

Title:	EWIC and Moyle User Forum
Date and Time:	8 <sup>th</sup> May 2014 14:00-17:00
Venue:	Conference Centre

No.	Topic	Speaker	Time
1.	Opening Comments	Aidan Corcoran	14:00 – 14:05
2.	EWIC Asset Management & Operational Statistics	John Egan	14:05 – 14:20
3.	EWIC One Year On	Peter Lantry & Marie-Therese Campbell	14:20 – 14:50
4.	Moyle Project Status	Stephen Hemphill	14:50 – 15:05
5.	Moyle Commercial Overview	Paul McGuckin	15:05 – 15:20
	Break and discussion (15 minutes)		15:20 – 15:35
6.	Access Rules Consultation 2014	Arthur Moynihan	15:35 – 15:45
7.	SEMO MIUN Update	Michael Atcheson	15:45 – 16:00
8.	Target Model Implementation	Mark Lane	16:00 – 16:15
9.	I-SEM & Interconnector Implications	Paul McGuckin	16:15 – 16:30
10.	Harmonisation of Allocation Rules	Peter Lantry	16:30 – 16:45
11.	Questions from the floor	Open	16:45 – 17:00

# East West Interconnector

## Asset Management

08<sup>th</sup> May 2014

John Egan  
Senior Lead Engineer



# East West Interconnector

## East West Interconnector Overview



## Contents

1. EWIC Overview
2. EWIC Technology
3. Asset Management
4. EWIC Performance
5. EWIC Faults
6. Future Works



# 1. EWIC Overview

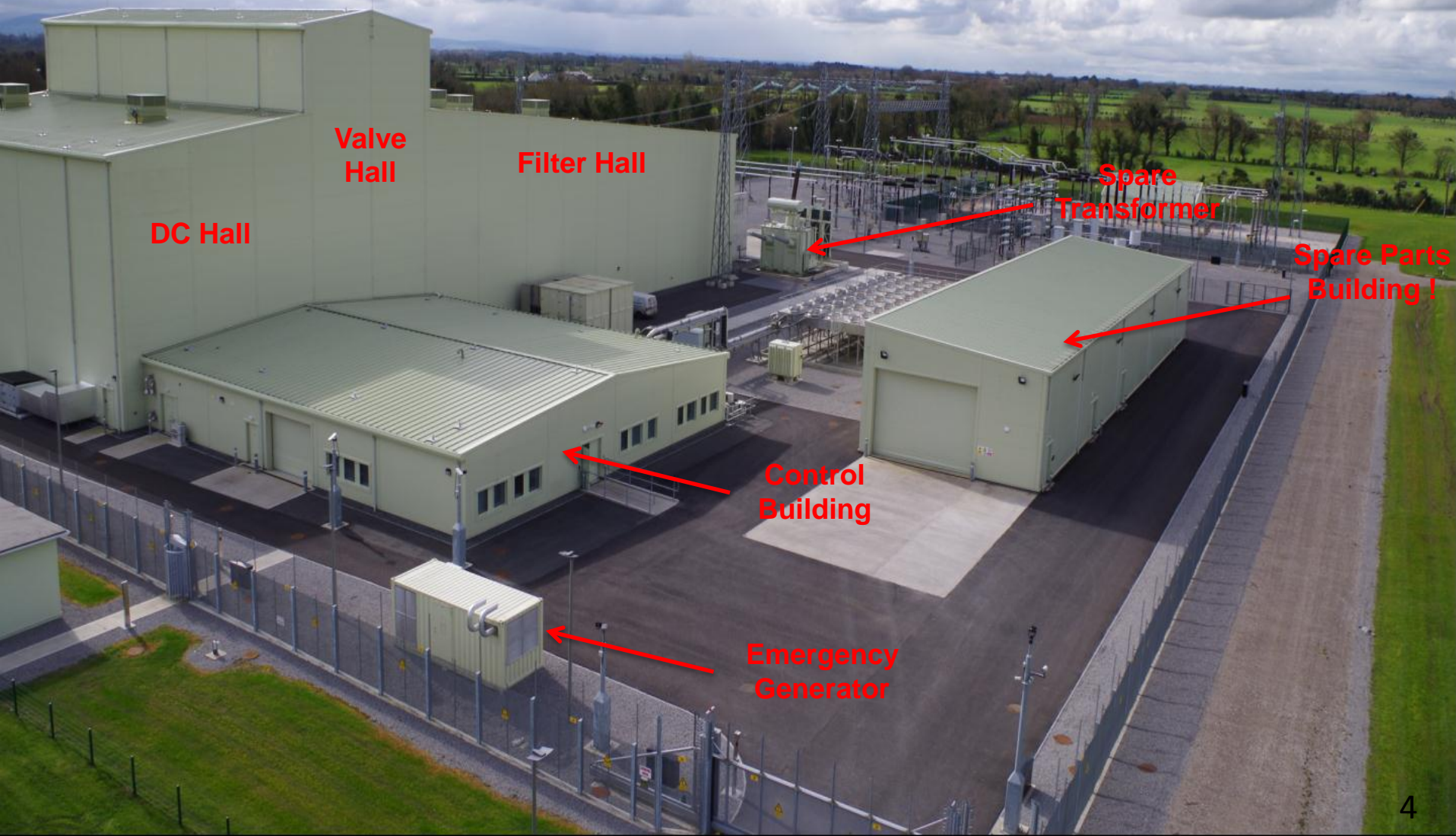
## East West Interconnector Overview



- **500 MW capacity** HVDC “VSC” interconnector
- **Two** HVDC VSC converter station
- **187 km** of subsea DC cable installed below the Irish Sea bed
- **70 km** of DC Land cable installed below the Irish Sea bed



# EASTWEST INTERCONNECTOR



## 2. EWIC Technology

*Portan Converter Station Valve Hall*



### HVDC Conversion

- Latest generation of HVDC technology implemented
- Core technology is based on the use of high power transistors (IGBT's)
- Optimum economical and technical solution



## 2. EWIC Technology

*The “AMC Connector” - Worlds Largest cable laying vessel*

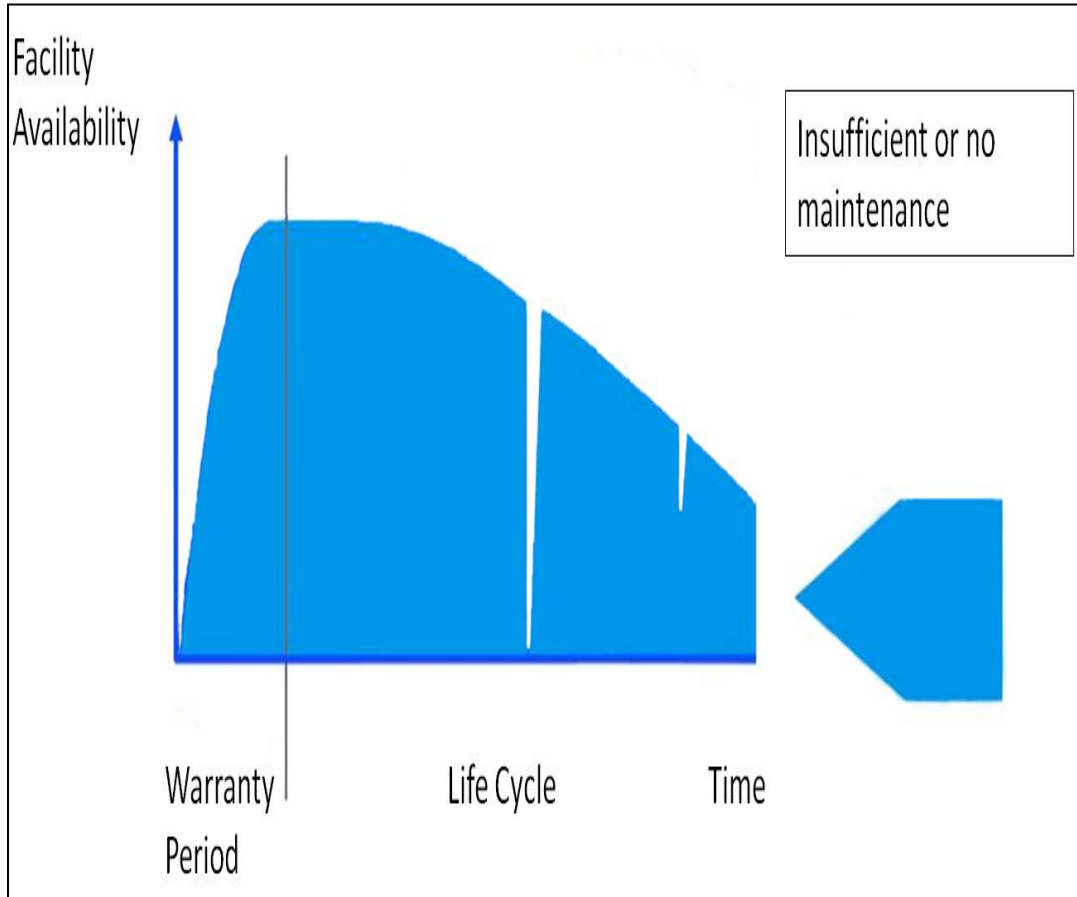


### Cables

- **186 km** of marine cable and high speed fibre cable laid across the seabed
- **30 plus vessels** used during the Marine Installation and burial of the cable below the seabed for protection



# 3. Asset Management

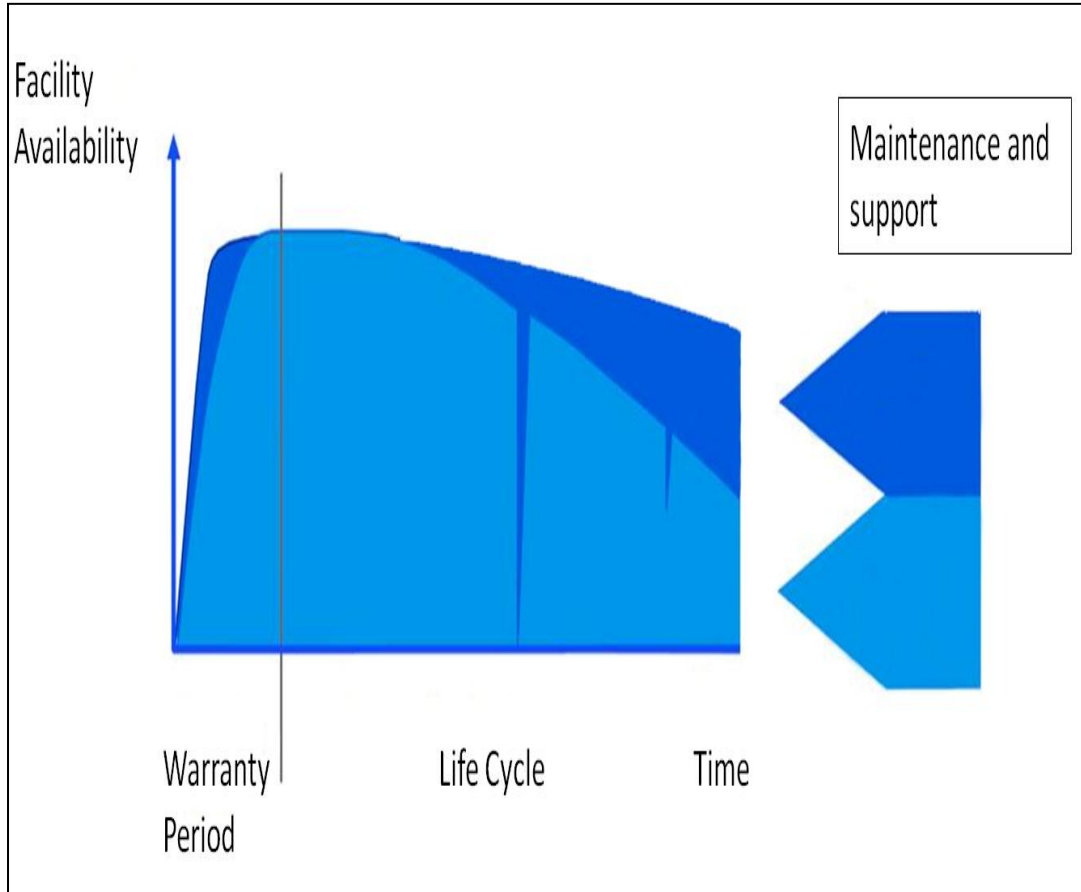


## Asset Management

- Preserve Warranty
- Maintain High Availability
- Minimise Down Time
- Ensure Highest Level of Safety



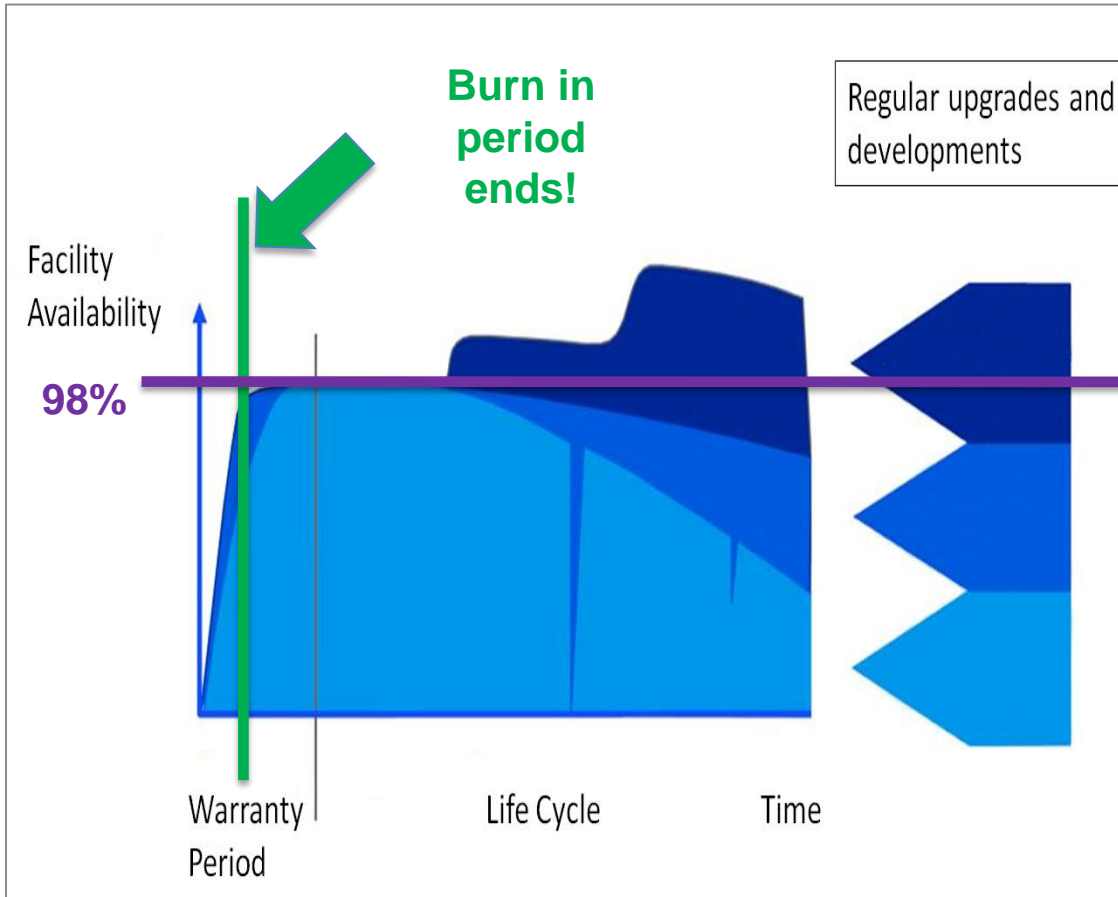
# 3. Asset Management



## Asset Management

- Preserve Warranty
- Maintain High Availability
- Minimise Down Time
- Ensure Highest Level of Safety

# 3. Asset Management

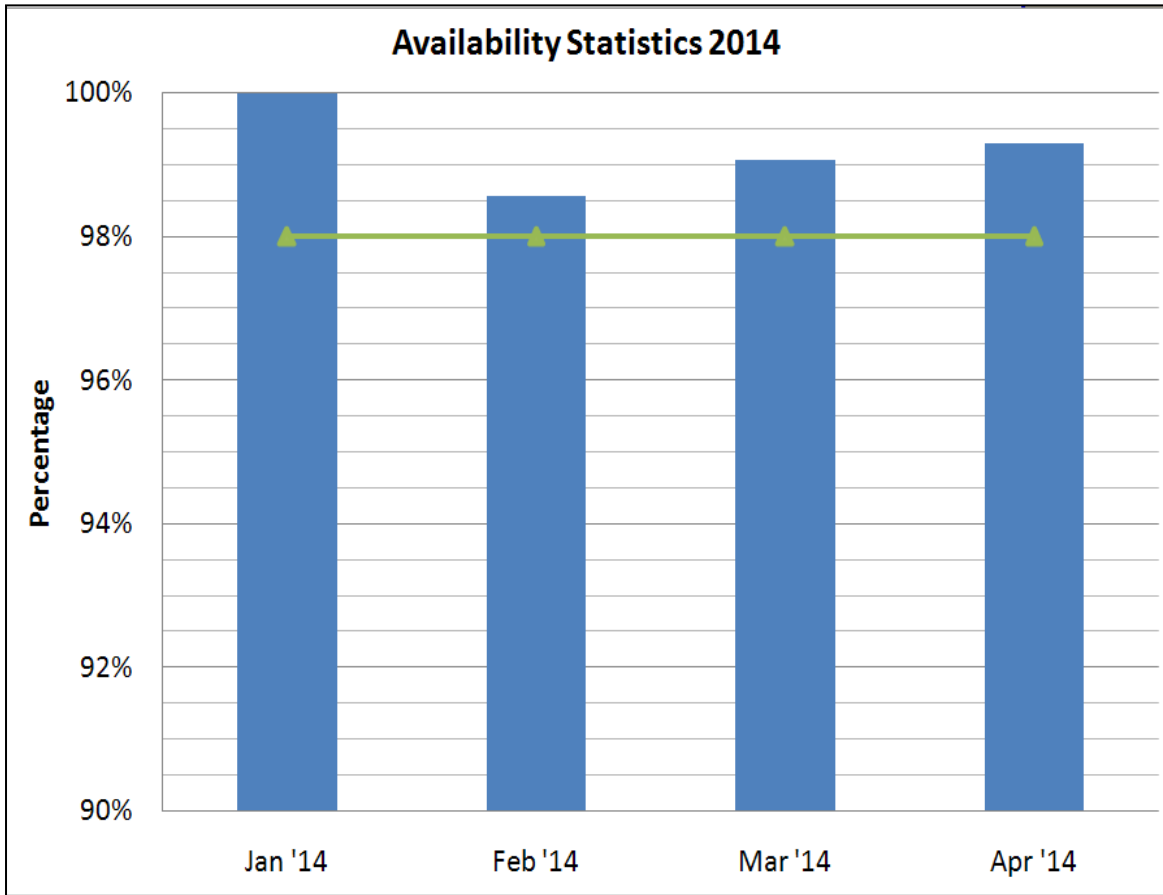


## Asset Management

- Preserve Warranty
- Maintain High Availability
- Minimise Down Time
- Ensure Highest Level of Safety

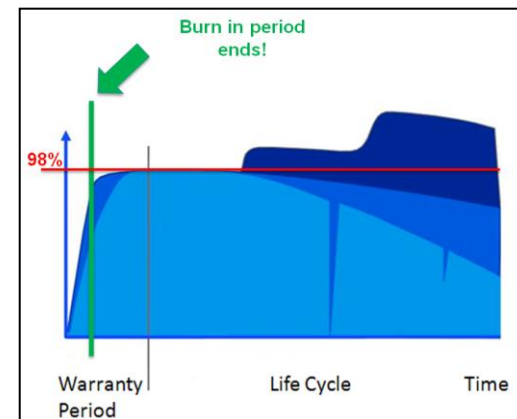


# 4. EWIC Performance



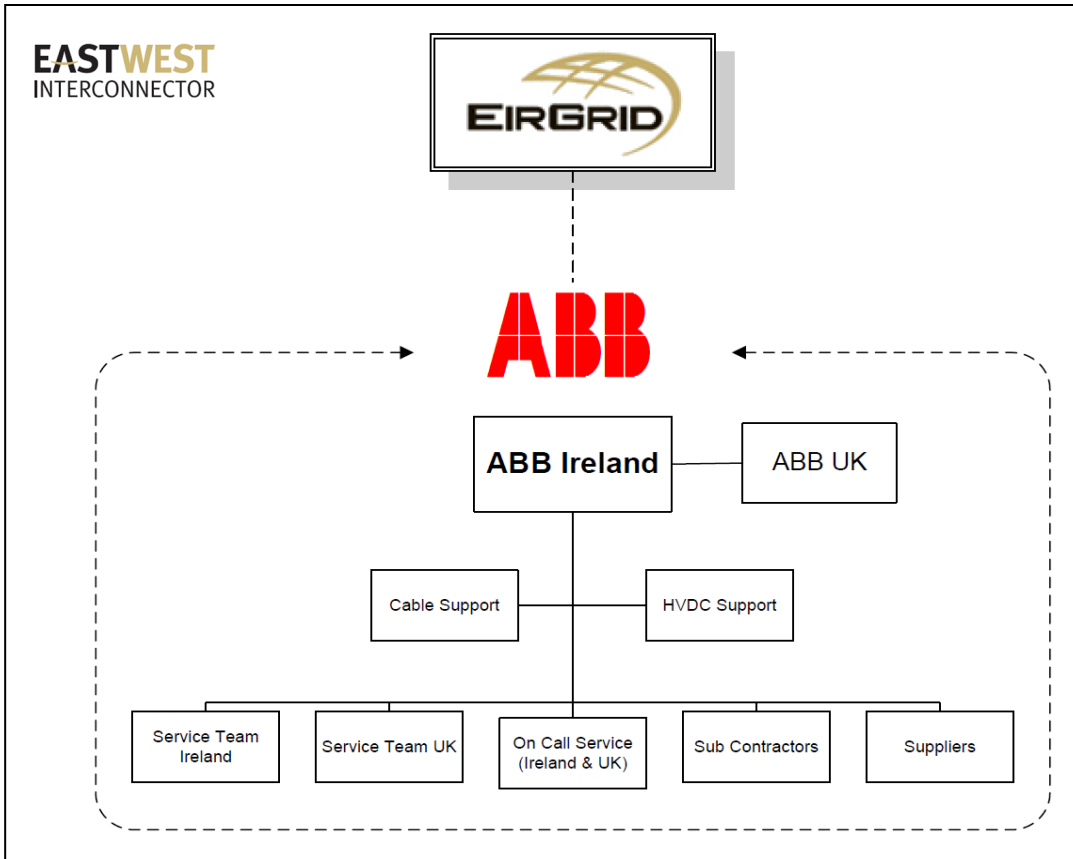
## 2014 Statistics

- Statistics are calculated in accordance with Cigre guidelines
- Metered data is taken as the source of data
- Currently at (cumulative) **99.3%** year to date (2014)



# 3. Asset Management

## Asset Management Structure



## EWIC Asset Management Structure

- EirGrid manage 30 contracts to ensure assets are maintained
- ABB Ireland - 5 Year Maintenance Package
- ABB Sweden provide a dedicated 24/7 converters Support Package
- ABB Sweden provide a dedicated 24/7 cable support package



# 4. EWIC Performance



## Annual Outage 2013

- Planning started in May 2013
- 800 separate tasks identified
- 50 people working on site for duration of the outage
- All tasks successfully completed

# 5. EWIC Faults

## Typical Fault Sequence

0 min

NTC Updated by NCC

15 min

ABB respond to trip

2 hours

ABB attend site

3 hours

Initial interrogation of trip

6 hours

Safety Isolation & Earthing

7 hours

Detailed Inspections Complete

8 hours

Repair Plan Complete

Market Update



# 6. Future Works



➤ **Annual Outage**

09<sup>th</sup> -11<sup>th</sup> September 2014

➤ **Blackstart testing**

25<sup>th</sup> September 2014

➤ **Connahs Quay**

2017 - 60 day outage to change from Deeside 400kV station to Connahs Quay 400 kV station



# EASTWEST INTERCONNECTOR





# East West Interconnector & Moyle Interconnector

User Forum  
8<sup>th</sup> May 2014

EWIC One Year On



# EirGrid Interconnector Limited



- EWIC is comprised of:
  - 2 x HVDC converter stations
  - 187km of submarine cables (2 x power & 1 x Fibre Optic)
  - 75km of land HVDC cables
  - 4km of HVAC cables
  - Storage facility in Liverpool Port
- Flows are controlled from the NCC
- Maintenance & Repair contracted to ABB

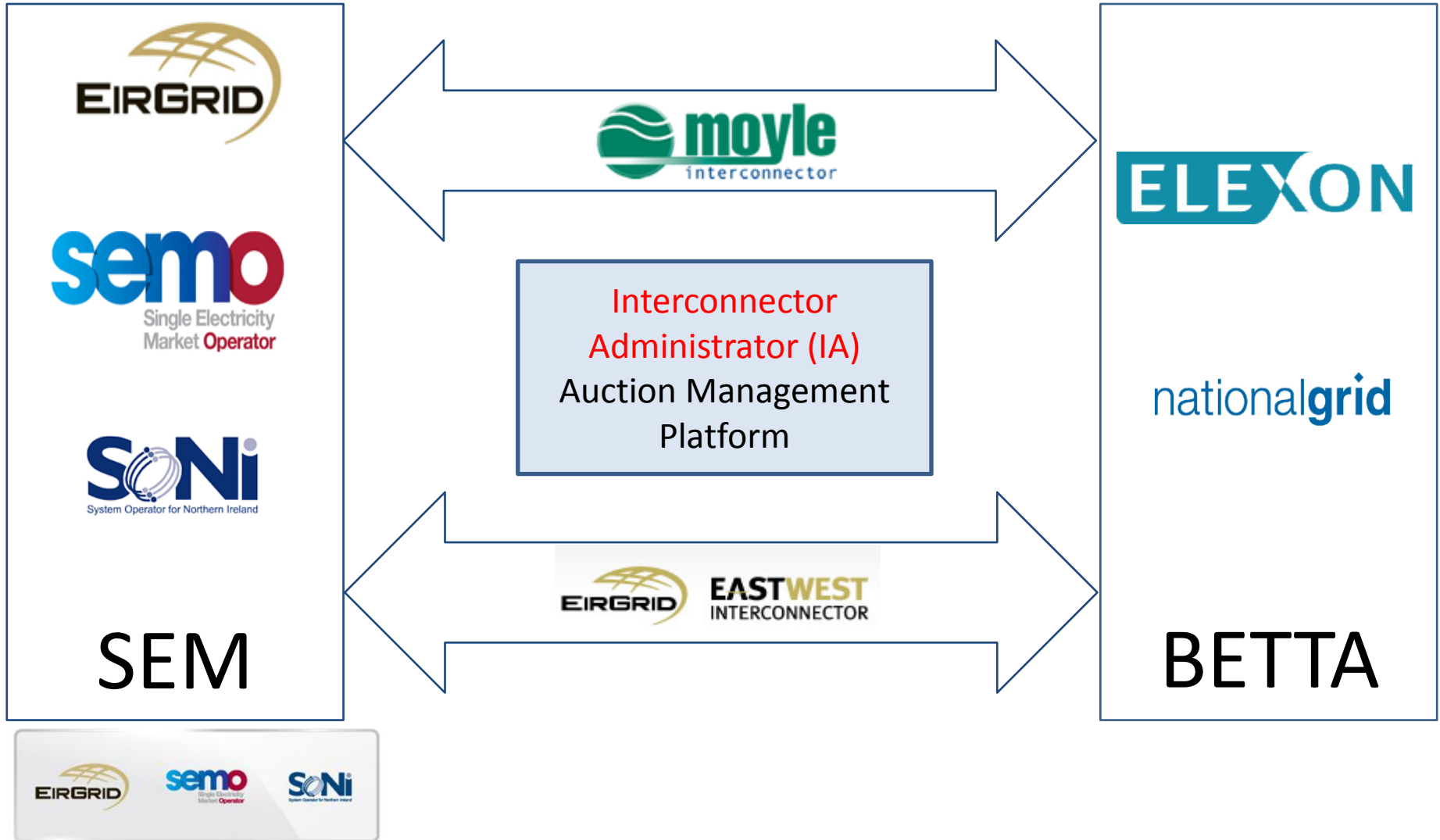


# The Interconnector Administrator

- Part of the Commercial Department within SONI
  - System Operator for Northern Ireland
- Interconnector Administrators
  - Ian McClelland
  - Alan Brady
  - Gary McCullough
  - Donna Maye
- Available 7 days a week from 07:00 to 15:00
- Contact number: +44 (0) 28 9070 7450
- E-mails: [interconnectors@soni.ltd.uk](mailto:interconnectors@soni.ltd.uk)



# IA interface between Markets



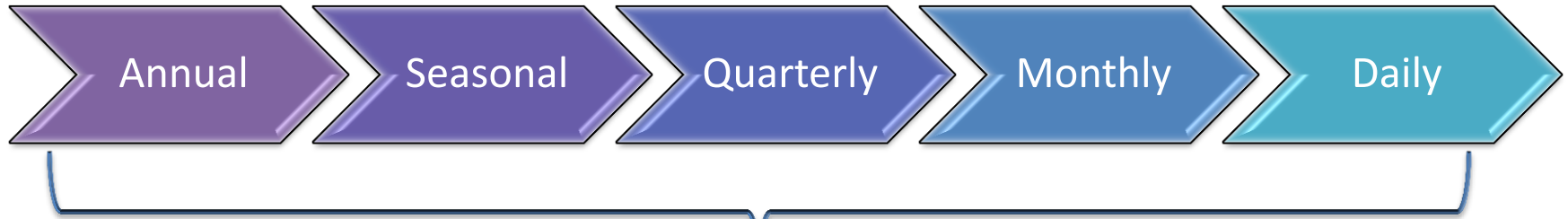
# EWIC Customers



Delivering on increased competition objective



# Auction Overview

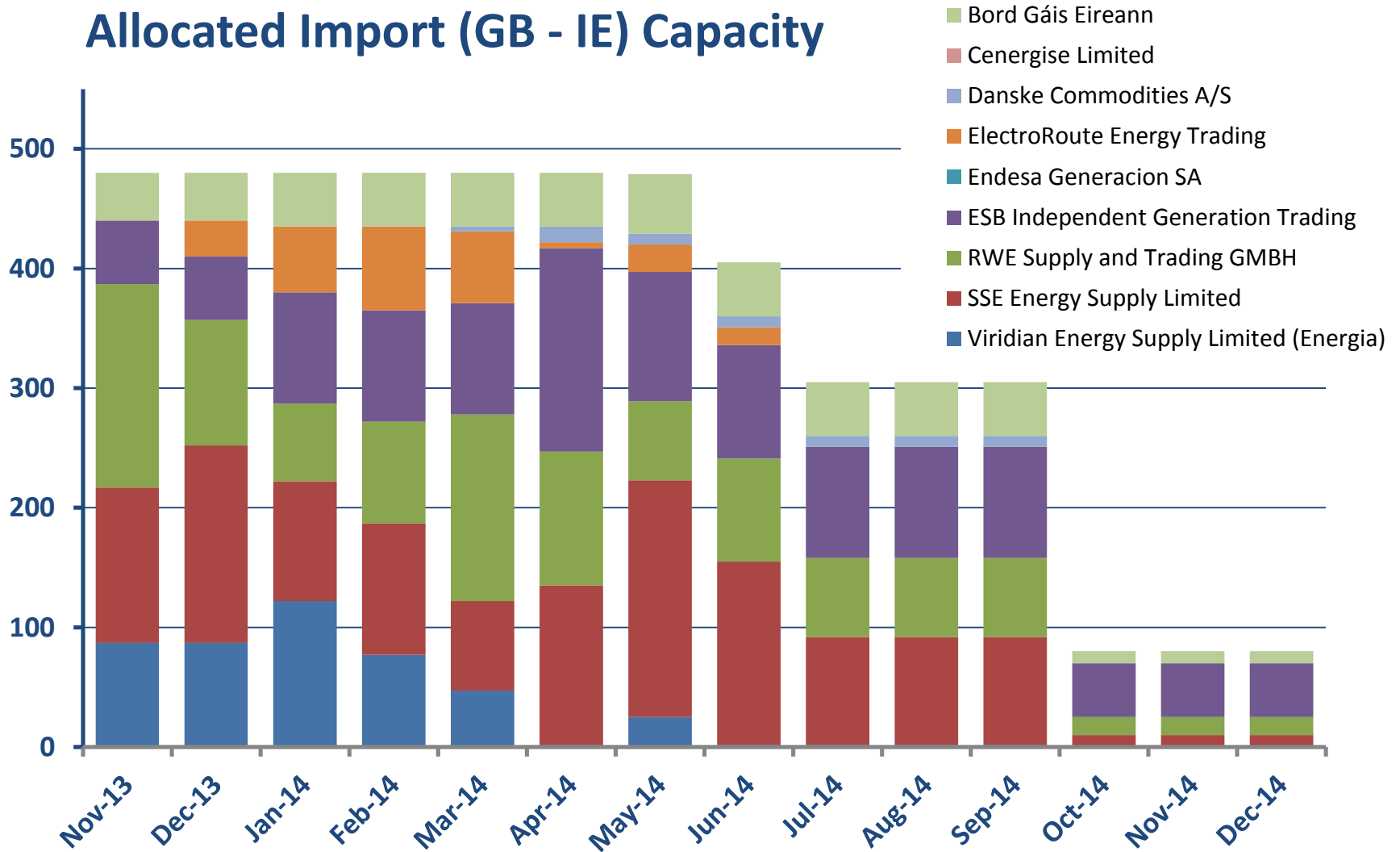


Explicit Auctions



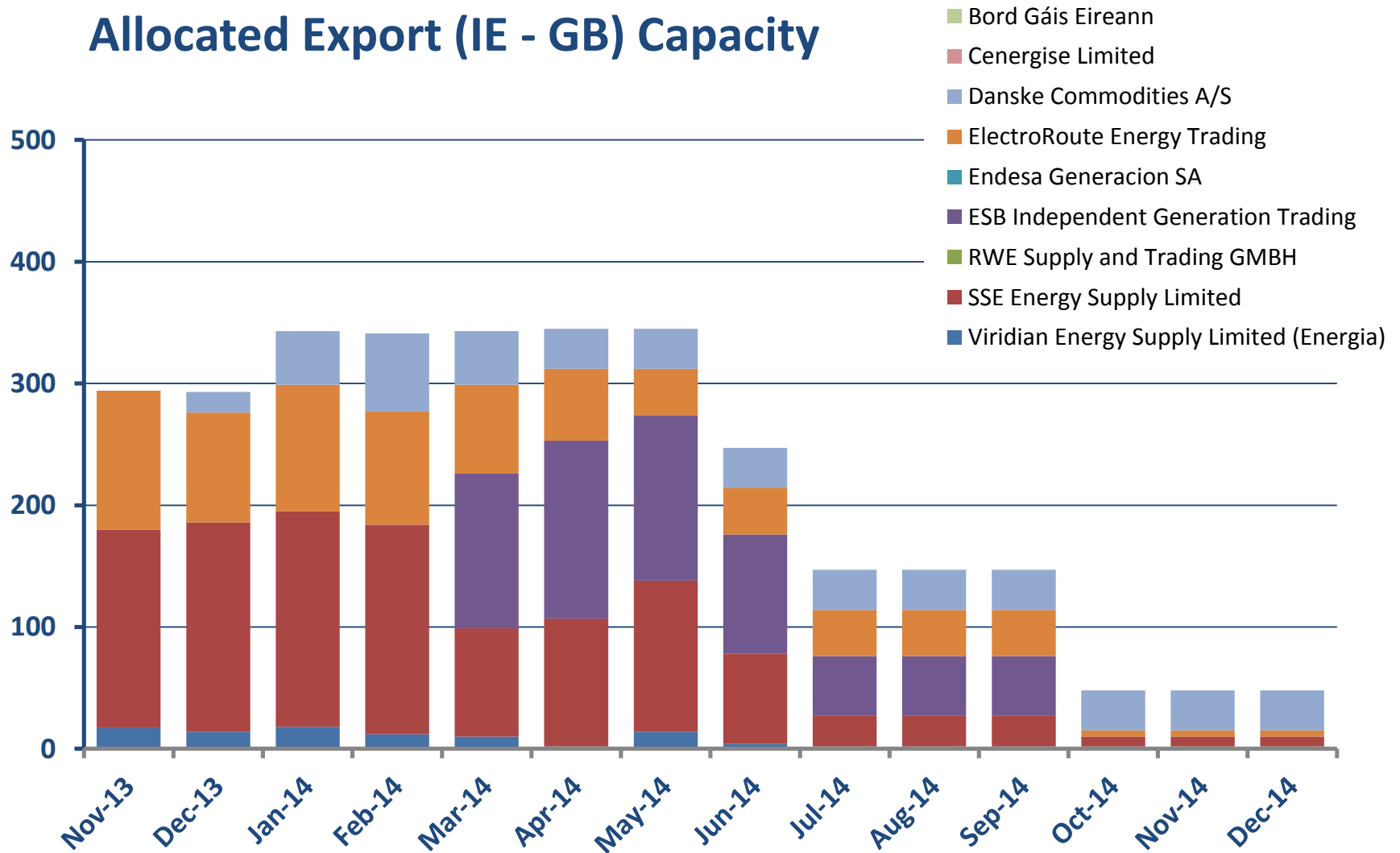
# Allocated Capacity Publication

## Allocated Import (GB - IE) Capacity



# Allocated Capacity Publication

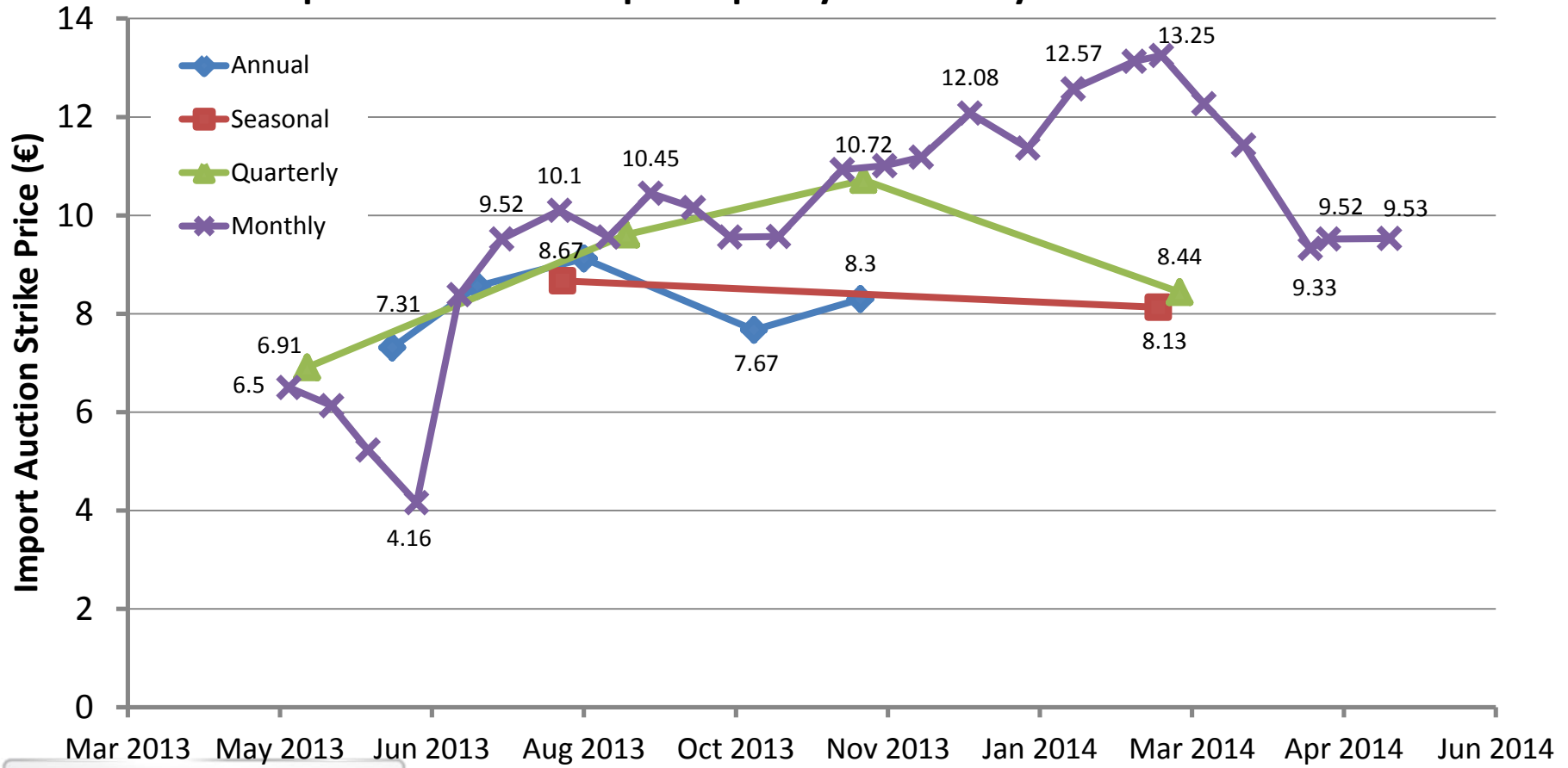
## Allocated Export (IE - GB) Capacity





# Long Term Price Chart

## Import Auction Price per Capacity Product by Date of Auction



# Average Price per Delivery Month

## Long Term Auctions

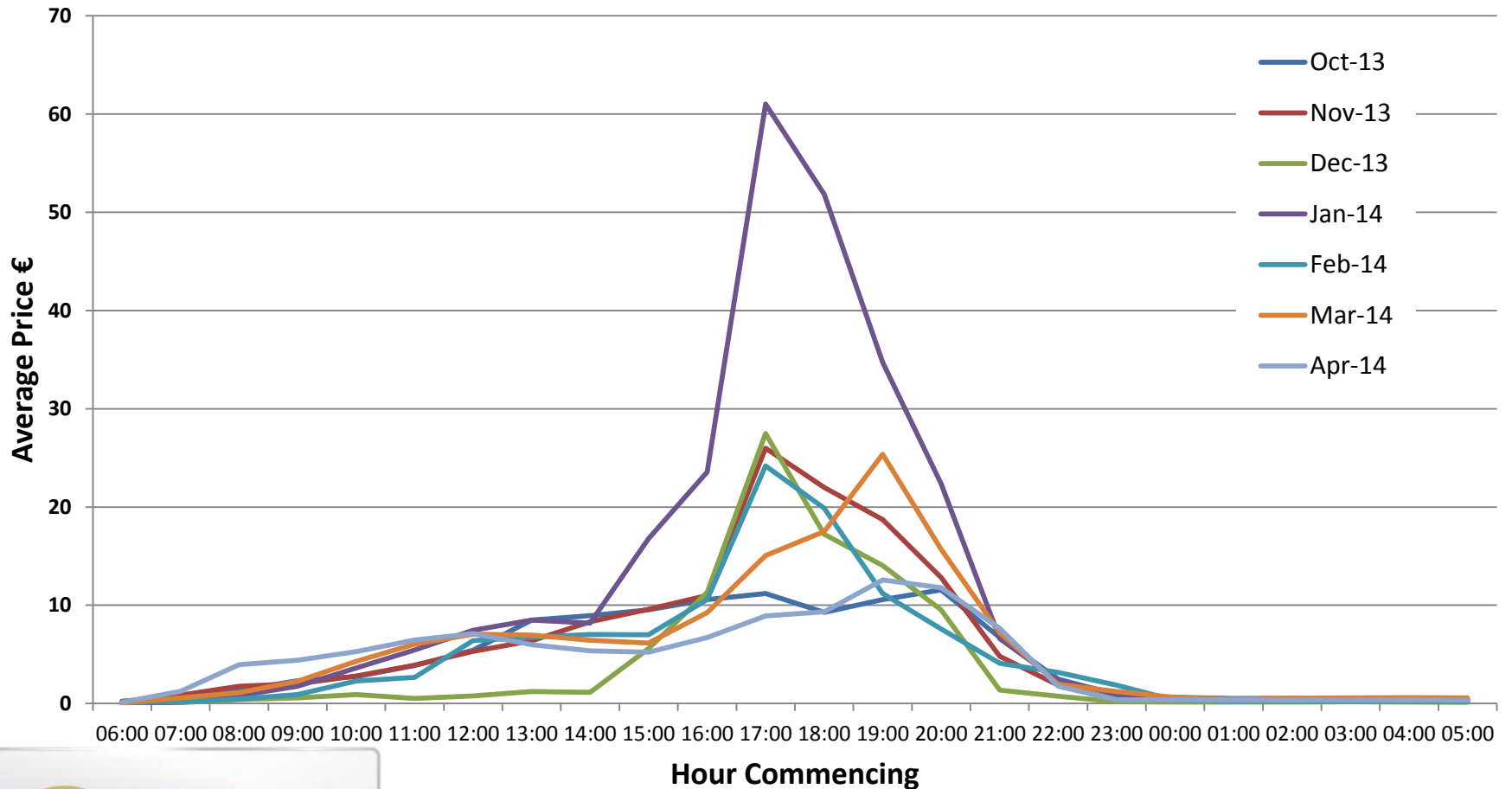
Average Price €/MWh		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
	2013/2014	GB-IE	€6.50	€6.22	€5.83	€6.99	€7.18	€8.84	€8.45	€9.02	€9.46	€9.55	€9.84
	IE-GB	€0.01	€0.01	€0.01	€0.01	€0.02	€0.01	€0.01	€0.02	€0.02	€0.02	€0.02	€0.04

## Daily Auctions

Average Price €/MWh		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
	2013/2014	GB-IE	€0.47	€1.17	€1.61	€3.11	€2.40	€4.57	€5.84	€5.78	€10.77	€6.12	€5.73
	IE-GB	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00	€0.00

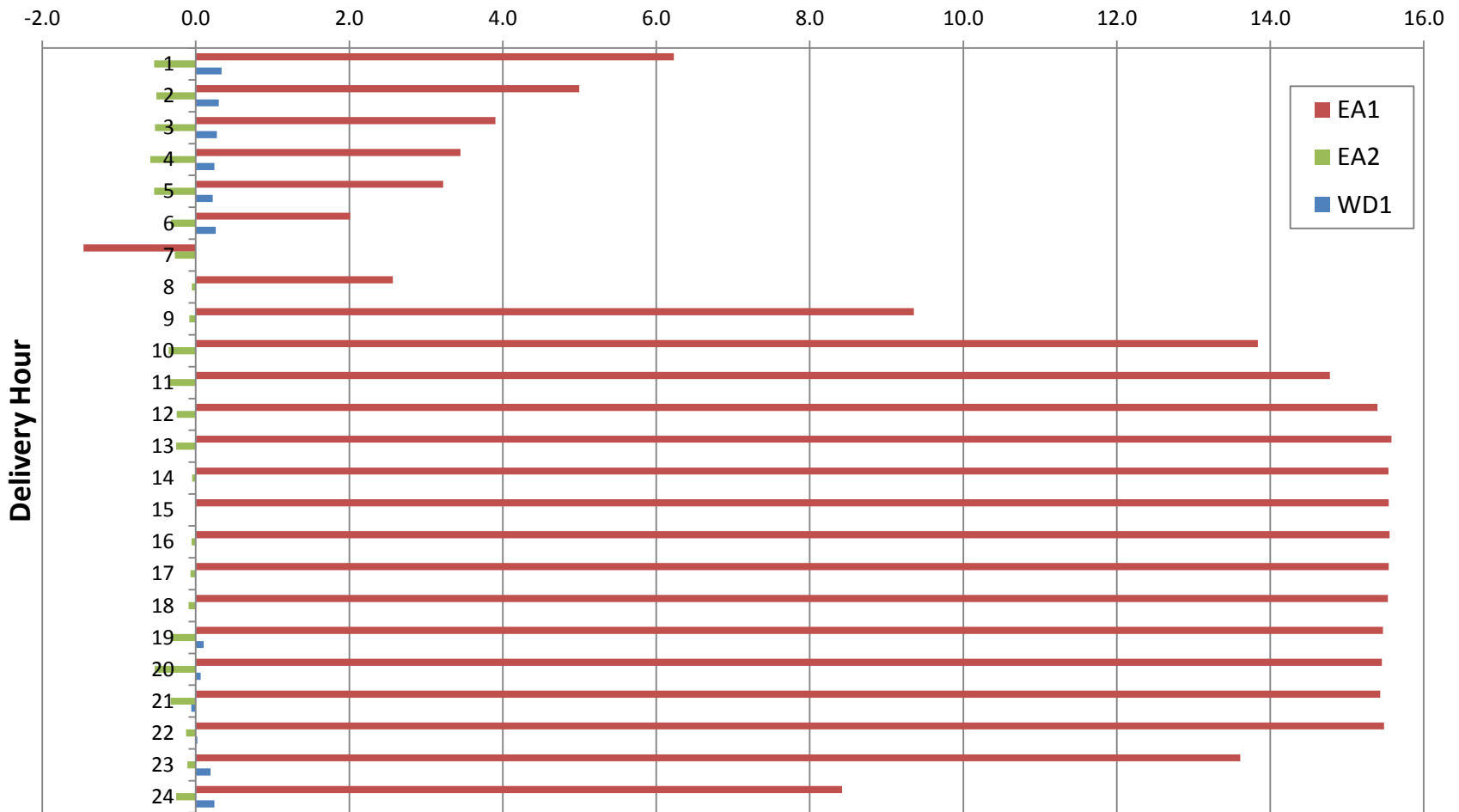
# Daily Prices

## Average Daily Auction Import Price Oct 13 - Apr 14



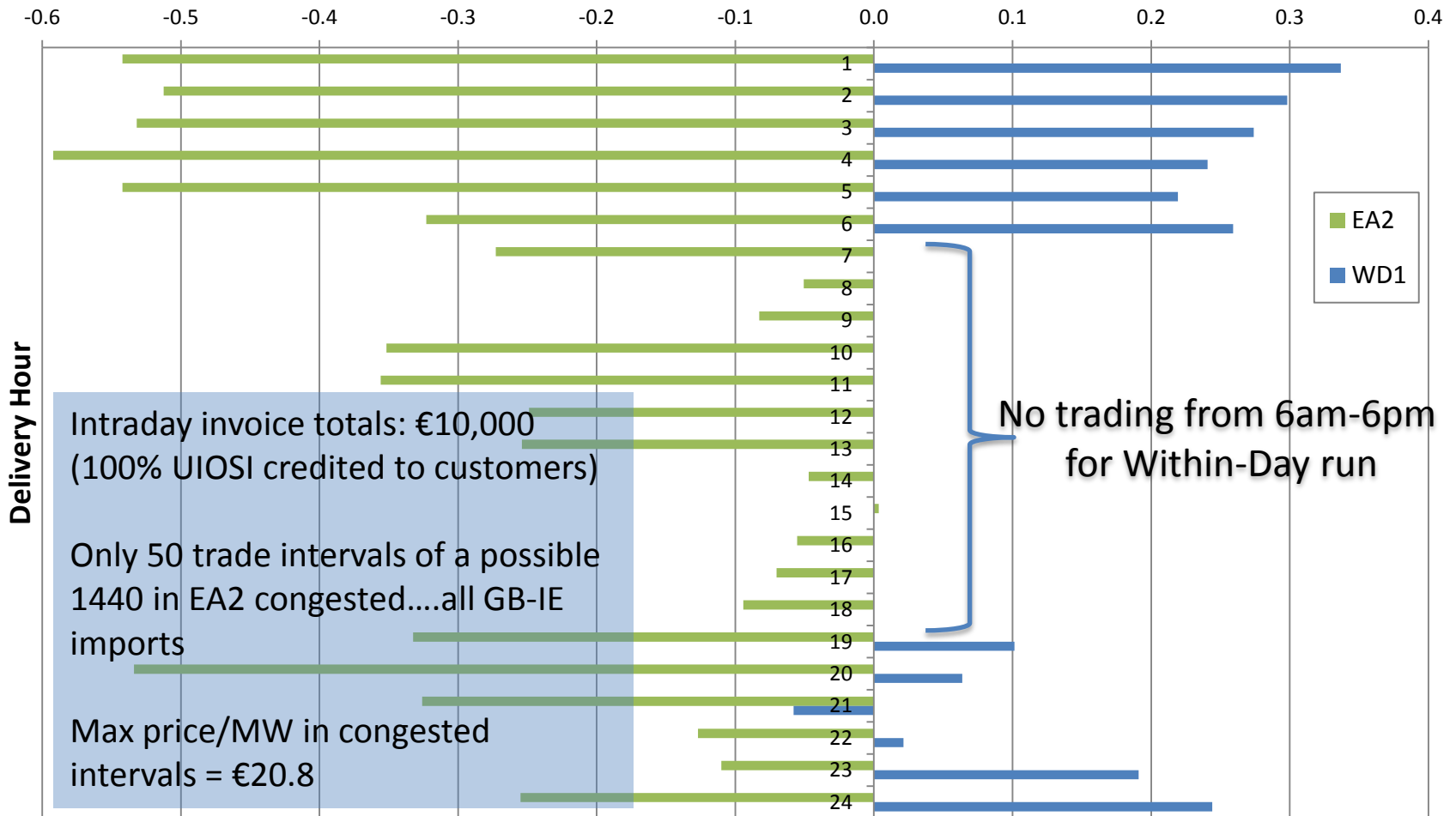
# Intraday Trading Overview

## Sum of MIUN GWh Volumes per Delivery Hour - April 2014



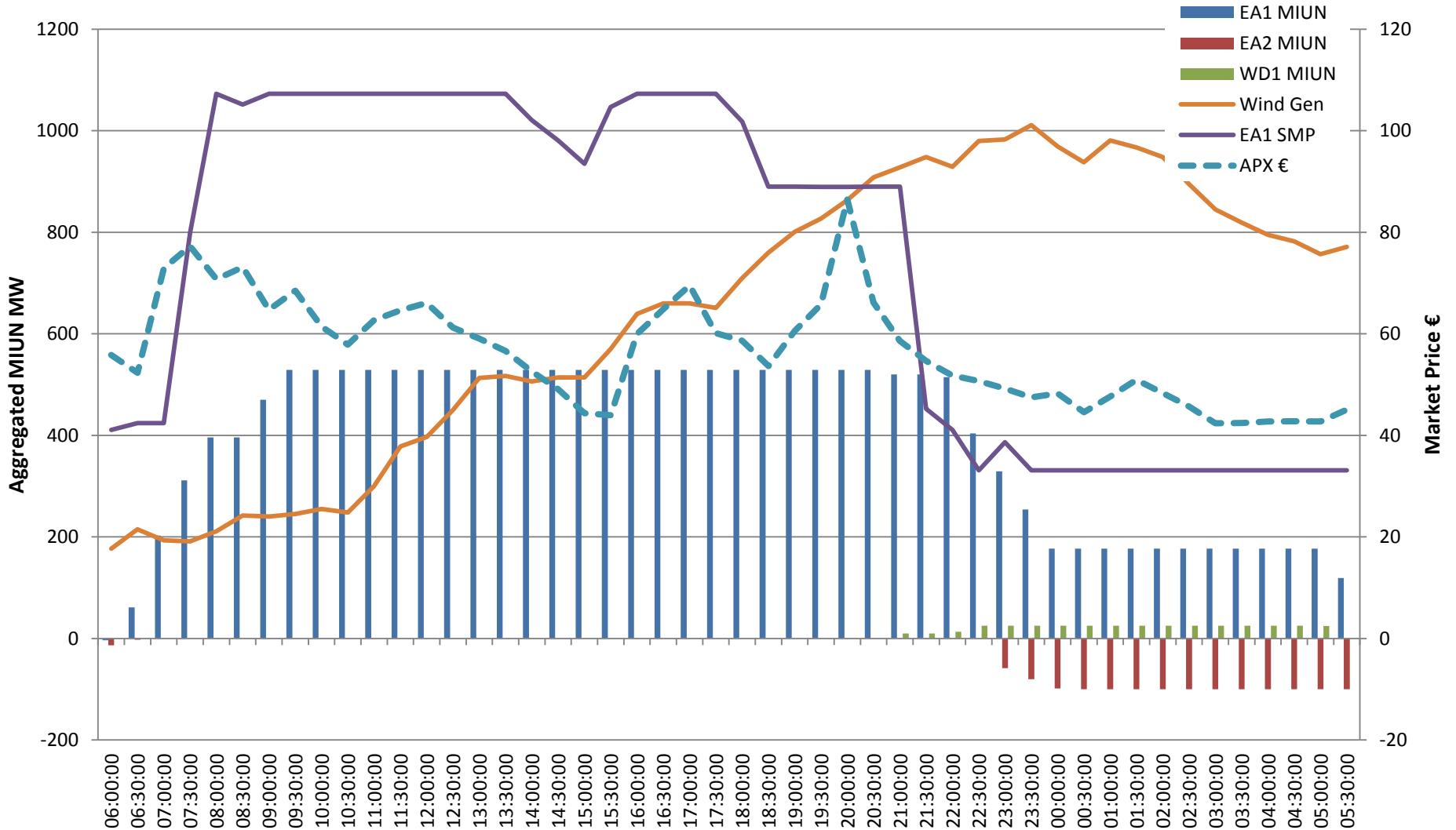
# Intraday Trading Overview

## Sum of MIUN GWh Volumes per Delivery Hour - April 2014



# Trading Behaviours

## MIUNs vs Market Prices and Wind Gen April 1st



# Intraday Charging and UIOSI

- Interconnector capacity available after the previous market run is auctioned in SEM EA2 and WD1 market runs for both interconnector directions
- EIL charges for capacity allocated in trade periods in which the auction for capacity was congested
- Congested Auction Definition:
  - If Sum of In-Merit Bids > Available (Offered) Capacity => Congested Auction (Yes)
- In Merit Bid Definition:
  - Import: Bids with a price less than or equal to the Shadow Price
  - Export: Bids with a price greater than or equal to the Shadow Price



# Intraday Charging and UIOSI

- Capacity unused by participants in EA1 or capacity lost due to ramping is subject to the principle of Use-It-Or-Sell-It (UIOSI)
- If revenue accrues from EA2 or WD1 Intra-Day auctions UIOSI compensation is owed to participants who lost/unused EA1 capacity
  - Import: Price = (Ex Ante Shadow Price – Highest Accepted Bid Price) x 0.5
  - Export: Price = Max[0, (Lowest Accepted Bid Price – Ex Ante SMP) x 0.5]
  - Revenue per Trade Period = (MW (MIUN) Allocated x Price) / 2
- Revenue for super-positioned capacity and unsold capacity is retained by Interconnector Owner





# Outage Communications

- Published Communications Protocol During Forced Outages
- Default of 12 hours NTC reduction
- Minute NTC Update in AMP as soon as is practicable
- EIL follow up with email to market participants
- Decision to extend NTC reduction taken at least 4 hrs prior to end of current reduction period
- Reduction periods selected based on best information available from M&R team
- Customer receive at least 4 hours notice of return to service

Website: <http://www.eirgrid.com/eastwest/outageinformation/>



# Super-positioning During Outages

- Reduction in MIUNs as per SEM T&SC
- Based on principle that trades will be fixed, where possible, once allocated
- SEM maintains MIUNs so long as the net effect (i.e. physical flow) is zero
- Individual customer MIUNs may not reduce to 0 when there is an NTC reduction to 0 due to netting with corresponding flows in the opposite direction



# EWIC – Credit Cover

- Letter of Credit
- Cash Deposit in Collateral Account
- Credit Limit assessed at bid submission
  - Based on one month exposure if bids are successful
  - Bid(s) rejected if insufficient credit cover in place
  - Credit cover updated after auction based on clearing price
  - Credit will be held until final invoice pertaining to auction is paid i.e. for annual product final invoice will be paid in month 11
- Example:
  - 20 MW in annual auction of price €10 would require credit cover:  
 $(20 \times \text{€}10 \times 365 \times 24) / 12 = \text{€}146,000$



# Commercials

## Revenue

Congestion rents less compensations

- Explicit Auctions
- Implicit Auctions

Ancillary services

- EirGrid TSO
- NGET

## Expenditure

Operating costs

Subcontractors

- IA, M&R, Security, Telecoms

The mortgage (debt repayments)



Benefits of the EWIC for SEM are far greater!

# Countertrade Overview

- Countertrading is carried out for:
  - Priority dispatch facilitation (e.g. reducing curtailment of wind)
  - Reducing costs associated with the EWIC being the largest single in-feed
- Revenues go directly into the DBC pot ...  
reducing costs
  - TLAf costs are born by EirGrid ...regulatory cost recovery necessary
- Business justification projections of €10m/y  
curtailment reductions by 2020
  - EWIC (and Moyle) often scheduled to import at times of high wind output
  - Renewables facilitation is not currently market driven



# Countertrade Process

**Market Position** established

Countertrade **initial bulk** volume

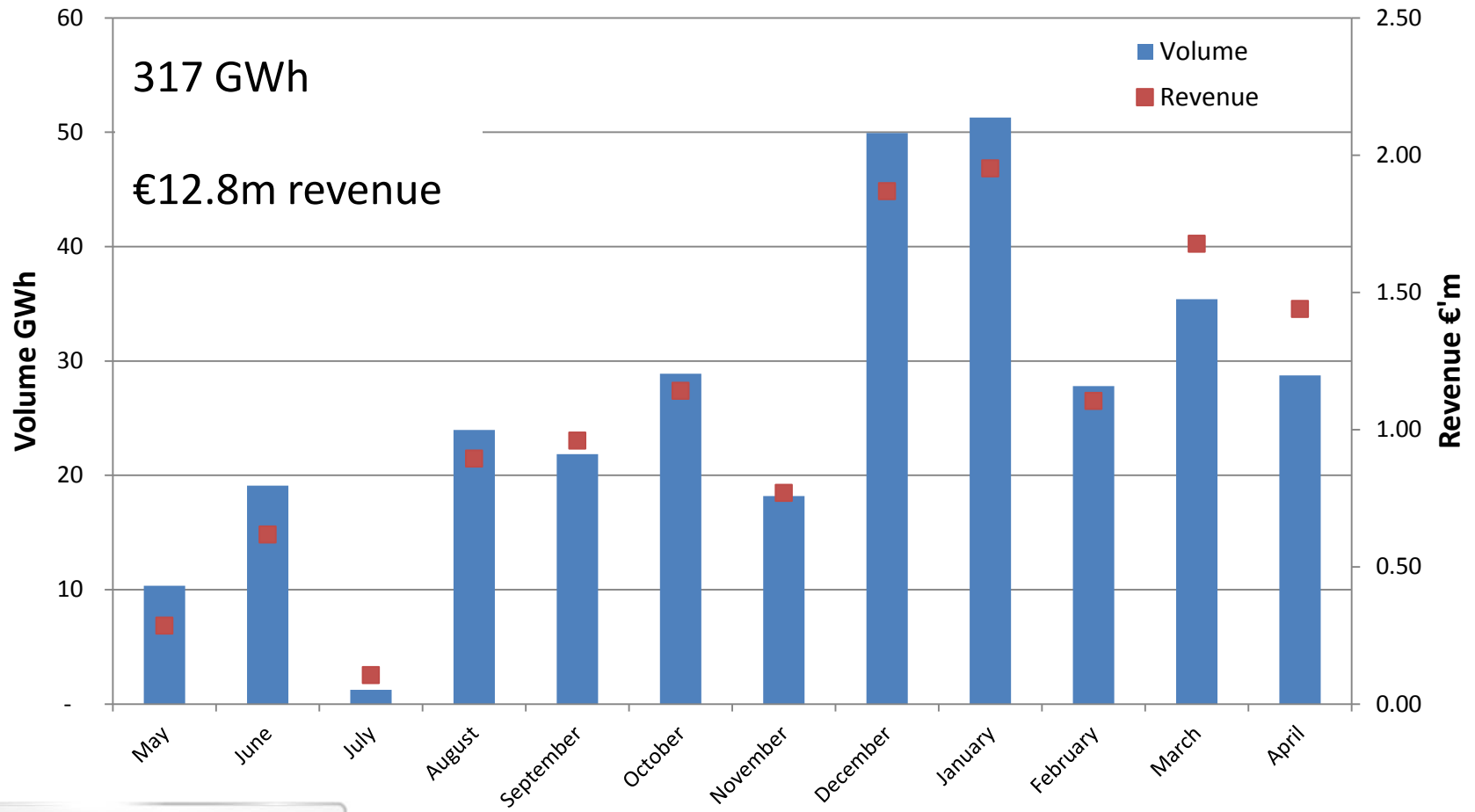
Countertrade **refined** volume

Arrange **SO-SO** Service

Real Time: Curtail if required



# Countertrade Volumes & Revenue



# EWIC in the News!

## UK power link knocks a tenth off electricity costs, says operator

Potential €1bn French link could reduce costs by similar amount, says EirGrid

## Wholesale electricity prices down 9 per cent

**Simon Cunningham**  
**W**HOLESALE electricity prices in Northern Ireland have lowered by nine per cent since an interconnector linking Ireland and Britain commenced full commercial operations last year.

That is according to energy firm EirGrid Group which includes the System Operator for Northern Ireland (SONI). EirGrid made the announcement as it revealed pre-tax profits of €61.1 million (\$50.2m) for the year to the end of September 2013.

It maintained its class-leading progress in facilitating renewable energy on the transmission system, and in delivering innovation and high standards of security of supply," he said.

EirGrid is electricity Transmission System Operator (TSO) in the Republic and also owns of the System Operator Northern Ireland (SONI Ltd). The Single Electricity Market Operator (SEMO) is part of the EirGrid Group, and operates the wholesale market on the island of Ireland.

## UK power link has cut electricity prices, says EirGrid

A NEW electricity link connecting Ireland and the UK has helped push down electricity prices by 9pc, EirGrid has claimed.

The East-West Interconnector, which cost around €950m to build, has already pushed down wholesale prices in the 10 months since it began operations, according to the national transmission system operator.

The interconnector, which runs between Meath and Denbigh in Wales, can import and export enough energy to power an extra 300,000 homes.

The savings created by this have been passed down to businesses and consumers through a series of deals offered by energy companies in recent months, EirGrid chief executive Fintan Slye said.

"The interconnector isn't the only reason for price falls, but it's a major contributor" said Mr Slye (pictured), discussing the company's 2013 annual results.

EirGrid made an underlying profit of €18.3m in the 12 months, virtually unchanged from 2012, and paid a dividend of €4m to the State. Revenues were €622m, up from €543m.

The success of the intercon-

lapse of talks over a massive network of wind-farms in the midlands has also denied the State access to an additional electricity source that could have seriously pushed down prices, EirGrid said.

The State would have been able to import as well as export electricity using an interconnector planned by UK developers as part of proposals to erect thousands of wind-farms in the midlands - with most of the costs of the interconnector shouldered by the developers, rather than Irish taxpayers.

But this option disappeared when talks about the windfarms collapsed in March.

**Sarah McCabe**



## New interconnector brings 9pc price drop

### ENERGY

A NEW electricity transmission system connecting Meath with Denbigh in Wales has helped push down electricity prices by 9pc, EirGrid has revealed.

The East-West Interconnector, which cost around €950m to build, has already had a major downward effect on wholesale prices in the 10 months since it opened, according to the national transmission system operator.

The savings have been passed down to businesses and consumers through deals offered by energy companies in recent months, EirGrid chief executive Fintan Slye (above) said.

EirGrid made an underlying profit of €18.3m in the 12 months, virtually unchanged from 2012, and paid a €4m dividend to the government. Revenues were €622m, up from €543m.







## WHOLESALE ELECTRICITY PRICES LOWER BY 9% DUE TO EIRGRID INTERCONNECTOR

- *East West Interconnector exerts significant downward pressure on wholesale electricity prices*

**Wednesday, 30 April, 2014:** EirGrid has announced, at the launch of its 2013 Annual Results, that wholesale electricity prices in the Single Electricity Market on the island of Ireland are lower by 9 per cent since the EirGrid East West Interconnector (EWIC) commenced full commercial operations.

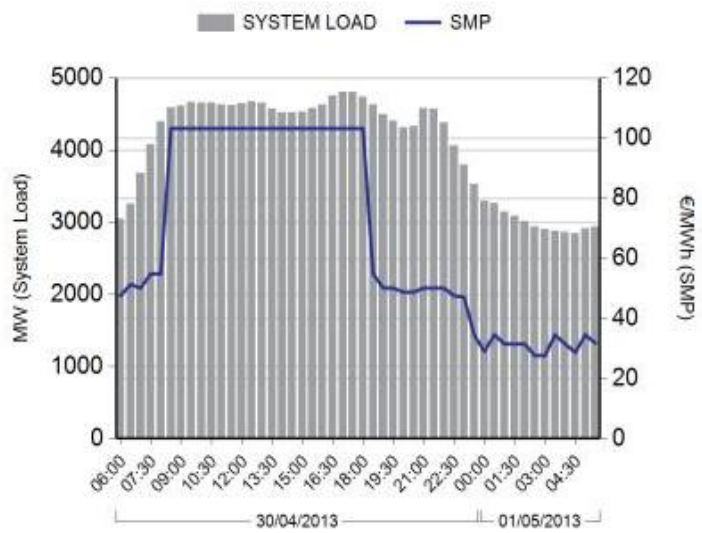
EWIC links power markets in Ireland and Great Britain. It has contributed to downward pressure on wholesale electricity prices.



# Impact of Wind on Price

## The Single Electricity Market Overview 29th April 2013

Ex-Ante 1 30th Apr



[View Chart Data](#)

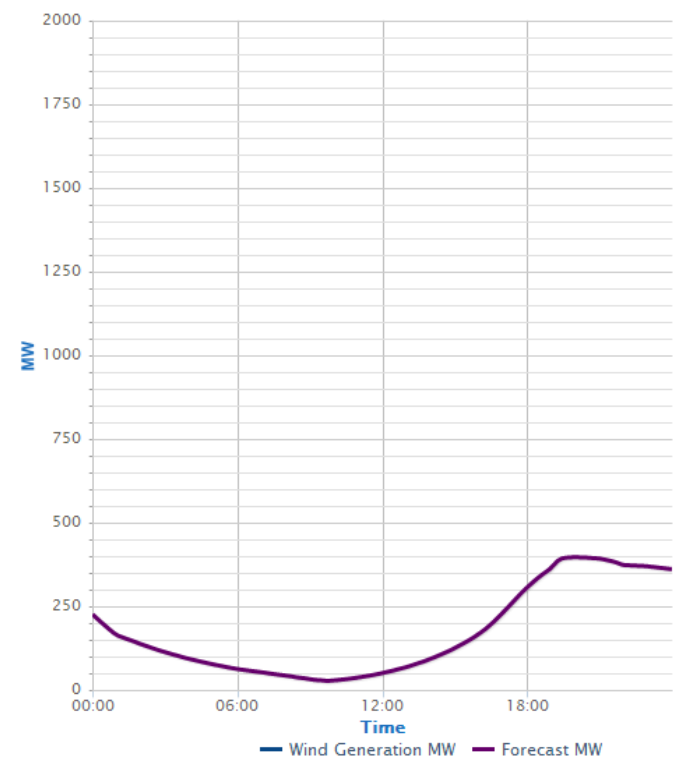
Currency:

**Trading Day Statistics**  
 Min Daily Price:  
**€27.63 MWh**  
 Max Daily Price:  
**€103.19 MWh**

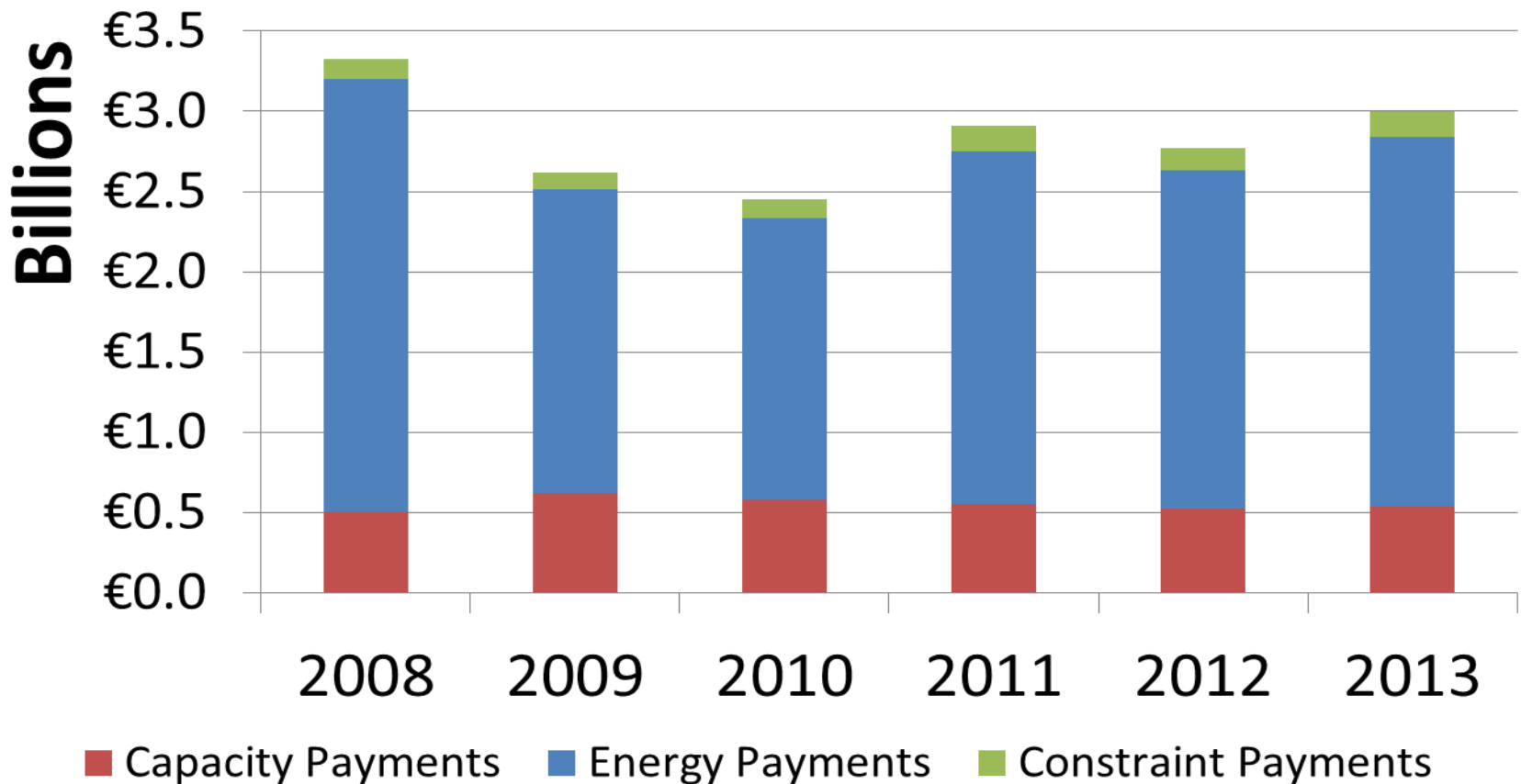
[More Market Data](#)

Last updated: 10:14 29th April 2013

### Wind Generation Forecast Generation



# Value of the SEM – Over €7.5M/day

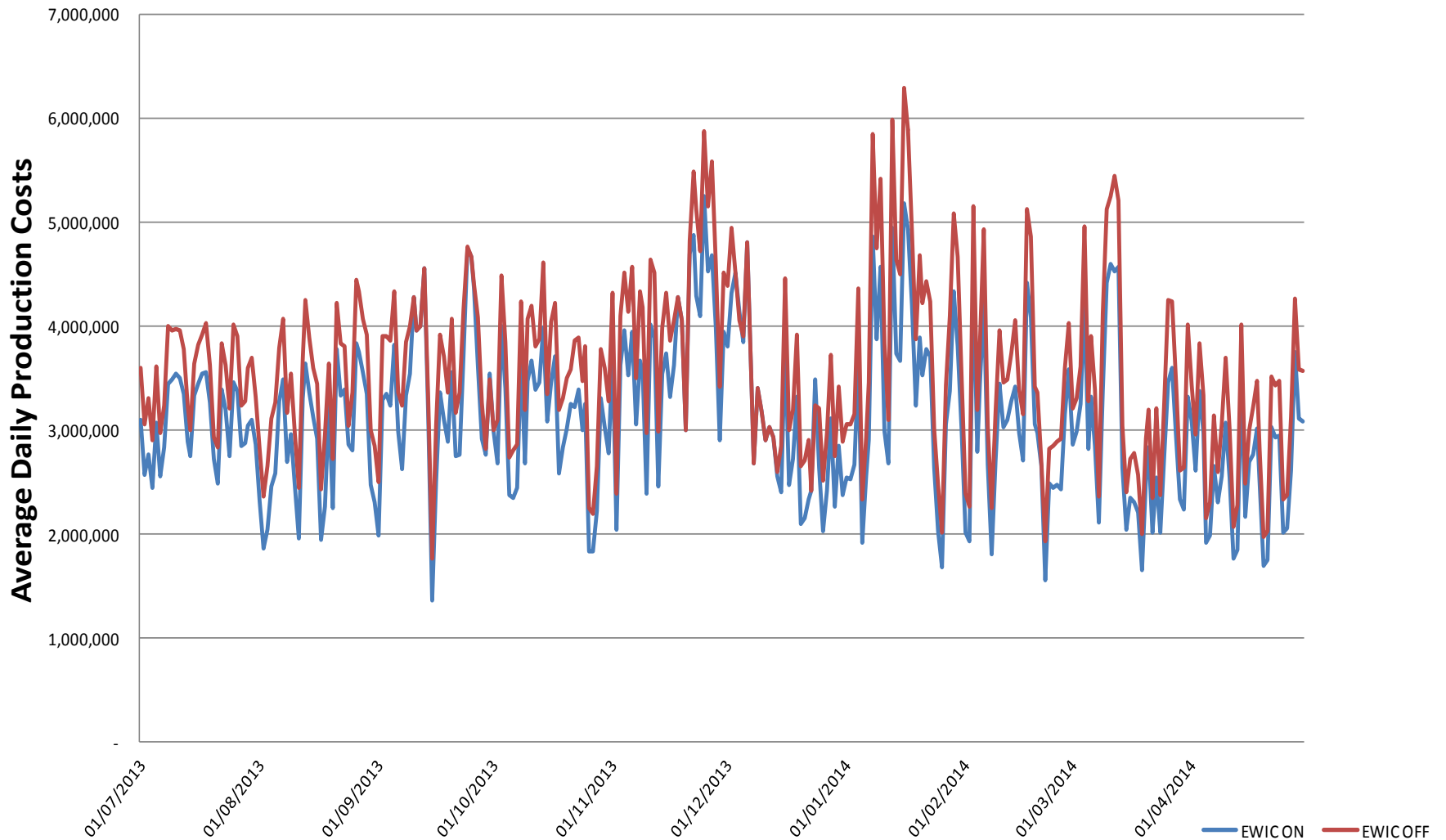


# EWIC Market Analysis

- Economic Dispatch only, no constraints, reserve or otherwise
- Unconstrained Unit Commitment (UUC) or market engine used in offline mode
- Base Case is actual UUC based on EWIC **fully available** from May 1<sup>st</sup> 2013 – April 1<sup>st</sup> 2014 – **EWIC ON**
- Scenario EWIC **unavailable** from UUC for all trade dates May 1<sup>st</sup> 2013 – April 30<sup>th</sup> 2014 – **EWIC OFF**
- Comparison of overall Production Costs and System Marginal Price (SMP)

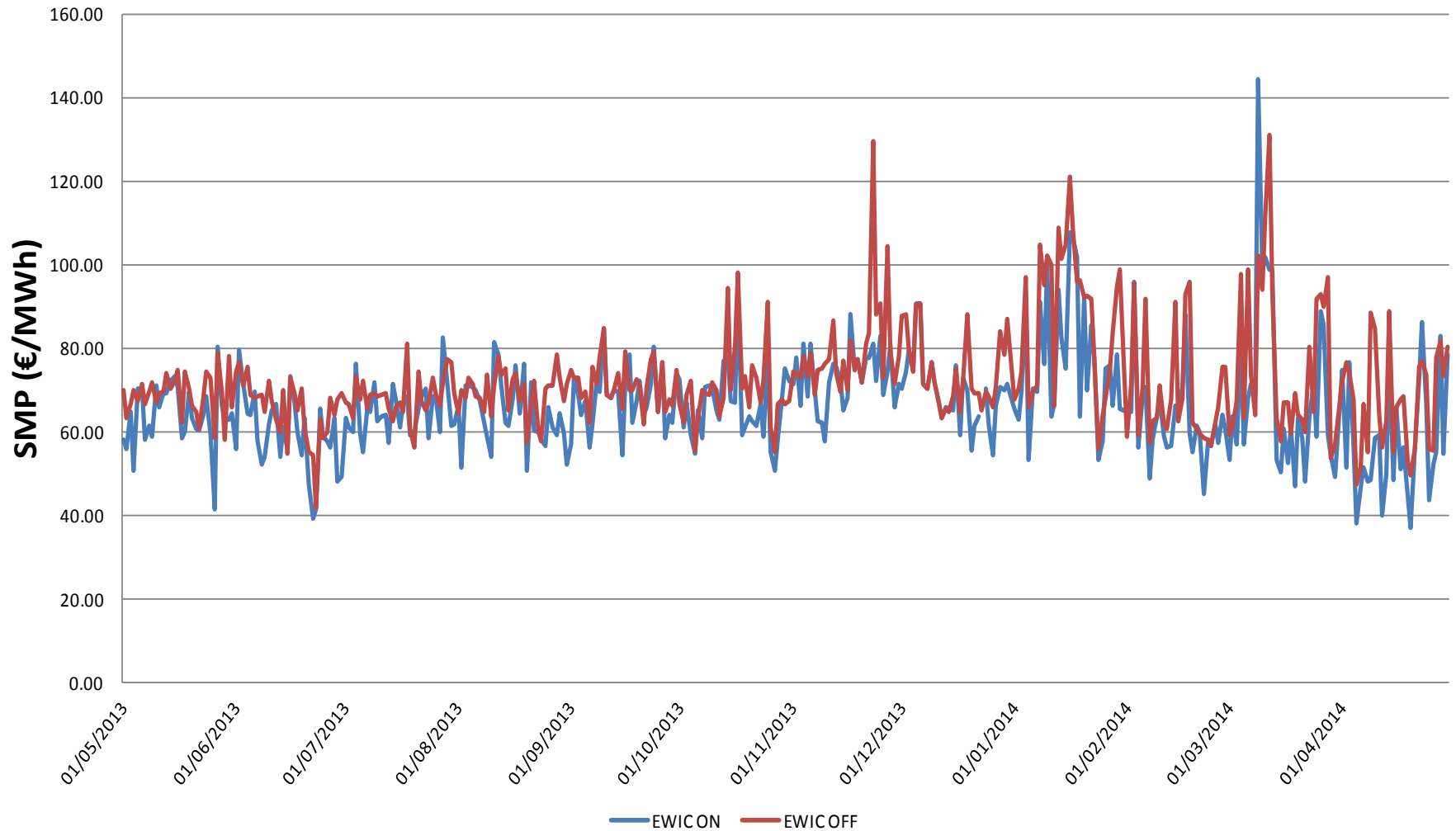


## Average Daily Production Costs with EWIC ON vs EWIC OFF - Trading Day

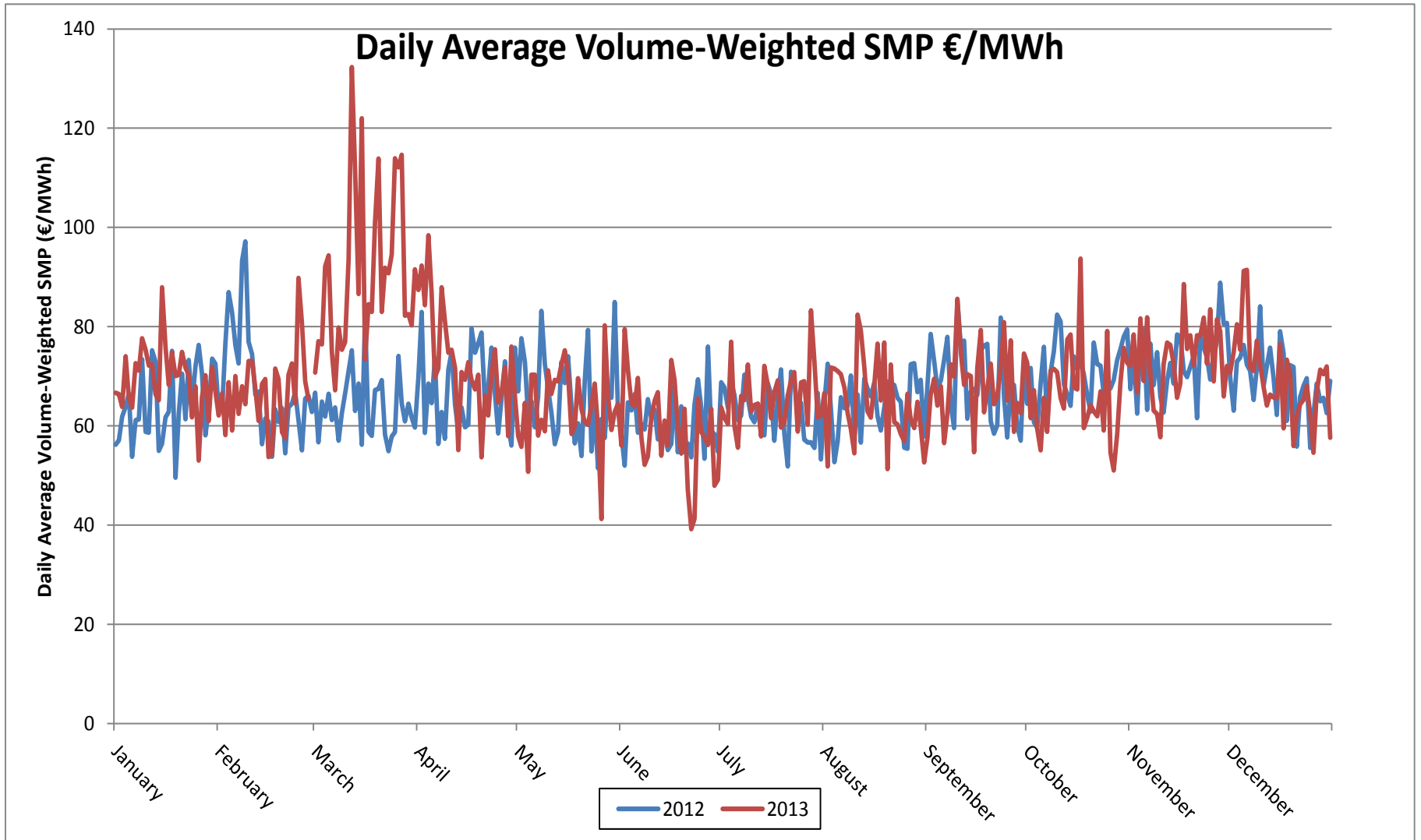


**Relative Average Daily Savings in Prod Costs €462k or 15% Per Day**

## Load Weighted Average SMP with EWIC ON vs EWIC OFF - Trading Day



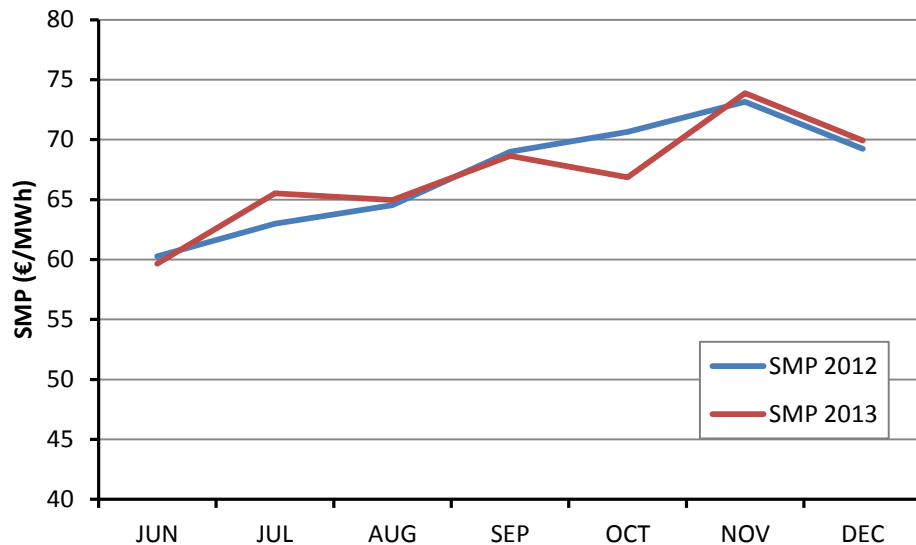
**Relative Average Daily Savings in SMP 5.85 €/MWh or 9% on average since May 1<sup>st</sup> 2013**



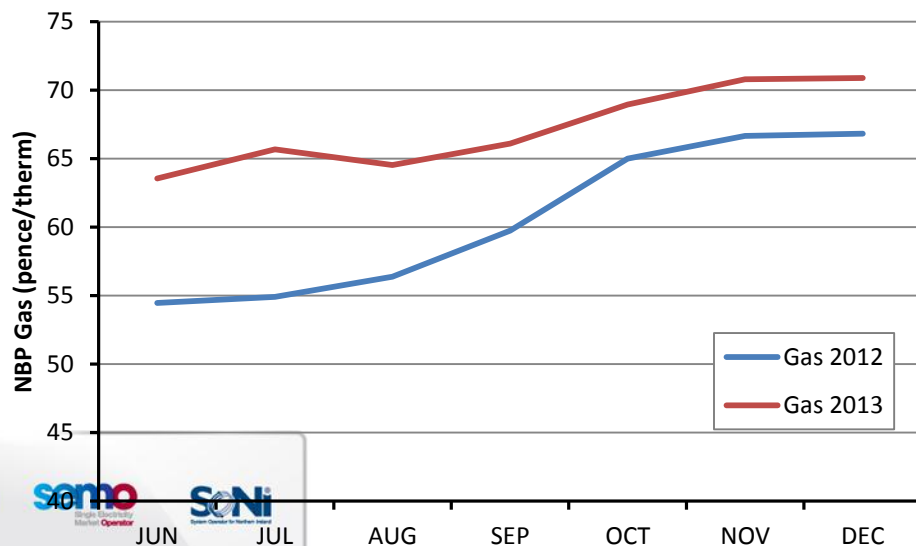
**Actual SMP Calendar Year 2012 v 2013**



# Year on Year Difference in Monthly Average SMP and Gas Prices



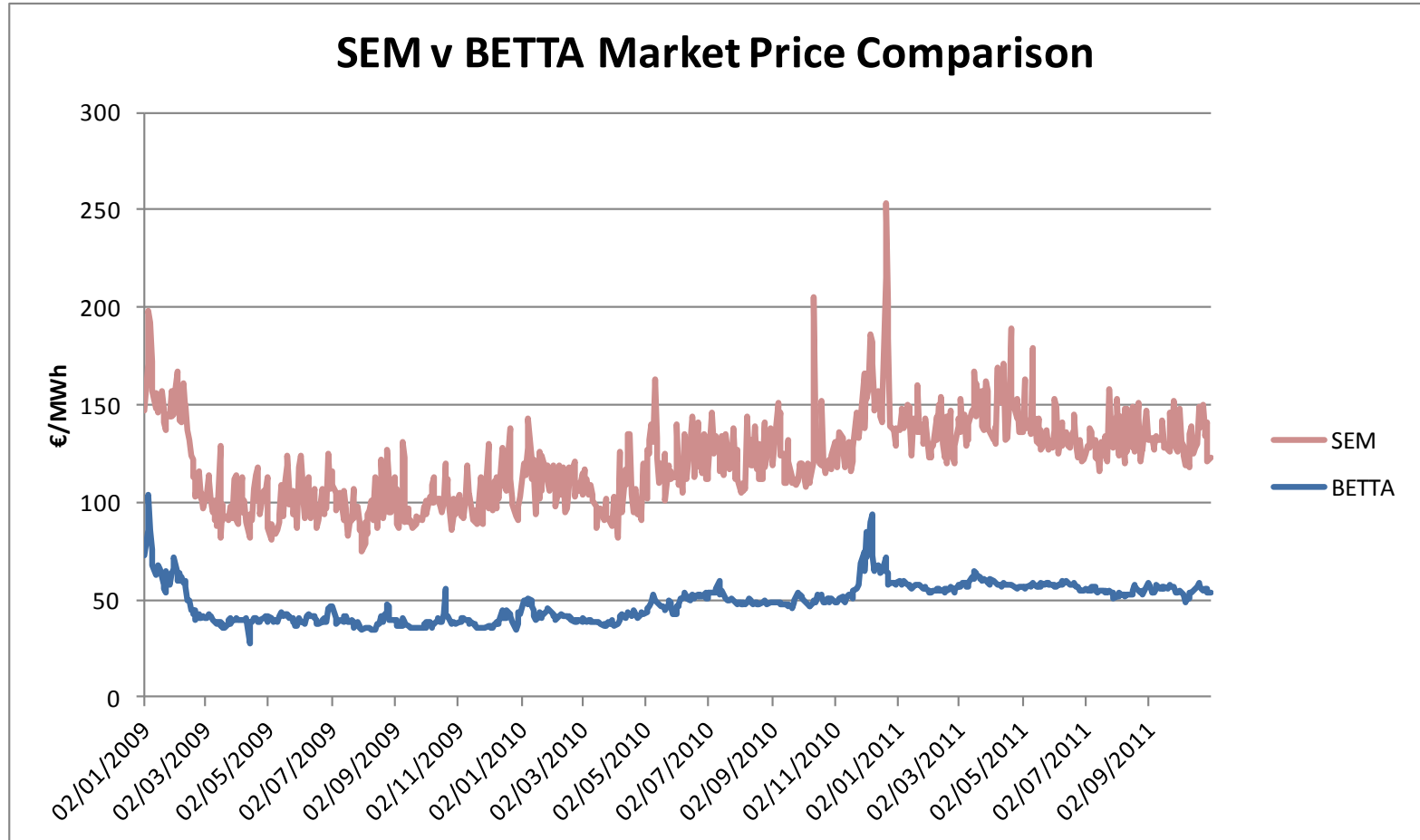
June – December  
0.1% Decrease in SMP



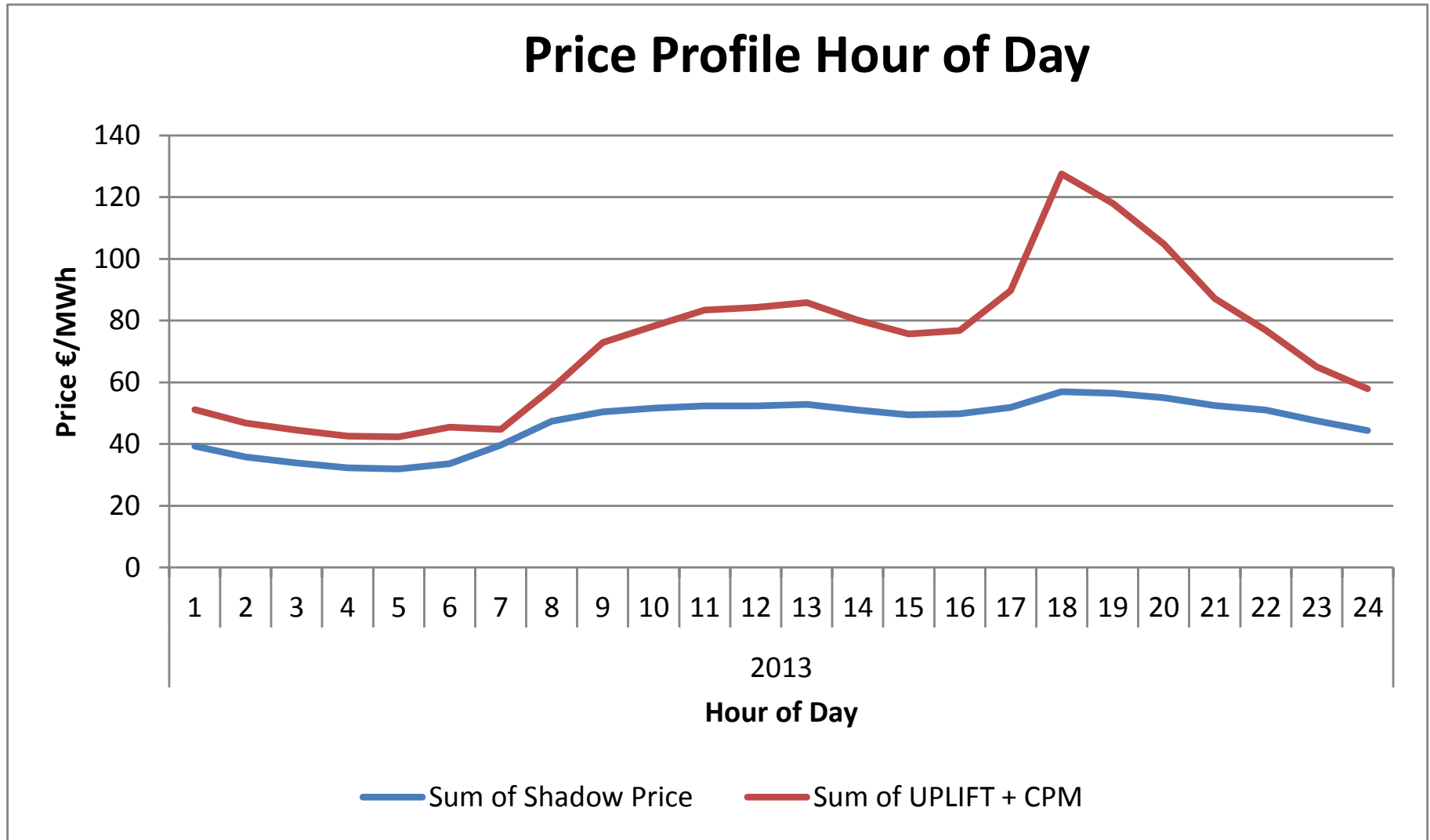
June – December  
12.9% Increase in NBP Gas



# Market Price Comparison



# Price Profile



# Markets

## SEM

Ireland & Northern Ireland

Transparent bidding

Short Run Marginal Cost,  
Start-up costs

Capacity Payments

3 gate closures

Ex-post Pricing

## BETTA

England, Scotland, &  
Wales

Non-transparent power  
trades Bilateral contracts

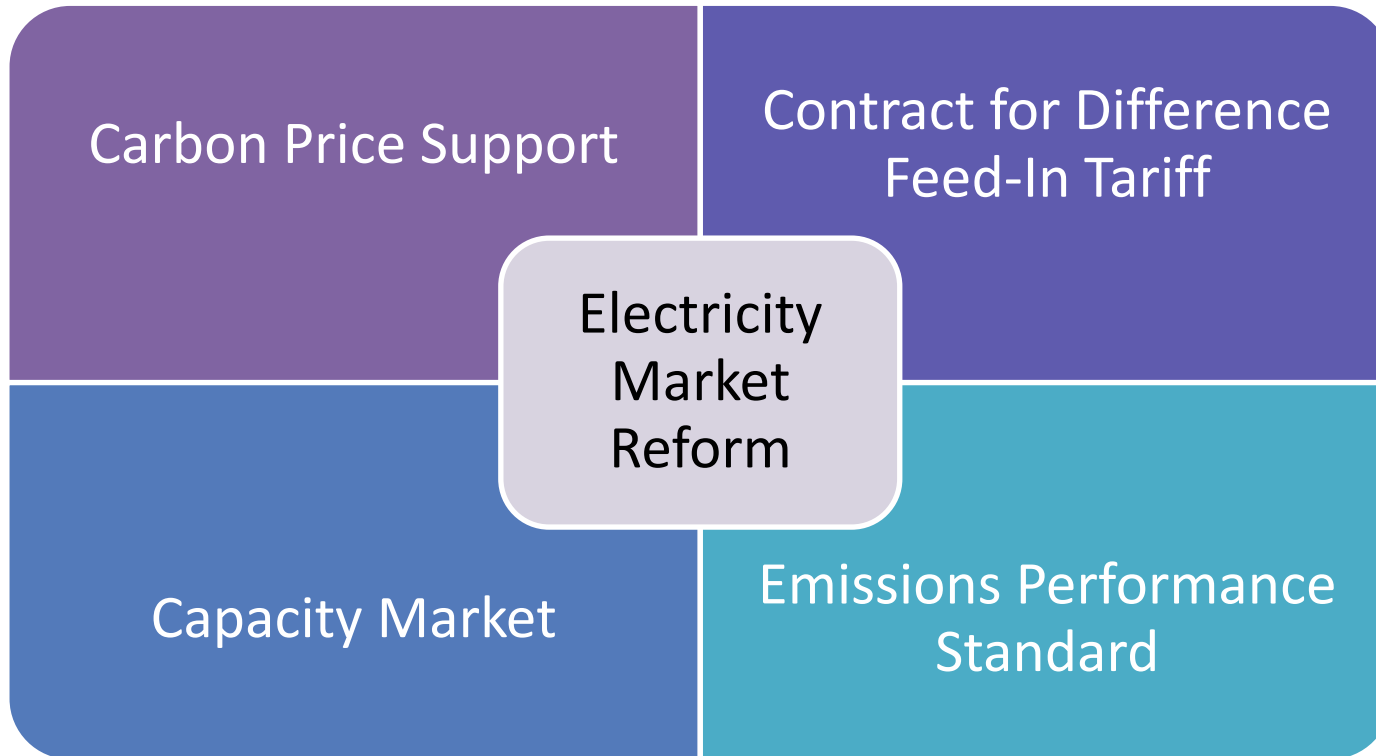
Power Exchange and  
Balancing Market

Hourly gate closures

Ex-ante Pricing



# GB – Electricity Market Reform



# Recap...

## EWIC impact on the market

Downward pressure on wholesale electricity prices  
(estimated at 9%, circa €170m savings in production costs per annum)

Contributed to reducing the level of wind curtailment  
Particularly during the exceptionally high sustained wind during Dec 13/Jan 14

EWIC on occasion is the “largest single infeed” (LSI)  
Increased reserve requirement  
Can increase the cost of constraints  
**Countertrading is limiting this impact**



# It's all about Balance...

Influencers on wholesale price

- Demand, Fuel Prices, SNSP%, Interconnector Flows, Availability of Generation
- Downward pressure on wholesale prices of 9% is a good news story





A Northern Ireland Company working for consumers

# **Moyle Interconnector Technical Update**

## **Interconnector Users Forum**

**8 May 2014, Dublin**

**Stephen Hemphill  
Group Operations Manager**



## Presentation Outline

- **Moyle Cable Faults History & Recovery Plan**
- **Recovery Plan Progress**
  - **Emergency Fall Back 250MW**
  - **Interim Solutions 500MW**
    - **Bipole Operation**
    - **Seabed Repair**
  - **Enduring Solution Return Conductor Cable Replacement**
- **South West Scotland Context**
- **Summary – Impact on Capacity & Availability**





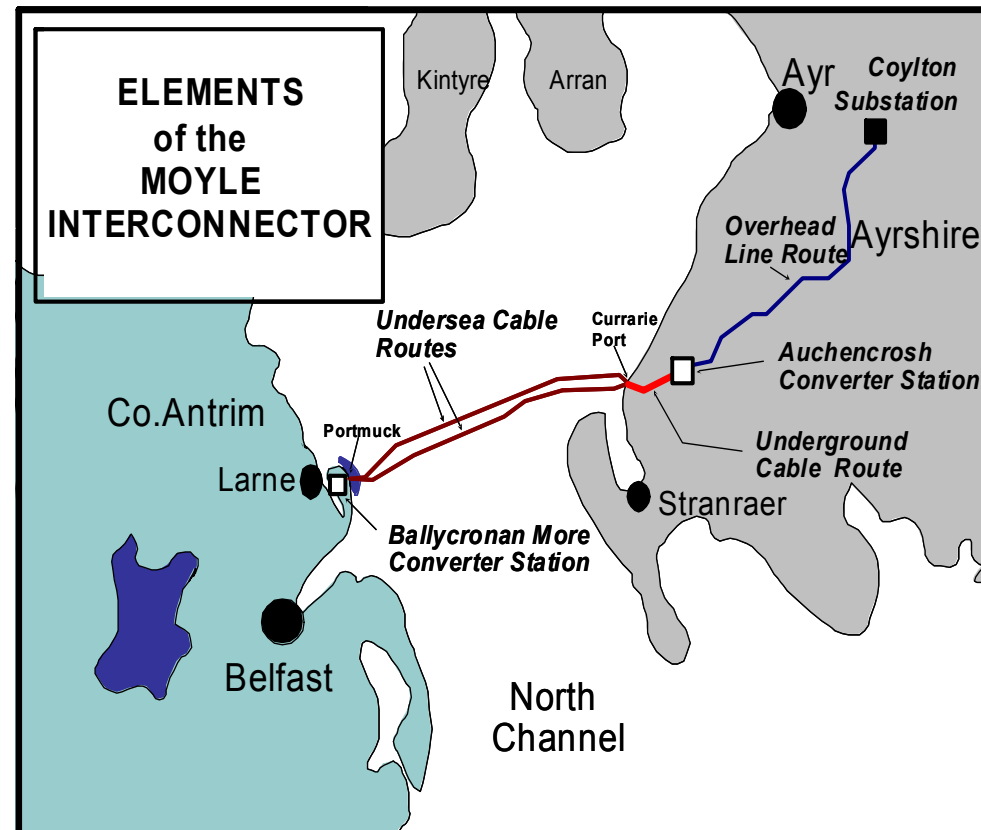
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## Fault History & Reason for Projects



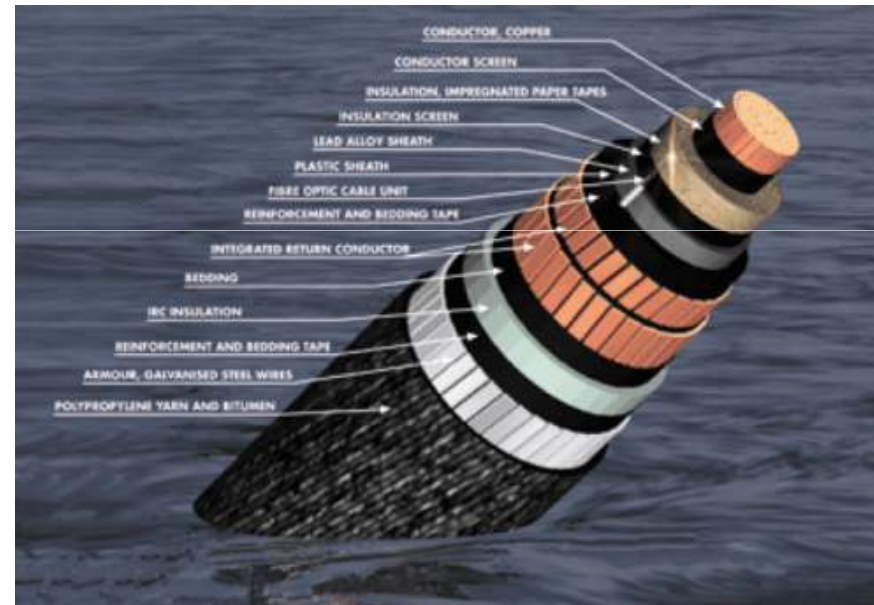
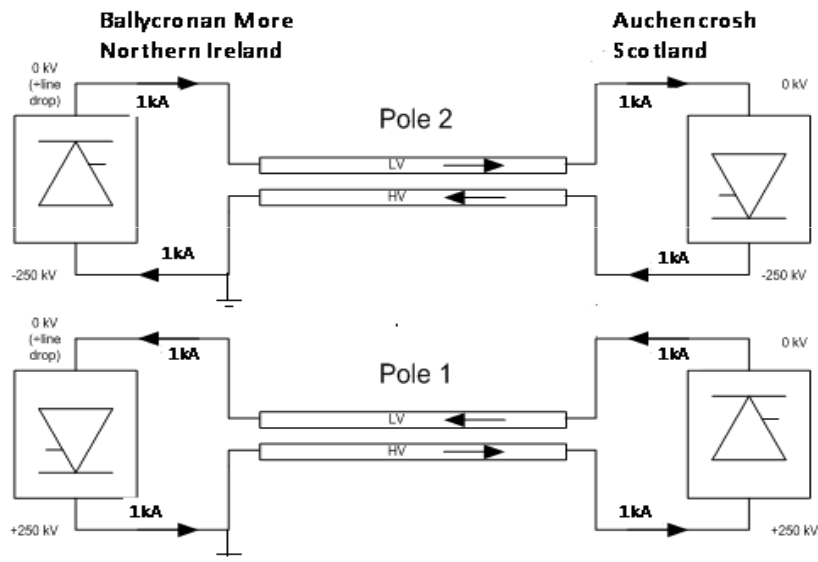
## Moyle Interconnector (Electricity Business)

- Links the electricity grids of Northern Ireland and Scotland through two submarine cables
- Cables run between converter stations at Ballycronan More in Islandmagee, County Antrim and Auchencrosh in Ayrshire
- The link has a capacity of 500MW (approx 30 % of Northern Ireland's energy requirements)
- Submarine DC cable system consisting of two separate 250MW cables running the 62km route length
- In NI, underground cable system between Ballycronan More and Port Muck
- In Scotland, underground cable system between Currarie Point and Auchencrosh





# System Line Diagram & Existing Cables



# Recent cable fault history





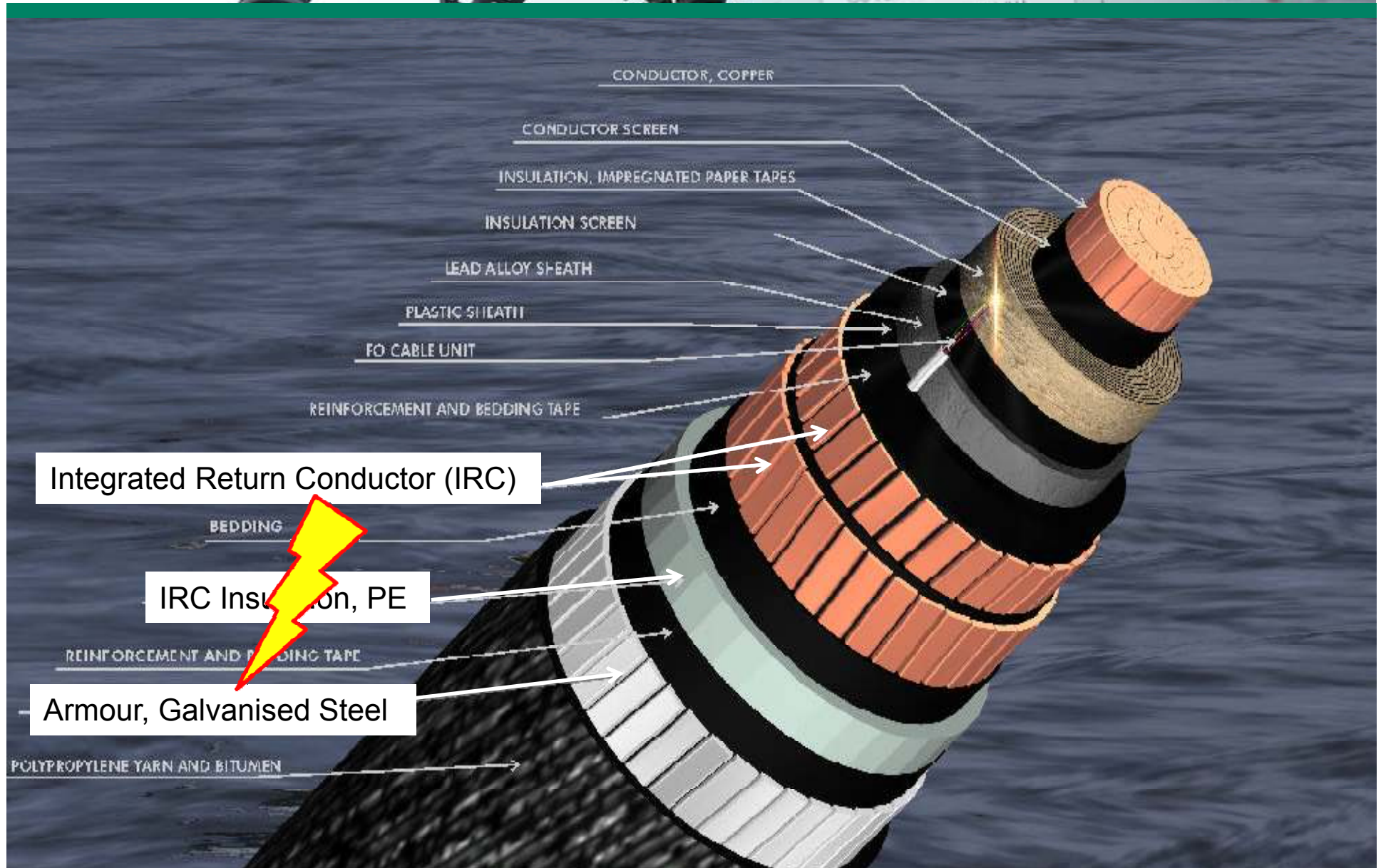








# Nature of Faults – IRC Insulation





## Nature of Recent Faults – IRC Insulation



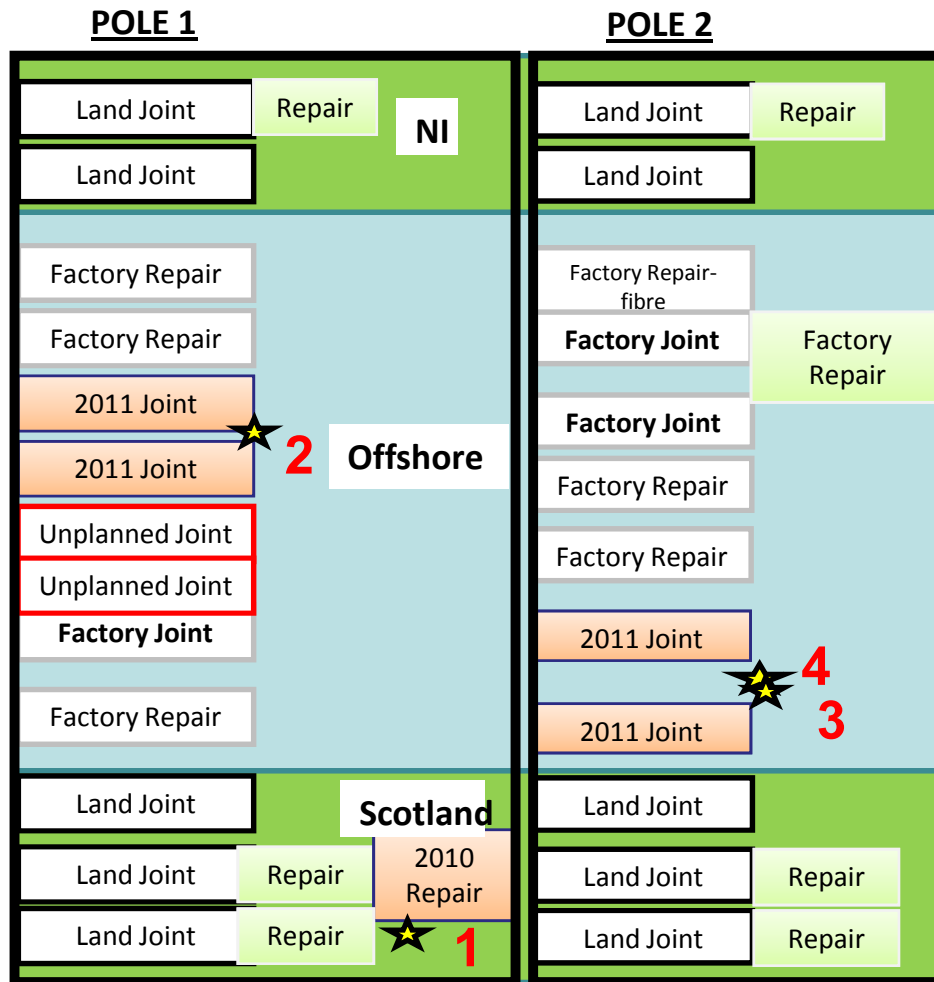


## Nature of Recent Faults – IRC Insulation





# Obvious Risk of further IRC insulation faults



**High Risk of further faults**

IRC Insulation known at risk locations	Pole 1	Pole 2
Onshore	4	5
Offshore	6	4



A Northern Ireland Company working for consumers

## Recovery Plan



## Recovery Plan : April 2013

- Engineer and prove an the ability to use two healthy HV conductors to reconfigure a single monopole capable of 250MW – with no reliance on fault prone integrated return conductor insulation
- Gain regulatory support to replace the fault prone integrated return conductors with new cables (estimated possible 2018) and commence specification and procurement
- Attempt to develop two possible “Interim Solutions” to temporarily return the technical capacity of Moyle back to 500MW
  - Bipole Operation
  - Seabed Repair – starting with pinpointing the fault !

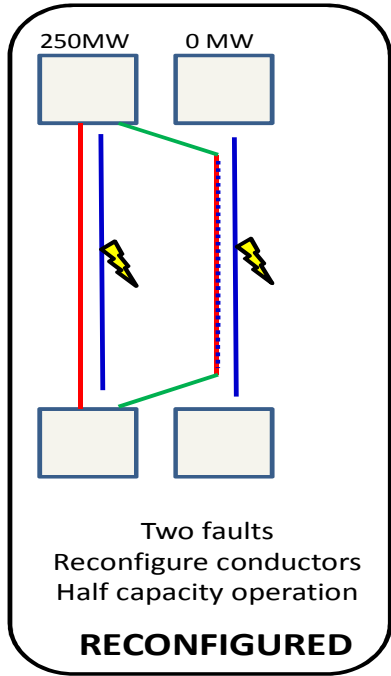
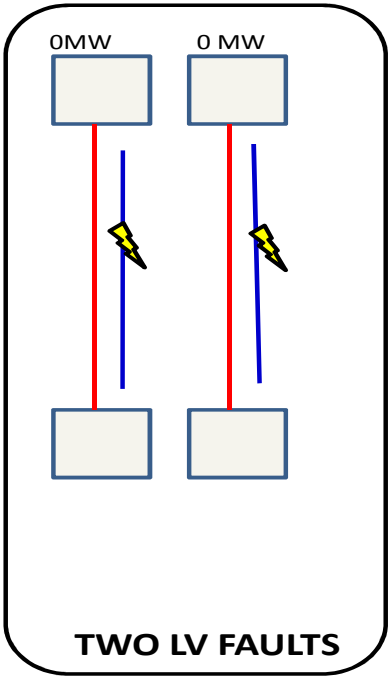
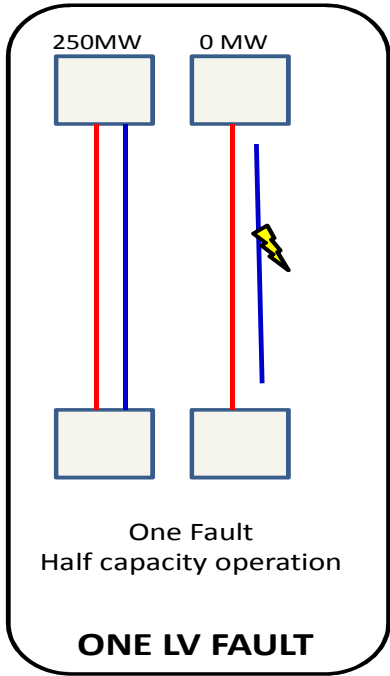


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## Emergency Fallback



# Emergency Fall Back Option



- High voltage (HV) conductor
- Low voltage (LV) conductor
- Link cable (LV)
- High voltage (HV) conductor acting as a LV





## Emergency Fall Back Option

- ✓ Attempted October 2012 when awaiting mobilisation of marine repair spread
- ✓ Simple concept – material effort and cost to put into practice
- ✓ Power transfer capability proven but some concerns regarding harmonic interference
- ✓ Theoretical analysis and studies to assess and identify possible mitigations
- ✓ Re-engineered by Siemens 2013 and successfully retested (outage and market test) November 2013
- ✓ Technically feasible



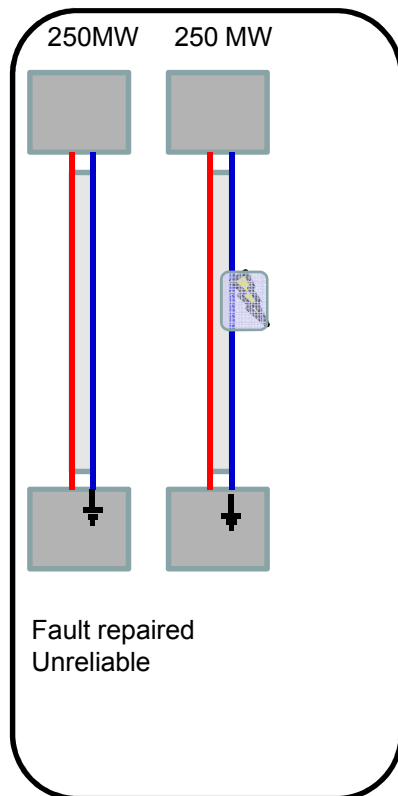
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## Seabed Repair



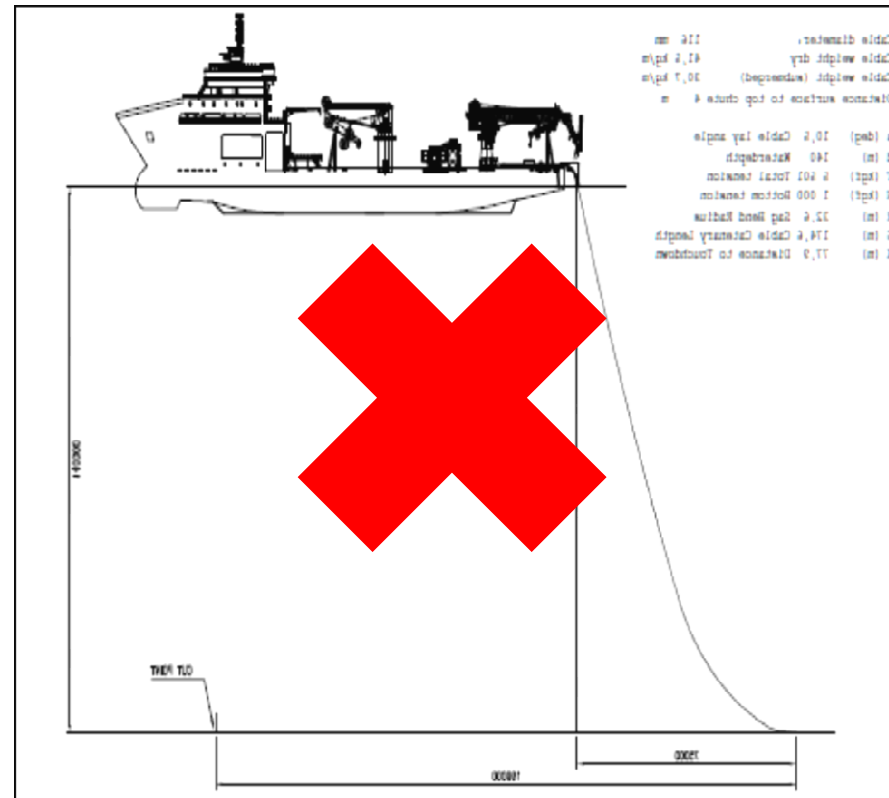
## Possible Interim Measures

### Repair existing fault on seabed



Fault  
precisely  
located

Experts  
appointed to  
design and  
test solution



SEA

LAND

Western "Hairpin"  
Repair Joint 2011

Eastern "Inline"  
Repair Joint 2011

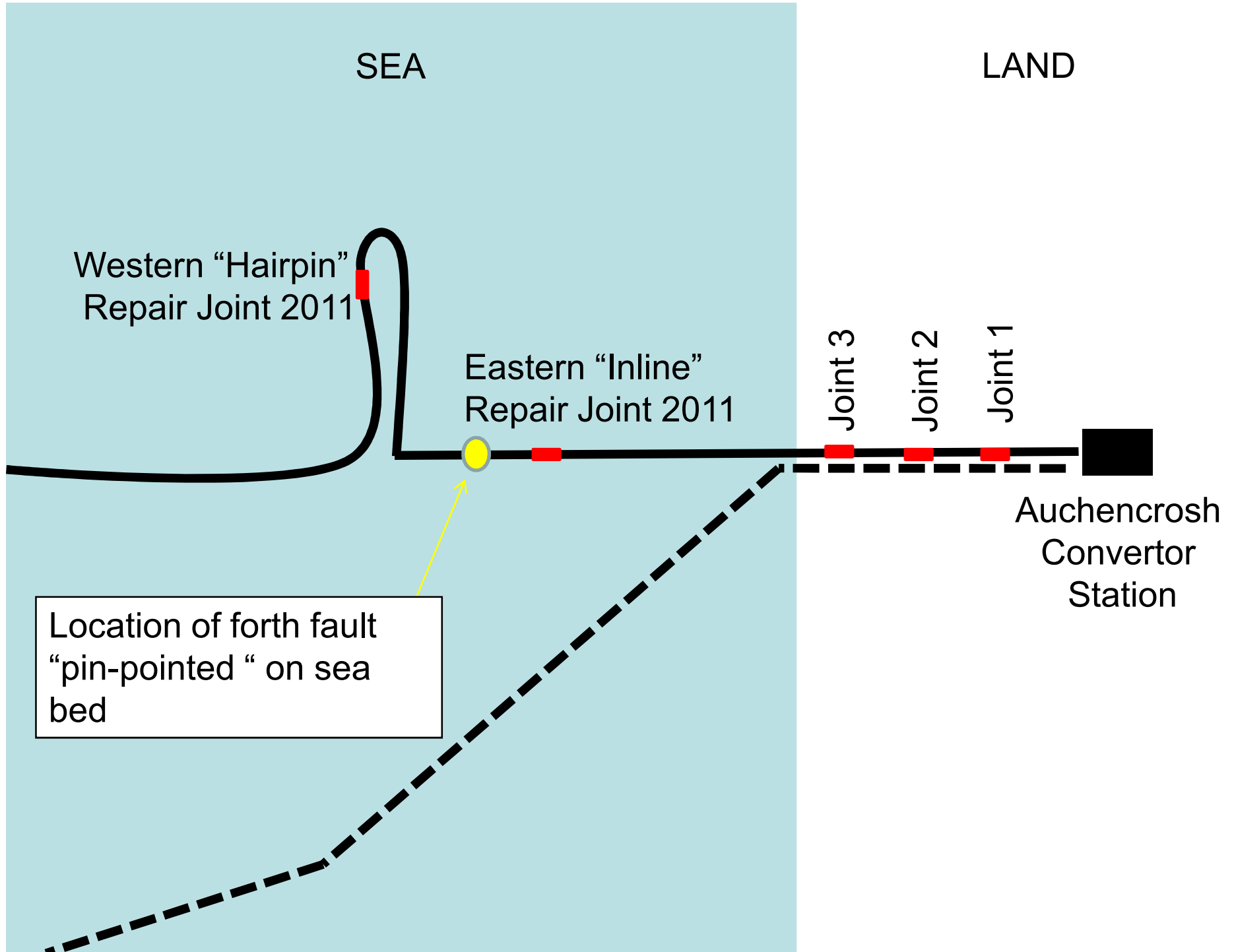
Joint 3

Joint 2

Joint 1

Auchencrosh  
Convertor  
Station

Location of forth fault  
"pin-pointed" on sea  
bed

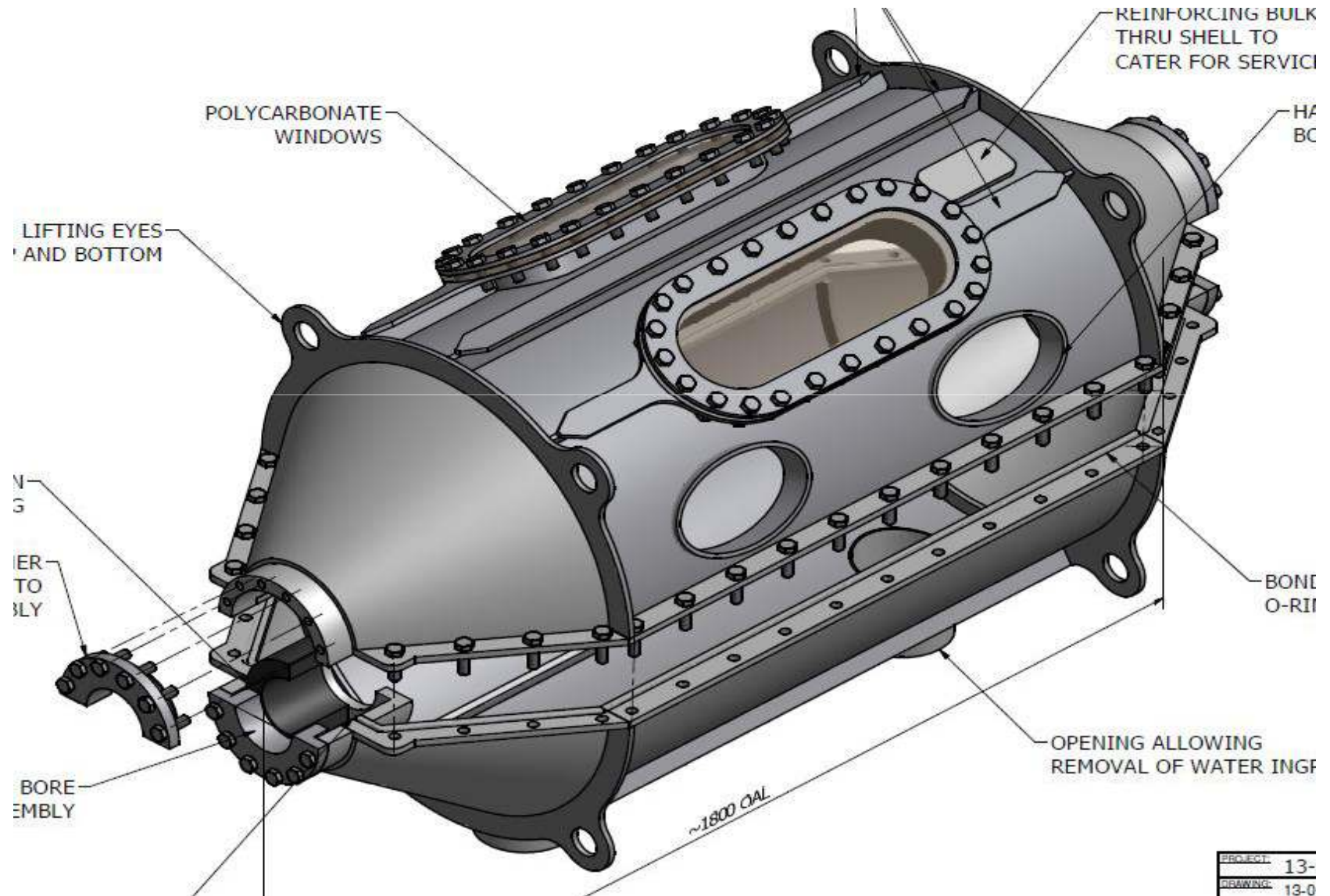


# Seabed Repair : Joint Wrap





# Seabed Repair : Habitat Concept



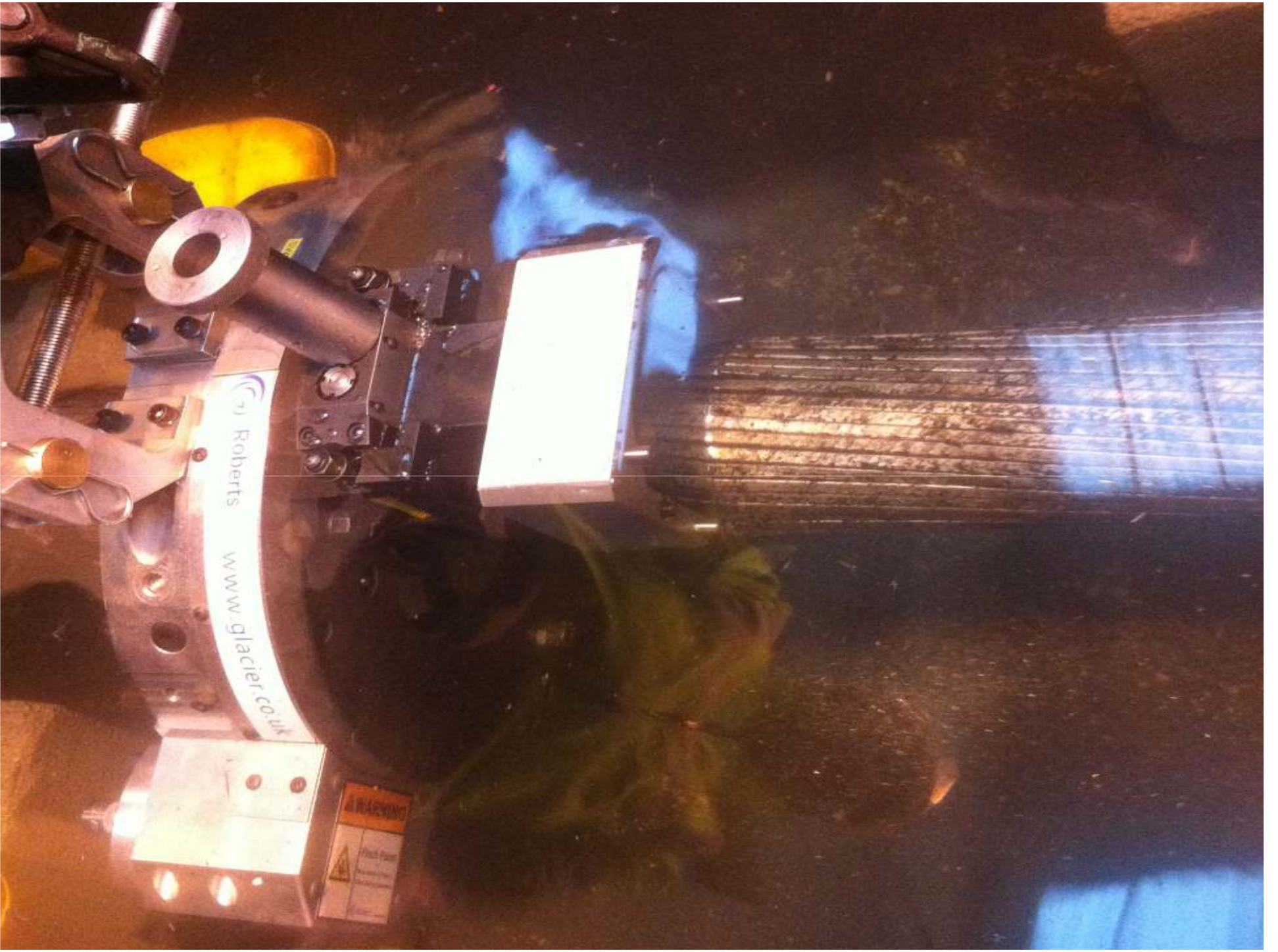
PROJECT: 13-  
DRAWING: 13-0



## Seabed Repair : Steps

- ✓ Pinpoint fault
- ✓ Prepare seabed & cable
- ✓ Cut & strip back the outer steel armour layer
- ✓ Fill the fault (a 1” diameter hole in the PE insulation?) with a putty type material called Stopaq
- ✓ Bolt a watertight enclosure (the habitat) around the hole in the PE
- ✓ Draw out the water and then, inside the dry enclosure created, dry and clean the surface of the PE
- ✓ Wrap layers of semi conducting mastic tape (a higher tech equivalent of insulation tape) onto the PE around the filled fault area.
- ✓ Remove the habitat
- ✓ Reconnect the armour









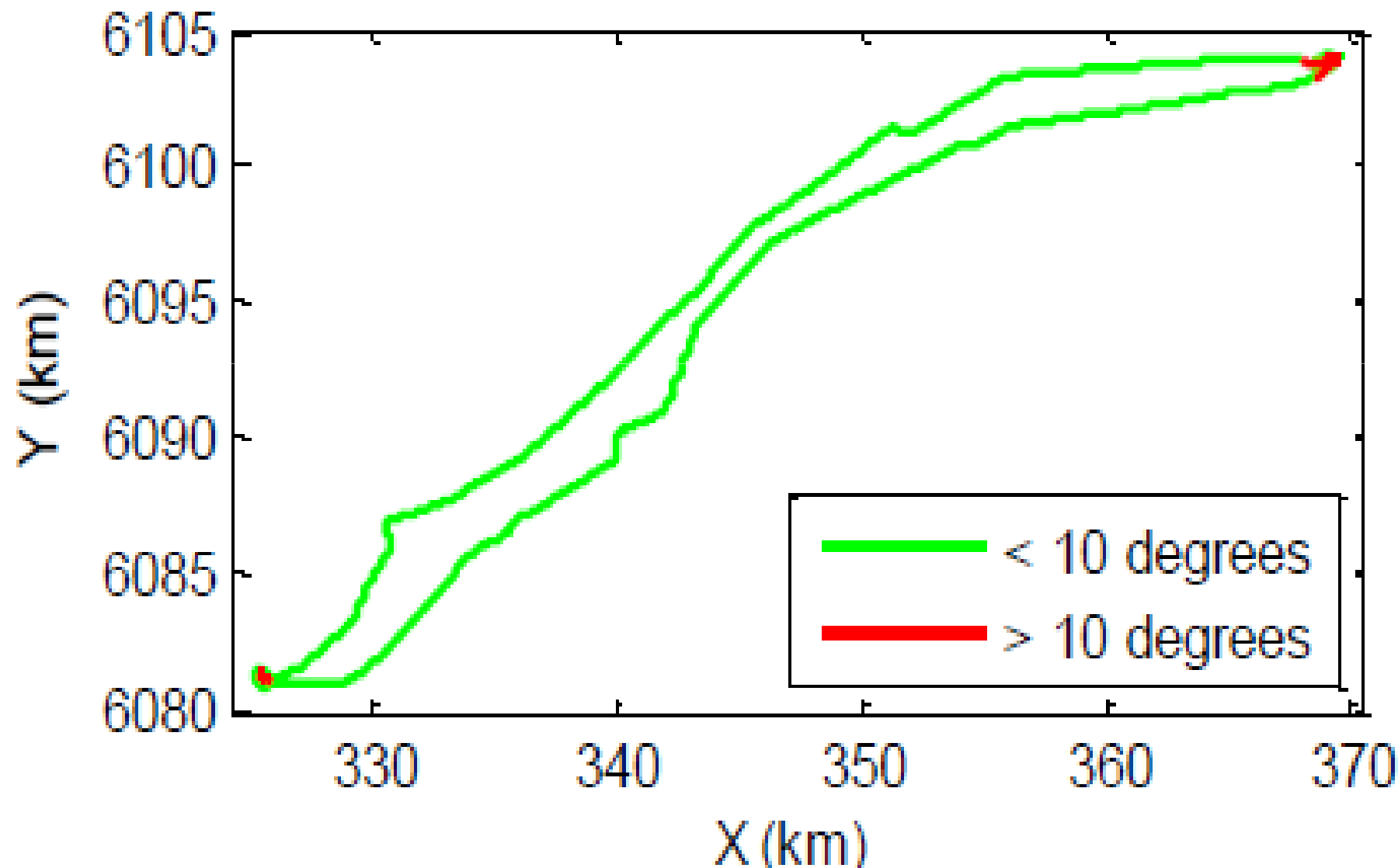
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## Temporary Bipole



# Separation of current paths = potential EMF

Compass deviation, threshold of 10 degrees



# Replace LV Conductors Target Programme



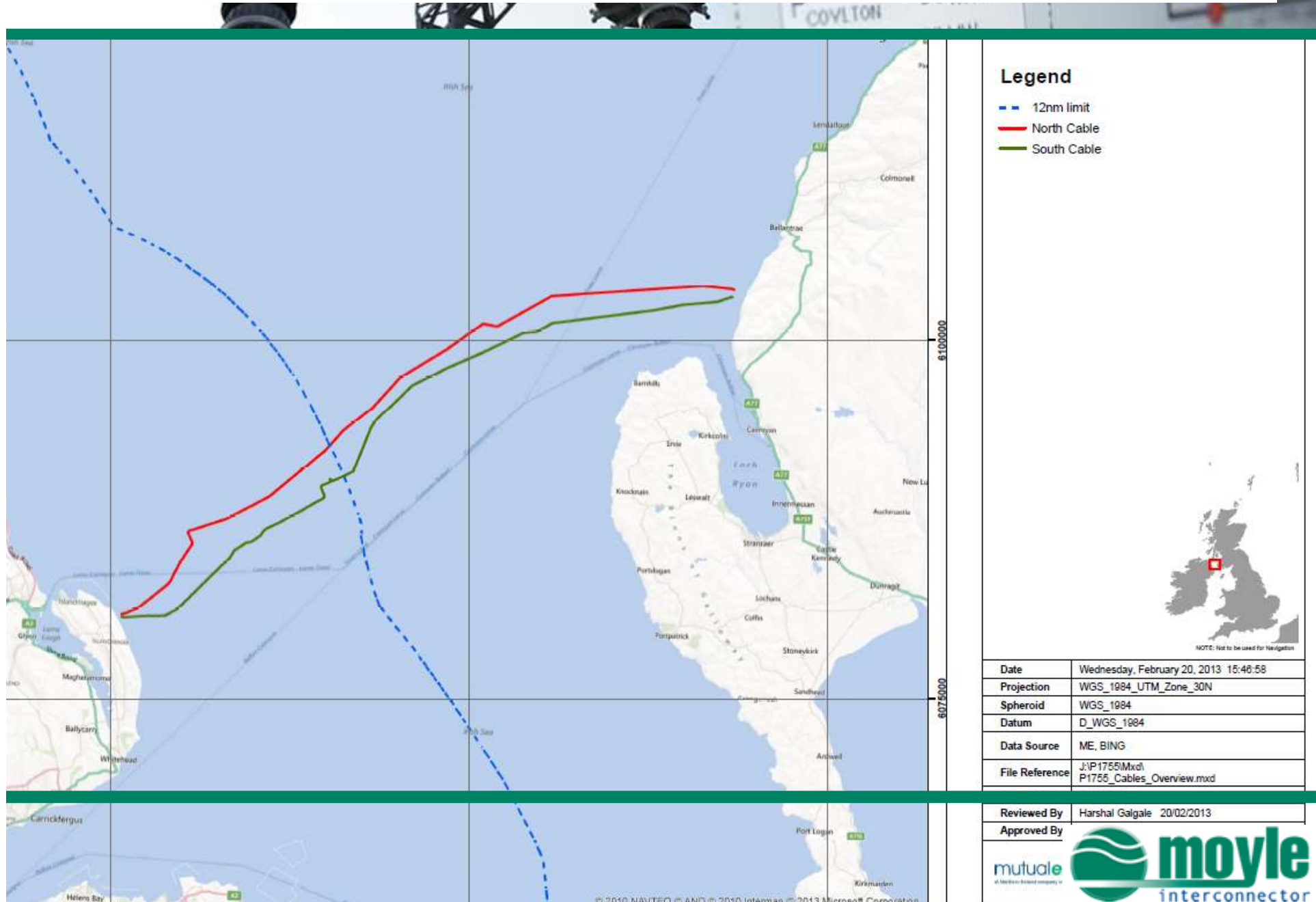


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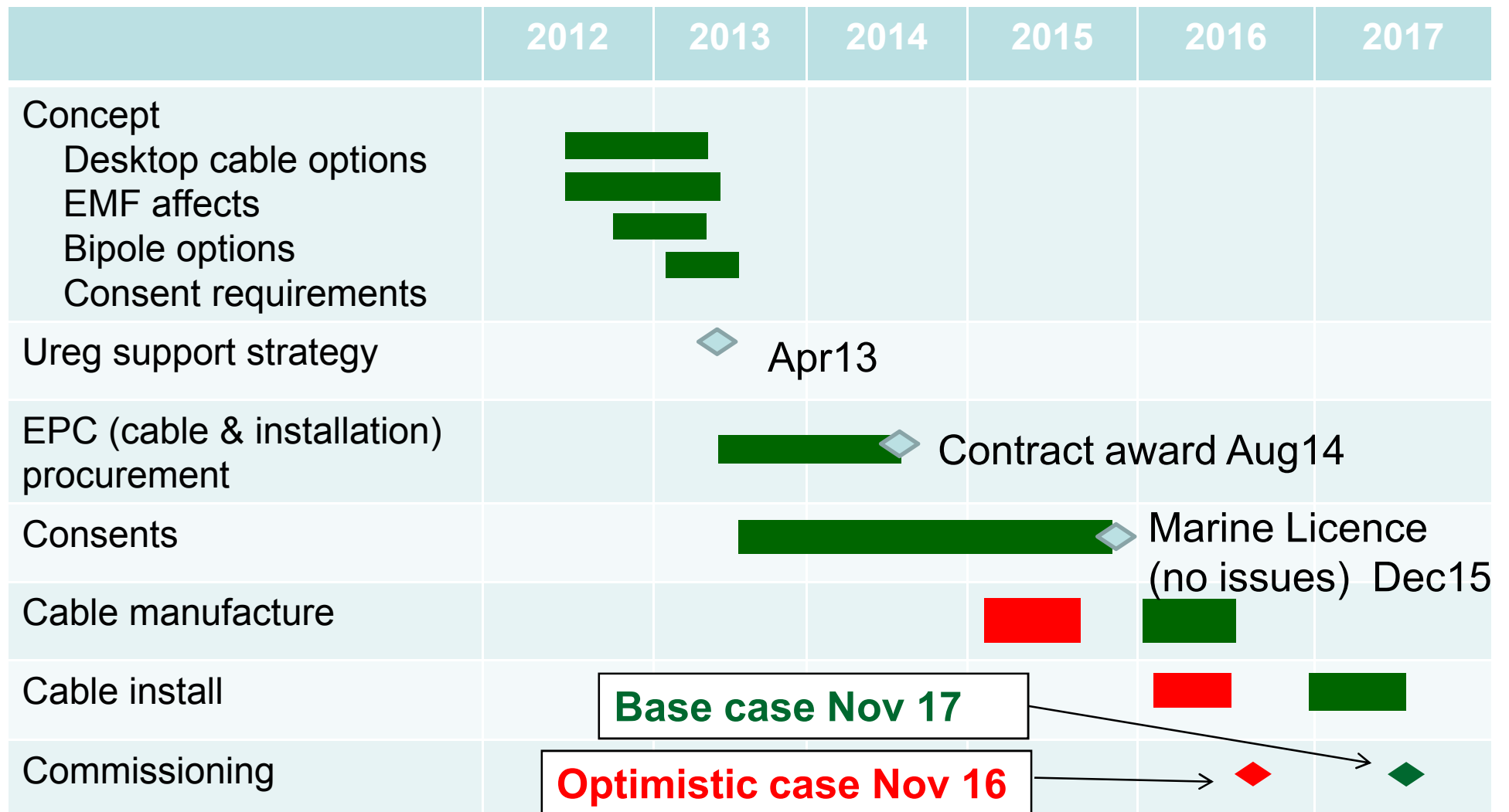
## Enduring Solution

## Replacement Return Conductors

# Replace LV Conductors Target Programme

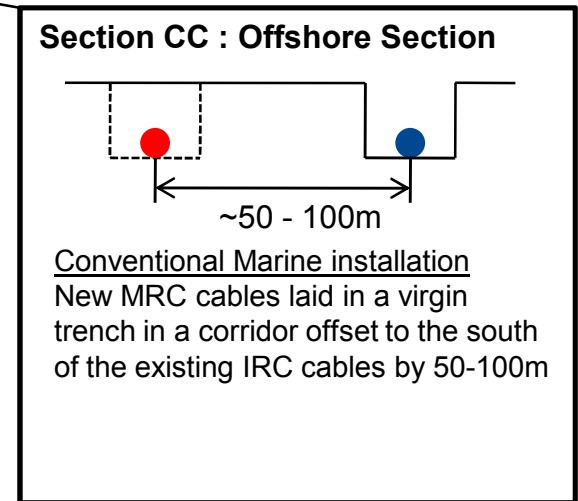
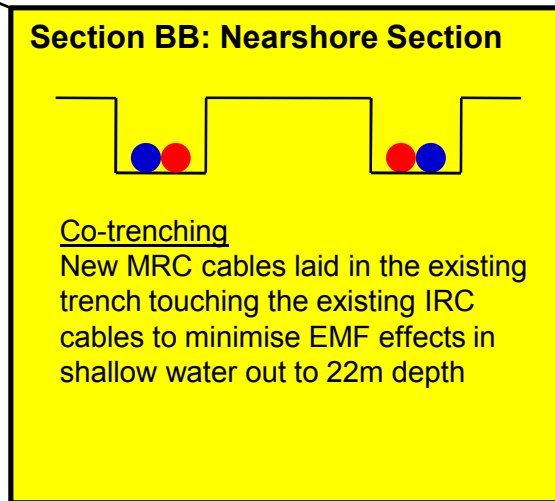
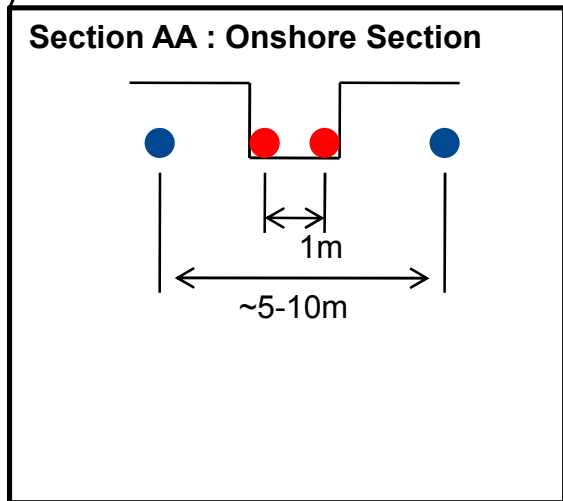
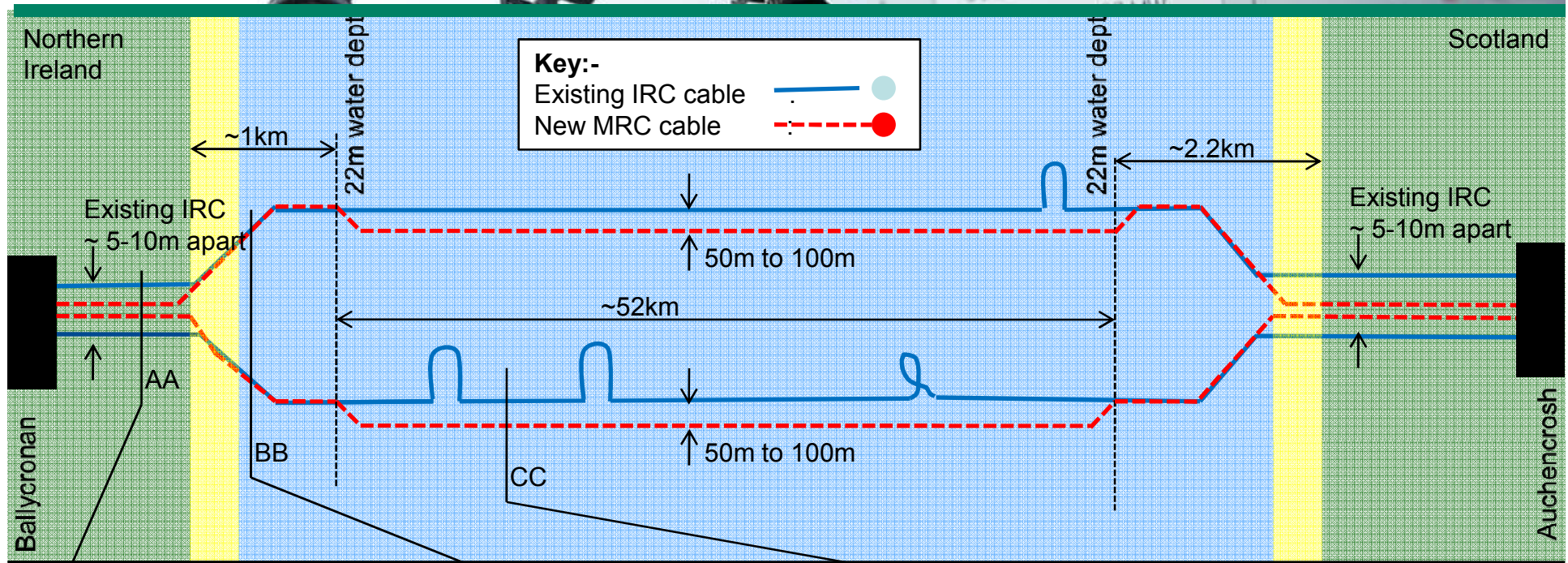


# Replace LV Conductors Target Programme





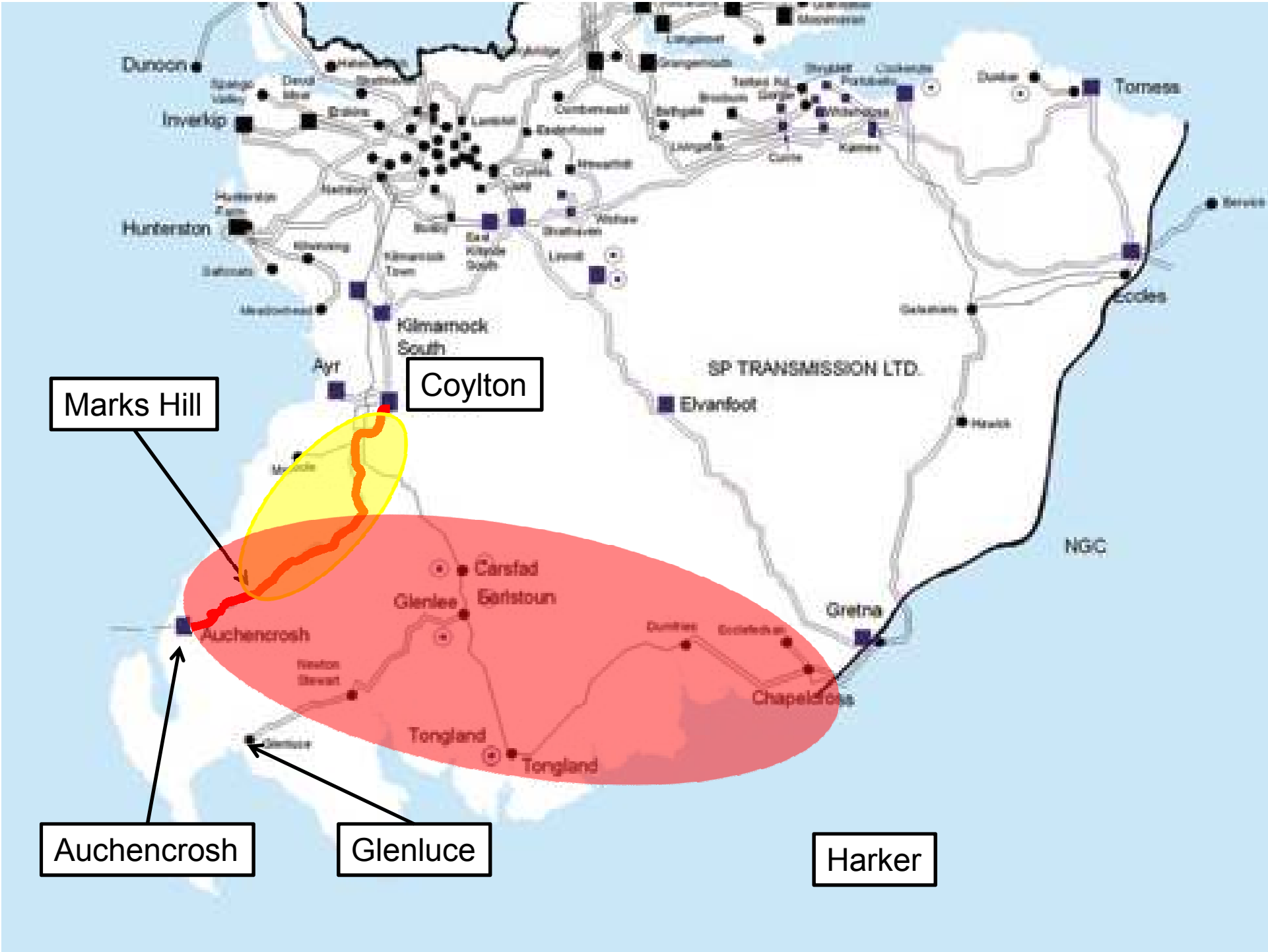
# Enduring Solution : Replace LV Conductors





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## South West Scotland Context





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## Summary / Q&A

# Summary



Solution	Latest	Next Steps	Delivery
Emergency Fallback	<ul style="list-style-type: none"> <li>• Successfully tested Nov 13</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• In emergency</li> </ul>
Seabed Repair	<ul style="list-style-type: none"> <li>• Concept of creating dry environment proven</li> <li>• Repair type tested</li> </ul>	<ul style="list-style-type: none"> <li>• Further design site prep &amp; cable handling Procure vessel</li> </ul>	<ul style="list-style-type: none"> <li>• Q3 2014?</li> </ul>
Bipole	<ul style="list-style-type: none"> <li>• Concept proven</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed studies</li> <li>• Compass deviation?</li> </ul>	<ul style="list-style-type: none"> <li>• In emergency</li> </ul>
New MRC Cables (Procurement)	<ul style="list-style-type: none"> <li>• ITN with three bidders</li> </ul>	<ul style="list-style-type: none"> <li>• Budget submission 24<sup>th</sup> May</li> <li>• Final submission 27<sup>th</sup> June</li> <li>• Contract award Aug14</li> </ul>	<ul style="list-style-type: none"> <li>• Base case 2017</li> <li>• Outages 2017</li> </ul>
New MRC Cables (Consents)	<ul style="list-style-type: none"> <li>• Onshore : PD rights secured</li> <li>• Offshore : Environmental Report ongoing</li> </ul>	<ul style="list-style-type: none"> <li>• Marine Licence submission Sept14</li> <li>• Compass deviation?</li> </ul>	<ul style="list-style-type: none"> <li>• Marine Licence Q1 2015</li> </ul>
NG Works	<ul style="list-style-type: none"> <li>• NG require long outages single circuit AUC-COY 2016</li> </ul>	<ul style="list-style-type: none"> <li>• Attempt to coordinate programmes</li> </ul>	<ul style="list-style-type: none"> <li>• Possible 7 month outage 2016</li> </ul>

# Interconnector user forum Moyle commercial update

Paul McGuckin

8<sup>th</sup> May 2014

## Topics to cover

- Auctions for capacity from Oct 2014
- Auctions for capacity from Oct 2015/2016
- Intraday trading uptake

# Auctions from October 2014

- Proposed auctions are based on 250MW capacity
- Product range as per previous year
  - Annual, seasonal, quarterly, monthly, daily, intraday
- 50MW import capacity already allocated
  - i.e. 200MW to be allocated
- Zero export capacity already allocated
  - i.e. 250MW to be allocated



# Auctions from October 2014

- GB-NI capacity split
  - Assume continued preference for longer term products
  - Majority continues to be offered annually
- NI-GB capacity split
  - Assume opposite approach to the above
  - Little value apparent from these auctions
  - Majority to be offered in shorter timeframes i.e. monthly/daily

# Auctions from October 2014

- Proposed capacity split

Capacity Product	Import Capacity (GB-NI)	Export (NI-GB) Capacity
Annual	120	50
Seasonal	25	15
Quarterly	25	15
Monthly/Daily	30	170

# Auctions from October 2015/2016

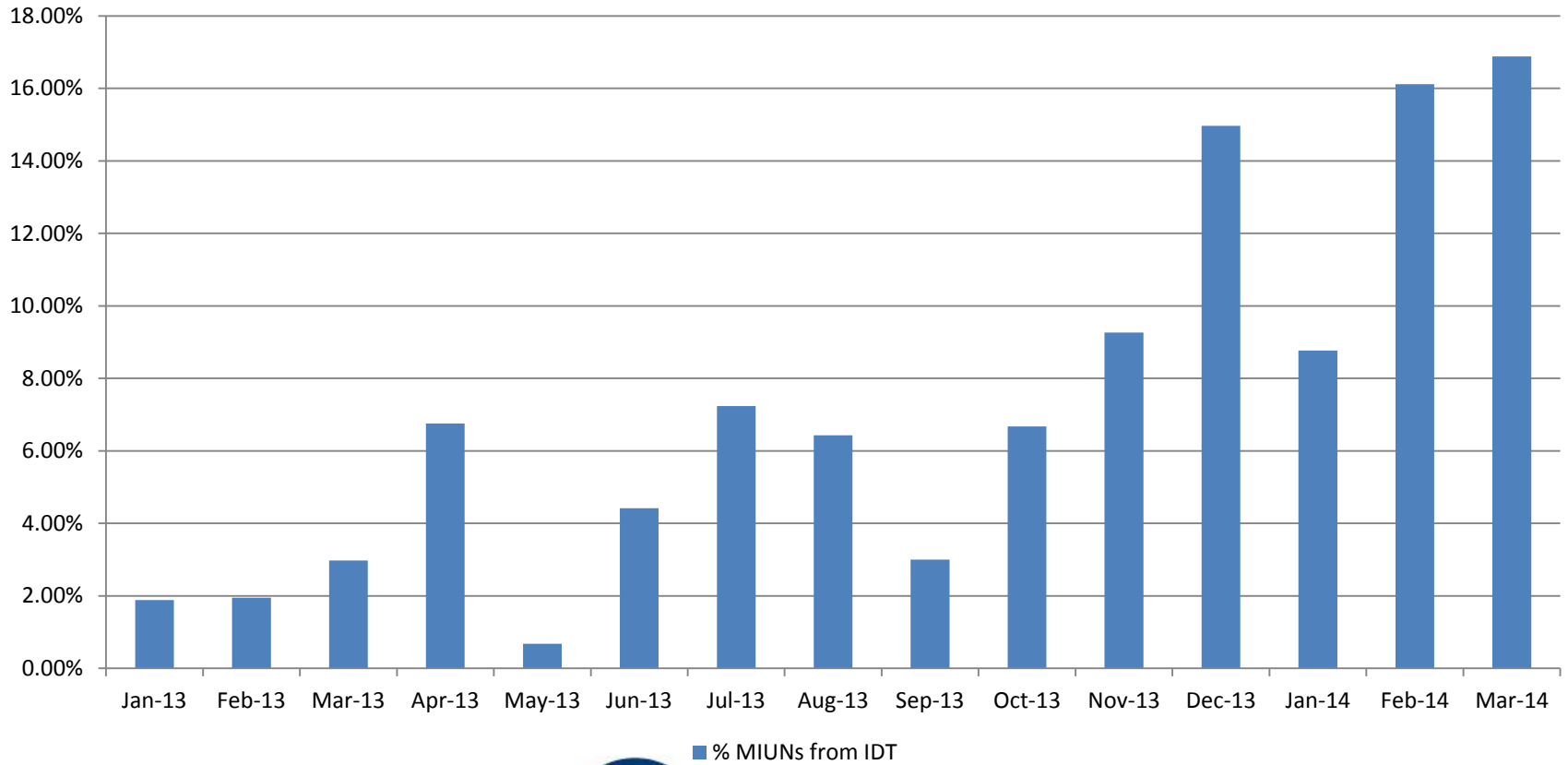
- Historically offered relatively small amounts of “Year 2” and “Year 3” capacity
  - 30MW annual last year
- Significant uncertainty
  - Available capacity
  - I-SEM, PTR/FTR and HAR issues
  - Not standard practice in Europe
- Propose to refrain from year 2 and 3 auctions this year

# Intraday trading update

- IDT has now been in place for almost 2 years
- Very limited participation in initial stages
  - Only small amounts of capacity reallocated
  - No congestion
- Interest has noticeably increased
  - Significant export
  - Significant superposition
  - Significant % of MIUNs arising from IDT

# Intraday trading update

% of total MIUNs from IDT



## Dates for your diary

- Moyle annual capacity auctions
  - 27<sup>th</sup> June 2014
  - 18<sup>th</sup> July 2014
  - 29<sup>th</sup> August 2014
- Contact:
  - [paul.mcguckin@mutual-energy.com](mailto:paul.mcguckin@mutual-energy.com)
  - +44 (0) 2890 437 589

# East West Interconnector & Moyle Interconnector

## Consultation 2014

User Forum  
8<sup>th</sup> May 2014



# 2014 Consultation Overview

- Included in EWIC and Moyle license obligations
- Issued: 31<sup>st</sup> March
  - Coordinated between Moyle and EWIC
- Closed: 5pm, 30<sup>th</sup> April
- Report to Regulators by 12<sup>th</sup> May
- Regulatory review/approval to follow





# Access Rules Changes

E5.2.4

- Changed wording to provide greater clarity to the meaning of Unused Units applying to Intraday Auctions

E5.2.5

- Added paragraph to clarify that no compensation will be due for Unused Units in the event of Curtailment.

E8.4a

- Improved paragraph (a) to clarify reference to Curtailed MIUNs

E8.4b

- Added new paragraph to ensure a fair basis for refund to Unit Holders who only hold Daily Units in the event of Curtailment.

E8.4c

- Added paragraph to clarify that no compensation will be due for Unused Units in the event of Curtailment.

Schedule 1

- Changed definition of Unused Units to align with reference to Unused Units in Rules E5.2.2 and E5.2.5 of Access Rules v4

Schedule 7

- Updated EWIC Letter of Credit to include full name of the Operator as Beneficiary



# Auction Calendar

Month	End Date	GB to IE (SEM Import)		IE to GB (SEM Export)	
		Product	Volume	Product	Volume
May	06/05/2014	Monthly – June	50 MW	Monthly – June	50 MW
	14/05/2014	Quarterly (Jul – Sep)	50 MW	Quarterly (Jul – Sep)	50 MW
	21/05/2014	Monthly – June	75 MW	Monthly – June	100 MW
June	10/06/2014	Monthly – July	50 MW	Monthly – July	50 MW
	11/06/2014	Annual – SEM (Oct – Sep)	50 MW	–	–
	18/06/2014	Monthly – July	75 MW	Monthly – July	100 MW
July	08/07/2014	Monthly – August	50 MW	Monthly – August	50 MW
	17/07/2014	Monthly – August	75 MW	Monthly – August	100 MW
	23/07/2014	Annual – SEM (Oct – Sep)	50 MW	–	–
August	07/08/2014	Monthly – September	50 MW	Monthly – September	50 MW
	13/08/2014	Annual – SEM (Oct – Sep)	50 MW	Annual – SEM (Oct – Sep)	50 MW
	14/08/2014	Seasonal (Oct – Mar)	75 MW	Seasonal (Oct – Mar)	50 MW



# Auction Calendar

Month	End Date	GB to IE (SEM Import)		IE to GB (SEM Export)	
		Product	Volume	Product	Volume
August	21/08/2014	Monthly – September	75 MW	Monthly – September	100 MW
	27/08/2014	Quarterly (Oct – Dec)	50 MW	Quarterly (Oct – Dec)	50 MW
September	09/09/2014	Monthly – October	50 MW	Monthly – October	50 MW
	17/09/2014	Monthly – October	75 MW	Monthly – October	100 MW
October	09/10/2014	Monthly – November	50 MW	Monthly – November	50 MW
	15/10/2014	Annual – Calendar	40 MW	–	–
	21/10/2014	Monthly – November	75 MW	Monthly – November	100 MW
November	06/11/2014	Monthly – December	50 MW	Monthly – December	50 MW
	12/11/2014	Annual – Calendar	40 MW	Annual – Calendar	50 MW
	14/11/2014	Quarterly (Jan – Mar)	50 MW	Quarterly (Jan – Mar)	50 MW
	19/11/2014	Monthly – December	75 MW	Monthly – December	100 MW
December	11/12/2014	Monthly – January	50 MW	Monthly – January	50 MW
	17/12/2014	Monthly – January	75 MW	Monthly – January	100 MW



# Auction Products: GB→IE

Auction Type	Import Amount	Auction Timing
SEM Annual (Oct to Sept)	150 MW	June (50) July (50) August (50)
Calendar Annual (Jan to Dec)	80 MW	October (40) November (40)
Seasonal	75 MW	Month-2, Week 3 (e.g. August for Oct to Mar)
Quarterly	50 MW	Month-2, Week 4 (e.g. August for Oct to Dec)
Monthly	125 MW	Month-1, Week 1 (50) Month-1, Week 3 (75)
Daily	50 MW	Day Ahead
<b>Total</b>	<b>530 MW</b>	

# Auction Product: IE→GB

Auction Type	Import Amount	Auction Timing
SEM Annual (Oct to Sept)	50 MW	August (50)
Calendar Annual (Jan to Dec)	50 MW	November (50)
Seasonal	50 MW	Month-2, Week 3 (e.g. August for Oct to Mar)
Quarterly	50 MW	Month-2, Week 4 (e.g. August for Oct to Dec)
Monthly	150 MW	Month-1, Week 1 (50) Month-1, Week 3 (100)
Daily	150 MW	Day ahead
Total	500 MW	

# I-SEM Transition Period

- I-SEM due to go live 1<sup>st</sup> December 2016
- Products sold for December 2016 start in October 2015
- Publication of details of Annual Capacity Auction for 2016 in December 2014
- Decision on product suite needed now!
- Proposal is to eliminate annual auctions which include December 2016 capacity for 2015
  - Split into Quarterly (Jan-Mar; Apr-Jun; Jul-Sep) and Monthly (Oct; Nov)





# SEMO MIUN Update

SEMO  
8<sup>th</sup> May 2014





# Recent Issues

Issue	Status
Performance of MIUN Software	Resolved - Jan
Revision of MIUNs	Resolved - May
NTC Change Out-of-Hours	Resolved - May

# Performance Issues

- January 2014, leading to delays (up to 40min) in publishing MIUNs
- Related to combination of factors, including change in bidding behaviour making a valid Interconnector dispatch solution more difficult to determine
- Fix implemented end of January to resolve

# Revision of MIUNs

- Occurs due to difficulty in solving IC dispatch problem
- Improvements implemented in January have reduced instances
- Improvements implemented start of May should significantly reduce instances
- Workaround
  - additional support staff were in place to deal with revisions until improvements implemented
  - procedural changes implemented to reduce times to provide revisions
  - improved communications of need and issue of revisions

# NTC Change Out-of-Hours



- Improvements made in process and systems
- Process is now automated once the control centre issues the NTC change
- Latest NTC change event on 2<sup>nd</sup> May completed without incident



# Contingency Measures

- Contingency Procedures
  - Comprehensive procedures developed in early 2014 involving SEMO, IA, IO's, IC users, NCC, vendors.
  - Defines roles, responsibilities, communication methods, timing and content, and key timelines
  - Majority of contingencies impacting IC users have been mitigated with the resolution of the above issues.
- Contingency File Application
  - Developed and deployed March 2014 to auto generate contingency files allowing:
    - more rapid implementation of contingency measures
    - increased time for resolution
    - earlier opportunities to communicate positions

# Contingency Timelines

Gate	Typical Publication Time	Code Timeline	Contingency Timeline
EA	10:30	11:00	<b>15:00</b>
EA2	12:30	13:00	<b>15:00</b>
WD1	09:00	09:30	<b>11:00</b>
Interconnector Planned Outage	< 30min	ASAP	<b><i>Time Issue raised with SEMO + 2 hours<sup>#1</sup></i></b>
Unplanned NTC reduction	< 30min	ASAP	<b><i>Time Issue raised with SEMO + 2 hours<sup>#1</sup></i></b>



*#1 Operational Support arrangements may mean that MIUN updates not possible until after 7am*

# Late Publications/Revisions

## Publication Times

Gate	Target	Typically
EA	11:00	10:30
EA2	13:00	12:30
WD1	09:30	09:00

## Delays/Revisions

Gate	January	February	March	April
WD1	8	3	3 <sup>#2</sup>	5 <sup>#3</sup>
EA2	2	1	1	2 <sup>#1</sup>
EA1	3	1	2	5 <sup>#2</sup>
<b>Total</b>	<b>13/93</b>	<b>5/84</b>	<b>6/93</b>	<b>12/90</b>

#1 One revised but issued before the target time

#2 Two were revised but issued before the target time

#3 Three were revised but issued before the target time

# Future Improvements

- Continue to monitor performance of MIUN software
- Review procedures and timelines after each event
- We also welcome any further feedback from you on MIUN related contingencies if/when they occur.



# Queries

- Market helpdesk
  - Raise 'urgent' query
  - *Mon-Fri from 8.30am until 5pm*  
ROI: 1800 778 111  
NI: 08000 778 111  
International: +353 1 237 0468  
[markethelpdesk@sem-o.com](mailto:markethelpdesk@sem-o.com)
  
- Market Operations Hotline
  - International: +353 1 2370573)
  - *Weekends and public holidays 7am until 3pm*

# EWIC & Moyle User Forum

## Target Model - Early Implementation

Mark Lane  
8 May 2014



# Introduction

- Review of main requirements under TM codes
- Early implementation plan in Europe
- Capacity Calculation developments
- Day ahead and Intraday developments
- HAR & SAP developments

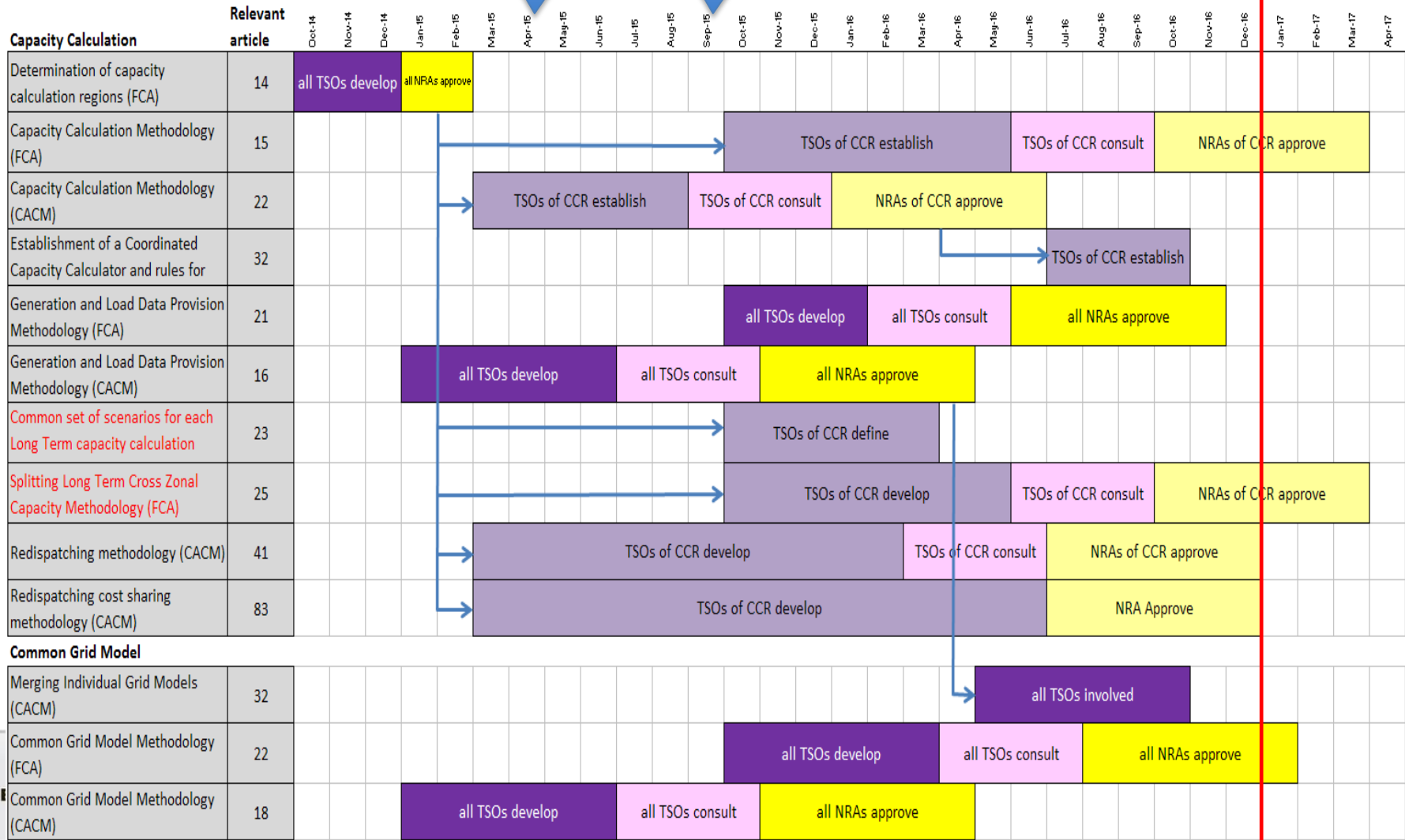


# Capacity Calculation & CGM Implementation

2016

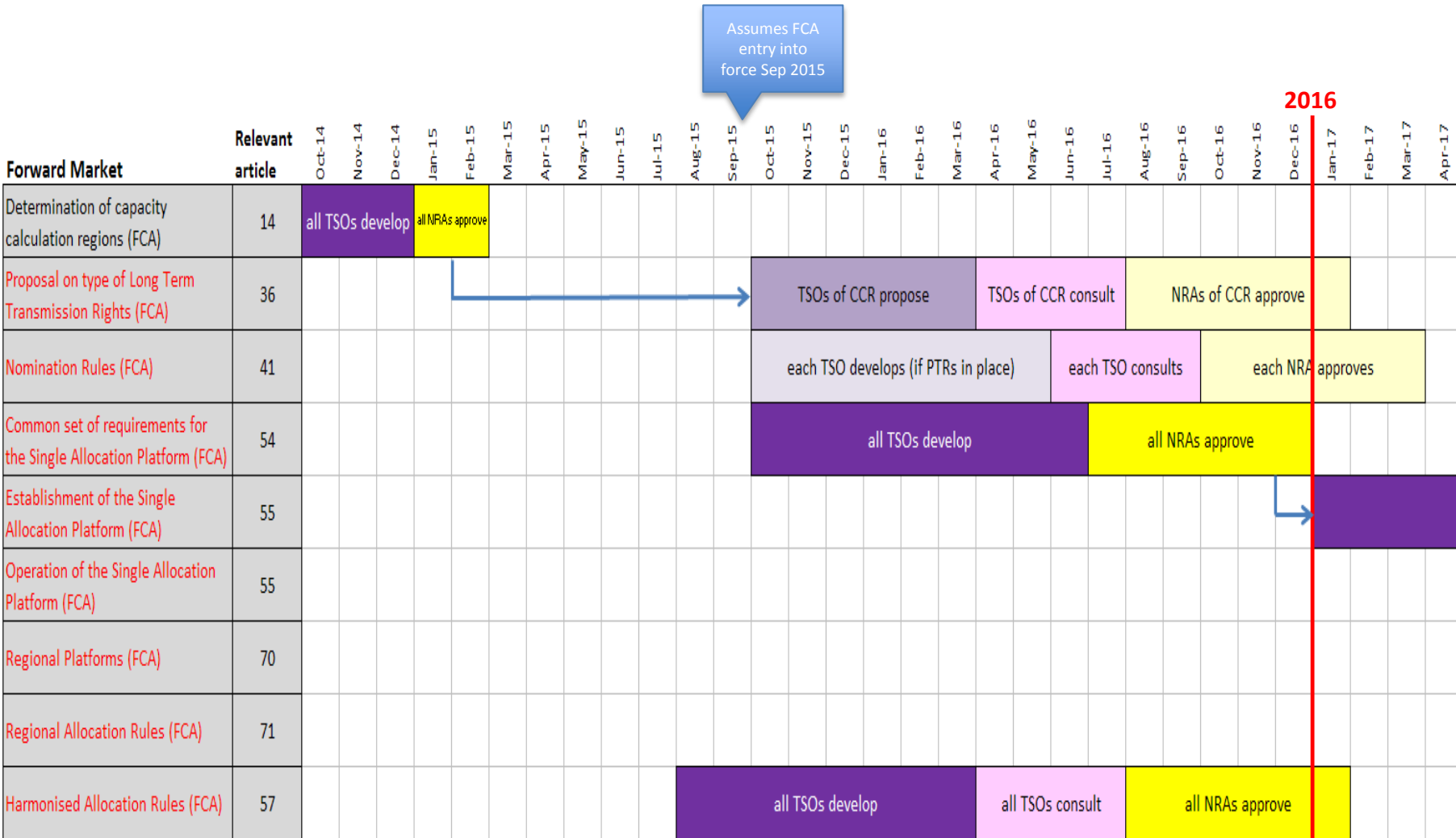
Assumes CACM entry into force end-2014

Assumes FCA entry into force Sep 2015



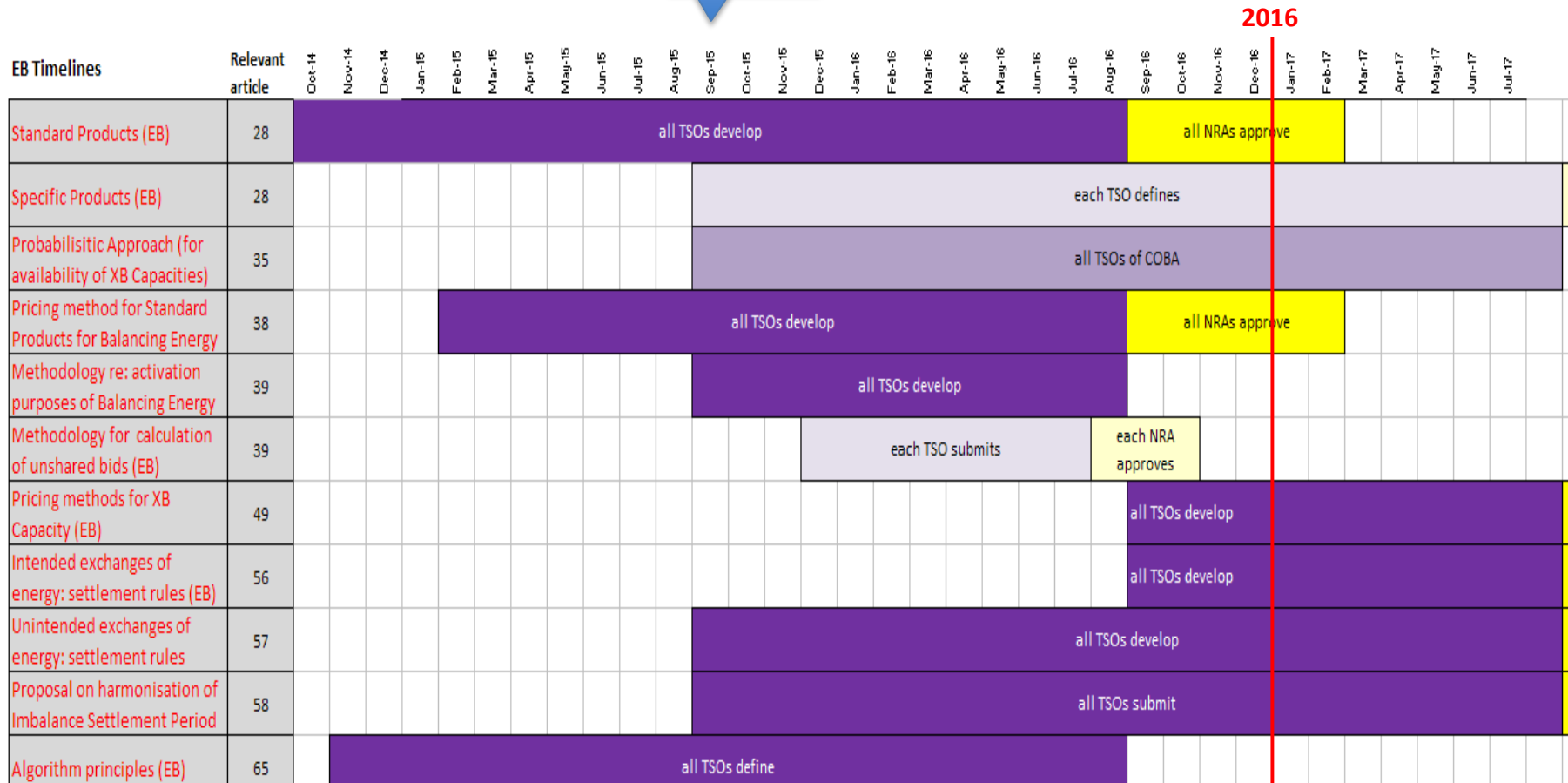


# Forward (Specific) Market Implementation



# Electricity Balancing Market Implementation

Assumes EB entry into force Sep 2015



# Early Implementation in Europe

## Early implementation of CACM NC

- Capacity Calculation
  - Definition of capacity calculation regions in order to be able to start regional work on capacity calculation methodologies (by autumn 2014)
  - Common Grid Model methodology to enable actual data collection and data base to be established for coordinated capacity calculation (2015)
- Single day ahead and intraday market coupling
  - Market Coupling Projects underway across Europe 2014-2016
  - XBID market project goes to implementation phase (start autumn 2014)

## Early implementation of FCA NC

- Harmonised allocation rules (PTRs & FTRs)

## Early Implementation of EB NC

- Pilot Projects: **Project Terre** (GB, FR, PT, ES?, IT, GR? and SEM?)





# Capacity Calculation Regions

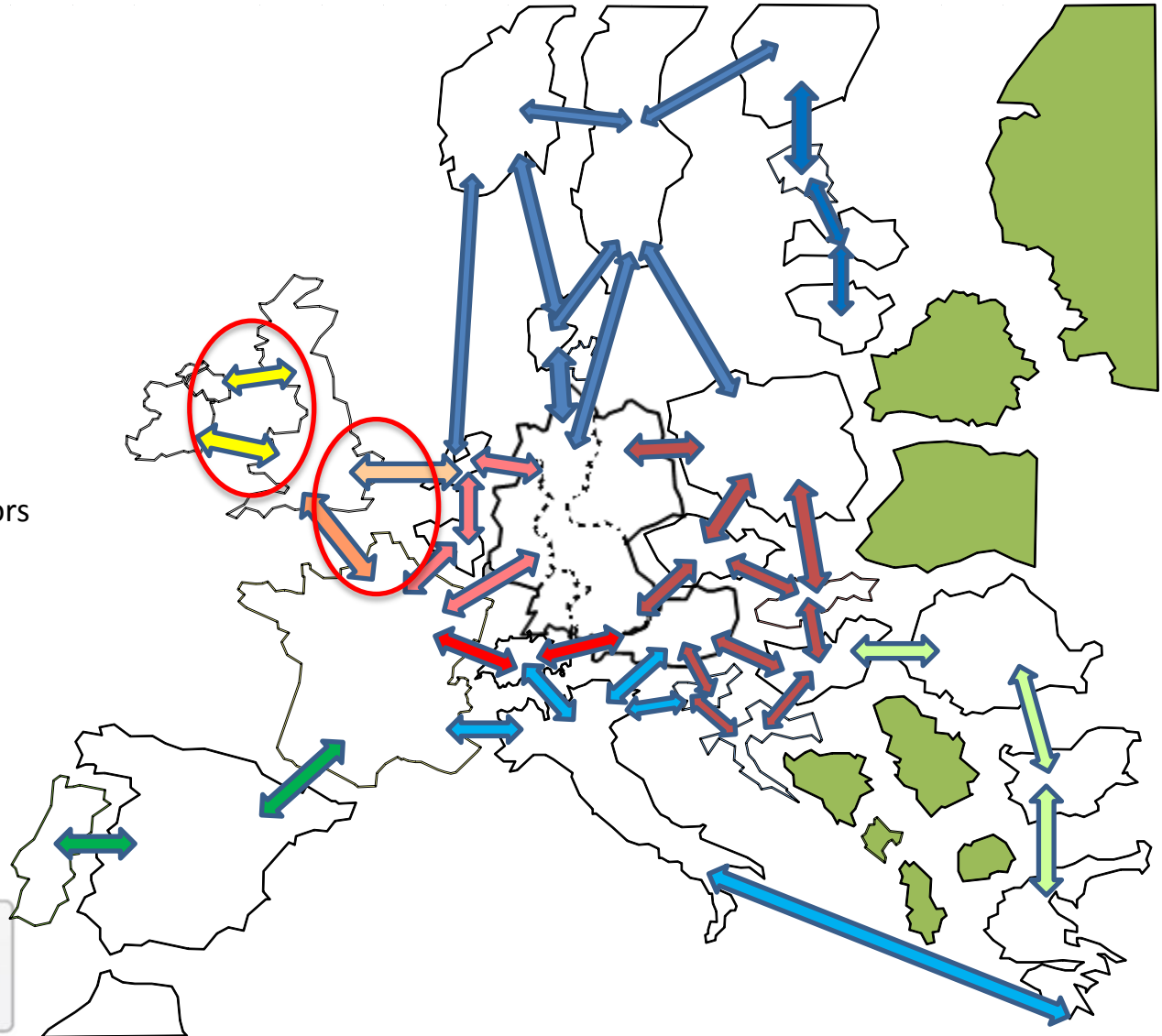
## Regions

- Nordic\*\*
- CWE
- CEE
- SWE
- Italian Borders
- FUI 1
- FUI 2
- FUI 3
- Baltic
- SEE
- Swiss North Borders

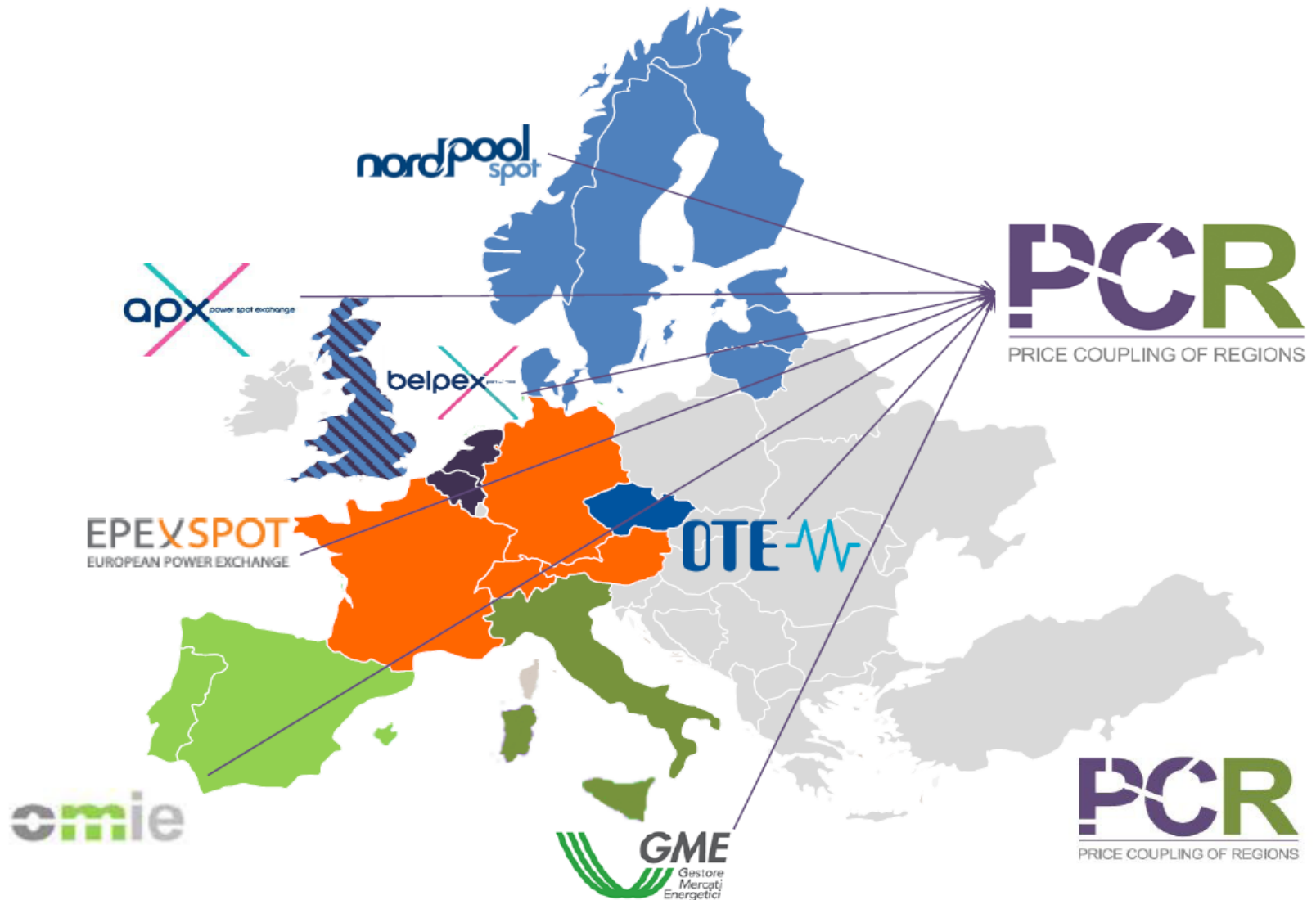
Interconnection

Interconnections are presented with different colors showing to which region they belong




\*\* ) some borders under discussion

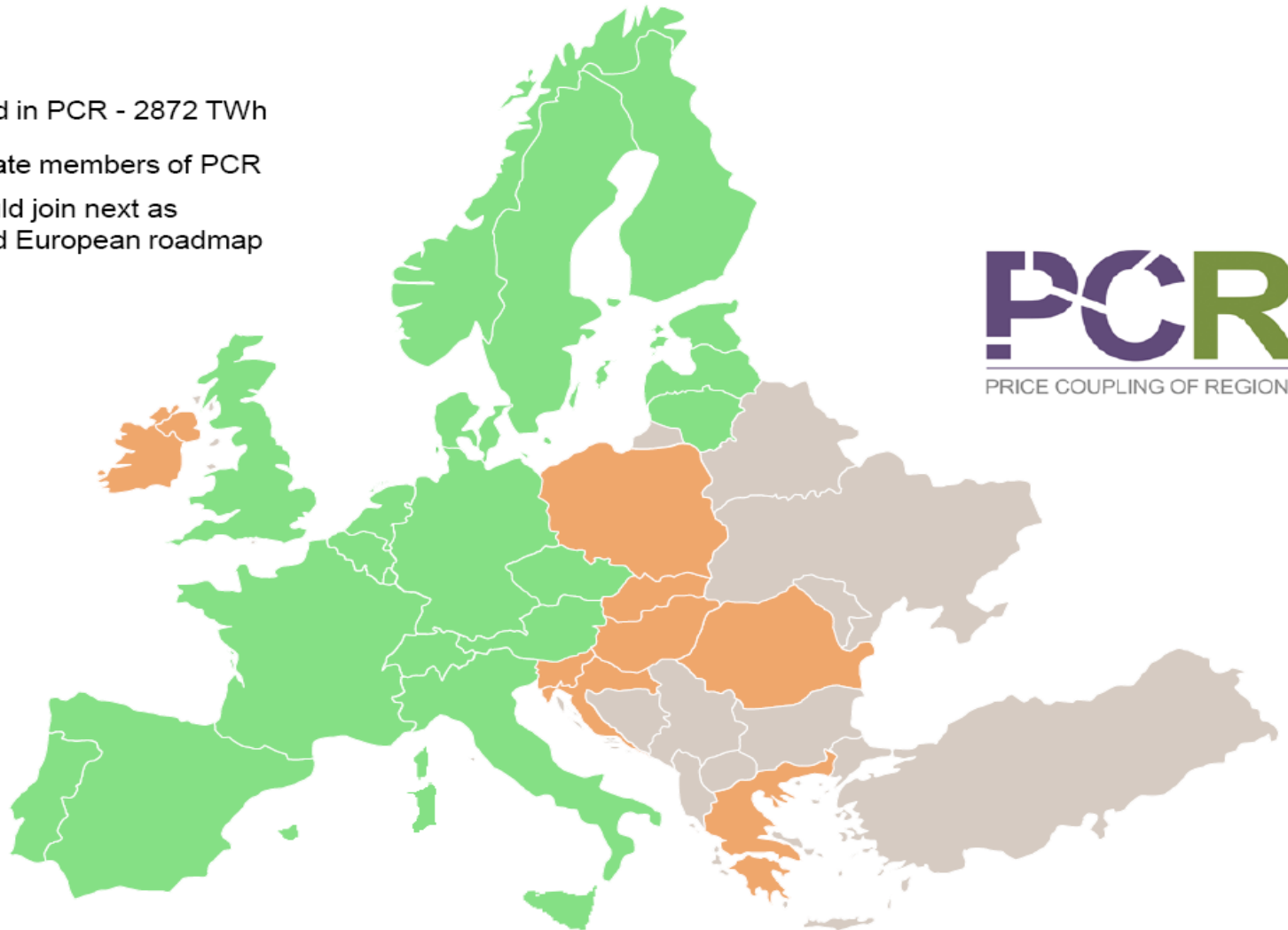


# Price Coupling of Regions



# Price Coupling of Regions – extended

-  Markets included in PCR - 2872 TWh
-  Markets associate members of PCR
-  Markets that could join next as part of an agreed European roadmap



# EU Market Coupling Progress

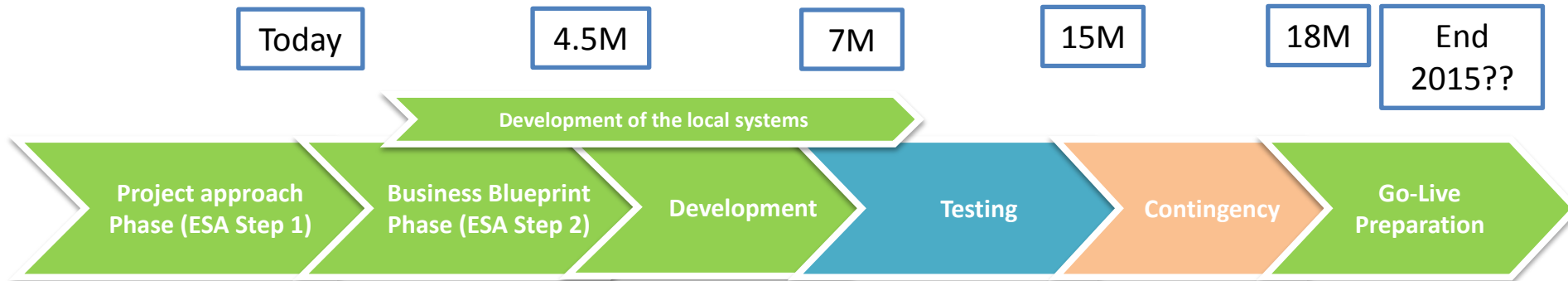
- **NWE delivery:** launched 4 February 2014 covering CWE, Nordic and Baltic countries and GB, based on PCR system and Euphemia algorithm.
- **SWE connection to NWE:** (TBC – May?)
- **Extension of the CZ-SK-HU MC to RO:** Design phase completed and Implementation phase started. The 4 Market Market Coupling (4M MC) planned to go-live 11 November 2014.
- **CEE Flow Based MC initiative:** CEE FB MC MoU signed in February 2014 and project kick-off meeting on 10 April 2014.
- **Italian borders Market Coupling:** Implementation phase started in January. Go-live window of the Project is expected to start in December 2014
- **Swiss Northern Borders Market Coupling:** Implementation Phase started in April. Technical readiness for joining EPC is planned to be achieved in December 2014.
- **I-SEM market design:** Work on new High Level Design has progressed with industry design fora, followed by a public consultation on proposed options for the Integrated SEM which closed on 6 April. A proposed decision is due in June.



# EU Market Coupling Chronology

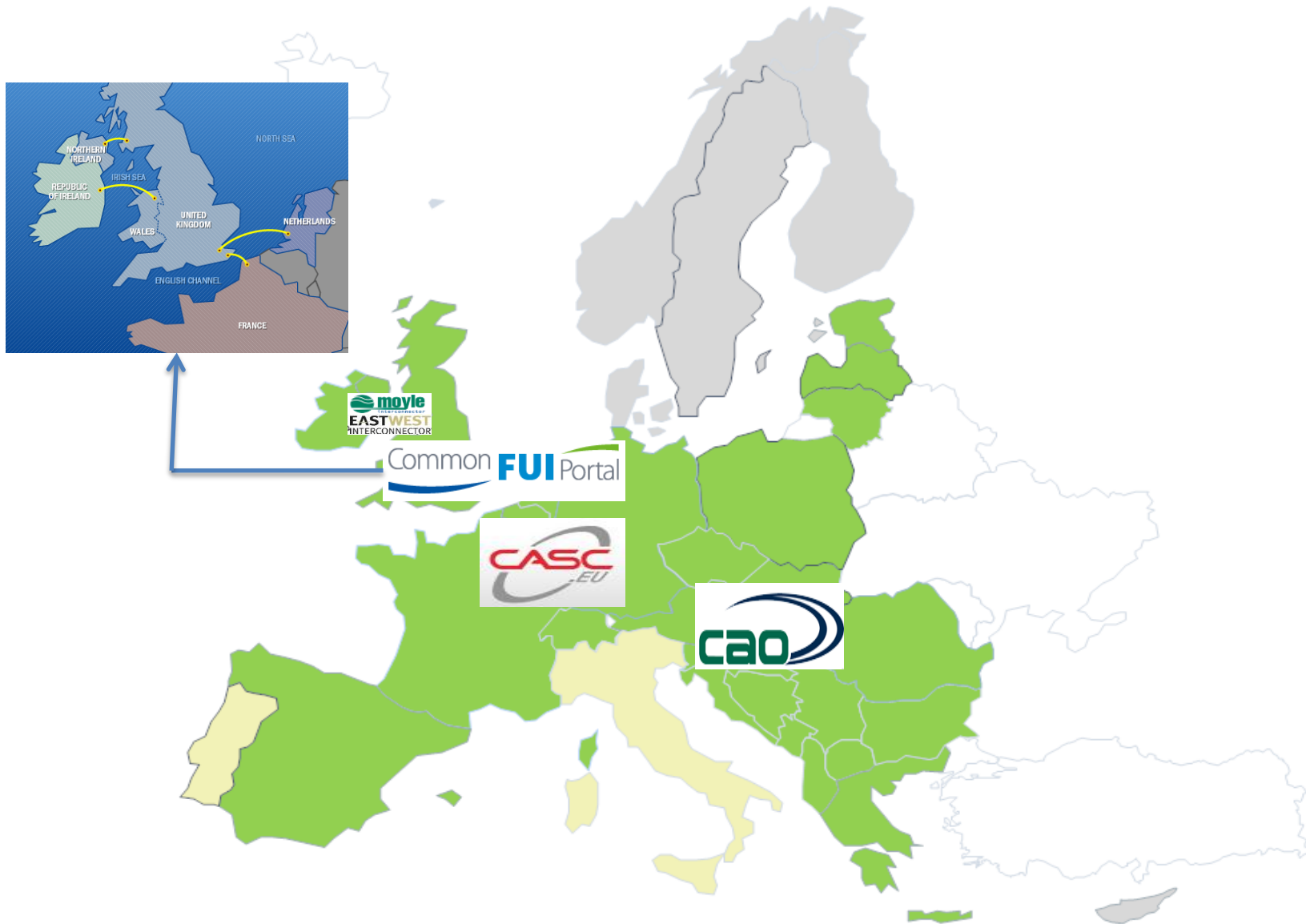


# XBID – Intraday Project



- Deutsche Borse AG – selected
- Phase 1 nearly completed dealing with issues such as performance, equal treatment and testing
- XBID Project Team meeting with EC on 12 May - progress/next steps
- Staggered implementation envisaged, no big-bang
- ENTSO-E Monitoring Group established – EirGrid Group will have access to Project Plans, Status Reports, Meeting Minutes, Costs etc

# HAR & Single Allocation Platform







# Interconnector user forum

## I-SEM interconnector

### implications

Paul McGuckin

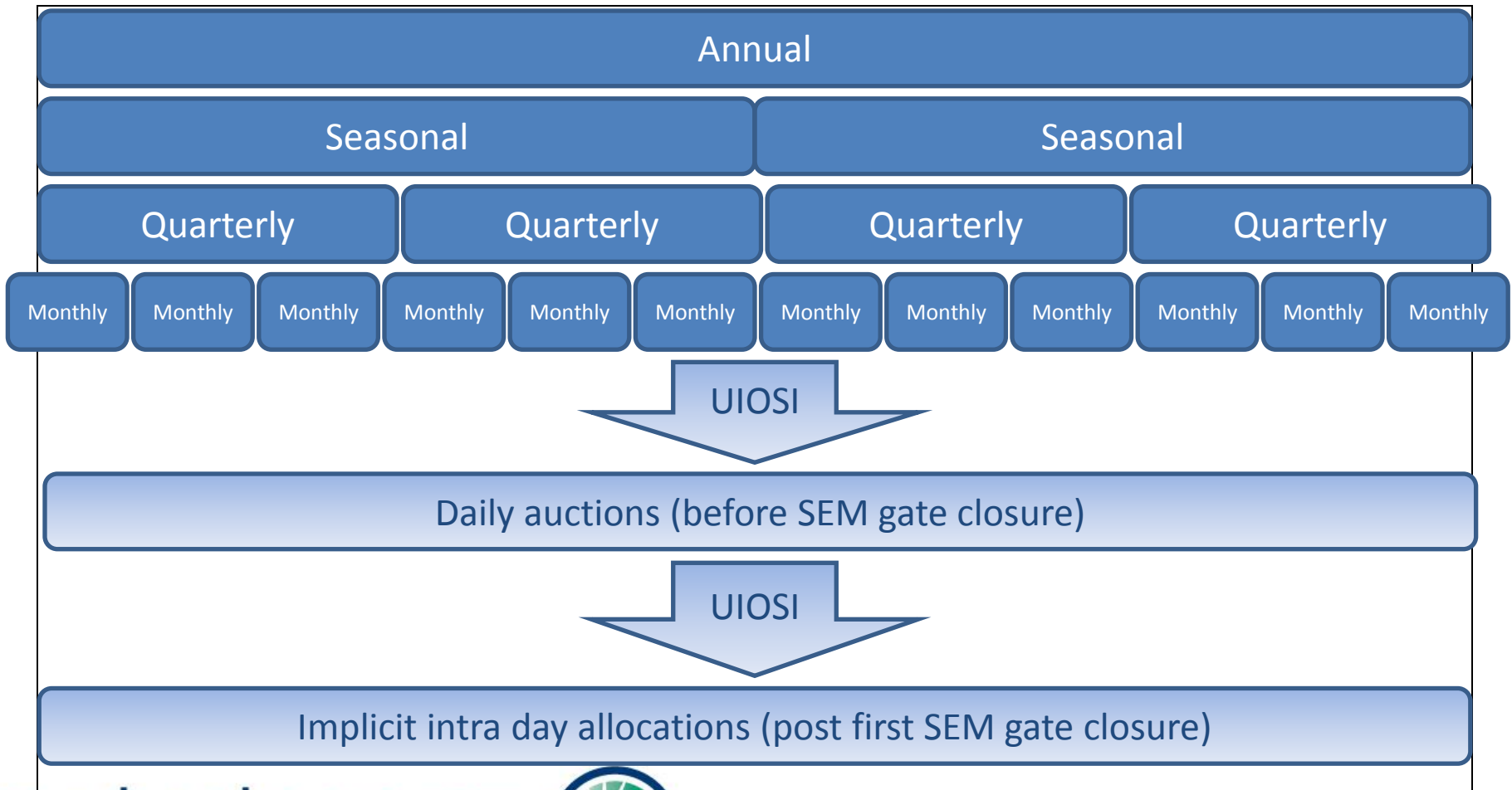
8<sup>th</sup> May 2014

# What will change for interconnectors?

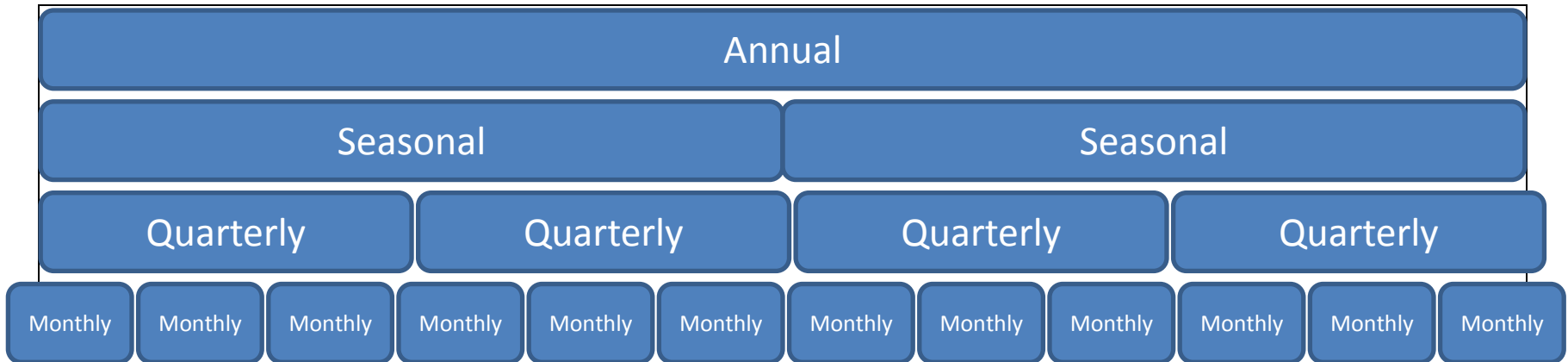
European target model (and by implication I-SEM) brings more harmonisation, implicit capacity allocation and market coupling at day ahead and more complex intraday implicit capacity allocations

- Allocation of capacity
- Types of transmission right i.e. What do we sell?
- Market coupling
- Firmness

# Current capacity allocation



# Changes to long term capacity allocation



- Capacity (or “Rights”) may still be allocated across all of these timeframes as at present
- Potential major change to rights of capacity holders – Physical or Financial transmission rights? (“PTRs” or “FTRs”)
- Enhanced firmness

# Changes to long term capacity allocation

- **Long term capacity allocation to be harmonised**
  - Single set of access rules
  - Single allocation platform

# Changes to long term capacity allocation



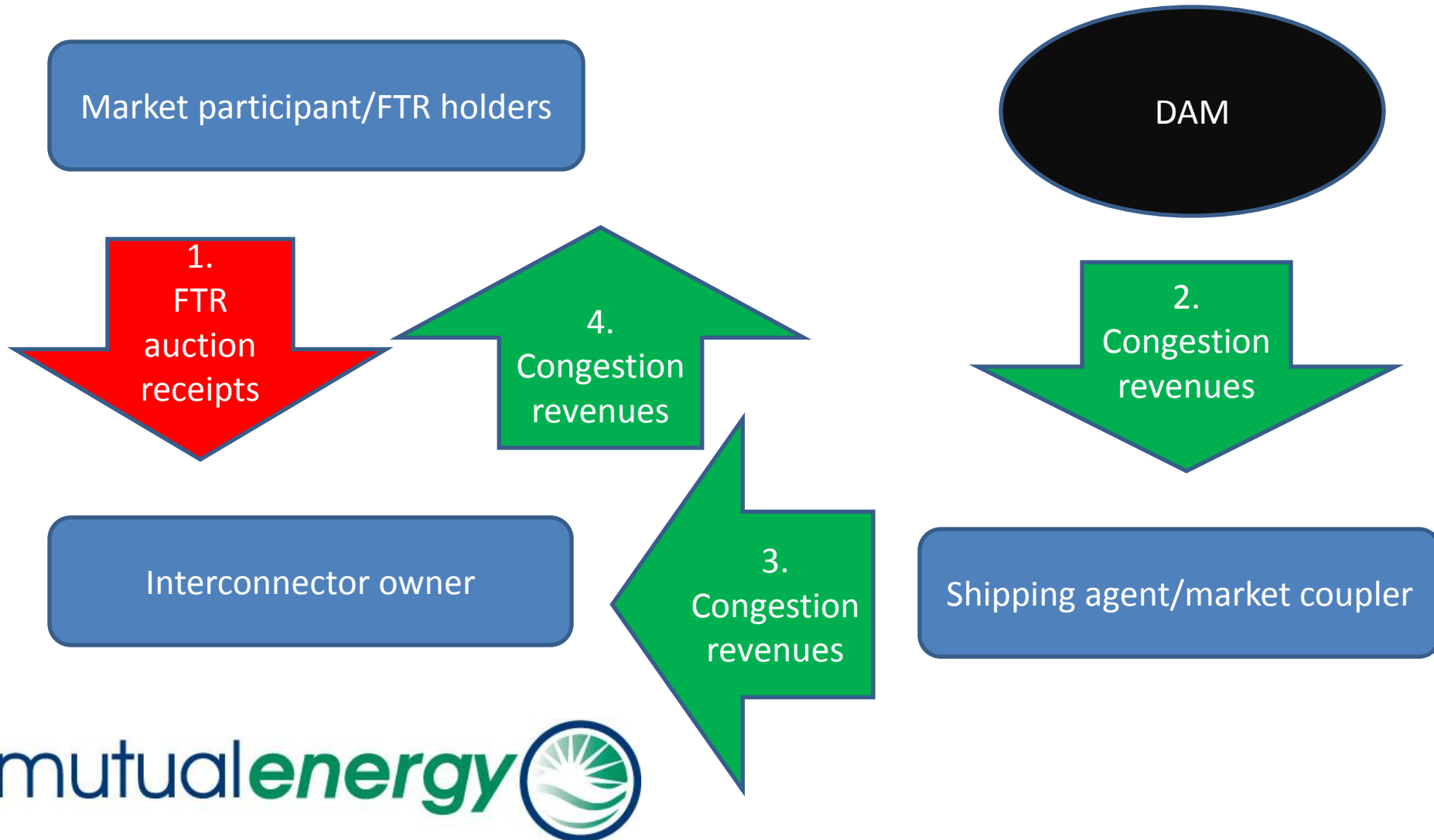
- **What are PTRs and FTRs?**
  - PTRs broadly equate to status quo
  - FTRs entitle the holder to a potential income stream but not to flow energy – energy flowed by interconnector owner or an agent
  - With FTRs entire interconnector capacity is scheduled by DAM coupling
  - TBC which will be used in SEM!

# Changes to long term capacity allocation



- **FTR risks**
  - Value of entire interconnector capacity subject to DAM
  - Critical that DAM functions as intended i.e. Enough liquidity on both sides to properly form price
  - Euphemia risk – extensive testing and scenario analysis required
  
- **Both PTRs and FTRs subject to enhanced firmness provisions**

# Changes to long term capacity allocation - FTR Money flow

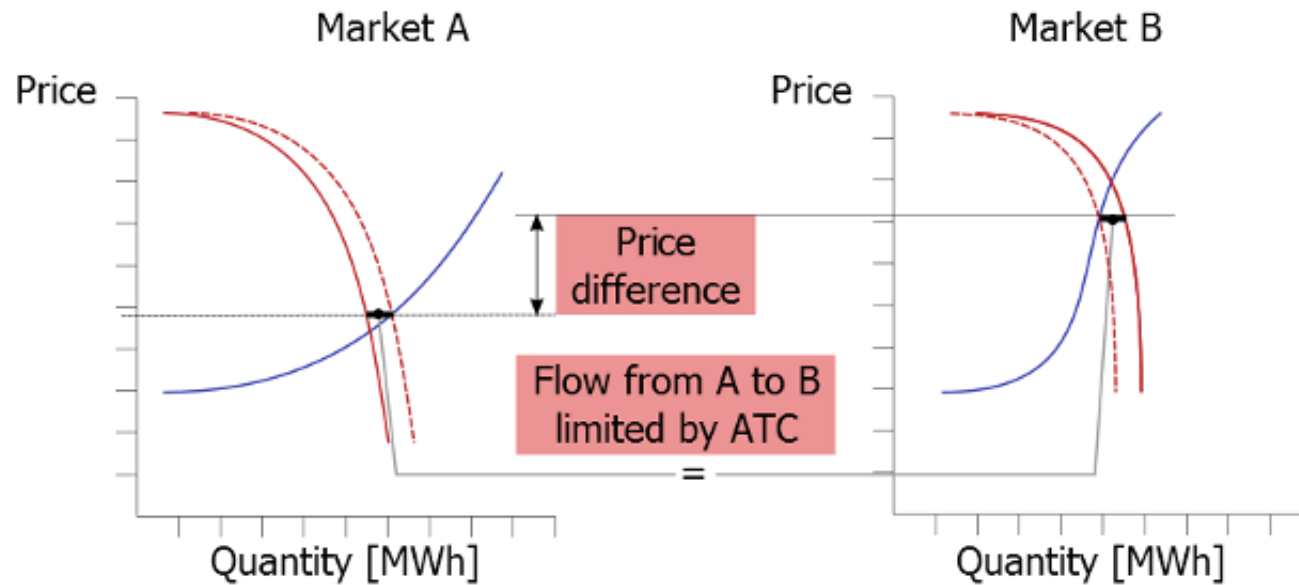




# Market coupling

- *Algorithm (“Euphemia”) which takes bids and offers from two (or more) markets at day ahead stage, works out prices for both and schedules interconnector flows to minimise overall cost*

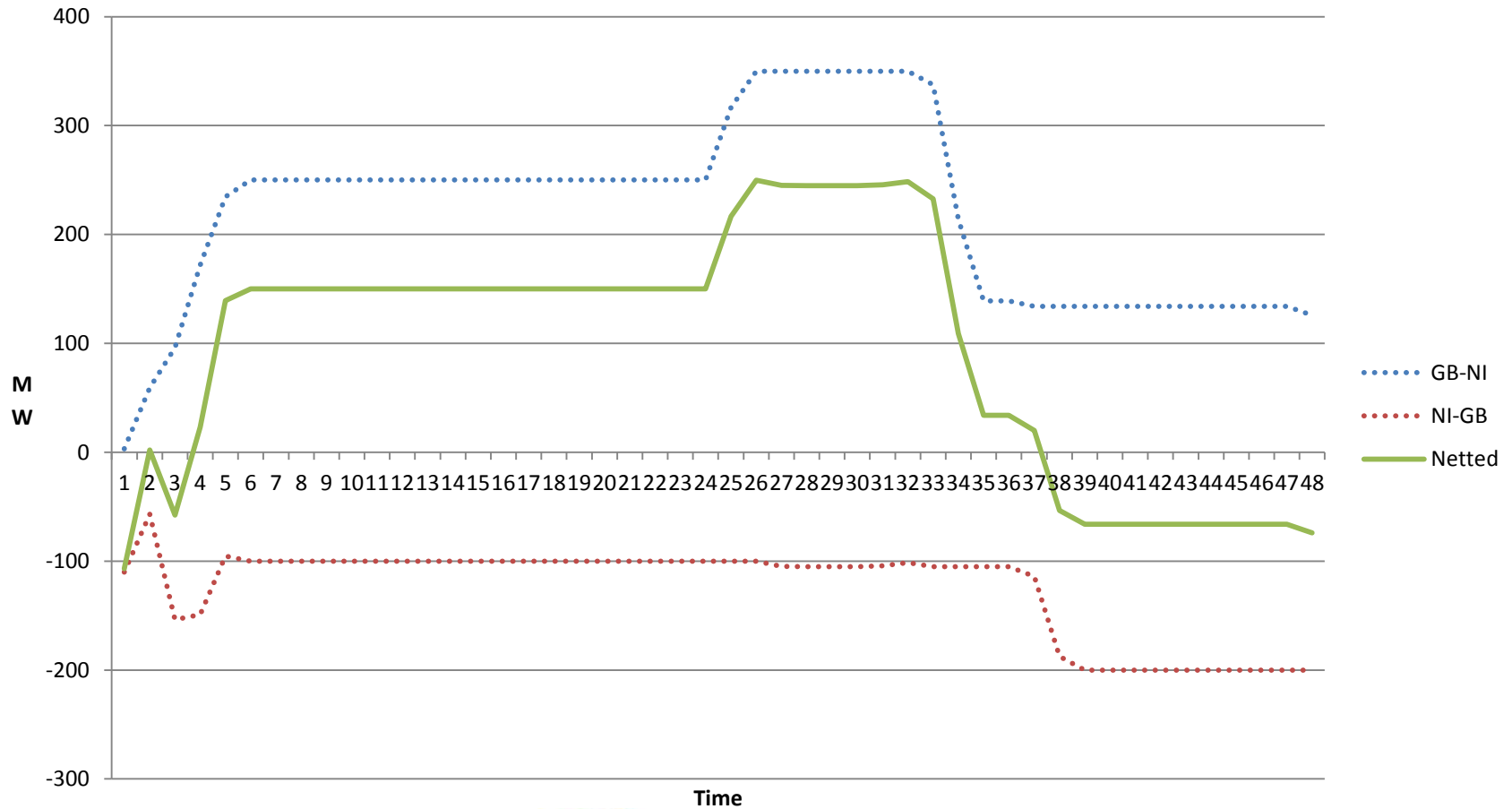
# Market coupling



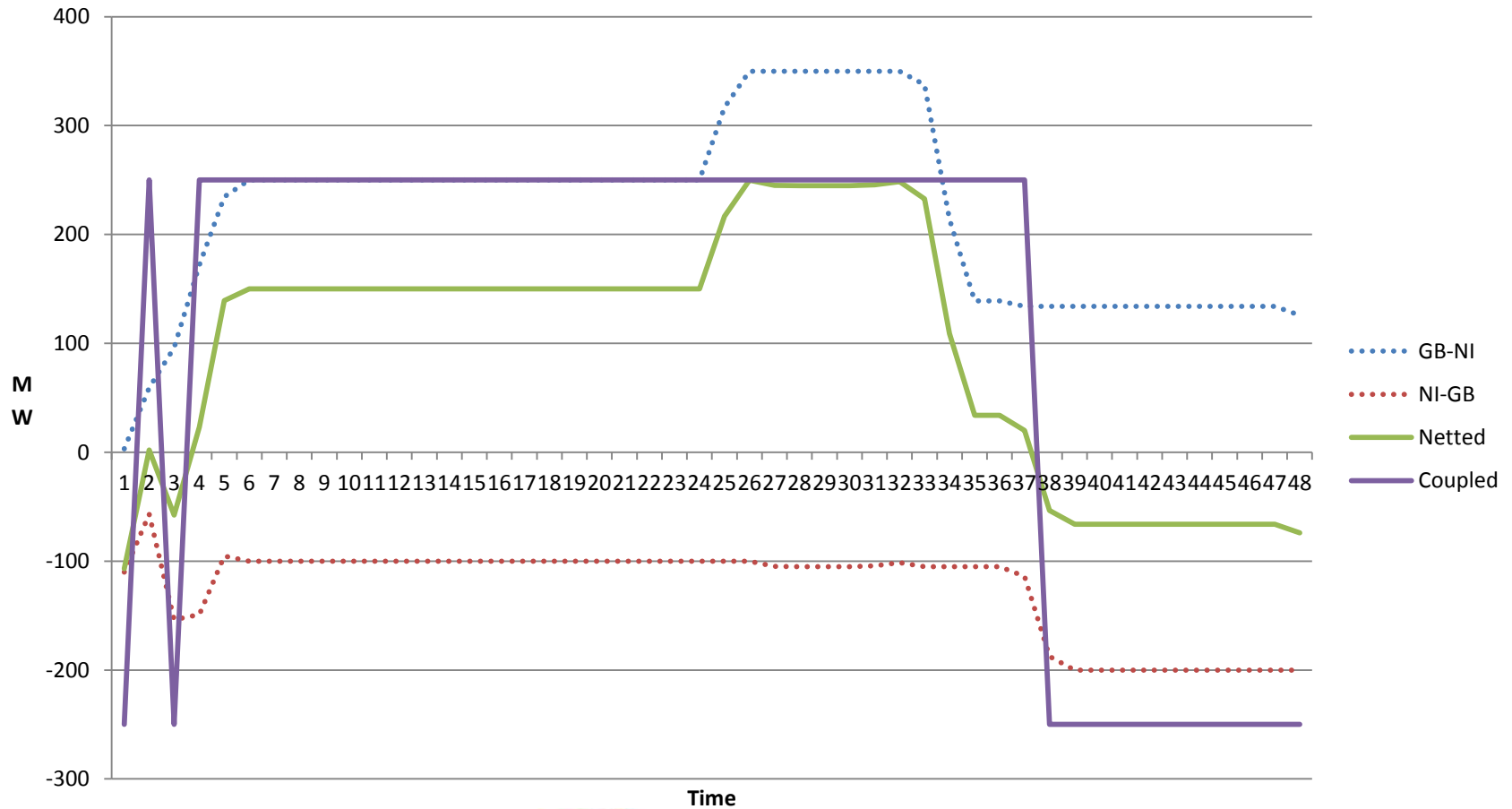
## Benefits of coupling

- Efficient allocation of capacity at day-ahead
  - More “participants” in each market
  - Capacity allocated to lowest energy prices
- Should see price convergence
- Interconnector flows should be maximised and in “right” direction
  - Moyle monthly load factor 70-90% within past year. Expect to tend toward 100% in “coupled world” (at day-ahead stage at least)

# Interconnector commercial flows in uncoupled market



# Interconnector commercial flows in coupled market



## Summary

- Significant change ahead for interconnector owners and users
- Potential for improved use of interconnectors bringing market/societal benefit
- Need to be cognisant of risks and hands-on in development of DAM for I-SEM at European level





# East West Interconnector & Moyle Interconnector

User Forum  
8<sup>th</sup> May 2014

Harmonised Allocation Rules



# Towards Single European Market: Next Steps

-  Markets initially included in PCR - 2860 TWh
-  Markets in the process of joining PCR
-  Markets associate members of PCR
-  Markets that could join next as part of an agreed European roadmap



**europex**  
association of european energy exchanges

Through our involvement with ENTSO-E and Europex, we continue to be active in the development of the Network Codes and the Target Model systems e.g. HAR, PCR, etc.

**EIRGRID**

**semo**  
Single Electricity  
Market Operator

**SONI**  
Single Electricity Market  
Operator



# Harmonised of Allocation Rules

- ENTSO-E working group in place to achieve Harmonisation of Allocation Rules
- FUI SPOC (Single Point of Contact)
  - Peter Lantry
- Monthly meetings in Brussels
  - Weekly half day conference calls also
- Input from FUI stakeholders including
  - EWIC / Moyle / BritNed / IFA interconnector operators
- Currently discussing the underpinning principles
- Working towards drafting harmonised solution



# Principles Under Review

## Accession

- MIWG approved

## Legal

- Queries received back from ACER. Reissued to MIWG

## Capacity Products

- Issued to MIWG

## Allocation Algorithm

- Issued to MIWG

## Transfer Returns & UIOSI

- Issued to MIWG

## Curtailment

- Drafted. Key document must correctly represent HVDC

## Credit Cover and Invoices

- Drafted. Issues here regarding credit cover and Sterling

## Capacity Usage

- Being drafted

# Current Concerns

- I-SEM Design and FTRs .vs. PTRs
  - Impact on types of auctions and timing in 2015
- Curtailment linked to the firmness regime and risk
- CPM (both markets) and application to Interconnector Users
- CASC/CAO MoU for establishment of the Single Allocation Platform
  - ACER indicated preference for CASC/CAO initiative becomes the single allocation platform
  - No FUIN involvement
  - Location of the Single Allocation Platform will influence the legal basis for the HAR
- Implications for role of Interconnector Administrator
- Currency and design implications for Moyle
- Business model changes for commercial teams



