

Brexit and electricity interconnectors

Jason Mann

12 May 2018

Expansion of UK interconnection capacity driven by strong fundamentals and benign policies - but complicated by Brexit

Mounting political pressures seem to go against strong market fundamentals and supportive policies...

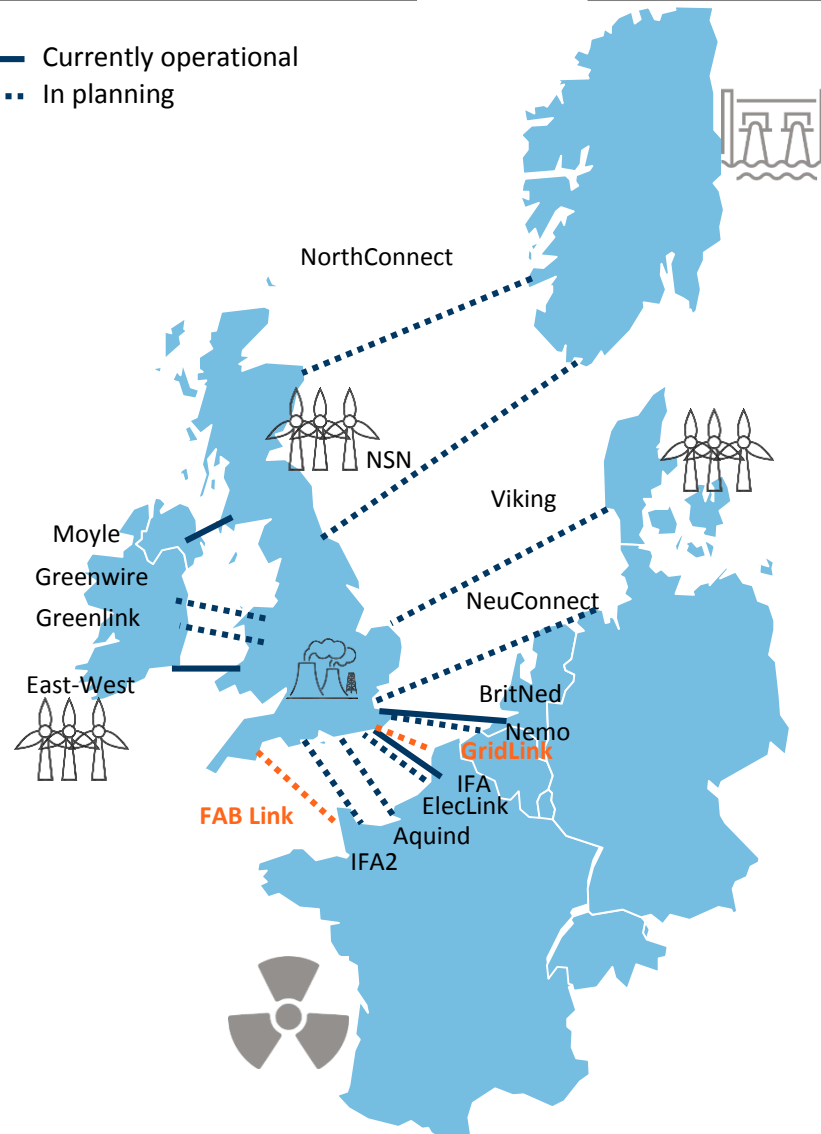
...neither the fundamentals nor the policies seem set to change immediately after Brexit

Significant price spreads between GB and neighbouring countries

Price differentials set to persist given fundamentally different generation portfolios

French regulator CRE appears to hesitate in approving new ICs...
....awaiting ACER decisions

— Currently operational
- - - - - In planning



Regulatory regime

Cap and Floor regime has led to 8 new projects with c 10GW of capacity – albeit varying degrees of progress
2 additional interconnectors progressing on a merchant basis

Wholesale power market

GB Capacity Market increasingly supportive of interconnectors (2 GW new capacity, Nemo, ElecLink and IFA 2, securing a contract in 2018)

Arguable, other policies are also supportive:

- Transmission charging arrangements
- GB carbon tax

Post-Brexit options for power market integration range from full IEM to trading tariffs



- × Tariffs on electricity trading would obviously create the strongest **'friction'**
- × Complete **absence of joint dispatch optimisation**
- × Uncharted territory with all the downsides of being outside the IEM
 - However, WTO rules imply electricity tariffs would remain at **zero**

- × **Loss of market coupling** potentially reduces market efficiency
- × Trading frictions **reduce volume of efficient trades**
- × Flows may go in the **'wrong' direction**, i.e. against price signals

- ✓ A degree of market coupling remains, allowing for **some joint optimisation of dispatch...**
- × ...but **no further progress** towards deeper integration
- × **No intraday coupling**
- × Market efficiency no longer improves
- × Second-order long-term impact may affect IC investment

- ✓ Trading continues as per **status quo**
- ✓ Aligned regulations with the EU lead continue improving trading efficiency through **coupling**
- × Potential cost to EU and UK if UK no longer has "seat at table" in discussions on evolution of IEM

Market coupling has made European electricity markets more efficient – decoupling of GB could reverse this trend and lead to welfare losses



1 Tariffs on trading

2 Outside of IEM, no tariffs but no market coupling

3 Outside of IEM, but day-ahead market coupling remains

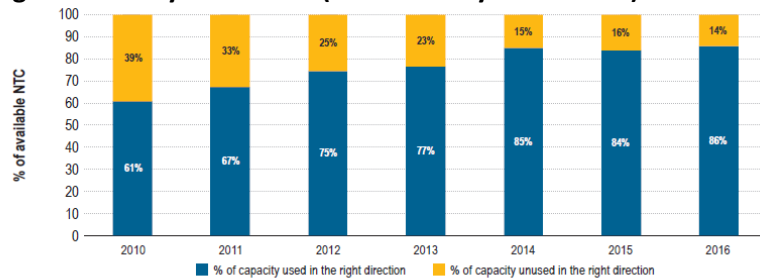
4 Stay in IEM



Coupled markets are generally agreed to have increased efficiency....

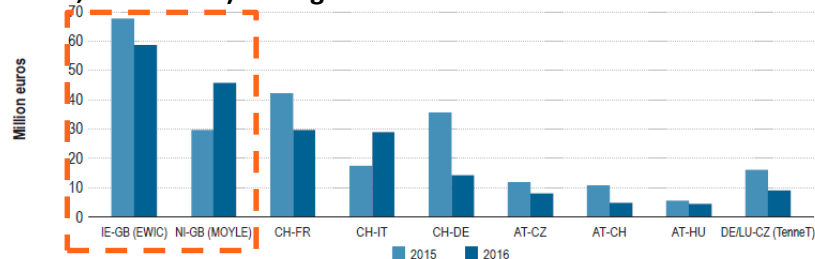
...yet, even revenues for sales of capacity under explicit auctions for interconnectors remain high....

Percentage of available capacity in Europe used in the 'right direction' has been growing consistently since 2010 (albeit mostly on AC links) ¹

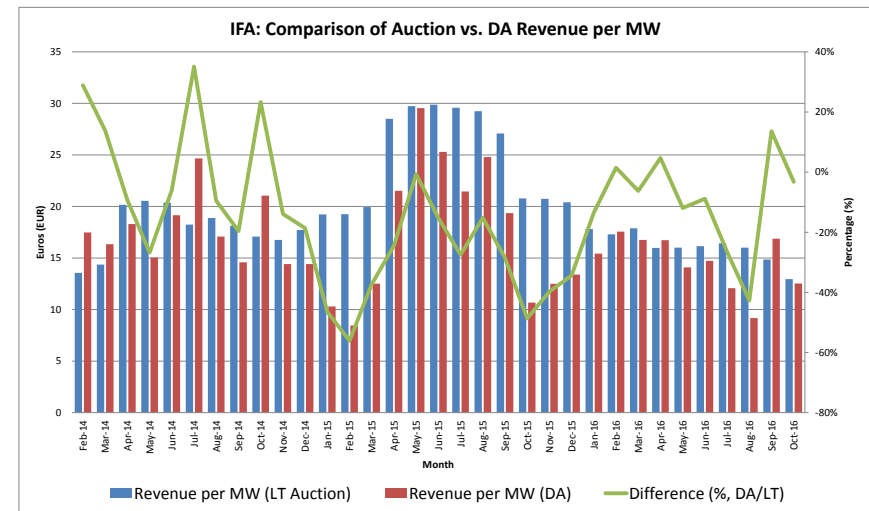


Source: ENTSO-E, Vulcanus (2017) and ACER calculations.

Estimated 'social welfare losses' in the absence of market coupling, per border (€ million, 2015–2016) are highest at the GB-Irish and Swiss borders



Source: ENTSO-E, NRAs, Vulcanus (2017) and ACER calculations.



...indeed, 16% higher

- Some loss of efficiency likely as more interconnectors go on line that will inevitably make cross border trading more complex...
- ...but possible that relying on explicit auctions across GB's DC links on an explicit basis would not be totally disastrous

* Notes: (1) Assessed in the presence of a significant (>€1) price differential. Data for 37 European electricity interconnectors. (2) Based on Chart 2, Moyle interconnector capacity of 500MW and EWIC capacity of 500 MW.

Over longer term, as renewables roll continues benefits of near real time co-ordination likely to increase but maybe lost if out of IEM



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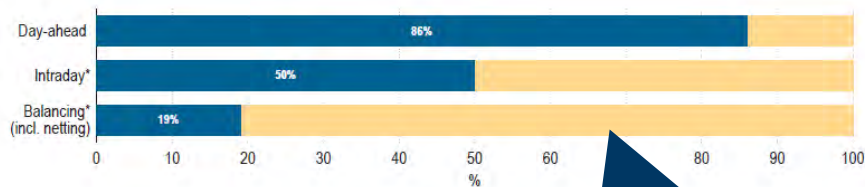
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A loss of intraday and balancing coupling may not currently be as dramatic as the day-ahead coupling...

...but this is likely to become a more significant issue in the future due to intermittent renewables

Chart 1: Level of efficiency in the use of interconnectors in Europe falls closer to the real-time delivery¹

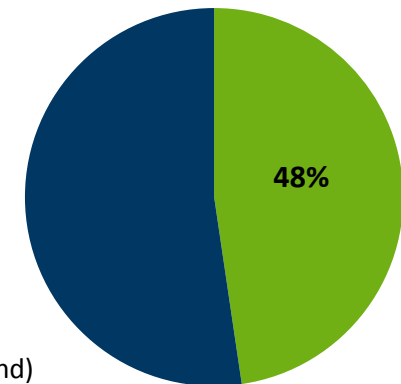
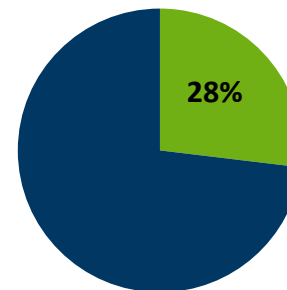


Source: ACER calculations based on ENTSO-E, NRAs, EMOS and Vulcanus.
Note: *Intraday and Balancing values are based on a selection of EU borders.

**With further market integration, intraday and balancing market coupling will drive future benefits ...
...lack of coupling in near real time markets likely to be much more detrimental to GB consumers in future**

2016: 99.5GW

2050: 157GW, Slow Progression scenario



■ Intermittent renewables (solar + wind)
■ Other generation

Being outside of IEM might deliver some, probably marginal, benefits....



1

Tariffs on trading

2

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4

Stay in IEM



Arguably, outside of IEM, there may new opportunities for policy-makers that might change outlook for interconnectors



A

No longer need to comply with under Article 16(6) of 714/2009...

B

Arguably, new GB policies may start diverging from the EU...

C

New market design

...facilitating merchant conditions for interconnectors (i.e. less conditions)

...leading to increasingly divergent energy mix between UK and EU

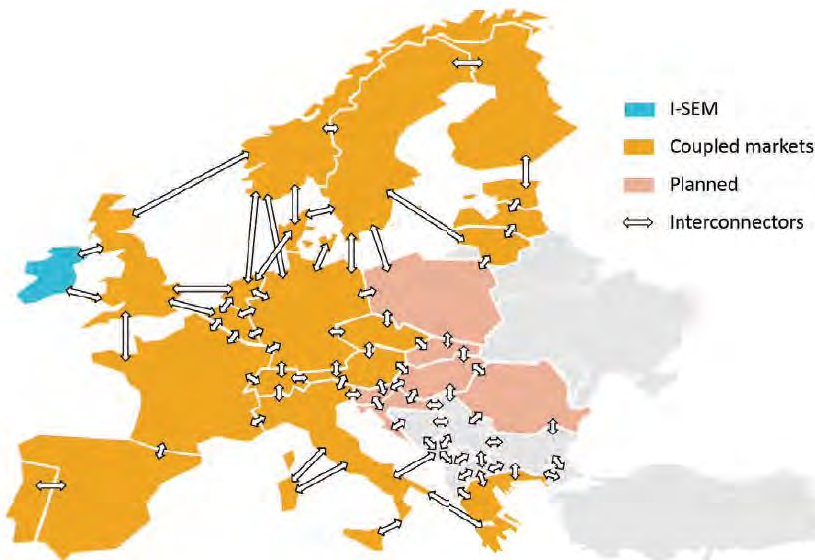
Potential for LMPs

Return of transmission charges on ICs

Staying in the IEM might be a likely outcome for GB given the Irish circumstances, yet there is precedent for policies to be disjointed



Chart 1: IEM and interconnectors: the integration of I-SEM



Source: EirGrid

Irish context sets the background

*"In the absence of agreed solutions, the United Kingdom will **maintain full alignment** with those rules of the Internal Market and the Customs Union which, no in the future, support w or North-South cooperation, the all-island economy and the protection of the 1998 Agreement."*

EU-UK Article 50 negotiations, 8 Dec 2017

*"there are **good economic reasons for the all-island market** which exist **independently of European Union law or policy**"*

SEM committee (2016)

I-SEM due to go live in October 2018

- Integrated Single Electricity Market (I-SEM) set to be integrated with EU markets
- Integration includes intraday continuous market, DAM and intraday auctions and balancing market

With I-SEM due to be coupled with the EU markets prior to Brexit taking place...

...seems unlikely that even the most committed Brexiter would demand that NI exit the new all-island arrangements.

Key question is whether GB exits from Northern Ireland



Any questions?



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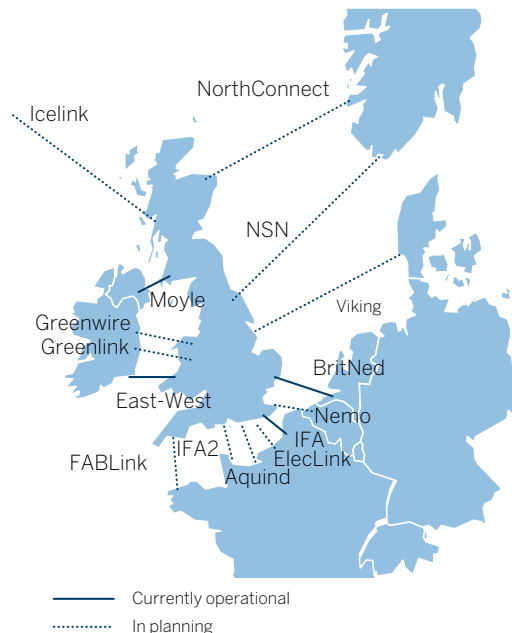
EXPERTS WITH **IMPACT**

Interconnector Services

Industry Challenges

The electricity sector around the world is undergoing significant changes, often driven by the decarbonisation agenda. For most countries, however, security of supply remains the number one priority. At the same time, consumer price also remains a key issue. Interconnectors are uniquely well placed to meet these challenges of sustainability, security and affordability.

Interconnectors are unique transmission assets that enable the flow of electricity over high voltage cables between different countries or regions. The economic rationale for interconnectors is driven by fundamental differences in the generation mixes in the connecting countries which lead to systematic electricity price spreads over long periods of time. For example, the generation portfolio in Great Britain (primarily thermal and renewable generation, with some nuclear) is very different from that in France (predominantly nuclear) or Norway (predominantly hydro). This is beneficial to consumers as it allows cheaper electricity to be imported at times of high local prices and to generators as it allows surplus generation to be exported at times of low local prices. Also, by providing access to additional generation capacity located in a neighbouring country, security of supply is enhanced.



Our Approach

We work with interconnector developers, regulators and investors on all aspects of interconnector development lifecycle. We assist developers in understanding the economics of interconnector projects, through the modelling of the power sector fundamentals, allowing an assessment of the costs, benefits and risks of a project both to the developers and wider energy market stakeholders. We also help the client navigate the relevant regulatory regimes.

We have significant experience in engaging with energy regulators and governments on all aspects of regulatory issues, including design, application and refinements of regulatory regimes to help deliver the regulators' statutory duties. In some cases, we also work with clients to gain an exemption from some aspects of the relevant regulations.

We also help investors identify, assess and progress specific investment opportunities in the interconnector space.

Our core experience lies in the European market where our experts have worked with a number of interconnectors and investors, including ElecLink, IFA, IFA2, Interconnection France-Spain, Nemo, NorGer, NorthConnect, NSN and Viking Link. We have also advised international clients, most recently an Australian TSO.

OUR SERVICES AT A GLANCE

Interconnector policy and regulation

- Design of regulatory regimes (including Cap and Floor in Great Britain)
- Policy design (e.g. incentives to increase interconnection)
- Energy market design (e.g. design of capacity market to incorporate interconnectors)

Quantitative analysis

- Power market fundamentals modelling
- Cost-benefit analysis (e.g. arbitrage revenues, Capacity Market, ancillary services)
- Socio-economic impact analysis
- Financial analysis (e.g. to support investment decisions)

Strategic support

- Advising on negotiations with regulators and policy-makers, both in the UK (e.g. Ofgem, BEIS), and in other jurisdictions
- Assistance in applications for regulatory support (e.g. Cap and Floor, Capacity Market)
- Assistance in applications for regulatory exemptions (e.g. merchant interconnectors)

FTI Consulting Energy Services

- Strategy
- Policy & Regulation
- M&A and Due Diligence
- Disputes (Economic, commercial, technical)

SELECTED EXPERIENCE

We have a wide range of experience with interconnectors, investors, regulators, transmission operators and energy companies:



NorthSeaLink IFA



Nemo Link®

IFA2



nationalgrid

ofgem

Statnett

Case studies

National Grid

THE CHALLENGE

Ofgem sought to incentivise the construction of interconnectors through a new 'cap and floor' regulatory regime, the detailed arrangements for which still needed to be worked out.

OUR INPUT

We assisted National Grid, as a developer, in evaluating various aspects of the proposed regime, including the impacts on the owners, developers and GB consumers, the basis for setting cap and floor levels, availability incentives, underlying financial models and specific design details of the capacity market.

THE RESULT

Our work enabled National Grid to discuss and agree with Ofgem a form of regulatory regime that was fair to consumers while providing a sufficient return for National Grid, thus enabling them to proceed with two interconnector projects – to Belgium and to Norway.

NorthConnect - Interconnector regulation

THE CHALLENGE

NorthConnect, a 1.4 GW proposed interconnector between Scotland and Norway, sought to operate under a form of GB regulatory support called 'Cap and Floor' regime, and to explore how Norwegian regulatory framework could also provide support.



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OUR INPUT

We have provided ongoing support to NorthConnect during the application process for the GB Cap and Floor regime by helping the client to demonstrate to Ofgem that the project delivers sufficient benefits to GB consumers. We have also advised NorthConnect on the possible regulatory arrangements on the Norwegian side.

RESULT

NorthConnect has successfully submitted the Initial Project Assessment application, the results of which are expected to become known in May 2017.

TransGrid

THE CHALLENGE

Precipitated by the closure of old coal-fired electricity generators, South Australia has been experiencing periodic black-outs since 2016. TransGrid – the TSO in New South Wales – thought that an interconnector between New South Wales and South Australia would be the most effective solution to the problem.

OUR INPUT

We assisted TransGrid by deploying our in-house power modelling expertise to assess the likely benefits of such an interconnector. We identified substantial savings for consumers in the Eastern States of Australia, more than 3-4 times the expected cost of the interconnector.

RESULT

Our work has enabled TransGrid to proceed to negotiate with State and federal governments as it moves forward to obtain regulatory approvals for the investment.