

Impact Assessment

Impact Assessment of AQUIND’s Exemption Request

Division:	Networks	Type of measure:	Wholesale Competition
Team:	Interconnectors	Type of IA:	Qualified under Section 5A UA 2000
Associated documents:	A Joint Consultation on AQUIND Exemption Request	Contact for enquiries:	riccardo.rosselli@ofgem.gov.uk
Coverage:	Partial coverage		

Overview

This document sets out the impacts Ofgem is required to consider in the assessment of the AQUIND Limited (AQUIND) partial exemption application. The information set out in this document should be taken into consideration in addition to the information and questions set out in the Joint Consultation published by Ofgem and CRE.

We are seeking views on the analysis and evidence provided by AQUIND describing the impacts of the project and on whether there is any additional evidence or factors that we should consider to inform our decision.

Summary: Intervention and Options

What is the problem under consideration? Why is Ofgem intervention necessary?

Article 63 of the Regulation (EU) 2019/943 (the Regulation) permits National Regulatory Authorities (NRAs) to exempt new investments in cross border electricity interconnectors from certain provisions of the Regulation.

AQUIND has applied for a partial exemption for a proposed 2GW interconnector between Great Britain (GB) and France (AQUIND Interconnector), which will enable AQUIND to operate the interconnector in France. We,¹ as the concerned NRA in GB, and the Commission de Régulation de l'Energie (CRE), as the concerned NRA in France, are jointly required to make a decision on AQUIND's exemption request.

We believe this decision to be 'important'² as defined under Section 5A of the Utilities Act 2000 (the Utilities Act), placing a duty on the Authority to carry out an Impact Assessment (IA) for any such proposals for the purposes of, or in connection with, the exercise of its powers under Part 1 of the Electricity Act 1989 (the Act).

However, it is important to note that, even if the NRAs agree to grant an exemption, AQUIND would still need to secure regulatory approval in GB before the project can be built and its expected impacts can materialise. Ofgem will have the opportunity to fully assess these impacts when AQUIND seeks regulatory approval in GB.

Consequently, whilst we recognise the need for this IA under the Utilities Act, we do not think it is proportionate to conduct a full independent assessment of the impacts of the AQUIND Interconnector in GB at this stage.

¹ The terms "the Authority", "Ofgem" and "we" are used interchangeably. The Authority is the Gas and Electricity Markets Authority. Ofgem is the Office of the Gas and Electricity Markets Authority.

² We note that 'important' is defined by reference to a proposal that would involve a major change in our activities or significantly impact industry participants, the general public or the environment.

What are the policy objectives and intended effects, including the effect on Ofgem's Strategic Outcomes

This is not a new policy. The relevant legislation is already in place and the Regulation requires NRAs to take decisions on any exemption requests.

Importantly, the exemption, if granted, will determine the regulatory arrangements of the project in France only. Although this would represent an important milestone in the development of the project, AQUIND would still have to secure a regulatory solution in GB before being built.

In terms of strategic outcomes, interconnectors link GB to nearby markets, allowing consumers to benefit when electricity is cheaper in these markets. Interconnectors also support consumers' interest in decarbonising at lowest cost by facilitating the integration of renewable generation.

The final joint decision with CRE, following a joint consultation and assessment of the request, will indicate our preference out of the following decision-making options:

- 1) In agreement with CRE, not to approve AQUIND's exemption request.
- 2) In agreement with CRE, to approve AQUIND's exemption request. In this case, AQUIND would secure regulatory approval in France only. AQUIND will still need to secure a regulatory solution in GB before the project can be built.³
- 3) If the NRAs do not reach an agreement on the exemption request within the time period provided for in the Regulation, the final decision will be referred to the European Agency for the Cooperation of Energy Regulators (ACER).

³ We note that the NRAs could also approve a partial exemption applying also conditions and/or modifications regarding the scope and duration of the exemption requested by AQUIND. However, at this stage of the consultation process it is not possible to determine if any conditions and/or modifications to the exemption request will be required. Thus, it is not possible to determine their impact.

Preferred option - Monetised Impacts (£m)⁴

	Developer's estimate (NPV, real 2018)
Net GB consumer welfare	£1997 million
Net total GB welfare	-£833 million
<p>Explain how the Net Benefit was monetised, NPV or other</p> <p>As part of the exemption request, the developers of the AQUIND interconnector commissioned Baringa Partners to study the impact of the project on socio-economic welfare, competition and congestion revenue.</p> <p>The Net Present Value (NPV) welfare benefit of the AQUIND interconnector project (based on Baringa's analysis) over the proposed exemption period of 2024-2048 is presented above. The NPVs are in 2018 real terms discounted at 4%⁵ to 2024.</p> <p>Further details on the approaches used by Baringa can be found in Exhibit 1 accompanying the exemption submission.</p> <p>It is important to note that whilst Ofgem generally supports additional interconnection with GB's neighbouring countries in principle, the approval of the exemption request from AQUIND would not necessarily result in the project being built and its expected impacts to materialise in GB. AQUIND would still need to secure a regulatory solution in GB before the project is constructed. In assessing AQUIND in GB, we would need to carefully scrutinise AQUIND's analysis and undertake our own socio-economic modelling.</p> <p>Consequently, we believe that at this stage is sufficient to base this IA on the analysis provided by AQUIND in support of its exemption request application. We will further review AQUIND's analysis as we work towards a joint final decision with CRE.</p>	

⁴ Original figures for AQUIND are expressed in Euro. To convert these figures into GBP, the Year Average exchange rate for 2019 from the Bank of England was used.

⁵ As indicated in Annex I of Recommendation 5/2015 of the Agency for the Cooperation of Energy Regulators.

Preferred option - Additional Impacts

Describe any hard to monetise impacts, including mid-term strategic and long-term sustainability factors following Ofgem IA guidance

The exemption, if granted, will represent an important milestone for the development of the AQUIND interconnector, although it will not in itself guarantee its construction. Therefore, we do not think it is necessary, at this stage, to conduct an extensive analysis of hard to monetise impacts of AQUIND interconnector. However, we have included an overview of the additional impacts the project may have on Ofgem's mid-term strategic and long-term sustainability factors if built.

We have considered factors such as:

- 1) Increase the GB energy security through additional diversity of supply in the GB energy mix, supporting a well-functioning market that minimises the costs of meeting energy needs.
- 2) Support to the decarbonisation of energy supplies through enabling the efficient dispatch of renewables and nuclear energy in GB, France and across interconnected markets, contributing to the market value of renewables by providing a route for export.
- 3) Other aspects such as environmental impacts and effects on competition in GB wholesale energy markets.

Key Assumptions/sensitivities/risks

Baringa’s analysis replicates the modelling assumptions the European Network of Transmission System Operators (ENTSO-E)⁶ uses in the 10-Year Network Development Plan (TYNDP) 2018.⁷

Baringa run three different scenarios: a central scenario on the evolution of the European power markets, a high commodities/renewables scenario, and a low commodities scenario. To these scenarios, Baringa applied several sensitivities in order to assess variations in assumptions used. Further details on sensitivities and scenarios can be found in Exhibit 1 accompanying the exemption submission.

The risks considered include the assumptions listed above, in addition to the incomplete understanding of the foreseeable future market arrangements due to Brexit and the prevailing future arrangements regulating this type of infrastructure.

As outlined earlier in this document, we are basing this IA on the analysis conducted by Baringa on behalf of AQUIND. We will assess the validity of the analysis to inform our joint final decision with CRE. We do not believe, however, that is proportionate to conduct an independent analysis on AQUIND’s impacts at this stage.

Will the policy be reviewed? Conditional

The Regulation allows for a review to be triggered when there is a material change in the circumstances which form the basis on which the exemption has been determined.

If applicable, set review date: Open

Is this proposal in scope of the Public Sector Equality Duty?

No

⁶ ENTSO-E represents 42 electricity transmission system operators (TSOs) from 35 countries across Europe. ENTSO-E was established and given legal mandates by the EU’s Third Legislative Package for the Internal Energy Market in 2009, which aims at further liberalising the gas and electricity markets in the EU.

⁷ The Ten Year Network Development Plan (TYNDP) that ENTSO-E publishes every two years presents how to develop the power grid in the next 10 to 20 years so that it can effectively contribute to achieving these different and sometimes competing goals.

Summary table for all options

Summary of options	Main effects on consumer outcomes	Benefits	Costs	Key considerations (Risks, assumptions, distributional impacts etc.)
Option 1: Exemption request is not approved	None	£0	£0	<p>Uncertainty over AQUIND’s ability to progress the project in France, which might not be built as currently proposed.</p> <p>Creates a disincentive for developers to seek merchant arrangements.⁸</p>
Option 2: Exemption request is approved	The project is approved in France and can proceed to seek a regulatory solution in GB	<p>£1997 million net GB consumers welfare</p> <p>-£833 million total net GB welfare</p>	Project cost estimates are £1252 million.	<p>Whilst the approval of the exemption request would represent an important milestone for the development of the project, it does not guarantee that the project will proceed to construction. This means the outlined costs and benefits will not immediately materialise. The approval of AQUIND’s request would increase the likelihood of the project going ahead and, consequently, of the benefits considered here to materialise.</p>

⁸ Merchant arrangements expose the developer to the full costs, benefits and risks of their investment.

Option 3: NRAs refer decision to ACER	Unknown	Unknown	Unknown	Under this option, ACER would conduct an independent assessment of AQUIND’s exemption request, becoming the <i>de facto</i> decision maker.
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Evidence base (for summary sheets)

1. Introduction

Section summary

This section describes the problem under consideration in this IA, as well its scope and purpose.

Background

1.1. Interconnector project developers can choose between two regulatory routes to progress their projects in GB: obtaining a fully regulated regime or securing an exemption from certain EU regulations.

1.2. The cap and floor regime is the regulated route to develop electricity interconnectors in GB. It is a developer-led regime that balances commercial incentives and appropriate risk mitigation for project developers by providing maximum (cap) and minimum (floor) returns for an interconnector project. Revenues above the cap are passed back to network users, benefitting consumers, whilst revenues below the floor are topped-up by consumers.⁹

1.3. The regime grants significant revenue certainty to developers. However, under Article 63 of the Regulation, developers can still seek exemptions from certain regulatory requirements. Under this ‘merchant’ or exempted route, developers would not enjoy consumers support (the floor, under the regime) and therefore would fully face the risks as well as the benefits of their investment.

⁹ For an overview of the cap and floor regime, please see:
https://www.ofgem.gov.uk/system/files/docs/2016/05/cap_and_floor_brochure.pdf

Problem under consideration and rationale for action

Legal framework

1.4. Article 63 of the Regulation permits NRAs to, in agreement with any other relevant concerned NRAs, and subject to the approval of the European Commission (EC), exempt new investments in cross border electricity interconnectors from certain legal provisions concerning third party access, regulatory approval for tariffs, use of revenue and ownership unbundling.

1.5. Article 63 requires the NRAs to reach an agreement on whether the exemption request should be granted and, as the case may be, on the extent of such an exemption, within six months of the date of receipt by the last of the relevant NRAs.

1.6. Appendix 1 of this document contains a diagram summarising the exemption request process under Article 63 of the Regulation.

1.7. In June 2020, AQUIND submitted an exemption request under Article 63 to the concerned NRAs, seeking exemption from use of revenues obligations under Article 19 of the Regulation for its proposed interconnector. AQUIND has requested the exemption only to apply to the French portion of the project.

1.8. The concerned NRA in GB is the Gas and Electricity Markets Authority, whose administrative functions are carried out by Ofgem. The concerned NRA in France is CRE. The two NRAs are currently seeking views on the impacts of AQUIND based on the legal framework of Article 63, which will inform their respective final decisions. For this purpose, the NRAs have published a Joint Consultation on AQUIND's exemption request that can be found on Ofgem's website.¹⁰

1.9. The Joint Consultation sets out the conditions, defined by Article 63 of the Regulation, which AQUIND must satisfy in order for an exemption to be granted. It also outlines the evidence provided by AQUIND in its application in support of its view that it

¹⁰ Please visit: <https://www.ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors>

should be granted an exemption for the AQUIND interconnector. It also seeks views from interested parties as to whether they consider AQUIND has met the exemption conditions.

Purpose and scope of this IA

1.10. Section 5A of the Utilities Act places a duty on the Authority to carry out an IA for any proposal for the purposes or in connection with its powers under Part 1 of the Act, which the Authority believes to be 'important'.

1.11. We note that 'important' is defined by reference to a proposal that would involve a major change in our activities or significantly impact industry participants, the general public or the environment. We think that a decision on AQUIND's exemption request meets these criteria, and requires Ofgem to perform an IA.

1.12. This document sets out the evidence to support the decision over AQUIND's exemption request. The evidence considered is presented in section 2. This document does not provide an assessment of whether AQUIND has met the six criteria specified in Article 63 of the Regulation.

1.13. The assessment of AQUIND's request against the criteria of the Regulation will be done by both NRAs after the Joint Consultation with the outcome being a decision by both NRAs to grant or reject the exemption request from AQUIND.

1.14. As such, this document and the Joint Consultation should be read together. Should there be specific comments on the material provided in this document, Ofgem welcome responses on impacts specifically addressed here in addition to those addressed in the Joint Consultation. We welcome single submissions addressing both documents, however we ask respondents to clearly mark the parts of their submission relating to the Joint Consultation and those relating to this IA.

Proportionality of our assessment

1.15. We note that due to the particular nature of this exemption request, the impacts of the project described in this IA will not immediately materialise in GB even if both NRAs agree to grant an exemption to AQUIND.

1.16. The exemption request submitted by AQUIND is only partial, i.e. it would apply to the French portion only. If granted, this exemption will determine the regulatory

arrangements in France. However, the project would still have to secure a regulatory solution in GB before being built.

1.17. As mentioned earlier in this document, the regulated route for interconnector development in GB is the cap and floor regime. Applications to the regime are considered in defined periods, or application windows. To date, Ofgem has run two application windows.¹¹

1.18. Before opening a third application window, Ofgem has decided to review the current regulatory policy and approach to new electricity interconnectors investments.¹² The primary objective of the interconnector policy review is to establish whether there is a need for further GB interconnection capacity beyond those projects currently with regulatory approval. If so, the secondary objective of the review is to consider Ofgem's approach to the regulation of future GB interconnection.

1.19. Both steps will require conducting detailed analysis of the impacts of additional interconnection in GB. Therefore, Ofgem will have multiple opportunities to fully assess the impacts of the AQUIND interconnector in GB, including when AQUIND seeks regulatory approval following Ofgem's interconnector policy review, should there be an appropriate opportunity for them to do so.

1.20. Additionally, it is difficult at this stage (i.e. the consultation phase, before we have decided, in agreement with CRE, whether to grant an exemption, whether the exemption would have conditions and if so, what those conditions would be), to accurately quantify costs and benefits that granting an exemption, with or without conditions, would have in GB.

1.21. Therefore, whilst we recognised the need to conduct an IA under the Utilities Act, we do not think it is proportionate to conduct a full assessment of AQUIND Interconnector's

¹¹ Decision to roll out a cap and floor regime to near-term electricity interconnectors: https://www.ofgem.gov.uk/sites/default/files/docs/2014/08/decision_cap_and_floor_near_term_electricity_interconnectors.pdf

Decision to open a second cap and floor application window for electricity interconnectors in 2016: <https://www.ofgem.gov.uk/publications-and-updates/decision-open-second-cap-and-floor-application-window-electricity-interconnectors-2016>

¹² Open letter: Notification to interested stakeholders of our interconnector policy review: https://www.ofgem.gov.uk/system/files/docs/2020/08/open_letter_-_interconnector_policy_review.pdf

impact at this stage. Consequently, the analysis presented in this IA is largely qualitative and based on the work produced by AQUIND.

1.22. In order to understand the potential monetised impact of AQUIND interconnector and inform our decision on AQUIND's exemption request, we will (i) assess the analysis provided by the developers. We will also (ii) compare its underlying assumptions and results with other analysis available, e.g. Ofgem's analysis for Window 2 projects and the ENTSO-E analysis for the TYNDP 2018. We will (iii) consider as additional evidence the Network Options Assessment (NOA) 2020 performed by National Grid Energy System Operator (NGESO), as well as the Connection and Infrastructure Options Note (CION) report AQUIND submitted alongside its exemption request.

2. AQUIND exemption request and its impacts

Section summary

This section summarises AQUIND's exemption request and the evidence that will be assessed to support our decision.

Question 1: Is there any other evidence that the Authority should take into account when assessing the impact of the AQUIND interconnector?

Question 2: Do you have anything to add (in addition to any response you have made to the questions in the Joint Consultation) on the impact of the AQUIND interconnector on consumers?

Question 3: Are there other impacts that the Authority should take into account when assessing the impact of the AQUIND interconnector?

AQUIND exemption request

2.1. The AQUIND interconnector is a planned 2GW interconnector project promoted by AQUIND SAS (France) and AQUIND Limited (UK). The project aims at connecting the UK to France in Eastney and Pourville, respectively. The estimated total length of the cable is about 240km.

2.2. Pursuant to Article 63 of the Regulation, AQUIND is seeking a partial exemption for AQUIND interconnector in France from Articles 19(2) and 19(3) of the Regulation (regarding the Use of Revenues) for a period of 25 years from the start of commercial operations. AQUIND is not seeking an exemption from other elements of the Regulation or the Directive (EU) 2019/944.

2.3. This partial exemption would only apply to a fixed share of AQUIND's revenues, corresponding to the proportion of the capital and operational costs incurred in French territory (onshore and French territorial waters). AQUIND has calculated this portion to be 32% of the total project costs. The remaining share of the revenues generated by the project will not be exempted from the requirements of Articles 19(2) and 19(3).

2.1. Under French law, no specific regime for the development, construction and operation of interconnectors operated by private investors is provided. Réseau de Transport d'Electricité (RTE), the French TSO, is currently the only entity responsible for these activities.

2.2. Consequently, this exemption would also have the effect of permitting AQUIND to operate the AQUIND Interconnector in France, if granted. However, AQUIND will still have to secure a regulatory solution in GB before the project can be built. If the exemption is not granted, AQUIND will not be able to progress the project in France as proposed.

Monetised impact of AQUIND

2.3. The following paragraphs outline the evidence we will consider when assessing AQUIND's exemption request.

AQUIND's CBA by Baringa Partners LLP

2.4. As part of the exemption request, AQUIND commissioned Baringa Partners LLP (Baringa) to assess the impact of the project on welfare, competition and congestion revenues.

2.5. In order to validate the modelling approach and framework used in its CBA, Baringa replicated the TYNDP 2018 analysis based on the same TYNDP scenarios. Baringa then developed a more detailed and up to date set of assumptions representing its own central view of how European power markets are expected to evolve in the future, referred to as the Market Scenario.

2.6. The Market Scenario includes a number of differences and additions to the TYNDP scenarios, for example with respect to price differentials between GB and France, technology costs, investments in generation capacity, the development of the concerned wholesale energy markets and other interconnector investment. A summary of these assumptions can be found in Appendix 2 of this document.

2.7. Baringa then modelled the impact of AQUIND on net socio-economic welfare (SEW)¹³ in GB, France and Europe under the Market Scenario as well as two alternative scenarios: High Commodity/Renewables Scenario and Low Commodities Scenarios. Table 1 below summarises the main features of the three scenarios used.

Table 1: AQUIND modelling main scenario descriptions

Scenario Description	Scenario Description
Market Scenario	A central view on the evolution of the European power markets. Under this scenario, European Governments continue to pursue a balanced energy policy, attempting to meet the sometimes competing demands of security of supply, competitive market structure, and environmental sustainability.
High Commodities/ Renewables Scenario	This represents a scenario where high renewable investment is driven by high commodity prices and economic growth across Europe. This in turns drives price volatility in GB, France and continental Europe leading to increased levels of interconnector investment compared to the Market Scenario.
Low Commodities Scenario	This represents a scenario with lower economic growth, demand and commodity prices compared to the Market Scenario. Low commodity prices, based on observed prices over the last 5 years, result in low renewable investment. Low commodity prices also reduce the running cost of marginal thermal generation with higher capacity margins reducing scarcity, placing downward pressure on wholesale prices across Europe. Low price volatility and cross-border spreads reduce the returns for interconnectors, therefore reducing interconnector investment compared to the Market Scenario.

2.8. Baringa has also assessed the impact of the variation of single market modelling assumptions on the SEW relative to the central Market Scenario, captured in Table 2 below.

Table 2: Sensitivities to the Market Scenario

Sensitivity	Description
No scarcity	Bidding behaviour is limited to Short-Run Marginal Cost, without scarcity uplift.
Low interconnector investment (GB-FR)	Focusing on the additional benefits delivered by AQUIND interconnector if other planned GB-France projects do not proceed as assumed in the Market Scenario.
High GB Interconnector investment	Assumes that AQUIND interconnector progresses alongside the other known GB-France projects, along with known additional interconnector projects to Norway, Germany and Belgium.

¹³ Net social and economic welfare is defined as the sum of the change to consumer welfare, producer welfare and interconnector welfare linked to the construction the AQUIND Interconnector.

Brexit	Continued reduction in trading efficiency between GB and continental Europe for a prolonged period of time (we assume this continues past 2048). Modelled by adding a market inefficiency fee – a cross-border charge that reduces the efficiency of cross-border trading between GB and continental Europe
Capex overrun	No adjustments to the market assumptions Adjustment to the capex contingency

2.9. To derive SEW estimates, Baringa used PLEXOS, a power markets simulation model based on a detailed representation of market supply and demand fundamentals at an hourly granularity.

2.10. The supply mix is represented with the operating parameters of generating plant including costs and operational constraints. Wind generation profiles have been based on historic wind data and modelled on future generation capacity. Electricity demand is represented as a projected hourly profile (derived from historic calibration). Market dispatch is then simulated with system-level constraints optimised to deliver the least cost solution. The marginal cost for each plant is calculated from heat rate curves, fuel costs, transportation costs, non-fuel variable operating costs and carbon costs.

2.11. The results of the CBA are then split between the distribution of welfare impacts between consumers, producers and interconnectors in GB, France and continental Europe. Table 3 below summarises the expected SEW impacts associated with the project in GB provided by AQUIND.

Table 3: AQUIND interconnector expected SEW impacts in GB

	Baringa’s estimate 2020 (£m, real 2018)	Pöyry’s estimate 2017 (£m, real 2015)
Net producer welfare GB	-1875	-3481
Net consumer welfare GB	1997	4516
Net interconnectors welfare GB	-955	-1337
Net welfare GB	-833	-231

2.12. The total net welfare for GB generated by Aquind interconnector is the sum of net producer, consumer and other interconnectors welfare in GB.

2.13. Net producer welfare is calculated based on wholesale revenue for generators, generation costs, capacity market revenues and net producer surplus.¹⁴ Consumer welfare is based on wholesale cost of electricity, demand side response curtailment, unserved energy and net consumer surplus.¹⁵ Interconnectors welfare comprises the wholesale revenues, capacity market revenues, interconnector costs, and net welfare of other interconnector projects already operating in GB.

2.14. The figures provided by AQUIND indicate a net social welfare for GB of -£833m, driven by a significant reduction in energy generators (-£1875m) and other interconnectors welfare (-£955m). This is primarily due to the additional price competition AQUIND interconnector is expected to introduce in GB by further tapping into the French electricity market, which is characterised by lower wholesale energy prices.

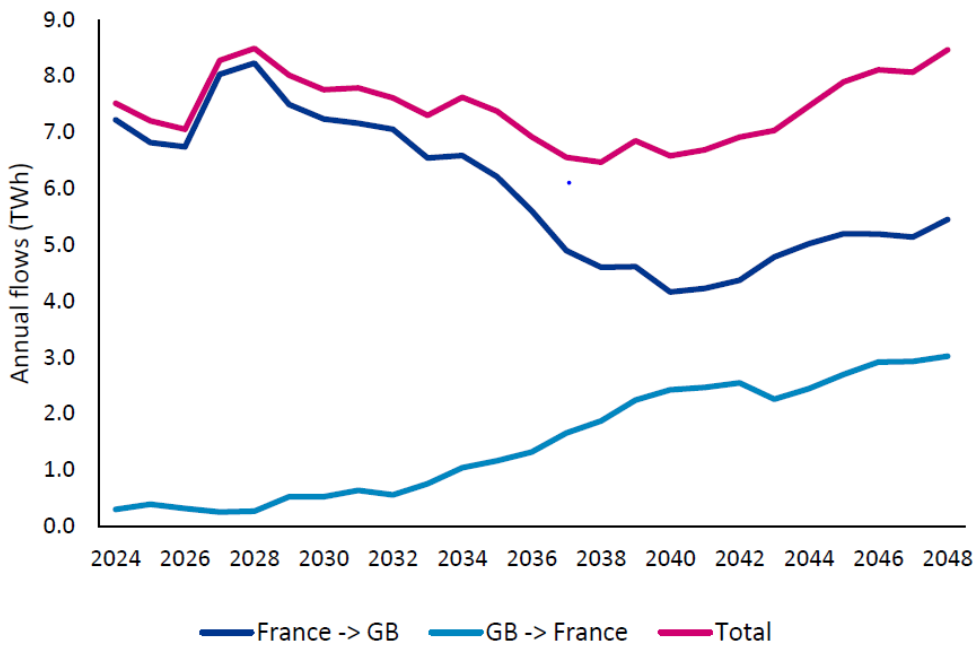
2.15. Due to the downward pressure on domestic wholesale prices, profit margins for local energy generators decreases. At the same time, the price differential between GB and other connected markets is also decreased, negatively affecting the revenues of other interconnectors. The same dynamic, however, leads to significant benefits to GB consumers (£1997m).

2.16. This is in line with AQUIND's estimated annual flows between GB and France. AQUIND interconnector is expected to primarily import cheaper energy from France into GB. However, as renewable generation capacity increases in GB, reducing average wholesale prices in GB, the project is also expected to increasingly export electricity to France at times. This is shown in Figure 1 below.

¹⁴ Electricity demand is represented as a projected hourly profile (derived from historic calibration). Market dispatch is then simulated with system-level constraints (e.g. emission limits) optimised to deliver the least cost solution. The marginal cost for each plant is calculated from heat rate curves, fuel costs, transportation costs, non-fuel variable operating costs and carbon costs.

¹⁵ This is equal to the sum of the change in wholesale cost of electricity, DSR costs and low carbon support.

Figure 1: Annual flows across AQUIND, AQUIND Market Scenario



2.17. More details on the developer’s approach to the socioeconomic welfare analysis provided can be found in Exhibit 1 accompanying the exemption application. Exhibit 1 is provided as a subsidiary document in the Joint Consultation.

Cap and floor Window 2 projects assessment by Pöyry

2.18. In 2016, Ofgem opened a second application window (W2) under the cap and floor regime for electricity interconnectors with a target connection date before the end of 2022.¹⁶ Three projects applied to be assessed and regulated under our cap and floor regime, i.e. Gridlink (1000 MW), Neuconnect (1400 MW) and Northconnect (1400MW). All three projects met our minimum eligibility criteria and were eligible to undergo the Initial Project Assessment (IPA) stage of our assessment process.

¹⁶ Decision to open a second cap and floor application window for electricity interconnectors in 2016: https://www.ofgem.gov.uk/sites/default/files/docs/decision_to_open_a_second_cap_and_floor_application_window_for_electricity_interconnectors_in_2016.pdf

2.19. In order to understand the impacts of these projects on GB welfare, Ofgem commissioned Pöyry Management Consulting (UK) Ltd. (Pöyry, now Afry) to conduct a CBA to support the decision making process.¹⁷

2.20. At the same time, AQUIND indicated to the relevant NRAs the intention to apply for an exemption in order to progress the project and commence operation in 2022 as well. Therefore, Ofgem decided to provisionally assess AQUIND in comparison to the W2 projects described above to better understand the interactions and dependencies between their need cases.¹⁸

2.21. Table 3 above reports Pöyry CBA results for AQUIND.¹⁹ We note the significant decrease in expected consumer benefits, and consequently lower overall GB social welfare, compared to the latest estimates by Baringa.

2.22. Whilst the Pöyry report does not consider AQUIND as a stand-alone project, some of its analysis and results relevant to AQUIND will be considered in the context of this IA. We acknowledge that some time has passed since Pöyry's analysis and assumptions were compiled, and that the actual development of wholesale markets and of other interconnector projects have diverged from Pöyry's modelling.

2.23. Nonetheless, we believe the study to be still relevant as a broader reference point in the context of AQUIND's current exemption request, and as a comparator for AQUIND's latest submission. For example, we note that the expected consumer benefits of AQUIND interconnector remain positive, although to a lesser degree compared to previous analysis.

¹⁷ For the complete analysis by Pöyry, please visit:
https://www.ofgem.gov.uk/system/files/docs/2018/01/near-term_interconnector_cost_and_benefit_analysis_-_independent_report_.pdf

¹⁸ We note that whilst AQUIND SEW impacts were assessed alongside Window 2 projects, the analysis was conducted on the assumption that the project would progress under an exemption without any consumer underwriting, rather than under a cap and floor regime and a partial exemption. Any future regulatory decision in GB will require the reassessment of these impacts.

¹⁹ This information was not presented in the Pöyry's report because at the time of its publication the assessment of AQUIND initial exemption request was still ongoing.

ENTSO-E TYNDP

2.24. As part of the Ten-Year Network Development Plan (TYNDP) 2018, ENTSO-E has estimated the total SEW impacts of AQUIND for one spot year (2030), under three different scenarios.²⁰ These are summarised in Table 4 below.

Table 4: AQUIND total net SEW impacts for EU27 (£m)

	Best Estimate 2025	Sustainable Transition (ST) 2030	Distributed Generation (DG) 2030	European Coordination (EUCO) 2030
ENTSO-E	11	31	23	31
Baringa	14	34	41	39

2.25. In Table 4, we have also reported Baringa’s estimate of AQUIND’s total net welfare impact in 2025 and 2030 under the same ENTSO-E scenarios. Whilst the estimates under the ST and EUCO scenarios are quite similar, we note a more substantial difference under the DG scenario.

2.26. As mentioned earlier in this document, Baringa’s analysis for AQUIND builds upon the TYNDP 2018 scenarios,²¹ adding more detailed and up to date sets of assumptions where needed, which may explain the difference in the results shown in Table 4.

2.27. We note that on 6 November 2020, ENTSO-E released a draft version of its bi-yearly pan-European plan for electricity infrastructure development, the TYNDP 2020, for public consultation. This will close on 4 January 2020.

2.28. The package also presents the provisional CBA results for the projects considered in the plan. We note that these are more positive than the TYNDP 2018 results for the AQUIND Interconnector. However, the results have yet to be finalised by ENTSO-E following the outcome of the public consultation. Hence, these provisional results are not considered

²⁰ For more details on ENTSO-E analysis on AQUIND, please visit:

<https://tyndp.entsoe.eu/tyndp2018/projects/projects/247>

²¹ For additional information on ENTSO-E TYNDP 2018 scenarios, please visit:

<https://tyndp.entsoe.eu/tyndp2018/>

in this document. However, we will take note of these and the outcome of the consultation process in the context of AQUIND's exemption request.

Network Options Assessment (NOA) 2020

2.29. The NOA is a study run by NGENSO every year assessing the future needs of GB's electricity transmission system. It recommends to transmission owners which future investments best meet the future network requirements.

2.30. In its NOA 2020,²² NGENSO assessed the optimal interconnection level for GB that would provide the most value to consumers and other interested parties. The assessment takes into consideration SEW, constraint costs and capital expenditure costs for a range of interconnector options from GB to seven European countries. These calculations are run for each of the four Future Energy Scenarios (FES) developed by NGENSO.²³

2.31. The NOA points out that reaching a total interconnection capacity between 18.1 GW and 23.1 GW by 2032 would provide the maximum benefit for GB consumers, depending on which FES is considered. This is between three and five times the current level of operational GB interconnection of 5 GW.²⁴ In the two scenarios achieving the 2050 decarbonisation targets for UK, the NOA indicates optimal interconnection levels between France and GB around 6 GW and 9 GW.

2.32. Currently, GB has 2 GW of interconnector capacity with France, with additional 2 GW currently under construction (IFA2 and ElecLink). Two other projects, GridLink and FABLink, have obtained regulatory approval in GB and are currently under development, potentially bringing the total future interconnection capacity between France and GB up to 6.8 GW. This could further increase to 8.8 GW if also AQUIND is also successful in securing regulatory approval in both France and GB.

²² Network Options Assessment 2020: <https://www.nationalgrideso.com/document/162356/download>

²³ For more information on FES 2019, please visit: <https://www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2019-documents>

²⁴ We note that two other interconnectors, ElecLink and IFA2, are under construction and will bring the operational interconnection capacity in GB up to 7GW.

Connection and Infrastructure Options Note (CION)

2.33. As part of its submission, AQUIND provided a Connection and Infrastructure Options Note (CION). The CION is a report undertaken by National Grid Electricity Transmission (NGET) assessing the impacts of the connection of AQUIND to the National Electricity Transmission System. The document facilitates the appraisal of a variety of connection options and identifies the preferred onshore connection points and offshore transmission network configuration, based on the system costs the interconnector will generate.

2.34. The report shows that the Lovedean substation is the most suitable and cost effective connection point for the AQUIND interconnector given its design. A summary note of the CION can be found in Exhibit 6 accompanying the exemption request.

Additional impacts of AQUIND

2.35. As outlined earlier in this document, we have not conducted a full assessment of the hard to monetise aspects of AQUIND at this stage. As part of this IA, however, we have qualitatively considered additional impacts the project might have if built.

2.36. Because of AQUIND interconnector, there could be positive impacts for GB in the medium and long-term in many of the assessed areas, as described below. These will be fully assessed once AQUIND seeks regulatory approval in GB. We note that the size of these impacts will depend on any conditions potentially attached to the joint exemption decision, if granted.

Providing alternative solutions to increase GB security of supply

2.37. AQUIND would allow the transfer of electricity across GB-French border. It would allow access to cheaper generation, providing more efficient ways to deliver security of supply and increasing the level of connection to a market with a significantly different and low-carbon energy mix.²⁵

2.38. These benefits, however, might be offset by the additional competitive pressure the interconnector could exercise on national generation capacity in the GB wholesale market.

²⁵ IEA, Key energy statistics for France, 2018: <https://www.iea.org/countries/france>

This in part may lead to higher capacity market prices, as more expensive domestic generation is force out of the national energy market.

Supporting the decarbonisation of energy supplies

2.39. In its 2030 climate and energy framework, the EU has committed to increasing the proportion of renewable energy to at least 32% of final energy consumption by 2030. The EU also aims to be climate-neutral by 2050, building an economy with net-zero greenhouse gas emissions. Similarly, the UK has committed to bring all greenhouse gas emissions to net zero by 2050, amending the previous target of an 80% greenhouse gas emission reduction under the Climate Change Act 2008.²⁶

2.40. Reducing the carbon emissions levels of the energy sector by installing additional renewable generation is key to progress our decarbonisation efforts. However, the inherent intermittency and variability of renewable generation represent major challenges to the cost effective operation of the GB energy system. Additionally, excess generation can be curtailed in situations when demand is low or when transmission lines do not have sufficient capacity to export the electricity generated.

2.41. Interconnectors can help address these issues by providing the opportunity for cross border flows of electricity when supply exceeds demand. As the volume of variable generation increases, bidirectional electricity flows across interconnectors can help to accommodate fluctuations in generation output in multiple countries. Opportunities for export would therefore help to achieve more efficient dispatch of renewables across a wider geographical area. This is particularly important as renewable energy generation variability becomes a larger driver of wholesale prices in the future.

2.42. The interconnector proposed by AQUIND may, in certain circumstances, provide an export route when transmission capacity is fully utilised and therefore generation would otherwise be constrained, improving the integration of renewable generation.

²⁶ The Climate Change Act 2008 (2050 Target Amendment) Order 2019:
<https://www.legislation.gov.uk/ukdsi/2019/9780111187654>

Impact on competition

2.43. Conditions (a) and (f) of the Regulation require an assessment of the impact of the proposed interconnector on competition as well as an assessment of the extent to which any exemption granted under Article 63 of the Regulation may be detrimental to competition, the relevant regulated transmission systems and the internal energy market.

2.44. In support of its exemption request, AQUIND has provided a competition study including a Residual Supplier Index (RSI) and a Herfindahl-Hirschmann Index (HHI) test,²⁷ presented in Exhibit 2 of AQUIND's submission. The result of the analysis shows that AQUIND interconnector would have a small but positive impact on competition.

2.45. Interconnectors can have a positive impact on competition in the electricity generation sector by enabling cross-border electricity flows, *de facto* increasing the size of the energy markets in which they operate. This allows more market players to participate in both the generation and supply of electricity to end customers, adding competitive pressure onto the market incumbents.

Other impacts

2.46. If the exemption is approved and AQUIND secures regulatory approval in GB, we expect the AQUIND interconnector to benefit vulnerable consumers. By importing cheaper electricity from abroad in the early years, consumers will enjoy lower priced energy. As consumers in vulnerable situations usually have energy costs that are high relative to their income, such impacts are likely to be positive and proportionally more positive than for consumers as a whole.

2.47. We acknowledge that the construction of an interconnector can have some localised negative impacts upon the environment, although these should be relatively limited. If the exemption is granted, and AQUIND obtains regulatory approval in GB, we would expect AQUIND, as the project developer, to successfully and fully meet all planning and environmental restrictions in place to minimise localised construction and operation related impacts.

²⁷ The RSI and HHI measure, respectively, the pivotality and market power of the largest energy supplier in the relevant energy markets

2.48. We note that AQUIND is required to obtain and satisfy any relevant planning requirements as part of the development of the project. We also note that Ofgem does not have a role in considering or approving any planning or consenting activities.

3. Consultation responses and next steps

3.1. We would like to hear the views of interested parties in relation to any of the issues set out in this document.

3.2. We would especially welcome responses to the specific questions that we have set out at the beginning of Chapter 2.

3.3. Responses should be received by 29/01/2021 and should be sent to:

Riccardo Rosselli
Interconnectors Team
Systems & Networks
Ofgem
10 South Colonnade
London
E14 4PU
Riccardo.Rosselli@ofgem.gov.uk

3.4. Unless marked as confidential, all responses will be published on Ofgem website. Respondents may request that their response is kept confidential. The Authority shall respect this request, subject to any obligations to disclose information.

3.5. Respondents who wish to have their responses remain confidential should clearly mark the document to that effect and include the reasons for confidentiality. Due to current COVID-19 measures in place, we kindly ask to submit responses electronically. Respondents are asked to put any confidential material in the appendices to their responses.

Next steps

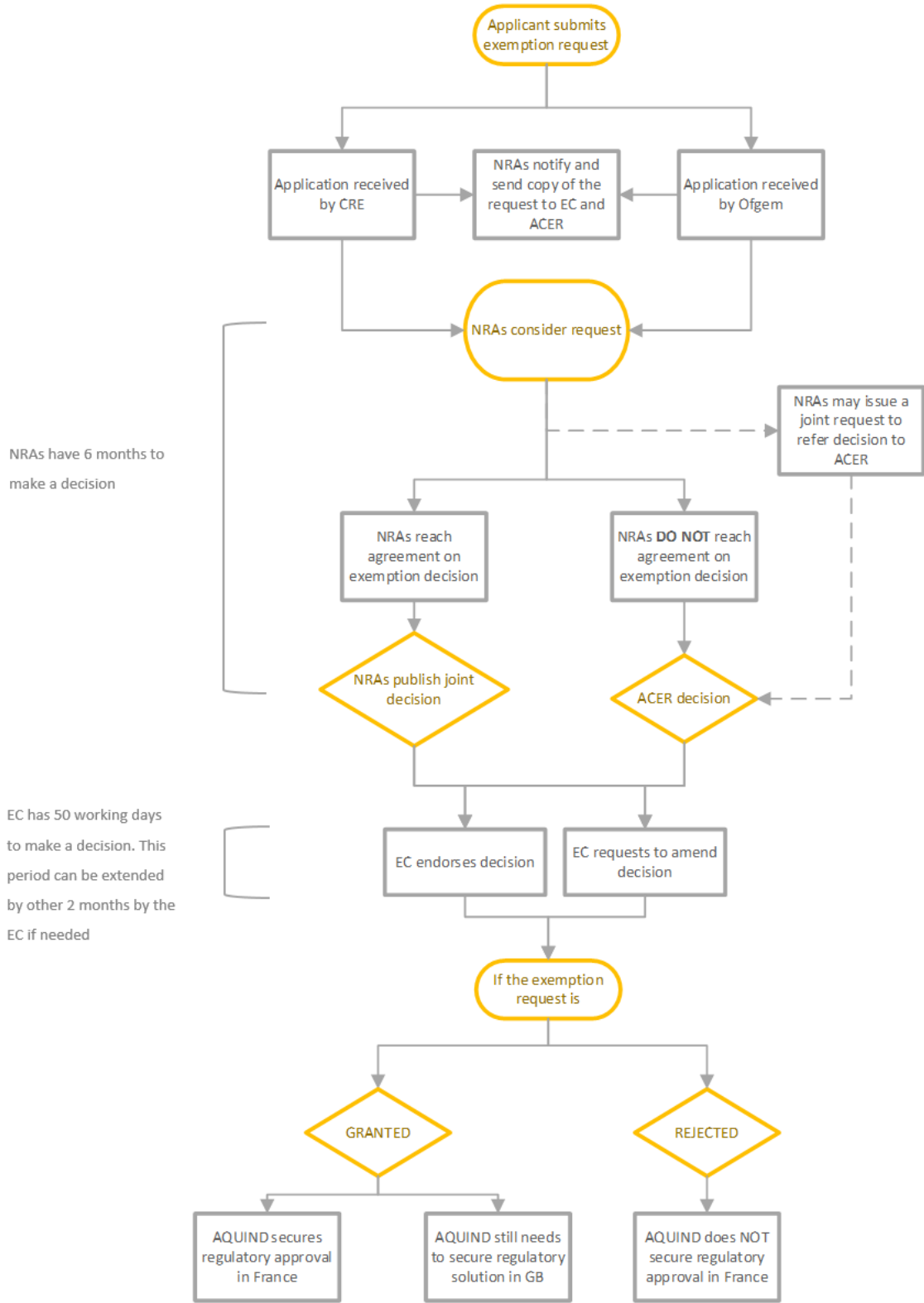
3.6. We will monitor and review the responses to this IA and the Joint Consultation document at the end of the consultation period. We will take into account AQUIND's submission as well as all the relevant responses to inform our exemption decision on the AQUIND interconnector, which will be taken together with CRE. Any questions on this document should, in the first instance, be directed to the above contact.

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Appendix 1 – Exemption request process



Appendix 2 – AQUIND assumptions and scenario modifications

Element	Description
Capacity Mix	The parameters of the TYNDP 2018 scenarios were established in 2016. The Market Scenario is based on the underlying assumptions behind the TYNDP 2018 (capacity mix in particular), but it also adds more updated assumptions for the whole 25 years period the model considers. The capacity mix assumptions in the Market Scenario are based on contemporary data and real life asset investment decisions (i.e. calculating the profitability of individual generation units across Europe to ensure commercial drivers for operation).
Technology costs	The Market Scenario includes estimates of technology-specific costs to ensure accurate investment and closure decisions and merit order dynamics: <ul style="list-style-type: none"> - Capital costs; - Annual fixed costs; - Variable costs; and - Financing assumptions (cost of equity, cost of debt, gearing levels, inflation).
Interconnector loss factors	The Market Scenario includes individual interconnector loss factors across Europe and storage parameters for pumped hydro storage and reservoir-based hydro (both missing from the ENTSO-E TYNDP 2018).
Renewable output profiles	Renewable output profiles are based on historical weather conditions (and aligned with demand profiling).
Flexible and inflexible demand and scarcity uplift	The Market Scenario includes a breakdown of flexible versus inflexible demand (to meet an annual demand figure specified by ENTSO-E) and a scarcity uplift (i.e. regression analysis to value scarcity based on the relationship between capacity margins and prices taking into account bidding behaviour above Short-Run Marginal Cost).
Commodity charges	For commodities, AQUIND takes into account commodity entry charges and gas and coal transportation charges to power stations.
GB balancing charges and losses	For GB, AQUIND has also modelled current charges, for example, BSUoS and losses, which are included in GB wholesale price projections (known as station gate).