COMMISSION DE RÉGULATION DE L'ÉNERGIE

The Energy Regulatory Commission (CRE) is consulting market players.

# PUBLIC CONSULTATION N°2021-07 OF 17 JUNE 2021 RELATING TO THE GRIDLINK INTERCONNECTION PROJECT AND TO THE OPPORTUNITY OF A NEW INTERCONNECTOR BETWEEN FRANCE AND THE UNITED-KINGDOM

Translated from the French: only the original in French is authentic

On 17 March 2021, GridLink Interconnector Limited ("GridLink") submitted to CRE an investment request for a 1400 MW interconnector project between France and the United Kingdom, pursuant to Regulation (EU) No 347/2013[1] ("TEN-E Regulation"). This investment request includes a request for a cross-border cost allocation.

**A specific legal framework following Brexit**

The GridLink project has been granted the european Project of Common Interest (PCI) status in 2017[2], and is listed as a PCI in the latest list adopted by the European Commission in 2019[3].

Article 12 of the TEN-E Regulation states that PIC project promoters can submit an investment request to the national regulatory authorities concerned. Within six months after the date of receipt of the last investment request, the authorities shall take coordinated decisions on the allocation of investment costs.

GridLink submitted an investment request to CRE and Ofgem in November 2020 based on the TEN-E Regulation. However, since the end of the Brexit transition period on 31 December 2020, the TEN-E Regulation has ceased to apply in the UK. CRE and Ofgem then considered that it was no longer possible to take coordinated decisions on GridLink's request.

As a result, GridLink submitted on 17 March 2021 a similar investment request addressed only to CRE.

**This investment request comes at a time when the interest of an additional interconnection between France and the United Kingdom is being questioned**

There are currently two electric interconnectors between France and the United Kingdom: IFA (2000MW, commissioned in 1986) and IFA2 (1000MW, commissioned in January 2021). These two direct current interconnectors are operated by National Grid and Réseau de Transport d'Electricité (RTE), respectively the British and the French Transmission System Operators. An additional interconnector is under construction: ElecLink, a 1000 MW direct current project owned by GetLink.

[1] Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R0347

[2] Commission Delegated Regulation (EU) 2018/540 of 23 November 2017 amending Regulation (EU) No 347/2013 of the European Parliament and of the Council as regards the Union list of projects of common interest: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0540

[3] Commission Delegated Regulation (EU) 2020/389 of 31 October 2019 amending Regulation (EU) No 347/2013 of the European Parliament and of the Council as regards the Union list of projects of common interest: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32020R0389

In addition to the GridLink project, two other interconnector projects are currently under study between France and the United Kingdom:

- Aquind is a 2000MW project promoted by AQUIND Limited (UK) and AQUIND SAS (France). Aquind submitted an exemption request to CRE and Ofgem in June 2020. Considering the trade and cooperation agreement[4] between the European Union (EU) and the United Kingdom (24 December 2020), which follows the United Kingdom's exit from the EU, CRE and Ofgem considered[5] that the exemption request process as provided for in Article 63 of Regulation (EU) 2019/943 was only applicable for interconnection projects developed between EU Member States. Since the United Kingdom is no longer a Member State and the transition period has come to an end, Aquind can no longer benefit from the provisions of the aforementioned regulation and the regulators no longer have the competence to examine and take a decision concerning an exemption request based on that regulation.
- FAB Link is a 1400MW project owned by FAB Link Limited, under a partnership with RTE. This project has also been granted the PCI status.

In this context, CRE carried out in 2019 a study to assess the optimal level of electricity interconnection between France and the United Kingdom, i.e. for which the benefits of the last interconnector exceed the costs of that interconnector. The study concluded that the benefits provided by the projects currently under study were not sufficient to justify further investments, without even considering the potential negative consequences of Brexit on the value of interconnectors.

Therefore, CRE considered[6] that the conditions were not met for an increase of the interconnection capacity between France and the United Kingdom and that it appeared necessary to wait for more clarity how Brexit modalities would be implemented, as well as on the evolutions of market fundamentals and on the implementation of public policies likely to favourably influence the value of these interconnectors.

Following GridLink's request, CRE has updated its previous analyses to consider the changes that have been implemented since 2019, in particular the update of the ten-year development plan for the European transmission network. The purpose of this public consultation is therefore to gather the opinions of market players on the relevance of an additional interconnector between France and the United Kingdom, as well as on GridLink's investment request. CRE invites interested parties to send it their contribution before 26 July 2021.

Following this consultation, CRE will decide on the investment request, as well as on the request for the cross-border cost allocation of the GridLink project.

**Paris, 17 July 2021.**

**For the Energy Regulatory Commission,**

**The President,**

**Jean-François CARENCO**

[4] Trade and Cooperation Agreement between the European Union and the European Atomic Energy Community, of the one part, and the United Kingdom of Great Britain and Northern Ireland, of the other part: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22020A1231(01)&from=FR

[5] Press release: CRE and Ofgem discontinue public consultation on Aquind's exemption request

[6] Deliberation by the French Energy Regulatory Commission of 11 July 2019 informing on the estimation of the optimal electricity interconnection capacity and the new interconnection projects with the United Kingdom

CRE invites interested parties to send their contributions by 26 July 2021, by entering their contribution on the platform set up by CRE: https://consultations.cre.fr.

In the interests of transparency, contributions will be published by CRE. **If your contribution contains elements that you wish to keep confidential, you will be able to generate through the platform a version that hides these elements.** In this case, only this redacted version will be published. CRE reserves the right to publish elements that could prove essential to the information of all players, provided that they are not covered by secrets protected by law. **In the absence of a redacted version, the full version will be published,** subject to information covered by legally protected secrecy.

Interested parties are invited to provide the grounds for their answers to the questions.

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# 1. BENEFIT OF AN ADDITIONAL INTERCONNECTOR BETWEEN FRANCE AND THE UNITED KINGDOM

## 1.1 Socio-economic welfare: recent analyses highlight strong uncertainties on the benefits of an additional interconnector

Socio-economic welfare (SEW) represents the savings in electricity production costs made possible by an interconnection project due to the reduction in congestion it allows. By construction, this indicator also takes into account, on the one hand, the value of the savings in $CO_2$ allowances and, on the other hand, the benefits derived from the reduction in the curtailment of renewable energies. In addition, by modelling high price spikes during periods where the power system has little margins, this indicator takes into account the contribution of interconnectors to Security of Supply (SoS). In order to estimate the future benefits allowed by an interconnection project, the various studies mentioned hereafter are based on prospective scenarios. These scenarios must be contrasted in order to cover a sufficiently wide range of the possible futures for generation, demand, and macroeconomic parameters.

### 1.1.1 The 2019 CRE's study concluded that the benefits of a new interconnector were lower than the projects' costs

CRE published in July 2019 a study[7] to evaluate the optimal electric interconnection capacity between France and the United Kingdom, assuming the UK would remain in the internal market in electricity. This study was based on the scenarios of ENTSO-E's 2018 Ten-Year Network Development Plan (TYNDP), as well as on the most recent national energy-climate plans in France (*Programmation pluriannuelle de l'énergie* - PPE) and in the United Kingdom. In all the scenarios considered, benefits were lower than the average project costs (including capital expenditures, operational expenditures and additional network losses resulting from a new interconnector).

Given these results as well as the uncertainties related to Brexit, CRE then considered that the conditions were not met for an additional increase in the interconnection capacity between France and the United Kingdom beyond the projects already under construction (ElecLink and IFA2), and that it seemed necessary to wait to have more clarity on the terms and conditions of Brexit, on the evolutions in market fundamentals and on the implementation of public policies likely to favourably influence the value of these interconnectors.

### 1.1.2 The latest version of the Ten-Year Network Development Plan (TYNDP 2020) calculates a higher value for interconnectors between France and the United Kingdom

While the 2019 CRE study on the optimal level of electricity interconnection capacity between France and the United Kingdom remains relevant in many aspects, it does not include the most recent government announcements in the United Kingdom and in the rest of Europe. In addition, the *Energy Transition* and *Prudent* scenarios are based on the TYNDP 2018 assumptions, which are no longer relevant following the latest versions of the PPE in France and the energy forecasts in the United Kingdom.

In February 2021, the European Network of Transmission System Operators for Electricity (ENTSO-E) published a version of its 2020 Ten-Year Network Development Plan (TYNDP 2020). This version has been submitted to the Agency for the Cooperation of Energy Regulators (ACER) for opinion. ACER published its opinion on 3 May 2021[8].

TYNDP 2020 relies on four scenarios for the evolution of the European energy system. These scenarios include forecasts for electricity demand profiles, generation capacities, commodity prices and take into account the most recent national energy-climate plans:

- *National Trends*, in line with the latest energy and climate policies, is viewed as the central and most likely scenario.
- *Global Ambition* is a more ambitious scenario. It uses as a reference the achievement of the objectives of the Paris Agreement and the carbon neutrality in 2050. It is characterized by a strong development of offshore wind in Northern Europe and solar PV in Southern Europe.
- *Distributed Energy* also aims to achieve the objectives set by the Paris Agreement. This scenario is based on a very ambitious development of local renewable energy sources, considered probably unrealistic by CRE. For instance, this scenario foresees 34 GW of PV capacity in the United Kingdom in 2030, for a government target of 16 GW.
- *Current Trends* is a less scenario less ambitious, based on the recent trends. Following the COVID-19 crisis, the evolutions observed since 2020 are closer to those envisaged in this scenario than those envisaged in *National Trends*.

[7] CRE study: Estimation of the optimal electricity interconnection capacity between France and the United Kingdom
[8] ACER opinion on TYNDP 2020, 3 May 2021

The characteristics of these scenarios are detailed in appendix.

As shown in Figure 1 below, the benefits are contrasted between the scenarios: they are higher than GridLink's costs in two of the scenarios, but lower in the other two scenarios. Overall, the benefits are higher than in the CRE study of 2019 and much higher than in the TYNDP 2018. This change in benefits is due to updated assumptions on generation capacities, demand, and macro-economic parameters, as well as methodological adjustments. These aspects will be discussed in the following sections. It should be noted, that ACER, in its opinion on the draft TYNDP 2020, highlighted a lack of transparency on the parameters of the different tools used for the modelling and on the criteria for setting the "reference network", one of the key parameters of the modelling.

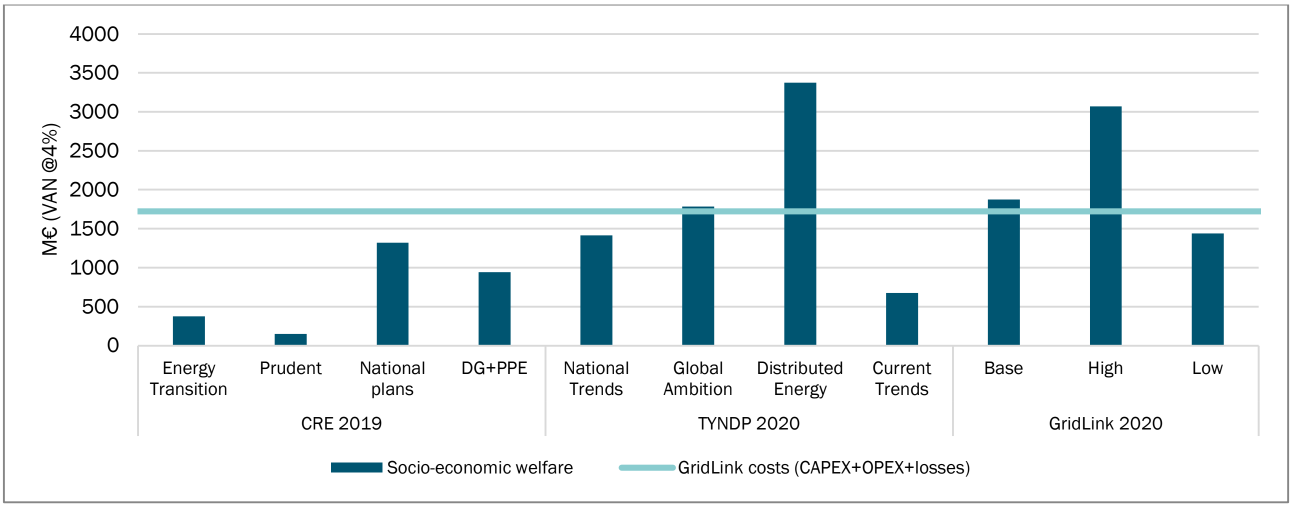


**Figure 1 – SEW of a 1.4 GW project between France and the UK (source: CRE, TYNDP 2020 and GridLink)[9]**

### 1.1.3 The socio-economic welfare presented by GridLink in its investment request is overall higher than the TYNDP 2020 result

GridLink has built 3 main scenarios and indicates that its scenarios are based on national policy guidelines and objectives.

- The low scenario represents a combination of factors driving electricity prices towards the lower limit of possible expectations. This scenario is based for example on a development of renewable energies below governmental targets (UK offshore wind does not reach 30 GW in 2030).
- The base case scenario represents the most likely evolution of the European electricity system according to GridLink. It reaches many European objectives.
- The high scenario represents a combination of factors driving electricity prices towards the upper limit of possible expectations. It is based for example on an accelerated development of renewable energies (e.g. 52 GW of installed photovoltaic capacity in France in 2030, 30% higher than the PPE objectives).

Although GridLink uses a modelling framework similar to the TYNDP 2020, the results of its modelling are significantly different from those of ENTSO-E. **In the central scenario, the SEW benefits are 26% higher than in the ENTSO-E central scenario.** In the high scenario, the benefits are between the two high ENTSO-E scenarios, in the upper range. In the low scenario, presented by GridLink as a combination of factors that consistently drive electricity prices towards the lower limit of plausible expectations, the results are more than 100% higher than in the ENTSO-E low scenario.

In both cases, the models used are complex, and CRE cannot replicate the results.

### 1.1.4 The EU27-level analysis is slightly more favourable than the overall analysis and the UK-level analysis

While projects are traditionally studied on the European level, the Brexit changes this criterion. When analysed at the EU27 perimeter (incorporating 50% of the costs and benefits in EU countries only), the results are not fundamentally different.

The benefits are located in France and the United Kingdom. The other EU countries, in particular Belgium and Italy, are negatively impacted by the construction of a new interconnector with the UK.

[9] The gross SEW benefit of the GridLink scenarios was estimated by CRE on the basis of the documents provided and without taking into account the costs of additional thermal power plants that could be avoided by the interconnector.

| | |
|---|---|
| Question 1 | Do you consider the use the TYNDP 2020 *National Trends* scenario as a baseline, and the *Global Ambition* and *Current Trends* scenarios as upward and downward sensitivities, to be relevant in assessing the economic value of a new interconnector at the France-UK border? |

## 1.2 Additional benefits: the methodologies proposed in the TYNDP 2020 are not in line with the estimation of socio-economic welfare

### 1.2.1 Security of supply benefits

In the TYNDP 2020, ENTSO-E calculates an indicator representing the contribution of an interconnector to security of supply only for the *National Trends* scenario. The value associated with a 1.4 GW interconnection between France and the UK is estimated at 37 M€/year.

The methodology developed by ENTSO-E to estimate the contribution of interconnectors to national security of supply consists mainly of changing the generation capacities in the different countries to comply with the national security of supply (SoS) criteria. In most cases, peak power plants are removed from the initial assumptions because the capacity margins are oversized. As a result, SEW and security of supply benefits are estimated using different assumptions, which leads to consistency problems for SoS estimates. This methodological bias is highlighted both by ACER in its opinion on the methodology followed by ENTSO-E[10], and by CRE and CRU in the appraisal of the Celtic project[11].

To evaluate the SoS benefit in a way that is consistent with the SEW estimates, CRE asked RTE to recalculate this benefit without changing the generation capacities. The value associated with a 1.4 GW interconnector between France and the United Kingdom is then estimated at 26 M€/year. However, this figure is probably overestimated as the simulations do not include the Celtic project and the interconnector projects between France and Germany.

Furthermore, ACER notes in its opinion on the TYNDP 2020 that some parameters of the calculation that could have a significant impact on the results are not specified. In particular, the modelling of outage of generation facilities is one of the main factors affecting security of supply and ENTSO-E only indicates that 15 outage scenarios have been considered without giving further details.

Finally, it should be noted that GridLink considers in its investment request that the indicator representing the contribution of an interconnector to security of supply is subjective and does not include it in the analysis of the benefits of the project.

### 1.2.2 Benefits in terms of avoided greenhouse gas emissions

As stated in section 1.1, the SEW value for an interconnection project includes the value of $CO_2$ allowance savings since the generation cost of power plants includes the purchase of $CO_2$ allowances on the European carbon market (EU-ETS).

Nevertheless, ENTSO-E calculates in the TYNDP 2020 an additional benefit of $CO_2$ emission reduction by considering that the EU-ETS market price is underestimated. To calculate the additional benefit of $CO_2$ reduction, ENTSO-E uses a two-step calculation:

1. Calculation of avoided emissions based on the $CO_2$ market price (28 €/tonne in *National Trends* 2030). In this configuration, the European generation capacity includes coal- and gas-fired power plants. The new interconnector is supposed to reduce emissions from these plants.
2. Valuation of these avoided emissions at a price higher than the market price (between 60 €/tonne and 189 €/tonne). In this configuration, the European generation capacity would rely on less carbon-intensive plants, and avoided emissions would be lower.

[10] https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2003-2020%20on%20ENTSO-E%20Guideline%20for%20cost%20benefit%20analysis.pdf
[11] CRE: Public consultation n° 2018-015 of 20 December 2018 on the investment request relating to the CELTIC Project, including a cross-border cost allocation
CRU : CRU Assessment of the Celtic Investment Request

This approach has important methodological biases because:

- It does not take into consideration how the European carbon market works: if the 2030 $CO_2$ market price is as high as foreseen in the scenario, the EU-ETS system will allow other carbon emitters to buy at market price $CO_2$ allowances saved thanks to the new interconnector. **The value of $CO_2$ savings is the $CO_2$ price on the European market.**
- It values at a high price emissions that would not exist in a context of high $CO_2$ price[12]: if the $CO_2$ price was higher than expected in the scenarios, then the use of carbon-intensive power plants would be much more limited in the counterfactual scenario without interconnector, thus reducing the emissions avoided thanks to the interconnector.

In order to take into account an ambitious $CO_2$ market price in a more relevant way, CRE asked RTE to perform sensitivity analyses on the $CO_2$ price in the calculation of the SEW. As illustrated in Figure 2, the benefits obtained are lower than those obtained by the ENTSO-E methodology and presented in the TYNDP 2020, although the differences are limited[13].

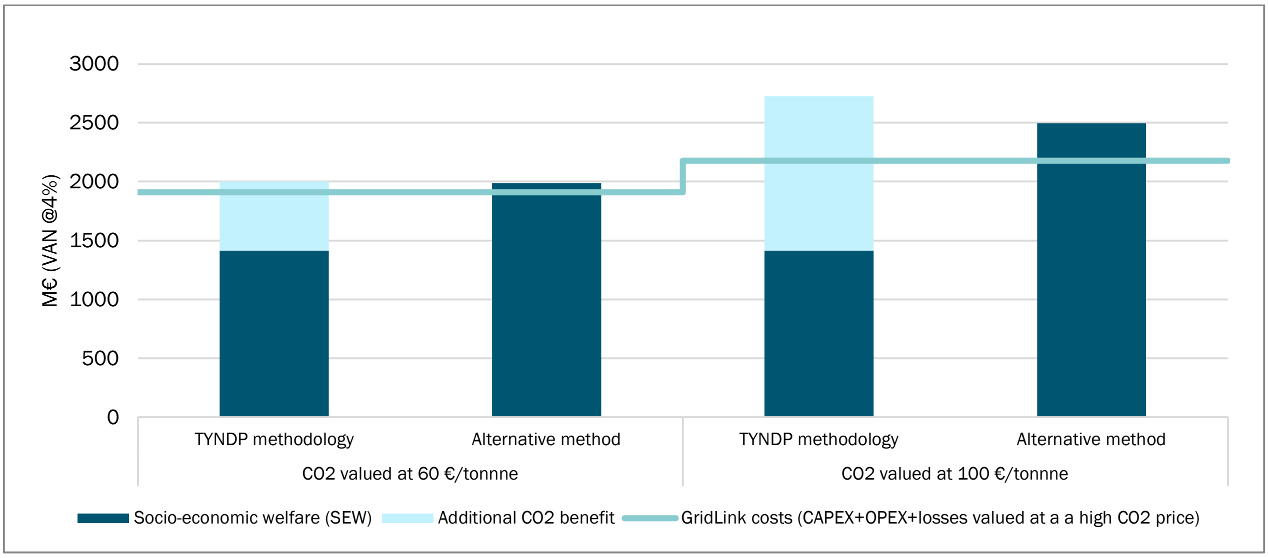


**Figure 2 - Sensitivity of the SEW of a 1.4 GW interconnection between France and the UK to the price of $CO_2$ in the *National Trends* scenario (TYNDP 2020)**

However, these sensitivity analyses are performed by only changing the $CO_2$ price while keeping the *National Trends* assumptions for generation capacities and fuel prices. Fuel costs and generation capacities could be significantly different in a high $CO_2$ price environment. For example, it is very likely that some thermal power plants would no longer be profitable with high $CO_2$ prices and would be closed and replaced by other sources of generation, or by demand side response. CRE considers that the current estimates are globally overestimated and that the sensitivity of the results to the $CO_2$ price should be studied in an adapted scenario.

| | |
|---|---|
| Question 2 | Do you share CRE's analysis on the limits of the methodology proposed in the TYNDP 2020 to assess the benefit of an interconnector in terms of security of supply and the value of projects in terms of avoided greenhouse gas emissions? |

[12] CRE analysis of this methodology has been detailed in the SDDR analysis: Deliberation of the Energy Regulatory Commission, 23 July 2020, SDDR 2019 analysis (FR)
[13] The cost of losses changes with $CO_2$ price.

### 1.3 Brexit remains a major source of uncertainty, particularly because of the decoupling of electricity markets

CRE conducted in 2017[14] a study to estimate the potential consequences of Brexit on new interconnection project between France and the United Kingdom.

Different Brexit scenarios were modelled. The study showed that Brexit could have a significant impact on the benefits of interconnection projects. For example, in the best-case scenario, where the United Kingdom remained in the internal energy market, but where Brexit had an impact on electricity demand and the development of renewable energy capacities, the value of a new interconnector could fall by up to 10%. In the case of decoupled electricity markets, the value of a new interconnector could fall by more than 30%.

Following the exit of United Kingdom from the EU that led to the decoupling of the daily electricity markets, electricity exchanges at the UK-France interconnection have become less efficient: the interconnection is no longer always used at 100% of its capacity in the economic direction and can even be used in the wrong direction. This reduces the benefits allowed by a new interconnector. Under the trade and cooperation agreement, the UK and the EU have committed to implement a *Loose Volume Coupling* methodology. However, there are uncertainties around the implementation of such a methodology: the only experience dates from September 2008 between Germany and Denmark. Yet this coupling had to be stopped after ten days because of repeated inefficiencies[15]. In this context, ENTSO-E has for now issued a reserved opinion[16] on this methodology, and highlighted the conditions needed for an efficient implementation.

In addition, strong uncertainties remain on the macro-economic impacts of Brexit, on the commercial relations between UE and the UK, or on the evolution of energy and environmental policies in the UK.

Thus, in spite of the trade and cooperation agreement, the Brexit is a source of uncertainty on the benefits of a new interconnector, which must be taken into account.

### 1.4 The availability of the interconnector may not be assured under all circumstances

The methodology developed by ENTSO-E in the TYNDP 2020[17] does not consider the availability rate of the interconnection projects, even though the projects may be shut down for maintenance or outage. When analysing previous interconnection projects, CRE used availability rates ranging from 92% to 95%, and had studied sensitivities with lower availability rates.

Beyond the availability of the interconnector itself, the GridLink project plans to connect to the Warande substation on the French side. This substation is located near the Mandarins substation in northern France, the connection point for the IFA2000 (2 GW) and ElecLink (1 GW) interconnectors. This network area is particularly loaded with the proximity of the Gravelines nuclear plant and the Belgian border.

In this context, the transmission system operators in the Channel area have been working on a methodology for calculating joint interconnection capacities in application of the network codes. Indeed, without even considering the GridLink connection, RTE might not be able to guarantee the full capacity of the interconnectors (including ElecLink) on the France-UK border in case of maintenance on network assets. The connection of the GridLink project could reinforce these constraints and therefore the unavailability of interconnectors on the border. Besides, the commercial relationship between the EU and the United Kingdom could impact the rules for capacity allocation.

These impacts should be considered in the cost-benefit analysis, which reinforces the uncertainty around the benefits of a new interconnector.

**Question 3** Do you share CRE's analysis of the benefits of an interconnection project between France and the United Kingdom? Do you have any additional remarks?

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[14] Deliberation of the Energy Regulatory Commission of 16 November 2017 establishing guidelines for new interconnector projects with the United Kingdom and deciding to transfer the exemption request submitted by AQUIND Ltd. to ACER
[15] Analysis by HoumollerConsulting of the Loose Volume Coupling methodology
[16] ENTSO-E cost-benefit analysis of the Loose Volume Coupling methodology
[17] Third ENTSO-E Guideline for cost-benefit analysis of grid development project

# 2. PRESENTATION OF THE INVESTMENT REQUEST, COSTS AND IMPACTS OF THE GRIDLINK PROJECT ON THE EUROPEAN NETWORK

## 2.1 GridLink's investment request

### 2.1.1 General presentation

GridLink is a direct current 1400 MW interconnection project between France and the United Kingdom (2 x 700 MW wires, 525 kV). It seeks to connect Kingsnorth in the United Kingdom to Warande in France, on a total distance of 160 km (108 km in the UK and 52 km in France, 146 km underwater in total). Its planned commissioning date is December 2024, it would then increase the already existing interconnection capacity of 4 GW at this border (including ElecLink).

GridLink, the company behind the interconnection project, is wholly owned by iCON Infrastructure Partners III LP, an infrastructure fund exclusively managed and advised by iCON Infrastructure LLP ("iCON"). iCON's investors include pension funds, asset managers and insurance companies from the UK, Europe, the US, Canada, the Middle East, and Asia. iCON invests in infrastructure projects, including telecommunications, transports and energy. In particular, in the energy sector, iCON invests in wind farms in the United States and Europe, and in cogeneration plants in the United Kingdom.

GridLink is seeking to build and operate an interconnector under the regulated regime, as provided for in Article 12 of the TEN-E Regulation. Compared to an exempted regime, the risk of non-profitability of the project is placed more on the grid users than on the project developer under this regime. Conversely, in case of significant profits, network users would benefit from lower tariffs.

In France, RTE is the only actor, at this stage, building and operating interconnectors under a regulated regime. In case of a favourable decision of the CRE regarding GridLink's request, the CRE will have to set up an adequate regulatory framework allowing to efficiently allocate the risks between the project developer and the grid users. GridLink requests for the French share of the project costs and revenues to be treated in the same way as the 'Cap and Floor' regime proposed in the UK, or in a similar way to the RTE regime on its interconnection projects. GridLink's investment request is published as an appendix to this public consultation.

### 2.1.2 Project progress and timeline

The GridLink project is at an advanced stage of development. GridLink is engaged in grid connection procedures with RTE and National Grid, has completed the acquisition of land in France and the UK, and has conducted various geophysical and geotechnical studies. In addition, GridLink has received bids for converter station contracts, and for offshore cable contracts.

GridLink was included in the fourth European Union list of PCIs and submitted and investment request to CRE on 17 March 2021.

This project was approved in 2018 by Ofgem and was granted a 'Cap and floor' regime covering 50% of the project costs. This scheme provides the project with minimum and maximum revenues, allowing it to secure funding. The parameters of this mechanism will be set in the Final Investment Decision (FID) around November 2021. Should CRE approve the project on the basis of a cost-sharing scheme different from 50%/50%, Ofgem would have to reconsider its decision.

The construction of the project would take approximately 36 months, and the projected schedule is as follows:

- November 2021: approval of the regulatory framework by the regulators (CRE and Ofgem);
- December 2021: FID, start of works;
- June 2024: commissioning;
- December 2024: commercial operation.

## 2.2 Project costs and impacts on national networks

### 2.2.1 GridLink's costs

Elements provided by GridLink

Capital expenditures (CAPEX) provided by GridLink in its March 2021 investment request amount to 915 M€. Following first bids on converter stations and offshore cables, GridLink submitted on 27 May 2021 to CRE a new estimate of these costs, estimated at 870 M€. The territorial allocation of the costs is almost balanced (53% in the UK, 47% in France).

Operation and maintenance costs (OPEX) are estimated at 26 M€/year in the investment request, for a total value of 416 M€ (discounting over 25 years). The estimate of these costs changed very slightly after the first bids (0.3% decrease).

CRE preliminary analysis

CRE notes that the costs communicated by GridLink are high compared to the costs of other interconnection projects between France and the UK:

| | GridLink | FAB Link | Aquind |
|---|---|---|---|
| CAPEX (M€) | 870 | 870 | 1400 |
| OPEX (M€ NPV @4%) | 416 | 123 | 227 |
| Project cost (M€) | 1286 | 993 | 1627 |
| Capacity (MW) | 1400 | 1400 | 2000 |
| Length (km) | 160 | 220 | 240 |
| Project cost (k€/MW) | 919 | 709 | 814 |
| Project cost (k€/km/MW) | 5.7 | 3.2 | 3.4 |

Table 1 – Costs of different France-UK interconnection projects (source: CRE calculations based on GridLink and TYNDP 2020 data)

When compared to the interconnector capacity, GridLink's costs are relatively higher than those of the competing projects. GridLink has the shortest length of the three projects, so its costs per kilometre are higher than those of the other projects. However, GridLink's costs are the result of actual bids and thus reflect real market conditions. They also include a 5% risk margin, allowing for more secure costs. In contrast, in the datasets provided to ENTSO-E for TYNDP 2020, FAB Link and Aquind do not include a risk margin in their cost estimates.

Question 4 Do you have any comments on the CAPEX and OPEX presented by GridLink?

### 2.2.2 The impact of an interconnection project on network costs includes the cost of electricity losses, but also other costs not assessed in the TYNDP

Beyond the costs of the GridLink project itself, a new interconnector changes the flows on the national transmission grids. By increasing withdrawals and injections at the ends of the networks, interconnectors tend to increase power losses and congestion. In some cases, interconnectors may recover grid reinforcements or an increase in reserves.

Variation of power losses on the networks

The impact of interconnectors on grid losses is modelled in the TYNDP. This impact depends on the interconnection points on both sides of the border and therefore differs for all projects. ENTSO-E has improved the methodology for calculating network losses, taking into account the various ACER opinions on the previous methodology. This new methodology is compatible with the SEW estimate and can therefore be used as a reference for project evaluation.

| M€/year | GridLink | FAB Link | Aquind |
|---|---|---|---|
| National Trends 2025 | 18 | 16 | 13 |
| National Trends 2030 | 31 | 20 | 31 |

Table 2 - Impact of interconnection projects on grid losses (source: TYNDP 2020)

CRE notes that the losses generated by the GridLink project are greater than those of FAB Link or Aquind. Indeed, GridLink plans to connect in France in a highly loaded network area, having an impact on flows with Belgium and Germany. When discounted over 25 years, in accordance with the TYNDP 2020 CBA methodology, this cost represents approximately 440 M€ for Gridlink, 430 M€ for Aquind and 290 M€ for FAB Link.

Variation of network congestions

A new interconnector can increase or decrease congestions on national networks, depending on network configurations. CRE asked RTE to update the calculations of the impact of the Aquind, FAB Link and GridLink projects on the French network.

The RTE study is focuses on the PPE 2035 scenario of the 2019 version of RTE's ten-year network development plan (*Schéma Décennal de Développement du Réseau,* SDDR), based on the latest French energy and climate ambitions (PPE). This reference scenario foresees flows oriented slightly more in the France towards UK direction. A sensitivity analysis was carried out by analysing a situation with flows slightly oriented from the UK to France, in order to simulate a strong development of renewable capacities in the UK leading to a reversal of exchanges.

The results indicate an additional cost for GridLink and Aquind, which is explained by the fact that these projects plan to connect to less favourable network areas, impacting on areas of fragility of the internal RTE network already identified in the SDDR analyses. When discounted over 25 years, in accordance with the TYNDP 2020 methodology, this cost represents approximately 80 M€ for GridLink and 120 M€ for Aquind.

Impact on reserve requirements

The commissioning of an additional interconnector between France and the UK could increase the level of reserves needed in France to ensure secure operation of the transmission network. Interconnection levels with other countries are indeed a parameter for sizing reserves in France, especially the secondary reserve – and more indirectly the primary reserve. This impact can be mitigated by imposing constraints on the rate of variation of flows, but would require an agreement between GridLink and RTE.

Question 5 Do you have any comments on the impact of GridLink on European (electricity losses) and French (congestion, reserves) network costs?

## 3. CRE'S PRELIMINARY ORIENTATIONS

### 3.1 In the most likely scenarios, the benefits of a new interconnector are lower than GridLink's costs, or not significantly higher

As indicated in part 1, CRE has mainly used the *National Trends* scenario of the TYNDP 2020 to assess the economic benefit of an additional interconnection project. CRE has considered different sensitivities on the accounting of additional contribution to security of supply, on the price of $CO_2$ or on the impact of decoupling.

To estimate the costs of GridLink, CRE relied on the latest CAPEX and OPEX values announced by the project promoter, on the estimate of the variation in network losses presented in the TYNDP 2020 and on the estimate of the variation in congestion calculated by RTE in a note published in appendix to the present consultation.

In the central scenario, the benefits are lower than the costs of the GridLink project. This is reinforced when considering decoupling of the UK from the domestic market, reduced availability or a delay in meeting national targets in terms of generation capacity. Conversely, the benefits could exceed the costs in scenarios of very high $CO_2$ prices, or if the 2030 national targets in terms of generation capacity are exceeded.

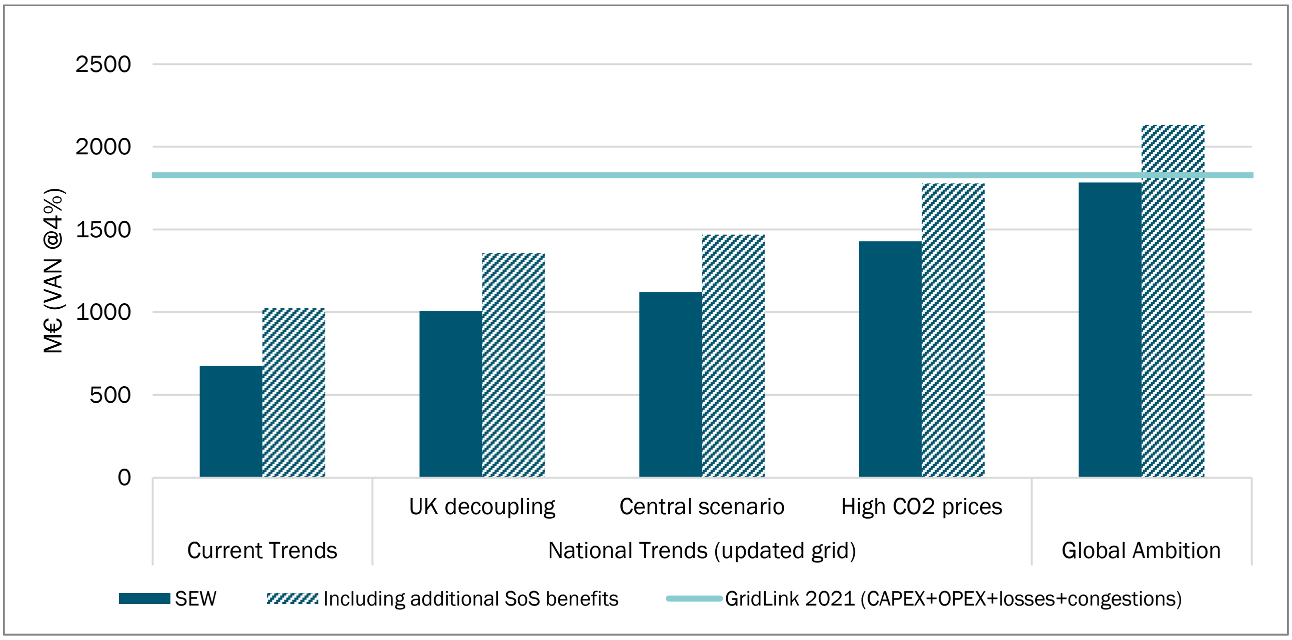


**Figure 3 – SEW and cost of a 1.4 GW project between France and the UK (source: CRE analysis based on TYNDP 2020 data. Updated grid: TYNDP 2020 reference network with the addition of the Celtic project and projects on the French-German border, as opposed to the network used in Figure 2)**

Question 6 Do you have any comments on the comparison between the benefits assessed by CRE and the costs of the GridLink project?

## 3.2 The economic and political context is very uncertain, which has a direct impact on the interest of all interconnexion projects with the United-Kingdom

### 3.2.1 There are significant economic uncertainties in the cost-benefit analysis

In addition to the fact that the projected benefits vary greatly between the scenarios analysed, CRE notes that the results tend to vary greatly between the different versions of the TYNDP. For example, in TYNDP 2018 and in the CRE 2019 analysis, the benefits were lower than the costs of the projects in all the scenarios studied. These variations can be explained by the inclusion of more up-to-date energy targets, however they highlight a possible readjustment of the forecast benefits every two years.

Regarding TYNDP 2020, the benefits vary by a factor of two between the Current Trends scenario, which depicts a delay in achieving national energy targets, and the Global Ambition scenario, which depicts a faster achievement of these same targets. Uncertainty also exists in the National Trends scenario as the results vary significantly depending on the sensitivity analyses discussed above.

### 3.2.2 Political uncertainties between the UK and the EU lead to a prioritisation of projects with other EU countries, some of them being much more profitable

Interconnectors are an essential element of the European internal energy market. Due to its geographical position, France plays a central role in the construction of this market. Several projects are under construction (Savoie-Piedmont with Italy, ElecLink with the United Kingdom, Avelin-Avelgem with Belgium) or have received favourable decisions from CRE (Bay of Biscay with Spain, Celtic with Ireland). These projects represent significant investment expenditure for the coming years, partly borne by French network users.

Several interconnection projects are currently being studied, on the border with the United Kingdom, but also with Germany, Belgium, Spain and Switzerland. In the context of the approval of the SDDR 2019[18], CRE considered that the construction of projects should be sequenced to give priority to the most mature and profitable projects, while waiting to remove the uncertainties relating to less mature projects before committing expenditure. This maturity is assessed according to three criteria: technical and industrial feasibility, socio-economic profitability and political and local context.

In addition to their important costs and uncertain profitability, interconnection projects with the UK are taking place in a particular political context. Following Brexit, many issues remain to be clarified regarding the relationship between EU and the UK, on the functioning of interconnectors and the consistency of UK market rules with those of the internal electricity market on the one hand, and on the coordination of energy and climate policies on the other hand.

In this context, CRE considers that it is appropriate to prioritise the commissioning of interconnectors currently under construction, as well as the most profitable and mature projects, especially with Germany and Belgium. Starting less mature projects, especially under a regulated regime, would entail major risks for network users, regarding both additional costs and delays in a busy industrial context in Europe, and the sustainability of the tariff in a context of already sharply rising investments in the transmission grid.

| | |
|---|---|
| Question 7 | Do you share CRE's analysis that the resolution of economic and political uncertainties is required before engaging a new interconnection project between France and the UK? |

### 3.3 In this context, CRE has reservations on GridLink's investment request

Given that i) the benefits in the scenario most consistent with public policies are insufficient to cover the likely costs of a new interconnector between France and the UK and that ii) there are economic and political uncertainties associated with a new interconnection project with the UK, CRE has at this point reservations on GridLink's investment request.

In any case, in view of the uncertainties mentioned above, if the GridLink project was to be approved following this consultation, the regulatory framework would have to be adapted to limit the risk for network users.

| | |
|---|---|
| Question 8 | Do you share CRE's reservations on GridLink's investment request? |

[18] Deliberation of the Energy Regulatory Commission, 23 July 2020, SDDR 2019 analysis (FR)

# APPENDIX 1: QUESTIONS OVERVIEW

| | |
|---|---|
| Question 1 | Do you consider relevant to use the TYNDP 2020 *National Trends* scenario as a baseline, and the *Global Ambition* and *Current Trends* scenarios as upward and downward sensitivities in assessing the economic value of a new interconnector at the France-UK border? |
| Question 2 | Do you share CRE's analysis on the limits of the methodology proposed in the TYNDP 2020 for assessing the benefit of an interconnector in terms of security of supply and for assessing the value of projects in terms of reducing greenhouse gas emissions? |
| Question 3 | Do you share CRE's analysis of the benefits of an interconnection project between France and the United Kingdom? Do you have any additional remarks? |
| Question 4 | Do you have any comments on the CAPEX and OPEX presented by GridLink? |
| Question 5 | Do you have any comments on the impact of GridLink on European (electricity losses) and French (congestion, reserves) network costs? |
| Question 6 | Do you have any comments on the comparison between the benefits assessed by CRE and the costs of the GridLink project? |
| Question 7 | Do you share CRE's analysis that it is appropriate to wait until the economic and political uncertainties are resolved before starting a new interconnection project between France and the UK? |
| Question 8 | Do you share CRE's reservations on GridLink's investment request? |

# APPENDIX 2: REVIEW OF GRIDLINK AND TYNDP 2020 ASSUMPTIONS

As stated in ACER's opinion on TYNDP 2020, *Current Trends* scenario assumptions are not always publicly available. The *Current Trends* assumptions are therefore not always presented in the graphs below, especially for 2040.

*Review of commodities assumptions*

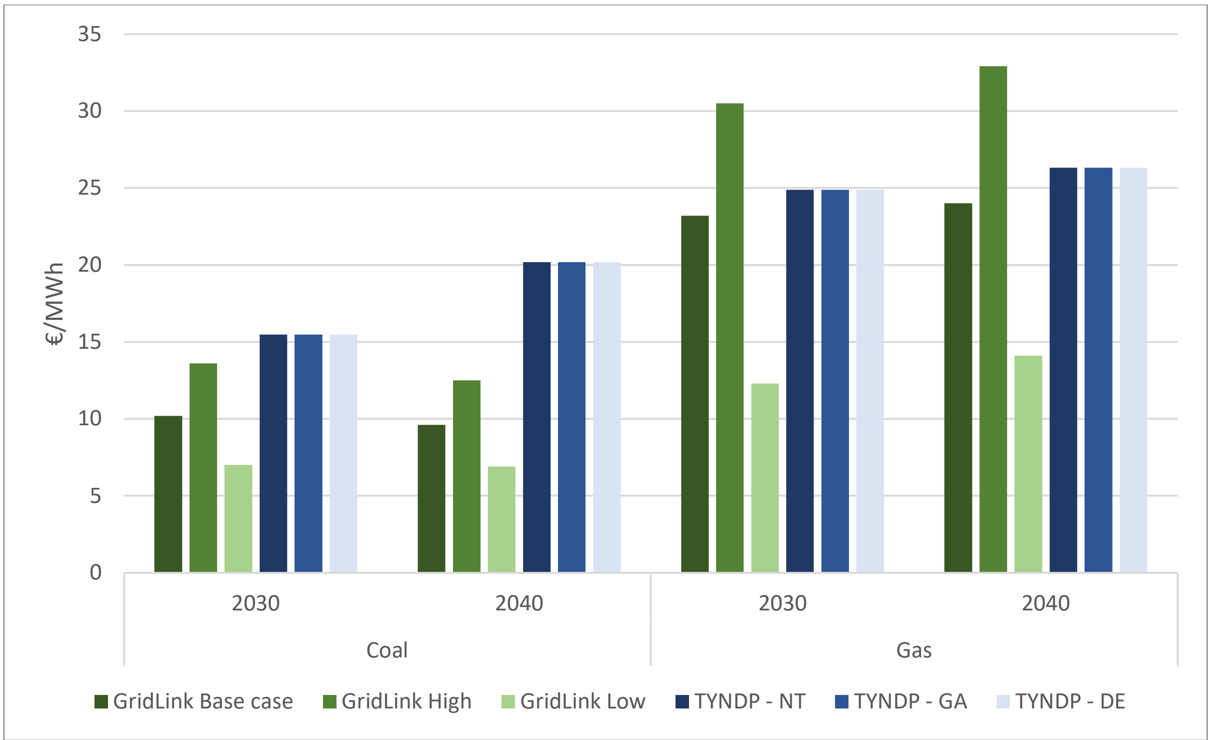


Figure 4 – Commodity prices: GridLink's analysis vs TYNDP 2020

GridLink's commodity price assumptions cover a relatively broad price range, while all TYNDP 2020 scenarios are based on the same assumptions. Regarding coal price, GridLink's assumptions are significantly lower than those of TYNDP 2020. Regarding gas price, the assumptions of the central scenario of GridLink are close to those of TYNDP 2020.

*Review of $CO_2$ prices assumptions*

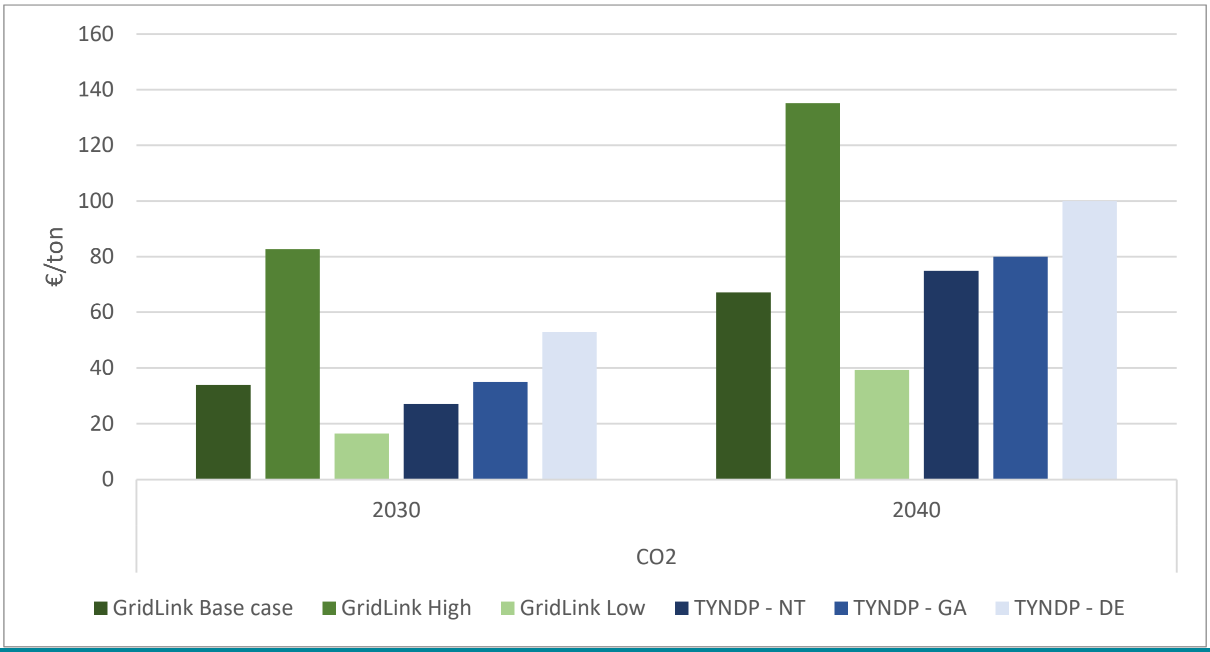


Figure 5 - $CO_2$ price: GridLink's analysis vs TYNDP 2020

The assumptions made by GridLink for the price of CO2 also cover a very wide price range. The values chosen by GridLink and the TYNDP 2020 do not take into account the values reached by the EU-ETS in June 2021 (around € 50/tonne).

*Review of electricity generation assumptions*

The power generation parks of the different scenarios are built considering the objectives of the United Kingdom and Europe in terms of climate change. However, assumptions made by TYNDP 2020 and the GridLink consultants are not identical : GridLink consultants make assumptions about achieving goals and concertations about TYNDP 2020 scenarios allowed some changes.

As a consequence, some assumptions differ between the baseline TYNDP 2020 and GridLink scenarios:

- GridLink foresees an increase in the gas capacity in France, reaching in 2040 a total capacity of between 27 and 31 GW, against 7 GW in 2021. This increase is against the French policy to stop building gas-fired units after 2021 ;
- In its base case scenario, GridLink forecasts a 2030 French photovoltaic capacity 30% lower than the TYNDP assumption. In 2040, GridLink forecasts a French installed photovoltaic capacity 40% higher than the National Trends assumption (80 GW against 58 GW);
- The GridLink base case scenario and National Trends foresee similar installed wind power capacities (maritime and onshore) in 2030. However, GridLink foresees in 2040 a French onshore wind capacity 25% lower than National Trends (45 GW against 60 GW). This difference is partially offset by an assumption of offshore wind capacity of 15 GW in the GridLink base case scenario against 8 GW in National Trends ;
- The gas capacity assumptions of the GridLink base case scenario for the United Kingdom in 2030 and 2040 are between 25% and 30% lower than the *National* Trends assumptions ;
- Regarding photovoltaic capacities in the United Kingdom: the 2030 assumptions are close, while the 2040 GridLink assumption is 40% lower than the *National Trends* assumption. The *Distributed Energy* assumptions are excessively high (more than twice as high as those of *National Trends*) ;
- Regarding onshore wind capacity in the United Kingdom: the assumptions of the 2 reference scenarios are close in 2030, but GridLink foresees a value 60% higher than that of *National Trends* in 2040.

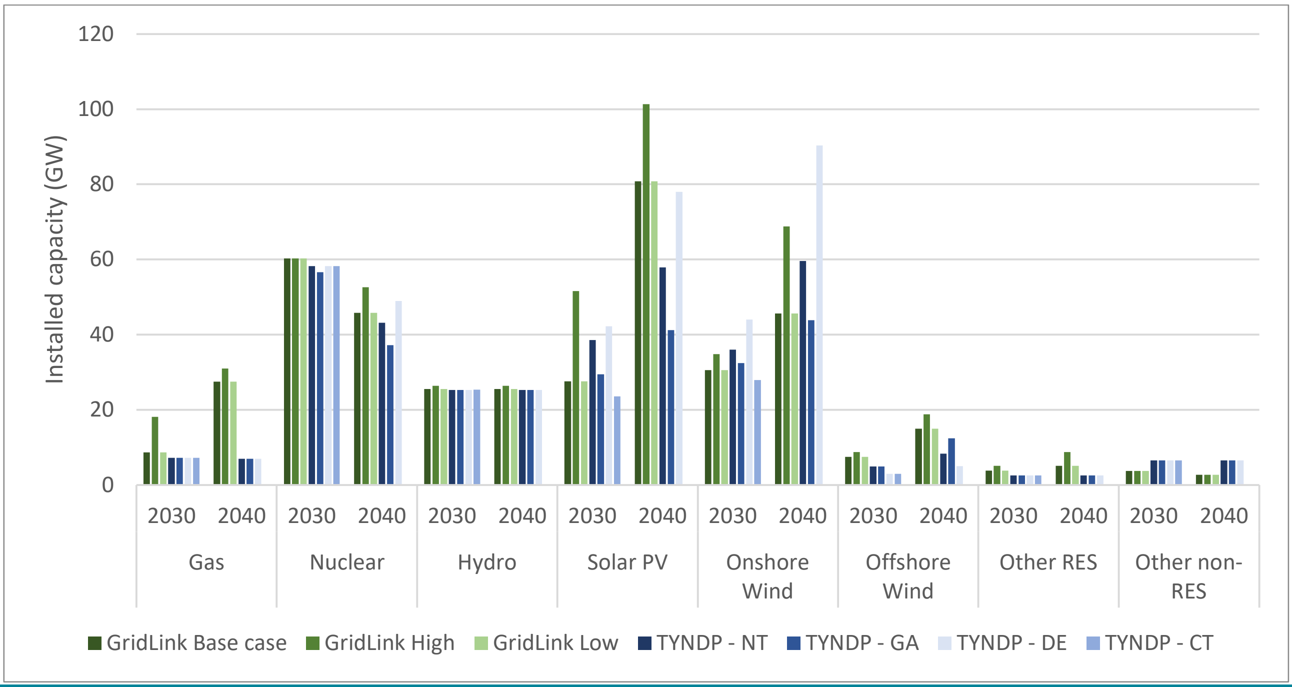


**Figure 6 – Capacity mix in France: GridLink's analysis vs TYNDP 2020**

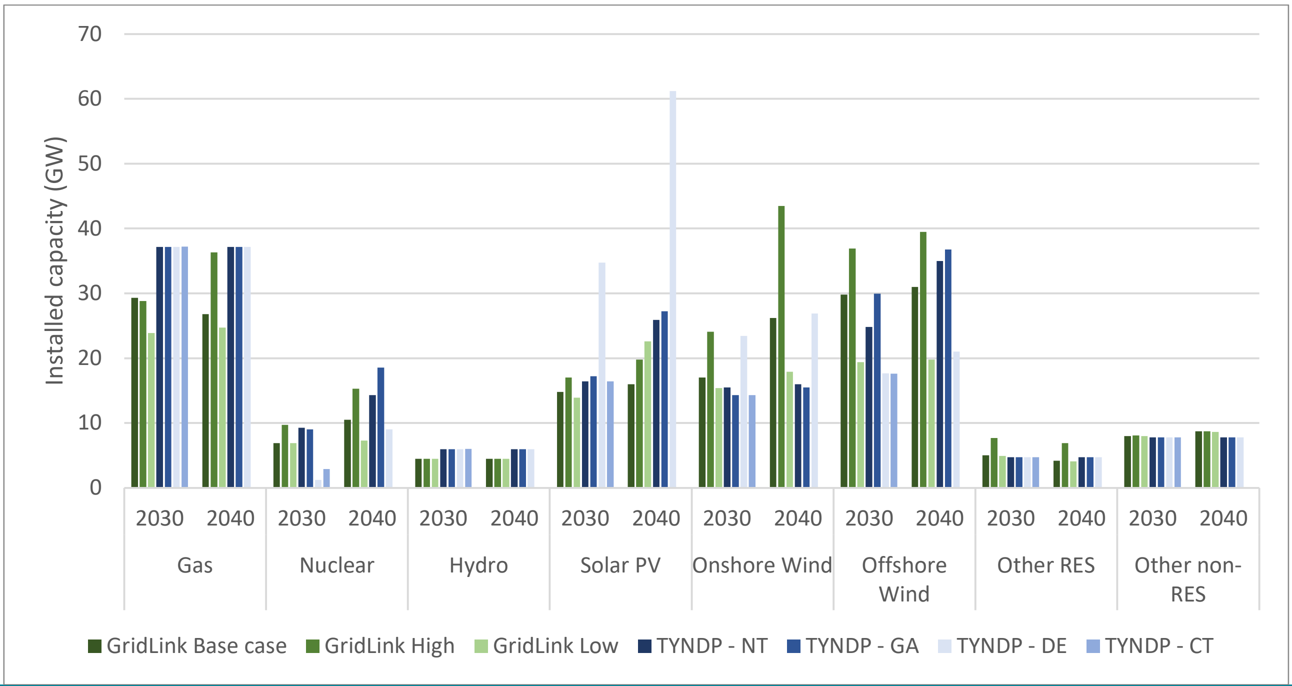


**Figure 7 - Capacity mix in the United Kingdom: GridLink's analysis vs TYNDP 2020**

*Review of electricity interconnection assumptions*

The comparison of the interconnection assumptions highlights notable differences, mainly between the base case scenario of GridLink and *National Trends*:

- GridLink foresees a total interconnection capacity of Great Britain appreciably lower than National Trends (11.6 GW against 12.6 GW in 2030, 14.4 GW against 23, 2 GW in 2040). This difference is mainly explained by the assumptions made for interconnections with Germany, France, the Netherlands, Norway, and Belgium.

- France's total interconnection capacity is close in the 2 studies (21.3 GW for National Trends and 24 GW for GridLink in 2030, 35.7 GW for National Trends and 37.6 GW for GridLink in 2040). However, there are many differences when comparing country by country. For example, the TYNDP does not consider the Celtic interconnection with Ireland.

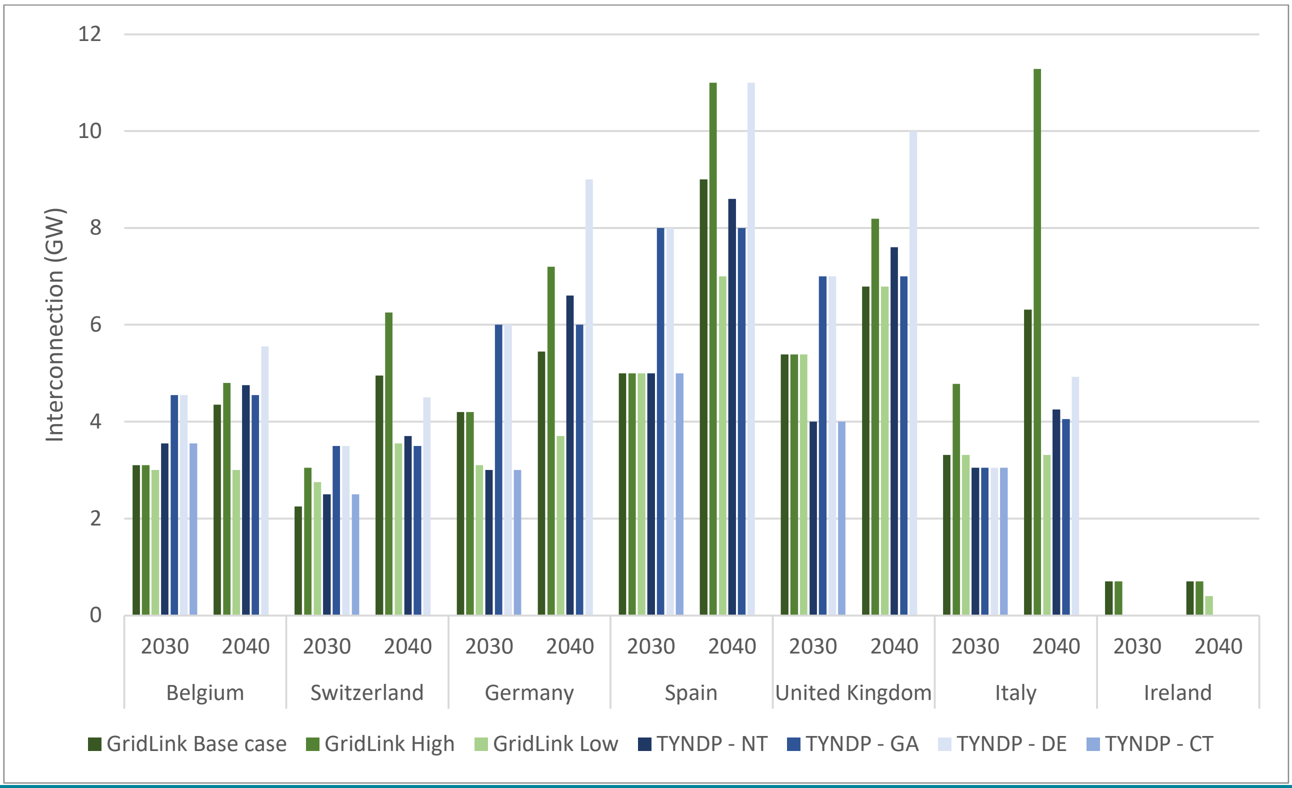


**Figure 8 – FR interconnection capacity: GridLink's analysis vs TYNDP 2020**

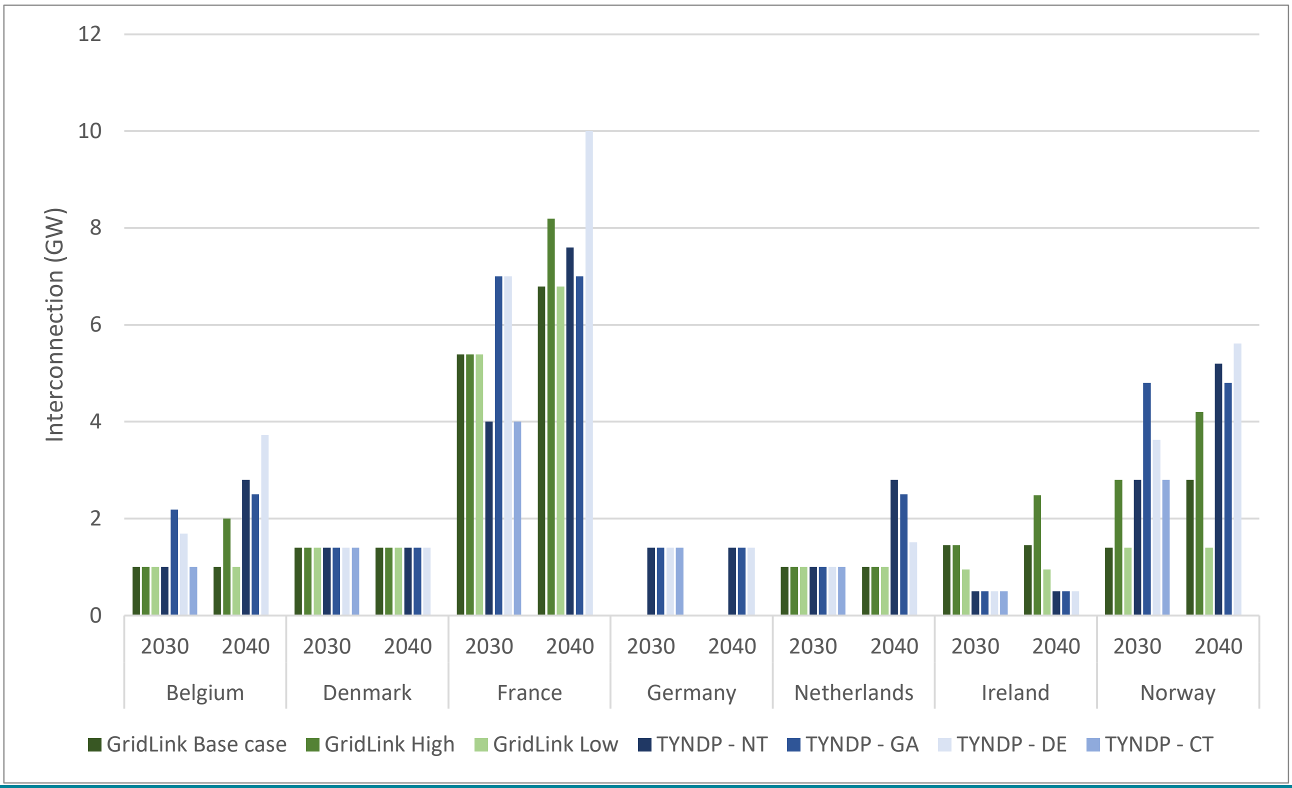


**Figure 9 - UK interconnection capacity: GridLink's analysis vs TYNDP 2020**

*Review of electricity demand assumptions*

GridLink's base case scenario electricity demand forecasts are generally higher than those of *National Trends*: +5% and +18% respectively in 2030 and 2040 for France; +11% and +23% for the United Kingdom. GridLink's base case UK electricity demand forecasts are close to those of the TYNDP 2020 *Global Ambition* and *Distributed Energy* scenarios.

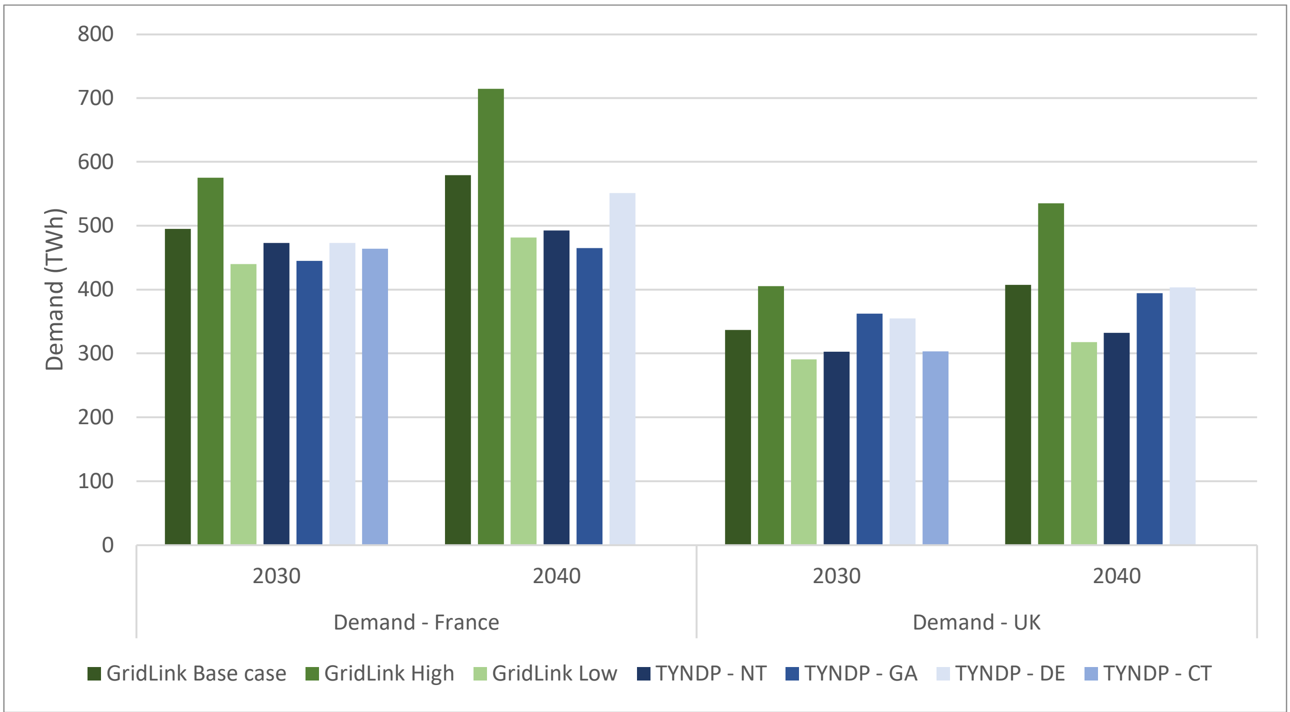


**Figure 10 – Electricity demand : GridLink vs TYNDP 2020**