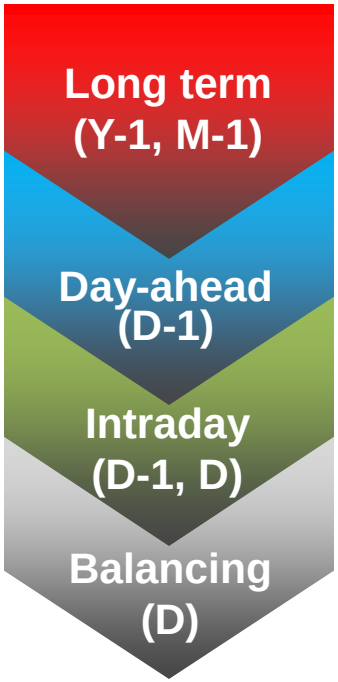
2010 entsoe TYNDP

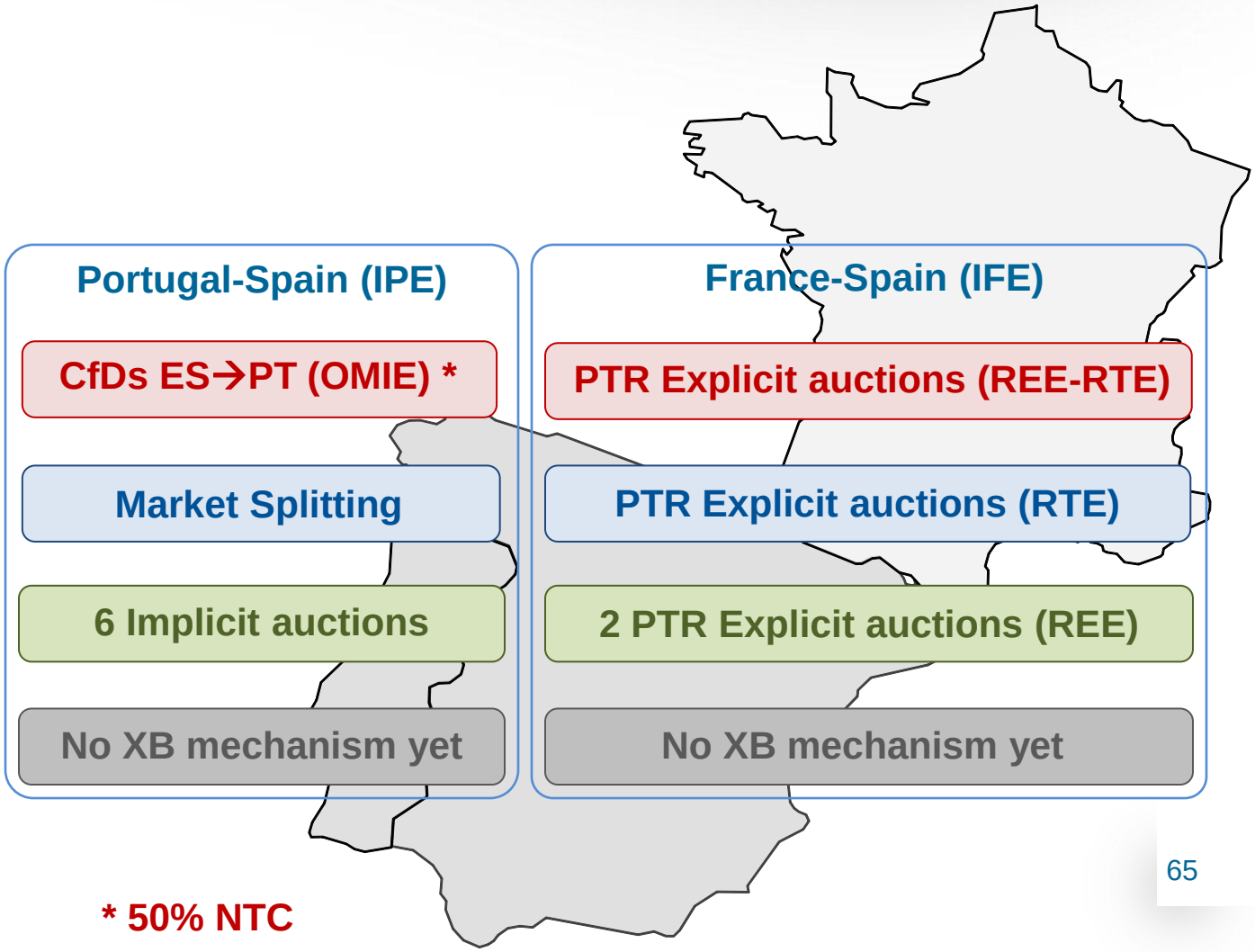
Midterm (2014 - 2015) investments in SWE region up to 6-7 bn€ according to TYNDP

1. The Spanish Electrical system
2. The MIBEL market
3. Integration of MIBEL into the IEM
4. Transparency and information management
5. Conclusions

Congestion management mechanisms within MIBEL

Current situation



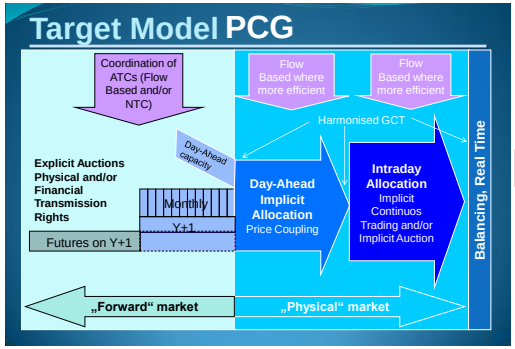


*** 50% NTC**

RED ELÉCTRICA DE ESPAÑA

Implementation of the IEM target model in the SWE region

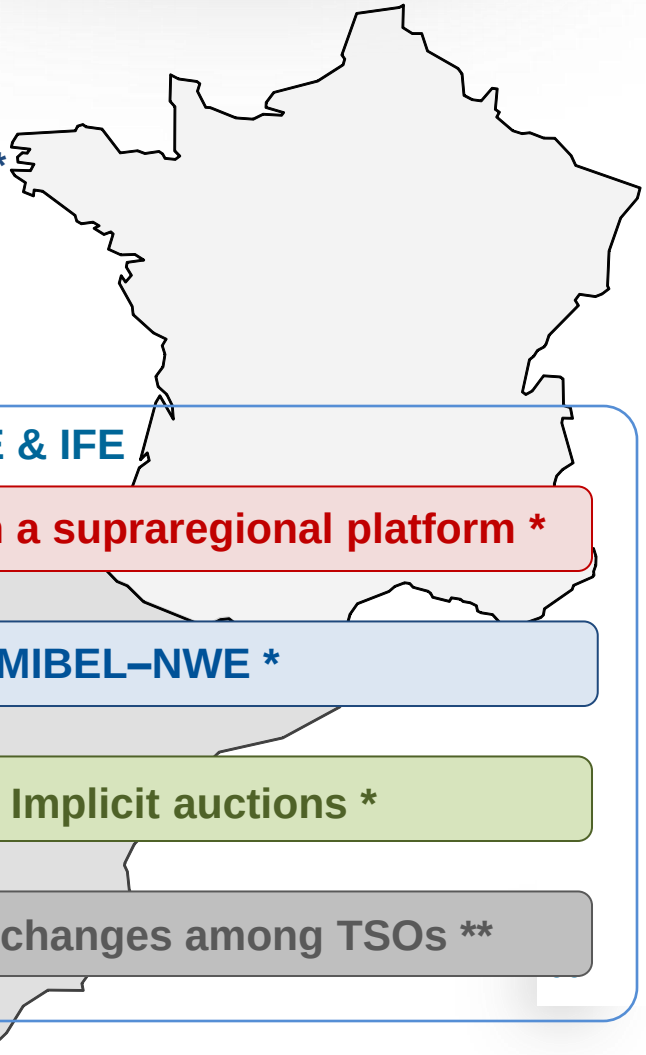
2014 outlook



ACER FWGL on CACM *

Future Balancing Guidelines **

NCs



Long term (Y-1, M-1)

Day-ahead (D-1)

Intraday (D-1, D)

Balancing (D)

IPE & IFE

PTR/FTR Explicit auctions in a supraregional platform *

Price coupling MIBEL–NWE *

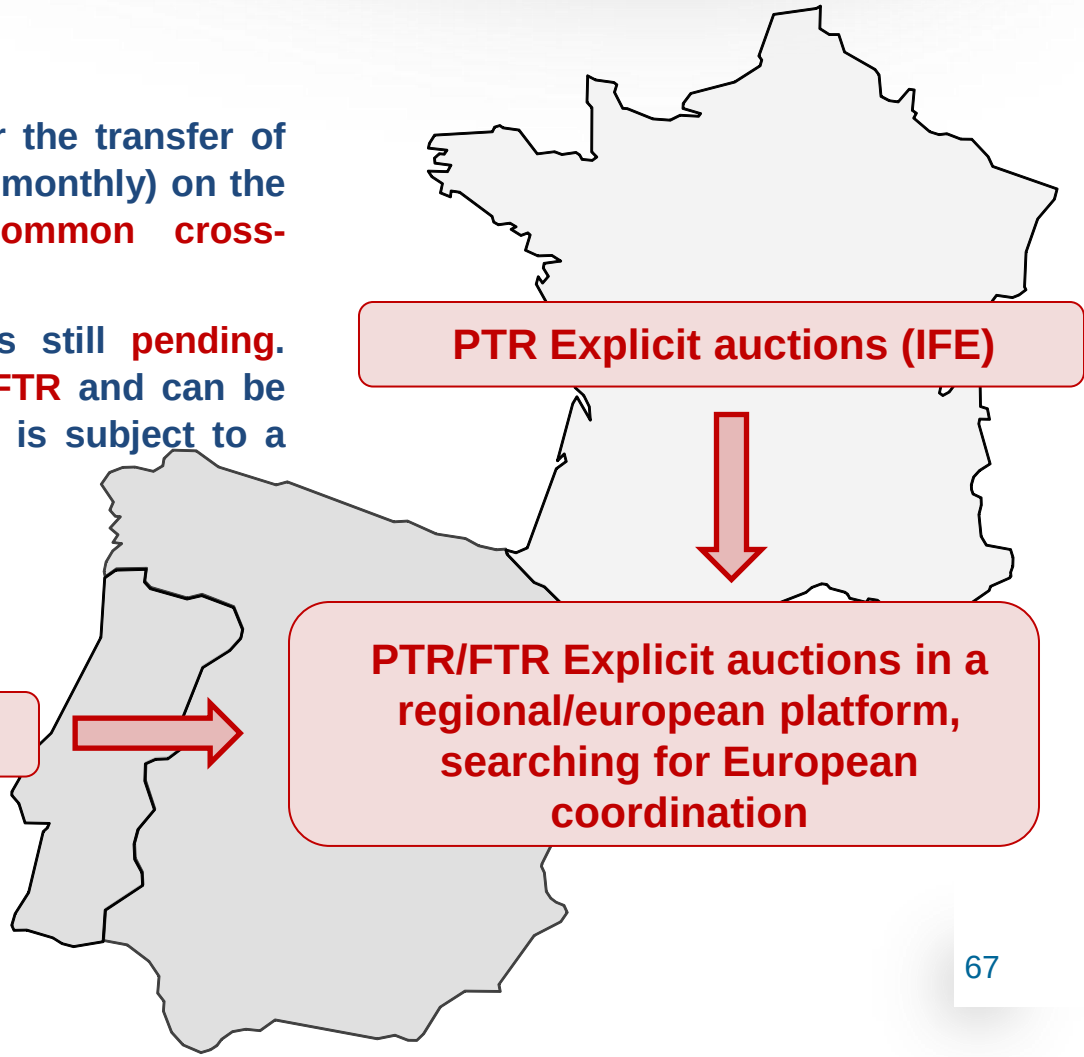
Continuous trading + Implicit auctions *

Cross-border balancing exchanges among TSOs **

Implementation of the IEM target model in the SWE region

→ Harmonization of long-term mechanisms

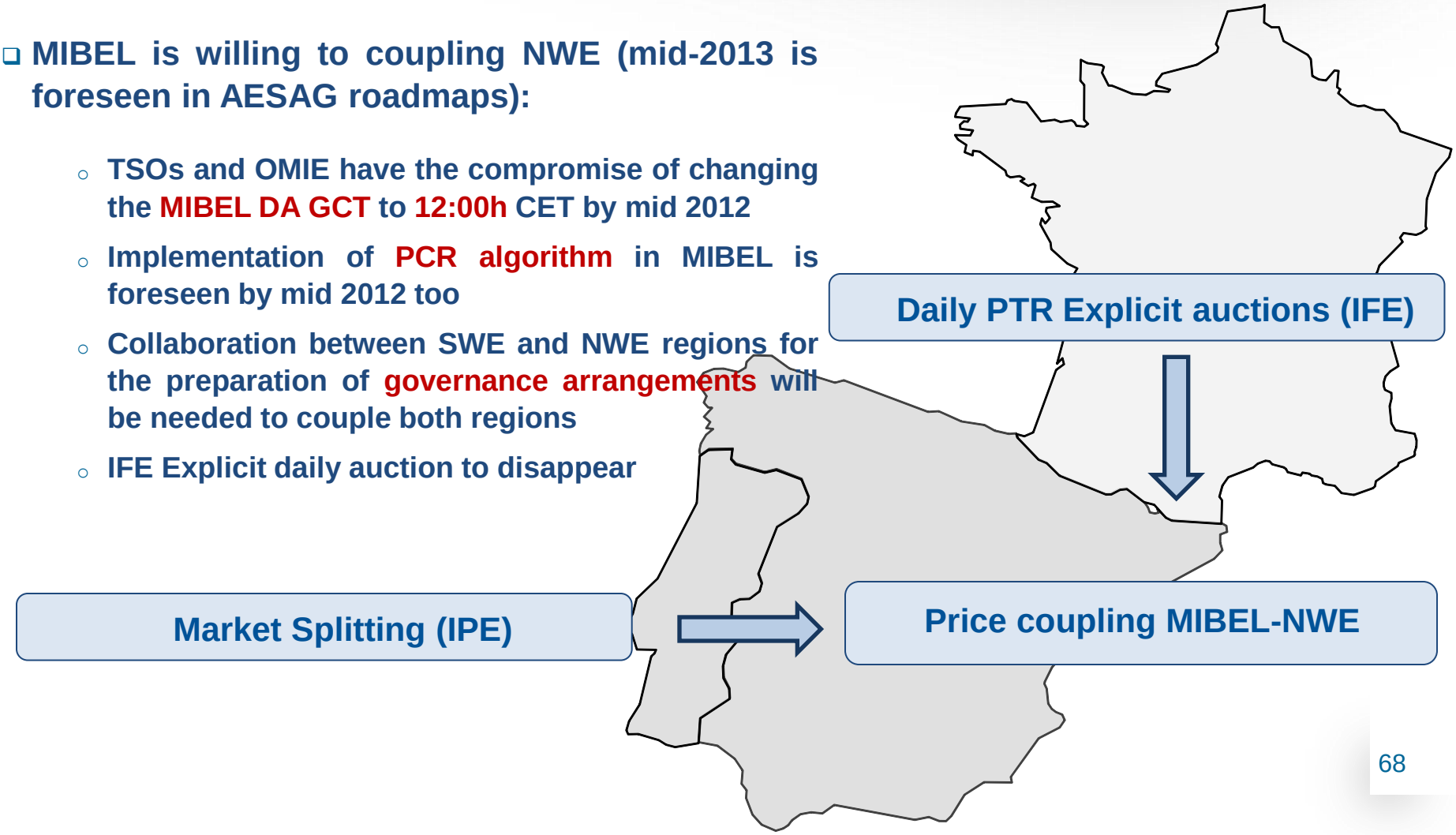
- **Ongoing projects:**
  - **IFE:** RTE and REE are working for the transfer of the long-term auctions (yearly and monthly) on the French-Spanish border to a **common cross-regional/european platform**
  - **IPE:** A coordinated mechanism is still **pending**. Whether the final product is **PTR/FTR** and can be auctioned by a European platform is subject to a coming regulatory decision



Implementation of the IEM target model in the SWE region

→ Market coupling MIBEL-NWE

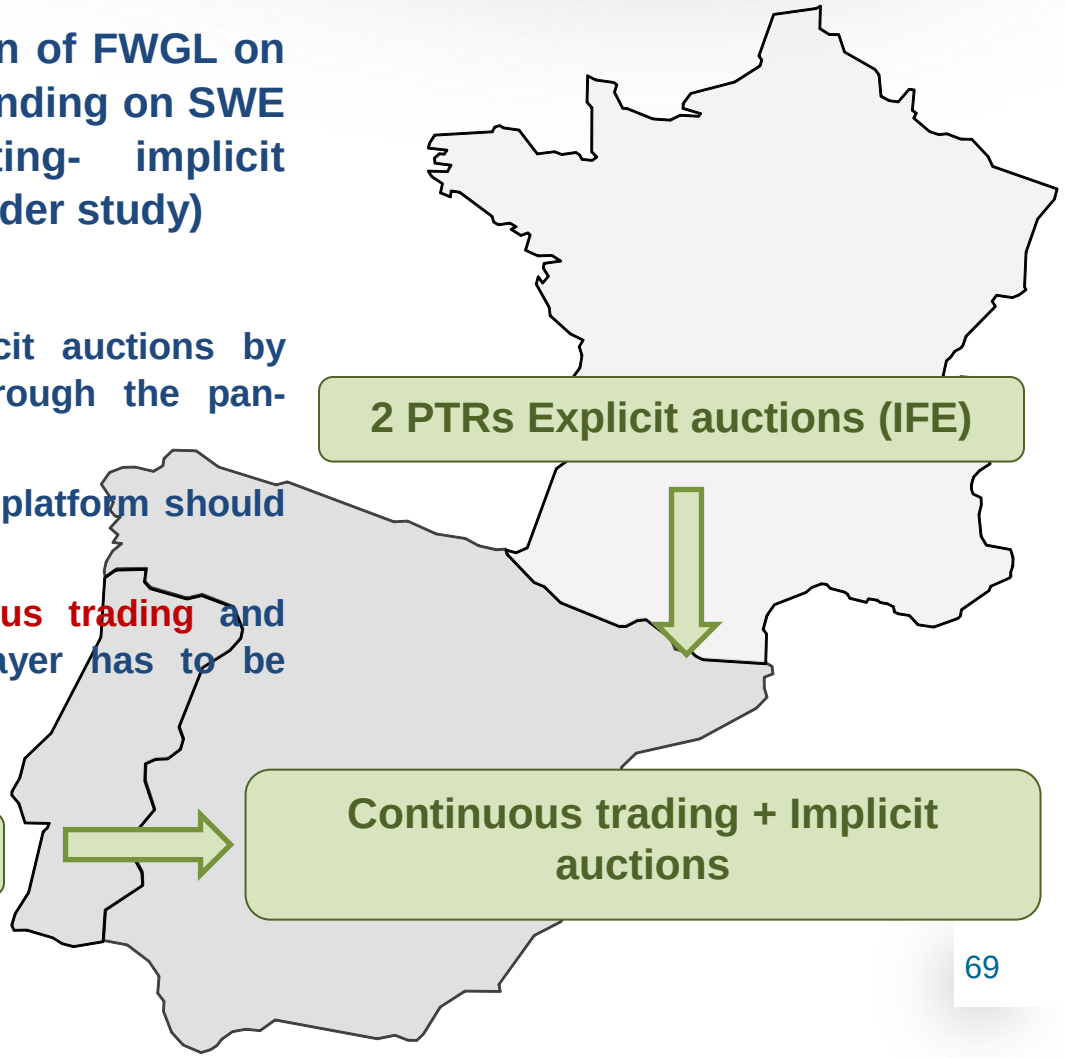
- MIBEL is willing to coupling NWE (mid-2013 is foreseen in AESAG roadmaps):
  - TSOs and OMIE have the compromise of changing the **MIBEL DA GCT** to **12:00h** CET by mid 2012
  - Implementation of **PCR algorithm** in MIBEL is foreseen by mid 2012 too
  - Collaboration between SWE and NWE regions for the preparation of **governance arrangements** will be needed to couple both regions
  - IFE Explicit daily auction to disappear



Implementation of the IEM target model in the SWE region

→ Intraday

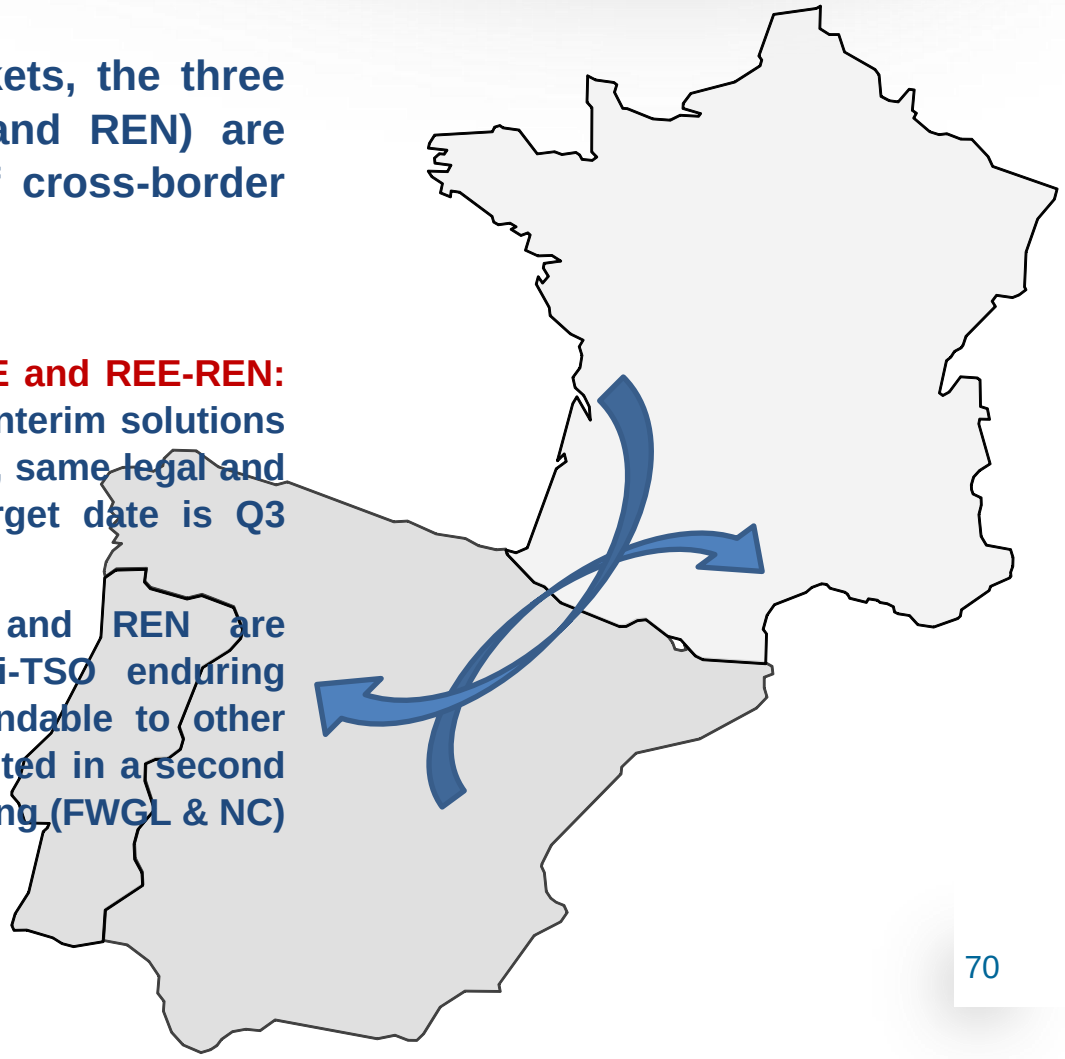
- A consensus on the implementation of FWGL on CACM target model on ID is still pending on SWE region (compatibility of –existing- implicit auctions and continuous trading under study)
- Next steps:
  - **IFE:** Replacement of 2 ID Explicit auctions by implicit continuous allocation through the pan-European intraday platform
  - **IPE:** Access to the continuous EU platform should be granted
  - **MIBEL:** Compatibility of **continuous trading** and **implicit auctions** as a second layer has to be guaranteed



Implementation of the IEM target model in the SWE region

→ Cross-border balancing

- On top of national balancing markets, the three TSOs of the region (RTE, REE and REN) are working for the implementation of cross-border balancing exchanges among TSOs
- A two-step approach is foreseen:
  - **Interim bilateral solutions RTE-REE and REE-REN:** The implementation work of both interim solutions is coordinated (common work plan, same legal and operational structure) and the target date is Q3 2012
  - **Enduring solution:** RTE, REE and REN are analyzing the design of a multi-TSO enduring solution within SWE region, extendable to other regions in Europe, to be implemented in a second step once the regulation on balancing (FWGL & NC) is in place



1. The Spanish Electrical system
2. The MIBEL market
3. Integration of MIBEL into the IEM
4. Transparency and information management
5. Conclusions

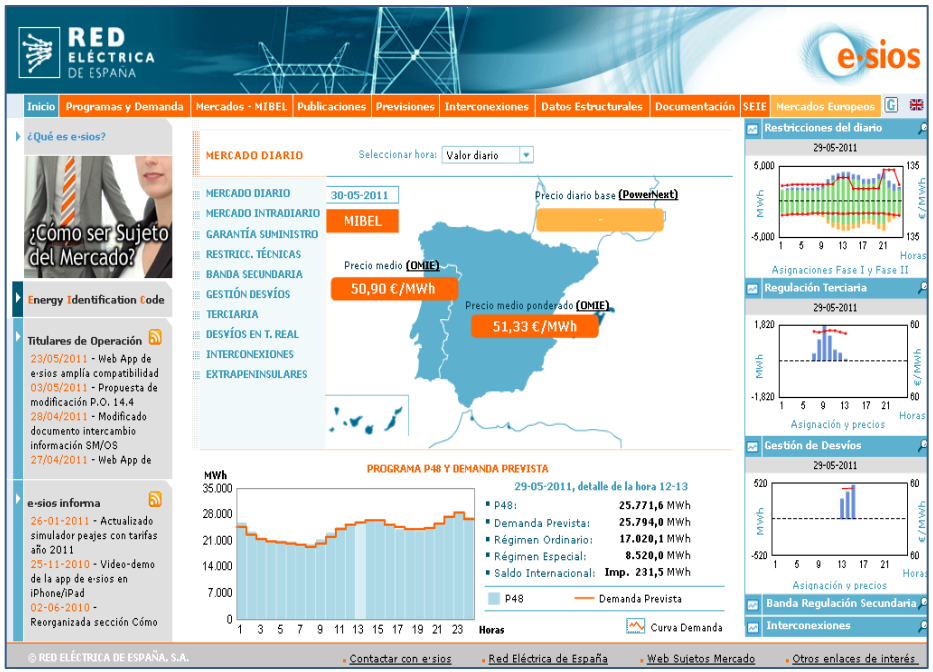
Next developments regarding Transparency

- The **Comitology Guidelines on Fundamental Electricity Data Transparency** (still under public consultation) will establish the framework for open publication of electricity data referred to Load, Transmission Network, Generation and Balancing
- **Entsoe.net** will be the common transparency platform where the detailed information will be published according to the Guidelines on FEDT
- Already existing regional or local platforms will continue publishing the same or more information

Source: www.entsoe.net

Transparency in REE

- REE supports the maximum level of transparency and it is recognized in Europe for its high degree of transparency (2008 ERGEG Transparency Report)
- High transparency standards, according to Spanish Regulation (Operational Procedure 9), are already published in our public website www.esios.ree.es



Source: esios.ree.es/web-publica

1. The Spanish Electrical system
2. The MIBEL market
3. Integration of MIBEL into the IEM
4. Transparency and information management
5. Conclusions

Conclusions

- The **creation of the IEM** is a challenging process that requires from the **collaboration** of all the parties (Regulatory Bodies, TSOs, PXs and MPs) and regions involved and needs clear **regulatory guidance**
- **REE** has a wide experience in **Market Integration** (MIBEL) and **has a leading role** in Europe **integrating renewable energy** in the Operational System.
- It is of the utmost importance to count on robust meshed interconnected network. For that purpose, **Spanish Electrical System** has an **ambitious network development plan** for the coming years and is reinforcing the links with neighbouring countries
- From the perspective of an outlying country like Spain, it is of the utmost importance **to be active** both in the elaboration of the **EU regulation** (FWGLs & NCs) and central European **projects monitoring and collaboration**
- From the IEM creation process perspective, REE is actively working in close collaboration with neighbouring TSOs towards the **harmonization of LT mechanisms** in the region and their integration into regional/european platforms, facilitating the **market coupling MIBEL-NWE**, following the implementation of **ID solutions** and developing cross-border **balancing** mechanism among TSOs.
- In the coming years the continuous need of integration and control of renewable (20-20-20 objectives) and demand management (flexible consumers, smart grids, electric cars, pumping…) will become more challenging issues

RED ELÉCTRICA
DE ESPAÑA

EU Integrated Electricity Market seminar

The implications for the Single Electricity Market

Sponsored by

ERNST & YOUNG

Quality In Everything We Do

Thursday 1st September

Chartered Accountants House, Dublin

www.energyireland.ie