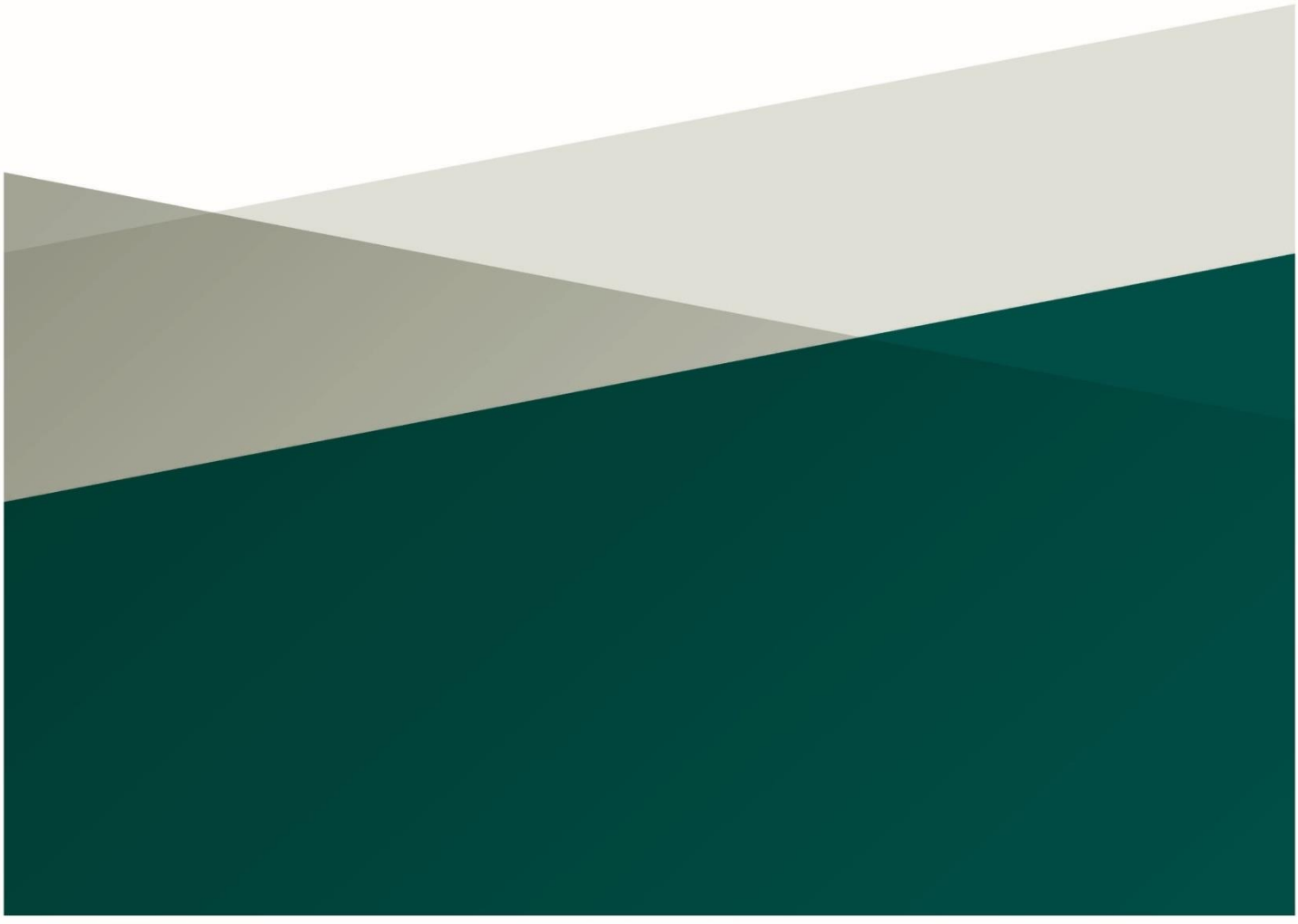
An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

International Connectivity for Telecommunications Consultation - Key Findings

2021



Contents

1 Introduction

A public consultation on international connectivity for telecommunications was launched by the CTO office[1] on 19 October 2020. The purpose of the consultation was to seek the views of interested parties on the current status of international connectivity in Ireland. This will allow the Department to gather information and consider views from relevant stakeholders to inform policy development and decision making. Submissions closed on 27 November with 9 responses received. Further information and background is available in the consultation document[2].

2 Information required from respondents

In the consultation document, there were seven specific questions posed that related to capacity, diversity of routes, key challenges and how Ireland is positioned internationally. The questions were as follows:

Question 1

"Is there sufficient capacity and diversity of routes available to meet current and future demand over the next 5 years (or over a longer timeframe if that information is available)?"

Please provide current capacity of international links (in absolute terms and percentage of fibre cable used/free at present) and plans for future capacity over the next 5 years (or over a longer timeframe if available).

Question 2

"What are the key challenges and commercial barriers that exist in the development of international connectivity in Ireland?"

Question 3

"What measures are required, including actions by the State, to alleviate the key challenges and commercial barriers in the development of international connectivity in Ireland?"

Question 4

[1] CTO office is the Chief Technology Office within the Communications area in the Department of the Environment, Climate & Communications

[2] https://www.gov.ie/en/consultation/79568-public-consultation-on-international-connectivity-for-telecommunications/

“Given that the most recently deployed and planned submarine cables on transatlantic routes have landed on the west coast of Ireland, are there likely to be any issues with onward connectivity from the landing station to service provider hubs and data centres?”

Question 5

“How do you think Ireland is positioned when compared to other countries with best practice international connectivity?”

Question 6

“How can Ireland position itself as the preferred location to land submarine fibre optic cables in Europe?”

Question 7

“How can Ireland make it attractive for companies to build new submarine fibre routes from other European countries to Ireland?”

3 Identification of subsea cable routes

The consultation responses (to Question 1 in section 2) have allowed the Department to identify the subsea cable routes and to establish if there is sufficient capacity to meet current and future demand. Ireland's international connectivity can be considered in three distinctive categories as follows:

1. Ireland to UK
2. Ireland to North America
3. Ireland to Europe

Figure 1 provides an overview of the subsea telecommunication cables for all three categories connecting to Ireland. Further detail for each category is provided in sections 4.1 to 4.3. The tables in section 4 provides a list of legacy cables which were built up to 2001 and next generation cables which were built from 2012 to 2019. Subsea cable projects that are currently being deployed or future planned projects that the Department has been made aware of are included at the bottom of each table with a status of "currently being deployed" or "planned", respectively.

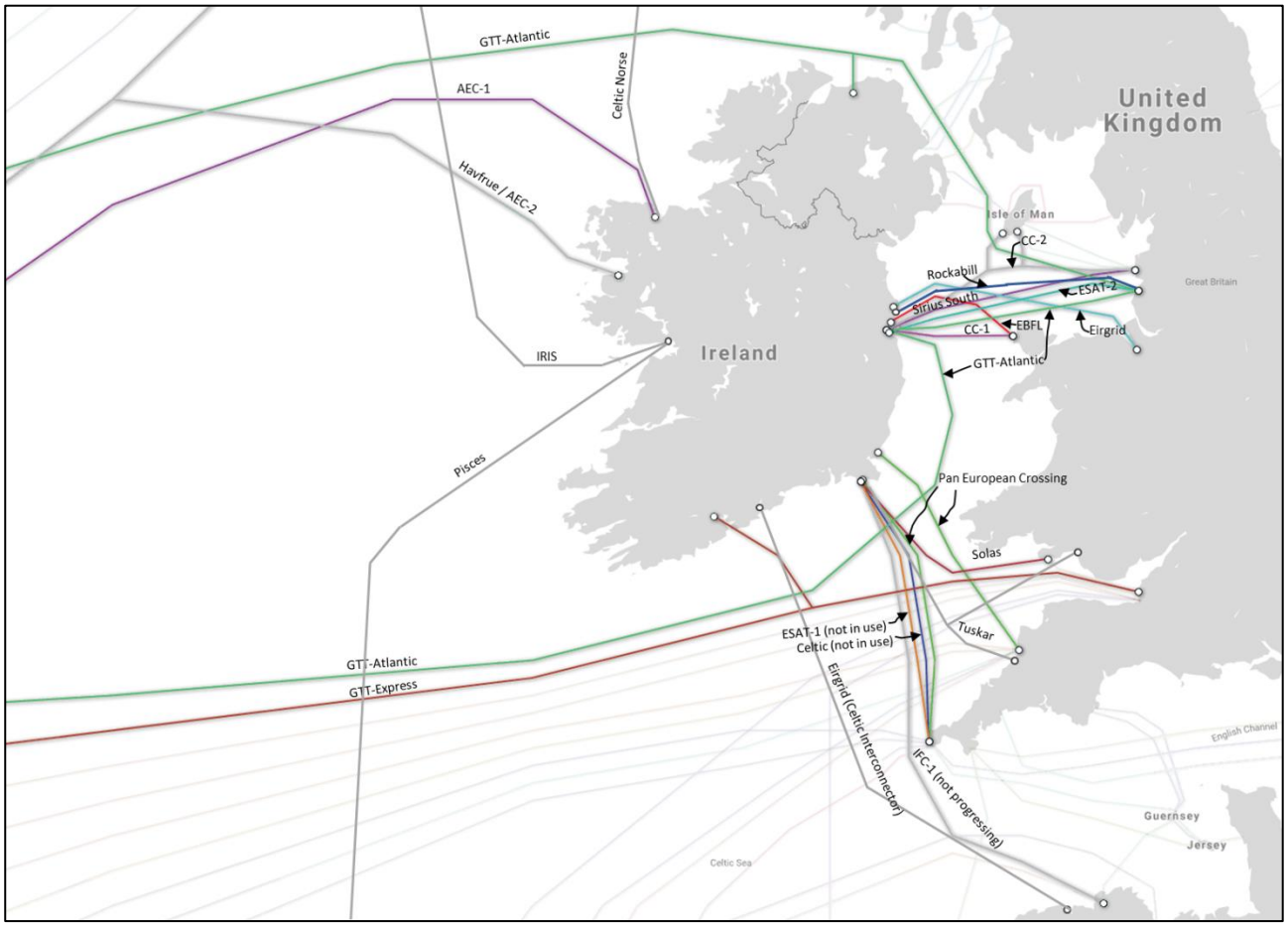


Figure 1: Map of existing and planned subsea cables connecting to Ireland (planned cables shown in grey)

3.1 Ireland to UK

There are ten subsea cables connecting Ireland to the UK and a further two currently being deployed; these cables are listed in Table 1. The Ready for Service (RFS) date in the table determines the status of the cable in terms of its built lifetime. The legacy built cables are approaching the end of their design lives which is typically 20 to 25 years. The respondents indicated that Ireland is well served to the UK. As there is a robust, competitive, open access subsea market in place it is considered that Ireland to UK connectivity is adequately supported now and for at least the next 10 years, both in terms of capacity and diversity of routes. Figure 2 shows the cable routes noting that some cables are marked as no longer in use. The planned routes are shown in a grey colour.

Table 1: Subsea cables connecting Ireland to UK

Subsea Cable	Owner/Developer	RFS	Landing	Status
Sirius South	Virgin Media	1999	Dublin, Blackpool (UK)	Legacy Built
Solas	Eir / Vodafone	1999	Kilmore Quay, Oxwich Bay (UK)	
ESAT 2	BT	2000	Sandymount, Southport (UK)	
Pan European Crossing	Lumen	2000	Ballinesker , Bude (UK)	
Pan European Crossing	Lumen	2000	Ballygrangans, Whitesands Bay (UK)	
GTT Atlantic Seg C	GTT	2001	Dublin, Coleraine (N.I.), Halifax (Canada), Lynn (UK), Southport (UK)	
CeltixConnect 1	AquaComms	2012	Dublin, Holyhead (UK)	Next Generation Built
EBFL	ESB / Zayo	2012	Clonshaugh, Holyhead (UK)	
Geo-Eirgrid	Eirgrid/Zayo	2012	Lusk, Deeside (UK)	
Rockabill	euNetworks	2019	Portrane, Southport (UK)	
CeltixConnect 2/Havingsten	AquaComms	2021	Loughshinny, Isle of Man, Blackpool (UK)	Currently being deployed
Tuskar	DeepSea Fibre	2022	Kilmore Quay, Bude (UK), Swansea (UK)	

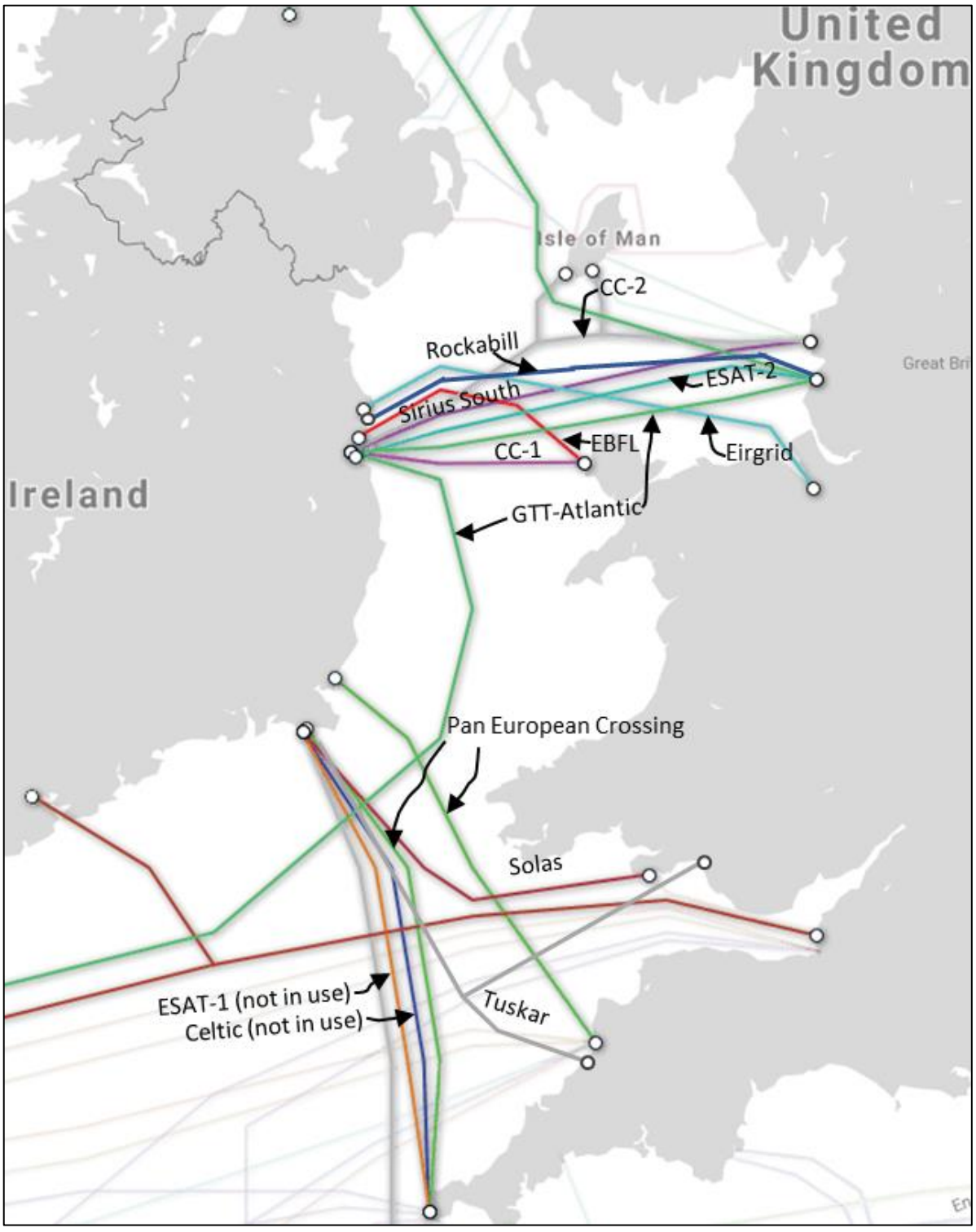


Figure 2: Map of cable routes connecting Ireland to UK

3.2 Ireland to North America

There are three transatlantic subsea telecommunication cables providing connectivity between Ireland and North America and one cable currently being deployed as shown in Table 2.

Table 2: Subsea cables connecting Ireland to North America

Subsea Cable	Owner/Developer	RFS	Landing	Status
GTT Atlantic	GTT	2001	Dublin, Coleraine (N.I.), Halifax (Canada), Lynn (UK), Southport (UK)	**Legacy Built**
GTT Express (spur)	GTT	2015	Cork, Halifax (Canada), Brean (UK)	**Next Generation Built**
America Europe Connect 1	AquaComms	2016	Killala, New York	
Havfrue / America Europe Connect 2 (spur)	AquaComms consortium	2021	Old Head Westport, New Jersey (US)	**Currently being deployed**

The transatlantic cables in Figure 3 that connect to Ireland are *GTT Atlantic*, *AEC-1* and a spur on the *GTT Express* system. The new *Havfrue/AEC-2* transatlantic cable which connects North America to Denmark has a spur currently being deployed to connect to Old Head Beach, Mayo as shown in Figure 4. The remainder of the *Havfrue* cable connecting Denmark and the US has been completed (without the landing in Ireland) and became operational in November 2020.

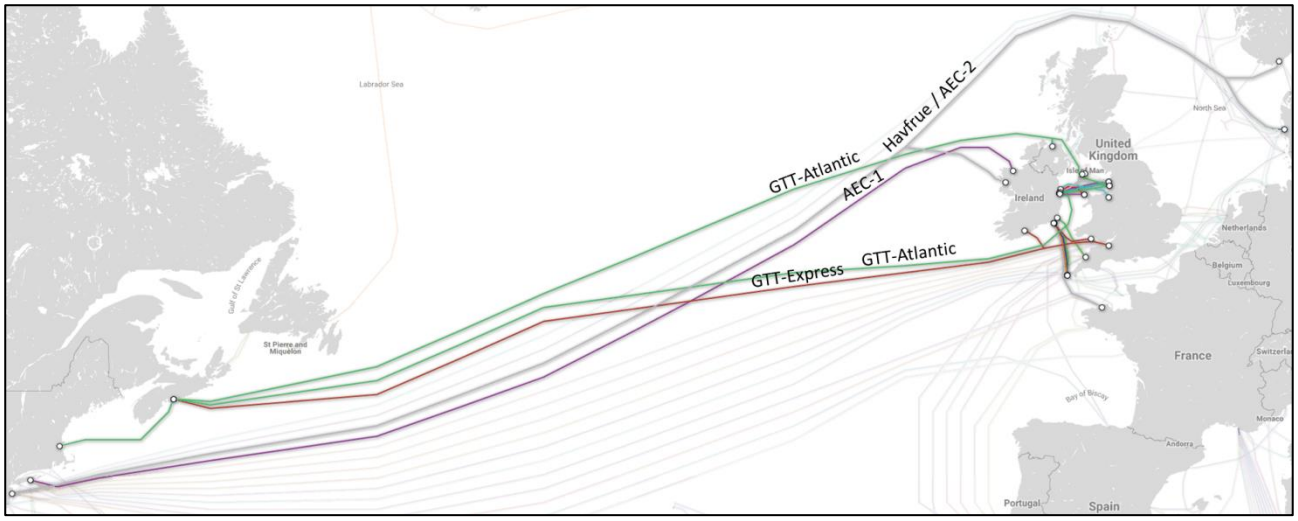


Figure 3: Transatlantic cable routes connecting Ireland to North America

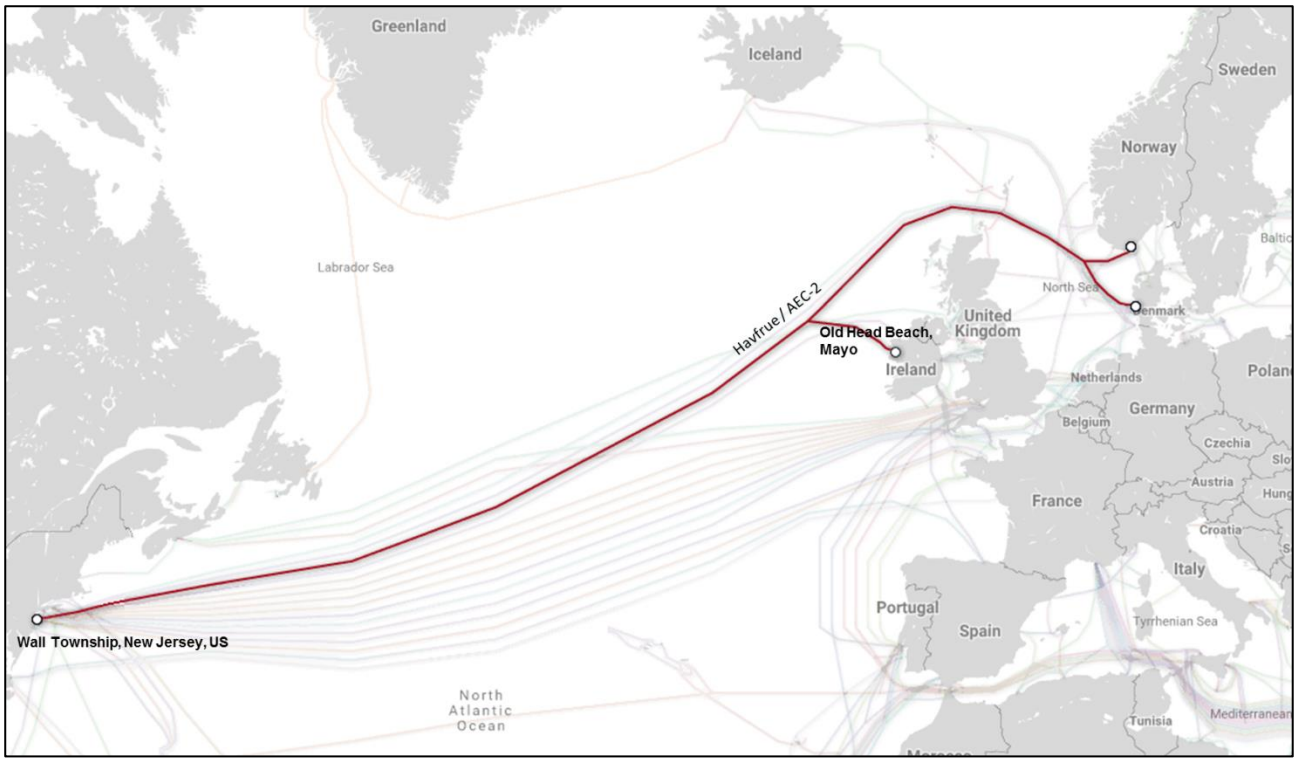


Figure 4: Transatlantic cable *Havfrue/AEC-2* connecting North America to Denmark with spur to Ireland

3.3 Ireland to Europe

Ireland currently has no direct connectivity to mainland Europe. All of Ireland's connectivity transits the UK. The spur off the *Havfrue* transatlantic system which is currently in deployment will provide some level of connectivity from Ireland to Denmark and Norway. However, this is a spur from a transatlantic system rather than a dedicated European regional cable system. Other planned cable projects from Ireland to Europe are shown in Table 3.

Table 3: Planned subsea cable projects connecting Ireland to European countries

Subsea Cable	Owner/Developer	RFS	Landing	Status
Havfrue / America Europe Connect 2 (spur)	AquaComms consortium	2021	Old Head Westport, Blaabjerg (Denmark), Kristiansand (Norway)	**Currently being deployed**
IRIS	Farice	2022	Galway, Molvik (Iceland)	
Pisces	DeepSea Fibre	2022	Dublin, Galway, Lisbon, Nantes, Bilbao	**Planned**
Celtic Norse	Eidsiva consortium	2023	Dublin, Scotland, Norway	
Eirgrid Celtic Interconnector	Eirgrid/RTE	2026	Cork, France	

The *IRIS* cable from Galway to Iceland to be installed in 2022 will also provide connectivity from Ireland to Denmark via the *IRIS* system to Iceland and the existing *DANICE* system from Iceland to Denmark (see Figure 5). The marine survey for this route was carried out in September 2020.

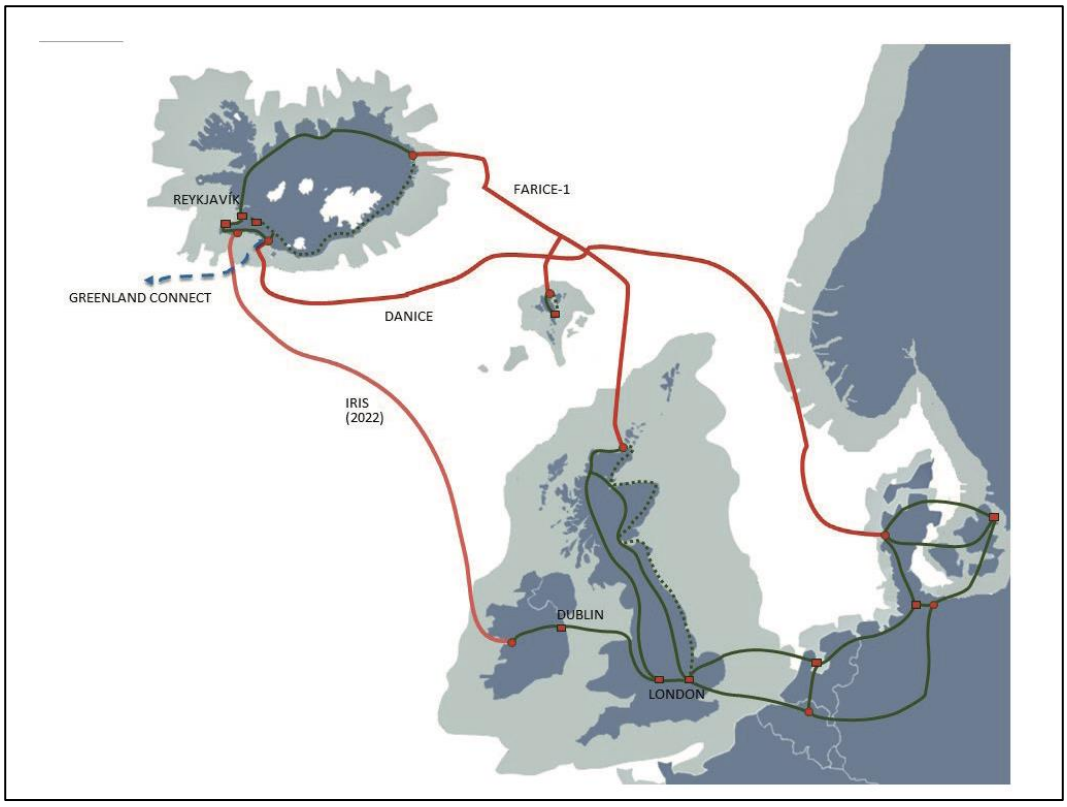


Figure 5: *IRIS* cable currently being deployed and existing *DANICE* system connecting Ireland to Iceland and onwards to Denmark

3.3.1 Celtic Interconnector planned

The planned *Celtic Interconnector* project which is up for decision in September 2022 will create a direct electrical interconnection between Ireland and France to allow the exchange of electricity between the two countries. It is being developed by EirGrid and its French counterpart, RTE (Réseau de Transport d'Électricité). A fibre telecommunications cable would be laid along side the electricity interconnector which would provide a direct link from Ireland to mainland Europe. This represents a strategically important connectivity route for Ireland. The project is currently at detailed design stage with a decision to proceed expected in September 2022. The planned completion date of cable construction is the end of 2025 with ready for service in early 2026. The route of this cable is shown in Figure 6.

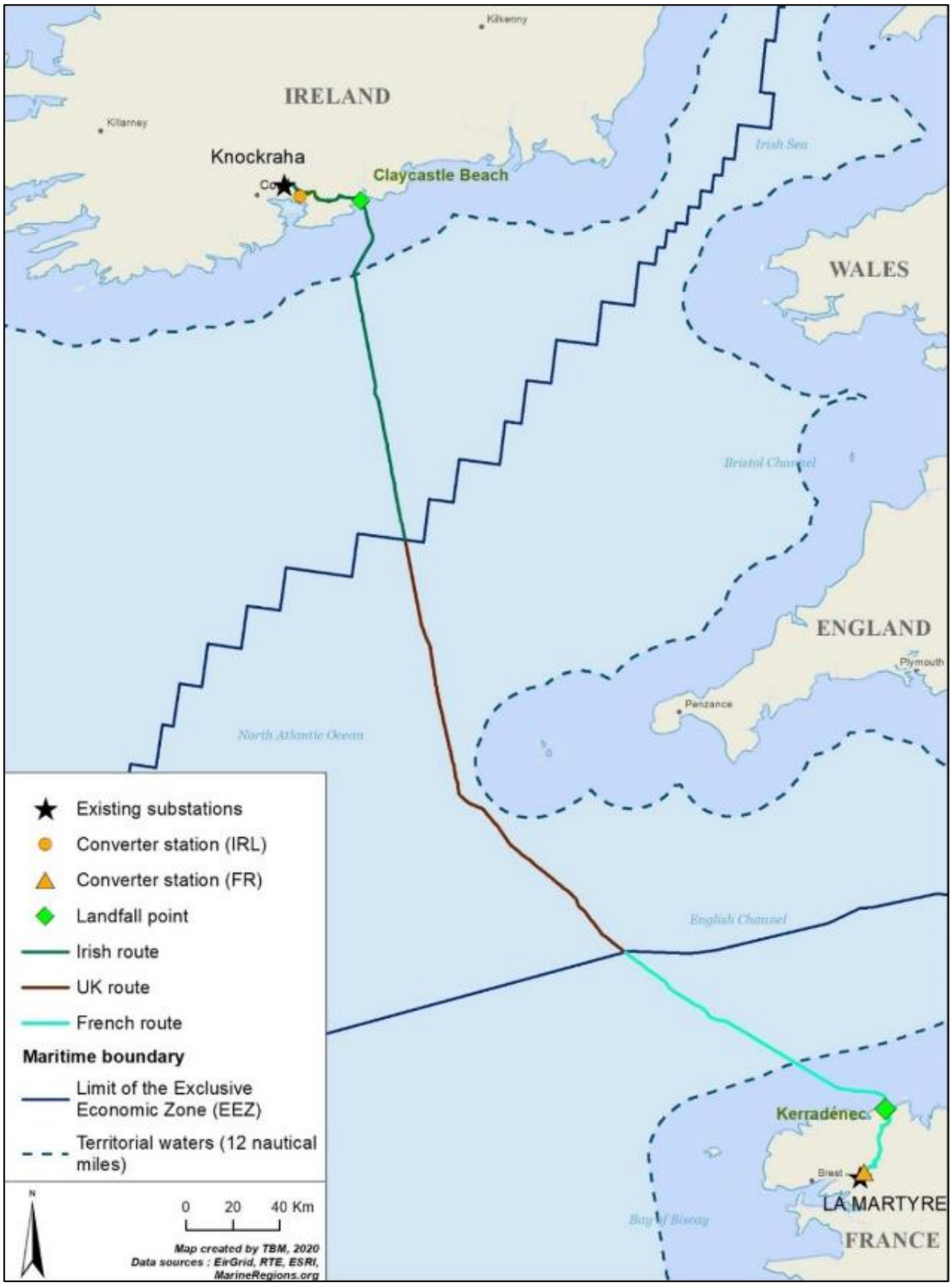


Figure 6: Planned *Celtic Interconnector* from Ireland to France which includes a fibre telecommunications cable (Source: Eirgrid)

3.3.2 Other projects planned

There are two prospective cable projects where the application process has not commenced or funding has not been secured. One of these projects is called *Celtic Norse* which would connect Killala, Mayo to Norway with a planned installation date of late 2022 and anticipated RFS date in late 2023. The application process has not commenced for this route which is shown in Figure 7.

Figure 7: Planned cable *Celtic Norse* connecting Ireland to Norway

Another prospective cable project called *Pisces* would connect Galway to Lisbon (Portugal) with a spurs to Nantes (France) and Bilbao (Spain). The indicative RFS date for the main leg is late 2022. However the application process is at an early stage and funding has not been secured at this point. The cable route is shown in Figure 8.

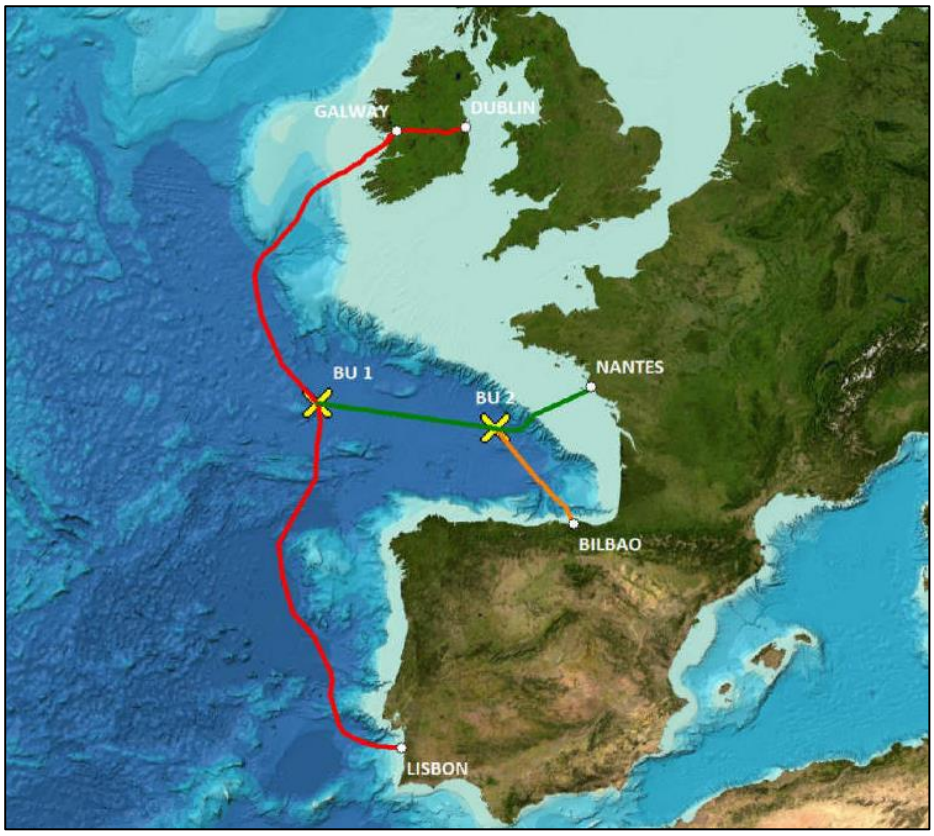


Figure 8: Planned cable *Pisces* connecting Ireland to Lisbon with spurs to Nantes and Bilbao

4 Consultation responses and main themes

4.1 Submissions received

There were 9 responses received of which 8 were from companies and one from an individual. The companies who made submissions were:

1. Aqua Comms
2. BT
3. DeepSea Fibre Networks
4. [Redacted]
5. HEAnet
6. IDA
7. Microsoft
8. Vodafone (partial submission received)

4.2 Main themes

The themes that were observed in the consultation responses have been divided into four distinctive groups which are:

1. Emergence of new opportunity to establish Ireland as a key hub for international connectivity
2. Licencing, permits and other commercial barriers
3. Risk to transatlantic capacity
4. Forum for submarine cable industry and engagement with Government

There was a consistency in the responses across the main themes identified. Table 4 provides a summary of the correlation of responses to the main themes.

Table 4: Correlation of responses to the main themes identified

Correlation of responses to main themes									
	Aqua Comms	BT	Deep Sea Fibre	[Redacted]	HEAnet	IDA	Microsoft	Voda-fone*	Individual
Theme									
1	●	●	●	●	●	●	●		●
2	●	●	●	●	●	●	●		●
3	●	●	●	●	●	●			
4	●	●							

*Vodafone submission was limited to fibre capacity figures only

The remainder of this section provides more detail on the main themes that were identified.

Theme 1 - Emergence of new opportunity to establish Ireland as a key hub for international connectivity

1A. Central hub for international connectivity opportunity

There is an opportunity to position Ireland as a central hub in an East - West corridor that connects North America to Ireland which could then feed through to the North – South corridor to mainland Europe with onward connection to the Southern Hemisphere. The *HAVFRUE* and *IRIS* cables currently being deployed will provide two routes from Northern Europe to Ireland. It is of strategic national importance that this connectivity is put in place and any barriers to make this happen should be addressed. To take advantage of the central hub opportunity, a connection from Ireland to Southern Europe is required to complete the missing leg as shown in Figure 9 and Figure 10. The shortest route (lowest latency) to connect to the North – South corridor from North America would be to land in Ireland. This would establish Ireland as a central hub for transatlantic connectivity as described in Theme 3.

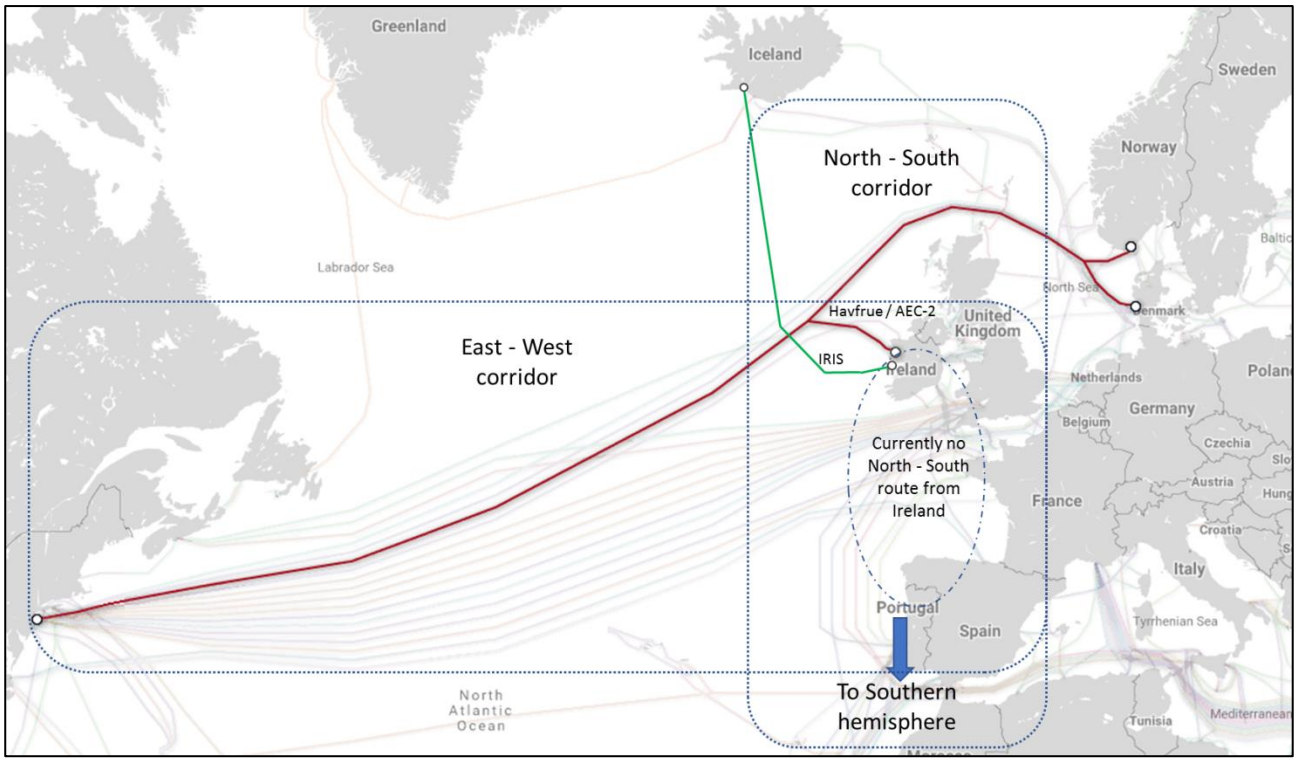


Figure 9: Illustration depicting the opportunity to develop Ireland as a central hub

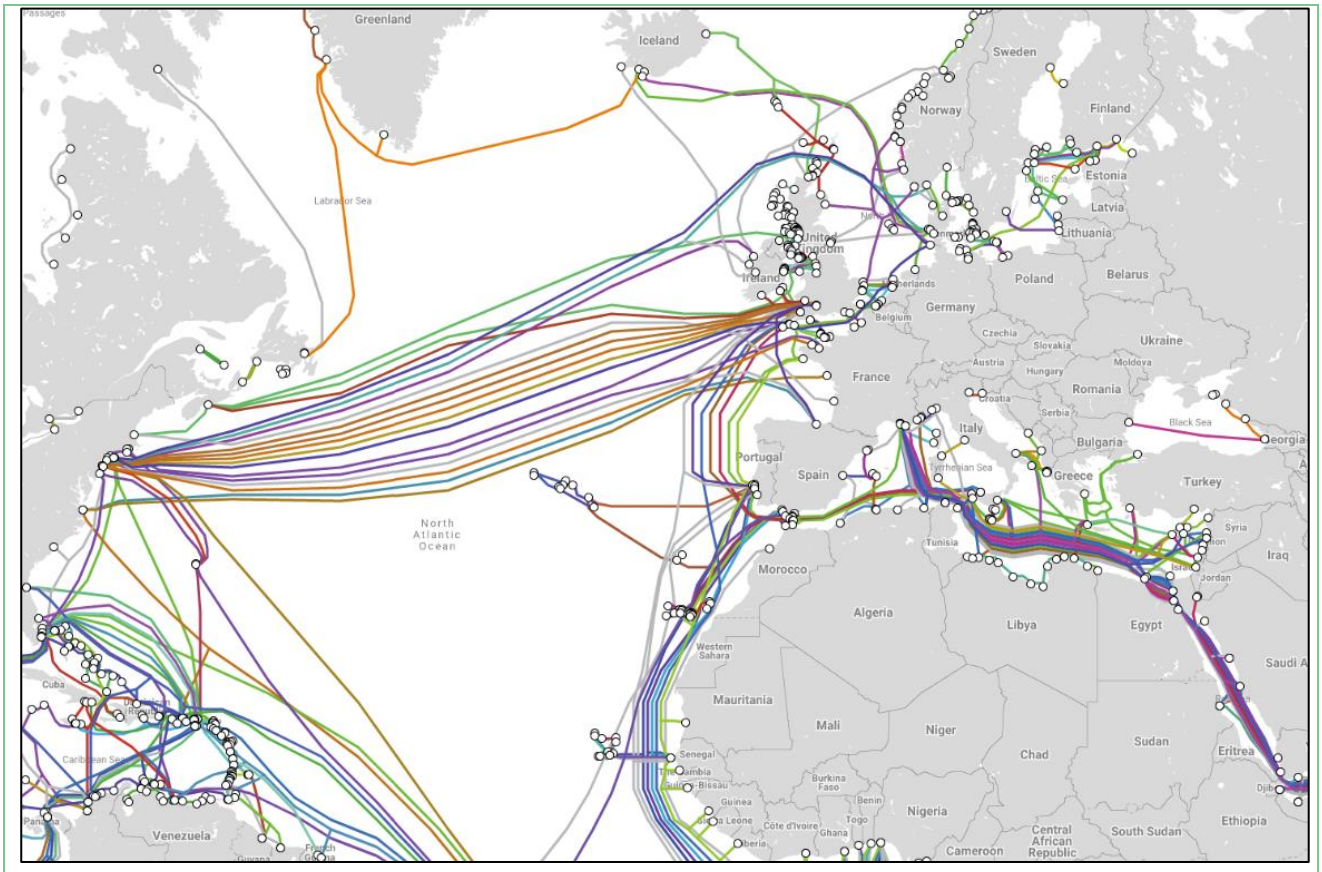


Figure 10: Connectivity to Global routes in Southern Hemisphere via North – South corridor

1B. Direct connectivity to Northern Europe

Ireland currently has no direct connectivity to continental Europe. All of Ireland's connectivity transits the UK. The spur currently being deployed off the *HAVFRUE* transatlantic system (RFS 2021) will provide some level of connectivity from Ireland to Norway/Denmark. However, this is a spur from a transatlantic system rather than a dedicated European cable system.

The *IRIS* cable currently being deployed from Galway to Iceland (RFS end 2022) will also provide connectivity from Ireland to Denmark via the *IRIS* system to Iceland and the existing *DANICE* system from Iceland to Denmark. However, even with the HAVFRUE spur and the new IRIS system in place by the end of 2022, it does not adequately address the requirements of direct international connectivity between Ireland and mainland Europe. The planned *Celtic Norse* from Ireland to Norway (RFS end 2023) has not yet commenced the application process and it's therefore too early to conclude if the project will materialise.

1C. Direct connectivity to Southern Europe

The Eirgrid *Celtic Interconnector* fibre is pending a decision to proceed in September 2022 and would not be commissioned until 2026 which does not address the immediate concerns. The planned *Pisces* project as described in section 4 is at an early stage in the application process and funding has not been secured to proceed at this point.

1D. Ageing of cables

Almost half of the submarine cables that currently land in Ireland have been in operation for twenty years or more and are close to the end of their design lives (20-25 years). Therefore there is a higher risk that these cables will be taken out of service in the foreseeable future. Direct connectivity to Europe provides greater diversity and therefore mitigates the impact of cables being retired on other routes.

1E. Brexit

Brexit is an unknown and the impacts are difficult to decipher at this point other than the uncertainty that it has created. The lack of direct connectivity to mainland Europe may be exacerbated by Brexit. However this creates an opportunity for Ireland, as an EU westerly location, to land transatlantic cables for data traffic bound for Ireland or other EU states. Data centres and submarine cables, as the main building blocks of infrastructure, offer the potential to further develop the IT industry ecosystem in Ireland and position Ireland as an international gateway hub between North America and mainland Europe.

1F. The EU prioritisation of international connectivity

The European Commission has in March 2021 presented a Communication *'2030 Digital Compass: The European way for the Digital Decade'* which sets a vision, targets and avenues for a successful digital transformation of Europe by 2030, which will set the tone and ambitions for the next decade.

The Communication goes on to emphasise that Europe's digital leadership and global competitiveness will be dependent on strong internal and external connectivity and inform outreach and international engagement, particularly in light of the emergence of data gateways around the EU's periphery. In that regard, the Commission highlights the importance of improving connectivity not only within the EU but also with external partners including via terrestrial and subsea cables, with a stated intention to increase the number of digital alliances and partnerships with a connectivity component.

Theme 2 – Licensing, permits and other commercial barriers

2A. Process of foreshore licencing and permitting

The respondents to the consultation indicated that Ireland has a relatively lengthy permitting system under the Foreshore Act where it can typically take from 3-4 years before a system can be installed. In the absence of an efficient process, the current licencing regime is likely to continue to be a major barrier for industry to advance submarine cable projects in Ireland. This issue will be largely addressed via the Maritime Area Planning (MAP) Bill once enacted (mid 2021).

2B. Interaction with other sectors

The successful development and co-existence of multiple sectors will be important for the future of connectivity to Ireland. The presence of a clear but flexible plan that facilitates the competing demand for space on the seabed will be vital to this effort. This will be largely addressed under the Marine Spatial Plan arising under the National Marine Planning Framework.

2C. Foreshore license costs

A number of respondents pointed out a substantial cost differential in foreshore licence fees between Ireland and other European countries (excluding the UK). This puts Ireland at a disadvantage when investment decisions for submarine cable projects in Europe are being considered by industry. DECC will engage with the Department of Housing, Local Government and Heritage and the Valuation Office with regard to the charging regime to be applied under the MAP Bill once enacted.

2D. Backhaul routes

It is considered that the high cost due to lack of competition in the backhaul dark fibre market in Ireland are current issues. The backhaul market is regulated and regularly reviewed by ComReg. The feedback will be given to ComReg for their consideration.

Theme 3 – Risk to transatlantic capacity

3A. Greater transatlantic fibre availability

The fibre availability on existing transatlantic cables is not deemed sufficient to meet demand over the next 5 to 10 years. The *HAVFRUE* cable currently being deployed will provide improved capacity, however this is a spur off the main route from North America to Denmark. To future proof the hugely important ICT business in Ireland, we need to ensure that there is available capacity and diversity of routes on the Atlantic to meet growing demands over the next 5 to 10 years.

3B. Opportunity for Ireland as a gateway to mainland Europe (shortest route)

Leveraging Ireland's Westerly location as a first European landing ground for transatlantic cables from North America is an opportunity for Ireland. As a proven and growing location for data centre facilities and world-leading Internet and technology companies, the opportunity is ripe for Ireland to extract increased value and diversity in terms of meeting a growing demand for transatlantic connectivity. This opportunity links to Theme 1A described above. By promoting Ireland as the shortest route from North America to Europe (offering lowest latency) and having direct connectivity to mainland Europe, it is likely to be more attractive for the submarine cable industry and investors to land transatlantic cables in Ireland.

Theme 4 – Forum for submarine cable industry and engagement with Government

4A. Forum for submarine cable operators and engagement with Government

The establishment of a forum for submarine cable operators was among the proposals in the submissions to the consultation. The forum would provide a voice for the industry to interact with Government and provide feedback on any major challenges. It is envisaged that the forum would have regular engagement with Government and regulatory bodies in order to continually address barriers to the development of submarine cable projects.

The Department of Housing, Local Government and Heritage currently hosts a forum for such operators and DECC will engage with that Department in relation to the possibility of co-hosting said forum, or establishing a new, policy-focused forum residing in DECC.

5 Conclusion and Recommendations

The consultation responses indicate that there are varying requirements on the three main categories of cable routes i.e. Ireland to UK, Ireland to North America and Ireland to Europe. The Ireland to UK category is deemed to have sufficient capacity and diversity of routes for at least the next 10 years although the ageing of cables on this route needs to be closely monitored. In the Ireland to North America category, the responses highlight that fibre availability on existing transatlantic cables is not deemed sufficient to meet demand over the next 5 to 10 years.

In the Ireland to Europe category, there is currently no direct connectivity to mainland Europe and this is seen as an area for development. There are two projects currently being deployed and a further three prospective projects up to 2026 as shown in section 4.3 which will provide direct connectivity from Ireland to mainland Europe and the Department will continue to monitor these projects as they materialise.

The main themes that were observed in the consultation are described in section 4. Recommendations on the next steps to further progress these themes are provided in the remainder of this section.

5.1 Theme 1 recommendations

Theme 1: Emergence of new opportunity to establish Ireland as a key hub for international connectivity

The Theme 1 recommendations are:

- The Eirgrid *Celtic Interconnector* fibre should be completed at the largest scale possible within technical limits and measures be put in place to safe guard its deployment
- The State should establish a project that is tasked with securing international connectivity directly with mainland Europe (both Northern and Southern Europe) through the State subsidisation (where necessary and appropriate) of subsea fibre cables
- The strategy of establishing Ireland as an international hub is further developed by this team and further recommendations are developed to advance this policy
- Direct connectivity to mainland Europe provides greater diversity and therefore mitigates the impact of ageing cables being retired on other routes (i.e. half of the cables on Ireland to UK route are close to the end of their design lives). The risk of ageing cables that may be taken out of service should continue to be monitored in the interim

- Ireland (DECC) should continue to engage proactively at EU level on EU initiatives to encourage strengthening of the EU's international connectivity including subsea cable connectivity, in alignment with Ireland's own focus on boosting our own connectivity within the EU and globally.

5.2 Theme 2 recommendations

Theme 2: Licencing, permits and other commercial barriers

It is understood that there is a need for a more streamlined and holistic regulatory process applicable to the management and development of telecommunications cables in the marine space. Such a process should be transparent and have clearly-defined clearance and approval timelines, thus enabling project developers to secure both investment and other required resources well in advance of the commencement of a project. The forthcoming Maritime Area Planning Bill, which is being designed in alignment with the National Marine Planning Framework (which is due for formal Government approval on the 23rd of March 2021), will fundamentally transform how Ireland manages maritime area consent and development management consent for all sectors, including subsea telecommunications projects in the maritime area. It is being is being developed and led by the Minister for Housing, Local Government and Heritage.

It will replace existing State and development consent regimes and streamline arrangements on the basis of a single consent principle, i.e. one State consent (Maritime Area Consent) to enable occupation of the Maritime Area, and one development consent (planning permission), with a single environmental assessment. Telecommunications subsea cable project developments will now fall under the new consenting regime under the Bill. This will provide an opportunity for creation of a more efficient end-to-end process in respect of the licencing of such subsea projects.

The Theme 2 recommendations are:

- DECC should continue to provide input as required into the development of the proposed marine consenting regime aspects of the MAP Bill, and in doing so will take consideration of the feedback received from key stakeholders, especially from Industry, as part of the consultation
- The issue of high cost of backhaul in the dark fibre market, as noted in the consultation submissions, will be raised with the Commissioners of ComReg.

5.3 Theme 3 recommendations

Theme 3: Risk to transatlantic capacity

The Theme 3 recommendations are:

- The *Havfrue/AEC-2* cable is completed and barriers hindering the project should be addressed as soon as possible
- The transatlantic routes should continue to be monitored to ensure sufficient availability of fibre to meet demand
- If the opportunity for Ireland in becoming a central hub is realised (as described in section 5.2), it is likely to make the investment decision more attractive for the submarine cable industry and investors to land transatlantic cables in Ireland. However this will need to be closely monitored.

5.4 Theme 4 recommendations

Theme 4: Forum for submarine cable industry and engagement with Government

The Theme 4 recommendations are:

- A policy-focused forum should be established for the submarine cable industry. The forum would provide a voice for the industry to interact with policy makers and provide feedback on any challenges, barriers or recommendations to improve or innovate within the sector. The Department of Housing, Local Government and Heritage currently hosts a forum for such operators and DECC will engage with that Department in relation to the possibility of co-hosting said forum, or establishing a new, policy-focused forum residing in DECC.