DKM
ECONOMIC
CONSULTANTS

Galway Harbour Extension
Alternative Solutions Report
13th December 2013

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

This document was prepared by:
DKM Economic Consultants Ltd., Office 6 Grand Canal Wharf, South Dock Road, Ringsend, Dublin 4, Ireland. Telephone: 00 353 1 6670372. Email: info@dkm.ie. Website: www.dkm.ie

EXECUTIVE SUMMARY

Purpose of this Report

- The proposed development at Galway Harbour Company (GHC) encroaches on a Natura 2000 site (i.e. SAC & SPA). The Natura Impact Statement (NIS) prepared for the proposed harbour extension has concluded that adverse impact on the Natura 2000 site cannot be ruled out. For this reason among others, the application for the harbour extension must assess alternative solutions with a view to establishing whether there is an alternative that would involve less damage to a Natura 2000 site.
- The assessment of alternatives has concluded that feasible alternative locations are confined to the port of Shannon-Foynes. The question arises however whether Shannon-Foynes is a feasible solution from a socio-economic viewpoint, and in particular whether it satisfies various regional public policy and economic objectives. This report addresses this issue.

Objectives and Roles for GHC in National Policy

- The proposed development at GHC, referred to as Galway Harbour Extension or GHE, is in accordance with national policy regarding ports, and indeed it is clear that the realisation of national policy requires the project to proceed, specifically in terms of:
  - The servicing of Galway's substantial hinterland.
  - The accommodation of larger vessels in deeper waters.
  - Strategic hub for petroleum logistics and storage.
  - Refocusing of the Inner Harbour towards leisure and tourism, and reconnection with the city.
  - Servicing the offshore renewable energy, oil and gas sectors.

- At a broader level, the project is in accordance with and contributes to meeting the policy requirements of national spatial, industrial development and employment policy, as articulated in the *National Spatial Strategy*, IDA Ireland's *Horizon 2020 Strategy*, and the *Action Plan for Jobs.*

The Business & Socioeconomic Case for GHE

- DKM has produced a business case and Cost Benefit Analysis (CBA) for Phase One of GHE, which confirms not only the commercial viability of the project from GHC's point of view, but also the very substantial wider economic benefits of the project.
- Indeed, the wider economic benefits of the project dwarf the commercial benefits to GHC itself. Most of the wider economic benefits estimated in the CBA accrue to the ports' customers and to the local tourism sector.
- All of this business is "natural" to GHC, being situated in its catchment.
- Some of these customers have made significant investment in Galway and the port, and plan to invest further and expand their operations significantly if the project proceeds.

- The investment in Galway would be lost if the business were to relocate in order to gain the benefits of higher capacity port facilities elsewhere. Indeed, some of the additional business would be lost to Ireland as a whole.
- Other business using GHC would be less viable if it had to use an alternative more distant port, because of higher land transport costs.
- The bulk of the tourism impacts – related to the cruise business – would be lost to Ireland if the project did not proceed, as these cruise ships are being attracted specifically to Galway Bay, the city and the surrounding region including Connemara and the Cliffs of Moher. Irish cruise destinations for the most part complement rather than compete with each other.
- Significant employment will be generated/maintained by the project. We estimate that during the construction phase of three years, some 190 Full Time Equivalent (FTE) jobs will be generated, while in the tourism industry some 73 additional FTE permanent jobs will be generated; the project will also underpin employment in the port, its suppliers and customers.
- The generation of these significant employment impacts, in the West region in particular, is important and contributes to meeting the Government's policy focus on employment generation.

Environmental Impacts of GHE

- There are a large number of Irish and EU environmental policies and obligations that relate to reducing (specifically land-based) transport and the related pollution, and to encouraging modal shift in favour of sea transport.
- Transport is responsible for around a quarter of all EU Greenhouse Gas (GHG) emissions, second only to the energy sector. Road transport alone contributes about one-fifth of the EU's total emissions of carbon dioxide (CO_2), the main GHG.
- This is relevant because GHE is expected to cater for large volumes of cargo (in excess of two million tonnes per annum compared to 500,000 tonnes per annum currently), arising in its hinterland, which in the absence of the project would have to be diverted by road to alternative more distant ports.
- There seems little doubt that, given Ireland's and the EU's long term strategy in the transport sector, the pressure will continue to intensify for further and more significant reductions in GHG emissions across all areas of economic activity, but notably, given its environmental footprint, in road transport.
- GHC handles bulk (high volume) cargo, servicing its hinterland. In the absence of GHE, most of the additional cargo would have to be transported by land to/from the nearest major port, Shannon-Foynes, which is approximately 130km from Galway.
- We estimate that an additional 170 million tonne km per annum would be generated on Irish roads if GHE did not proceed, in the Base Case. Under certain scenarios, this could exceed 400 million tonne km per annum.
- This would have a significant energy usage and environmental impact. We estimate total additional fuel usage of approximately 60 million litres per annum.
- This equates to an additional 156,000 tonnes of CO_2 per annum, and significant tonnages of CO, HC, NO_x, SO_x and particulates, all of which are

subject to national and EU targets, and have implications for global warming and human health.

- This is not to include the additional impacts on road damage, noise and congestion, which would also be significant, given the nature of the traffic being generated.
- Another environmental benefit is that, with the movement of petroleum-related activities out of the Inner Dock, the Seveso-restricted area of the port will be moved away from the city centre.
- Apart from health and safety benefits and reductions in risk, this is likely to have a positive impact on future planning applications in the city centre by removing obstacles to redevelopment.

Summary

In summary, we conclude that there are compelling reasons why the alternative solution, whereby additional port traffic is catered for at Shannon-Foynes - is not feasible from the policy, socioeconomic and environmental perspectives, and that there are overriding reasons of public interest why GHE should proceed. The following table summarises the impacts of proceeding with GHE compared with not proceeding:

Impacts of Proceeding with and not Proceeding with GHE

Dimension	Impact of GHE Proceeding	Impact of GHE Not Proceeding
National Ports Policy (NPP)	Realisation of national policy requires the project to proceed, specifically in terms of: • Servicing Galway's substantial hinterland. • Accommodation of larger vessels in deeper waters. • Strategic hub for petroleum logistics & storage. • Refocusing of the Inner Harbour towards leisure and tourism, and reconnection with the city. • Servicing the offshore renewable energy, oil and gas sectors.	• GHC's hinterland will be less well served by port infrastructure, and will suffer competitiveness disadvantage vis à vis other regions. • GHC will remain unable to cater for larger vessels. • Continuing role as petroleum hub in question. • Inner harbour's capacity to cater for leisure/tourism traffic remains constrained, and disconnected from city. • Servicing of offshore energy sector will migrate to more distant port, or outside of State.
National spatial, industrial development & employment policy	GHE is in accordance with and contributes to meeting *National Spatial Strategy*, IDA Ireland's *Horizon 2020 Strategy*, and *Action Plan for Jobs,* specifically regarding balanced regional development.	Regional aspects of these policies will be more difficult to deliver, as infrastructure of West and BMW regions will be less competitive vis à vis other regions.
Commercial & Socioeconomic	Project is commercially viable, caters for GHC's natural catchment, and generates substantial wider economic benefits. It also generates and maintains significant employment.	Commercial future of GHC will be damaged. Wider economic benefits will be reduced and in some cases lost (notably tourism). Employment gain would be largely lost.
Environmental	• GHE will cater for the relevant trade in a significantly less land-transport-intensive way, reducing global, regional and local emissions to air, as well as minimising road damage and congestion. • Seveso site will be more distant from city centre, with health and safety benefits and positive implications for planning in city centre through the removal of obstacles to redevelopment	• Significant increases in global, regional and local emissions to air, as well as road damage and congestion, if business has to be catered for via more distant port. • Seveso impacts on city centre will remain.

1. INTRODUCTION

This report represents an addendum to the Business Case & CBA prepared by DKM Economic Consultants in relation to the proposed Phase One Galway Harbour Extension (GHE) by Galway Harbour Company (GHC).

The proposed development at Galway Harbour encroaches on a Natura 2000 site (i.e. SAC & SPA). The Natura Impact Statement (NIS) prepared for the proposed harbour extension has concluded that adverse impact on the Natura 2000 site cannot be ruled out. For this reason among others, the application for the harbour extension must assess alternative solutions with a view to establishing whether there is an alternative that would involve less damage to a Natura 2000 site.

Among the alternative solutions to be assessed are –

- alternative means of meeting the project objectives (i.e. demand management),
- alternative scale or size and
- alternative locations.

Demand management is not relevant in the current context, as the GHE is designed to cater for economically important international trade, upon which the livelihoods of a significant number of people depend. Planning & Environmental Consultants McCarthy Keville O'Sullivan Ltd. (MKOS) have addressed alternative scale and size, and alternative locations within Inner Galway Bay, both in terms of viability and environmental/ecological impact, and have concluded that these can be ruled out.

They have further concluded that feasible alternative locations beyond Galway Bay are confined to the national port of Shannon-Foynes, which it is understood has sufficient capacity to cater for the GHC's current tonnage, if not its future tonnage, without the need for further expansion. It is difficult therefore, to rule out Shannon Foynes on the basis of an equal or greater ecological impact on an SAC.

A further relevant issue is whether Shannon-Foynes is a feasible solution from a socio-economic viewpoint, and in particular whether it satisfies various regional public policy and economic objectives.

In this context, GHC has asked DKM to prepare a report which will address the following issues in:

- The objectives and roles for Galway Harbour, as outlined in national ports, spatial and industrial development policy;
- The Business Case and CBA for GHE; the socio-economic benefits to the region and to the wider economy of GHE, and by the same token the loss to the region and wider economy if GHE does not proceed.

- The environmental footprint of servicing the region via GHE, compared to the environmental footprint of servicing this region from elsewhere, in the event that GHE does not proceed.

These are dealt with in the subsequent sections of this report.

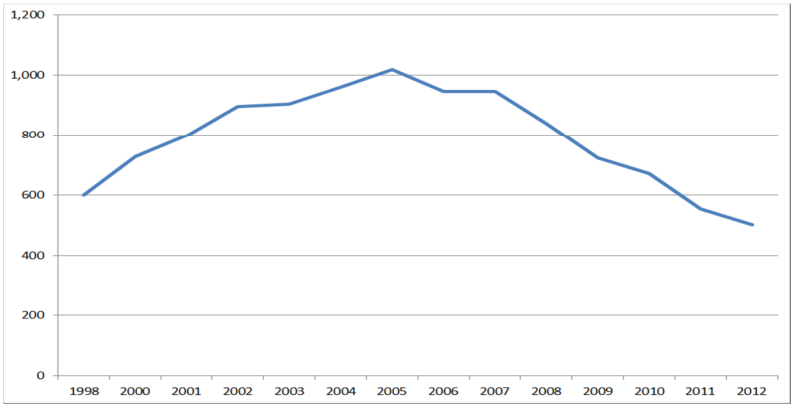
2. OBJECTIVES AND ROLES FOR GHC IN NATIONAL POLICY

2.1 NATIONAL PORTS POLICY

GHC's investment plans must have regard to the *National Ports Policy 2013* (NPP)[1], which provides the over-arching Government policy context for the future operations and relative roles of the commercial ports of Ireland.

Part of the context for the NPP is the long term trends towards larger ships requiring deeper waters (p.23). The Policy also notes long term reductions in volumes handled by a number of smaller ports, including Galway, comparing volumes in 1998 to 2011. It must be noted, however, that this comparison at two points in time is somewhat misleading, since volumes at Galway grew strongly in the meantime before falling back in recent years, reflecting among other things the economic downturn.

Figure 2.1: GHC TOTAL VOLUMES HANDLED 1998-2012 ('000 TONNES)



Source: CSO, NPP.

The NPP categorises Ireland's ports into Ports of National Significance (Tiers 1 & 2), and Ports of Regional Significance. There are 14 ports designated as ports of regional significance, five of which are operated by State-owned port companies. The largest (by tonnage handled) in 2011 was Galway, although it came second to Drogheda in the 2012 statistics[2].

The NPP sees the function of a port of regional significance as serving its particular region. A port of national significance on the other hand fulfils both a regional role within its hinterland and national role. Consequently, in the current context, no other regional port can fulfil Galway's role within its region, while a port of

[1] http://www.transport.ie/uploads/documents/news/National%20Ports%20Policy%202013%20-%20Web.pdf

[2] http://www.cso.ie/en/media/csoie/releasespublications/documents/transport/2012/spt_2012.pdf

national significance could theoretically do so. Assessment of alternative ports would therefore exclude other Ports of Regional Significance but includes Ports of National Significance.

In this context, it is clear from the map and table below that GHC has a significantly larger hinterland than most regional ports, being one of the few ports of any size on the west coast.

Figure 2.2: PORTS OF IRELAND

Source: MKOS, based on IMDO Report *A Review of Irish Ports Offshore Capability in Relation to Requirements for the Marine Renewable Energy Industry*. Sligo included.

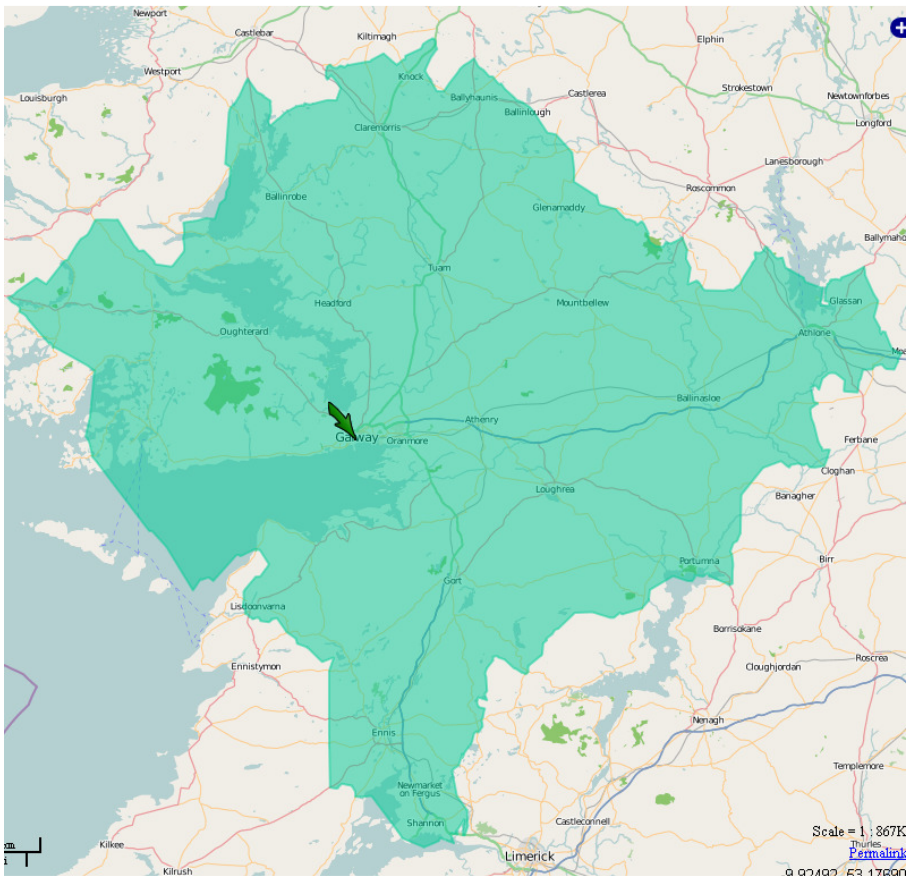
Table 2.1: COMMERCIAL PORTS ON WEST COAST OF IRELAND & 2012 BULK TRAFFIC

Port	Designation under NPP	Distance from Galway (km)	Cargo 2012 ('000 Tonnes)				
			Direction	Liquid Bulk	Dry Bulk	Break Bulk & Other Goods	Total Bulk & Other Goods
Shannon-Foynes	Tier 1 National	130	In	1,094	7,099	15	**8,208**
			Out	3	1,839	44	**1,886**
Galway	Regional Significance	-	In	415	0	13	**428**
			Out	0	47	25	**25**
Killybegs	Regional Significance	309	In	0	0	10	**10**
			Out	0	0	117	**117**
Sligo	Regional Significance	139	In	0	19	0	**19**
			Out	0	8	6	**14**

Source: Department of Transport, CSO

The following map shows the one-hour drivetime "heat map" of GHC, per the IMDO, which is generally considered the natural hinterland of a port of regional importance. All of GHC's customers are located within this one-hour catchment.

Figure 2.3: ONE-HOUR "HEAT MAP" OF GHC



Source: IMDO

Given the lack of commercial ports north of GHC, we would contend that in fact its hinterland extends considerably beyond this, to the north. By the same token,

the presence of Shannon-Foynes on the southern edge of this one-hour drive time would indicate that the operational catchment of GHC may not stretch fully that far south. This is also reflected in Chapter 2 of the EIS, where it states: "Accordingly, a port's natural catchment area is its hinterland and, for Galway Harbour Company, it is, primarily, the western and north-western counties." (Section 2.2.1.2).

The NPP makes a number of references to GHC, notably:

> "Galway Harbour Company is an important strategic regional hub for petroleum importation, storage and distribution". (p.32)
>
> "Similar to Dún Laoghaire harbour, the location of the harbour close to Galway's city centre limits its potential for further expansion in terms of increasing trade. However, the inner harbour is an immensely attractive location for the development of marine tourism and leisure facilities, in particular a marina, as well as for urban redevelopment.
>
> While there is no Exchequer support available for these developments, National Ports Policy endorses the development proposals in respect of the inner harbour, as referred to in the Regional Planning Guidelines for the West Region 2010–2022 and the Galway City Development Plan 2011–2017, for marine tourism and leisure facilities as well as for urban redevelopment and regeneration. Furthermore, the Government notes the return of cruise tourist traffic to Galway harbour in 2012, and supports the company's efforts to develop this business.
>
> The Department of Transport, Tourism and Sport and other relevant agencies are currently giving detailed consideration to the plans to relocate commercial port activities to a new site on reclaimed land." (p.32)
>
> "In relation to the emerging ocean energy sector, the recently published IMDO Report on Irish Ports' Offshore Renewable Energy Services concluded that the three Ports of National Significance (Tier 1) had the greatest potential in servicing current and future demand in the offshore renewable energy sector. The report additionally identified the two Ports of National Significance (Tier 2), as well as Galway Harbour Company and Killybegs Fishery Harbour Centre, as having important potential in terms of servicing future demand in this sector. National Ports Policy endorses these findings." (p.45)

2.2 SERVICING OF OFFSHORE RENEWABLE ENERGY AND OIL & GAS EXPLORATION

In a similar vein, the Irish Maritime development Office's report *Irish Ports Offshore Renewable Energy Services (Ipores)*[3] indicates that "Galway Harbour is located in the heart of the city and occupies a strategic location on the west coast that could service the developing offshore marine renewable energy and oil and gas sector." (P.46)

The IPORES report designates Galway as one of five Category B ports on the island of Ireland, which is defined as per the box overleaf.

Box 1: Category B Ports per IPORES Report

"Category B: Strategic support operations and maintenance ports

We believe that Category B ports have an important role to play in servicing future offshore demand but would probably not have the same scope to handle in the short term a large scale investment given natural hinterland or other constraints.

1. Ports that have some potential to serve as an operations and maintenance base for the offshore renewable energy sector but may currently have limitations in terms of depth, quay length, set-down space and hinterland.
2. Most of these ports could accommodate specialised vessels such as jack-up barges but would be unable to support large-scale operations.
3. Some experience with importing wind turbines and some practical experience with offshore energy sector.
4. Distance to markets would vary from 50 to 200 km with the economic viability of operations depending on how close the offshore wind farms are located to the port. Some strategic planning in relation to offshore renewable energy sector including some provisional contact with developers.
5. Some job creation 50-100 potential possible depending on level of operations by offshore wind farm developers and expansion work regarding existing facilities to cater for requirements of the sector.
6. Skilled workforce available." (p.14)

The map overleaf confirms that GHC is the "natural" port to service a large section of the energy exploration sector off the west coast of Ireland.

2.3 STRATEGIC OIL RESERVES

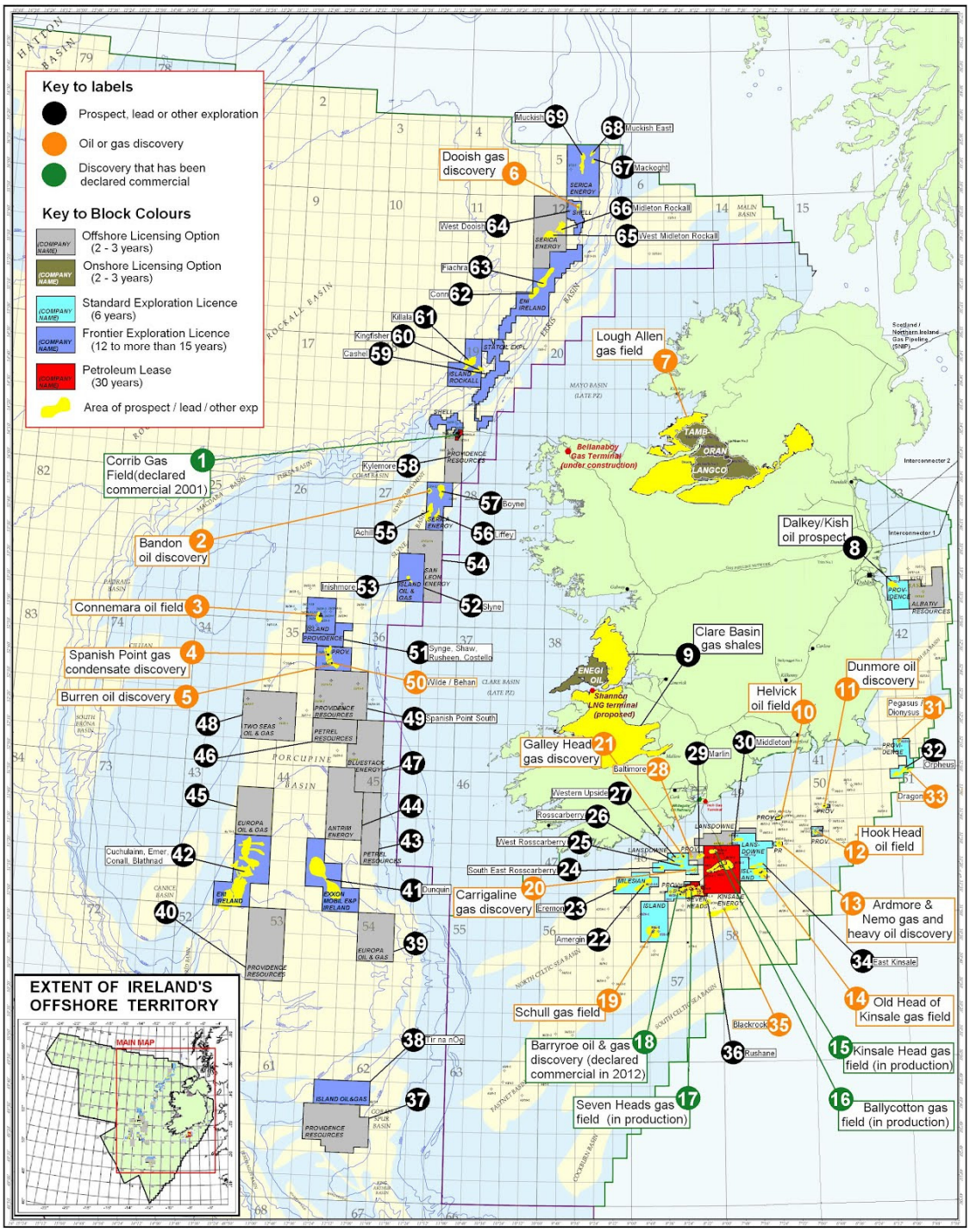
Arising from membership of both the European Union (EU) and the International Energy Agency (IEA), Ireland has obligations to maintain 90 day reserves of national strategic stocks[4]. Galway is one of the locations in which the National Oil Reserves Agency (NORA) holds Ireland's strategic oil stocks (see map). Government policy in recent years has been to increase the proportion of

[3] http://www.imdo.ie/NR/rdonlyres/5ABD1D19-223B-4F2A-9506-15B860496AF0/0/IMDOIPORESReport.pdf

[4] http://www.dcenr.gov.ie/Energy/Oil+Security+Division/Oil+Stock+Policy.htm

Ireland's strategic reserves that are held on the island of Ireland, as articulated in the 2007 White Paper *Delivering A Sustainable Energy Future For Ireland - The Energy Policy Framework 2007 – 2020*[5].

Figure 2.4: MAP OF OIL AND GAS EXPLORATION IN IRISH TERRITORY



http://www.shelltosea.com/sites/default/files/images/MapOilGasIreland_Aug2012.jpg

[5] http://www.dcenr.gov.ie/NR/rdonlyres/54C78A1E-4E96-4E28-A77A-3226220DF2FC/30374/EnergyWhitePaper12March2007.pdf.
See also http://www.kildarestreet.com/wrans/?id=2013-07-17a.69

Figure 2.5: OIL STORAGE FACILITIES IN IRELAND

Source: International Energy Agency
http://www.iea.org/publications/freepublications/publication/ireland_2011.pdf

2.4 NATIONAL SPATIAL STRATEGY, NATIONAL & REGIONAL DEVELOPMENT POLICY

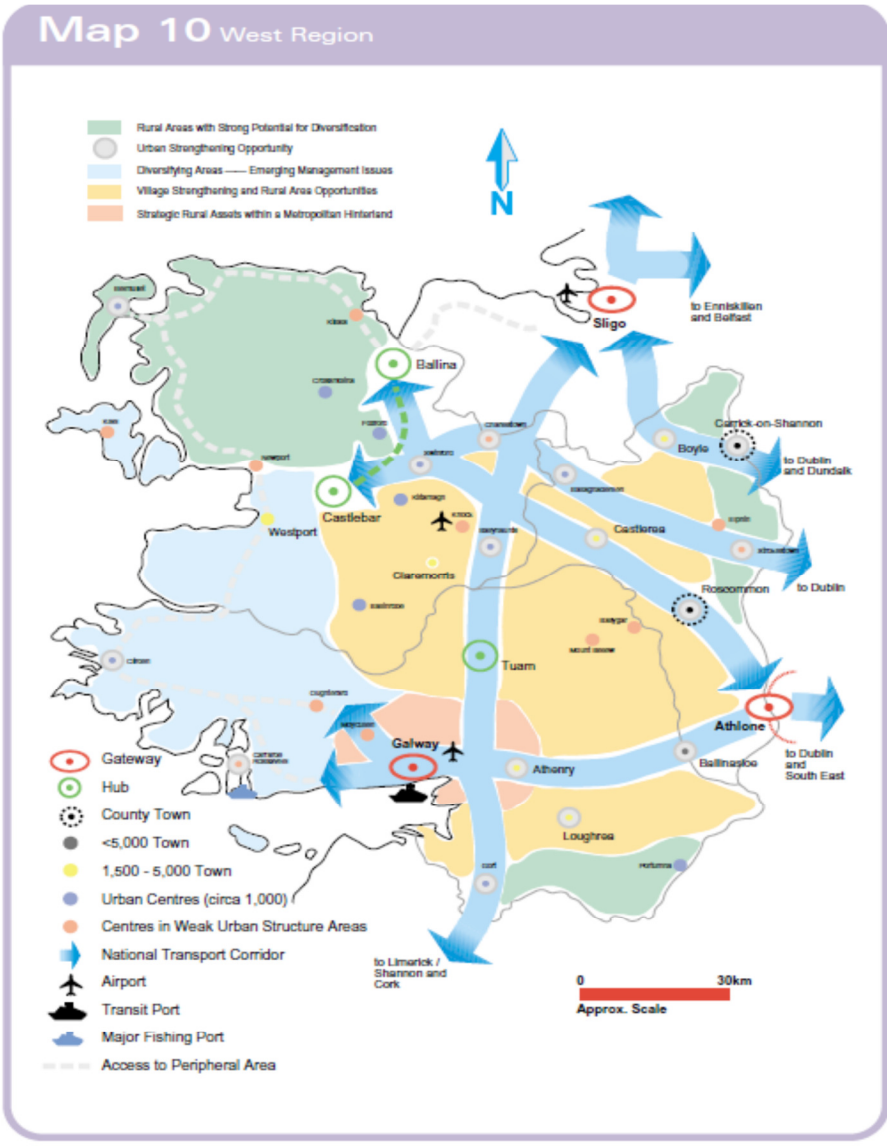
2.4.1 National Spatial Strategy

Maintaining and expanding a commercial port in Galway in light of the city's designation as a regional gateway under the National Spatial Strategy (NSS)[6], and a major population and employment centre, is of key importance. In this regard, the objectives for balanced regional development are relevant:

> "In addition to initiating the process of preparing the NSS, the NDP 2000-2006 identified the five main cities, Dublin, Cork, Limerick, Galway and Waterford, as 'Gateways', or engines of regional and national growth."

[6] http://nss.ie/pdfs/Completea.pdf

Figure 2.6: NSS GATEWAYS & HUBS



Source: NSS

"Gateways have a strategic location, nationally and relative to their surrounding areas, and provide national scale social, economic infrastructure and support services. Further development of the five existing gateways at Dublin, Cork, Limerick/Shannon, Galway and Waterford is a key component of the NSS." (p.12)

"The research undertaken for the NSS confirms therefore that Ireland's existing and emerging city-regions are critical sources of economic dynamism within the Irish economy and should be nurtured and built upon for the benefit of all. In particular, they represent important resources for the future development and expansion of the enterprise sector."

> "The successful aspects of the Greater Dublin Area's development need to be emulated in other areas to deliver a more even distribution of successful economic development. The growing strengths of Cork, Limerick/Shannon, Galway and Waterford suggest that the co-ordinated development of these cities has the potential to offer a counterweight to the pull eastwards on the island." (p.18)

> "Strengthening the critical mass of the existing gateways of Cork, Limerick/Shannon, Galway and Waterford, to complement Dublin's successful national spatial role offers the most immediate prospects of establishing more balanced patterns of development over the next few years." (p.38)

> "The existing gateways of Cork, Galway, Limerick and Waterford are strategically located in different parts of the country. They have considerable potential for further development and expansion to achieve more balanced regional development." (p.41)

> "Another of the existing designated gateways, Galway, also needs to be strengthened further on the basis of the Land Use and Transportation Strategy now being developed for the city." (p.44)

The NSS goes on to describe one of the characteristics of gateways as:

> "(4) A focal point in transportation and communications terms: (a) on the national roads and rail networks (b) within 1 hour of an airport either with international access or linking to one with such access (c) adequate, reliable, **cost effective and efficient access to port facilities** (d) effective, competitive broadband access." (p.40, DKM emphasis)

With regard to ports, the NSS notes:

> "For sea access, transit between Ireland and other countries passes principally through four main bands of routes which contain one or more ports. These are
>
> - the *Central* band – to and from Dublin/Dun Laoghaire/Drogheda
> - the *Northern* band – to and from Belfast/Larne/Warrenpoint/Greenore/Derry
> - the *Southern/South Eastern* band – to and from Cork/Waterford/New Ross and Rosslare
> - the *Western* band – to and from the Shannon Estuary and Galway." (p.63)

and

> "The export-oriented nature of the Irish economy is highly dependent on effective access to foreign markets. Therefore it is important to maintain a wider international perspective in order to identify critical interventions abroad that would improve Ireland's onward connections and thus reduce the time and cost of moving people and goods between Ireland and the

> EU. Initiatives in this regard will be undertaken through trans-national collaboration within the EU context." (p.63)

2.4.2 Industrial Development Policy

Development policy is articulated for example through IDA Ireland's *Horizon 2020 Strategy*[7], which specifically has a target of 50% jobs generation outside Dublin and Cork and to support regional economic development:

> "IDA has identified key areas of infrastructure improvement that are essential if we are to be successful in winning new investments into the regions outside Dublin and Cork. Transport and energy are vital. The importance of delivering next-generation networks is arguably the most important of all."

Galway Harbour is thus a key element of transport infrastructure.

2.4.3 Action Plan for Jobs

The *Action Plan for Jobs 2013*[8] is an over-arching statement of Government economic policy, which focusses policy first and foremost on promoting employment. In common with IDA Ireland's strategy, infrastructure is seen as critical to this. With regard to ports, the Plan includes as an action:

158	Complete the review of ports policy and ensure that it incentivises timely investment in port facilities to meet future enterprise needs and promotes competition. **(DTTAS)**

2.5 SUMMARY

The proposed development at GHC is therefore in accordance with national policy regarding ports, and indeed it is clear that the realisation of national policy requires the project to proceed. Specifically:

- Servicing of Galway's substantial hinterland.
- The accommodation of larger vessels in deeper waters.
- Strategic hub for petroleum logistics.
- Refocusing of the Inner Harbour towards leisure and tourism, and reconnection with the city.
- Servicing the offshore renewable energy, oil and gas sectors.

At a broader level, it is in accordance with spatial, industrial development and employment policy, as articulated in the *National Spatial Strategy*, IDA Ireland's *Horizon 2020 Strategy*, and the *Action Plan for Jobs.*

There are, in addition, environmental policy implications with respect to the project, and these are explored in Section 4.

[7] http://www.idaireland.com/news-media/publications/library-publications/ida-ireland-publications/IDA-Ireland-Strategy-2020.pdf
[8] http://www.djei.ie/publications/2013APJ_Annex.pdf

3. THE BUSINESS & SOCIOECONOMIC CASE FOR GHE

3.1 BUSINESS CASE & CBA

DKM has produced a business case and Cost Benefit Analysis (CBA) for Phase One of the proposed development of GHC, the results of which are summarised in the following two tables:

Table 3.1: SUMMARY OF BUSINESS CASE RESULTS PER DKM – BASE CASE

Upfront Capex (€ million)	51.6		
Proceed of Land Sales	24.6		
Net Cost (Borrowings)	27.1		
Business Case	**With project**	**Without project**	**Net Impact**
NPV (€'000)	34,470	21,483	12,986
IRR	12.9%	n/d	7.8%

Source: DKM *Business Case & CBA of Galway Harbour Extension*.

Table 3.2: SOCIO-ECONOMIC COST BENEFIT ANALYSIS RESULTS – BASE CASE

	Direct Return With Development*	Net Wider Economic Costs	Net Wider Economic Benefits	CBA With Project	CBA Without Development*†	Net Socio-economic Impact of Project
NPV (€'000)	38,940	0	131,162	**170,102**	**22,693**	**147,409**
IRR	12.9%			**31.3%**	**n/d**	**26.8%**

*Using the social discount rate of 4% as opposed to the Business Case rate of 4.6%, in accordance with *Public Spending Code*. †Same as Direct Return Without Development. n/d .. not defined.

Source: DKM *Business Case & CBA of Galway Harbour Extension*.

This analysis confirms not only the commercial viability of the project from GHC's point of view, but also the very substantial wider economic benefits of the project. Indeed, the wider economic benefits of the project dwarf the commercial benefits to GHC itself.

3.2 REGIONAL & WIDER ECONOMIC BENEFITS OF GHE

3.2.1 Impacts on GDP

Most of the wider economic benefits estimated in the CBA accrue to the ports' customers and to the local tourism sector. They arise because:

a. The extended Galway harbour can handle larger and more economical ships, leading to cheaper cargo, and/or
b. Galway harbour is nearer than the next best port and thus land transport costs are reduced.

These savings to port customers can be retained, leading to higher profits, or partly passed onto staff (increased employment, wages), or to customers, leading to higher profits and/or lower prices along the supply chain.

In a more dynamic sense, they can also enable port customers to expand their business, leading to greater economic activity and greater profits and/or employment and wages. Profits and wages combined make up the Gross Value Added (GVA) of a company and add to the region's and Ireland's GDP.

As was seen in the last section, all of this business is "natural" to Galway, being situated in its catchment. Some of these customers have made significant investment in Galway, and plan to invest further and expand their operations significantly if the project proceeds. The investment in Galway would be lost if the business were to relocate in order to gain the benefits of higher capacity port facilities elsewhere. Indeed, some of the additional business would be lost to Ireland as a whole.

Other business using GHC would be less viable if it had to use an alternative more distant port, because of higher land transport costs (see later discussion under environmental footprint).

The bulk of the tourism impacts – related to the cruise business – would be lost to Ireland if the project did not proceed, as these cruise ships are being attracted specifically to Galway Bay. It is difficult to see them being attracted to alternative locations in Ireland if GHC did not expand to increase the port's capacity to handle the expected additional cruise business - Irish cruise destinations for the most part complement rather than compete with each other.

3.2.2 Impacts on Employment

Significant employment will be generated/maintained by the project. We estimate that during the construction phase of three years, some 190 FTE jobs will be generated, while in the tourism industry some 73 additional FTE permanent jobs will be generated; the project will also underpin employment in the port, its suppliers and customers.

The generation of these significant employment impacts, in the West region in particular, is important and in line with the Government's policy focus on employment generation.

4. ENVIRONMENTAL IMPACTS OF GHE

4.1 TRANSPORT-RELATED POLICY

There are a large number of Irish and EU environmental policies and obligations that relate to reducing (specifically land-based) transport and the related pollution, and to encouraging modal shift in favour of sea transport.

Transport is responsible for around a quarter of all EU greenhouse gas (GHG) emissions, second only to the energy sector. Road transport alone contributes about one-fifth of the EU's total emissions of carbon dioxide (CO_2), the main greenhouse gas. While emissions from other sectors are generally falling, those from transport increased 36% in the 1990-2007 period, with only modest declines of circa 5% in subsequent two years to 2009.[9]

This is relevant because GHE is expected to cater for large volumes of cargo (in excess of two million tonnes per annum compared to 500,000 tonnes per annum currently), arising in its hinterland, which in the absence of the project would have to be diverted by road to alternative more distant ports.

As a member of the EU, Ireland is legally obliged to meet the targets set out in the **Doha Amendment** to the Kyoto Protocol[10], as well as those contained in the EU's **Climate & Energy Package**. These set the so-called "20-20-20 targets": 20% efficiency improvement, 20% renewable energy penetration and 20% greenhouse-gas emissions reduction by 2020[11]. Longer term, the EU has set goals of reducing GHG emissions by between 80% and 95% by 2050 compared to 1990 levels[12].

The **National Emission Ceilings Directive** meanwhile sets upper limits for each Member State for the total emissions in 2010 and beyond for the four pollutants responsible for acidification, eutrophication and ground-level ozone pollution, i.e.

- SO_2 42 kilotonnes
- NO_x 65 kilotonnes
- VOC 55 kilotonnes
- NH_3 (ammonia) 116 kilotonnes

All of these are relevant from a transport viewpoint. The EPA indicates that the NOx target was not met in 2010[13].

[9] EU Transport in Figures. Statistical Pocketbook 2012
http://ec.europa.eu/transport/facts-fundings/statistics/doc/2012/pocketbook2012.pdf
[10] https://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php
[11] http://www.seai.ie/Publications/Statistics_Publications/Statistics_FAQ/Energy_Targets_FAQ/
[12] http://ec.europa.eu/clima/policies/roadmap/faq_en.htm
[13] http://www.epa.ie/pubs/reports/air/airemissions/NECD_Summ_Rpt_2013.pdf

Numerous Directives are also specifically aimed at reducing the environmental impact of road transport[14].

A number of policies and measures have been implemented at a national level in Ireland in order to meet these targets. The **National Climate Change Strategy 2007-2012** contained a target to reduce GHG emissions to 13% above 1990 levels in the 2008-2012 period. Ireland's emission targets are also underpinned by its objectives in respect of energy efficiency. The **2009 National Energy Efficiency Action Plan** (NEEAP)[15] and its 2013 successor had among others a target to achieve 20% energy efficiency savings across the economy by 2020. The 2013 plan identifies 97 actions already taken or which will be taken in the period to 2020 to achieve these targets, a number of which relate to transport.

The **Smarter Travel: A Sustainable Transport Future**[16] policy framework also reasserts the Government's commitment to the importance of ports and to the promotion of the EU short seas shipping policies.

Ireland is also in the process of drafting the **Climate Action and Low-Carbon Development Bill**[17], designed to "enable the State to pursue and achieve transition to a low carbon, climate resilient and environmentally sustainable economy in the period up to and including the year 2050."

Recent estimates from the EPA[18] show that, while Ireland's GHG emissions have declined over the past five years, primarily due to the economic downturn, it is expected that, once growth returns emissions will once again start rising.

There seems little doubt that, given Ireland's and the EU's long term strategy in the transport sector, the pressure will continue to mount for further and more significant reductions in GHG emissions across all areas of economic activity, but notably, given its environmental footprint, in road transport.

---

[14] For example:

- Passenger Car CO_2 Regulation (EC) No 443/2009 and COM(2012) 393 final. CO_2 emissions from new passenger cars registered in the EU are to be reduced to 130g per kilometre by 2015 and further to 95g per kilometre from 2020.
- Regulations on CO_2 from Vans COM(2009)593. This will limit CO_2 emissions from new vans to a fleet average of 175g of CO_2 per kilometre by 2017 – with the target phased in from 2014 - and 147g/km by 2020. Vans are defined as light commercial vehicles of category N1, with a reference mass not exceeding 2610kg and vehicles to which type-approval is extended in accordance with Article 2(2) of Regulation (EC) No 715/2007. N2 and M2 vehicles with a reference mass meeting the above criteria will be included for monitoring purposes and their full inclusion in the scheme will be considered during a review.
- The Fuel Quality Directive applies to all petrol, diesel and biofuels used in road transport as well as to gasoil used in non-road-mobile machinery, aims for a 10% reduction in GHG emissions; made up of a 6% reduction in the greenhouse gas intensity of fuels by 2020, 2% reduction subject to developments in new technologies and 2% reduction to come from the purchase of Clean Development Mechanism (CDM) credits.

[15] http://www.dcenr.gov.ie/NR/rdonlyres/FC3D76AF-7FF1-483F-81CD-52DCB0C73097/0/NEEAP_full_launch_report.pdf

[16] http://www.smartertravel.ie/download/1/NS1264_Smarter_Travel_english_PN_WEB.pdf

[17] http://www.environ.ie/en/PublicationsDocuments/FileDownLoad,32468,en.pdf

[18] http://www.epa.ie/downloads/pubs/air/airemissions/GHG_1990-2009_Provisional_2011.pdf

Considering GHC specifically, the port handles bulk (high volume) cargo, servicing its hinterland. In the absence of GHE, most of the additional cargo would have to be transported by land to/from the nearest major port for shipping, i.e. Shannon-Foynes, which is approximately 130km from Galway. Some of the additional business may be lost to Ireland if GHE does not proceed.

We estimate that, taking account of volumes, vehicle weight and additional distance travelled to Shannon-Foynes, an additional 170 million tonne km per annum would be generated on Irish roads if GHE did not proceed, in the Base Case. Quite apart from the damage caused to roads, this would have a significant environmental impact.

Currently fuel usage for HGVs is estimated at 35 litres diesel/100km, which implies total additional fuel usage if GHE does not proceed of approximately 60 million litres per annum.

The Sustainable energy Authority of Ireland (SEAI) indicates the following pollutant emissions per litre of diesel, and from that we can estimate the total additional emissions if GHE does not proceed:

Table 4.1: TOTAL ADDITIONAL VOLUMES OF POLLUTANTS IF GHE DOES NOT PROCEED

	Tonnes per '000 litre Diesel	Total Tonnes generated per annum
Carbon dioxide (CO_2)	2.63037	156,608
Carbon monoxide (CO)	0.00417	248.1
Hydrocarbons (HC)	0.00050	30.0
Nitrogen oxides (NO_x)	0.00444	264.5
Sulphur oxides (SO_x)	0.00001	0.5
Particulates (PM)	0.00055	32.7

Source: SEAI, DKM estimates.

There is clearly a significant environmental impact if the project does not proceed, in terms of increased emissions, which will have implications in terms of climate change and human health. This is not to include the additional impacts on road damage, noise and congestion, which would also be significant, given the nature of the traffic being generated.

4.2 SEVESO SITES

While the main environmental policy issues relate to transport, one other significant benefit also arises. With the movement of petroleum-related activities out of the Inner Dock, the Seveso-restricted area[19] of the port will be moved away from the city centre (while the storage facilities will not be moved, the ship

[19] http://ec.europa.eu/environment/seveso/legislation.htm

discharging fuel is a Seveso site while discharging). Apart from health and safety benefits and reductions in risk, this is likely to have a positive impact on future planning applications in the city centre by removing obstacles to redevelopment.

5. CONCLUSIONS

This report has considered the policy, socio-economic and environmental implications of adopting the alternative solution to the Galway Harbour Extension project, effectively catering for the port's future bulk traffic through ports of national significant, most obviously Shannon-Foynes.

We conclude that there are compelling reasons why the alternative solution – catering for the additional port traffic at Shannon-Foynes - is not feasible from the policy, socioeconomic and environmental perspectives, and that there are overriding reasons of public interest why GHE should proceed. The following table summarises the impacts of proceeding and not proceeding with GHE, across the policy, socio-economic and environmental dimensions:

Table 5.1: IMPACTS OF PROCEEDING WITH AND NOT PROCEEDING WITH GHE

Dimension	Impact of GHE Proceeding	Impact of GHE Not Proceeding
National Ports Policy (NPP)	Realisation of national policy requires the project to proceed, specifically in terms of: • Servicing Galway's substantial hinterland. • Accommodation of larger vessels in deeper waters. • Strategic hub for petroleum logistics & storage. • Refocusing of the Inner Harbour towards leisure and tourism, and reconnection with the city. • Servicing the offshore renewable energy, oil and gas sectors.	• GHC's hinterland will be less well served by port infrastructure, and will suffer competitiveness disadvantage vis à vis other regions. • GHC will remain unable to cater for larger vessels. • Continuing role as petroleum hub in question. • Inner harbour's capacity to cater for leisure/tourism traffic remains constrained, and disconnected from city. • Servicing of offshore energy sector will migrate to more distant port, or outside of State.
National spatial, industrial development & employment policy	GHE is in accordance with and contributes to meeting *National Spatial Strategy*, IDA Ireland's *Horizon 2020 Strategy*, and *Action Plan for Jobs,* specifically regarding balanced regional development.	Regional aspects of these policies will be more difficult to deliver, as infrastructure of West and BMW regions will be less competitive vis à vis other regions.
Commercial & Socioeconomic	Project is commercially viable, caters for GHC's natural catchment, and generates substantial wider economic benefits. It also generates and maintains significant employment.	Commercial future of GHC will be damaged. Wider economic benefits will be reduced and in some cases lost (notably tourism). Employment gain would be largely lost.
Environmental	• GHE will cater for the relevant trade in a significantly less land-transport-intensive way, reducing global, regional and local emissions to air, as well as minimising road damage and congestion. • Seveso site will be more distant from city centre, with health and safety benefits and positive implications for planning in city centre through the removal of obstacles to redevelopment	• Significant increases in global, regional and local emissions to air, as well as road damage and congestion, if business has to be catered for via more distant port. • Seveso impacts on city centre will remain.

DKM
ECONOMIC
CONSULTANTS

CONTACT DETAILS

DKM ECONOMIC CONSULTANTS
Office 6 Grand Canal Wharf
South Dock Road
Ringsend, Dublin 4.
Telephone: 01 6670372
Fax: 01 6144499
Email:info@dkm.ie

www.dkm.ie