MWP

in association with

Raymond Burke Consulting

Cost Benefit Analysis

Revised Deep Water Berth at Rossaveel Fishery Harbour Centre

Department of Agriculture, Food and the Marine

2nd December 2022

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
17648	17648-6109	A	23/08/2021	R Burke	R Burke	P Parle	DRAFT
17648	17648-6109	B	11/10/21	R Burke			Not Issued
17648	17648-6109	C	12/11/21	R Burke	R Burke	P Parle	Draft final
17648	17648-6109	D	15/11/21	R Burke	R Burke	P Parle	Draft final
17648	17648-6109	E	18/11/21	R Burke	R Burke	P Parle	Draft final
17648	17648-6109	F	27/01/22	R Burke	R Burke	P Parle	Final
17648	17648-6109	G	2/12/22	R Burke	R Burke	P Parle	Final

MWP, Engineering and Environmental Consultants
Address: Park House, Bessboro Road, Blackrock, Cork, T12 X251
www.mwp.ie

Contents

Appendices

Executive Summary

Planning Permission was granted by Galway County Council in April 2018 for a Deep Water Berth at Rossaveel Fishery Harbour Centre to cost some €29.2 million in 2017 prices in accordance with a design prepared by Mott MacDonald. A Cost Benefit Analysis was finalised by DKM Economic Consultants in June 2017 that found that there was a strong economic case for the development to proceed.

Subsequently, the Department of Agriculture, Food and the Marine (DAFM) commissioned Gavin and Doherty Geosolutions Ltd (GDG) to carry out a peer review on the design completed by Mott MacDonald. The GDG Report proposed a number of design options with the following initial costs.

Design Option	Total Cost based on -12.0m CD berth slot and 200m dia. turning circle	Total Cost based on -12.0m CD berth slot and 150m dia. turning circle	Total Cost based on -10.0m CD berth slot and 150m dia. turning circle
1	€29,293,572.50	N/A	N/A
2A	€21,304,182.90	€20,398,497.90	€19,022,667.90
2B	€21,090,720.50	€20,185,035.50	€18,809,205.50
2C	€18,973,220.50	€18,067,535.50	€16,691,705.50
3	€21,006,705.50	N/A	N/A

In late September 2021, Gavin and Doherty Geosolutions Ltd (GDG) issued a draft Numerical Modelling Report, updated in November 2021, on the Rossaveel Deepwater Quay which indicated that the cost estimate for the open piled quay option is now €25.6m. Their Report also updated the cost estimates based on the -10.0m CD berth slot and 150m dia. turning circle options presented in their earlier Report.

These costs are summarised below.

Design Option	Option Description	Total Cost
2A	Rock ledge profile & smaller caisson units	€24.0m
2B	Rock ledge profile & “L” Wall structure	€22.6m
2C	Rock ledge profile & mass concrete retaining wall	€21.0m
3	Ruukki Pile type retaining wall	€23.3m
4	Open Piled Quay Wall	€25.6m

The Open Pile Quay Wall option cost of €25.6 million was the amount used in estimating the Socio-Economic Impact of the development of the harbour. However, it should be noted that the CBA has been undertaken based on an open quay structure to demonstrate the economic case for a potential worst case scenario (i.e. most expensive feasible option). The actual structure constructed will be decided at the detailed design stage. A 20 per cent reduction in the Capital Cost to €20.5 million would increase the Benefit Cost Ratio by up to 0.5 depending on the volume and mix of landings.

In mid 2021, DAFM commissioned Malachy Walsh and Partners (MWP) to review and update the DKM Cost Benefit Analysis on the basis of the updated costs.

Malachy Walsh and Partners requested Raymond Burke Consulting (RBC) to carry out the CBA on its behalf and DAFM approved this arrangement.

The key findings of this outline Cost Benefit Analysis are as follows:

- Rossaveel is the only fishing port between Dingle and Killybegs and thus is the best located for fishing fleets operating off the west coast of Ireland
- However, it is located in a remote area of the local Gaeltacht that has a range of socio-economic challenges
- The provision of a deep-water berth at Rossaveel would address a range of opportunities including:
    - Catering for landings from foreign vessels
    - Landings by Irish vessels currently landing at Irish and non-Irish ports
    - Enabling the servicing of potential offshore windfarms
    - Reducing congestion and delays to entry because of insufficient water depths
    - Mitigating health and safety risks
    - Facilitating increased cargo landings
    - Acting as a port of refuge
- The economic well-being of Rossaveel is very much inter-twined with the fortunes and future of the Fishery Harbour Centre
- Iasc Mhara Teo is the only industry based in Rossaveel; it is currently closed and its recovery and future as a processing plant are very much dependent on the development progressing. New landings at Rossaveel should see the reactivation of the Iasc Mara Teo fish processing plant and the employment of many local people generating income for the region
- Increased traffic will also result in a growth in local spending by local and foreign vessels in the Rossaveel area. This relates to fuel supplies, food purchases, vessel maintenance, hospitality etc.
- The additional quay space will also facilitate local maritime industry to expand and grow
- The development offers the opportunity to rebalance the West region economy, revitalise the Rossaveel coastal economy and address the BREXIT quota consequences on the fishery sector
- Government policy, as set out in Food Wise 2025, notes that there is a need to develop and initiate practical and competitive measures to attract additional landings into Irish ports and continue to invest significantly in necessary infrastructure at the Fishery Harbour Centres ensuring that sufficient quay space and draught is available to avoid queuing and to facilitate quick vessel turnaround at the ports
- In addition, it is Government policy to encourage, promote and grow local fish processing by fish caught and landed by foreign vessels
- It also supports the goals of the Government's Policies laid out for Coastal Communities in the document: *Our Rural Future: Rural Development Policy 2021 -2025*
- According to the SFPA, in 2020, almost 3,100 tonnes of fish were landed at Rossaveel with a value of some €11.1 million
- Of that 3,100 tonnes, approximately 250 tonnes were landed by foreign vessels

- There is a local fleet of 18 vessels that operate out of Rossaveel that increases to about 35 vessels during the busy season
- An initial outline Cost Benefit Analysis was carried out on the proposed development in accordance with the Public Spending Code that incorporates a Financial Appraisal and an Economic Appraisal
- The socioeconomic CBA takes the net cash flows from the financial appraisal, adjusts them to shadow prices (i.e. true economic prices) including a 30 per cent premium for the shadow price of public funds, and adds the wider economic benefits and the external costs to the calculation. It then applies a social discount rate of 4% real over a timeframe of 20 years
- The Financial Case evaluates the project from the point of view of Rossaveel FHC, while the socioeconomic CBA evaluates it from the point of view of society as a whole
- The three Performance Metrics measured were the Net Present Value (NPV) in €m at constant prices over a 20 year timeframe; the Internal Rate of return (%) and the Benefit Cost Ratio (BCR)
- The elements that make up the Economic Cost Benefit Analysis are:
  - Capital Expenditure including Residuals incorporating Shadow Price of Public Funds
  - Less Operating and Maintenance Costs
  - Incremental Revenue to Rossaveel FHC from fishing catch not currently being landed at any Irish port (but excluding fish that would have been landed at Roosaveel that did not require the development to proceed)
  - Shadow Price of Labour
  - Added Value from local Fish Processing of Irish catch
  - Added value of fish caught and sold locally
  - Added Value from local Spend by landing Vessels at Rossaveel
- The principal risks facing the success of this development relate to
  - Failure to secure anticipated fish catch volumes
  - Diversion to alternative ports without local processing
  - Difficulties with processing anticipated volumes
  - CAPEX increase and/or programme over-running
- Fundamental to the business case for the proposed development is that all landed Irish fish are processed locally; foreign landings are unlikely to be processed locally
- The CBA on the Core Option, which incorporates additional landings of some 5,000 tonnes of primarily pelagic catch annually by foreign vessels and 3,000 tonnes of additional catch from vessels of the Irish fleet, provides the following results on the assumption that only the Irish catch is processed.

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-16.8	-1.8	0.1
Economic Analysis	14.2	7.7	1.6
Exchequer Impact	-10.4	-2.3	0.8

  It should be noted that the achievement and sustaining of the additional foreign landings is very much dependent on having a good local Agent in place to service the foreign vessels

- Discussions with BIM supported these projections and confirmed that these annual projections were not unreasonable

- Any local processing of foreign landings would improve the economic return
- However, if the Irish landings of 3,000 tonnes are purely ***displaced*** catch from other Irish ports, then, in accordance with the principles of the Public Spending Code, the economic impact of these landings should be excluded and the resultant CBA would show a Benefit/Cost Ratio of less than one
- In this particular case, notwithstanding that the Irish fish landings are displaced landings from another Irish port, from a purely Rossaveel FHC perspective, it could be argued that the economic benefits noted under the Core Option are the benefits generated locally from the proposed development
- An option examined was a decrease in the annual average Irish landings to 2,000 tonnes. This generated the following results:

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-17.0	-1.9	0.1
Economic Analysis	4.0	5.1	1.2

- Because of the uncertainty that surrounds all forecasting exercises, the scenario where Capital Costs have been increased by 10 per cent in the Core Option was also examined as follows:

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-18.6	-1.9	0.1
Economic Analysis	12.0	6.9	1.5

- Increasing the Core Option costs by 40 per cent, an extreme case, resulted in the following:

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-24.2	-2.0	0.1
Economic Analysis	5.4	5.0	1.2

- This analysis highlights the sensitivity of CAPEX to the economic analysis but, in all cases, resulted in a benefit /cost ratio in excess of 1.
- Excluding any landings by foreign vessels, an incremental volume of the order of 1,600 tonnes of Irish vessel landed fish annually and processed locally is required to break-even on the proposed CAPEX. It is generally believed that such volumes are achievable
- The overall economic impact of the proposed development as set out under the Core Option may, in fact, be an under-estimate as it should be noted that a prudent and conservative approach has been adopted to projecting expected landings
- Rossaveel has been recognised, because of its location, to be of great strategic importance in servicing both floating and fixed offshore windfarms such as the Sceirde Offshore Wind Energy Farm, recently acquired by the Australian-based multinational, Macquaries' Green Investment Group, that are expected to give rise to many direct and indirect jobs, and significant local spend. This spend is likely to amount to many millions of Euro annually much of which will support the Rossaveel and surroundings economies. These developments alone would justify the provision of the deep-water berth
- A report prepared by Dublin Offshore Consultants Ltd for Udaras na Gaeltachta confirms that Ros a Mhíl has the potential to play an important role supporting the significant pipeline of Floating Offshore Wind on the West Coast of Ireland. Its combined attributes of proximity to offshore project locations and consented deepwater harbour infrastructure provide the opportunity for cost effective entry into the offshore energy market for the Port

- Serious consideration should be given to the co-development and funding of the proposed development with Udaras na Gaeltachta/Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media because of their joint interest in and because of the benefits that will accrue to the stakeholders of each

The overall analysis confirms that there is a business case for the proposed development and that the new berth would be a catalyst for the socio-economic regeneration of Rossaveel and its regional environment.

1. Introduction

1.1 Overview

Planning Permission was granted by Galway County Council in April 2018 for a 200 metre Deep Water Berth to cost some €29.2 million in 2017 prices at Rossaveel Fishery Harbour Centre in accordance with a design prepared by Mott MacDonald. A Cost Benefit Analysis of the project was finalised by DKM Economic Consultants in June 2017 that found that there was a strong economic case for it to proceed.

Subsequently, the Department of Agriculture, Food and the Marine (DAFM) commissioned Gavin and Doherty Geosolutions Ltd (GDG) to carry out a peer review on the design completed by Mott MacDonald. The GDG Report proposed a number of design options with the following costs.

Design Option	Total Cost based on -12.0m CD berth slot and 200m dia. turning circle	Total Cost based on -12.0m CD berth slot and 150m dia. turning circle	Total Cost based on -10.0m CD berth slot and 150m dia. turning circle
1	€29,293,572.50	N/A	N/A
2A	€21,304,182.90	€20,398,497.90	€19,022,667.90
2B	€21,090,720.50	€20,185,035.50	€18,809,205.50
2C	€18,973,220.50	€18,067,535.50	€16,691,705.50
3	€21,006,705.50	N/A	N/A

In late September 2021, Gavin and Doherty Geosolutions Ltd (GDG) issued a draft Numerical Modelling Report, updated in November 2021, on the Rossaveel Deepwater Quay which indicated that the cost estimate for the open piled quay option is now €25.6m.

It built on previous studies and design work and addresses specific issues that have arisen in relation to the potential impacts of locally generated waves incident on the proposed quay.

A breakdown of the agreed option cost is as follows:

Key Element of Works	Description	Estimated Costs €m
Dredging	Rock and overburden dredging incl. rock slope formation and material re-use and handling	€6.3
Quay Wall Structures	Open-piled construction incl. mobilisation, both drilled tubular piling and sheet piling works	€10.2
Concrete Elements	Reinforced concrete quay slab, concrete pavement and vertical boundary walls	€3.1

Reclamation Fill	Imported rockfill, rock armour revetments and Clause 804 for access road	€5.4
Ancillary Civils Works	Various items incl. drainage, services, perimeter fencing, high mast lighting and marine fendering	€0.8
TOTAL COSTS		**€25.6**

Their Report also updated the cost estimates based on the -10.0m CD berth slot and 150m dia. turning circle option presented in their earlier Report.

These costs are summarised below.

Design Option	Option Description	Total Cost
2A	Rock ledge profile & smaller caisson units	€24.0m
2B	Rock ledge profile & "L" Wall structure	€22.6m
2C	Rock ledge profile & mass concrete retaining wall	€21.0m
3	Ruukki Pile type retaining wall	€23.3m
4	Open Piled Quay Wall	€25.6m

The Open Pile Quay Wall option cost was the amount used in estimating the Socio-Economic Impact of the development of the harbour. However, it should be noted that the CBA has been undertaken based on an open quay structure to demonstrate the economic case for a potential worst case scenario (i.e. most expensive feasible option). The actual structure constructed will be decided at the detailed design stage. A 20 per cent reduction in the Capital Cost to €20.5 million would increase the Benefit Cost Ratio by up to 0.5 depending on the option.

DAFM commissioned Malachy Walsh and Partners (MWP) to review and update the DKM Cost Benefit Analysis on the basis of the original updated costs, which were subsequently replaced by the most recent costs.

In addition, there was a requirement to review the CBA Report previously carried out by DKM Economic Consultants Ltd.

Malachy Walsh and Partners requested Raymond Burke Consulting (RBC) to carry out the CBA on its behalf and DAFM approved this arrangement.

1.2 Rossaveel Fishery Harbour Centre

1.2.1 Summary Profile

Rossaveel (Ros an Mhíl), located in the Connemara Gaeltacht, is the largest and busiest port in County Galway and acts as the main base for the Galway and Aran Co-op fishing fleet. As well as being a busy fishing port, its proximity to the Aran Islands also makes Rossaveel FHC invaluable to the residents of the islands and acts as a catalyst for the development of the island based tourism industry. Rossaveel is located, approximately 40 kilometres to the west of Galway city, within the functional area of Galway County Council.

Map 1.1: Map showing location of Rossaveel Fishery Harbour Centre

Rossaveel FHC is a distinct harbour authority and designated fishery harbour centre managed by the Department of Agriculture, Food and the Marine (DAFM), under the Fishery Harbour Centres Acts.

The next FHC to the south of Ros an Mhíl is Dingle, approximately 90 nautical miles, and to the north is Killybegs, 120 nautical miles away.

Rossaveel FHC has some 215 metres of quay and an ice plant. Maximum draft is 8 metres.

A report prepared by Oxford Economics in 2018 for BIM, entitled *The Economic Impact of the Seafood Sector: Ros a Mhil*, found that the total economic contribution of the seafood sector at Roosaveel equated to €34.1 million of GVA across the West economy. The port's seafood sector supported an estimated 595 jobs across the region and generated €4.3 million in tax revenues from wages of almost €14 million.

In 2020, according to the SFPA, some 3,100 tonnes of fish were landed by Irish and foreign vessels in Rossaveel worth some €11.1 million.

- Rates charged at Rossaveel and other Fishery Harbour Centres are set out in Statutory Instrument Number 214 of 2012[1] entitled Fishery Harbour Centres (Rates and Charges) Order 2012.

1.2.2 Proposed Development

DAFM proposes to develop a new deep water quay that will enable the harbour to accommodate larger fishing vessels. The quay will also help facilitate the development of opportunities in the fishing sector which in turn will support the continued operation and sustainable development of Rossaveel Harbour.

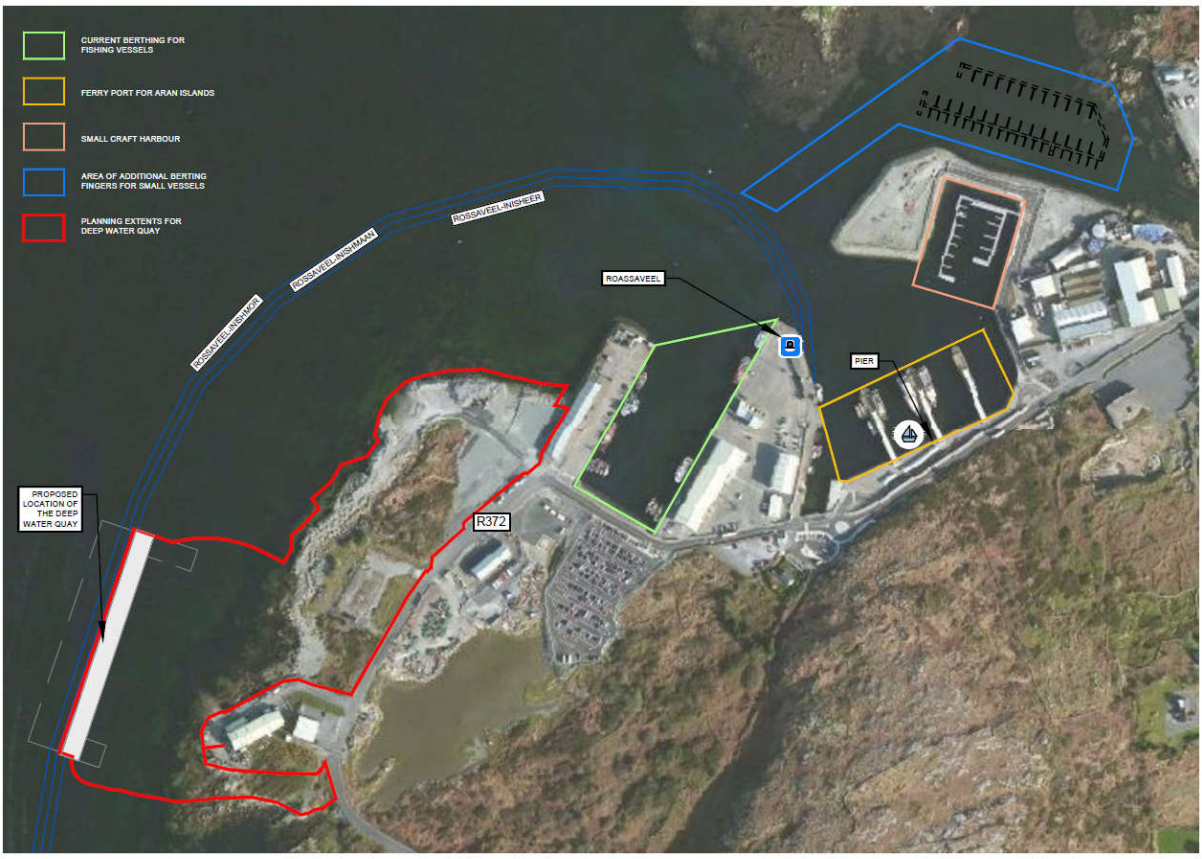
The quay will provide 200m of outside berthing frontage which, along with associated dredging works, will make Rossaveal Harbour a viable location for increased fish landings, particularly by larger Irish and foreign vessels.

To facilitate berthing by these vessels, a 30m wide x 200m long pocket directly adjacent to the quay will be dredged to a depth of -12m Chart Datum (mCD).

In addition, a vessel approach corridor of approximately 600m length and a vessel turning circle of 200m diameter will be dredged to a depth of -8m mCD. A reclamation area will also be constructed directly behind the quay which will link to the existing onshore components of Rossaveel Harbour.

[1] https://www.agriculture.gov.ie/media/migration/seafood/fisheryharbours/ratesandchargesatfisheryharbourcentres/FisheryHarbourCentresRatesChargesOrder2012.pdf

Figure 1.1: Location of Functions



1.2.3 Planning Status

An application for the proposed development was submitted to Galway County Council in late June 2017 and planning permission for the development was granted in April 2018 subject to a number of conditions. Permission lapses in April 2023.

1.3 The Case for Development according to the Rossaveel Harbour Development Committee

The case for the Deep Water Berth has been summarised by the Rossaveel Harbour Development Committee (Coiste Tacaíocht Calaphort Ros a Mhíl) as follows:

- The existing harbour is too shallow and cannot accommodate vessels over 30m in Length from the Irish fishing fleet and no foreign vessels can be accommodated in the harbour.
- Rossaveal is the only harbour where a deep water pier can be developed between Killybegs and Foynes.
- It is a sheltered harbour so (there is) no need for an expensive break-water and the channel has a natural depth in excess of eight meters at the lowest low tide.

- Between Udarás Na Gaeltachta and DAFM there is a total of 84 acres of land in State ownership (ref: Mott McDonald Land Use Zoning Study 2007), adjacent to the port, available for development.
- Planning permission and all other necessary permissions are in place up to April 2023.(Galway County Council, Ref No 17/967)
- A number of studies have been carried out on the project to date, some by DAFM and one by Coiste Tacaiocht Chalaphort Ros a Mhíl. All of the studies concluded that this deep water pier should be built.
- The proposed project is in the Government Capital Programme
- Option 2 C on page 44 of the Quay Wall Peer Review Study September 2020,(a 200 m pier with a depth alongside of –12 m and a turning circle of 150 m), estimates the cost at just over €18m.
- Rossaveal port is located in An Gaeltacht where a high percentage of people use Gaeilge on a daily basis. Creation of jobs is this area aligns with Government's policy to support the transmission of Irish as a living language.
- This infrastructure would provide the basis to create 300 jobs in the Offshore Renewable Energy Sector – as presented by Mark De Faoite of Udarás Na Gaeltachta.
- It is the policy of the current Government to reduce carbon emissions by 51% by the end of this decade.

1.4 The Significance of the Irish Fishing Sector

1.4.1 Government Policy

Current government policy[2], as set out in the Programme for Government, is to recognise the importance of the fisheries, tourism, and other sectors that support balanced regional development and employment noting that everything must be done to protect marine biodiversity and to secure a sustainable future for the fisheries sector, while supporting coastal communities

Specifically it states that the Government will

Invest strategically in harbour infrastructure to attract increased landings into Ireland of sustainably caught fish in our waters, driving the development of the seafood processing sector and the blue economy in coastal communities.

The National Development Plan 2021 – 2030[3], the National Marine Planning Framework[4] and Food Vision 2030[5] equally recognises the importance of the

[2] Programme for Government – Our Shared Future, June 2020
[3] National Development Plan 2021 – 2030, Government of Ireland, October 2031
[4] National Marine Planning Framework, Department of Housing, Local Government and Heritage
[5] Food Vision 2030 – A World Leader in Sustainable Food Systems, Department of Agriculture, Food and the Marine, August 2021

fishing sector for the Irish economy and stating that Ports are key facilitators and enablers of economic development in general. As such, their strategic development is supported as a key objective in the Government's National Development Plan.

Food Vision notes that fishers, farmers and food producers are at the core of the Strategy and, working with Ireland's world-class food and drinks businesses, will ensure the sector's continued contribution to the national economy, and especially to rural and coastal communities.

The Department of Agriculture, Food and the Marine reflects these objectives in its current Statement of Strategy 2021 - 2024 as an Action (4.3.3) in respect of Objective 4.3 as follows:
Manage utilisation of sea fisheries and aquaculture resources in consultation with stakeholders to promote environmental sustainability and the development of the sector's economic and social contribution to rural and coastal communities

In the Government's policy document, *Our Rural Future: Rural Development Policy 2021 -2025*, it notes in Chapter 10*, Supporting the Sustainability of our Islands and Coastal Communities* that the marine economy is a key enabler of effective regional development, especially in remote coastal communities.

Government will seek to ensure that coastal communities continue to benefit from the unique characteristics and attributes of Ireland's coastline and its natural resources in a sustainable manner. Government will achieve this through developing and implementing a National Marine Planning Framework and investing in coastal communities to support economic growth.

Specifically, it adds that offshore renewable energy projects will also offer employment opportunities around the coast of Ireland. Further development of offshore energy projects will support future diversification in employment and ensure that coastal areas benefit from opportunities in this sector, including through supply chain opportunities.

1.4.2 The Ocean Economy[6]

Ocean-based economic activity makes an important contribution to Ireland's economy. Recent estimates by the Socio-Economic Marine Research Unit (SEMRU) at NUI Galway put the overall turnover of Ireland's ocean economy

[6] Challenges and Opportunities for Ireland's Major Ocean Economy Industries, SEMRU, June 2020

in 2019 at €5.8 billion. Ocean economy industries directly contribute nearly €2 billion in value added (approximately 1 per cent of GNI*) to the Irish economy and provide almost 31,000 jobs. The ocean economy has an especially important role to play in regional development. The employment provided by ocean economy industries has a wide geographical spread, with most jobs in the sector located outside of Dublin. Moreover, the figures above refer only to the direct economic contribution of the ocean economy. Measures that take into account the indirect activity and employment generated from ocean-based industries show markedly higher contributions to overall economic activity, typically about twice that of the direct contribution.

In 2020, according to BIM, the estimated GDP of the Irish sea fishing industry was worth some €1.09 billion including domestic consumption of €406m and imports/exports worth €263 million. This is a decline of almost 12 per cent on 2019 values.

The value of Irish seafood was €526 million including the value of Aquaculture worth €180 million. Some €346 million in seafood was landed by Irish and non-Irish boats in Irish ports during the year.

Due primarily to the global Covid-19 pandemic Ireland's seafood economy declined in 2020, with a drop of 12% (-€142million) compared to 2019, giving a total value of €1.1 billion. This was driven mainly by a reduction of 18% in domestic consumption due to the closure of the food-service sector with additional impacts of a 17% reduction (-€44 million) in private investment and an 8% decline (-€50 million) in exports. Global markets faced severe disruption from the Covid-19 pandemic, and when added to the continued uncertainty from the UK's departure from the EU, this made for challenging trading conditions.

Despite these challenges the seafood sector remained resilient and adapted to the disruption the market faced. While there was a decrease of 18% in domestic consumption to €406 million, mainly due to a fall in sales in food service, this was somewhat offset by a 6% increase (€18m) in retail sales. There was also a reduction in private investment to €213 million (-17%) reflecting the uncertainty in the markets leading to cautious activity from many seafood businesses. There was also a decline in our seafood balance of trade (exports – imports) which fell by €28 million (-10%) to €263 million. Overall investment in the sector was €416 million, equivalent to 39% of seafood GDP, a slight increase compared to 2019, underlining the importance of strong public sector support through times of economic turbulence.

The volume of seafood produced by the Irish seafood sector surpassed 220,000 tonnes with a value of €394m. While less than 20% of this volume was produced by the aquaculture sector it contributed 46% of the total value.

The volume of landings into Irish ports fell by 4% in 2020, to 252,000 tonnes, this decline being driven by the Irish fleet, landing 10% less than 2019 while landing volumes of non-Irish vessels increased by 17%. The value of landings fell 18% in 2020 to €346m with the Irish fleet contributing the most to this decline falling by 26% in value. Most ports saw a decline in the volume and value of landings in 2020 with Killybegs seeing a 9% decline in volume (8% in value) and Castletownbere landings declining by 16% in volume (20% in value). Mackerel was the most valuable species landed by the Irish fleet with over 60,000 tonnes landed worth €80m. This was an increase in value of 3% on 2019.

Landings of Dublin Bay prawn declined by around 40% in volume and value terms after a difficult year in which many of the main international markets for this species were shut down

1.4.3 Economic Significance of the Seafood Sector to Rossaveel

A report prepared by Oxford Economics in 2018 for BIM, entitled *The Economic Impact of the Seafood Sector: Ros a Mhil*, clearly showed the importance and value of the seafood sector to the Rossaveel economy.

The consultants found that that the sector directly generated some €50 million in turnover, supporting nearly 440 direct jobs. Aquaculture was the largest of the three seafood sub-sectors generating an estimated €35 million in turnover, followed by fish processing (€15 million) and commercial fishing (€9 million). When translated into GVA, the seafood sector directly contributed an estimated €24 million to the local port economy.

When the indirect and induced effects are calculated, the total economic contribution of the seafood sector at Roosaveel equated to €34.1 million of GVA across the West economy in 2018. The port's seafood sector supported an estimated 595 jobs across the region and generated €4.3 million in tax revenues from wages of almost €14 million.

A survey carried out to establish the main constraint on growth found *that Quotas and Regulations* were the primary constraint for 37 per cent of respondents followed by *Competition and Market Issues*, and *Overfishing* by

12 per cent each. *Harbour Facilities* was only mentioned by 2 per cent of respondents.

As Oxford Economics did not produce a Report for the Seafood Sector at a national level, it is not possible to relate and compare the economic impact of Rossaveel with national figures.

1.4.4 Other Developments

BREXIT

The UK's withdrawal from the European Union under Article 50 of the Treaty on European Union (BREXIT) has had a major impact on the €1 billion Irish seafood economy with Irish quota transfers to the UK from the EU under the TCA contributing around €43m of the total estimated €199m of quotas transferred. This amounts to a 15% reduction compared to the overall value of the 2020 Irish quotas which compares unfavourably with other EU Member States which, proportionally, contributed far less.

The seafood sector and dependent coastal communities are amongst the areas most negatively impacted by the EU/UK Trade & Co-operation Agreement. The impacts are significant, immediate and long lasting, and need to be addressed.

Based on the preliminary analysis of available data carried out by the Department of Agriculture, Food and the Marine (DAFM) with the assistance of the Marine Institute and BIM, under the TCA, Ireland will lose 26,412 tonnes of quota, of which 23,500 tonnes is pelagic and 2,366 tonnes is demersal species, valued at around €43m over the period 2021-2026. These figures are estimated on the mean fish price per species in 2019 from Irish Sales Notes data, 2020 Irish quotas and assumes 100% quota uptake.

While there may be some re-adjustment in the medium to longer term through possibly quota swaps, the TCA represents a significant and permanent loss of quota. Pelagic stocks account for 67% of the total loss in quota value, with Nephrops making up 20%. Whitefish and deepwater stocks combined make up for the remaining 13%.

The objective of the EU Brexit Adjustment Reserve is "to provide support to counter the adverse consequences of the withdrawal of the United Kingdom from the Union in Member States, regions and sectors, in particular those that are worst affected by that withdrawal, and to mitigate the related impact on the economic, social and territorial cohesion".

As Rossaveel has been affected by BREXIT, the Brexit Adjustment Reserve could therefore support employment, businesses and local communities negatively affected by Brexit, including those in the fishing industry.

Over-fishing

It is understood that an analysis by the European Commission has concluded that during the period 2012-2016, Ireland overfished its quota of mackerel by 28,700 tonnes; its horse mackerel quota by 8,100 tonnes and blue whiting by 5,600 tonnes.

This over-fishing may see tens of thousands of tonnes of pelagic and whitefish deducted from its quotas in the coming years and Ireland faces losing up to €40 million in European funding.

The reduction in quotas will have a significant impact on current whitefish landings and potential pelagic landings by Irish fishers in Rossaveel which could be attracted by the proposed new berth.

1.5 Report of the Seafood Task Force[7]

According to the Report of the Seafood Task Force published in October 2021, the seafood industry supports some of the most fragile and vulnerable communities in the State. The implication of any reduction in competitiveness or resilience can send economic and social shock waves through their communities. The complexity and interplay between jobs at sea and their supporting communities is well recognised and any loss of profitability at sea leaves an economic vacuum ashore.

Much of our marine public infrastructure (piers, harbours and facilities) is old and is holding back the full development of a range of marine water-based activity. Accordingly, and in line with the Terms of reference, the Task Force has recommended an €80 million initiative for the development of publicly owned marine infrastructure. The resulting infrastructure development can provide a platform for the development of new and diversified economic activity in our coastal communities.

The provision this modernized, publicly owned marine infrastructure will be a key enabler in allowing integrated application at a local level of the Task Force's initiatives for the seafood sector, such as community led local development and tourism initiatives.

Under the Trade & Cooperation Agreement (TCA) between the EU and UK, Ireland will

[7] Report of the Seafood Sector Task Force "*Navigating Change – The way forward for our Seafood Sector in the wake of the EU/UK Trade & Cooperation Agreement*", October 2021

lose 26,412 tonnes of quota per year, on a phased basis up to 2026, valued at around €43 million. The seafood sector and dependent coastal communities are amongst the areas most negatively impacted by the TCA. The impacts are significant, immediate and long lasting. The impacts of the TCA on the Seafood Sector and Coastal Communities need to be addressed. While much of the quota reduction will be felt at the 6 DAFM Fishery Harbour Centres and 5 larger County Council ports (Clogherhead, Kilmore Quay, Union Hall, Baltimore and Greencastle) the wider, direct and indirect impacts of Brexit will be felt by communities around the entire coast who are dependent on fisheries, aquaculture, and spending power they generate at a local level. and will have direct downstream impact on the processing sector and workforce in coastal communities.

A key enabler in offsetting the implications, for local communities, of the Brexit related adjustments to the fisheries sector is regeneration and development of many of the coastal structures around the coastline. Many of these structures, especially those of a minor nature and which are important landmarks to local communities, have declined in both their structural integrity and effective usage over the years. A new focus on innovative restoration would see many of these structures delivering new benefits to smaller and often remote communities. In some instances, this investment could result in these structures becoming different in nature to their original functionality, with diversification into leisure, recreational and other usages, such as aquaculture support facilities for small vessel launch to access nearby sites.

The scale of investment needed to address the Brexit losses, to sustain a new sense of momentum and transition in our seafood and coastal communities will be significant. The overall funding required has been determined by the Task Force, as in the order of €423.3 million.

1.6 Structure of the Report

The structure of this Report is as follows.

Following this Introduction which highlights the significance of the Fishery Sector for the Irish economy, there are Chapters dealing with

- A profile of Rossaveel Fishery Harbour Centre and its importance in and for the development of the fishing sector; the Profile also includes current facilities at and key stakeholders of Rossaveel Fishery Harbour Centre
- A description of the Proposed Development
- An Outline Cost Benefit Analysis including Risk and Sensitivity Analyses
- A Conclusion chapter

1.7 Acknowledgements

Raymond Burke would like to thank Capt Mairtin Mylotte, Harbour Master Rossaveel Fishery Harbour Centre, Mr Padraic O'Toole, Deputy Harbour Master and Mr Gerry Egan, Engineer, as well as the staff of the Department of Agriculture, Food and the Marine including Mr Noel Clancy and Mr Noel O'Murchu.

Thanks are also due to the members of Coiste Tacaíochta Chalaphort Ros a Mhíl including Máirtín Ó'Conghaile, Cathaoirleach, Niclás O'Conchubhair and Mr Cathal Groonell, Runai who was also Chief Execuive of Iasc Mara Teo.

Other consultees were:

- Capt Fergal Hegarty, Harbour Master, Killybegs Fishery Harbour Centre
- Mr Pat Fitzpatrick, MV Shauna Ann
- Mr Cornelio Diarmuid O'Donovan
- Mr Grattan Healy, Fuinneamh Sceirde Teoranta
- Mr Máirtín Eidne O'Conghaile "Realt Ara",
- Mr Donal Kelly, CEO, Fast Fish Ltd.
- Mr Anthony Sheehy Knollway Ltd
- Mr Aodhan Fitzgerald, The Marine Institute

He would also like to thank Mr Mark De Faoite (White), *Stiúrthóir Fiontraíochta, Fostaíochta & Maoine, Udaras na Gaeltachta,* Mr Peter Coyle, Chairman Marine Renewables Industry Association (MRIA), Mr John Paul Molloy, SFPA, Mr Dominic Rihan Head of Economic and Strategic Services, BIM and Mr Sean Griffin, Aran Fishermen's Co-Op.

2. Rossaveel (Ros an Mhíl) Fishery Harbour Centre – A Profile

In this chapter, we provide a brief profile of the Rossaveel Fishery Harbour Centre, its facilities and principal stakeholders.

Figure 2.1: Ros an Mhíl Harbour

2.1 Socio-Economic Profile

2.1.1 Planning Vision and Context

Galway County Council, in its most recent Development Plan, recognises that the presence of the Ros an Mhíl deep water port facility - one of the largest fishing ports in the country - is an economic strength and opportunity for the county noting that Rossaveel is the main base for the Galway and Árann Deep-Sea fishing fleet and is a major ferry port for passengers and goods for the three Oileáin Árann Islands.

A key objective of the Plan, Objective TI 24 – Sustainable Development of Ports, Harbours, Piers and Slipways is to "*Support the development of Ros an Mhíl Harbour as a deep water port and support and facilitate improvements and maintenance to other harbours including Inis Oirr and Inis Meáin, piers and slipways and consider any new marine infrastructure where appropriate".*

2.1.2 Population

For the purposes of this analysis, the Rossaveel Harbour area comprises the four Electoral Divisions of Bear, Curryglass and Killaconenagh, and between 2006 and 2016, the population growth in the area was 4.5 per cent compared with a national growth of 12.3 per cent pointing towards a potential underlying weakness of the Rossaveel Harbour area.

Table 2.1: Population

Rossaveal	1991	1996	2006	2011	2016
Arainn	1,322	1,303	1,225	1,251	1,226
Kilcummin	1,241	1,273	1,304	1,315	1,314
Sailearna	1,051	1,148	1,362	1,448	1,453
An Crompan	2,077	2,167	2,294	2,505	2,472
Rossaveal	**5,691**	**5,891**	**6,185**	**6,519**	**6,465**
State	**3,525,719**	**3,626,087**	**4,239,318**	**4,588,252**	**4,761,865**

Source: CSO

2.1.3 Relative Affluence and Deprivation

The Rossaveal Harbour Area is considerably more disadvantaged than the West region or the country as a whole. In 1991, the Relative HP Index score for the Rossaveal Harbour Area was -9.0, indicating that this is a disadvantaged area by national comparison. Despite a significant improvement of 2.6 points over the 10-year period, the Index score in 2016 was -6.4, which would still classify as comparatively deprived. It is also worth noting that of the four EDs which make up the Rossaveal Harbour Area, Sailearna is slightly less disadvantaged, whilst the other three EDs show signs of even greater weakness than Sailearna.

Table 2.2: Ros an Mhíl Geographical Area Relative Affluence and Deprivation

	2006	2011	2016
Inishmore	-10.0	-6.0	-7.9
Kilcummin	-12.4	-8.2	-7.7
Selerna	-2.6	-2.5	-1.4
Crumpaun	-10.2	-7.9	-8.8
Rossaveel	-9.0	-6.0	-6.4
West	-1.0	-0.3	-0.4
State	-0.4	**0.2**	**0.6**

Source: Haase and Engling

2.2 Governance of Rossaveel Fishery Harbour Centre

Rossaveel is one of the state's Fishery Harbour Centres operated by the Department of Agriculture, Food and the Marine.

The other five Fishery Harbour Centres are: -

- Howth, Co. Dublin
- Dunmore East, Co. Waterford
- Castletownbere, Co. Cork
- An Daingean (Dingle), Co. Kerry
- Killybegs, Co Donegal

These harbours are managed and operated in accordance with the Fishery Harbour Centres Acts 1968 (as amended). This Act provides for the establishment and operation of these harbours to promote, develop and carry on sea fishing, fish processing, fish related activities and matters connected with the fish industry as well as any other purpose, including the provision, improvement and development of leisure or amenity facilities or for facilitating or promoting the social or economic development of the area in which the Fishery Harbour Centre is located.

The 1968 Act was amended in 1998 to broaden how properties owned by the State could be used. Section 5 defines the scope of use for which Fishery Harbour Centres can be put to. While the Section states that *'the facilities can be used for facilitating or promoting the social or economic development of the area in which the Fishery Harbour Centre is located, which the Minister considers advantageous and appropriate in respect of the operation or development of the Fishery Harbour Centre',* it could be strengthened to confirm that FHCs can be used for the support of offshore windfarms.

The Harbours are managed via a statutory fund, known as the Fishery Harbour Centres' Fund, which the Comptroller & Auditor General audits on an annual basis. The Fishery Harbour Centre Management Committee has overall responsibility for the management of the Fishery Harbour Centres. This committee is made of an Assistant Secretary General and the Heads of Divisions for the Sea Food Administration Division (SFAD), Marine Engineering Division (MED) and Accounts Divisions. SFAD and MED are jointly charged with the day to day management of the harbours with SFAD responsible for financial management of the harbours including the Fishery Harbour Centres' Fund, the Capital Programme and the property portfolio and MED responsible for operations, HR, Health and Safety and implementation of the Capital Programme.

2.3 Staffing

The Rossaveel Fishery Harbour Centre has a Full-Time-Equivalent staffing of 10 as follows:

- Harbour Master and deputy Harbour Master
- Harbour Engineer
- Foreman, craft and general operatives
- Receptionist

About 18 local fishing boats including up to six pelagic vessels, operate out of Rossaveel; these numbers grow to some 35 with vessels from the East Coast when the Porcupine Basin season (September to June).

2.4 Financial Performance

Irish fishing boats pay annual Harbour Dues based on tonnage. In addition, they pay goods due based on the volume of catch. These details can be found in S.I. No. 214 of 2012, Fishery Harbour Centres (Rates and Charges) Order 2012.

Rates are under review at present and are expected to undergo public consultation in the near term. It is likely that the charges will be adjusted, at a minimum, in line with inflation.

The most recent financial data available for the Rossaveel Fishery Harbour Centre is for the year ending 31 December 2015. *The Accounts are prepared in accordance with the relevant legislation include Receipts & Payments Accounts as well as an Income & Expenditure Account. Depreciation does not feature in any of these Harbour Accounts.*

The financial performance of Rossaveel on an Income and Expenditure basis is as follows:

Table 2.3: Rossaveel Fishery Harbour Centre Income & Expenditure for the year ended 31 December (€000)

Extract from Audited Financial Statements

	2017	2018	2019
	€	€	€
Income			
Harbour Dues	111	293	258
Rents	57	57	73
Sundry Receipts	13	4	3
Sale of Assets	0	0	19
	181	**354**	**353**
Expenditure			
Salaries & Wages	295	318	362
Light, Heat & Power	39	53	43
Maintenance	86	40	51
Telephone	2	2	2
Water Rates	3	17	20
Sundry Expenses	24	25	111
Bad Debt Expense	47	1	3
Bad Debt Provision	76	59	23
Depreciation		**23**	**27**
	420	**538**	**642**
Surplus/(Deficit)	**(239)**	**(184)**	**(259)**
Opening Balance	**(2,279)**	**(2,517)**	**(2,701)**
Closing Balance	**(2,517)**	**(2,701)**	**(2,990)**

Source: Department of Agriculture, Food and the Marine

2.5 Fisheries Infrastructure

The photo below shows the location of the principal facilities, namely

- Pier 1, 120m long with a water depth of 3.7 metres.
- Pier 2, 313 metres long with the part beyond the Ice Plant some 5.5 metre deep
- the Sean Ceibh wharf at the eastern side of No 2 Quay, 70 metres long, where the cargo vessels generally tie up (Rossaveel Port Services, Lasta Mara Teo)
- Galway and Aran Co-op / Auction Hall,
- Harbour Office,
- Ferry Boarding Facilities,

- (6) Sea Angling / Charter Boat Boarding Facilities, These three pontoons handle the ferry boats to the Aran Islands (Aran Island Ferries). The Doolin Ferries vessels tie up there during the winter months.
- Iasc Mara Teo – now out of voluntary liquidation with plant and equipment still in place
- Small Craft Harbour (160 berth marina to grow to 240 berths),
- Car Park,

  BIM Ice Plant,
- Ferry Offices,
- Old Auction Hall.
- Marina

Figure 2.2: Locations of Key Infrastructure

2.6 Landings

2.6.1 National

Table 2.5 presents details of Irish and foreign landings at the six Fishery Harbour Centres for the period 2013 – 2019 as well as the total for the state.

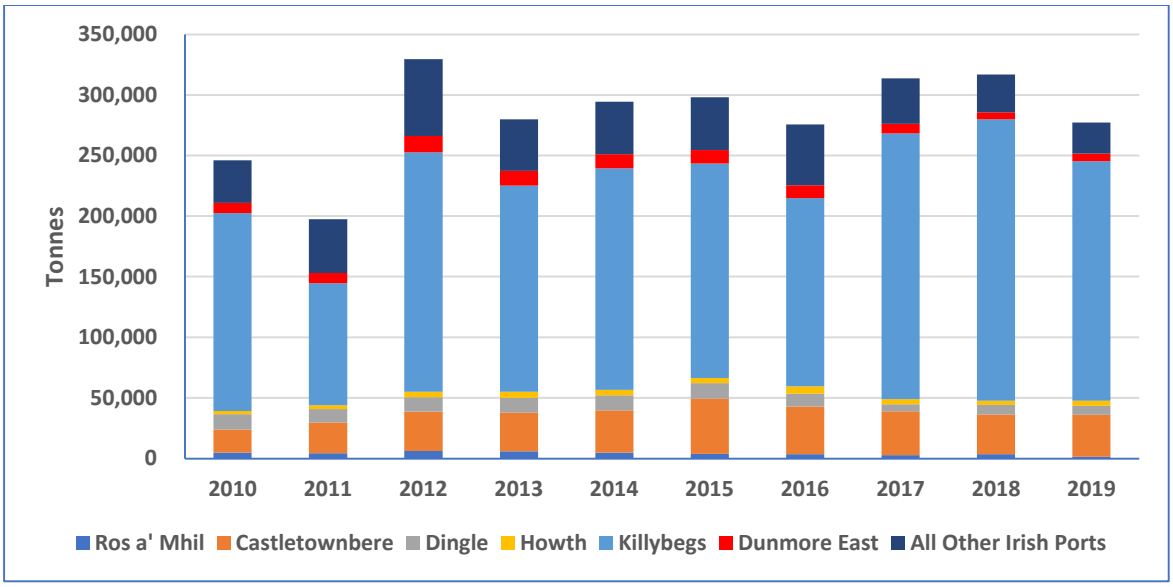
Appendix 6 shows Fishing Activity in Irish EEZ based on VMS for various days during the year by nationality of boat owner. It shows that, at certain times of the year, there is significant fishing activity off the west coast.

Table 2.8: Total Irish and Foreign Fish Landings by FHC (2013– 2019)

	2013	2014	2015	2016	2017	2018	2019
Ros a' Mhil	5,795	4,770	3,637	3,391	2,744	3,526	1,429
Castletownbere	32,105	35,004	45,762	39,562	36,221	32,811	34,540
Dingle	12,123	12,221	12,610	10,454	5,645	7,715	7,386
Howth	5,054	4,482	4,411	5,997	4,331	3,551	4,181
Killybegs	170,139	183,052	177,036	155,535	219,346	232,228	197,760
Dunmore East	11,994	11,534	10,978	10,387	7,942	5,784	6,430
All Other Irish Ports	42,658	43,318	43,698	50,305	37,575	31,237	25,583
TOTAL	**279,868**	**294,381**	**298,132**	**275,631**	**313,804**	**316,852**	**277,309**

Source: CSO, Fish Landings (Live Weight Equivalent)

Fig 2.3: Fish Landings by FHC (2010– 2019)



Source: CSO, Fish Landings

2.6.2 Catch by Species

Table 2.7 details the catch by species for Rossaveel for 2017 – 2020 as published by the SFPA.

Table 2.8 relates the tonnage and value of catch between Rossaveel FHC and for Ireland in 2020.

Table 2.7: Fish Catch by Species for Rossaveel FHC (2017– 2020)

	2017		2018		2019		2020	
Species	**Tonnes**	**€**	**Tonnes**	**€**	**Tonnes**	**€**	**Tonnes**	**€**
Irish Landings								
Demersal	546	1,449,167	465	1,235,053	466	1,199,458	650	1,522,624
Pelagic	974	589,578	1,494	1,275,095	11	10,459	1,410	732,207
Shellfish	1,149	8,934,924	1,356	12,028,848	775	7,235,405	746	7,368,443
Deepwater	0.2	110	0.4	416.0	0	0	2	3,276
Total	**2,669**	**10,973,779**	**3,315**	**14,539,412**	**1,252**	**8,445,322**	**2,809**	**9,626,550**
Foreign Landings								
Demersal	5	16,416	32	112,011	32	111,817	33	110,897
Pelagic	0	0	0	0	0	0	0	0
Shellfish	70	481,828	178	1,380,300	149	1,081,765	215	1,369,599
Deepwater	0	0	0	0	0	0	0	0
Total	**75**	**498,244**	**210**	**1,492,311**	**181**	**1,193,582**	**248**	**1,480,496**
All Landings								
Demersal	551	1,465,583	497	1,347,064	498	1,311,275	683	1,633,521
Pelagic	974	589,578	1,494	1,275,095	11	10,459	1,410	732,207
Shellfish	1,219	9,416,752	1,534	13,409,148	924	8,317,170	961	8,738,042
Deepwater	0.2	110.0	0.4	416.0	0	0	2	3,276
Total	**2,744**	**11,472,023**	**3,525**	**16,031,723**	**1,433**	**9,638,904**	**3,057**	**11,107,046**

Source: SFPA

Table 2.8: Fish Catch by Species for Rossaveel FHC and All Irish Ports (2020)

	2020					
	Rossaveel		**Ireland**		**Ratio**	
Species	**Tonnes**	**€**	**Tonnes**	**€**	**Tonnes**	**€**
Demersal	683	1,633,521	49,663	132,322,695	1%	1%
Pelagic	1,410	732,207	252,601	111,998,313	1%	1%
Shellfish	961	8,738,042	24,888	101,497,069	4%	9%
Deepwater	2	3,276	622	961,677	0.3%	0.3%
Total	**3,057**	**11,107,046**	**327,773**	**346,779,753**	**1%**	**3%**

Source: SFPA

Fig 2.4: Vessels at Rest at Rossaveel Fishery Harbour Centre

2.7 Facilities

2.7.1 Quays

The harbour has a number of quays.

- The Ferry quay which is 98 metres long
- The No.2 quay which is 215 metres long
- The Old Auction Hall (No 1) pier which is 125 metres in length
- The Sean Cheibhe (old granite pier), which dries out, located between No.2 pier and the passenger ferry berths, which is 70 metres long

With an access channel of 7 metres, the water depth is typically 3.7 metres, with one deepwater berth of 5.8 metres on the No.2 quay. There is a slipway located on the old quay.

2.7.2 Auction Hall

The Auction Hall is managed by the Galway and Aran Fishermen's Co-Op. and sells mainly whitefish, shellfish and a small amount of pelagic fish. It is a new modern building located close to the Harbourmasters office. The old auction hall is used to store nets and other fishing gear.

2.7.3 Properties

The harbour administration block, which contains the Harbour Master's Office, the SFPA Offices and the Marine Institute Office and Laboratory are owned by the Department. The ferry offices, which are located on a site owned by the harbour centre, were built by Tourism Chonnamara agus Árainn.

A building housing the Coast Guard Station, Department Engineers' store and a store/workshop for the Harbour Master is located on a site owned by the harbour centre. There is a helicopter pad operated by The Commissioners of Irish Lights; the site which is owned by the harbour centre and a car park with spaces for 300 cars, is also owned by the harbour centre.

2.7.4 Ice Plant

BIM has an Ice Plant on a site at No 2 pier leased from the FHC at Rossaveel

2.7.5 Marina

There is a 160 berth marina with toilets, showers and other amenities within

the harbour area. This is planned to grow to 250 berths.

2.7.6 Charter Island

This company, located within the estate, offers yacht charter, training courses and trips to the Aran Islands.

2.7.7 Iasc Mara Teo

There has been a fish processing operation in Rossaveal since the late 1960's. Herring processing commenced in the mid-seventies and by 1980 the Rossaveal plant became the largest processor of herring in Ireland and one of the leading marinating companies in Europe; as well as being the first supplier of herring roe processed in Ireland to the Japanese market.

Iasc Mara Teo was founded in 1992 by the Directors, Cathal Groonell and Tom Kane. They diversified the range of pelagic species processed to include mackerel, horse mackerel and sprat and also processed prawns during the summer period. IMT was the only processor of pelagic fish between Donegal and Kerry and until the time operations ceased in 2018 it was the natural destination for fish landed in Rossaveal.

Over the period from 1985 until 2017 the supply of herring and mackerel reduced significantly. As a result, employment at the factory has reduced significantly as follows:

	Full-Time	**Seasonal**
1985	60	340
1995	40	160
2005	15	40
2017	12	18

The company traded successfully from 1992 until 2015 with an annual turnover of approximately, €5 million. On average the company processed approx. 7,000 Mt of pelagic species per annum. In 2017 the company processed 1,200 Mt Mackerel and 1,000 Mt herring.

With the deterioration in supply, the financial performance of the company also suffered. In 2017 the turnover was €2.9 million. The herring quotas were significantly reduced for 2018 and the four pelagic boats from the local Galway and Aran Fisherman's Co-Op were either bought out or contracted by competitors based in Killybegs. After exhausting all avenues to find a solution

to the supply problem, the company was forced to take the decision to cease operations in April 2018

Iasc Mara Teo specialised in processing pelagic species, in particular mackerel and herring. The company had been in business on a 3.5 acre site since 1992.

"The factory has modern processing, freezing and cold storage facilities and it is hoped to find a buyer that will continue to operate it as a fish processing facility," the company said.

The Company is now out of receivership.

The context of the closure can be found in the opening Statement to the Joint Oireachtas Committee on Agriculture, Food and the Marine on Tuesday 4th April 2017, when the Company noted that

"there were 12 registered pelagic processing factories in the country - eight in County Donegal and one each in Rossaveal, Baltimore, Dingle and Castletownbere. These factories mainly process mackerel, herring, horse mackerel, sprat and blue whiting.

There are 50 boats in the fleet with a pelagic quota entitlement. There are 23 in the refrigerated sea water, RSW, sector which are currently allocated 87% of the mackerel quota. A total of 21 of the 23 are Killybegs based. There are 27 boats in the polyvalent fleet, based mainly on the south coast. They are allocated the remaining 13% of the mackerel quota.

Large Killybegs based companies which already control much of the quota are actively encouraging fishermen whose boats have licences with a pelagic quota entitlement to sell their boats, offering prices well in excess of their economic value. This trend has serious implications for fishing ports in the south and west. In Rossaveal three boats have been sold to Killybegs based companies in the past year. These boats were the main suppliers to Iasc Mara Teoranta for decades and accounted for over 60% of the fish supply to the factory. The reported prices paid for the boats were €5 million, €6 million and €8 million. Of these prices about 20% relates to the actual cost of the boats and 80% to the licences and the pelagic quota entitlements. All of the fish from them is now processed in Killybegs or outside the country. This has put the future of Iasc Mara Teoranta in jeopardy. It is also a major blow to the local fisherman's co-op that handled their fish and all of the service providers and small businesses in the Rossaveal area. In total, five Rossaveal based boats have been bought by companies in Killybegs in recent years. There are now no active pelagic boats based in Rossaveal."

2.7.8 The Galway & Aran Fisherman's Co-op

The Galway & Aran Fisherman's Co-op is located in Rossaveal Harbour, County Galway. The co-operative consists of a fleet of twelve fishing vessels as well as a number of smaller fishing vessels.

The Galway & Aran co-op auctions mostly sea prawns to Italy, Spain and Irish wholesalers in a new modern building located close to the Harbourmaster's office.

2.7.9 Ferry Services from Rosaveel

Aran Island Ferries offer daily services from Rossaveel to the three Aran Islands.

They operate from dedicated berths.

Fig 2.5: Aran Islands Ferry arriving from Inis Oirr

2.7.10 Cargo Services from Rosaveel

Lasta Mara Teo[8] commenced cargo ferry services to the Aran Islands in 1999 and was set up to facilitate utility and heavy cargo services to the Western Islands. Since the 1st January 2005 Lasta Mara Teo has operated the cargo contract to the three Aran Islands Inis Mor, Inis Meain and Inis Oirr. The vessel MV Blath na Mara is the main cargo vessel to the Aran Islands.

[8] https://www.lastamarateo.com/index4.html

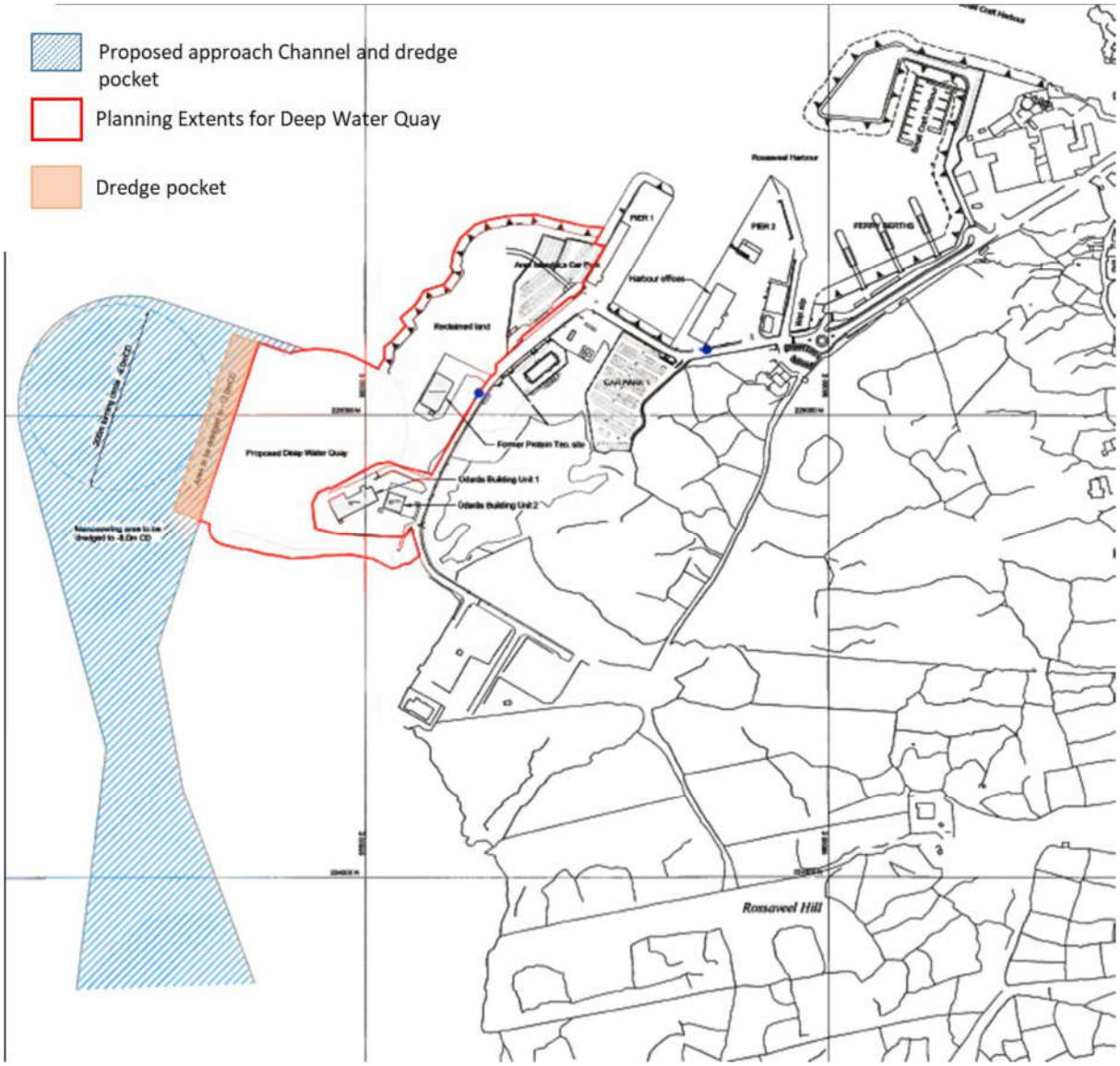
All food stuffs chill and frozen, all household goods, furniture, coal, cars, transit vans, tractors, horses and all types of lifestock are carried on Blath na Mara. Chill and frozen facilities are provided in the warehouse and on the vessel. A 'roll on roll off' service is provided by the vessel MV Chateau Thierry for heavy goods machinery from Rossaveal, i.e. Trucks, Diggers and heavy plant and machinery.

Fig 2.6: Lasta Mara Teo Vessels

3. The Proposed Development

In this Chapter, we outline the deep water development as proposed by Mott Macdonald and the findings of the peer review carried out by GDG.

Fig 3.1: Location of the proposed Deep Water Quay



3.1 The Original Proposal[9]

The existing harbour at Rossaveel is constrained as no deep water facilities are currently available for larger vessels. Modern fishing vessels continue to increase in size as the industry trends towards larger and more sophisticated boats, and Rossaveel

[9] EIS Non-Technical Summary: Rossaveel Harbour: Deep Water Quay Development; Dept of Agriculture, Food and Marine, June 2017

Harbour is increasingly unable to serve these larger vessels. In order to address this, a new deep water quay is being considered that will enable the harbour to accommodate these larger fishing vessels. The quay will help facilitate the development of opportunities in the fishing sector which in turn will support the continued operation and sustainable development of Rossaveel Harbour.

Government policy in Ireland in relation to the fisheries industry is to improve Irish harbour infrastructure and to attract more large foreign fishing vessels into Irish harbours to land their catches.

The quay will provide 200m of outside berthing frontage which, along with associated dredging works, will make Rossaveal Harbour a viable location for increased fish landings, particularly by larger Irish and foreign vessels. To facilitate berthing by these vessels, a 30m wide x 200m long pocket directly adjacent to the quay will be dredged to a depth of -12m Chart Datum (mCD). In addition, a vessel approach corridor of approximately 600m length and a vessel turning circle of 200m diameter will be dredged to a depth of -8m mCD. A reclamation area will also be constructed directly behind the quay which will link to the existing onshore components of Rossaveel Harbour. Rossaveel has significant strengths which would make it an attractive location for increased fish landings, particularly by larger Irish and foreign vessels. These strengths include:

- Close proximity to the main fishing grounds off the Irish west coast, meaning short steaming times for vessels;
- Connectivity via motorway network to Dublin and on to Rosslare, which would enable trucks to speedily transport fish exports across to Irish ferry ports; and
- Substantial excess capacity in existing fish processing facilities at Rossaveel.

The deep water quay would have a significant impact on local businesses. For example, Iasc Mara Teoranta estimates that the quay would attract fish landings which would increase sales value by 60%-100%, with the majority going to the export market. Employment would be expected to rise by 20-25 staff during the busy season. Moreover, the busy season would be extended by a further two months due to landings of blue whiting, and this would maintain a workforce of 50-60 staff for nine months of the year. However, should the status quo continue in Rossaveel Harbour (i.e. no deep water quay), IMT have stated that its ability to survive commercially would be undermined and that it would likely close in a matter of years, with a resultant loss of output and employment for the local economy.

Likewise, Údarás na Gaeltachta has advised that the deep water quay would be strategically essential for the South Connemara Gaeltacht in generating economic activity for a peripheral region. Údarás has vacant buildings and land available for

development in Rossaveel Harbour, and has indicated that its overall agenda for the region would be advanced by the quay.

In addition, Coiste Tacaíochta Chalafort Ros a' Mhíl (an Coiste), a committee with representatives from the community and local businesses in the Rossaveel area, has conducted a high-level economic impact assessment which indicated that significant job creation and economic multipliers would arise from the development of a deep water quay at Rossaveel Harbour.

3.2 Alternative Design Options

As an alternative to the Mott MacDonald design, GDG has presented three main alternative design solutions for the deep-water quay and suggested some variations in depth for proposed dredging areas with the intention of reducing the overall cost of construction whilst maintaining scheme functionality. Four different types of retaining structures have been proposed for the quay wall along with a subset variation in the bedrock profiles, to improve the efficiency of the design. Options considered include caissons, an "L" wall type proprietary system, a mass concrete retaining wall and also a Ruukki piled retaining wall involving the drilling of relatively small diameter tubular piles connected immediately adjacent to one another. Within a number of the designs, the finished bedrock profile has been altered in order to reduce the rock blasting and dredging required attributing to high costs.

3.2.1 Costs of Options and Savings

The total costs of each option are provided in Table 4.1 below. It should be noted that these design options are based on a turning circle diameter of 200m and with an adjacent berth slot depth of -12.0m CD. Cost savings between the new alternative design options and the original design and associated cost estimate is also presented.

Table 3.1: Comparison of Cost Saving Estimates for all Design Options

Design Option	Description	Total Cost	Cost Saving relative to original Mott MacDonald design, 2017
1	Steepening Rock profile based on the original design	€29,293,572.50	-€82,335.00 (cost increase)
2A	Rock ledge profile & smaller caisson units.	€21,304,182.90	€7,907,054.60
2B	Rock ledge profile & "L" Wall structure	€21,090,720.50	€8,120,517.00
2C	Rock ledge profile & mass concrete retaining wall	€18,973,220.50	€10,238,017.00
3	Ruukki Pile type retaining wall	€21,006,705.50	€8,204,532.00

Each of the alternative design options considered provide the functional requirement for the structure while saving on the overall cost of dredging and constructing the quay wall in various ways.

Option 1 provides the least savings of the alternative designs considered – and is in fact a small increase due to the potential variation discovered in rock head levels. It maintains the originally proposed structure by using the caisson with no changes to the dimensions and properties. The design remains technically feasible for its required usage with cost saving due to the reduction of rock blasting and rock dredging of the natural bedrock profile (although the overall rock profile has been updated based on the latest geophysical survey). Option 1 thus provides a cost increase estimate of €82,000.

Option 2A provides a cost saving estimate of €7,907,000. The design remains technically feasible by adopting the same principles as in terms of using caisson structures to form the main quay wall but with reduced height due to the bedrock ledge profile. To obtain this profile more detailed and advanced methods of blasting and dredging are required. The slope from the foundation of the caisson structure to full depth of the dredge pocket will remain as close to vertical as possible. From a technical point of view, a wider fender along the face of the quay will likely be required to ensure that any vessel that is berthing alongside the quay maintains clearance from the slope face. This can be addressed through projecting brackets or concrete outstand elements, helping to increase the overhang distance along the quay and effectively offset the berthing line slightly seaward.

Option 2B offers a cost saving in the order of €8,120,000. This design uses an alternative “L” wall type structure compared to the box caissons. The structure maintains the functional requirements of the quay wall but is achieved through a different construction form. Similarly, to the caisson option, all panels for the “L” walls are cast and cured on site. The majority of the cost savings within this design option comes from the reduction in concrete volume and reinforcement needed to produce the structure. The thickness of the walls is significantly reduced due to the supports and the interlocking panels between each “L” shape unit.

The Option 2B concept design also uses the bedrock ledge profile to reduce the total volume of material requiring blasting and dredging. This Option 2B design will also require the use of a wider fender or outstand wall to ensure that any vessel can berth safely along the length of the quay and avoid the rock slope. The proposed use of the “L” wall comes from similar successful

installations of the structures in projects reported from Finland. In Finland there are similar geological ground conditions to that of Rossaveel where there are extensive areas of hard rock such as granite, along with the need for significant water depths and drafts. This alternative design is also based on its use elsewhere for achieving similar retained heights as presented.

Option 2C potentially offers the most cost saving in the order of €10,238,000. This design uses an insitu concrete pillar caisson as the main cell with alternating rockfilled (or partially concrete filled) cells between. This type of structure was previously used in Castletownbere to provide a robust concrete face without fendering

Option 3 has a cost saving in the order of €8,204,000. This design uses a fully drilled Ruukki piled system to advance the interlocking steel tubes into the rock and avoids the necessity of dredging in advance. One considerable advantage over any Option2 is the negated risk of an unsatisfactory rock ledge/plinth or sufficiently stable rock slope being created. The creation of the rock ledge may be seen as a particular risk given the uncertainties of the rock properties at this stage.

A further refinement of the dredging volumes and associated options costs was developed in conjunction with DAFM in Q1 2020 (as discussed in Sections 5.5 and 6.7), whereby a reduced turning circle diameter of 150m (from 200m) was considered in conjunction with potential reduction to the berth slot depth to -10.0m CD (from -12.0m CD) for Options 2A, 2B and 2C. Such measures were able to further reduce cost estimates to the extent shown in Table 4.2 below.

Table 3-1 Cost Estimates from Cost Reduction Exercise in Q1 2020

Design Option	Total Cost based on -12.0m CD berth slot and 200m dia. turning circle	Total Cost based on -12.0m CD berth slot and 150m dia. turning circle	Total Cost based on -10.0m CD berth slot and 150m dia. turning circle
1	€29,293,572.50	N/A	N/A
2A	€21,304,182.90	€20,398,497.90	€19,022,667.90
2B	€21,090,720.50	€20,185,035.50	€18,809,205.50
2C	€18,973,220.50	€18,067,535.50	€16,691,705.50
3	€21,006,705.50	N/A	N/A

As demonstrated, there is a relative cost saving of approximately €906k from reducing the turning circle diameter from 200m to 150m and maintaining a berth slot depth of -12.0m CD, and a further cost saving of €1,376k from raising the level of the berth slot from -12.0m CD to -10.0m CD and maintaining the turning circle diameter at 150m.

3.2.2 Summary of Recommendations and Conclusions from Original Report

The points below summarise the recommendations and conclusions considered by GDG within the alternative designs proposed.

- There have been five alternative design solutions considered; Options 1, 2A, 2B, 2C and 3, each with their relative merits. The options have been advanced at a conceptual level. In order to progress with a preferred design option, we would recommend that this body of work is further advanced through preliminary and detailed design studies. At the preliminary design stage, a more detailed cost estimate accompanied by a set of preliminary design drawings should be provided.
- Option 1 maintains the use of the same caisson structure but involves the steepening of the rock slopes at the back of the caisson. The rock slopes should be more stable than assumed in the original design allowing for this increase. This has been based on the strength of the rock that has been proven through rock testing, leading to the same design change allowing saving in all three alternative designs.
- Due to the relative difference in rock levels between surveys, using the updated dredge volume estimates, it is estimated that there is a marginal cost increase of €82,000 for Option 1, when compared to the originally proposed caisson design by Mott MacDonald.
- In order to create the large base required for the placing the caisson large amounts of rock blasting and rock dredging with depth was deemed to be required. A potential alternative to this, to limit the blasting and rock dredging required, is to create a stepped bedrock ledge at a depth where bedrock is strong enough for bearing capacity of the retaining structure and sufficiently competent for a steep graded slope down to the dredged depth of -12mCD. This solution was carried through design alternatives Options 2A, 2B and 2C.
- This ledge/plinth, in combination with potential to reduce the proposed dredge depth in the navigation channel from -8.0m CD to -7.0m CD could reduce circa 70,000m^3 of rock and 10,000m^3 of overburden compared to the original design.
- Option 2A adopts the rock ledge profile along with a caisson unit of consequently lesser retained height. The stability of the reduced height caisson has been proven through the design calculation completed.
- The approximate cost saving estimate for design Option 2A is €7,900,000 compared to the originally proposed caisson design by Mott MacDonald.
- Option 2B adopts the rock ledge profile along with a “L” wall retaining units with interlocking panels, that is filled behind the quay wall.
- The approximate cost saving estimate for design Option 2B is €8,120,517.00 compared to the originally proposed caisson design by Mott MacDonald.
- The structural stability of the “L” wall system has been considered as suitable based on precedence where the retained height and geological ground conditions are similar to that of Rossaveel. However, this design alternative needs further detailed design and structural checks in discussion with Boskalis if to be carried forward as a viable solution.
- In terms of installing the “L” wall panels and interlocking units, the maximum dry weight of the 12m height panel is 265 Tonnes and therefore

it may be more suited to contractors with access to large scale marine plant capable of lifts greater than this weight.

- The assumptions associated with the cost saving assessment of design alternative Option 2B include the following:
  - The use of a 12m retained height structure with the possibility of extending this height. Comparably, to the caisson structures, a cope beam/services trench is used to make up the level difference from the top of the retaining structure to the finished proposed deck level.
  - The casting yard used for the "L" wall units and interlocking panels will be situated on land for casting, curing and installation.
- Option 2C adopts the same rock ledge profile but utilises concrete pillars with infilled cells between, essentially providing alternative forms of wall than the caisson and ''L'' wall systems. This option is estimated to provide the greatest cost saving from those considered, with up to €10,238,000 cost saving, equivalent to an overall cost in the order of €18,973,000.
- Option 3 utilises a Ruukki retaining wall system which effectively requires no dredging behind the quay line, allowing for piles to be installed directly into the rock in order to form the quay wall. This option provides the greatest cost savings in terms of dredging, but is offset relative to other alternative due to significant civils construction costs. The overall cost saving from this option is approximately €8,205,000 relative to the original cost estimate.
- A further cost refinement exercise was undertaken in Q1 2020 on Options 2A, 2B and 2C to examine the cost savings associated with amendments to the turning circle diameter and to the berth slot depth. It was found that there is a relative cost saving of approximately €906k from reducing the turning circle diameter originally from 200m to 150m and maintaining a berth slot depth of -12.0m CD, and a further cost saving of €1,376k from raising the level of the berth slot originally from -12.0m CD to -10.0m CD and maintaining the turning circle diameter at 150m. When both cost saving measures were applied, the range of costs of these options was found to vary from €16,692,000 for Option 2C, to €19,023,000 for Option 2A.

3.2.3 Numerical Modelling Report

Subsequently, GDG was commissioned to undertake a Numerical Modelling Report.

The report first details a wind analysis at the site using numerically generated data and based on the output of this analysis two types of numerical models were setup and run. The first numerical model determined the magnitudes of locally generated wind waves at the site whilst the second examined in detail the interaction of these waves with the proposed deepwater quay structure. The outcome of the modelling led to a re-examination of the nature of the quay seaward face such that to mitigate against potential negative impacts.

It builds on previous studies and design work and addresses specific issues that have arisen in relation to the potential impacts of locally generated waves incident on the

proposed quay.

The primary issue associated with this study has been the use of a vertical face on the proposed deepwater quay. Locally generated waves are most critical with respect to this and the work examined and quantified the frequency of occurrence and impacts of these waves. It was determined that on a vertical face quay face the incident wave heights can be more than doubled in terms of their propagation in front of the quay. Although the 0.5m wave heights that were simulated only occur approximately once per year at the site it would be expected that if the vertical face was used then lower incident waves could also cause operational issues. The model output demonstrated that an open face design with a revetment could solve such operational issues with respect to reflected waves.

However, it needs to be decided, based on the frequency of occurrence of winds that give rise to adverse conditions whether the additional expense associated with the open face design is justified

The model output also showed that variations in relation to the bed levels associated with the access channel and turning circle do not influence the wave characteristics. Therefore, there is no restriction in relation to which should be selected for the final design.

The 2021 cost of Option 4, the Open Piled Quay Wall, is as follows and was used in the socio-economic analysis undertaken.

Key Element of Works	Description	Estimated Costs €m
Dredging	Rock and overburden dredging incl. rock slope formation and material re-use and handling	€6.3
Quay Wall Structures	Open-piled construction incl. mobilisation, both drilled tubular piling and sheet piling works	€10.2
Concrete Elements	Reinforced concrete quay slab, concrete pavement and vertical boundary walls	€3.1
Reclamation Fill	Imported rockfill, rock armour revetments and Clause 804 for access road	€5.4
Ancillary Civils Works	Various items incl. drainage, services, perimeter fencing, high mast lighting and marine fendering	€0.8
TOTAL COSTS		**€25.6**

Appendix 2 contains the Open Piled Quay Wall Concept Appraisal and Cost Estimate Assumptions drawn from the GDG Numerical Modelling Report.

4. Cost Benefit Analysis

In this Chapter, we present an outline Cost Benefit Analysis (CBA) of the proposed development in terms of Net Present Value (NPV), Internal Rate of Return (IRR) and Benefit/Cost Ratio.

CBA is the mandatory appraisal technique for projects costing more than €20m.

To address uncertainty in relation to fish landing projections and to establish the minimum volumes that were necessary to ensure the socio-economic viability of the proposed development, a highly conservative approach to forecasting was adopted.

It should be noted that no account was taken of fish landings that would have occurred that did not require the development to proceed.

4.1 General Approach

The general approach to carrying out this CBA is set out in Circular 13/13 of the Department of Public Expenditure and Reform: *The Public Spending Code: Expenditure Planning, Appraisal & Evaluation in the Irish Public Service - Standard Rules & Procedures*. CBA is an analysis tool used generally for projects seeking public funding, and attempts to identify the net socioeconomic benefit of a project.

Three forms of evaluation have been prepared:

- Financial
- Exchequer
- Economic

In all cases,

- As noted above, the projections were prepared on a prudent conservative basis over a 20 year horizon
- The financial projections are presented in constant prices, ie, inflation is ignored
- It is assumed that there are no displacement effects, ie, no developments at other Irish fishery harbours, eg Killybegs, will impact on landings at Rossaveel, and that developments (or non-developments) at Rossaveel will impact any other harbour company

It should be noted that the analysis is constrained by the commercial confidentiality of the fishing and fish processing sector and various assumptions, therefore, have had to be made based on conversations held with some of the local stakeholders. In a number of cases, averages have been used and estimates made.

VAT has been assumed to be neutral; while the capital costs of the development will attract VAT, there will be VAT payments back to the Exchequer from the VAT payments of builders and suppliers.

No account is taken of any processing in foreign owned processors or other Irish processors in the economic analysis other than the spend of foreign calls in Rossaveel.

Tables 4.1(a) and 4.1(b), later, provide detail of the Drivers of Development and Key Parameters used in the CBA calculations.

Appendix 1 is a print-out of the Cost Benefit Analysis of the Core Option.

4.1.1 Financial Appraisal

General Financial Appraisal is a method used to evaluate the viability of a project by assessing the value of net cash flows that result from its implementation.

There are at least two types of financial analysis which must be carried out for projects over €20m:

- A Financial Analysis from the perspective of the Sponsoring Agency
- An Exchequer cashflow analysis

The Financial Analysis looks at the impact of the project on the finances of the Sponsoring Agency, in this case, the Department of Agriculture, Food and the Marine, while the Exchequer Analysis is concerned with the impact of the project on the Exchequer.

Financial analysis focuses on cash flows as opposed to economic flows and in particular considers sustainability and profitability. The financial analysis is one of the first steps in the overall appraisal stage because an understanding of the pattern of the cashflows is a critical building block for the overall business case as well as the CBA.

4.1.2 Economic Appraisal

The net economic benefit consists of:

The **additional value-added** is made up of the additional income (profits + wages) generated by the project, and can be considered the private return to the resources (enterprise and labour) used in the project.

The **social opportunity cost of the resources used** represents the cost to society of using enterprise and labour resources on the project. It is effectively their value in the next best use, and is often referred to as the shadow price.

The Public Spending Code sets out the Shadow Price of Labour (SPL) for use in economic appraisals. The guidance provides that the appropriate range for the SPL is between 80 per cent and 100 per cent, and to be employed in

appraisal. A rate of 80 per cent has been adopted to reflect the precariousness of employment in the Gaeltacht area.

As Exchequer funds are used, a shadow price of 130 per cent is applied to account for the distortionary effect of the taxes used to generate them.

External benefits are those that affect third parties who are not charged for these benefits or compensated for these costs.

In the current context we include **wider economic benefits**, specifically the additional **Gross Value Added** or GVA generated by customers of the FHC, because they can increase their profitability or reduce their costs as a result of the proposed harbour development.

The most familiar **external costs** are time, fuel, non-fuel and pollution costs of fleet transport. However, as it is assumed that all catch will be processed in Rossaveel, these costs have been excluded.

While congestion may arise during the construction phase and subsequent operations, these costs have also been excluded.

The socioeconomic CBA takes the net cash flows from the financial appraisal, adjusts them to shadow prices (i.e. true economic prices) including a 30 per cent premium for the shadow price of public funds, and adds the wider economic benefits and the external costs to the calculation. It then applies a social discount rate of 4 per cent real.

The wider external benefits include the additional economic activity by the FHC's customers, eg, spend by foreign vessels and crew at Rossaveel and the added value generated by the fish catching and fish processing sectors.

In the case of Rossaveel Fishery Harbour Centre, it can be summarised as follows:

Financial CBA	• **The financial benefits minus financial costs of the project, from the point of view of Rossaveel FHC**

Economic CBA	***plus*** • **External and wider economic benefits** • **Adjustments for the shadow price of Labour and public funds** ***minus*** • **External costs**

Put simply, the Financial Case evaluates the project from the point of view of Rossaveel FHC, while the CBA evaluates it from the point of view of society as a whole.

4.1.3 Performance Metrics

The three performance metrics applied in Cost Benefit Analysis are:

Net Present Value Method (NPV): The Net Present Value (NPV) is the sum of the discounted cash flows over the period. This criterion is simply based on whether the sum of discounted benefits exceeds the sum of discounted costs.

Benefit Cost Ratio (BCR): This is the ratio of discounted benefits to discounted costs. If the benefit cost ratio is greater than one the project may be accepted as there are more benefits than costs. Generally a BCR of greater than 1:1 is an indicator that a proposal's benefits exceed the costs.

Internal Rate of Return (IRR): The internal rate of return is the maximum rate of interest that a project can afford to pay for the resources used which allows the project to cover the initial capital outlay and on-going costs and still break even. It can also be described as the discount rate that equates the present value of benefits and costs.

4.2 Rationale for the Project

The rationale for the Deep Water Berth is to facilitate existing and potential traffic using Rossaveel harbour that are currently impacted by the absence of deep water.

In addition, the current facilities at Rossaveel are not adequately or efficiently catering for existing traffic, with congestion, queuing and delays a regular occurrence particularly during the Porcupine Basin season.

Fig 4.1: A Busy Harbour

This limitation also impacts the number of potential visiting vessels that would come to Rossaveel to land their catch and grow the local fish processing sector.

Discussions with stakeholders, particularly the Harbour Development Ctte, suggest that providing a deep water berth would open up the harbour to additional business and attract more vessels to Rossaveel; however, what is uncertain is the nature of the business, the volumes and the extent that it would be additional rather than a displacement.

New businesses, both new landings and diversification, suggested include the Spanish fleet operating off the west coast that used to land fish in Rossaveel, cargo services and cruise vessels.

However, the most likely, relevant and certainly additional services relate to the offshore wind energy sector that we will consider later. The servicing of the Sceirde off-shore windfarm requires a facility nearby and Rossaveel is ideally suited to provide this service and support.

A new deeper berth would address the delays suffered by certain existing large fishing vessels entering the harbour at low tide and the dangerous congestion that can arise when fleet from the east coast tie up during the porcupine basin season or during bad weather.

From a strictly CBA perspective, a CAPEX of €33.3m, after taking into account the

shadow price of capital of 130% and a Residual Value of €20m, requires an average annual net revenue of approximately €1.6m to break-even.

4.3 Offshore Energy

In recent times, the importance of servicing the offshore energy sector has become more pronounced and the Fishery Harbour at Rossaveel is considered an ideal location and of strategic importance as a base offering supporting facilities for such projects off the west coast because of its proximity to potential wind farms. Being some 40 kilometres west of Galway reduces steaming time to sites thus saving travel and fuel costs.

It also benefits from the available land alongside owned by Udraras na Gaeltachta for sub-assembly and other activities, as well as community support.

Both the IPORES[10] and Carbon Trust[11] Reports confirm that Rossaveel is suitable as an Operations & Maintenance facility location for instance.

The Marine Renewables Industry Association (MRIA) is a strong advocate of Rossaveel as an offshore servicing site; see Appendix 3.

4.3.1 The Benefits of Renewable Energy

Offshore wind will play a critical role in Ireland achieving its 2030 target of having 70 per cent of electricity generated from renewable sources and the net 2050 net zero carbon target. Ireland has a phenomenal natural resource in the Atlantic winds which blow across the island.

It is expected that developing the 3.5 GW of offshore wind energy identified in the Government's Climate Action Plan would create around 2,500 jobs in construction and development and around 700 permanent operations and maintenance jobs. The Programme for Government published in 2020 has an enhanced target of 5 GW of offshore wind which would create even more employment. The industry says that in the initial stages, the development of offshore wind energy would create employment in conducting environmental surveys, community engagement and development applications for planning. As a site moves to construction, people with backgrounds in various types of engineering, marine construction and marine transport would be recruited. Once the site is up and running, a project requires a team of turbine

[10] IPORES 2018 - A Review of Irish Ports Offshore Renewable Energy Services, IMDO

[11] Harnessing our Potential: Investment and jobs in Ireland's offshore wind industry March 2020, Carbon Trust, Green Tech Skillnet

technicians, engineers and administrators to ensure the wind farm is fully and properly maintained, as well as crew for the crew transfer vessels transporting workers from shore to the turbines.

A typical 500 MW offshore wind farm would require an operations and maintenance base which would be on the nearby coast. Such a project would generally create between 80-100 fulltime jobs, according to the IWEA. There would also be a substantial increase to in-direct employment and associated socio-economic benefit to the surrounding area where the operation and maintenance hub is located.

The imminent development of a number of offshore wind farms in the Republic of Ireland presents a sizable opportunity to stimulate the Irish economy through the growth of an indigenous and globally competitive offshore wind supply chain according to a study[12] undertaken to evaluate the economic and employment potential of the offshore wind sector for Ireland. The analysis is based on the expenditure on products and services required to develop an offshore wind farm, the planned capacity of projects in the pipeline, and the ability of Irish companies to supply the sector. Results suggest that by 2030, 2.5–4.5GW of domestic offshore wind development could create between 11,424 and 20,563 supply chain jobs and generate between €763m and €1.4bn in gross value added.

A recent report[13] published by Irish Wind Energy on floating wind energy noted that ports and offshore wind projects can be a locus for regional development. The port of Wick, Scotland, provides a great example of this. £20 million was invested in Wick to renovate two largely derelict port buildings for O&M facilities and to ready the port. The renovated port will serve as the O&M base for the Beatrice Offshore Windfarm, guaranteeing the Harbour Authority 25 years of rental and harbour fees, as well as supporting up to 90 full-time personnel, and more support staff. As FLOW opens up new areas for the development of projects, it provides an opportunity to address Ireland's regional economic

1. [12] ***Economic and employment impacts of offshore wind for Ireland: A value chain analysis***, Sarah Kandrot, Val Cummin, Declan Jordan & Jimmy Murphy

[13] Revolution – a Vision for Floating Wind Energy, Irish Wind Energy, July 2021

imbalance and associated issues, such as rural depopulation and the decline of many coastal communities, especially on the west coast.

4.3.2 Templates

One example of an opportunity for Rossaveel FHC is the proposed state-of-the-art O & M facility to be developed by SSE Renewables[14] at Arklow Harbour, Co. Wicklow, proposed as part of Arklow Bank Wind Park Phase 2.

Fig 4.2: Drawing of Proposed O & M Facility

Source: SSE Renewables

The facility will act as the support base for the offshore wind farm over its operational lifetime and is a key component of the planned Phase 2 520MW Arklow Bank Wind Park, located 6km to 13km off the coast of Arklow, Co. Wicklow. SSE Renewables is actively progressing its plans to deliver Ireland's first offshore wind farm of scale by 2025, and expects to invest between €1 billion and €2 billion to deliver the project.

Delivery of the planned Operations and Maintenance Facility at Arklow Harbour's South Dock will require an expected investment of around €15 million.

SSE Renewables is proposing to develop the facility at a disused site known as The Old Shipyard. Approximately 60 construction roles will be created

[14] https://openplans.uk/arklowbank/

during the delivery phase of the Operations and Maintenance Facility alone, and additional indirect supply chain roles are expected.

Once complete, the building will accommodate around 80 full-time employees who will be recruited to work on the wind farm once it becomes operational. These direct jobs will include site managers, supervisors, technicians, control room operators, engineers, vessel crew, stores and administration staff. The wider wind park project will also support thousands of indirect and induced jobs over the project's lifetime

The Arklow Bank Wind Park will also contribute significantly to Ireland's green economic recovery and will create 10,500 FTE years nationally, 4,800 of which will be local.

Another example is the establishment at Wicklow Port the Codling Wind Park's Operations and Maintenance base, the long-term facility from which the offshore wind farm – located 13-22km off the coast of County Wicklow – will be operated and serviced.

Codling Wind Park is a 50:50 joint venture between EDF Renewables and Fred Olsen Renewables.

The busy fishing and commercial port was selected following a detailed technical study of potential port options along the east coast and engagement with relevant port authorities and stakeholders.

The new base will provide offices, warehousing and vessel berthing facilities, as well as an operations control centre. This will enable the safe operation and maintenance of Codling Wind Park over its expected 30-year operational lifetime.

A total of 115 jobs are anticipated during the construction and operational phases combined. The new facility will see the creation of 75 new, long-term, local jobs in a variety of maintenance, technician, engineering, administration, and other roles. Additional potential benefits include training, retraining and apprenticeship opportunities in the local area. There will also be opportunities for local businesses to support the planning, design, construction, and ongoing operation of the new base.

The location of the long-term base in Wicklow Town represents a major economic boost for the area, with significant investment to be made in the development of the port facilities in readiness to support Ireland's flagship offshore wind project.

4.3.3 Udaras na Gaeltachta Initiative

Údarás na Gaeltachta announced that they are to research and formulate a development plan for the environs of Ros an Mhíl harbour to investigate the opportunities to develop the location as a national resource for marine renewable energy. The board of Údarás na Gaeltachta has approved funding to prepare a development plan regarding the lands (30 acres) in Údarás na Gaeltachta's ownership in Ros an Mhíl in County Galway to be utilised to progress opportunities for renewable energies on the West Coast of Ireland. The land in question is immediately adjacent to the proposed site of the deep water quay and is anxious to develop this landbank.

Údarás na Gaeltachta is committed to ensuring Gaeltacht areas will benefit from any boost in the renewable energy sector in the years ahead and it will form a significant part of the Údarás na Gaeltachta Strategy for 2021-2025 to be published this year.

Renewable energy issues will be central to the organisation's new strategy for the 2021-2025 period and it will investigate issues in relation to energy conservation, carbon reductions and energy generation from renewable sources.

Ros an Mhíl has been long identified by Údarás na Gaeltachta as a strategic resource, where there are feasible opportunities for the harbour to be a strategic national centre with regards to marine renewable energy. Údarás na Gaeltachta is working hand in hand with the community and the harbour development committee to ensure that the Harbour will have the opportunity to attain every possible benefit from this sector in future and that the appropriate basic infrastructure is available in the area to that end.

In that regard, Udaras na Gaeltachta commissioned Dublin Offshore Consultants Ltd to undertake a study to include a review of the marine renewable energy sector, the opportunities that arise and the requirements and advantages that Ros an Mhíl harbour agus Gaeltacht companies have to meet future demands and to benefit from same.

The Consultants published their Report in September 2021 and Appendix 4 is the Executive Summary of their Report.

The key findings of their final Report confirm that Ros a Mhíl has the potential to play an important role supporting the significant pipeline of Floating Offshore Wind on the West Coast of Ireland. Its combined attributes of proximity to offshore project locations and consented deepwater harbour infrastructure provide the opportunity for cost effective entry into the offshore energy market for the Port. The significant economic activity associated with offshore construction and wind farm operations may be realised through long term employment opportunities local to the Port and within the region.

Specifically,

- The development of Ros a Mhíl as a support port for the floating offshore wind sector would represent a major opportunity for the Galway Gaeltacht and the wider economy. Early signs of market intent for offshore wind in the region have been demonstrated by Green Investment Group's recent acquisition of the 400MW Sceirde Rocks offshore wind farm
- Each of the scenarios examined requires additional investment in the port to become fit for purpose for all users (i.e. fishing, tourism, ferry and offshore renewables). The variation in port investment costs between €17.4M and €170.5M for operational scenarios indicates the importance of clearly identifying the targeted market segment the Port intends to service and developing infrastructure in close alignment with the industry requirements.
- Ros a Mhíl does not currently have suitable infrastructure to support large scale construction & assembly activities, and will require channel dredging, quay extension, and land redevelopment work to do so
- O&M port selection is more geographically sensitive to location than construction phase activities. Ros a Mhíl is well positioned to compete as O&M port to wind farms from Loop Head to Belmullet.
- A focus on use of the Port only for Operations and Maintenance offers the best Cost Benefit Ratio of modelled scenarios (5.95), but the lowest GVA benefit to the Galway Gaeltacht (€103.5 million) for a single 500 MW Windfarm. In total, the development and construction of a 500MW FOW project would support 66 years of employment within the Galway Gaeltacht and 61 jobs during operations
- A focus on use of Ros a Mhíl as an Assembly port offers an equivalent Cost Benefit Ratio, and significant GVA benefits (€321.3), compared to O&M only. Deployment Scenarios show a demand for port capacity in excess of the Ports' facilities, which also indicates there will be a requirement for space across a number of west coast ports.
- Project construction activities offer economic activity earlier than O&M. Ros a Mhíl will lose their first mover advantage if progressing an O&M only strategy should adjacent ports in the region develop capability to service the construction phase first. An investment decision prior to expiration of existing planning permission is key.
- Ensuring the port is suitable for O&M activities as well as Assembly will be important as a contract for O&M activities brings long term benefit and local employment. However, winning a contract to be an O&M port is more locationally dependent relative to project location than activities such as Assembly. O&M activity follows sequentially from Assembly activity, and

Ros a Mhíl may be at a disadvantage if progressing an O&M only strategy should competing ports in the region develop capability to service the Assembly phase first.

- A challenge in assessing these options is the need to have port infrastructure ready ahead of demand. Assembly activity also offers economic activity earlier than O&M. Therefore, an earlier investment decision is required, and build-out of the necessary infrastructure prior to its' planning permission running out is key.
- A 700m quay would open up the port to a wide range of manufacturing, assembly and operational activities. However, it would require significant additional cost but does not deliver a significant additional benefit.
- Environmental risk is low for the proposed additional infrastructure components identified, but additional consenting may be required for some of the additional work.
- A clear strategy for procuring crane services is key to determining the highest Cost Benefit approach in supporting the Assembly phase

The potential for Ros a Mhíl to play an active support role in the construction and operation of offshore assets on the Irish West Coast, and the benefit of this economic activity to the surrounding region, is set out in the Dublin Offshore Consultants Ltd Report. The nature of the opportunity for the Port is dependent on the pace of FOW deployments over the coming years, the platform types to be deployed, and the exact capabilities to be developed at the Port.

While the facilities specified in the planning permission granted in 2018 were not intended for support to the FOW industry, many of the key requirements for a support facility could be met by effective leveraging of this facility specification. In order for Ros a Mhíl to benefit from the burgeoning offshore industry, the timely and targeted development of dedicated infrastructure at the Port is required.

The accurate targeting of high value segments within the FOW industry is key to the guidance of beneficial development at Ros a Mhíl. Four viable scenarios have been analysed here in terms of their Market, Logistics, Environmental, and Socio-Economic impact. The variation in investment requirements, port activity and economic benefit are calculated and presented to inform decision making by all stakeholders of the Port on the direction of future investment. While the timing of build out of the FOW industry on the West Coast cannot be guaranteed, the scale of the related operations requires a magnitude of ports and harbour capacity on the West Coast not currently available and provides significant opportunity to deliver a sustainable source of high value long term employment and revenue for Ros a Mhíl.

4.3.4 Sceirde Offshore Windfarm

This wind farm, being developed by Fuinneamh Sceirde Teoranta, a Galway Gaeltacht-based company, at Skerd Rocks, is a 20 turbine offshore wind farm located off the County Galway coastline, approximately 2.8km northeast of Sceirde Mór (Skerdmore), 5km southwest of Maoinis (Mweenish), Co. Galway, 14.3km southwest of Cill Chiaráin (Kilkieran), Co. Galway and 16.4km northwest of Inis Mór, Oileain Árainn (Inishmore, Aran Islands). The development would include an offshore substation and buried/rock armoured (if suitable) cabling between the turbines and the substation and between the substation and shore.

The investment value of the Sceirde wind farm is currently of the order of €1 - €2 billion and would involve a diverse range of businesses including civil engineering design, specialist plant hire, shipping and transportation, rental of port facilities, purchase of turbine and electrical components and civil and marine engineering contractors etc.

According to the EIS, approximately 530 full time equivalent (FTE) jobs and 123 FTE professional and managerial jobs would be created over the 1-year construction period, both on shore and offshore. A number of these workers are likely to be sourced locally.

Also, the operational and maintenance period would involve the creation of 32 FTE jobs for the lifetime of the development. In addition, there would be investment related to monitoring of the marine environment, including the periodic hire of local boats for seabird surveys and benthic grab surveys during the first few years of the operation of the wind farm.

In May 2020, the Government announced that seven offshore renewable energy projects, including Sceirde, have been designated as Relevant Projects. These are offshore wind projects that either applied for or were granted a lease under the Foreshore Act 1933, or offshore wind projects that are eligible to be processed to receive a valid grid connection offer. The Climate Action Plan commits to increasing Ireland's offshore wind capacity to 3.5GW as part of our overall ambition to reach 70% renewable energy by 2030.

The announcement of the transition of these projects means that they can continue to work and update a number of aspects of their projects so that they will be in a position to apply under the National Marine Planning Framework (NMPF).

A number of other economic impacts are expected to arise including:

- Skills obtained in developing and operating this project are transferable and a competency would be developed that could be used elsewhere in the economy.
- The potential contribution to the area in terms of strengthening social capital and addressing persistent weaknesses in its social structure go beyond the economic benefits identified
- There is potential for other sectors such as tourism and fishing to benefit from proximity to the windfarm. The indications to date are that any negative impacts would be minor and opportunities exist
- When operational, it's estimated the project will reduce Irish carbon emissions by up to 457 Kt CO_2 emissions avoided per annum
- The investment would contribute to policy aims such as developing the Gaeltacht and sustainable energy thereby underpinning the credibility of policy making

In September 2021, it was announced that an Australian-based multinational, Macquaries' Green Investment Group, had acquired Fuinneamh Sceirde Teoranta.

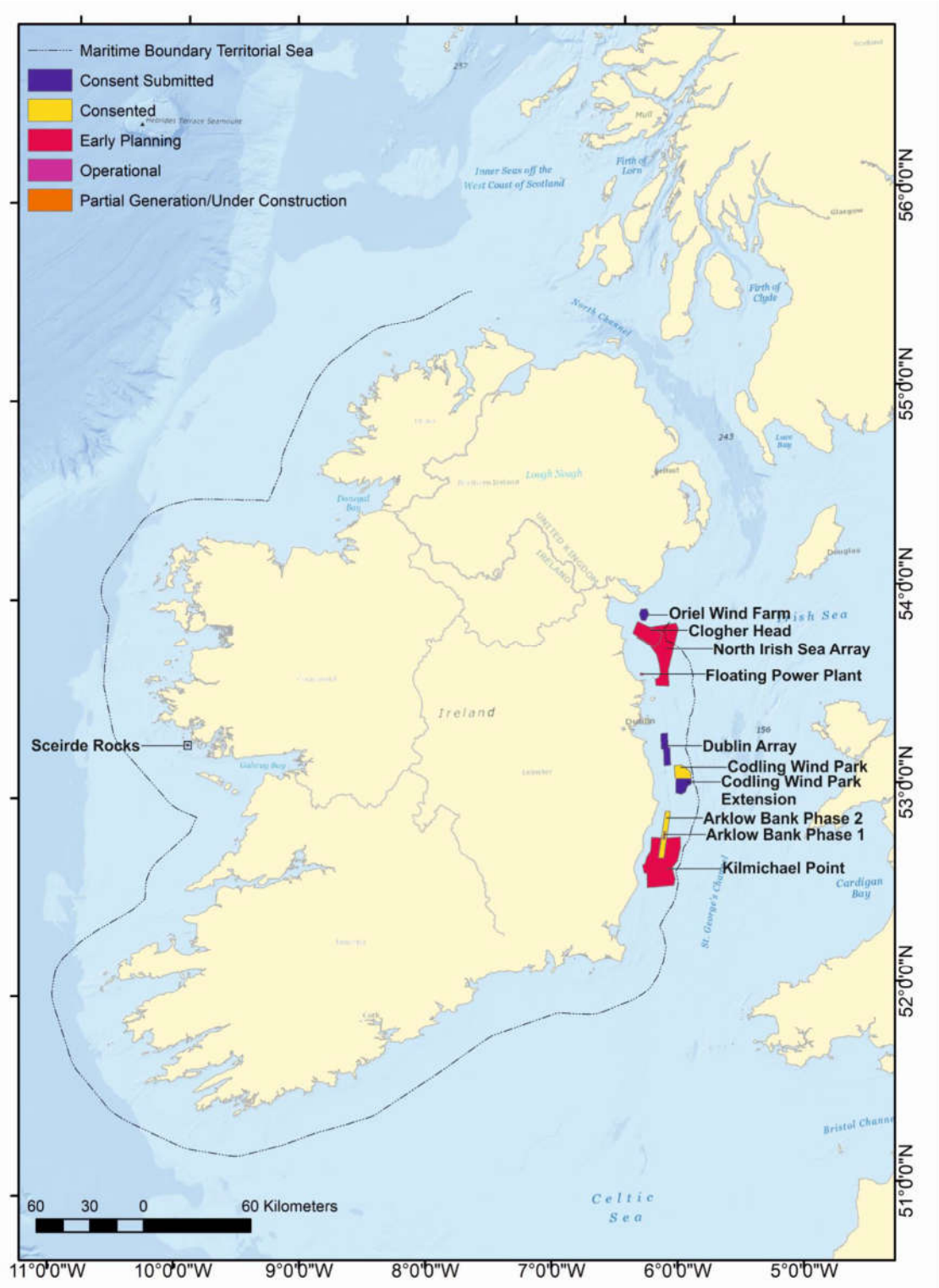
GIG, a leading renewable energy developer with a mission to accelerate the green transition, is currently developing 14 GW of offshore wind across the globe. Sceirde Rocks will be GIG's first offshore wind investment in Ireland.

GIG says the planned wind-farm would be a "flagship" development for the West of Ireland. It stated that the project will be the largest ever infrastructure project in Connemara and will position Galway as a leader in Ireland's new green energy economy.

The project will also establish a multi-million euro Community Benefit Fund, which will support sustainable community initiatives once the wind farm becomes operational.

Rossaveel FHC is ideally located to service this proposed windfarm.

Figure 4.2: Location of Sceirde Rocks Offshore Wind Site



Source: ***Co-designing opportunities towards the development of Irish offshore wind*, EirWind. Adapted from 4C Offshore, (2019)**

4.4 Other Opportunities

4.4.1 The Marine Institute

The Marine Institute is the state agency responsible for marine research, technology development and innovation in Ireland. They do so by providing scientific and technical advice to the government to inform policy and support the sustainable development of Ireland's marine resources.

They manage, develop and promote the two national research vessels RV *Celtic Explorer* and the smaller RV *Celtic Voyager, 65.5m and 31.4m in length respectively,* and the deep-water Remotely Operated Vehicle *Holland 1*. The research vessel operations team handles all aspects of scheduling and survey planning from ship-time application stage through to pre and post cruise preparation.

The 52.8m *Tom Crean*, Ireland's new state-of-the-art multi-purpose marine research vessel, due for completion in summer 2022, will replace the RV Celtic Voyager.

The RV *Celtic Voyager* regularly uses Rossaveel but the harbour at this time, cannot handle the larger vessel because of its size.

While the Institute will continue to use Galway Port as its main base, the Institute would expect to see greater use being made of Rossaveel by all of its vessels should the harbour be developed, particularly if there are difficulties with accessing alternative ports due to weather, tidal or congestion reasons.

Rossaveel's closer proximity to the Atlantic makes it an attractive port for the Institute.

4.4.2 The Naval Service

The Naval Service noted in their submission to the EIS that they would use Rossaveel if there was a deep water berth there. They need berths around Ireland to resupply, to refuel and embark operational equipment.

A deep water berth with 24 hour access would greatly facilitate Naval Service Operations.

4.5 Drivers of Development

Table 4.1 details the key parameters applied to the Drivers of Development used in this Cost Benefit Analysis and classified in terms of Costs or Benefits for the Financial Analysis and the Economic Analysis.

Discussions with BIM confirmed that the targets of 5,000 tonnes of foreign pelagic landings and 3,000 tonnes of mixed fish landings by Irish fleet vessels were not unreasonable.

It should be noted that the CBA has been undertaken based on an open quay structure to demonstrate the economic case for a potential worst case scenario (i.e. most expensive feasible option). The actual structure constructed will be decided at the detailed design stage.

Table 4.1 (a): Parameters – Financial Analysis

Financial Analysis				
Benefit		**Costs**		**Data Source/Comment**
Residual Value	60%	Construction Cost (Nett of Contingency and VAT)	€25.6m	GDG; excl VAT & Contingency in 2022 money terms
Values in 2022 Money Terms	€15.4m	Construction Cost (Nett of Contingency and VAT)	€25.6m	
Contingency %			10%	Sensitivity Options
Displaced Calls by Irish boats (*should the deep-water berth be built*)	60			RBC Estimate
Calls by foreign boats (excluding any foreign vessels landing for direct export to mainland Europe or to an alternative port for processing)	12 rising to 20			RBC Estimate
Catch per Landing (Tonnes)	50 tonnes per Irish boat 250 tonnes per foreign boat			RBC Discussions
Rossaveel Revenue from increased Fish Landings	Based on GT & Fish Landings			DAFM
		Increased Operating & Maintenance Costs	Maintenance Costs of €2.5k	Estimate
Test Discount Rate %	4%			As per Public Spending Code

Table 4.1 (b): Parameters – Economic Analysis

Economic Analysis				
Benefit		Costs		Data Source/Comment
		Construction Cost (Nett of Contingency and VAT)	€25.6m	GDG; excl VAT & Contingency in 2022 money
Residual Value	60%			
		Shadow Price of Public Funds	130%	
Credit for reduced Shadow Price of Labour	80%			PSC (Shadow Price of Labour applied to both Construction & IMT staff) to reflect precariousness and vulnerability of labour in Gaeltacht areas
Construction Jobs/€m Spent	12			DKM
Average Salary – Construction & Processing	€35k			Industry sources
Average Selling Price per Tonne €	3,000			Industry sources
Average Added Value from Fish Processing Sector (Labour & Margin).	27%			Discussions with Industry Sources
Fish Processing Yield %	55			Industry Sources
Incremental Purchases of Fuel, Provisions and Other Services & Crew Local Spend (foreign)	€5k per Visit			Estimate
Incremental Purchases of Fuel, Provisions and Other Services & Crew Local Spend (Irish)	€1k per Visit			Estimate
Added Value per Tonne of Fish Landed	€270			SFPA Stats, Ocean Wealth Data
Added Value from Local Spend	65%			Derived from CSO Input/Output Tables
Incremental Labour (FTEs)	40			
Average Tax Rate %	20			Estimated
Incremental Processing Labour Costs	€1,400,000			Discussions with Industry Sources and derived from FTEs and Average Salary/FTE

4.6 Financial Cost Benefit Analysis

The elements that make up the Financial Cost Benefit Analysis are:

- Revenue from the Irish and Foreign Fishing sectors in terms of vessel calls and fishing landings
- Capital Expenditure including Residuals
- Less Operating & Maintenance Costs

The key assumptions driving the financial cost-benefit analysis are as follows:

- CAPEX €m 25.6
- Discount Rate 4.0
- Port Infrastructure Depreciation (years) 50
- Straight Line Depreciation
- Residual Value of 60 per cent of CAPEX
- Year 0 is 2022 and Year 20 is 2042
- Year 1 is first year of operation

Applying the values set out in Table 4.1, Table 4.2 provides details of the Key Parameters for the period between 2023 and 2042.

Table 4.2: Cost Benefit Analysis – Financial Base Case

	2023	2028	2033	2038	2042
Incremental Fish Catch (Tonnes)	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income €	102,123	136,040	136,040	136,040	136,040
Project NPV @ 3.37% (€m)	**-16.8**				
IRR %	**-1.8**				
Benefit/Cost Ratio	**0.1**				

4.7 Exchequer Cost Benefit Analysis

The components that make up the Exchequer Cost Benefit Analysis are:

- Capital Expenditure
- Port Revenue from Foreign and Irish Fishing Traffic
- Less Operating & Maintenance Costs
- Taxes from Jobs in Fish Processing
- Corporate Taxes on Shipping Company

- Taxes on Construction Employment
- Corporate Taxes on Construction Companies

Table 4.3 provides a summary of the Key Parameters for specific years between 2023 and 2042. It should be noted that the economic values returned are very sensitive to the Corporate Tax rate used.

Table 4.3: Cost Benefit Analysis – Exchequer Base Case

	2023	2028	2033	2038	2042
Incremental Economic Benefit €	832,123	866,040	866,040	866,040	866,040
Economic NPV @ 4% (€m)	**-10.4**				
IRR %	**-2.3**				
Benefit/Cost Ratio	**0.8**				

4.8 Economic Cost Benefit Analysis

The components that make up the Economic Cost Benefit Analysis are:

- Capital Expenditure including Residuals incorporating Shadow Price of Public Funds
- Port Revenue from Foreign and Irish Fishing Traffic
- Less Operating & Maintenance Costs
- Shadow Price of Labour
- Added Value from Landings of Irish catch
- Added Value from Fish Processing of Irish catch
- Added Value from Local Spend by Vessels at Rossaveel

The key assumptions driving the economic cost-benefit analysis are as follows:

- Shadow Price of Public Funds % 130
- Shadow Price of Labour 80
- Added Value of Fish Landed per Tonne € 270
- Added Value of Fish Processing Sector % 27
- Added Value of Local Purchasing % 65
- Purchases of Fuel, Provisions and Other Services per Foreign Vessel Landing € 5,000
- Purchases of Fuel, Provisions and Other Services per Irish Vessel Landing € 1,000

The average estimate of Added Value assumes that all species are graded and whole round frozen. The sale price of Mackerel and Horse Mackerel wound be higher and the sale price of Herring, Sprat and Blue Whiting would be lower so on average over all species and quantities, €1000 / Mt sales price ex factory, is considered reasonable.

That figure would include, the cost of the fish, labour, packaging, freezing, transport to the factory, a contribution to overheads and a profit margin.

A Socio-Economic report carried out for The Polyvalent Fishing and Processing Group in 2009 by Erinshore Economics Ltd found that every additional €1 Million of fish landed for processing in Ireland would result in an overall increase in output throughout the Irish economy as a result of the combined multiplier effects of €3.88 Million.

Table 4.3 provides a summary of the Key Parameters for specific years between 2023 and 2042.

Table 4.4: Cost Benefit Analysis – Economic Base Case

	2023	2028	2033	2038	2042
Incremental Economic Benefit €	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**14.2**				
IRR %	**7.7**				
Benefit/Cost Ratio	**1.6**				

While Iasc Mara Teo is currently not operating, it is assumed that the factory will have commenced processing fish from other sources at the time of the availability of the new berth. Should this not be the case, the socio-economic benefits arising from the new berth would be higher because of the creation of new jobs.

4.9 Summary of Projected Impact and Economic Benefits

From the foregoing it can be seen that Rossaveel Fishery Harbour and the proposed deep water berth are of local and regional importance both economically and socially.

In the first instance and most significantly, the proposed development will facilitate the entry of vessels that heretofore could not enter the harbour because of inadequate water depth.

The new development will facilitate additional fish landings of over 150,000 tonnes over the next twenty years or so. Most of this additional tonnage is expected to be foreign landings, while the balance will be from Irish vessels that will be a mixture of new catch and previously landed fish at Irish or non-Irish ports.

The overall economic impact is, in fact, under-estimated as it should be noted that a prudent and conservative approach has been adopted to projecting expected landings.

In addition, the value of time, the expected health & safety benefits and congestion savings have not been taken into account.

In particular, what has been excluded is the significant impact of the proposed facility to service the Sceirde offshore Wind Energy Farm that has been identified by Eirgrid as one of the sources of offshore energy to come onstream by 2030. This development is expected to give rise to many direct and indirect jobs, and significant local spend. This spend is likely to amount to many millions of Euro annually.

4.10 Employment Impacts

The proposed development will impact on employment locally both directly and indirectly initially during construction. Thereafter, direct impacts will arise through increased numbers employed in fish processing, agency services and port users.

Modern processing technology has resulted in significant automation and reduction in overall labour requirements. A total staff of 50 to 55 skilled staff would be required during an eight month season this would drop to 25 in the off season. The estimate of total annual labour cost would be €1.4 to 1.5 Million. Approximately the same number of people would be employed in local businesses supplying goods and services to the factory, for example transport, packaging suppliers, engineering services, accountancy, local shops, hospitality and garages etc.

4.11 Social Impacts

The proposed development will support the long established fishing tradition which is integral to the social and cultural life of Rossaveel. The development will allow the coastal community to be revitalised as a key fishing harbour and address the effects of BREXIT by ensuring that the fishing industry will continue to be accommodated at Rossaveel.

4.12 DKM Cost Benefit Analysis Report

DKM, now EY DKM, carried out the original CBA on the proposed Deep Water Quay based on the original cost estimated by Mott Macdonald of €29.2 million. The CBA was published in late June 2017.

The CBA was carried out in accordance with the Public Spending Code Guidelines then in place that subsequently have been developed and expanded.

Based on a range of assumptions including the achievement of landings of 7,774 tonnes of demersal species and 44,054 tonnes of pelagic fish by Year 20, the Socio Economic Cost Benefit Analysis showed for Option 2, the *Do Project*, the following results:

- NPV of €27 million
- Internal Rate of Return of 10.6 per cent
- Benefit/Cost Ratio of 2.83

Since the production of that CBA Report, a number of significant events have occurred that would, no doubt, have influenced the assumptions and analysis results.

They include:

- The reduction in CAPEX values
- BREXIT and the revised reduced quotas for Ireland
- The issues raised in recording fish catch, particularly in relation to pelagic fish
- Covid 19
- The voluntary liquidation of Iasc Mara Teo (now out of it)
- The development of new berths and facilities at the Fishery Harbour Centres of Castletownbere and Killybegs
- The ever-increasing likelihood of Rossaveel being selected for servicing the Sceirde Rocks offshore wind farm.

5. Risk and Sensitivity Analysis

In this Chapter, we carry out a brief Risk Analysis and examine the impact of an increase of 10 per cent on the Capital Cost of the project.

5.1 Risk Analysis

The principal risks facing this development relate to

- CAPEX increase and/or programme over-running
- Failure to secure anticipated fish catch volumes
- Diversion to alternative ports without local processing
- Difficulties with processing anticipated volumes

We consider each of them briefly.

5.1.1 CAPEX Increase and/or Programme Over-Running

Serious construction inflation, eg in the cost of labour, of steel or other raw materials, could result in a major increase in the cost of the project.

An appropriate Contingency Sum should be added to the budget sum to take account of such eventualities.

Major projects can suffer from delay for all sorts of reasons. It would be important to choose a reputable contractor with relevant experience during the tender process and ensure scope / schedules are put in place from the outset to ensure smooth delivery of project.

5.1.2 Failure to Secure Anticipated Fish Catch Volumes

The fish projections were developed in association with local stakeholders and consideration of the intentions of some Irish companies to land at Rossaveel if the deep water berth was provided.

With the best intentions and changing circumstances, the delivery of the projections may be affected adversely with a consequent impact on the overall benefits.

For instance, the recent capital developments at Killybegs and Castletownbere may influence the potential volumes through Rossaveel.

5.1.3 Difficulties with Processing Anticipated Volumes

It is assumed that all Irish vessel landed fish will be processed at Iasc Mara.Teo.

Any failure by the company to deliver the required output on schedule, to the quality expected and in line with budget may also impact volumes landed.

5.2 Sensitivity Analysis on Base Case

Other scenarios have been examined:

- The impact of a 10 per cent increase on the CAPEX
- The impact of a 15 per cent increase on the CAPEX
- The impact of a 20 per cent increase on the CAPEX
- The impact of a 25 per cent increase on the CAPEX
- The impact of a 40 per cent increase on the CAPEX
- Annual landings of Irish catch of 2,000 tonnes
- Exclusion of Shadow Price of Labour Benefits and a 25 per cent increase in CAPEX

For each case, we present details of

- NPV
- IRR
- Benefit/Cost Ratio

5.2.1 10 Per Cent Increase on CAPEX

This scenario examines the impact of a further increase in the Capital Costs by 10 per cent, ie, an expenditure of €28.2 million.

Table 5.1 shows the Financial and Economic impacts.

Table 5.1: Capital Costs Increase by 10 per cent

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-18.6**				
IRR %	**-1.9**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	**2023**	**2028**	**2033**	**2038**	**2042**
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**12.0**				
IRR %	**6.9**				
Benefit/Cost Ratio	**1.5**				

Table 5.1 demonstrates an economic NPV of €12 million, IRR of 6.9 per cent and a Benefit / Cost Ratio of the order of 1.5 still justifying the investment.

5.2.2 15 Per Cent Increase on CAPEX

This scenario examines the impact of a further increase in the Capital Costs by 15 per cent, ie, an expenditure of €29.4 million.

Table 5.2 shows the Financial and Economic impacts.

Table 5.2: Capital Costs Increase by 15 per cent

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-19.6**				
IRR %	**-1.9**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**10.9**				
IRR %	**6.5**				
Benefit/Cost Ratio	**1.4**				

Table 5.2 demonstrates an economic NPV of €11 million, IRR of 6.5 per cent and a Benefit / Cost Ratio of the order of 1.4 still justifying the investment.

5.2.3 20 Per Cent Increase on CAPEX

This scenario examines the impact of a further increase in the Capital Costs by 20 per cent, ie, an expenditure of €30.7 million.

Table 5.3 shows the Financial and Economic impacts.

Table 5.3: Capital Costs Increase by 20 per cent

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-20.5**				
IRR %	**-2.0**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**9.8**				
IRR %	**6.2**				
Benefit/Cost Ratio	**1.3**				

Table 5.3 demonstrates an economic NPV of €10 million, IRR of 6.2 per cent and a Benefit / Cost Ratio of the order of 1.3 still justifying the investment.

5.2.4 25 Per Cent Increase on CAPEX

This scenario examines the impact of a further increase in the Capital Costs by 25 per cent, ie, an expenditure of €32 million.

Table 5.4 shows the Financial and Economic impacts.

Table 5.4: Capital Costs Increase by 25 per cent

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-21.4**				
IRR %	**-2.0**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**8.7**				
IRR %	**5.9**				
Benefit/Cost Ratio	**1.3**				

Table 5.4 demonstrates an economic NPV of €8.7 million, IRR of 5.9 per cent and a Benefit / Cost Ratio of the order of 1.3 still justifying the investment.

5.2.5 40 Per Cent Increase on CAPEX

This scenario examines the impact of a further increase in the Capital Costs by 40 per cent, ie, an expenditure of €35.8 million.

Table 5.5 shows the Financial and Economic impacts.

Table 5.5: Capital Costs Increase by 40 per cent

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-24.2**				
IRR %	**-2.0**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**5.4**				
IRR %	**5.0**				
Benefit/Cost Ratio	**1.2**				

Table 5.5 demonstrates an economic NPV of €5.4 million, IRR of 5.0 per cent and a Benefit / Cost Ratio of the order of 1.2 still justifying the investment.

5.2.6 Exclusion of the Benefits of the Shadow Price of Labour and a 25 Per Cent Increase on CAPEX

This scenario examines the impact of excluding the benefits of the Shadow Price of Labour (€280,000 annually) and a further increase in the Capital Costs by 25 per cent, ie, an expenditure of €32 million.

Table 5.6 shows the Financial and Economic impacts.

Table 5.6: Capital Costs Increase by 25 per cent and Exclusion of Shadow Price of Labour

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	**-21.4**				
IRR %	**-2.0**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	**4.9**				
IRR %	**5.0**				
Benefit/Cost Ratio	**1.2**				

Table 5.6 demonstrates an economic NPV of €4.9 million, IRR of 5.0 per cent and a Benefit / Cost Ratio of the order of 1.2 still justifying the investment.

5.2.7 Annual Landings of 2,000 Tonnes from Irish Vessels

The Base Case assumed landings of 3,000 tonnes of Irish catch.

This scenario considers the impact of landings of 2,000 tonnes.

Table 5.7 shows the Financial and Economic impacts.

Table 5.7: Average Annual Landings of 2,000 Tonnes

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	5,000	7,000	7,000	7,000	7,000
Irish Calls	40	40	40	40	40
Foreign Calls	12	20	20	20	20
Total Calls	52	60	60	60	60
Incremental Financial Income	84,207	118,124	118,124	118,124	118,124
Project NPV @ 4% (€m)	**-17.0**				
IRR %	**-1.9**				
Benefit/Cost Ratio	**0.1**				
Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit	1,860,207	1,920,124	1,920,124	1,920,124	1,920,124
Economic NPV @ 4% (€m)	**4.0**				
IRR %	**5.1**				
Benefit/Cost Ratio	**1.2**				

Table 5.7 demonstrates an economic NPV of €4 million, IRR of 5.1 per cent and a Benefit / Cost Ratio of 1.2.

As this table shows, reducing the volume landed and processed does not impact the economic return and the viability of the project.

6. Conclusion

This document sets out the initial outline Cost Benefit Analysis of the proposed deep water berth at Rossaveel Fishery Harbour Centre. The general approach to carrying out a CBA is set out in Circular 13/13 of the Department of Public Expenditure and Reform: *The Public Spending Code: Expenditure Planning, Appraisal & Evaluation in the Irish Public Service - Standard Rules & Procedures*.

In 2020, almost 3,100 tonnes of fish were landed at Rossaveel with a value of some €11.1 million. Approximately 250 tonnes of the 3,100 tonnes landed were by foreign vessels.

Iasc Mara Teo, the only fish processor in Rossaveel, closed in April 2018 following the loss of supply of fish to Killybegs. The Iasc Mara factory has modern processing, freezing and cold storage facilities that is available for catch landed at Rossaveel.

The lack of deep water in Rossaveel has constrained the growth in landings as the depth is not sufficient for modern fishing vessels to berth there.

As noted in Food Wise 2025, there is a need to develop and initiate practical and competitive measures to attract additional landings into Irish ports and continue to invest significantly in necessary infrastructure at the Fishery Harbour Centres ensuring that sufficient quay space and draught is available to avoid queuing and to facilitate quick vessel turnaround at the ports.

The Government's policy document, *Our Rural Future: Rural Development Policy 2021 -2025*, notes in Chapter 10*, Supporting the Sustainability of our Islands and Coastal Communities* that the marine economy is a key enabler of effective regional development, especially in remote coastal communities.

It is also Government policy to grow, encourage and promote local fish processing by fish landed by foreign vessels.

The provision of a deep-water berth at Rossaveel would address a range of opportunities including:

- Catering for additional landings from Irish and foreign vessels
- enabling the servicing of potential offshore windfarms
- reducing congestion and delays to entry
- mitigating health and safety risks
- facilitating increased cargo landings

Rossaveel has been recognised, because of its location, available land alongside and community support, to be of great strategic importance for servicing both the fixed and floating offshore windfarm sector that are expected to give rise to many direct and indirect jobs, and significant local spend. This spend is likely to amount to many millions of Euro annually much of which will support the Rossaveel and surrounding economies. This development alone would justify the provision of the deep-water berth.

Discussions with the developer of the proposed Sceirde Offshore Wind Energy facility, the Marine Renewables Industry Association and Udaras na Gaeltachta indicate that Rossaveel has major potential for supporting the sector.

The economic well-being of Rossaveel is very much linked with the fortunes and future of the Fishery Harbour Centre. For instance, the deep water berth will facilitate the reopening of the local fish processing plant that will result in the creation of some 50 to 55 skilled staff during an eight month season that would drop to 25 in the off season. Approximately the same number of people would be employed in local businesses supplying goods and services to the factory.

The provision of a deep water berth at a cost of €25.6 million, excluding VAT, will also lead to a growth in local spending by visiting fishing vessels. This spend would cover such purchases as fuel, food, ice, vessel maintenance, local transport and hospitality, medical attention etc.

However, it should be noted that the CBA has been undertaken based on an open quay structure to demonstrate the economic case for a potential worst case scenario (i.e. most expensive feasible option). The actual structure constructed will be decided at the detailed design stage.

The CBA on the Core Option of annual landings of 5,000 tonnes of foreign catch and an additional 3,000 tonnes of Irish catch, with processing of Irish catch only, generated the following results:

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-16.8	-1.8	0.1
Economic Analysis	14.2	7.7	1.6

If Irish landings are restricted to 2,000 tonnes, the following results are obtained:

	NPV (€m)	IRR (%)	Benefit/Cost Ratio
Financial Analysis	-17.0	-1.9	0.1
Economic Analysis	4.0	5.1	1.2

It should be noted that the overall economic impact of the proposed development as set out under the Core Option is, in fact, under-estimated as a prudent and conservative approach has been adopted to projecting expected landings.

Adopting the Public Spending Code Guidelines, an annual net revenue of €1.6 million, including 1,600 tonnes of fish processed locally, is required to break-even on the proposed CAPEX. It is generally accepted that the achievement of such minimum volumes is highly likely.

Serious consideration should be given to the co-development and funding of the proposed development with Udaras na Gaeltachta/Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media because of their joint interest in and because of the benefits that will accrue to the stakeholders of each.

The overall analysis confirms that there is a business case for the proposed development and that the new berth would be a catalyst for the socio-economic regeneration of Rossaveel and its regional environment.

Appendix 1

CBA Analysis of Core Option

Version: 27 January 2022 *Table 4.2* *Core excluding Foreign Catch Processing*

Catch per Whitefish Boat (Tonnes)	11	Base No of Fishing Vessel Calls per Annum	2,810
Catch per Pelagic Boat (Tonnes)	250	Base Number of Domestic Fishing Vessel Landings pa	1,360
€ Rate per Irish Vessel Call	140	Base Number of Foreign Fishing Vessel Landings pa	1,450
Vessel GT (Foreign Calcs)	816		
€ Port Charges per Foreign Vessel Call	4,240	Base Gross Tonnage of Foreign Fish Landed	
Added Value per Tonne of Processed Fish	0.27	Base Gross Tonnage of Irish Fish Landed	
Vessel GT Irish Vessel)	243	Contingency %	0%
Catch per Local Boat (Tonnes)	50		
€ Port Charges per Irish Vessel Call	896	Unemployment Benefit per annum	17,100
Local Spend per Foreign Vessel	5,000	Salary for Additional FHC Employee	35,000
Local Spend per Irish Vessel	1,000	Non-Payroll Costs Uplift	25%
Added Value of Local Spend %	65%	Average Personal Tax Rate (FHC)	15%
		Construction Unit Labour Costs	35,000
Added Value per Tonne of Landed Fish €	270	Average Personal Tax Rate	20%
Average Sale Price of Processed Fish €	3,000	Imputed Pension Cost	13%
Processing Yield (Fish Sector) %	55%	Jobs per €1 million Construction Sector	12
Processing Share of Irish Catch	100%	Corporate Tax Rate %	5%
Processing Staffing Costs €	1,400,000		
		Shadow Price of External Funds	130%
Depreciation (Years)	50	Shadow Price of Labour (Processing)	80%
Annual CAPEX Inflation Rate %	3.0%	Test Discount Rate (TDR) %	4.00%
NPV @ TDR €000	-16,771.1	Shadow Price of Labour (Construction)	80%
IRR %	-1.8	Tonnes Fish/Truck	18
Benefit/Cost Ratio incl Residual Value	0.10	Litre/100 km	15
		Single Distance Killybegs/Rossaveel (km)	260
		Fuel Consumption (Return) per truck (Litres)	78
Journey Time Value per Hour €	41	VAT & Excise Duty on Diesel per Litre €	0.639
Non-Fuel Cost €/km	0.27	Taxes per Return Journey per Truck	49.84
Fuel Cost/Km	0.24	Diesel Cost per Litre €	1.590
Journey Time Cost €	143.5	Journey time (Hours)	3.50

Model Inputs

Model Outputs

Financial Impact:	2023	2028	2033	2038	2042
Incremental Fish Catch	6,000	8,000	8,000	8,000	8,000
Irish Calls	60	60	60	60	60
Foreign Calls	12	20	20	20	20
Total Calls	72	80	80	80	80
Incremental Financial Income €	102,123	136,040	136,040	136,040	136,040
Project NPV @ 4% (€m)	-16.8				
IRR %	-1.8				
Benefit/Cost Ratio	0.1				

Exchequer Impact:	2023	2028	2033	2038	2042
Incremental Exchequer Benefit €	832,123	866,040	866,040	866,040	866,040
Exchequer NPV @ 4% (€m)	-10.4				
IRR %	-2.3				
Benefit/Cost Ratio	0.8				

Economic Impact:	2023	2028	2033	2038	2042
Incremental Economic Benefit €	2,606,623	2,666,540	2,666,540	2,666,540	2,666,540
Economic NPV @ 4% (€m)	14.2				
IRR %	7.7				
Benefit/Cost Ratio	1.6				

	NPV	IRR	BCR
Financial	-16.8	-1.8	0.1
Economic	14.2	7.7	1.6
Exchequer	-10.4	-2.3	0.8

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	TOTAL
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	
Dredge	6,296,401	**0**																				
Construction	19,300,000																					
Sub-Total	**25,596,401**	0																				
Prelims/Overheads (0%)	-	0																				
Contingency	0	0																				
Total CAPEX in 2018 money	**25,596,401**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,596,401
CAPEX Inflation Factor	1	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30	1.34	1.38	1.43	1.47	1.51	1.56	1.60	1.65	1.70	1.75	1.81	
Capital Expenditure (€'000) - Current Values	**25,596,401**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25,596,401**
Fish Landings (Tonnes)	0	6,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	**158,000**
Irish Fishing Vessel Calls	0	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	**1,200**
Foreign Pelagic Fishing Vessel Calls	0	12	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	**392**
Total Fishing Vessel Calls	0	72	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	**1,592**
Incremental FHC Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Increase in Fish Landings (Tonnes)	0	6,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	**158,000**
- Irish		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	**60,000**
- Foreign		3,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	**98,000**
Incremental Volume into Irish Processing		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	**60,000**
Foreign Volume to Killybegs (>12,000 tonnes)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
No of Trucks		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Rossaveel Income from Increased Irish Calls	0	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	53,748	**1,074,960**
Rossaveel Income from Increased Foreign Calls	0	50,875	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	84,792	**1,661,923**
Total Increased Income (at *constant* prices)	**0**	**104,623**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**138,540**	**2,736,883**
Costs at *constant* prices																						
Rates		0																				**0**
Staffing		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Non-Payroll Costs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Imputed Pension Cost		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Maintenance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HLP		0																				**0**
Insurance		0																				**0**
Other/Miscellaneous		2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	**50,000**
Total Operating & Maintenance Costs	**0**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**2,500**	**50,000**
Iasc Mara Teo Labour Costs €		**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**1,400,000**	**28,000,000**

Financial Impact - 20 years	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	TOTAL
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	
CAPEX including Residual Value	25,596,401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-15,357,841	**10,238,560**
Revenue	0	104,623	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	**2,736,883**
Operating and Maintenance Costs	0	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	**50,000**
Nett	-25,596,401	102,123	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	15,493,881	**-7,551,677**
NPV @ TDR	**-16,771,067**																					
IRR%	**-1.8**																					
Net Revenues	**0**	**102,123**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**136,040**	**2,686,883**
Discounted Net Revenues	**1,816,216**																					
Discounted CAPEX incl Residual	**18,587,283**																					
Benefit/Cost Ratio incl Residual	**0.1**																					
Exchequer Impact																						
Financial Impact Nett	-25,596,401	102,123	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	**-22,909,518**
Taxes from Jobs from Fishing Activity	0	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	**5,600,000**
Corporate Taxes on Fishing Company	0	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	**9,000,000**
Taxes on Construction Employment	2,150,098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2,150,098**
Corporate Taxes on Construction Companies	1,279,820	0	0	0																		**1,279,820**
Nett	**-22,166,483**	**832,123**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**-4,879,600**
NPV @ TDR	**-10,429,329**																					
IRR%	**-2.3**																					
CAPEX	-25,596,401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,357,841	**-10,238,560**
Revenue	0	104,623	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	138,540	**2,736,883**
Operating and Maintenance Costs	0	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	**-50,000**
Taxes from Jobs from Fishing Activity	0	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	**5,600,000**
Corporate Taxes on Fishing Company	0	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	**9,000,000**
Taxes on Construction Employment	2,150,098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2,150,098**
Corporate Taxes on Construction Companies	1,279,820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1,279,820**
Nett	**-22,166,483**	**832,123**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**16,223,881**	**10,478,241**
Net Revenues	**3,429,918**	**832,123**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**866,040**	**20,716,801**
Discounted Net Revenues	**15,167,072**																					
Discounted CAPEX incl Residual	**18,587,283**																					
Benefit/Cost Ratio incl Residual	**0.8**																					
Economic Impact																						
CAPEX including Residual Value	-33,275,321	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	0	0	0	0	19,965,193	**-13,310,129**
Financial Nett Revenues to FHC	0	102,123	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	136,040	**2,686,883**
Added Value from Additional Processing	0	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	1,336,500	**26,730,000**
Added Value from Landed Fish	0	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	810,000	**16,200,000**
Local Spend per Call - Foreign	0	39,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	**1,274,000**
Local Spend per Call - Irish	0	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	39,000	**780,000**
Credit for Reduced Shadow Price of Labour	0	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	280,000	**5,600,000**
Credit Reduced Shadow Price Const Labour	2,150,098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2,150,098**
Less Incremental Emission & Other Costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Nett	**-31,125,224**	**2,606,623**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**22,631,733**	**42,110,852**
NPV @ TDR	**14,168,166**																					
IRR%	**7.7**																					
Net Revenues	**2,150,098**	**2,606,623**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	**2,666,540**	
Discounted Net Revenues	**38,331,634**																					
Discounted CAPEX incl Residual	**24,163,468**																					
Benefit/Cost Ratio incl Residual	**1.6**																					

Appendix 2

Open Piled Quay Wall Concept Appraisal and Cost Estimate Assumptions[15]

INTRODUCTION

This appendix has been specifically prepared to accompany the numerical modelling work undertaken with respect to an alternative open piled quay wall at Rossaveel Fishery Harbour Centre. It also builds on the previous work by GDG in their peer review report (reference "18122-R-002 - Quay Wall Peer Review Report") where a variety of vertical quay wall solutions were developed with associated cost estimates for dredging and marine civils works.

As outlined in the body of this study, the use of an open piled quay wall may offer benefits to DAFM in terms of providing marginal improvements to the operability of the new deepwater port facility. The work contained in this appendix should be considered in particular context with the wind analysis and percentage occurrence of wind and wave conditions at occurring at the deepwater port site.

OPEN PILED QUAY WALL ARRANGEMENT

Considering the original functionality of the deepwater quay in terms of quay loading, achieving dredge depth at the adjacent berth slot of up to -12m CD, quay line, fendering, drainage, services, etc, along with new requirements such as wave absorption capability (i.e. rock armour profiling, sizing and composition) and having to carry a suspended reinforced concrete deck in an open-piled arrangement, GDG has developed a concept design for the open piled quay wall.

A full-scale drawing illustrating the proposed concept has been included in Appendix A.1, but screen-clips from the drawing are provided below for ease of reference. A cross-section taken from the drawing is provided below in Figure A-1.

[15] Numerical Modelling Report, GDG Gavin & Doherty Geosolutions, November 2021

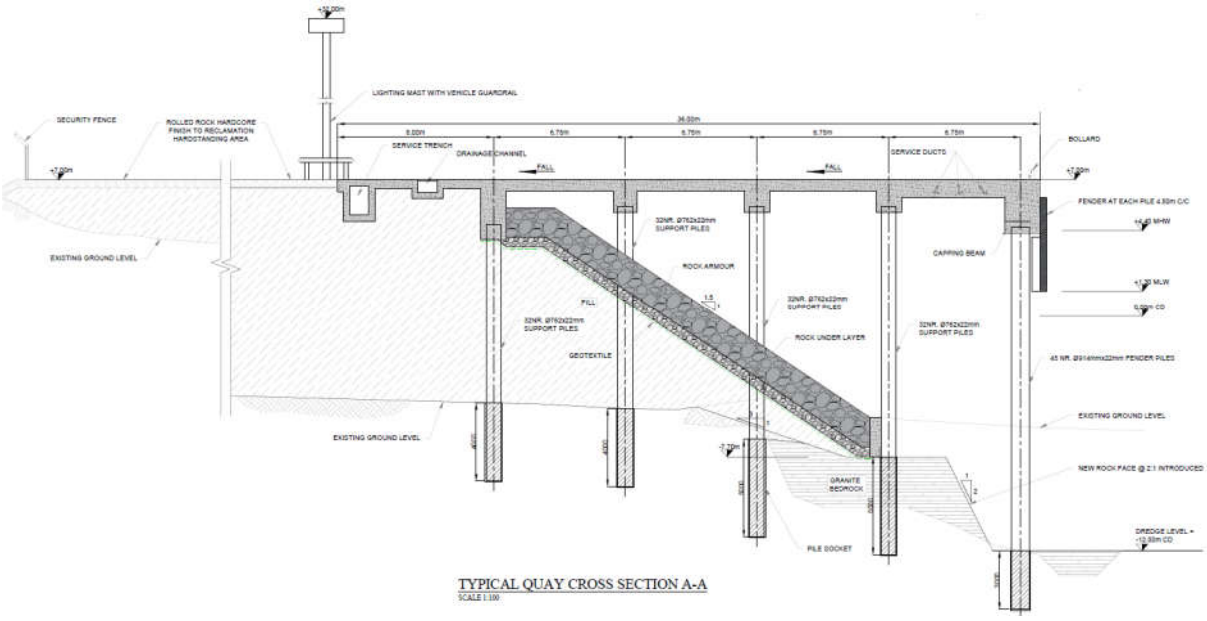


Figure A-1 Cross-Section through Open Piled Quay Wall

The main elements comprising the concept design have been laid out in an anticipated set of construction stage steps, as follows:

1. Similar to the previous solutions developed in the peer review report, a ledge of rock shall be formed in an effort to minimise rock dredge volumes in proximity to the quay line. Whilst the final dredge level is subject to final agreement, either -12m CD or -10m CD berth pocket dredge level can be accommodated. A new rock face at 1:2 (V:H) shall be formed in the granite bedrock during dredging using drilling and blasting methods, also such that a reasonably flat ledge of rock at -7.7m CD is formed to help support the rock armour revetment. Rockfill generated from the dredging process is to be readily stored within the main filled area within the reclamation area.

2. Drilled rock socketed steel piles shall be installed into the underlying granite bedrock in order to support the new suspended reinforced concrete deck. Piles are expected to be rock socketed circa 3.0m into rock using an oversized casing. Pile lengths may typically vary between 16 - 22m. Piles shall generally be arranged on a 6.75m (transverse spacing) x 6.50m (longitudinal spacing) pile grid to accommodate an approximate design load of at least 50 kN/m^2. Piles are expected to be circa 762mm dia x 22mm thk S430 steel grade. However, the most seaward gridline, gridline 1, shall comprise 813mm dia x 22mm thk S430 steel grade piles spaced at 4.5m centres. Thus, a total of circa 173nr piles are required across the extent of the 200m long quay, 4nr gridlines comprising 32nr and 1nr gridline at the seaward face with 45nr piles. The piles shall be closed end and shall be grouted in place around their annulus within the rock socket. Piles are likely to be installed on site using either jack-up barge or floating marine plant given their relative location away from shore.

3. The rock armour revetment shall be constructed following piling activities. A concrete facing panel shall first be installed between adjacent piles along pile gridline 2 (i.e. one gridline in from most seaward gridline, gridline 1), in order to prevent the toe of the revetment from pushing seawards. The revetment comprises core rockfill material with a geotextile prepared base layer with two layers of rock armour overlain, as i) underlayer, relatively lightweight armour typically around 100 – 300 kg and ii) and primary layer armourstone comprising 2nr separate layers of heavier 1 – 3 tonne rock armour. The main core material of the revetment shall be obtained primarily from dredging works of the navigation channel and berth; however, with additional material needed to be imported to site from local quarries. The revetment shall be brought up

in layers achieving the 1:1.5 (V:H) gradient set. Each layer shall be carefully compacted and placed with cognisance paid to the presence of the new piles. It should also be noted that in keeping within the original planning boundary, the northern face of the revetment shall wrap around underneath the extent of the suspended deck, with the inclusion of a vertical sheet piled wall into the corner of the filled area in this location (refer to Figure A-2), which may provide the added benefit of having a short length of quay face approximately 50m long at circa -4m to -6m CD.

4. At this point, filling activities behind the quay can proceed concurrently alongside installation of the structural elements of the quay including the reinforced concrete deck and capping beam, services including water, lighting, electricity, etc, fendering and remaining deck furniture including bollards, safety ladders, life-rings, etc.

A plan arrangement demonstrating the extents of the 200m long open piled quay is provided below in Figure A-2. As illustrated, the rock armour revetment should wrap around at either end appropriately in order to remain within the original planning boundary.

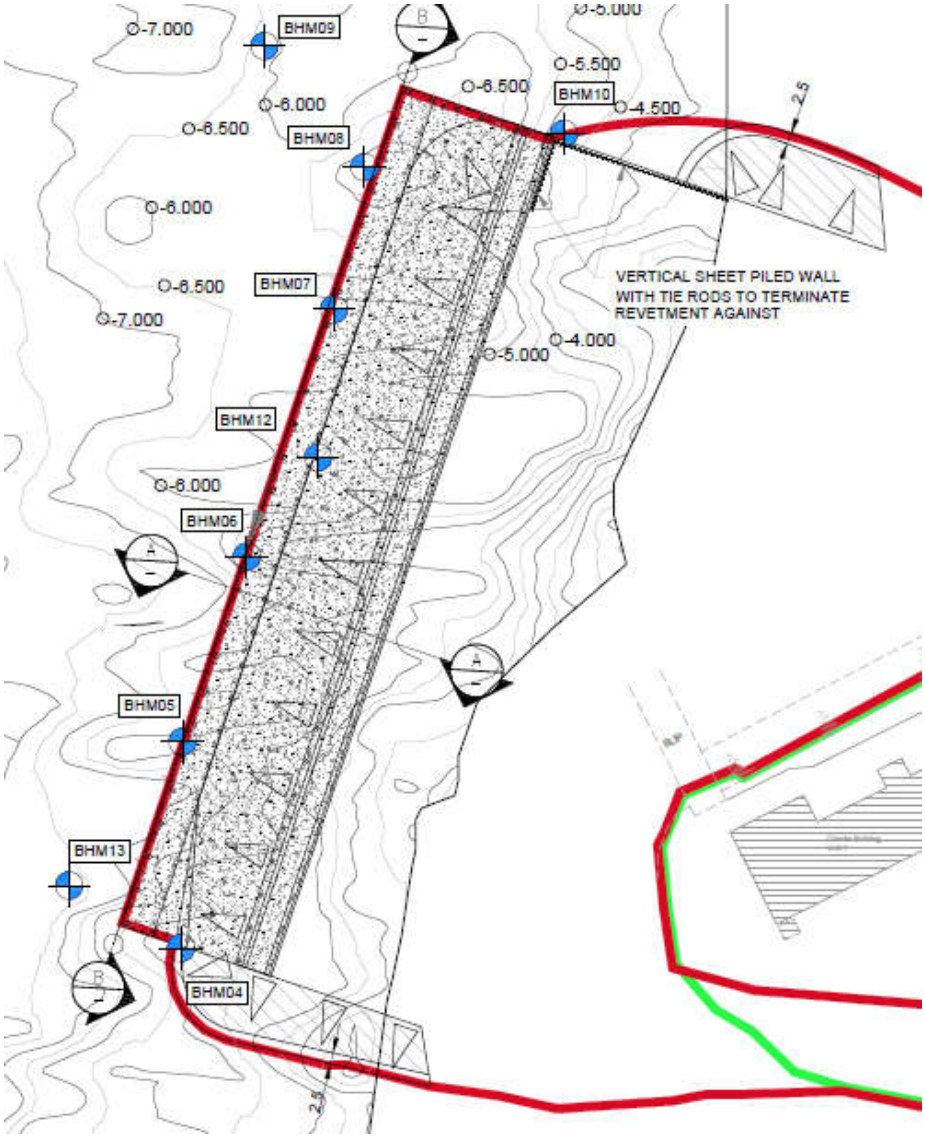


Figure A-2 Plan Arrangement of Open Piled Quay Wall

OPEN PILED QUAY WALL ARRANGEMENT

COST ESTIMATE ASSUMPTIONS

The following assumptions have been made with respect to cost estimation.

- The baseline of the original cost has been extracted from a cost assessment carried out by Mott MacDonald in 2017. The prices that have been quoted exclude VAT.
- Estimates of the original cost have been made using the planning drawings provided. Similar cross section layouts have been used to produce cost savings for the newly proposed conceptual designs.
- All dredged material is being reused in filling / placement behind to form the revetment core and main reclamation area.
- In order to draw direct comparison of cost savings between other design options, generally the plan extents of the structure are retained between options.
- The estimates provided are generally best estimates of likely contract costs without any additional provision for contingencies.
- The costs are subject to variation from factors such as barge and marine plant availability, stability of the rock slope in front of the proposed revetment, extent, type and frequency of fendering required, any influence from variation in rock strength and its stratification along the wall, final quality of backfill material (after dredging and recovery), remoteness of the site which may restrict availability of material and concrete deliveries, etc.
- We consider that the costs presented may be taken as fairly representative of the different costs relative to one another as costings has been based on relative parametric costs.
- It may be expected that the costs presented will need to be re-assessed at a later date, closer to tendering / procurement.
- Reasonable assumptions on design loads and toe levels have been made during concept design development. Refinement and variation of loading scenarios could influence specific options to a greater or lesser extent.

At this stage a contingency figure of +10 to +20% would not be unreasonable given recent market volatility combined with reduced material availability.

COST ESTIMATE

The cost estimate for the open piled quay wall is presented in Table A-1. This option is referred to as Option 4, given the numbering of previously developed concept designs and cost estimates.

Table A-1 Option 4 (Open Piled Quay Wall) 2021 Cost Estimate

Key Element of Works	Description	Estimated Cost
Dredging	Rock and overburden dredging incl. rock slope formation and material re-use and handling	€6.3m
Quay Wall Structures	Open piled quay construction incl. mobilisation, both drilled tubular piling and sheet piling works	€10.0m
Concrete Elements	Reinforced concrete quay slab, concrete pavement and vertical boundary walls	€3.1m
Reclamation Fill	Imported rockfill, rock armour revetments, general reclamation fill and Clause 804 for access road	€5.4m
Ancillary Civils Works	Various items incl. drainage, services, perimeter fencing, high mast lighting and marine fendering	€0.8m
	Total Cost	**€25.6m**

Appendix 3

Letter of Support from the Marine Renewables Industry Association

Marine Renewables Industry Association

MRIA Energy from Ireland's Waves and Tides

Raymond Burke
Verona
9 Ballinclea Road
Killiney
Co Dublin

8 July 2021

Dear Raymond,

I was delighted to discuss the possible future development of Rossaveal Harbour from the perspective of the Offshore Renewable Energy (ORE) industry with you yesterday.

Ireland's major ORE resource lies off the west coast where the wind speeds and availability levels are global leaders while our west coast waves are deemed the most energy intensive world-wide. Three factors will drive the development of these resources.

First, west coast ***wind*** will be exploited almost exclusively (Sceirde Rocks is an exception to the rule) by Floating Offshore Wind (FLOW) technology which is rapidly emerging. This is due to various reasons, most notably the closeness to shore of the 50m depth contour line (practical limit of most traditional Bottom Fixed Offshore Wind turbine types) in the west. Several of the projects seeking sites already off the south coast involve FLOW - (part of) the SSE project and the full proposals by DP Energy, Simply Blue Energy and ESB/Equinor's 'Celtic 2' are based on this technology. The vast majority of the planned projects off Clare (to take advantage of the grid capacity that will be released when the 1GW Moneypoint coal station closes in 2025) are also based on FLOW. Floating offshore wind activity has increased rapidly in the past 5 years. Global installed capacity stands at 65MW but there is currently 25GW of floating wind capacity under development worldwide. ***Wave*** energy is at an earlier stage and will start to emerge in the 2030s. Ireland's *National Energy and Climate Plan 2021-2030* includes indicative wave capacity forecasts for the2030s. Wave energy off the Irish coast is likely to be largely focused on the west coast.

The second driver of ORE is Government policy. The Programme for Government calls for a pal develop 30GW of FLOW of the west coast in the 2030s which will be underpinned by an exercise called *Offshore Renewable Energy Development Plan 2* which is now underway in the Department of Environment, Communications and Climate. This will inter alia update the locations of the ORE resource off our coasts and facilitate planning of the *Designated Maritime Area Plans* i.e., zones provided for in the new Maritime Area Planning Bill.

The final driver will be market opportunity. Our early ORE will be fully utilised by domestic needs as we decarbonise the electricity system but export opportunities will arise from a variety of sources such as the UK where the generating fleet is reaching mass retirement and the Government is actively seeking electricity deals with its neighbours;

c/o "Leixfort"
Corrig Avenue
Dun Laoghaire
Co. Dublin
Ireland

Directors:
P Coyle (Chairman)
R Alcorn (Secretary)
J Galvin, J Keating

Tel: + 353 86 2516390
Email: chairman@mria.ie
Web: www.mria.ie

the development of an EU wide energy market linked up by an undersea grid is progressing rapidly and will enable Ireland to export to continental Europe where some countries (e.g., Germany) have limited renewable resources; and, of course, the rise of hydrogen is already leading energy giants to think in terms of converting seawater into hydrogen using offshore, west of Ireland wind and wave machines, and shipping e.g., in converted oil tankers to Europe.

Turning to the shore support required to support the ORE future, this breaks down into three elements. First, **turbines have to be installed** on site and this involves such activities as cable laying to shore, construction of sub-stations ashore (and at sea), assembly of key components etc. This requires support from a local port. A key feature of the ORE industry is that the specialist vessels required in this phase are very expensive to hire and industry is always seeking to minimise 'steaming' distances.

Second, a wind farm will last c25 years and then will have to start all over again with new turbines etc. The **Operations and Maintenance** (O&M) required over the life time of a farm involves a shore operations centre, a logistic facility ashore and vessels to transport technicians to and from individual turbines for maintenance. Occasionally, major components may have to be replaced or a turbine towed into a shore base for repair. A good rule of thumb would be to envisage about 100 people being employed full time on O&M per wind or wave farm. A point to bear in mind is that the types of vessels required to support the developments off the west coast are likely to be similar in size (c80m in length) to the vessels used to support oil and gas fields. There is potentially employment available for fishers who may decide or need to leave that industry.

Finally, a cluster of major developments off the west coast may drive decisions to manufacture major components close to site e.g., Siemens are currently building a blade factory, to supply the southern North Sea, at Le Havre - c800m long and will employ c700 people. This would be a great prize for the 2030s.

We in industry have long been concerned about port capacity on the west coast to support ORE - please see *MRIA Discussion Paper on Maritime Infrastructure Development Priorities to Support Ireland's Future Ocean Energy Industry* available at the Publications page of www.mria.ie . There is a role for all ports on the west coast but, taking into account the potential scale of the opportunity in the 2030s, the nature of the technologies involved, the 'steaming' distance issue etc, there is a need for extra capacity to serve the seas to the west of Galway and Mayo in particular.

We fully support the efforts of Údarás na Gaeltachta to develop a plan for Rossaveal (we are a member of the steering group) by way of consultation with key stakeholders (industry, local community etc) and the development of options by consultants. We don't believe that there is an immediate need for investment decisions necessarily but it would be a major blunder if the existing consents associated with possible quay developments at Rossaveal were allowed to lapse. We urge the Department of Agriculture, Food and Marine to renew them and to keep closely in touch with the vital work being undertaken by An Údarás.

Yours Sincerely,

Peter Coyle

Chairman

MRIA
ENERGY FROM IRELAND'S OCEANS

www.mria.ie @Marineireland

Appendix 4

Executive Summary Report from Udaras na Gaeltachta

Dublin Offshore

EXECUTIVE SUMMARY

Ros a Mhíl

A Strategic Hub for the Development and Support of the Offshore Wind Industry on the West Coast of Ireland

September 2021

Client

Údarás na Gaeltachta is the regional development authority for the economic, social and cultural development of the Gaeltacht with the overall objective of maintaining Irish as the communal language of the region. Further information can be obtained on www.udaras.ie.

About this Report

Date of Issue: September 2021

Lead Author: Dublin Offshore

Project Team:

Scenario Creation & Enterprise Strategy – Lumen Energy & Environment.

Environmental Analysis – ITP Energised.

Economic Analysis – BIGGAR Economics.

The Project Team authored this report based on an impartial analysis of primary and secondary sources, including stakeholder consultation. The Authors would like to thank everyone that has contributed their time and expertise during the preparation and completion of this report. Special thanks go to Údarás na Gaeltachta and the Stakeholder Advisory group whose input and feedback were invaluable in completing this report.

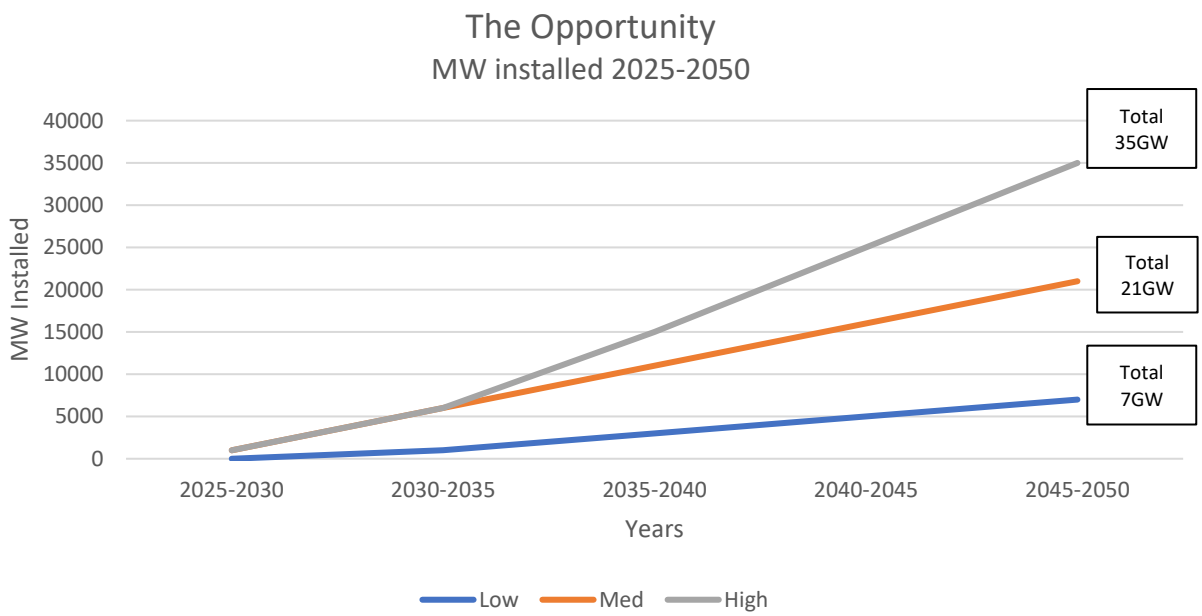
Disclaimer

Opportunity and Context

This report assesses the Technical, Environmental and Socio-Economic opportunities and constraints for Ros A Mhíl port considering the proposed development of Floating Offshore Wind (FOW) on the west coast of Ireland. The analysis may be used to guide decision making by all stakeholders in the long-term development of infrastructure and facilities to meet the targeted FOW market segment requirements.

Ireland has made a strong commitment to the growth of offshore wind, and environmental conditions, particularly on the west / Atlantic coast are better suited to Floating Offshore Wind Platforms – a rapidly emerging market beginning to scale up over the next decade. However, Ireland will require port and infrastructure investment to capitalise on the environmental and economic benefits from the construction and operation of new generation assets.

The Programme for Government 'Our Shared Future' aims to take advantage of the "at least 30 GW of offshore floating wind power" off the Atlantic coast by 2050. Offshore Renewable Energy Development Plan (OREDP) outlines the possibility of 27 GW of floating wind in Irish waters (7GW on the West Coast region closest to Ros a Mhíl). In order to predict which capacity in MW will be installed and require port facilities on the western seaboard, Low, Medium & High scenarios have been created with indicative installed capacity (MW) per 5-year window.



It should be noted that the Low scenario will require grid reinforcement along the west coast given existing grid capacity constraints, the high scenario requires both major grid reinforcement as well as other uses for electricity produced by floating wind, such as the production of Hydrogen, integration to a super grid and other e-fuels like Ammonia for shipping.

Ros a Mhíl has the potential to play an important role supporting the significant pipeline of Floating Offshore Wind on the West Coast of Ireland. Its combined attributes of proximity to offshore project locations and consented 12m deep berth provide the opportunity for cost effective and timely entry into the offshore energy market for the Port. The significant economic activity associated with offshore construction and wind farm operations may be realised through long term employment opportunities local to the Port and within the region.

This analysis highlights risks and opportunities for Ros a Mhíl both as an Operations and Maintenance (O&M) port and as a base for Assembly activities during floating offshore wind development.

Target Market Scenarios

The following potential scenarios were defined and assessed as part of the analysis.

Scenario 1: defines a port that can be used as a quick reaction port for Operation & Maintenance of a FOW project, the port would include an O&M office facility for technicians and control centre for the operation of the windfarm. Technicians would access the wind farm from the port using service operation vessels, crew transfer vessels and helicopters.

Scenario 1a: defines a port that can act as a quick reaction O&M Port, but with the additional facilities and requirements to be able to store and deploy certain, smaller components required during the construction of a FOW project, this could include mooring chains & anchors.

Scenario 1b: defines a port that can act as a quick reaction O&M Port, but also act as a centre for major maintenance repairs, with the additional facilities and requirements to be able to store and deploy some of the larger components (mooring systems, cables etc) required during the construction of a FOW project.

Scenario 2: defines a ‘cluster port’, i.e. a port large enough to host Pre-fabrication, Assembly, wind turbine staging; all construction related activities as well as a full Operation & Maintenance service (quick reaction & major repairs).

Key Findings

- The development of Ros a Mhíl as a support port for the floating offshore wind sector would represent a major opportunity for the Galway Gaeltacht and the wider economy. Early signs of market intent for offshore wind in the region have been demonstrated by Green Investment Group's recent acquisition of the 400MW Sceirde Rocks offshore wind farm.
- Each of the scenarios outlined require additional investment in the port to become fit for purpose for all users (i.e. fishing, tourism, ferry and offshore renewables). The variation in port investment costs between €17.4M and €170.5M for operational scenarios indicates the importance of clearly identifying the targeted market segment the Port intends to service and developing infrastructure in close alignment with the industry requirements.
- Ros a Mhíl does not currently have suitable infrastructure to support large scale construction & assembly activities, and will require channel dredging, quay extension, and land redevelopment work to do so.
- O&M port selection is more geographically sensitive to location than construction phase activities. Ros a Mhíl is well positioned to compete as O&M port to wind farms from Loop Head to Belmullet.
- A focus on use of the Port only for Operations and Maintenance offers the best Cost Benefit Ratio of modelled scenarios, but the lowest Gross Value Add (GVA) benefit to the Galway Gaeltacht.
- A focus on use as an Assembly port offers similar Cost Benefit Ratio, and significant GVA benefits, compared to O&M only. However, as stated above significant marine and onshore works are required.
- Project construction activities offer economic activity earlier than O&M. Ros a Mhíl will lose their first mover advantage if progressing an O&M only strategy should adjacent ports in the region develop capability to service the construction phase first. An investment decision prior to expiration of existing planning permission is key.
- Scenario 2 requires significant additional investment in order to open up the port to a wide range of manufacturing, and assembly and operational activities. However, it does not deliver a significant additional GVA benefit compared to Scenario 1b.

Key Consideration : While all options are available to Ros a Mhíl, the potential to provide O&M plus Assembly support as captured in Scenario 1b is of particular interest for the reasons outlined above. Based on servicing 3GW of projects, which is less than half of the Low FOW deployment scenario, this has the potential to result in up to 900 direct and indirect jobs for the region.

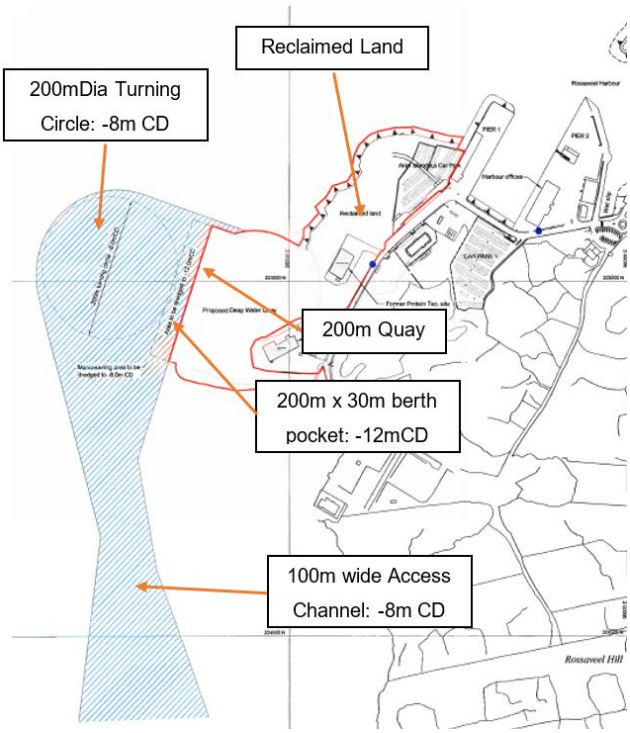
Summary Scenario Outcomes (per 500MW Project)

	Scenario 1	Scenario 1a	Scenario 1b	Scenario 2
Description	O&M quick reaction for 1 x 500MW project	Scenario 1 plus ancillary construction support	Scenarios 1a & Staging / Assembly	Cluster port
Port Investment Cost (€m) (Fixed Cost)	17.4	24.6	54.5	170.5
GVA (€m) – Galway Gaeltacht (per 500MW Project)	103.5	105.4	321.3	389.1
Benefit Cost Ratio (per 500MW Project)	5.95	4.28	5.90	2.28
Consenting Assessment	Minor	Minor	Significant	Significant
Environmental constraints	Low	Low – Medium	Medium-High	Medium - High
Risk	Low risk option in terms of least cost route to port utilisation. However will prevent port infrastructure development that secures wider economic benefit. Utilisation depends on the construction of a wind farm near to port and timing of O&M contracts	Scenario offers low Benefit Cost Ratio, as requires investment to be viable, but additional GVA benefits in comparison to Scenario 1 are small. Significant on-shore ground preparation and development required.	Significant marine and land development required. Under low deployment pathway scenarios there is risk of under contracting the Port. In addition, this option has greater environmental impacts and associated consenting risks.	Significant marine and land development required. Additional investment comes with high risk of securing additional port activity. In addition, this option has greater environmental impacts and associated consenting risks.
Opportunity	O&M contract opportunity offers stable long term benefit over life of the wind farm. Opportunity to develop multi use port to enhance existing port activities such as fishing.	Allowing additional activities and benefit beyond O&M (though the additional GVA benefits are not significant). Opportunity to develop multi use port to enhance existing port activities such as fishing.	West coast of Ireland does not yet have suitable assembly port facilities. In medium-high deployment scenarios, a multi-port strategy will be required. Opportunity to develop multi use port to enhance existing port activities such as fishing.	Opportunity to benefit from a clustering effect over time, as has been seen in locations such as the Humber on the east coast of England.

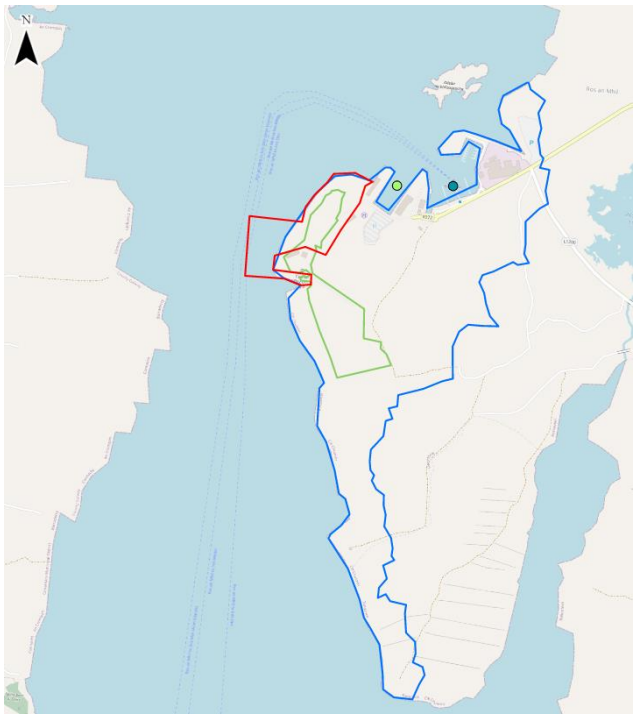
Ros a Mhíl

Ros a Mhíl does not currently have the capacity to support large scale offshore construction activities. However, planning permission granted to the Department of Agriculture, Food and the Marine (DAFM) in 2018 for a 200m deepwater quay provides opportunity to develop the necessary onshore infrastructure. Ros a Mhíl is unique among ports on the Irish west coast in having existing permission for infrastructure with the potential to support the FOW project pipeline.

The Port currently supports ferry, fishing and leisure activities with the existing harbour. The proposed additional development must consider existing port users, and infrastructure specifications are to be progressed in-line with the target market requirements and stakeholders needs.



Ros a Mhíl consented infrastructure



Land ownership in Ros a Mhíl. Planning boundary in RED. Údarás owned land in GREEN. DAFM owned land in BLUE

Ros a Mhíl benefits from a significant land bank adjacent to the proposed 12m deep-water berth, under ownership of both Údarás na Gaeltachta and DAFM. The available land supports direct access to quayside and provides growth potential for servicing significant project cargo throughput, in addition to office and workspace.

The dual functioning of the existing harbour activities and FOW support activities at the proposed development would be achievable through detailed design of the new facility footprint, and project specific logistics planning.

Its combined attributes of proximity to offshore project locations and consented 12m deep-water berth infrastructure provide the opportunity for cost effective entry into the offshore energy market for the Port.

Suitability of Consented Infrastructure

The consented infrastructure has a high level of suitability for re-purposing the development in service to the FOW industry. The quay length, berth depth and onshore landbank provide capacity for many of the anticipated O&M and cargo handling activities. The potential of the facility to directly service FOW platforms within the Port is constrained primarily by the Access Channel depth and the footprint of the deep pocket. Market segments within FOW which do not require platform access to quayside have also been identified as having a high Benefit Cost ratio relative to the investment required.

Consented Facility Traits				Yes	Requires Clarification	No
1	**1a**	**1b**	**2**	**FOW Support Activity**		
✓	✓	✓	✓	Service Operation Vessel home port.		
✓	✓	✓	✓	Crew Transfer Vessel home port.		
✓	✓	✓	✓	Project Cargo Vessels: Lo-Lo		
✓	✓	✓	✓	Anchor Handling Vessel		
		✓	✓	Platform Assembly and Deployment Support		
		✓	✓	Platform O&M Support		
		✓	✓	Permanent cranage for RNA operations: Quayside Crane.		
		✓	✓	Temporary cranage for RNA operations: Crawler Crane.		
		✓	✓	Cranage for RNA operations: Jack-Up Barge (JUB) alongside		
		✓	✓	Onshore Space Requirements	Quay Deck Set Down Area: Space required for close storage of cargo for timely assembly of WTG at quayside.	
		✓	✓		Blades: (3-unit racking)	
		✓	✓		Nacelles	
		✓	✓		Tower	
	✓	✓	✓		Anchors	
	✓	✓	✓		Chain	
	✓	✓	✓		Synthetic Line	
	✓	✓	✓		Mooring Jewellery: Buoys, clump weights, load reduction components etc	
	✓	✓	✓		Electrical Array Cable	
✓	✓	✓	✓		RNA Components	
✓	✓	✓	✓		O&M Centre	
✓	✓	✓	✓		Helicopter Access	
✓	✓			Access Channel: -7m CD, 100m Width		
✓	✓			Access Channel: -8m CD, 100m Width		
		✓		Access Channel: -9m CD, 100m Width		
			✓	Access Channel: -12m CD, 100m Width		
✓	✓			Turning Circle: -7m CD, 200m Diameter		
✓	✓			Turning Circle: -8m CD, 200m Diameter		
		✓		Turning Circle: -9m CD, 200m Diameter		
			✓	Turning Circle: -12m CD, 200m Diameter		
		✓	✓	Wet Storage: Galway Bay		

Environmental Constraints

The key aims of this study were to identify:

1. If the scenario is covered under the existing planning permission and/or if additional environmental impacts to those identified in the EIS were expected.
2. If additional impacts are expected, what are they and what additional assessments and/or consents, if any, would be required.
3. Rank each scenario using a traffic light system (i.e. low, medium and high environmental and consenting risks) to determine the environmentally preferred scenario.

The assessment identified potential constraints and consenting requirements associated with each development scenario and provides recommendations for further investigations, where relevant. It does not guarantee that no other barriers to planning or development will be identified during further investigative work. Scenario 1 would result in the fewest additional impacts and consenting requirements whilst Scenario 2 would have the most. Scenario 1b would have similar additional impacts to Scenario 2.

Topic		Scenario 1	Scenario 1a	Scenario 1b	Scenario 2
Ecology	Terrestrial	Low	Medium	Medium	Medium
	Marine	Low	Low	High	High
	Designated sites	Low	Low	High	High
Landscape and visual		Low	Low	Medium	High
Geology and water resources		Low	Low	Low	Medium
Cultural heritage		Low	Low	Low	Medium
Noise	Terrestrial	Low	Medium	Medium	Medium
	Marine	Low	Low	High	High
Other marine users	Shipping	Low	Low	Low	Low
	Fishing	Low	Low	Low	Low
	Offshore wind	Low	Low	Low	Low
	Energy test sites	Low	Low	Low	Low
	Aquaculture	Low	Low	Low	Low
Transport and access		Low	Low	Low	Low
Aviation		Low	Low	Low	Low

Socio-Economic Benefit

Investment in Ros a Mhíl has the potential to lead to the creation of highly skilled permanent jobs within the Galway Gaeltacht for every farm serviced by the port. The forecasted national pipeline of projects is up to 35GW by 2050, and therefore multiples of these job numbers may be achievable subject to the pace of project deployments.

If the port were to target servicing 3GW (6 x 500MW) of wind farms it could lead to the creation of up to 366 - 1080 O&M jobs within the Galway Gaeltacht, this would account for under half of the 7000MW total predicted pipeline of projects to be installed by 2050 under the low deployment scenario.

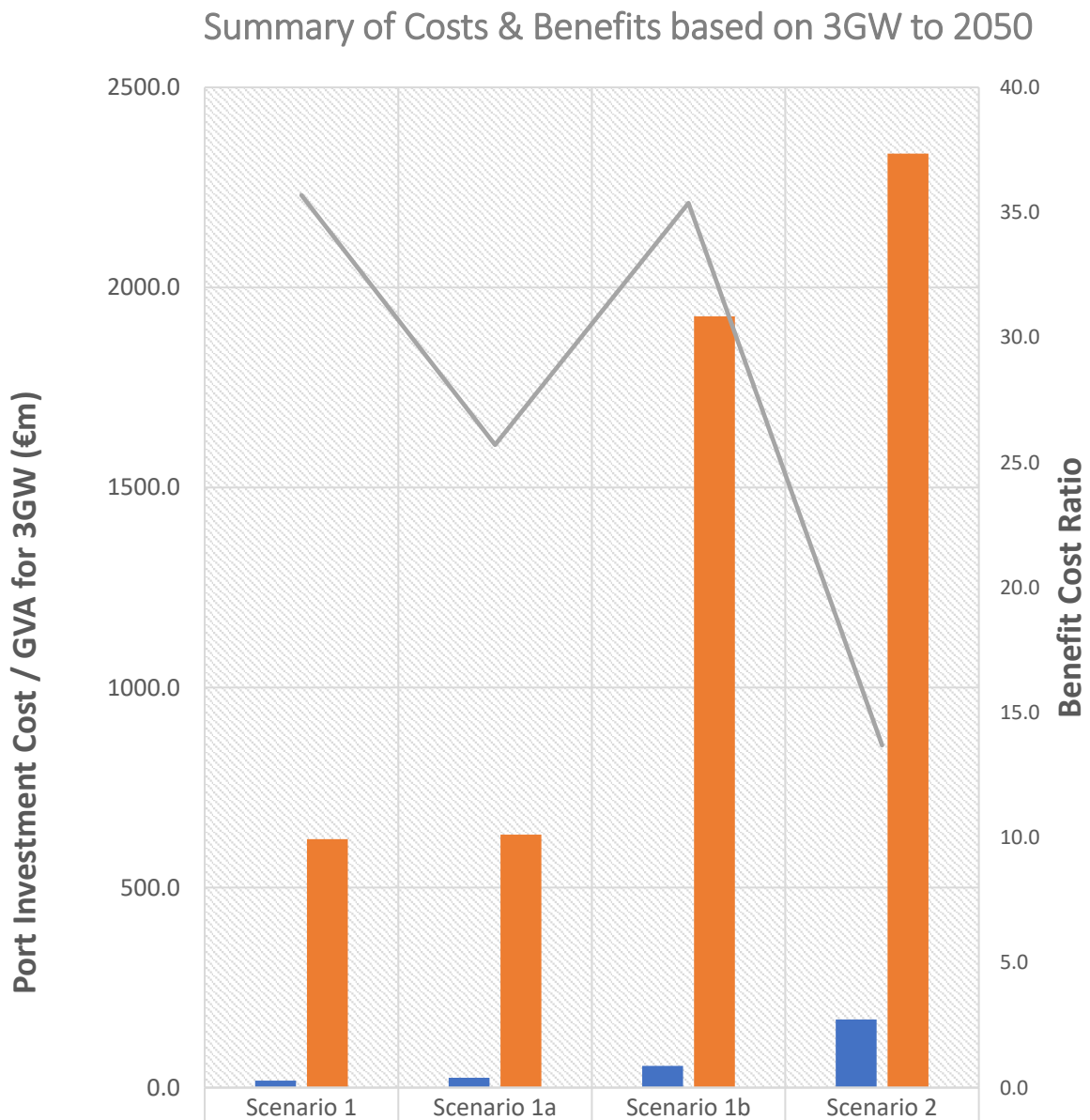
500MW Job Creation Opportunity					
Criteria		**Scenario 1**	**Scenario 1a**	**Scenario 1b**	**Scenario 2**
Direct Jobs by Area	Galway Gaeltacht	54	54	134	160
	County Galway	63	63	23	23
	Rest of Ireland	147	147	107	81
Indirect Jobs by Area	Galway Gaeltacht	7	7	16	20
	County Galway	15	15	12	13
	Rest of Ireland	122	122	116	111
Total Jobs by Area	Galway Gaeltacht	61	61	150	180
	County Galway	78	78	35	36
	Rest of Ireland	269	269	223	192
Total Ireland per 500MW		408	408	408	408

For Scenario 1b, by servicing 3GW, which is only 10% of the Programme For Government targets, the port of Ros a Mhíl would create 900 permanent jobs within the Galway Gaeltacht. This development has the potential to support retention of the local population and return of regional emigrants within the area.

Each of these scenarios will rely on additional investment in the port. The variation in port investment costs between €17.4M and €170.5M for operational scenarios indicates the importance of clearly identifying the targeted market segment the Port intends to service and developing infrastructure in close alignment with the industry requirements. A key decision is related to the investment required to enable platform access directly to quayside, and the impact on dredge volumes and CAPEX associated with the necessary navigable water depths. Bringing platforms alongside, as considered in Scenario 1b and Scenario 2, allows for step changes in the GVA delivered for the region, but with significant impact

for cost, planning and logistics. The role of cranage, given the cost and supply issues for cranes sizes required for FOW, is key to establishing the most beneficial role for the Port. Cost effective pathways to initially deliver least-cost support options, potentially followed by future upgrades to realise the greater economic benefit of increased capability, may be worth detailed consideration in advance of investment.

Summary of Costs & Benefits based on 3GW O&M activities (achievable even within the low roll out scenario) to 2050 is given in the following table. It's important to note that while the investment costs are fixed the GVA outlined per 500MW is factored by the project capacity secured by Ros a Mhíl port.



	Scenario 1	Scenario 1a	Scenario 1b	Scenario 2
Port CAPEX (€m)	17.4	24.6	54.5	170.5
GVA (€m)	621.0	632.4	1927.8	2334.6
BCR	35.7	25.7	35.4	13.7

Dublin Offshore

www.dublinoffshore.ie

Appendix 5

Submission from Fuinneamh Sceirde Teoranta (FST)

Fuinneamh Sceirde Teoranta (FST), a Galway Gaeltacht-based firm, began developing the Skerd Rocks Offshore wind farm project off the Galway coast in 2001. Given the at times uncertain policy environment, the project is still in the development phase. However, the Government's Climate Action Plan has transformed that environment into an aggressive policy in favour of offshore wind. FST's project was fortunate enough to have kept going regardless, submitted a Lease application in 2008, a grid application in 2011 and was ultimately designated a 'Relevant Project' by Government in 2020.

Under the new process to be established on enactment of the MAP Bill, the project will need to resume its full consenting process and will also need to participate in the Government's proposed Offshore Renewable Energy Support Scheme (ORESS) in the not too distant future. Its grid application is being processed. Assuming success in all of the above, it could be envisaged that the project would move from development to construction sometime over the next 5 plus years, making it one of the largest ever investments in a Gaeltacht area.

Such a large project would require considerable infrastructure and installation equipment. Marshalling the very large turbine and foundation components, as well as an offshore transformer station and cabling, is likely to require a large quayside area at a deep water port, such as that being considered at Rosaveel, not to mention berthing for the jack-ups, cranes ships, cable-laying vessels & other marine vessels likely to be involved in the installation. The nearest alternative would seem to be Galway Harbour, though that is a lot further away from site. The smaller operation and maintenance (O&M) vessels and possibly helicopters could be accommodated at various sites around the area, some nearer to the site that Rosaveel, but of course no decision of any kind has been taken on any of these matters so far. Rosaveel would also seem to be a good location for the local HQ for the project, given its proximity to the site, while also having ready access to the motorway system the other side of Galway City. Clearly there would be hundreds of people involved in installation which could stretch over some years, with a smaller contingent permanently employed for the ongoing O&M over the subsequent 25 to 30 years.