
# Groupe Eurotunnel SE – ElecLink Presentation

## 4 October 2016

François Gauthey - Deputy CEO Groupe Eurotunnel

Steven Moore - CEO ElecLink

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# Groupe Eurotunnel has full control of ElecLink

- 2011: Groupe Eurotunnel and STAR Capital Partners establish a joint venture (49/51) to develop an electricity interconnector between Great Britain and France. Star Capital brings its knowledge of the electricity market and regulation

- 2011-2016: ElecLink evolves from a concept to a fully developed project ready to be constructed

- 2016: Groupe Eurotunnel pays €75M and takes full ownership of this strategic infrastructure to speed up the project and have a closer control of the works. The price reflects the value which Groupe Eurotunnel puts on the current progress of the project and its strong financial outlook

- 2016+: Full control gives Groupe Eurotunnel flexibility to maximize the value of the project. The group is reviewing all options, including financing scenarii which were not possible with Star Capital's presence.

# Groupe Eurotunnel confirms its focus on infrastructure



- Groupe Eurotunnel operates the Fixed Link, with a concession running until 2086 (one of the world's longest).
- ElecLink enhances the value of the group's infrastructure and utilises its skills
- An investment which will boost the group's profitability and cash flows with revenues not correlated to the Group's current market
- ElecLink further reinforces the Group's presence in infrastructure business

# Agenda

## ElecLink welcomes you to the Investor Presentation

1. **Introduction to ElecLink**
   - *Steven Moore (ElecLink)*
2. **Market & Regulatory Overview**
   - *Vasilis Machias (ElecLink)*
3. **Closing Remarks**
   - *Steven Moore (ElecLink)*

# Introduction to ElecLink

Steven Moore, CEO, ElecLink

# Agenda

1. What we do
2. Where we are
3. EPC contracts
4. Achievements to date
5. Market background

# What we do

## A new build high voltage cable through the Channel Tunnel

- ElecLink will build, own and operate an exempted electricity interconnector through the Channel Tunnel to provide 1000 MW of bidirectional transmission capacity between the UK and France.
- ElecLink will respond to the need for greater electricity interconnection to:
  - ✓ ***Improve security of supply*** in both the UK and France;
  - ✓ ***Enable higher levels of renewables*** and meet the challenge of intermittency;
  - ✓ ***Avoid significant costs*** of building new peak generation capacity;
  - ✓ ***Contribute to decarbonisation*** a reduction of circa 6.1m tonnes $CO_{2,}$ and
  - ✓ ***Enable European energy market integration*** and more competitive energy pricing.
- ElecLink will offer long-term and short-term capacity contracts to its users, including major utilities and power traders, in a transparent and non-discriminatory manner.

# Who we are

## An experienced and complementary management team

**Steven Moore**
*CEO*

More than 20 years of commercial experience in the electricity sector having previously served as Group Director of Commerce, Optimisation and Trading at EDF and Power Markets Director at British Energy

**Vasilis Machias**
*Head of Sales & Regulation*

12 years of professional experience in electricity trading and energy markets regulation having previously worked at Gazprom Marketing & Trading, EDF Trading and ICF International

**Alex De Luca**
*Legal Counsel*

Legal expertise in upstream, exploration, telecoms and land access arrangements having previously worked for Australia Pacific LNG

**David Mooney**
*Contracts Administration Manager*

A qualified Chartered Quantity Surveyor with over 30 years of experience in large high profile energy and rail infrastructure projects in the UK and Asia

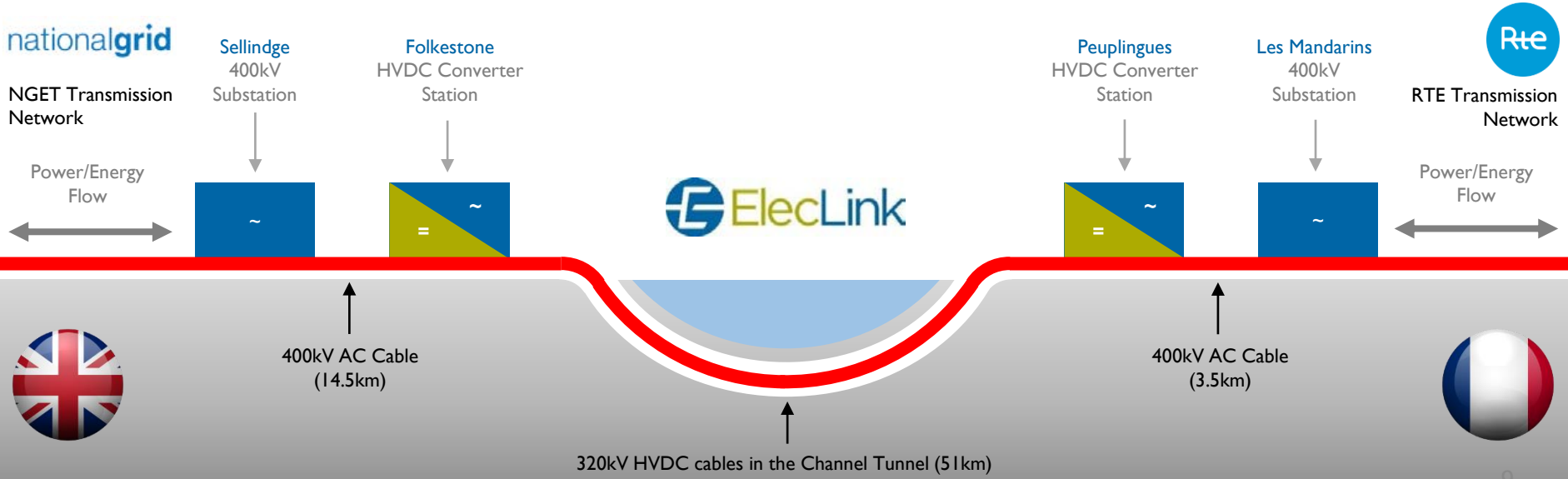
# Route and Grid Connections

## Key Facts

- ElecLink's route mirrors closely the route of the existing IFA interconnector
- Converter stations within the Eurotunnel terminal perimeter
- 51 km in the Channel Tunnel
- 3.5 km on French soil to connect to Les Mandarins substation
- 14.5 km on British soil to connect to Sellindge substation

## ElecLink's Route

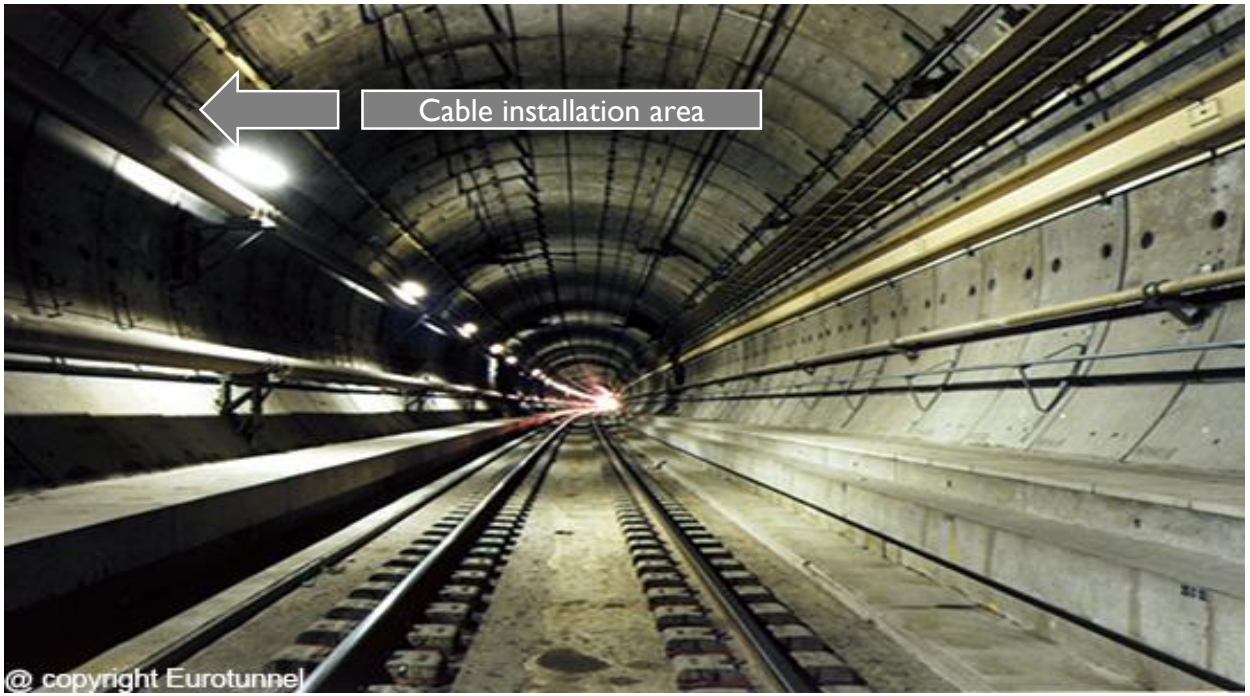

## ElecLink's Grid Connections



# The Channel Tunnel

## The 1,000 MW HVDC cable will be installed in the north running tunnel

### Interior of the running tunnel




### HVDC cable cross section


*Image property of Prysmian*

ElecLink will use tested and proven HVDC technology, comprising Voltage Source Converters (VSC) and Cross-linked Polyethylene (XLPE) cables at ±320kV, which is widely used across the globe for long-distance power transmission with low losses and high reliability.

# The converter stations

## The converter stations will be located adjacent to the tunnel entrances in GB and FR

Exterior

Interior

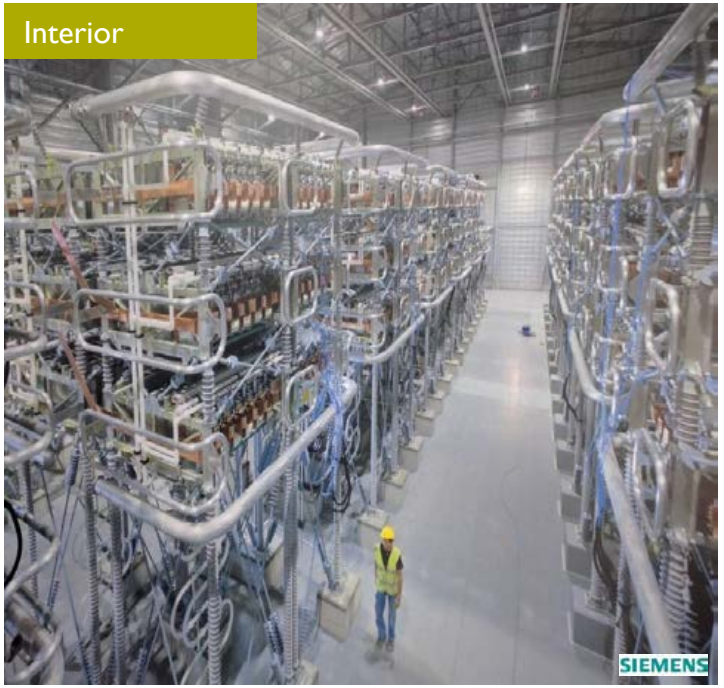



*Image property of Siemens*

# Where we are

ElecLink

**2012 - 2016**

- ✓ Obtain 25 year exemption and interconnector licence
- ✓ Secure grid connections in the UK and France
- ✓ Conduct feasibility studies

⇩

**Today**

- Secure EPC and O&M contracts
- Forward sell long-term contracts
- Raise debt to part-finance construction

⇩

**2016 - 2019**

- Construct 1000 MW power interconnector

⇩

**2020 +**

- ✓ Own and operate
- ✓ Monetise capacity throughout economic lifetime

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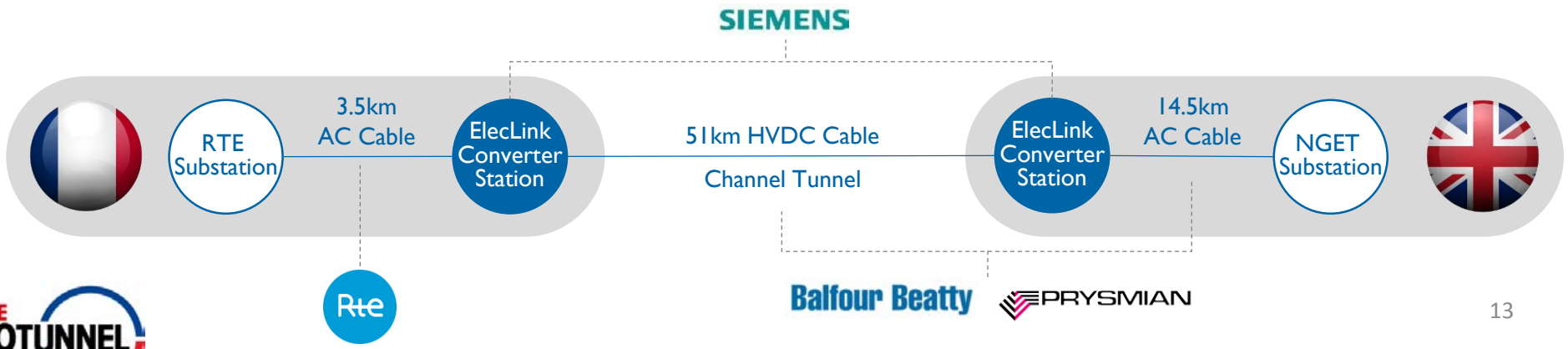
# World Class EPC Contractors

ElecLink will subcontract construction to industry leading companies with long and successful track record.

- Construction will be undertaken by globally renowned contractors:
    1. Siemens has been nominated as preferred bidder for the construction of the converter stations in FR and UK;
    2. Balfour Beatty/Prysmian has been nominated as preferred bidder for the manufacturing and installation of the DC cables in the Channel Tunnel and the underground AC cable in UK; and
    3. RTE will undertake the manufacturing and installation of the underground AC cable in FR.
- The construction programme is 36 months.
- The construction budget is circa €580m *(including EPC works, grid connections, insurances, IT systems, personnel and appropriate contingencies).*

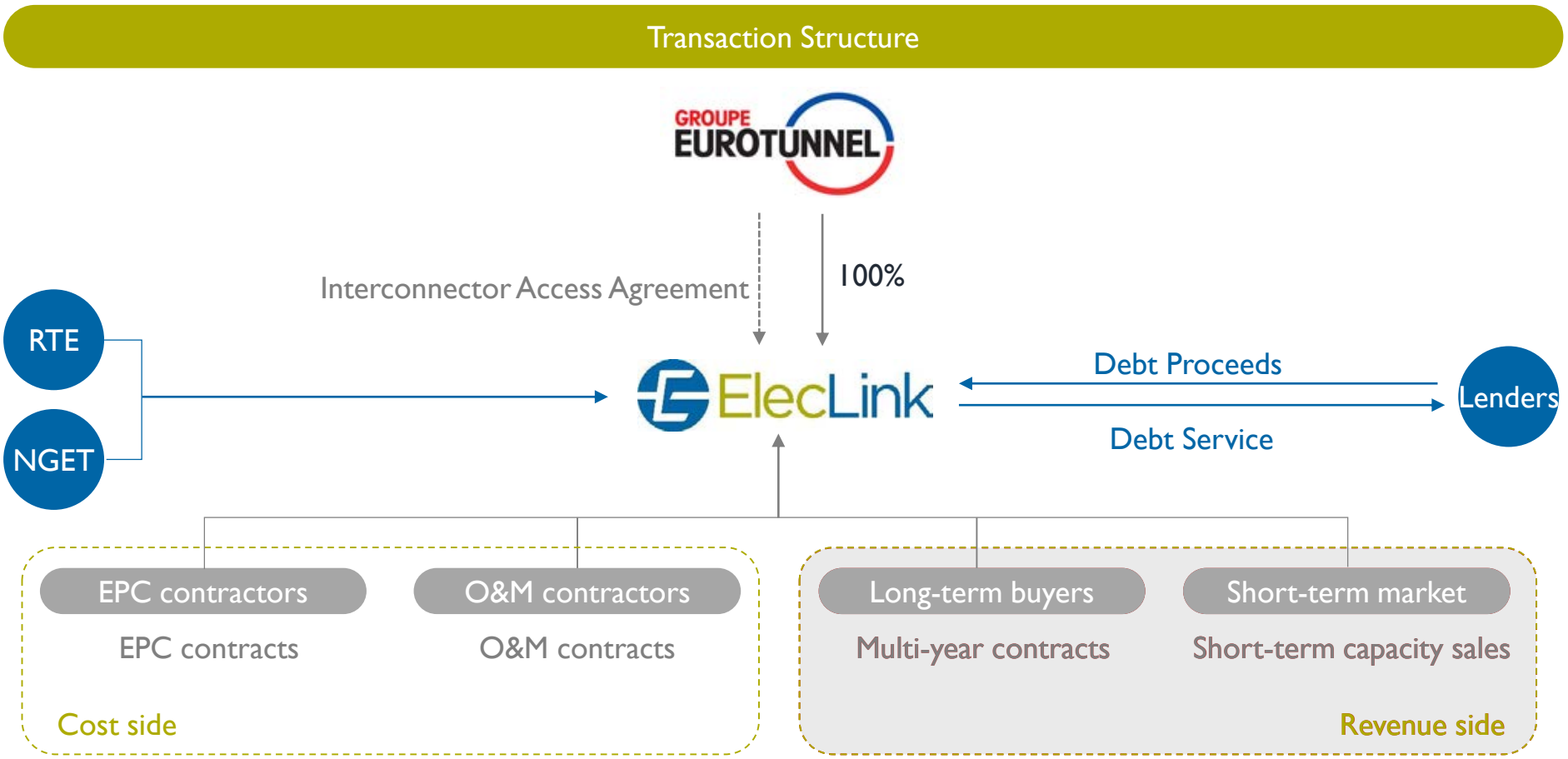


# Significant Achievements

ElecLink is amongst the most advanced new interconnection projects in the UK.

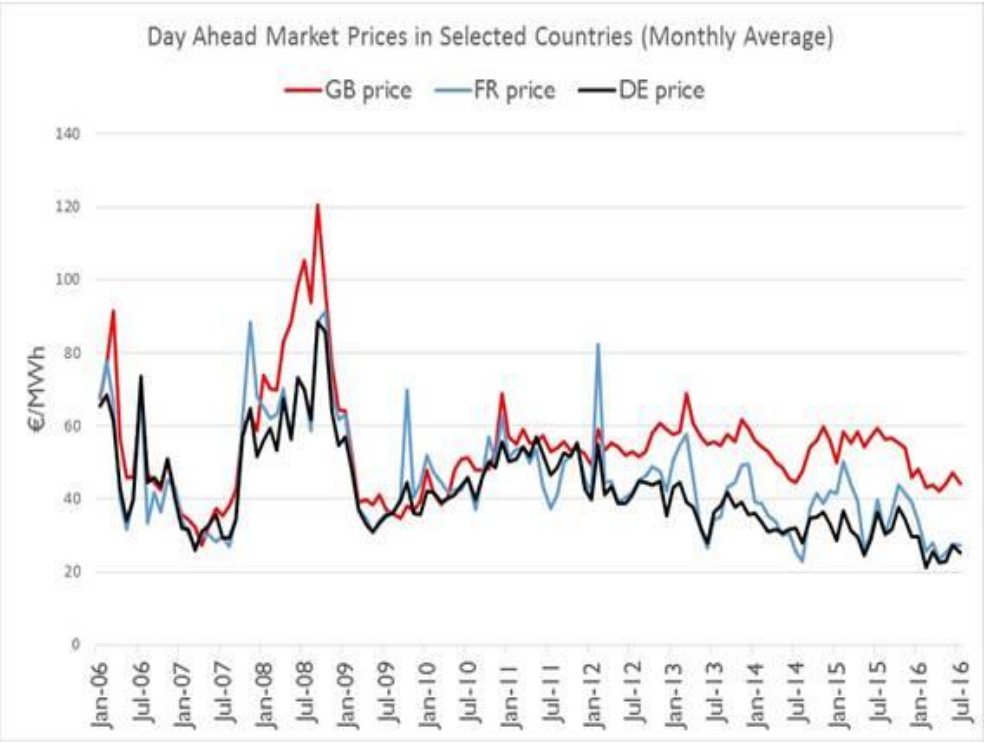
- ✓ Endorsed by the UK and FR governments
- ✓ Designated Project of Common Interest by the European Commission
- ✓ Awarded grant agreements by the Innovation and Networks Executive Agency
- ✓ Awarded 25-year exemption
- ✓ Obtained interconnector licence
- ✓ Secured grid connections in UK and FR
- ✓ Obtained building permits in UK and FR
- ✓ Appointed preferred bidders for EPC contracts
- ✓ Completed construction of new switchgear at UK substation
- ✓ Obtained regulatory approval on the terms of third party access

# Our focus today is revenue generation



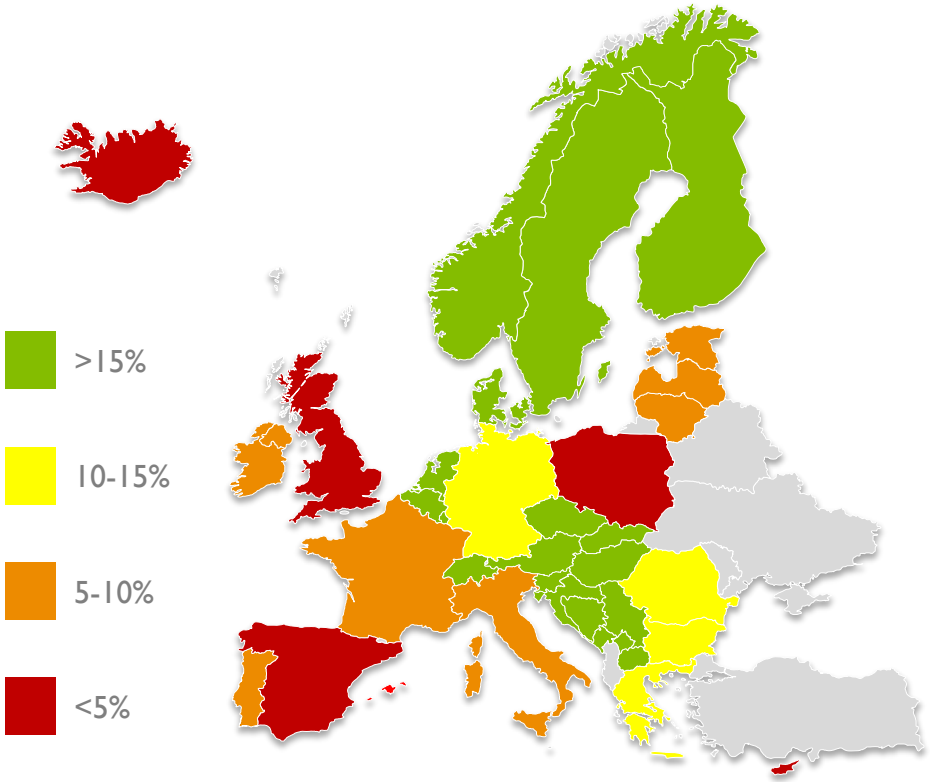
# What is the market background in GB, FR and neighbouring countries?

The difference in generation mix and demand profile drives the difference in wholesale electricity prices between connected countries

# What is the current electricity interconnection level in Europe?

GB currently has a low interconnection level whilst France has a medium interconnection level compared to European targets.




EU non-binding target of interconnection capacity as a % of installed generation capacity 2030:
**15%**

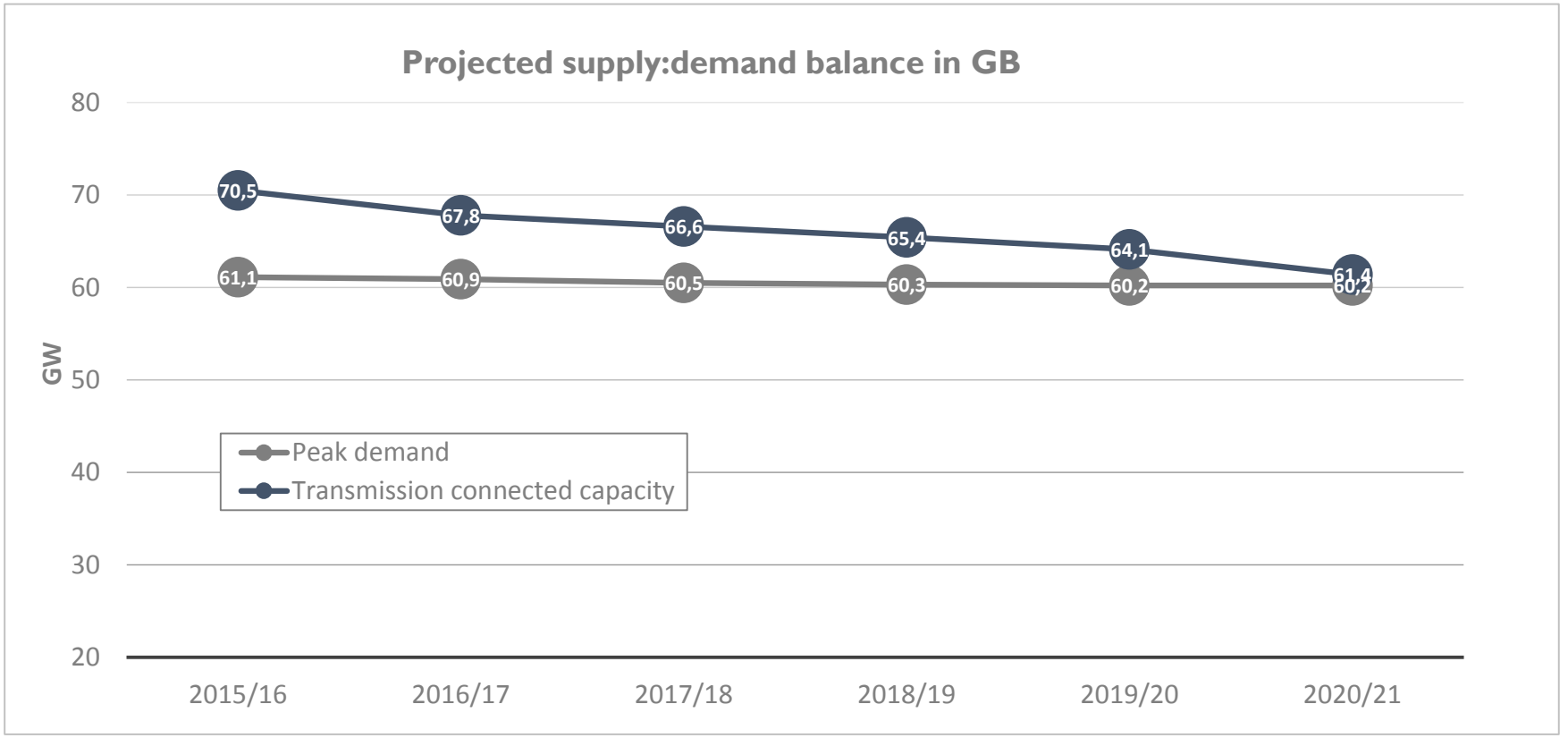
Current GB interconnection capacity as a % of installed capacity:
**<5%**

Current FR interconnection capacity as a % of installed capacity:
**~10%**

Data source: European Commission Energy Union Package – Achieving the 10% electricity interconnection target

# Why is new interconnection important?

## Tight reserve margins towards the end of the decade make interconnectors essential for security of supply




*Source: National Grid's Base Case projections, EMR Electricity Capacity Report, 31 May 2016 (submitted to DECC)*

# Market & Regulatory Overview

Vasilis Machias, Head of Sales & Regulation, ElecLink

# Agenda

1. What is the regulatory environment for electricity interconnectors?
2. ElecLink exemption
3. How does an electricity interconnector monetise its value?
4. Congestion rents
5. What other revenue streams might be accessible?

# What is the regulation for electricity interconnectors?

There are three regulatory regimes for electricity interconnectors: regulated asset base, cap and floor and exempted.

## Regulated Asset Base (RAB)

Standard investment route for most European interconnection projects

**Revenue:** fully regulated, price controlled

## Cap and Floor

A new regime open to electricity interconnectors in GB

Revenue "capped" at an upper limit. Downside protected by the "floor" with consumer underwriting

## Exempted

Developers can seek exemptions from regulatory requirements

**Revenue**: Greater access to revenue upside, subject to exemption conditions, but without consumer underwriting

Example in GB: **ElecLink**

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# ElecLink is the most advanced new project in the UK

## Existing interconnectors

| Interconnector | Border | Capacity (MW) | Commissioning Date |
|---|---|---|---|
| IFA | GB – FR | 2,000 | 1986 |
| Moyle | GB – NI | 500 | 2002 |
| Britned | GB – NL | 1,000 | 2011 |
| EWIC | GB – IE | 500 | 2012 |

## New interconnectors*

| Interconnector | Border | Capacity (MW) | Commissioning Date | Regulatory Framework |
|---|---|---|---|---|
| ElecLink | GB – FR | 1,000 | (2019) | Exempted |
| Nemo | GB – BE | 1,000 | (2019) | Cap and Floor |
| IFA 2 | GB – FR | 1,000 | (2020) | Cap and Floor |
| FABLink | GB – FR | 1,400 | (2021) | Cap and Floor |
| NSL | GB – NO | 1,400 | (2021) | Cap and Floor |
| Aquind | GB - FR | 2,000 | (2021) | N/A |
| Viking | GB – DK | 1,400 | (2022) | Cap and Floor |
| Greenlink | GB – IE | 500 | (2022) | Cap and Floor |
| IceLink | GB – IS | 1,000 | N/A | N/A |
| NorthConnect | GB – NO | 1,400 | N/A | N/A |

* Commissioning dates and nominal installed capacities based on information available on respective developers' websites

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# ElecLink Exemption
## General

ElecLink is different from fully regulated interconnectors.

| Provision | Difference vis-à-vis fully regulated interconnectors |
|---|---|
| Third party access | ElecLink is allowed to forward sell multi-year products for up to 80% (800 MW) of the total capacity in each direction.<br>The remaining 20% (200 MW) must be sold as shorter-term products which must be aligned with the products offered by the existing interconnector between GB and FR. |
| Use of congestion revenues | RAB interconnectors must use congestion revenues only for the following purposes:<br>a) Guaranteeing the actual availability of the allocated capacity; and/or<br>b) Maintaining or increasing interconnection capacities through network investments; and/or<br>c) Setting network tariffs for system users.<br>Cap & Floor interconnectors have their revenues capped.<br>ElecLink is not subject to these requirements. Congestion revenues can be retained as income and returns are not capped. However, a sharing mechanism applies for proceeds exceeding a predetermined IRR level set by the regulators. |
| Ownership unbundling | Partial exemption from ownership unbundling requirements subject to certain conditions. |

# ElecLink Exemption
## Third Party Access

**Multi-year products**

- Max 800 MW per direction
- Average tenor must not exceed 15 years
- Tenors equal to or less than 5 years must be offered
- All users restricted to 400 MW per direction
- Users with market share of more than 40% are restricted to 200 MW in the direction of import to the country where their market share exceeds 40%

**Medium term & daily products**

- Min 200 MW per direction
- Yearly, monthly and daily products
- No limits imposed on individual users
- ElecLink must take part in market coupling

**Intraday products**

- Unutilised capacity must be reallocated in the intraday market

- All products will be allocated to the market through an open, transparent and non-discriminatory auction process
- In Q4 2015, ElecLink consulted market participants on the terms of access to and use of the interconnector capacity (the ElecLink Access Rules)
- In Q2 2016, ElecLink obtained regulatory approval from Ofgem and CRE on the ElecLink Access Rules
- To participate in auctions, users must accede to the ElecLink Access Rules and satisfy credit worthiness requirements
- The ElecLink Access Rules are available at http://www.eleclink.co.uk/os-general.php

# What is the value of interconnection to developers?

Potential revenue streams include energy market revenues, capacity market revenues and ancillary services revenues.

## Congestion rent: Energy market revenues

The fundamental value driver is the congestion rent, i.e. the hourly price spread between the connected markets multiplied by the resulting flow after transmission losses have been accounted for

## Capacity market revenues

Interconnectors may receive capacity payments in GB if they contribute positively to the security of supply

## Ancillary services revenues

Revenues by offerings TSOs access to ancillary services in the connected markets and facilitating the efficient sharing of flexible reserves

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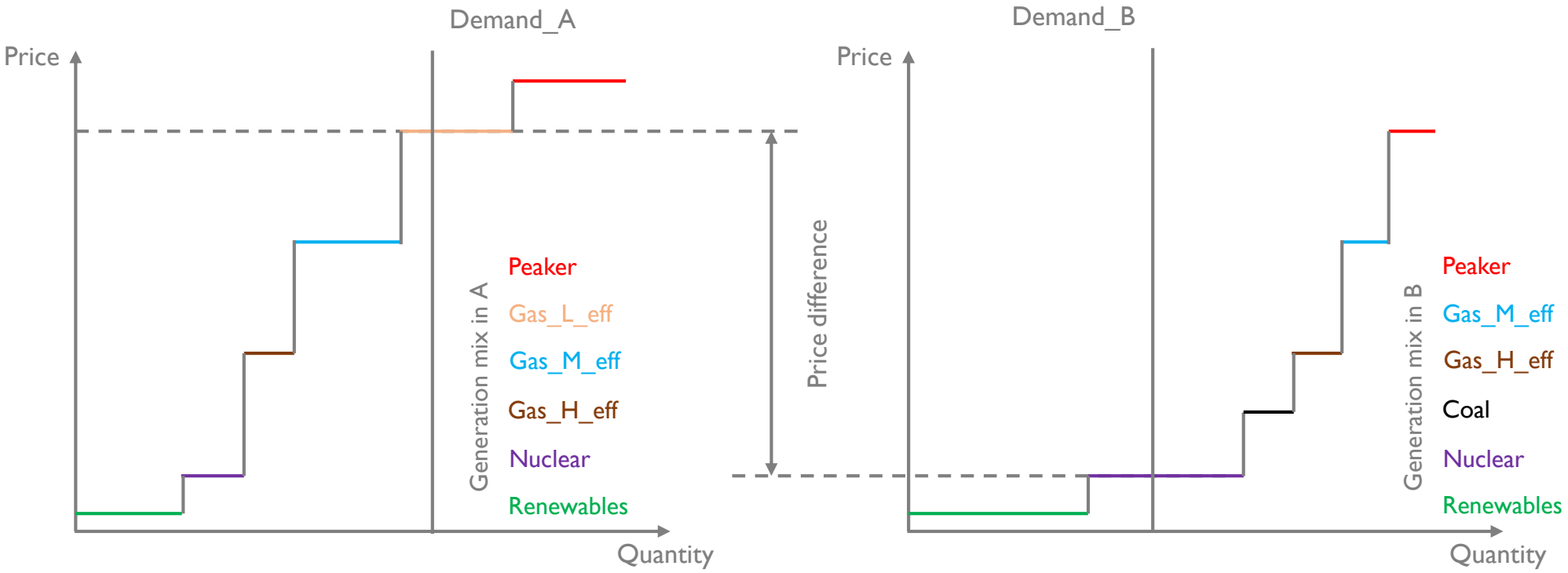
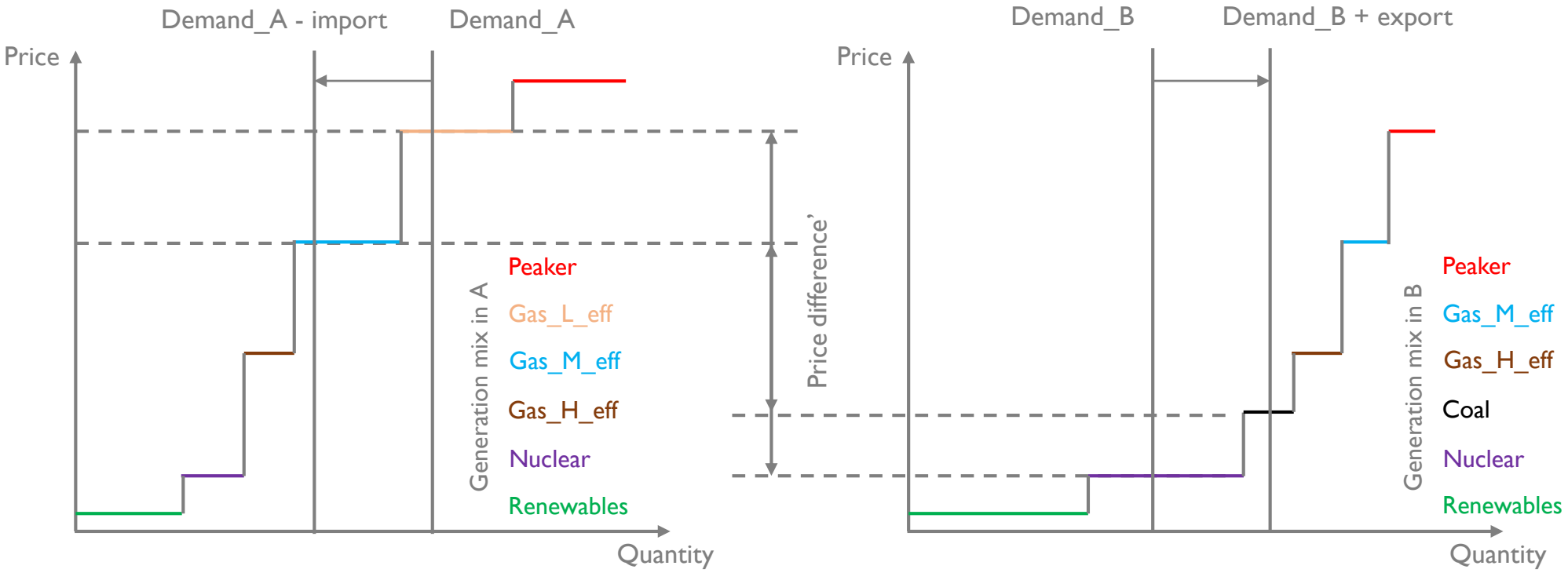
# What are congestion rents? (I)

- Consider a scenario where Country A and Country B are not connected
- The price of electricity in each country is determined by supply and demand
- Different countries with different generation mixes and demand profiles can therefore have different prices



# What are congestion rents? (II)

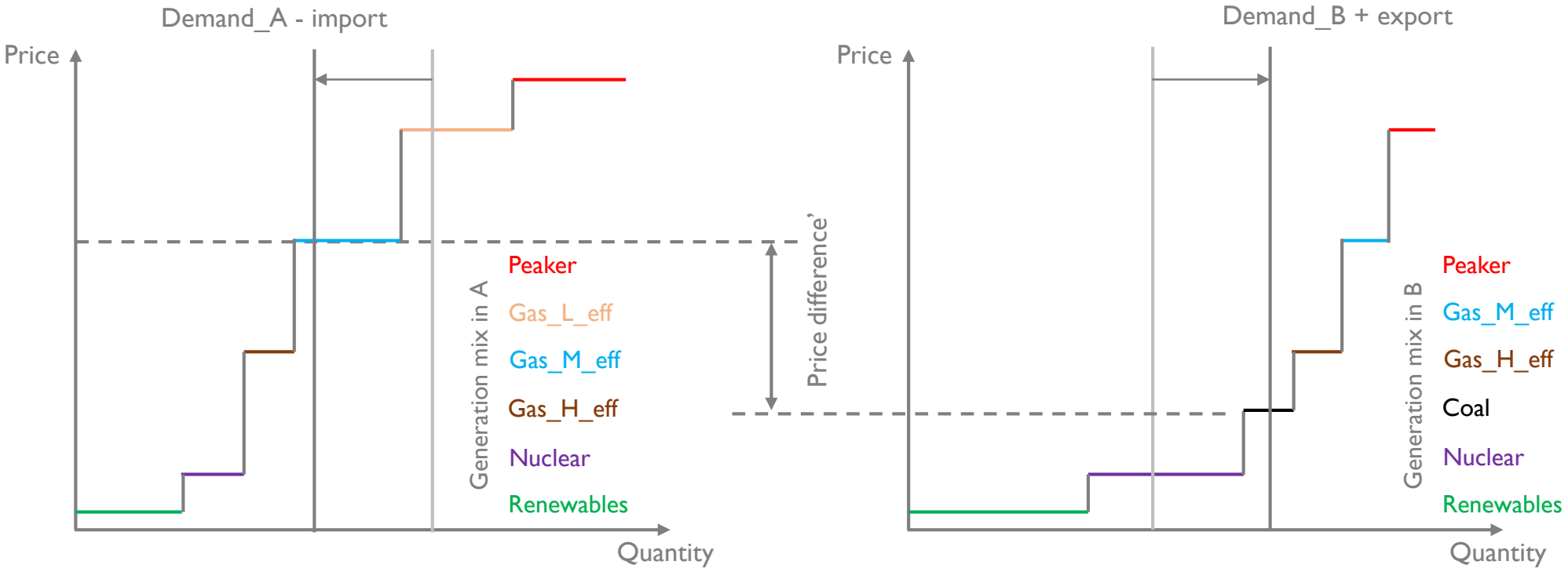
- Consider a scenario where Country A and Country B are linked with an interconnector
- The price difference triggers a flow of electricity from the less expensive country to the more expensive one
- The flow of electricity tends to reduce the price difference, but the limited capacity of the interconnector causes "congestion" and a significant price differential remains



# What are congestion rents? (III)

The fundamental value of an interconnector is derived from congestion rents which in turn depend on price differentials.

- Congestion rent = Price difference x Volume of electricity flow



# How does an interconnector monetise congestion rent?

Interconnectors monetise congestion rents by selling capacity rights.

| | Forward | Day ahead | Intraday |
|---|---|---|---|
| Overview | Auctions of long term interconnector capacity | Allows buying and selling of electricity for delivery on the following day in each region | Allows players to trade closer to real time |
| Typical European Allocation Process | Capacity is sold separately from electricity | Market coupling: a Pan-European auction in which capacity is allocated implicitly | Target of implicit allocation with continuous trading |
| Contract duration | Multiple days to one year-ahead | One day | Hours |

| | Multi-year | Year Ahead | Season Ahead | Quarter Ahead | Month Ahead | Week Ahead | Multi-day | Day Ahead | Intra-day |
|---|---|---|---|---|---|---|---|---|---|
| IFA[1] | N/A | 45% | 15% | 15% | 15% | N/A | 1% | Remaining (9%) | |
| Moyle[1] | N/A | 32% | 6% | 4% | 5% | N/A | N/A | Remaining (53%) | |
| BritNed[1] | N/A | 67% | N/A | 7% | 7% | N/A | 10% | Remaining (9%) | |
| EWIC[1] | N/A | 48% | 15% | 10% | 35% | N/A | N/A | Remaining (2%) | |
| **ElecLink** | **Up to 80%** | | | **Minimum 20%** | | | | | |

1.Typical product type breakdown, based on 2015 auction data and predominant direction of flow (FR-GB for IFA, GB-NI for Moyle, NL-GB for BritNed and GB-IE for EWIC)

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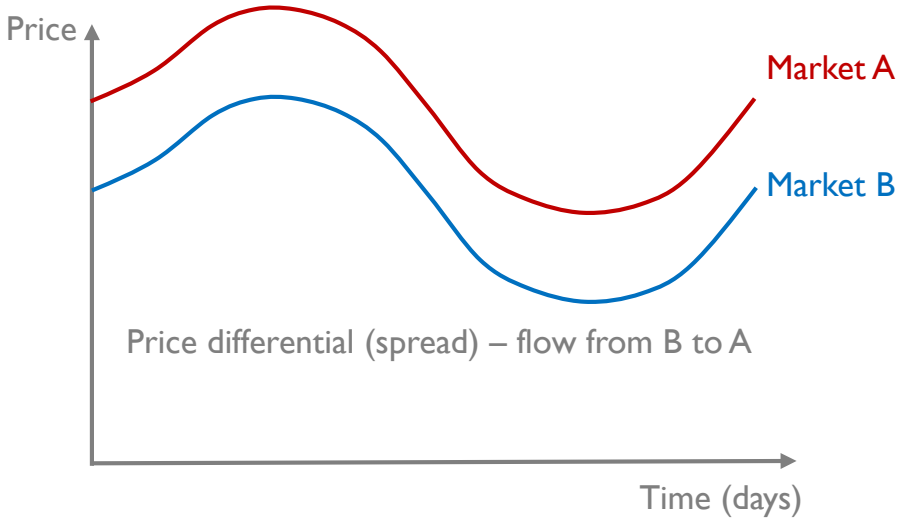
# What are the sources of value for congestion rents? (I)

There are two sources of value for the congestion rents earned by an interconnector: structural value and volatility value.

- ***Structural value*** derives from systematic average hourly price differentials between the connected markets




- These differences may manifest as average spreads in the forward curves and/or structural patterns in daily price shape

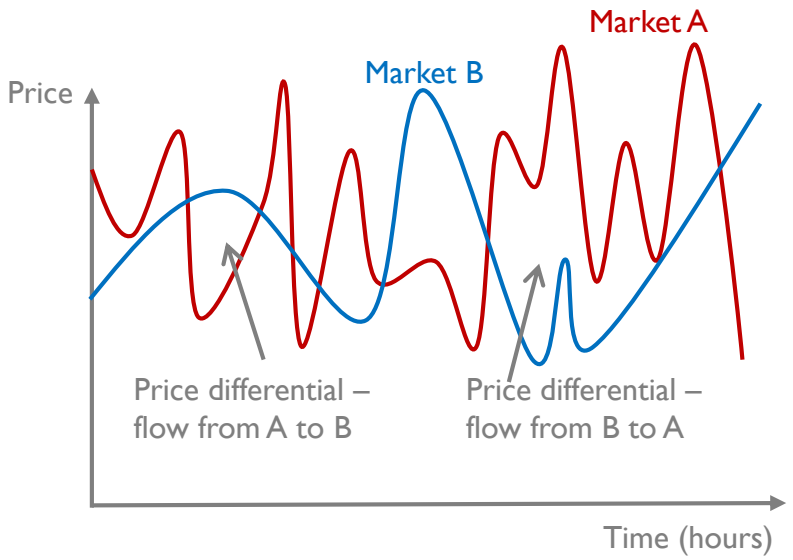
| Forward prices in UK and FR @ 16.09.2016 | | |
|---|---|---|
| Product | UK (€/MWh) | France (€/MWh) |
| CAL 2017 (Base) | 48.49 | 32.95 |

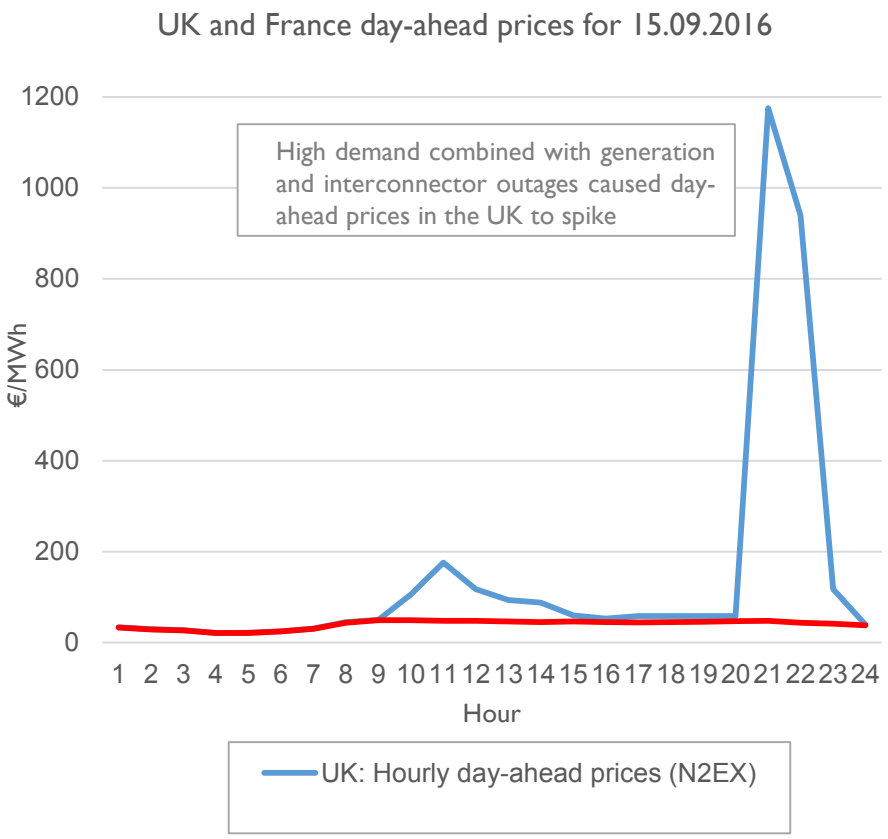
*Source: European Power Daily, S&P Global Platts, September 19, 2016*

# What are the sources of value for congestion rents? (II)

There are two sources of value for the congestion rents earned by an interconnector: structural value and volatility value.

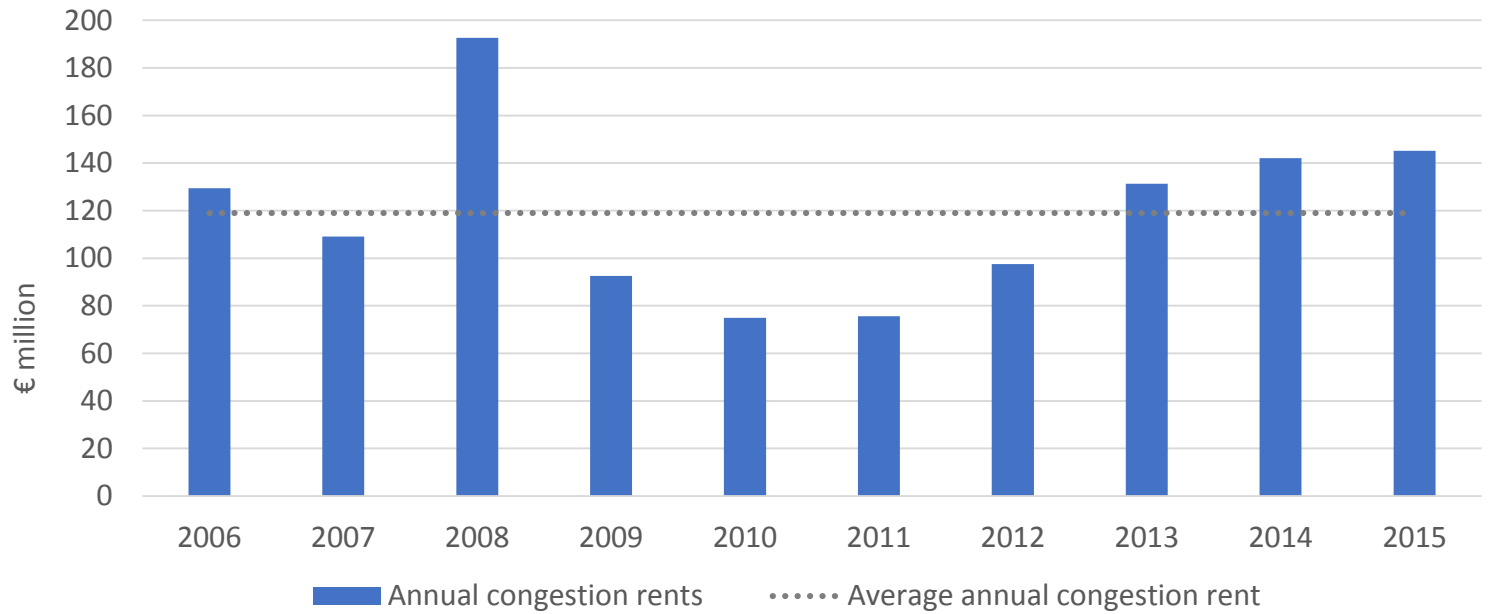
- ***Volatility value*** derives from random hourly price variations between the markets
- Even if the difference in average prices is small, it is still possible for an interconnector to have high value (due to high volatility)



# Historical congestion rents

In the period 2006 – 2015, a hypothetical 1000MW interconnector between GB and FR could have potentially generated an average of circa €119 million per year in terms of congestion rents based on the outturn day-ahead hourly prices in the two countries*




*** Past performance is not a guide to future performance.**

Source: ElecLink calculations showing the theoretical congestion rent of a hypothetical 1000 MW interconnector between GB and FR based on the hourly differentials between the outturn day-ahead prices in FR and GB in the period 2006 - 2015; assumes an end-to-end transmission loss factor of 2.5% and annual availability rate of 98%. Note that, in practice, the actual congestions rents monetised by interconnectors will be different depending on the contracting strategy of the interconnector and the actual split of capacity between (a) the different forward timeframes (e.g. year-ahead, season-ahead or month-ahead) and (b) the day-ahead allocation of capacity via implicit auction (market coupling). For simplicity the analysis has assumed that the hypothetical 1000 MW interconnector had no impact on outturn day-ahead prices in GB and FR.

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# Prospective users

## ElecLink's prospective customer base consists of market participants active in cross-border trading

- Vertically Integrated Utilities
- Suppliers
- Oil/Gas Majors
- Generators
- Traders
- Financial Players
- Other importers/exporters

- A list of current power market participants in GB can be found at https://www.apxgroup.com/members/spot-markets/trading-members/
- A list of current power market participants in France can be found at https://www.epexspot.com/en/membership/list_of_members

# What revenues can interconnectors earn from the GB capacity market?

## Interconnectors are eligible to participate in the GB Capacity Market if they contribute positively to security of supply

- The GB Capacity Market awards contracts to generators, demand side response and interconnectors
- NGET procures capacity from the market through auctions four years and one year ahead of delivery
- Interconnectors are awarded annual contracts*
- Revenues from the GB Capacity Market is complementary to revenues earned from congestion rents

| | | ElecLink[1] |
|---|---|---|
| [A] | **Capacity** | 1,000 MW |
| [B] | **De-rating factor** (2019/20 delivery year) | 56% |
| [C] | **De-rated capacity** (A * B) | 560 MW |
| [D] | **Auction clearing price** (2019/20 delivery year) | £18/kW |
| [E] | **GB CM revenues (£)** (C * D * 1000) | £10.1m |

1. Estimated capacity market revenues for ElecLink had it participated successfully in the GB Capacity Market auction for delivery in 2019/20 based on the de-rating factor of 56% awarded to it by DECC

* The direct participation of interconnectors in the GB Capacity Market was intended as an interim measure until an enduring solution is found to enable the participation of foreign generators and may, therefore, be subject to policy changes in future.

# What revenues can interconnectors gain from ancillary services?

## Interconnectors can also provide ancillary services to Transmission System Operators

- A range of additional services can be provided by interconnectors to the national Transmission System Operators, including:
  - Frequency response;
  - Reactive power;
  - Black Start capability; and
  - Emergency assistance and cross-border balancing.
- Interconnectors are remunerated based on contracts entered into with the Transmission System Operators
- The scope of, demand and price for ancillary services will depend on a number of factors, including the topology of the grid and supply/demand conditions

# Closing Remarks

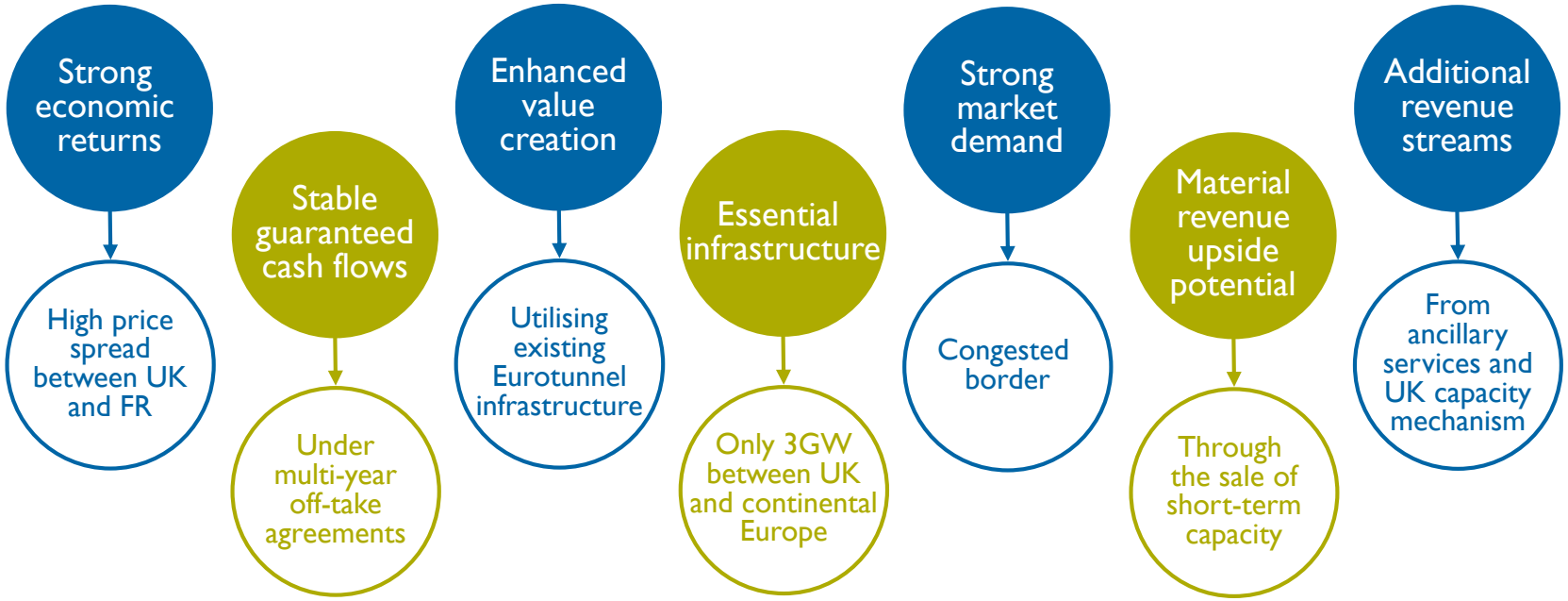
Steven Moore, CEO, ElecLink

# Closing Remarks

Thank you for attending our presentation. We hope you found this helpful in improving your understanding of the ElecLink project

- ✓ ***Essential infrastructure:*** an extension of respective host countries' regulated transmission networks
- ✓ ***EU Project of Common Interest:*** planned and permitted by way of joint agreement of the EU, French and GB regulatory authorities
- ✓ ElecLink allowed to ***operate and earn revenue on an "Exempted" basis***
- ✓ ***Well-developed construction arrangements*** supported by top tier EPC counterparties
- ✓ ***Strong economic rationale*** for a GB-FR interconnector based upon structural price differentials and the ability to monetize hourly volatility in market prices
- ✓ ***Minimal environmental impact***

# Strategic Rationale



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