



ABERDEEN HARBOUR
EXPANSION PROJECT
November 2015

*Volume 3:
Technical
Appendices*

APPENDIX 16-B ECONOMIC IMPACT
OF ABERDEEN HARBOUR NIGG BAY
DEVELOPMENT - TECHNICAL APPENDIX
TO SOCIO-ECONOMIC AND TOURISM
REPORT





Economic impact of Aberdeen Harbour Nigg Bay Development

Technical appendix to socio-economic and tourism report

21st October 2015

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1 EXECUTIVE SUMMARY

1.1 Current Impact of Aberdeen Harbour

Aberdeen Harbour is the principal commercial port serving the north east of Scotland and is one of Europe's leading marine support centres for offshore energy. The Harbour plays a key role in the economies of both Aberdeen and Scotland, **currently generating around £1.5 billion GVA and 12,260 jobs for the Scottish economy.** This includes £1.4 billion and 9,565 jobs for the Aberdeen City and Shire economy.

At present it is estimated that around two thirds of the economic impact associated with Aberdeen Harbour is linked to the key role the Harbour plays in supporting the oil and gas sector.

1.2 Future Impact of Aberdeen Harbour

In recent years the Harbour has experienced significant growth in demand for its services but despite investing significantly in upgrading facilities, the existing site is now operating at or near full capacity. It is clear additional capacity is required to retain activity in the oil and gas sector in Scotland. If this capacity is not developed, then there is a risk that new and existing demand will be lost to Norway. Capacity constraints at the Harbour are also likely to hinder existing and potential users from developing new market opportunities in areas such as renewable energy, decommissioning, passenger ferries and cruise liners.

If the new Harbour is not developed then it is estimated that in 20 years time the Harbour will be contributing £1.1 billion GVA to the Scottish economy each year and supporting around 8,375 jobs, around 30% less than its current impact. It is expected that this decline will be largely due to a reduction in activity within the UK oil and gas sector as a whole and as opportunities are lost to Norway.

In order to accommodate existing and future demands from harbour users, the Harbour Board is considering options for expanding the Harbour into Nigg Bay to the south of the existing harbour, outside the City centre at a cost of around £320 million (in current prices).

If Nigg Bay is developed as planned then it is estimated that in 20 years time Aberdeen Harbour will be contributing £1.4 billion GVA to the Scottish economy each year and supporting around 11,395 jobs. This is around a third more than the impact that might be expected if the new harbour is not developed.

The development of the new harbour would also create an opportunity to upgrade the roads infrastructure in the surrounding area. This investment would help to make industrial land surrounding the new Harbour more attractive to potential investors and could result in a significant increase in employment in this area.

If this opportunity were to be realised then in 20 years time Aberdeen Harbour could be contributing £2.0 billion GVA to the Scottish economy each year and supporting around 15,540 jobs, around 85% more than might be expected if the new harbour is not developed.

Over 20 years of operations the new harbour could generate £5.3 billion additional GVA for the Scottish economy of which £5.0 billion could be retained within Aberdeen City and Shire. If the new harbour stimulates complementary investment in surrounding infrastructure then over 20 years of operations the

development stimulated by this investment could generate a further £8.2 billion GVA for the Scottish economy, of which around £7.0 billion could be retained in Aberdeen City and Shire.

This implies that the total potential additional operational impact of the new harbour could amount to £13.5 billion GVA for the Scottish economy over 20 years, of which around £12.0 billion could be retained in Aberdeen City and Shire.

In addition, it was estimated that the development of Nigg Bay would also generate a temporary economic impact of £74 million GVA for the Scottish economy and support 1,215 years of construction related employment. It was estimated that £10 million of this GVA and 175 years of construction related employment could be retained within Aberdeen City and Shire.

This would be in addition to the temporary construction impact associated with the infrastructure upgrades, which it was estimated could amount to £5.0 million GVA for the Scottish economy and 81 years of construction related employment. It was estimated that £1 million of this GVA and 10 years of this employment could be retained within Aberdeen City and Shire.

2 INTRODUCTION

This report presents the results of assessment by BiGGAR Economics of the potential economic impacts of proposals by Aberdeen Harbour Board to develop a new harbour at Nigg Bay.

2.1 Background

Aberdeen Harbour is the principal commercial port serving the north east of Scotland and one of Europe's leading marine support centres for offshore energy. In recent years the Harbour has experienced year on year growth in demand for its services and has responded to this by investing in modern, fit for purpose facilities.

In 2012, in response to on-going demand, Aberdeen Harbour initiated a consultation with key stakeholders to consider various scenarios for the future growth of the Port. The preferred option emerging from this exercise was an expansion of the Harbour into Nigg Bay, to the south of the existing harbour mouth, at an estimated cost of £320 million (in current prices).

The Harbour Board then commissioned a study to investigate the feasibility of an expansion into Nigg Bay. As part of this study, Scottish Enterprise commissioned BiGGAR Economics and GL Garrad Hassan to undertake an economic impact assessment of the proposals. The results of that assessment were published in December 2013.

The Harbour Board is now in the process of preparing a formal planning application for the proposed expansion. As part of this process BiGGAR Economics was invited to update the economic impact analysis to inform the socio-economic impact chapter of the Environmental Statement that will accompany the planning application. This report, which has been prepared as a technical appendix to the ES, presents the findings of the updated analysis

2.2 Structure and Approach

The remainder of this report is structured as follows:

- Chapter 3 describes the market context for the proposed development;
- Chapter 4 explains how each type of impact was estimated;
- Chapter 5 presents the baseline economic analysis – i.e. the current economic impact of Aberdeen Harbour;
- Chapter 6 explains the assumptions that were used to estimate the future impact of Aberdeen Harbour;
- Chapter 7 summarises the future potential economic impact of Aberdeen Harbour;
- Chapter 8 presents the summary and conclusions of the report; and
- Chapter 9 contains a list of the individuals who were consulted as part of the original study.

3 MARKET CONTEXT

The following section describes trends in markets that are currently important to Aberdeen Harbour or that are expected to be important in the future.

3.1 Oil and Gas Sector

The oil and gas sector is a vital industry to Aberdeen City and Shire and the harbour. Ships servicing the industry in the North Sea account for between 65% and 75% of the traffic in and out of the harbour. This is not just service vessels but also trading ships, as companies export oil and gas equipment to nearly 40 countries from Aberdeen Harbour. Consultations undertaken to support the original analysis with current harbour users suggested that current high levels of activity are expected to either remain the same for the next five years or to increase.

Oil and Gas has had a huge impact on Aberdeen City and Shire in the past four decades. Since the discovery of North Sea oil and gas in the 1960s over 41 billion barrels of oil equivalents (boe) have been extracted from the UK share of these North Sea resources. Although most analysts agree that the majority of the North Sea resources have been extracted, the amount remaining is unknown due to difficulties associated with projecting future discoveries.

Oil and Gas UK, the industry body for the oil and gas sector estimate that there are between 15 billion and 24 billion barrels of oil equivalent still to be extracted from the North Sea. Similar reports published by Oil and Gas UK in 2012 indicate that industry's estimates of recoverable reserves have not changed over the past two years.

Table 3-1: Estimates of recoverable oil (billion boe)

	Low estimate	High estimate
UKCS Reserves and Resources	15	24

Source: Oil and Gas UK, Economic Report, 2014

The same report also estimates that current investment plans have the potential to deliver 10.7 boe, 3.7 boe more than in 2012. This is likely to be linked to the amount of capital investment made by the sector, which in 2013 amounted to £14.4 billion, the highest on record.

The United Kingdom Continental Shelf (UKCS) can be split into two main areas. The fields to the northeast of East Anglia are predominantly gas fields and those further north are predominantly oil fields. The majority of the oil fields in the northern North Sea are located near the eastern boundary of the UKCS, near the Norwegian Continental Shelf. This means that the ports that service the oil and gas industry in the Norwegian continental shelf could be viable alternatives to Aberdeen Harbour for ships working in the UKCS. The current levels of interplay between Aberdeen and Norwegian harbours is shown in the fact that shipments between Aberdeen and Norway are more than double the tonnage of any other country.

Evidence from the consultation programme undertaken to support the original economic impact study suggested that the cluster effect is very strong in Aberdeen and is considered to be one of Aberdeen Harbour's main advantages over other ports. There was a strong view amongst businesses within the oil and

gas sector that it is necessary for suppliers to be close by in order to minimise delays, accidents and to enable problems to be sorted out quickly.

3.2 Decommissioning

There are over 600 oil and gas platforms in the North Sea and the market for decommissioning them is expected to be worth £30 - £35 billion between 2010 and 2040¹. In the immediate term this market is expected to be worth £4.5 billion between 2012 and 2017².

Some of the decommissioning contracts are undertaken offshore, with support vessels, while others such as decontamination and dismantling are based onshore or in shallow waters. Other port authorities such as Lerwick Port have already identified the decommissioning market as a potential opportunity and built specialist decommissioning facilities to help the port to secure business from this market.

The majority of the decommissioning market opportunities will be in the future, however there have been 53 North Sea platforms that have been decommissioned to date³. Aberdeen has been involved with these decommissioning projects by providing technical and logistical support. There has also been research and development into methods used for the decommissioning market, such as the project in underwater laser cutting at the University of Aberdeen.

The different phases of the decommissioning process will involve different companies and will be carried out in different locations (see Figure 3-1).

¹ Oil & Gas UK, 2012 UK Decommissioning Insight, 2012

² Ibid.

³ Oil & Gas UK, The decommissioning of steel piled jackets in the North Sea Region, 2012

Figure 3-1 - Phases of the decommissioning process



Source: Oil and Gas UK, *Decommissioning insight*, 2012

Some aspects, such as removal and disposal will require specialist onshore or near shore facilities, such as those developed in Lerwick (Shetland), at Humberside in England and across the North Sea in Norway. Other aspects of the decommissioning process however will be undertaken offshore and require either air or sea support from suitable onshore locations such as Aberdeen. Based on the Oil and Gas report⁴ the total value of the market for these contracts is estimated to be worth up to £27.5 billion between 2010 and 2040.

Consultations with harbour users undertaken to inform the original economic impact study in 2013 suggested that little actual large-scale dismantling of decommissioned platforms was likely to be undertaken in Aberdeen due to space constraints, noise restrictions due to the existing Harbour's city centre location and lack of decontamination facilities. It was however expected that Aberdeen would experience an increase in general activity to service decommissioning traffic such as smaller scale dismantling of offshore structures, subsea related vessels and the import and export of scrap metal. It was also expected that the management of this activity would likely be undertaken in Aberdeen.

⁴ Oil & Gas, 2012 UK Decommissioning Insight, 2012

Table 3-2: Estimates decommissioning costs

	% of total decommissioning	Value to 2040 (£bn)
Preparation for CoP	1%	0.4
Suspension (live)	22%	7
Well abandonment	44%	15.3
Decommissioning and cleaning	5%	1.6
Disconnection	7%	2.6
Suspension cold	0%	0.0
Removal	19%	6.7
Disposal	1%	0.4
Continued liabilities	0%	0.0

Source: Oil and Gas UK, *Decommissioning insight*, 2012

3.3 Renewables

Scotland's growing renewable energy sector is a potential source of demand for Aberdeen Harbour. In 2011 the Harbour handled two shipments of onshore wind turbines and blades and demand for logistics infrastructure to service the onshore wind energy developments in the North East is only set to continue.

In 2013 37 onshore wind farms had been consented in Aberdeenshire and Moray, involving a total of 159 turbines⁵. There are also a considerable number of wind farm projects in the area that are still in the planning and scoping stages. These projects represent one potential source of demand for the Harbour. There are however many alternative ports in Scotland and it is likely that port facilities and availability are likely to be more important to wind farm developers than minimum transport distances.

There is also set to be increased demand from the offshore renewables sector, both during the initial construction phase and later operations and maintenance. Although Aberdeen was identified in the Scottish Government's National Renewables Infrastructure Plans as a strategically important site, the Harbour is not currently particularly well placed to meet this demand due to the size of components involved and the need for unrestricted quayside access.

Anecdotal evidence from industry suggests that at present, importing large wind turbine large components (blades, towers, nacelles) is not easy at Aberdeen. This is because of the harbour's city centre location, which makes it difficult to transport large components out of the harbour to inland locations and the lack of laydown areas that developers require to store components prior to removal by road. If the development of a new harbour at Nigg Bay helped to resolve these difficulties then the harbour may become more attractive to developers of both on and off shore wind farms.

3.4 Tourism

Aberdeen Harbour is an important hub for domestic ferry traffic as it provides the mainland base for the Serco Northlink Ferry services, which serve Orkney and Shetland. The Harbour currently welcomes around 150,000 passengers each

⁵ RenewableUK, UK Wind Energy Database, accessed 09/08/13

year. The vast majority of these passengers are traveling to and from Orkney and Shetland but a small proportion are passengers on visiting cruise liners. Although the cruise market currently represents a very small proportion of activity at the Harbour, this is an area where there is potential for future growth. In 2012 nine cruise vessels docked in Aberdeen harbour, the same number as the year before but increased to 13 vessels in 2013.

The cruise market has grown significantly since the turn of the century and that growth is expected to continue into the future. Statistics from Cruise Market Watch⁶ show that worldwide the number of passengers increased from 7.2 million in 2000 to 20.3 million in 2012. This is expected to increase to 23.7 million in 2017. Although Scotland constitutes a small segment of the international cruise market, growth in Scotland has been quicker than that in the rest of the world. The number of cruise passengers in Scottish ports increased from 45,000 in 2000 to over 240,000 in 2012⁷.

The growth of the cruise market is supported by the growth in both the number and size of cruise ships. It is however expected that the majority of cruise ships in use by 2015 will be too big to dock in Aberdeen Harbour. Cruise Market Watch reports that in 2014-15 a further 13 ships will be added to the global cruise market fleet, with an average passenger number of over 3,000. Only two would have the capacity for fewer than 2,000 passengers and these are being built by operators that do not currently travel to Scotland.

3.5 Commercial Property Market

The commercial and industrial property markets in Aberdeen are some of the most competitive in the UK due to demand created by the North Sea oil and gas industry. The latest market trends and data in both of these markets can be found in the Industrial Market Activity Report⁸ and the Commercial Market Activity Report⁹, prepared by Knight Frank LLP.

In spring 2014 the Office Market Activity Report reported that Aberdeen had recorded a third consecutive year of impressive office take-up, reaching 740,000 sq ft in 2013. This growth was underpinned by record levels of investment in the North Sea oil and gas industry. The report confirms that the price of office space in Aberdeen remains at £31.50 per square foot (the same as in 2012), which is the highest prime headline rent in the UK outwith London and the South East of England. These high prices have attracted large investment in office capital. The total investment in the office market in 2013 was £254 million, around 23% higher than 2012, which was more than double the level in 2011.

The Industrial Market Activity Report shows that the market for industrial property in Aberdeen is also highly competitive. The rate for prime industrial rent in Aberdeen is £8.50 per square foot, which is the highest in the UK outwith the Southeast of England. The rate for good quality second-hand rental space in Aberdeen is £7.50 per square foot, and the gap between prime and second-hand has been narrowing in recent years reflecting the need for companies to take what is available as supply becomes increasingly constrained. The level of rent

⁶ <http://www.cruisemarketwatch.com/growth/> accessed August 2013

⁷ Cruise Scotland, *News Bulletin*, December 2010

⁸ Knight Frank LLP, *Winter 2012 Aberdeen: Industrial market activity report*, 2012

⁹ Knight Frank LLP (2014), *Office market activity report*, spring 2014

has been fairly consistent since 2008 and is in line with land values, which are currently £405,000 per acre.

The report found that there were tenants who were unable to find adequate spaces within Aberdeen and were forced to relocate elsewhere due to the lack of supply; however, in 2012 the amount of land that become available for development increased. There are currently over 500 acres of employment land being promoted in Aberdeen City with a value of approximately £200 million.

Since the economic downturn in 2008, there has been very little speculative industrial property development in the UK. Aberdeen has been an exception to this and remains one of the few places where speculative industrial property development does still occur. This provides evidence of the relative strength of the Aberdeen property market in relation to other towns and cities elsewhere in the UK.

3.5.1 Surrounding Industrial Estates

Nigg Bay lies to the north east of two large industrial areas known as Altens and Tullos, both of which currently have somewhat limited roads access. Infrastructure improvements associated with the new harbour could contribute facilitating new industrial development.

Aberdeen City Council identifies four distinct industrial areas that would potentially benefit from improved roads infrastructure associated with the new harbour. These include:

- East Tullos;
- Altens;
- Altens East; and
- Peterseat.

East Tullos is a 63 hectare site located to the south of the existing harbour and was one of the first industrial estates developed in Aberdeen after WWII. Although the site is fully developed it is currently occupied mainly by light industrial users, warehouses and storage yards and has a surprisingly low employment density considering its proximity to the city centre.

According to a report published in June 2013¹⁰, there are also currently eight vacant sites on the estate and consultations with the City Council suggests that many of the existing units are also now quite old and would benefit from upgrading. This is particularly the case for units toward the east of the site, which are less accessible from the main (A956) road. If the accessibility of the site were to be improved as a result of new roads infrastructure associated with a new harbour at Nigg Bay then this could provide an incentive to some owners to improve or redevelop their sites.

The Altens estate is located further to the south of East Tullos. It is a larger and generally more modern site than East Tullos with a slightly higher employment density. Although Altens is also largely full, an employment land audit published in March 2014¹¹ shows that there are 0.9 hectares of established but

¹⁰ Aberdeen City Council (June 2013), Aberdeen Industrial Areas Guide 2013-14.

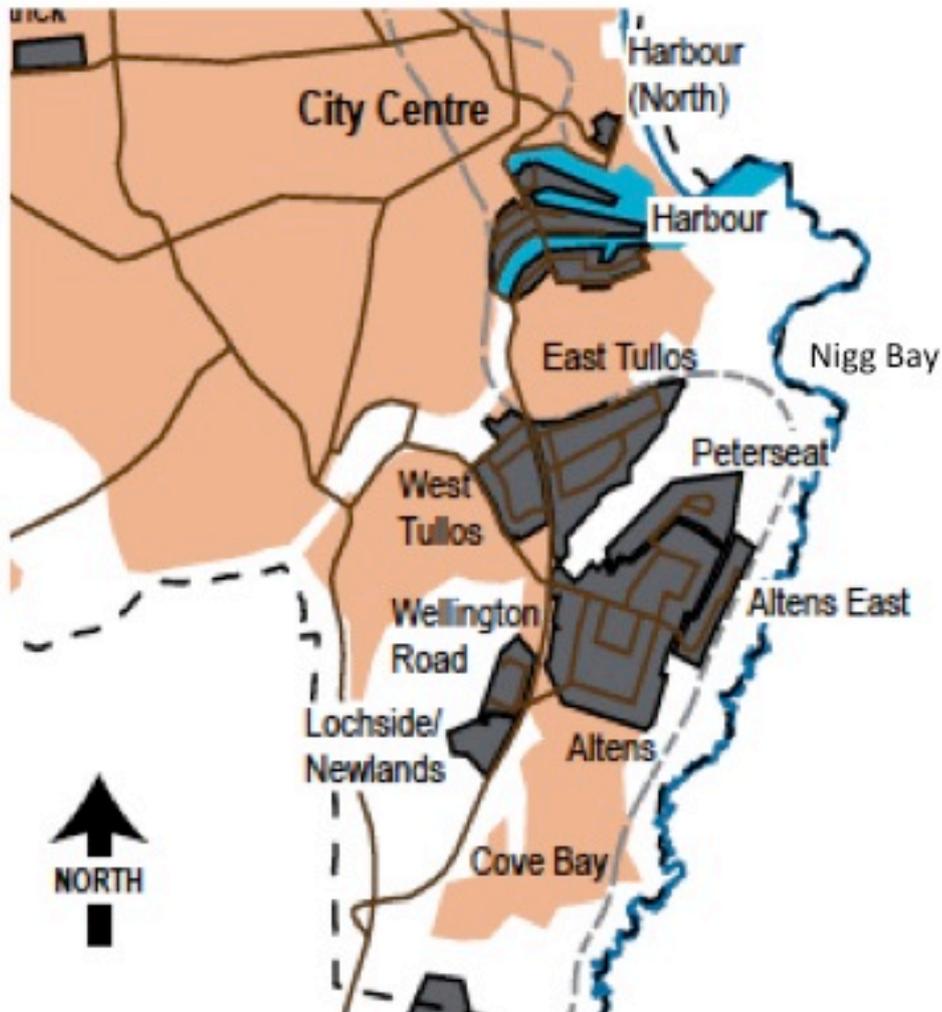
¹¹ Aberdeen City Council and Aberdeenshire Council (March 2014), Aberdeen City and Shire Employment Land Audit 2013.

undeveloped industrial land that are available for immediate development. Although this land is not technically constrained from a planning perspective, neither is it currently particularly commercially attractive because of limited accessibility. If the accessibility of the site were to be improved as a result of new roads infrastructure associated with a new harbour at Nigg Bay then this could make these undeveloped sites more commercially attractive to potential investors.

To the north and east of the existing Altens estate there are two further industrial areas known as Altens East and Peterseat, both of which have a significant amount of undeveloped space. According to the recent land audit, Altens East currently has 8.8 hectares of established but undeveloped industrial land, 2.3 hectares of which is constrained by lack of infrastructure.

There are also a further 6.9 hectares of land available for immediate development at Peterseat. If the accessibility of these sites were improved by new roads infrastructure associated with developments at Nigg Bay then this could make this undeveloped land more attractive to potential developers. The location of Nigg Bay in relation to these industrial areas is illustrated in Figure 3-2.

Figure 3-2 – Industrial Areas relevant to Nigg Bay Harbour



Source: Aberdeen City Council Industrial Areas Guide 2013-14.

4 APPROACH

This section describes the economic impact approach used in this report.

4.1 Sources of Impact

There are six main sources of economic impact associated with Aberdeen Harbour. These are:

- Aberdeen Harbour Board – the direct and indirect impacts of Aberdeen Harbour Board including its expenditure on supplies and the expenditure of its staff;
- other on-site operations – the direct impact of other businesses located within the Harbour and the indirect impact of the expenditure of their staff;
- tourism – the direct and indirect impact of tourism expenditure generated by cruise ships visiting Aberdeen Harbour;
- off-site logistics – the direct impact of Harbour related logistics activity based outside the Harbour and the indirect impact of the expenditure of people employed by these businesses;
- industrial development – the direct impact of new industrial development associated with the Harbour and of the expenditure of people employed in these developments; and
- oil and gas – the direct impact associated with oil and gas activity in Aberdeen City and Shire supported by the Harbour and of the expenditure of employees whose jobs are supported by this activity.

Each of these sources of impact is described and then quantified in the following chapters. Each impact is measured in terms of the value of wealth it creates, measured by gross value added (GVA) and the number of jobs it supports.

GVA is generally regarded as the best measure of the total wealth creation in a given area (e.g. Scotland). It measures the economic contribution of each business. GVA is the difference between the value of goods and services produced (output) and the cost of raw materials and other inputs.

4.2 Types of Impact

For each source of impact this report estimates three types of impact:

- direct impacts – the employment and GVA directly generated by the business or group of businesses being considered;
- supplier impacts – impacts generated elsewhere in the supply chain as a result of purchases made by these businesses; and
- employee spending impacts – the effect of employees who's jobs are supported by this activity spending their wages.

For each source of impact the process for estimating direct, supply chain and employee spending effects is the same.

4.2.1 Direct Impacts

The starting point for assessing the direct impact of an activity is the turnover it generates. This is converted into GVA by dividing it by an appropriate turnover/GVA ratio. Where turnover is not available, GVA is calculated by applying an estimate of GVA/employee in relevant sectors to the total employment supported by an activity.

4.2.2 Supply Chain Impacts

The starting point for estimating supplier impacts is the amount spent by an organisation or group of businesses on supplies. The employment impact of this expenditure is calculated by dividing total expenditure by turnover/employee in relevant sector(s). The GVA by these employees is then estimated by multiplying the number of jobs supported by an estimate of GVA/employee in relevant sector(s). Multiplier effects are then captured by applying GVA multipliers for the appropriate sectors to these direct impacts.

4.2.3 Employee Spending Impacts

The starting point for estimating the impact of employee expenditure is the amount of money paid to staff who work in the businesses being considered. In order to estimate how much of the impact of this expenditure occurs within Aberdeen City and Shire it is necessary to make assumptions about where staff live and how much they spend where they live.

Based on previous experience, it is assumed that 75% of staff working in businesses based in Aberdeen, live in Aberdeen City and Shire, and the rest live somewhere else in Scotland. The amount staff spend in Aberdeen City and Shire will vary depending on where staff live but it is assumed that all staff spend around 70% of their wages somewhere in Scotland (i.e. leakage at the national level is 30%). A summary of these assumptions is provided in Table 4-1.

Table 4-1 – Staff spending assumptions

Staff Location	Staff Spending		
	Aberdeen C&S	Rest of Scotland	Scotland (total)
Aberdeen C&S	35%	35%	70%
Rest Scotland	20%	50%	70%

Source: BiGGAR Economics

To estimate the impact of this expenditure it is first necessary to estimate how much staff spend in Aberdeen City and Shire and how much they spend in Scotland. This expenditure was then divided by average turnover per employee in the relevant area to determine how many jobs it supports. The GVA of this expenditure was estimate by multiplying the number of jobs supported by average GVA/employee in the Scottish (or Aberdeen City and Shire) economy. Average employment and GVA multipliers covering all sectors of the economy were then applied to capture multiplier effects.

4.2.4 Sources

The turnover/GVA ratios and estimates of GVA/employee used in this report are all derived from the 2011 Annual Business Survey published by the Office for National Statistics. The effects of subsequent spending rounds are captured

using type II GVA and employment multipliers. These are published in the Scottish Government's input-output tables.

4.2.5 Note on Rounding

Throughout this report jobs impacts have been rounded to the nearest five jobs and GVA impacts are rounded to the nearest whole number.

4.3 Current and Future Impacts

This report considers the current and potential future impact of Aberdeen Harbour in 20 years' time under three development scenarios. These scenarios are:

- the reference case - a new harbour is not developed at Nigg;
- the basic development scenario – a new harbour is developed as planned but no improvements are made to the surrounding infrastructure; and
- the enhanced development scenario - a new harbour is developed as planned and complementary investment is also made in nearby transport infrastructure to stimulate wider commercial development in the local area.

5 BASELINE ECONOMIC ANALYSIS

The sources of economic impact considered in this report include:

- Aberdeen Harbour Board – the direct and indirect impacts of Aberdeen Harbour Board including its expenditure on supplies and the expenditure of its staff;
- other on-site operations – the direct impact of other businesses located within the Harbour and the indirect impact of the expenditure of their staff;
- tourism – the direct and indirect impact of tourism expenditure generated by cruise ships visiting Aberdeen Harbour;
- off-site logistics – the direct impact of Harbour related logistics activity based outside the Harbour and the indirect impact of the expenditure of people employed by these businesses;
- industrial development – the direct impact of new industrial development associated with the Harbour and of the expenditure of people employed in these developments; and
- oil and gas – the direct impact associated with oil and gas activity in Aberdeen City and Shire supported by the Harbour and of the expenditure of employees whose jobs are supported by this activity.

The current impact from each of these activities is considered below. The potential future impact from each source is considered in chapter 7.

5.1 Aberdeen Harbour Board

The economic impacts of Aberdeen Harbour Board include the direct impacts of operations, impacts associated with the Board's expenditure on supplies, impacts generated by staff expenditure and impacts of construction projects commissioned by the Board. Each of these is considered below.

The most recent financial data for the Aberdeen Harbour Board relates to the financial year ending December 2013; however, these figures reflect changes that have occurred as a result of preparations that have been made to bring forward the proposed Nigg Bay expansion. As such the most recent figures do not provide an accurate reflection of underlying baseline activity. For this reason the current economic impact of Aberdeen Harbour Board was estimated based on financial accounts for the year ending December 2012 before significant preparations were underway.

5.1.1 Direct Impact

Aberdeen Harbour Board directly employs 94 people and in the year ending December 2012 it reported total turnover of more than £27 million. The GVA of this turnover was estimated by subtracting the total value of expenditure on goods and services purchased that year, which amounted to almost £18 million. This gives a net direct GVA impact of almost £10 million.

5.1.2 Supplier Impact

When Aberdeen Harbour Board purchases goods and services this increases the turnover of the Harbour's suppliers and enables them to generate more wealth

and employ more people. The vast majority of Aberdeen Harbour Board's regular annual expenditure relates to civil engineering work undertaken to maintain the harbour facilities and dredging. The harbour also purchases services such as facilities management. Relevant sectors therefore include civil engineering, water related construction, coastal freight transport and building services.

Where possible Aberdeen Harbour Board try to maximise local economic impacts by awarding contracts to local suppliers. Based on consultation with the Harbour Board, it is therefore assumed that 70% of supplies are purchased from businesses located within Aberdeen City and Shire and 90% are purchased from Scottish companies (i.e. leakage at the national level is assumed to be 10%).

In this way it was estimated that Aberdeen Harbour Board's annual expenditure on goods and services generates a net impact of almost £10 million GVA for the Scottish economy and supports around 110 jobs. In Aberdeen City and Shire this impact amounts to almost £5 million GVA and almost 60 jobs.

5.1.3 Staff Expenditure Impact

When staff employed by Aberdeen Harbour Board spend their wages this increases the turnover of the businesses that provide them with goods and services. The starting point for estimating this impact was to estimate how much of their income staff spend in Aberdeen City and Shire and elsewhere in Scotland.

In this way it was estimated that the expenditure of Aberdeen Harbour Board employees contributes a net benefit of more than £3 million to the Scottish economy each year and supports around 45 jobs. In Aberdeen City and Shire this impact amounts to more than £1 million GVA and around 10 jobs.

5.1.4 Construction Impact

In addition to regular maintenance expenditure, the Aberdeen Harbour Board also makes a significant annual investment in new capital projects. In 2012 this expenditure amounted to £21.3 million, much of which was associated with a major project to develop new deep-water berths at the Torry Quay.

This expenditure increases the turnover of the appointed contractors, generating wealth and supporting employment in Scotland and beyond. Due to legal requirements related to the scale of the projects, many of these contracts are awarded to contractors outside Aberdeen City and Shire and some are awarded to firms based outside Scotland. Analysis of information provided by Aberdeen Harbour suggests that around 10% of construction related expenditure benefits firms based in Aberdeen City and Shire and around two thirds benefits Scottish Firms (i.e. at the national level leakage is around one third).

The employment impact of this expenditure was estimated by dividing total expenditure in each area by turnover/employee in relevant sub-sectors of the construction sector. The GVA impact was then estimated by multiplying the number of jobs directly supported by GVA/employee in the same sub-sectors. Appropriate GVA and employment multipliers were then applied to capture the effect of subsequent spending rounds.

In this way it was estimated that in 2012 major capital projects undertaken by Aberdeen Harbour contributed a net benefit of almost £11 million GVA to the Scottish economy of which £1 million GVA was retained within Aberdeen City and Shire. It can also be estimated that these projects supported almost 180 Scottish jobs in 2012, including almost 20 in Aberdeen City and Shire.

5.1.5 Aberdeen Harbour Board Summary

In 2012 the activities of the Aberdeen Harbour Board contributed almost £33 million GVA to the Scottish economy and supported 430 jobs. In Aberdeen City and Shire this amounted to a net benefit of £17 million and almost 180 jobs. These impacts are summarised in Table 5-1.

Table 5-1 – net economic impact of Aberdeen Harbour Board – 2012*

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Direct	95	10	95	10
Supplier	55	5	110	10
Staff spending	10	1	45	3
Construction	15	1	180	11
Total	180	17	430	33

Source: BiGGAR Economics economic impact model. *numbers may not sum due to rounding.

5.2 Other On-site Operations

Aberdeen Harbour Board is only one of a large number of businesses based on the Harbour site. Although these businesses operate independently of the Harbour Board, being located close to the Harbour is critical to most of them so it is reasonable to include the impact of their activities.

5.2.1 Employment in On-site Operations

Aberdeen is the main hub of the Scottish oil and gas sector and Aberdeen Harbour is the focus for much of this activity. The Harbour hosts a well developed cluster of oil and gas related companies. This includes both companies that are directly involved in the extraction of oil and gas (such as BP, Total and Shell) and those that provide goods and services to the sector such as logistics specialists, waste disposal experts and training providers. Other types of businesses located at the Harbour include:

- businesses engaged in the distribution of cargo entering or leaving the port (e.g. Omya UK Ltd);
- Serco NorthLink Ferries, which provides freight and passenger transport services between Orkney, Shetland and the Scottish mainland;
- ships agents; and
- haulage companies.

The starting point for estimating the economic impact of these companies is to establish how many people they employ. This was done through consultation with Aberdeen Harbour Board, interviews with some of the largest tenants and a review of information on company websites. These estimates are presented below.

Table 5-2 - Estimated employment in selected on-site businesses

Company	Estimated employment	Company	Estimated employment
Asco UK Ltd	284	Caledonian Oils	30
Serco Northlink Ltd	145	BP & Total	12
NOV Brandt	22	Shell & TAQA	6
Peterson Ltd	267	Nord Centre (includes several companies)	200
Streamline Shipping Agencies Ltd	50	Agents (assumed 20 agents, each employing 15 people.	300
Dales Properties (Scotland) Limited	105	Waste recycling	10
M-I Drilling Fluids U.K Ltd	50	Euroline	6
Petrofac Training Services	18	C-Mar Global Solutions Ltd	53
ARR Craib Transport Ltd	50	Omya UK Ltd	18
		GAC	25
Total		1,651	

Source: BiGGAR Economics estimates based on consultation with Aberdeen Harbour, selected tenants and company websites.

Although the businesses identified in Table 5-2 are amongst the largest businesses operating at the Harbour, the list is not comprehensive and excludes numerous smaller operations. It is estimated that these smaller businesses account for 5% of total on-site employment. It is therefore estimated that direct on-site employment is around 1,735. Consultation with Aberdeen Harbour Board in February 2015 confirms that these estimates have not changed significantly since the original study was completed in 2013.

5.2.2 Direct Impact

The direct impact of on-site operations was estimated by multiplying the direct employment in each of the businesses listed above by an estimate of GVA/employee in the sector in which it operates. Total GVA was then inflated by 5% to account for businesses not identified in Table 5-2. In this way it was estimated that the total net direct GVA impact of on-site businesses amounts to around £297 million.

5.2.3 Supplier Impact

Most of the businesses located at Aberdeen Harbour are part of the oil and gas supply chain. The impact of the oil and gas supply chain is considered as part of section 5.5 so the supply chain impact of on-site businesses is therefore omitted here to avoid double counting.

5.2.4 Staff Expenditure Impact

The starting point for estimating the impact of the expenditure of people who work at Aberdeen Harbour is to estimate the total value of wages paid to people who work there each year. This is done by multiplying the total number of employees

by an estimate of the average annual income of workers in Aberdeen City, which is currently a little over £37,000 per year.

In this way it can be estimated that the expenditure of employees working at Aberdeen Harbour contribute a net benefit of more than £32 GVA million to the Scottish economy each year and support more than 467 jobs. In Aberdeen City and Shire this impact amounts to more than £14 million GVA and around 105 jobs.

5.2.5 Other On-site Operations Summary

Each year the activities of businesses located at Aberdeen Harbour contribute £329 million GVA to the Scottish economy and supports around 2,200 jobs. In Aberdeen City and Shire this impact amounts to around £311 million GVA and around 1,835 jobs. These impacts are summarised in Table 5-3.

Table 5-3 – net economic impact of businesses located at Aberdeen Harbour

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Direct	1,735	297	1,735	297
Staff spending	105	14	465	32
Total	1,835	311	2,200	329

Source: BiGGAR Economics economic impact model

5.3 Tourism

Each year Aberdeen Harbour welcomes a growing number of cruise ships. When these ships berth in Aberdeen, expenditure by passengers and crew and supplies purchased for the ship all help to generate economic activity in the Aberdeen City and Shire economy. This section quantifies this impact.

5.3.1 Tourism Related Activity

There are two main sources of economic impact associated with cruise tourism. The first is expenditure by passengers and ships crew in Aberdeen when the ship is berthed at the Harbour and the second is associated with purchases made by the ships operators on supplies for the ship.

The starting point for estimating these impacts is the total number of cruise passengers arriving at Aberdeen each year. In 2012 Aberdeen Harbour welcomed 1,434 passengers. This is a relatively small number and reflects the fact that the cruise ships currently using Aberdeen Harbour tend to be fairly small by the standards of the industry. Consultation with Aberdeen Harbour Board in February 2015 confirms that the number of cruise passengers arriving at the Harbour has not changed significantly since the original study was completed in 2013.

The largest cruise ship that has visited Aberdeen Harbour is MS Europa, which has the capacity to carry 408 passengers, but most are considerably smaller than this with an average capacity in 2013 of just 95 passengers. The volume of current cruise liner activity at Aberdeen Harbour is such that the impact of this expenditure is likely to be very small but the impact is considered here because this is an area with considerable potential for future growth.

In 2012 Aberdeen Harbour welcomed just nine cruise liners but during 2013, this had increased to 13 vessels. The average size of cruise liners is expected to increase substantially in the future and the Nigg Bay expansion would enable Aberdeen Harbour to cater for these larger vessels. This means that if the development goes ahead, the harbour will have the potential to substantially increase its tourism impact.

5.3.2 Tourism Related Expenditure

The starting point for calculating the current tourism impact is to estimate how much additional expenditure is generated by cruise related expenditure. This can be done by multiplying the number of cruise passengers by an estimate of average expenditure per passenger, which is taken from research¹² relating to cruise activity at the Port of Leith.

The next step is to consider what type of goods this expenditure might be spent on. Cruise passengers and crew will eat most of their meals on board the ship so any expenditure ashore will tend to be on things like shore excursions, retail purchases of clothing, jewellery and local crafts and souvenirs. Purchases of supplies for the ship will be mainly fresh food.

It is then necessary to estimate how much of this expenditure might be retained within Aberdeen City and Shire. Cruise passengers and crew have limited time available to spend ashore so it is assumed that the vast majority (90%) of their expenditure will be retained within Aberdeen City and Shire. As operators are able to arrange delivery of fresh food prior to arrival geography will be less of a constraint for this impact so it is assumed that 75% of supplies are purchased from businesses based in Aberdeen City and Shire.

The employment supported by the expenditure of passengers and crew can be estimated by dividing the total value of expenditure by an estimate of turnover/employee in the retail sector. Employment supported by expenditure on ships supplies can be estimated by dividing the total value of expenditure by an estimate of turnover/employee in the wholesale food sector.

The GVA impact associated with this expenditure was then estimated by multiplying the employment supported in each sector by an estimate of average GVA/employee in each sector. The effects of subsequent spending rounds were then captured by applying appropriate multipliers for these sectors.

In this way it was estimated that expenditure associated with cruise liners contributes less than £100,000 GVA to the Scottish economy each year and supports around one job. Although small, this impact is included here because of its future potential.

5.4 Off-Site Logistics

The activity undertaken at the harbour also generates a significant volume of activity off-site associated with the storage and transportation of cargo to and from the port. This section considers the impact of this activity.

¹² GP Wild International Ltd (August 2012), a study of cruise tourism demand at the Port of Leith.

5.4.1 Employment in Off-site Logistics

The two main logistics providers at the Harbour are Perterson Ltd and Asco, both of which have substantial on-site operations. Although the direct employment associated with these operations is included as part of the on-site operational impact calculated above any additional employment supported off-site by these companies and similar operators is not. In particular, the on-site impact does not include any employment in warehouses operated (or used) by these companies elsewhere in Aberdeen.

Consultation with Euroline, one of the shipping agents located at the Harbour, confirms that the scale of this off-site activity is likely to be significant. Euroline currently directly employ 6 people on-site but estimate that their activity supports employment in excess of 100 sub-contractors elsewhere in the supply chain. The type of activities that are sub-contracted include truck drivers, crane operators and other ancillary services.

Euroline provided an estimate of the total volume of cargo they handle each year and the total amount of off-site logistics staff this supports. By applying this to the total volume of cargo that passed through Aberdeen Harbour in 2012, it can be estimated that a total of 2,570 logistics staff are currently required to support harbour operations.

As some of the logistics companies are based on-site, some of this employment has already been counted in section 5.2. Based on consultations with the Harbour Board and some of the businesses located at the Harbour it is estimated that around 1,100 of these staff are located on-site. To avoid double counting, only the impact of the 1,470 logistics jobs located off-site is estimated in this section. This level of employment is not believed to have changed significantly since the previous study was completed in 2013.

5.4.2 Direct Impact

The net direct GVA impact of off-site logistics can be calculated by multiplying the total additional logistics jobs supported by an estimate of GVA/employee in the road freight transport and warehousing sectors. This gives a direct GVA impact of around £160 million.

5.4.3 Supplier Impacts

Most of the logistics support associated with Aberdeen Harbour is part of the oil and gas supply chain. The impact of the oil and gas supply chain is considered as part of section 5.5 and is therefore omitted here to avoid double counting.

5.4.4 Staff Spending Impact

The starting point for estimating this impact is to estimate the total value of wages paid to off-site logistics staff each year. This is done by multiplying the total number of employees by £28,600, which is the average annual income of workers in the transportation and storage sector according to the Annual Survey of Hours and Earnings.

From this it can be estimated that the expenditure of off-site logistics employees supported by Aberdeen Harbour contributes a net benefit of more than £21 million to the Scottish economy each year and supports around 305 jobs. In Aberdeen City and Shire this impact amounts to almost £9 million GVA and 65 jobs.

5.4.5 Off-Site Logistics Summary

Each year the activities of off-site logistics companies that service Aberdeen Harbour contribute a net benefit of over £181 GVA to the Scottish economy and supported around 1,770 jobs. In Aberdeen City and Shire this impact amounted to almost £169 million GVA and around 1,535 jobs. These impacts are summarised in Table 5-4.

Table 5-4 – net economic impact of off-site logistics providers

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Direct	1,470	160	1,470	160
Staff spending	65	9	305	21
Total	1,535	169	1,770	181

Source: BiGGAR Economics economic impact model

5.5 Industrial Development

If a new harbour is constructed at Nigg Bay it is expected that this will help to encourage development on surrounding industrial estates. As discussed in section 3.5.1, there are four industrial estates close to Nigg Bay with future growth potential. Between them Altens East, Altens and Peterseat have 14.3 hectares of land that is immediately available for development. East Tullos has no available land but there is significant scope for some of the plots to be upgraded, which could result in an increase in employment density.

5.5.1 Direct Impact

The starting point for estimating the direct economic impact of this development was to estimate the number of additional jobs that could be created as a result of any new industrial development. The economic impact of these jobs was then estimated by multiplying the total number of additional jobs supported by an estimate of GVA/employee in the Aberdeen City and Shire economy.

5.5.2 Supplier Impacts

It is likely that most of the new jobs created in the industrial estates would be either directly or indirectly involved in the oil and gas supply chain. The impact of the oil and gas supply chain is considered as part of section 5.6 so the supply chain impact of new businesses that might locate close to the Harbour was omitted here to avoid double counting.

5.5.3 Staff Spending Impact

The starting point for estimating this impact was to estimate the total value of wages paid to staff working in the industrial space each year. This was done by multiplying the total number of employees by £37,268, which is the average annual income of people working in Aberdeen City according to the Annual Survey of Hours and Earnings.

5.5.4 Industrial Development Summary

The development of new and existing land around Nigg Bay has not yet occurred so the current impact of this is zero.

5.6 Wider Oil and Gas Sector Impacts

The discovery of oil reserves in the North Sea in the late 1960s led to a rapid transformation of the economy of Aberdeen City and Shire. By most standard measures of success the Aberdeen City and Shire is amongst the most prosperous regions of the UK. Much of this prosperity is directly attributable to the oil and gas sector.

While the existence of the sector cannot be attributed to Aberdeen Harbour, the port has played an important role in enabling the sector to develop in the way that it has. Aberdeen Harbour has been at the heart of the Scottish oil and gas industry since the late 1960s and it is estimated that between 65% and 75% of current activity at the harbour is oil and gas related. Consultations with major oil and gas corporations undertaken to support this study confirm that the Harbour continues to be regarded as extremely important to the continued success of the sector.

It is of course impossible to accurately assess what Scotland's oil and gas sector might look like today if Aberdeen Harbour did not exist but it is difficult to imagine that the concentration of oil and gas related activity that currently exists in and around the city would have developed to the same extent without the Harbour. If the sector had been unable to develop this concentration then this would undoubtedly have impacted on its competitiveness. This may have resulted in the sector being smaller than it currently is and/or in some of the activity that is currently undertaken in Scotland being undertaken in England or overseas instead.

For this reason it is reasonable to include some of the economic impact generated by the sector within this assessment. How much of the impact of the oil and gas sector should be included within this assessment is necessarily a matter of judgement. The Harbour is not the only reason that Aberdeen has become such a hub for the oil and gas sector. Other factors such as Aberdeen Airport, Aberdeen's proximity to North Sea oil fields and the skills profile of the local labour market have all also been important.

If it were assumed that each of these factors were equally important then one approach would be to include 25% of the impact of the sector in this assessment. This would however risk ignoring other important factors that may have influenced the development of the sector. It is impossible to know exactly what these may be so a more conservative assumption of 10% was therefore adopted.

5.6.1 Direct Impact of Oil and Gas Sector

The starting point for estimating the impact of the oil and gas sector that is attributable to the Harbour is the number of people who are directly employed in the sector. The original study undertaken in 2013 used data published by Oil and Gas UK to estimate that just over 70,000 people were employed in the oil and gas sector in Aberdeen City and Shire or in the associated supply chain in 2013.

This estimate was based on data published in the 2013 economic report published by Oil and Gas UK. The 2014 economic report published by Oil and Gas UK suggests that overall employment in the industry has not changed. This suggests that recent announcements of future job losses in the industry may not yet have taken effect and implies that the assumptions used in the original study remain valid.

As discussed above, 10% of these jobs (just over 7,000) are included within this assessment. The next step is to exclude oil and gas jobs that have already counted as part of the on-site impact estimated in section above, which leaves around 5,590 jobs.

The net GVA impact of these jobs was estimated by multiplying the number of jobs by an estimate of the GVA/employee for employees working in the sector. This gives a GVA impact of more than £851 million.

5.6.2 Supplier Impacts

The direct impact described above includes employment supported in the oil and gas supply chain. It is therefore unnecessary to calculate supply chain impacts separately.

5.6.3 Employee Expenditure Impacts

The starting point for estimating this impact was to estimate the total value of wages paid to these staff each year. This is done by multiplying the total number of employees by £53,484, which is the weighted average annual income of workers in the oil and gas extraction sector and supporting industries derived from the Annual Survey of Hours and Earnings.

In this way it was estimated that the expenditure of these employees contributes a net benefit of almost £151 million to the Scottish economy each year and supports almost 2,270 jobs. In Aberdeen City and Shire this impact amounts to almost £56 million GVA and around 425 jobs.

5.6.4 Summary Oil and Gas Sector Impacts

Activity in the oil and gas sector in Aberdeen City and Shire that can be attributed to the Harbour contributes a net benefit of almost £1,002 million GVA to the Scottish economy and supports almost 7,860 jobs. Included within this is almost £907 million GVA and almost 6,015 jobs within the Aberdeen City and Shire economy. These impacts are summarised in Table 5-5.

Table 5-5 – net economic impact of oil and gas sector employment attributable to Aberdeen Harbour

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Direct	5,590	851	5,590	851
Staff spending	425	56	2,265	151
Total	6,015	907	7,855	1,002

Source: BiGGAR Economics economic impact model

5.7 Summary of Current Impact

Taken together the impacts described in this chapter amount to a net annual economic contribution of almost £1.5 billion in Scotland, £1.4 billion of which is retained in Aberdeen City and Shire. It is also estimated that Aberdeen Harbour supports around 12,260 jobs across Scotland, of which around 9,565 are in Aberdeen City and Shire. These impacts are summarised in Table 5-6, which breaks-down the total impact into impacts that are generated on-site and impacts that are generated off-site.

Table 5-6 – net economic impact of businesses located at Aberdeen Harbour

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Aberdeen Harbour Board	180	17	430	33
Other on-site operations	1,835	311	2,200	329
Tourism	1	<0.1m	1	<0.1m
Total on-site impact	2,015	328	2,630	363
Off-site logistics	1,535	169	1,770	181
Industrial development	n/a	n/a	n/a	n/a
Oil and gas sector	6,015	907	7,855	1,002
Total off-site impact	7,550	1,077	9,630	1,184
Total impact	9,565	1,404	12,260	1,546

Source: BiGGAR Economics economic impact model

6 ASSUMPTIONS ABOUT FUTURE DEVELOPMENT

The objective of this report is to consider what the impact of Aberdeen Harbour might be in the future. To do this it is necessary to make assumptions about how activity associated with the Harbour might change. This section describes these assumptions.

6.1 Aberdeen Harbour Board

This section considers what the impact of Aberdeen Harbour Board might be in 20 years' time under the three development scenarios.

If the development of Nigg Bay does not happen the Harbour anticipates that employment will remain at current levels so the direct employment impact will remain unchanged at 94 jobs. There will however be a gradual decline in revenue from harbour activities, which is expected to start in around five years and result in revenues being around 4% lower in 20 years' time than they are at present.

If the new harbour is developed, then Aberdeen Harbour Board expect to employ approximately four additional staff and revenue from harbour activities are expected to increase by 41% to £23.2 million by year 20. Aberdeen Harbour Board's expectations about future activity and the revenue this will generate are based on the assumption that the roads infrastructure around the new harbour will be improved. If this does not happen then it will be more difficult for expected levels of growth to be realised. The location of Nigg Bay to the south of the city and clear of Market Street will also make it a preferred option for some oil and gas sector companies.

Consultation with the Harbour and harbour users suggests that if the roads infrastructure around the site is not improved this is unlikely to deter harbour users from increasing activity on the site but it will make it more difficult for them to do so. In effect it will mean that users might delay planned investments and development will take longer to realise. This is modelled by assuming that in the basic development scenario anticipated growth starts around five years later than anticipated and that revenue from harbour activities peaks in year 15.

At present harbour revenues represent 64% of total turnover and the Harbour Board spends approximately 64% of turnover on supplies. It is assumed that these proportions will not change in the future. These assumptions can be used to estimate the future turnover of the Harbour and its future expenditure on supplies, both of which are necessary to estimate future GVA impact.

It was assumed that if the new harbour is developed then Aberdeen Harbour Board would not undertake any additional capital expenditure for the duration of the project but that after the new harbour is completed on-going capital expenditure would account for around 10% of turnover. If the new harbour is not developed then it was assumed that capital investment would account for 10% of turnover.

The assumptions used to estimate the future impact of Aberdeen Harbour Board are summarised in Table 6-1.

Table 6-1 – On-site activity assumptions

Assumption	Reference Case	Basic Development Scenario	Enhanced development scenario
Total employment by year 20	94	98	98
Revenue from activities by year 20	£16.5 million	£23.2 million	£23.2 million
Year change starts	Year 5	Year 5	Year 1
Year change fully realised	Year 18	Year 15	Year 11

Source: BIGGAR Economics economic impact model

6.1.1 Gross to Net Impact

The proposals to develop a new harbour at Nigg Bay would be in addition to rather than as a replacement of existing operations so no displacement will occur. The Harbour Board is progressing these proposals in response to market demand and potential incentives from the public sector have not been a factor in the decision making process. This means that there will be no substitution effect.

6.2 On-site Operations

The future impacts of other on-site operations will be driven by the number of employees working on-site in 20 years' time, which will in turn be driven by the rate of growth experienced by on-site businesses between now and then.

It is reasonable to assume that the short-term growth expectations of on-site businesses are likely to have been curtailed by the fall in global oil prices that has occurred since the original study was completed. There is however no reason to conclude that this will have significantly affected the long-term expectations of the industry (see section 6.6 for further discussion on this point).

The majority of businesses consulted for the original study were optimistic about long-term future business growth prospects but the extent to which users will be able to achieve these will depend largely on whether they have access to the facilities and services they require. At present this is often not the case.

The majority of businesses consulted (12 out of 17) indicated that their current activities were either already constrained to some extent by the availability of services or facilities at Harbour or could become so in the near future. The main constraint mentioned was the lack of space at the existing harbour and the delays that this causes for ships entering the harbour. Of the five businesses that do not experience constraints, three either already use other ports on the east coast or would consider doing so if Aberdeen became too constrained and one has its own berths and quayside facilities.

The time-scale considered by most of these businesses was around five years. After this, expectations became much more uncertain. The main growth driver for the vast majority of these businesses is the price of oil so it is reasonable to expect that growth in current markets will broadly reflect activity in the wider oil and gas sector.

It is expected that employment in the oil and gas sector will decline by around 20% over the next 20 years (see section 6.6). This suggests that in the longer

term, activity amongst existing users may decline by up to 20%, although this should be considered a worst-case scenario and the large scale decommissioning of offshore infrastructure required may keep employment in some sectors at current levels.

At least two of the businesses consulted confirmed that they are already experiencing a slight decline in demand from the oil and gas sector and are beginning to look at the renewables market as an alternative source of future growth. In the medium to long term (10 years plus) it is reasonable to expect that more businesses will have a similar experience and that over time some of the current demand from the oil and gas sector will be replaced by other markets.

Over a 20 year period, this suggests that, unless additional facilities are provided, many current users will be unable to achieve anticipated levels of growth in the short-term or make the transition into new markets in the longer term. This would be consistent with Aberdeen Harbour Board's expectation that if a new harbour is not developed at Nigg Bay then revenue from harbour activities will decline by around 4% over the next 20 years. It was therefore assumed that if a new harbour is not developed then employment within on-site companies will be 4% lower in 20 years than it is today.

Although most of the businesses consulted for this project were not able to quantify future growth expectations, those that could were optimistic. Developing a new harbour at Nigg is expected to be very important to helping businesses to realise these expectations. This is not to say that individual businesses will not grow if the new Harbour is not developed, but rather that capacity constraints within the Harbour will mean that growth within one company is likely to be offset by a decline in another. Developing the new harbour should enable all businesses that expect to grow to realise their aspirations.

Aberdeen Harbour Board expects that if a new harbour is developed at Nigg Bay as proposed, then revenues from harbour activities will increase by around 41% over the next 20 years. It is reasonable to assume that harbour revenues are broadly proportionate to the level of activity amongst Harbour users so it is assumed that if the Harbour is developed as planned, employment amongst existing users will increase by around 41% over the next 20 years. This would be broadly consistent with the expectations of the businesses that were able to quantify future growth aspirations.

If a new harbour is developed but no improvements are made to the surrounding infrastructure, this is expected to make it more difficult for harbour users to realise their growth aspirations. Although users are still expected to achieve the same level of growth, it is expected that this will take longer to achieve. This is modelled by assuming that under the Enhanced development scenario growth begins in year 5 and is fully realised by year 15 but under the basic development scenario, growth begins in year 10 and is fully realised by year 20.

The assumptions used to estimate the future impact of on-site activities are summarised below.

Table 6-2 – On-site activity assumptions

Assumption	Reference Case	Basic Development Scenario	Enhanced development scenario
Total growth in activity by year 20	-4%	+41%	+41%
Year growth starts	Year 1	Year 5	Year 1
Year change realised	Year 5	Year 15	Year 10

Source: BIGGAR Economics economic impact model

6.2.1 Gross to Net Impact

At a Scottish level there are a number of ports that could potentially accommodate some of this activity including Nigg (north of Inverness), Invergordon or Montrose. Anecdotal evidence from consultees suggests that demand for space at these ports is also high so it is likely that displacement would be low. At the Aberdeen City and Shire level, the only port that could potentially accommodate any of this demand is Peterhead but its capacity to do so is likely to be limited so displacement would be lower than the Scottish level.

It is therefore assumed that displacement at the Scottish level would be 25% at the Scottish level and 10% at the Aberdeen City and Shire level. If the harbour is developed without improvements to surrounding roads infrastructure then it will be somewhat less attractive as an investment location so it is also assumed that displacement under the basic development scenario will be lower, i.e. 10% at the Scottish level and 5% at the Aberdeen City and Shire level.

6.3 Future Tourism Development Assumptions

It is assumed that even if Nigg Bay is not developed, the modest level of current activity will be maintained and that in 20 years' time the Harbour will be welcoming around 15 cruise ships per year. It is assumed that the size of these ships will be similar to that of the ships that currently use the harbour, which in 2013 carried an average of 95 passengers.

Aberdeen Harbour Board expects that the new harbour at Nigg will enable it to attract between 30 and 40 cruise ships each year. The new harbour will also enable much larger ships to visit.

If a new harbour is built and improvements are made to surrounding roads infrastructure then this may make the harbour a more attractive destination for visiting ships. For example road improvements may make it easier for coaches to access to the quayside, which would make it easier for cruise companies to organise excursions for passengers. The additional space may even make it possible to create dedicated visitor reception facilities.

It is therefore assumed that under the enhanced development scenario, the number of ships visiting Aberdeen Harbour in the future would be around 40, toward the top of the range of expectations. Under the basic development scenario it was assumed that the level of growth realised will be toward the bottom end of the range, which would equate to around 30 ships per year.

For both development scenarios it is assumed that 15 of the ships would be of a similar size to the ships that currently visit the Harbour and the rest would be much larger ships, with a capacity of up to 3,000 passengers.

The assumptions used to model future tourism impacts are summarised in Table 6-5.

Table 6-3 – Tourism development assumptions

Reference Case	Basic Development Scenario	Enhanced development scenario
Harbour attracts 15 cruise ships per year carrying an average of 95 passengers each.	Harbour attracts 30 cruise ships per year 15 of which carry an average of 95 passengers and 15 of which carry an average of up to 3,000 passengers.	Harbour attracts 40 cruise ships per year 15 of which carry an average of 95 passengers and 15 of which carry an average of up to 3,000 passengers.

Source: BiGGAR Economics economic impact model

6.3.1 Gross to Net Impact

If a new harbour is developed at Nigg Bay it is possible that some of the cruise ships that visit the Harbour in the future might otherwise have visited other Scottish ports so displacement could be an issue at the Scottish level. Displacement will not occur at the Aberdeen City and Shire level because there are no other ports within the region that could accommodate large cruise ships.

If improvements are not made to the surrounding roads infrastructure then it is unlikely that Aberdeen would be a sufficiently attractive destination to attract cruise liners away from other Scottish ports so displacement is unlikely to be an issue in the basic development scenario. In the Enhanced development scenario it is assumed that this effect will be small (10%) because of the overall level of growth in the global cruise market.

Cruise liner activity will depend on global market demand for this type of holiday, which will not be influenced by public sector incentives so there would be no substitution effect.

6.4 Off-site Logistics

The future impact of off-site logistics will be driven by the volume of cargo that will go through the Harbour in the future. In 2012 the Harbour Board received £6.9 million in harbour dues on 5.1 million tonnes of cargo, equating to £1.34 per tonne. If it is assumed that this ratio will not change in the future then it is possible to estimate how much cargo will pass through the Harbour in the future based on the value of harbour dues that the Aberdeen Harbour Board expects to receive in the future.

If the new Harbour does not go ahead then in 20 years' time Aberdeen Harbour Board expect to receive around £6 million per year in dues on goods, which implies that around 4.5 million tonnes of cargo will be passing through the Harbour each year. Using the approach described above, it can be estimated that this volume of cargo would support employment for 2,237 people.

If the new harbour does go ahead, it is expected that in 20 years' time dues on goods passing through the Harbour will be worth around £8.5 million. This implies that around 6.3 million tonnes of cargo will pass through the Harbour by year 20, which would support around 3,170 jobs.

Off-site logistics activity is closely linked to on-site harbour operations so it is reasonable to expect that growth amongst the two groups of businesses will be

similar. As discussed in above, if a new harbour is developed but the surrounding roads infrastructure is not improved, on-site businesses will find it more difficult to realise their growth expectations. The effect of this is likely to be that it will take longer for expected levels of growth to occur. This is modelled by assuming that under the basic development scenario, growth in off-site logistics starts five years later than expected.

At present around 57% of logistics employment supported by the Harbour is based off-site. It is assumed that this will not change in the future.

These assumptions are summarised in Table 6-4

Table 6-4 – Oil and gas sector assumptions

Assumption	Reference Case	Basic Development Scenario	Enhanced development scenario
Annual Cargo	4.5 million tonnes	6 million tonnes	6 million tonnes
Total gross logistics jobs (approx.)	2,250	3,150	3,150
Gross off-site logistics jobs (approx.)	1,280	1,810	1,810
Year growth starts	n/a	Year 1	Year 5

Source: BiGGAR Economics economic impact model

6.4.1 Gross to Net Impact

Off-site logistics activity will be closely linked to on-site harbour operations so the same assumptions about displacement and substitution were adopted for this impact as were used for the on-site harbour operations impact. That is 25% at the Scottish level and 10% at the Aberdeen City and Shire level for the Enhanced development scenario and 10% at the Scottish level and 5% at the Aberdeen City and Shire level for the basic development scenario.

6.5 Industrial Development

The starting point for estimating this impact was to estimate how many people are currently employed on the East Tullos Industrial Estate. This was done using Information about the size of each site on the Estate from Aberdeen City Council¹³ and assumptions about the current use of each site, which were obtained by reviewing each site on Google Earth.

Once the size and use of each plot was identified, an estimate of how many people are employed on each plot was made by applying an appropriate employment density assumption, which was obtained from guidance produced by the Homes and Communities Agency¹⁴. Using these assumptions it can be estimated that there are currently between 5,600 and 5,700 people employed on the East Tullos industrial estate.

Several of the sites at East Tullos are currently vacant. Given the existing level of demand for industrial space in Aberdeen it is assumed that all of these sites will be occupied in 20 years' time even if the new harbour at Nigg Bay does not go

¹³ Aberdeen City Council (June 2013), Aberdeen Industrial Areas Guide 2013-14.

¹⁴ Homes and Communities Agency (2010), Employment Densities Guide.

ahead. It is assumed that they will be occupied to similar users and for similar purposes to the rest of the site at present. In this way it can be estimated that approximately 200 more people might be working on the East Tullos industrial estate in 20 years' time even if the new harbour does not go ahead.

It is expected that the new harbour will increase demand for existing industrial space, regardless of whether the surrounding roads infrastructure is improved or not. This is modelled by assuming that the density of existing land use at East Tullos will increase by 10% over the next 20 years.

If improvements are made to the surrounding roads infrastructure however, this will improve the accessibility of the industrial land and make it more valuable to potential occupiers. This is likely to provide an incentive to owners to improve or redevelop their sites. The effect of this is modelled by assuming that new offices, are built on each of the currently vacant sites.

Each of the other three industrial estates (Altens, Altens East and Peterseat) currently have further space available for development. Demand for industrial space in Aberdeen is generally buoyant so it is assumed that all unconstrained space that is available at the other three estates will be developed at some point over the next 20 years. It is however assumed that the density of development will reflect the level of activity at the Harbour.

This is modelled by assuming that employment density on the newly developed land will be similar to the employment density that East Tullos is expected to have in the future in each scenario. In the Enhanced development scenario it is also assumed that the 2.3 hectares of land that is currently constrained is also developed.

The assumptions used to model future industrial development are summarised in Table 6-5.

Table 6-5 – Industrial development assumptions

Reference Case	Basic Development Scenario	Enhanced development scenario
Currently vacant sites at East Tullos are occupied by new warehouses, increasing overall employment density to 108 square metres/job.	Currently vacant sites at East Tullos are occupied by new warehouses and employment density on existing sites increases by 10%. This will increase overall employment density to 99 square metres/job.	Currently vacant sites at East Tullos are occupied by new offices of a similar scale to an existing office on the site and employment density on existing sites increases by 10%. This will increase overall employment density to 80 square metres/job.
All 14.3 hectares of established, unconstrained land supply at Altens, East Altens and Peterseat are developed at a density of 108 /square metres/job.	All 14.3 hectares of established, unconstrained land supply at Altens, East Altens and Peterseat are developed at a density of 99 square metres/job.	All 14.3 hectares of established, unconstrained land supply at Altens, East Altens and Peterseat and 2.3 hectares of constrained supply at Altens East are developed at a density of 80 square metres/job.
Circa. 1,500 new jobs	Circa. 2,200 new jobs	Circa. 4,400 new jobs

Source: BiGGAR Economics economic impact model

6.5.1 Gross to Net Impact

It is possible that some of this additional development will occur at the expense of other industrial estates elsewhere in Aberdeen City and Shire so displacement could be an issue. As demand for industrial land is generally very high in Aberdeen City and Shire however, it is assumed that in the enhanced development scenario this effect will be small (25%). Under the basic development scenario, it is expected that the industrial estates will be less attractive to potential investors than they would be under the enhanced development scenario so displacement is assumed to be lower (10%).

It is also possible that some displacement will occur at the Scottish level but as there are a variety of alternative sites elsewhere in Aberdeen City and Shire it is assumed that there will be very few developers who are unable to find a suitable site anywhere else in the city so this effect will be very small. Under the Enhanced development scenario displacement at the Scottish level is therefore assumed to be 10% and in the basic development scenario it is assumed to be zero.

It is considered unlikely that there will be any displacement at the Scottish level for this type of use and as the development of industrial land will not be influenced by public sector investment decisions there will be no substitution effect.

6.6 Oil and Gas Sector

A key driver of the future economic contribution of Aberdeen Harbour will be the future performance of the Scottish energy sector. When the economic impact of the proposed development was assessed in 2012 the key assumption underpinning this part of the analysis was that in 20 years time employment in the Scottish oil and gas sector is likely to be around 80% of current levels¹⁵.

Since the original analysis was undertaken there has been a dramatic fall in global oil prices, leading some companies in the sector to make cut backs and announce job losses. As a result there has been extensive media debate about the future prospects of the Scottish energy industry with some commentators¹⁶ questioning the future viability of the sector. In this context it was important to scrutinise the assumptions underlying the original analysis to ensure that they remain robust.

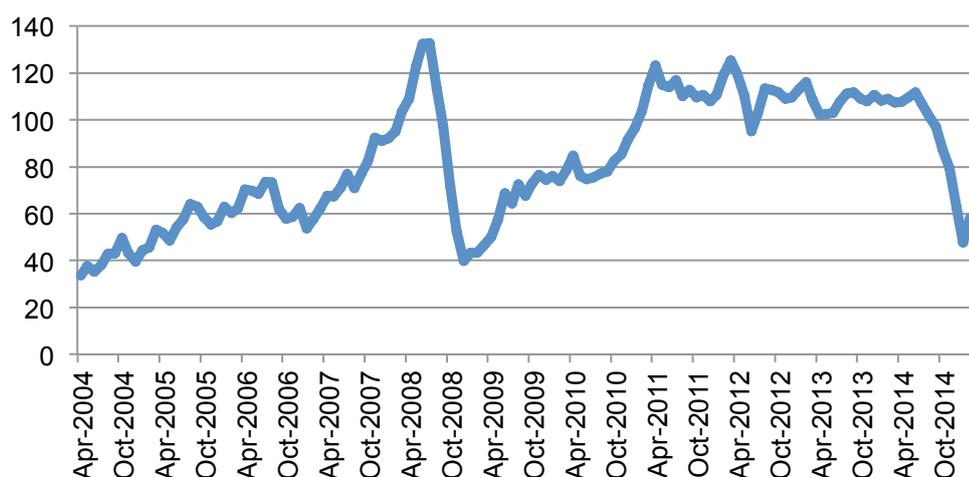
The main assumption underpinning this part of the analysis was based on work undertaken by Professor Alex Kemp on the future level of production in the North Sea. This work was based on oil price scenarios of between \$70 and \$90 per barrel. At the time of writing global oil prices were fluctuating between \$55 - \$60.

Although current prices are somewhat below those used to model the scenarios considered by Professor Kemp, they are of a similar order of magnitude and within the range of recent oil price fluctuations. As Figure 6-1 illustrates, global oil prices have fluctuated significantly over the past 10 years. This means that the price at any particular point in time is not necessarily a reliable predictor of future prices - or levels of activity.

¹⁵ BiGGAR Economics and Optimat (August 2013), Research and Development in the oil and gas sector: economic and exchequer impacts – update report.

¹⁶ Guardian (24th February 2015), North sea oil and gas industry suffers worst losses in decades

Figure 6-1 - Europe Brent Spot Price 2004-2014



Source: Thomson Reuters (15 April 2015)

Instead levels of activity in the North Sea tend to depend on overall levels of production. To date most of the announcements that have been made by companies operating in the North Sea have related to current operations rather than future production. As such there is no reason to conclude that expectations about the long-term future of the sector have changed significantly. For this reason it was concluded that the assumption underpinning this part of the analysis remains robust.

This implies that by year 20 the oil and gas sector will employ a little over 56,000 people in Aberdeen City and Shire. This estimate is however based on the implicit assumption that businesses within the sector will be able to operate efficiently and behave in a way that enables them to maximise their own competitiveness and that of the sector as a whole.

If a new harbour is not developed at Nigg Bay then this could prevent businesses in the sector from behaving in this way, which is likely to have a negative impact on the overall competitiveness of the sector. Businesses will only be able to develop in an optimal way if a new harbour is developed at Nigg Bay, which will also enable future increases in harbour related road traffic within the city centre to be avoided.

As discussed elsewhere in this report, the activities of harbour users are already constrained by the capacity of the Harbour. For example, a number of consultees discussed the possibility of moving dive support vessels and other very large vessels to Nigg (north of Inverness) because there are very few berths in Aberdeen that are deep enough to accommodate them.

Whether the nature of the constraint relates to delays in ships being able to berth at the Harbour, the availability of nearby warehousing space or a lack of quayside facilities, the overall effect is to increase the cost of operations. As most current harbour users provide services to the oil and gas sector, this directly increases the costs of extracting oil and gas. As the costs of operations increase, activities that are at the margin of profitability will become unprofitable and the businesses providing these services will exit the market and the industry will decline.

If a new harbour is not developed at Nigg Bay then the operational costs faced by the oil and gas sector will increase faster than currently expected and the

anticipated decline of the sector will accelerate. This can be modelled by assuming that the 20% decline referred to above will occur within 15 years rather than 20 under the reference case.

If a new harbour is developed at Nigg Bay but improvements are not made to the surrounding roads infrastructure, then the new harbour will not be as efficient as it should be. This will also have an impact on the operational costs of harbour uses.

For example, consultation with existing harbour users suggest that there is currently unfulfilled demand for warehouse space close to the harbour. If a new harbour is developed at Nigg Bay and improvements are made to the surrounding roads infrastructure then this is likely to stimulate investment in nearby industrial estates, which would help to fulfil demand for additional warehouse space. If the surrounding roads infrastructure is not improved however, less development will occur and some of this demand may remain unfulfilled. This would mean that harbour users would need to utilise warehouse space further away from the harbour, which would increase transportation costs and indirectly increase the operational costs of the oil and gas sector.

Although this effect is likely to be small, it would impact on the overall competitiveness of the oil and gas sector and slightly increase its rate of decline. To model this effect it is assumed that in the basic development scenario the decline in the oil and gas sector that is expected in 20 years will instead occur in 17 years' time.

If Nigg Bay is not developed then as well as the industry declining faster, it is also likely that Aberdeen Harbour will gradually become less important to the sector because some of the activity that would have occurred in Aberdeen is likely to be undertaken at other ports, particularly in Norway. Evidence from consultations suggests that this is already occurring to some extent with existing users making use of ports such as Peterhead, Montrose and Dundee, although Aberdeen appeared to be the preference of most users. Due to the significant investment in deep water port facilities on the West coast of Norway it is highly likely that subsea and decommissioning related oil and gas traffic will be diverted there if Nigg Bay is not developed.

This effect can be modelled by including a smaller proportion of oil and gas sector employment in this assessment if a new harbour is not developed or is developed with no improvements to the surrounding infrastructure. For the reference case, 6% of employment is included and for the basic development scenario 8% is included.

The assumptions used to model the future impact of the oil and gas sector are summarised in Table 6-6.

Table 6-6 – Oil and gas sector assumptions

Reference Case	Basic Development Scenario	Enhanced development scenario
Employment reaches 80% of current levels in 15 years' time.	Employment reaches 80% of current levels in 17 years' time.	Employment reaches 80% of current levels in 20 years' time.
6% of the total impact of oil and gas sector employment in Aberdeen City and Shire is included.	8% of the total impact of oil and gas sector employment in Aberdeen City and Shire is included.	10% of the total impact of oil and gas sector employment in Aberdeen City and Shire is included.

Source: BiGGAR Economics economic impact model

6.6.1 Gross to Net Impact

In the context of this impact displacement would occur if the development of Nigg Bay caused the oil and gas sector to undertake activity in Aberdeen that would otherwise have occurred in another Scottish port. Although evidence from consultations suggests that current users do use other Scottish ports, it appears that these decisions are generally driven by lack of capacity at Aberdeen rather than a preference for other Scottish ports. This means that the development of Nigg Bay would not be taking business from other Scottish ports but rather accommodating existing surplus demand.

Evidence from consultations also suggests that there is also currently no shortage of demand at other Scottish ports with any shortfall in the provision of berthing at Aberdeen is likely to be accommodated across the North Sea in Norway. This could have potential long term negative implications for the sector in Scotland and means that displacement is unlikely to occur.

Investment decisions in the oil and gas sector are driven by oil prices and will not be influenced by public sector investment decisions so there will also be no substitution effect.

7 FUTURE ECONOMIC IMPACT

This chapter summarises what the future economic impact of Aberdeen Harbour could be under each of the development scenarios. The impacts presented in this chapter were all estimated using the methodology described in chapter 5 and the assumptions presented in chapter 6.

7.1 Reference Case

In order to estimate the additional economic impact that the Nigg Bay harbour development could generate it is first of all necessary to establish what the economic impact of Aberdeen Harbour might be in the future if the development does not proceed.

This was done using the assumptions described in chapter 6. In this way it was estimated that in 20 years' time, if no new harbour is developed at Nigg Bay, Aberdeen Harbour could be contributing almost £1.1 billion each year to the Scottish economy and supporting around 8,375 jobs. This impact is summarised in Table 7-1.

Table 7-1 – Summary net economic impact in year 20

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£millions)
Aberdeen Harbour Board	160	15	270	23
Other on-site activities	1,765	298	2,110	316
Tourism	1	<0.1	1	<0.1
Total on-site impacts	1,925	313	2,380	339
Off-site logistics	1,335	147	1,540	158
Industrial development	1,615	220	1,935	237
Oil and gas sector	1,925	291	2,515	321
Total of-site impacts	4,880	658	5,995	716
Total	6,800	972	8,375	1,055

Source: BIGGAR Economics economic impact model

7.2 Basic Development Scenario

If a new harbour is developed at Nigg Bay then, in 20 years time, Aberdeen Harbour could be contributing around £1.4 billion GVA in Scotland and supporting around 11,395 jobs. In Aberdeen City and Shire this impact amounts to almost £1.3 billion and around 9,270 jobs. This is summarised in Table 7-2.

Table 7-2 – net economic impact of basic development scenario in year 20

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Aberdeen Harbour Board	185	21	325	31
Other on-site operations	2,540	430	3,000	449
Tourism	30	1	40	1
Total on-site impacts	2,760	452	3,365	481
Off-site logistics	1,865	206	2,120	217
Industrial development	2,275	310	2,810	344
Oil and gas sector	2,370	358	3,100	395
Total off-site impacts	6,515	874	8,030	957
Total	9,270	1,326	11,395	1,438

Source: BiGGAR Economics economic impact model

7.2.1 Net Additional Operational Benefits

The net additional benefits of this scenario – i.e. the total benefit of the basic development scenario less the benefits that would have been realised anyway under the reference case are summarised in Table 7-3. This shows that in 20 years time the development of a new harbour at Nigg Bay could be supporting an additional £383 million GVA/year to the Scottish economy and supporting an additional 3,020 jobs. In Aberdeen City and Shire the impact could amount to £354 million GVA/year and 2,470 jobs.

Table 7-3 – Net GVA impacts of Nigg Bay development

Impact	Jobs		GVA (£ millions)	
	Aberdeen C&S	Scotland	Aberdeen C&S	Scotland
Reference case	6,800	8,375	972	1,055
Basic development scenario	9,270	11,395	1,326	1,438
Net additional benefit	2,470	3,020	354	383

Source: BiGGAR Economics economic impact model

This implies that over the full 20 year development period the new harbour could contribute a total of £5.3 billion additional GVA (in today's prices) to the Scottish economy. It is estimated that almost £5.0 billion of this could be retained within Aberdeen City and Shire.

7.2.2 Temporary Construction Benefits

In addition to the operational benefits described above the development of Nigg Bay would also generate a temporary benefit during the construction phase. It is expected that the construction of the new harbour would require an investment of £300 million (excluding associated infrastructure). Using the methodology set out in section 5.1.4 it was estimated that this expenditure could generate £74 million GVA for the Scottish economy and support 1,215 years of construction related employment. The impact within Aberdeen City and Shire was estimated at £11 million GVA and 175 years of construction employment.

7.3 Enhanced Development Scenario

If a new harbour is developed at Nigg Bay and improvements are also made to the surrounding roads infrastructure then, by year 20, Aberdeen Harbour could be contributing a net benefit of £2.0 billion GVA to the Scottish economy and supporting 15,540 jobs. This is summarised in Table 7-4.

Table 7-4 – Net economic impact of enhanced development scenario in year 20

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (millions)
Aberdeen Harbour Board	185	21	325	31
Other on-site operations	2,500	423	2,855	427
Tourism	45	1	65	2
Total on-site impacts	2,735	445	3,245	460
Off-site logistics	1,840	203	2,030	209
Industrial development	3,900	532	5,195	636
Oil and gas sector	3,880	586	5,070	647
Total off-site impacts	9,620	1,321	12,295	1,492
Total	12,355	1,766	15,540	£1,952

Source: BiGGAR Economics economic impact model

7.3.1 Net Additional Benefits

The net additional benefits of this development scenario – i.e. the total benefit of the enhanced development scenario less the benefits that would have been realised anyway under the reference case are summarised in Table 7-5. This shows that in 20 years time the development of a new harbour at Nigg Bay could generate an additional £897 million GVA/year to the Scottish economy and support an additional 7,165 jobs. In Aberdeen City and Shire the impact could amount to £794 million GVA/year and 5,555 jobs.

Table 7-5 – Net GVA impacts of Nigg Bay development (enhanced development)

Impact	Jobs		GVA (£ millions)	
	Aberdeen C&S	Scotland	Aberdeen C&S	Scotland
Reference case	6,800	8,375	972	1,055
Enhanced development scenario	12,355	15,540	1,766	1,952
Net additional benefit	5,555	7,165	794	897

Source: BiGGAR Economics economic impact model

This implies that over the full 20 year development period the new harbour could contribute a total of £13.5 billion additional GVA (in today's prices) to the Scottish economy. It is estimated that almost £12.0 billion of this could be retained within Aberdeen City and Shire.

7.3.2 Temporary Construction Benefits

In addition to the operational benefits described above the development of Nigg Bay would also generate a temporary benefit during the construction phase as described in section 7.2.2 and a further benefit associated with infrastructure upgrades. It is expected that the infrastructure upgrades would require a further investment of £20 million. Using the methodology set out in section 5.1.4 it was estimated that this expenditure could generate £5 million GVA for the Scottish economy and support 80 years of construction related employment. The impact within Aberdeen City and Shire was estimated at £1 million GVA and 10 years of construction employment.

7.4 Sensitivity Analysis

The future economic impact of Aberdeen Harbour will depend to a large extent on future levels of activity within the oil and gas sector. This assessment is based on the latest available information about future expectations within the sector but this is subject to considerable uncertainty. For this reason it is prudent to consider what the impact of the Harbour might be if future expectations turn out to be overly optimistic.

Activity within the oil and gas sector affects both on and off site operations so to model this scenario adjustments were made to two key assumptions. Firstly it was assumed that in 20 years time employment within the Scottish oil and gas sector might be 50% rather than 80% of 2012 levels. Secondly it was assumed that on-site employment within the Harbour might increase by 20.5% over the next 20 years, rather than 41% as assumed above – i.e. half the increase anticipated.

Applying these assumptions suggests that if a new harbour is developed at Nigg Bay then, in 20 years time, Aberdeen Harbour could be contributing around £1.1 billion GVA in Scotland and supporting around 9,180 jobs. In Aberdeen City and Shire this impact amounts to almost £1.1 billion and around 7,530 jobs. This is summarised in Table 7-2.

Table 7-6 – net economic impact of basic development scenario in year 20

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (£ millions)	Jobs	GVA (£ millions)
Aberdeen Harbour Board	185	21	325	31
Other on-site operations	2,190	371	2,600	389
Tourism	30	1	40	1
Total on-site impacts	2,405	392	2,965	421
Off-site logistics	1,865	206	2,120	217
Industrial development	2,275	310	2,810	344
Oil and gas sector	985	148	1,285	164
Total off-site impacts	5,125	664	6,215	725
Total	7,530	1,057	9,180	1,146

Source: BiGGAR Economics economic impact model

7.4.1 Net Additional Operational Benefits

The net additional benefits of this scenario are summarised in Table 7-3. This shows that in 20 years time, even if levels of activity in the oil and gas sector are much lower than expected, the development of a new harbour at Nigg Bay could still be generating an additional £304 million GVA/year to the Scottish economy and supporting an additional 2,470 jobs. In Aberdeen City and Shire the impact could amount to £277 million GVA/year and 2,005 jobs.

Table 7-7 – Net GVA impacts of Nigg Bay development – less optimistic scenario

Impact	Jobs		GVA (£ millions)	
	Aberdeen C&S	Scotland	Aberdeen C&S	Scotland
Reference case	5,530	6,710	780	842
Basic development scenario	7,530	9,180	1,057	1,146
Net additional benefit	2,005	2,470	277	304

Source: BiGGAR Economics economic impact model

This implies that over the full 20 year development period the new harbour could contribute a total of £4.6 billion additional GVA (in today's prices) to the Scottish economy. It is estimated that almost £4.3 billion of this could be retained within Aberdeen City and Shire.

This implies that, even if levels of activity in the oil and gas sector turn out to be much lower than expected, the proposed development should still generate a very substantial economic impact for the Scottish economy.

8 SUMMARY AND CONCLUSIONS

This section summarises the findings of this report and presents the key conclusions.

8.1 Future Impact of Aberdeen Harbour

If Aberdeen Harbour is not extended and the proposed development at Nigg Bay does not go ahead then it is estimated that in 20 years' time Aberdeen Harbour will be generating £1.1 billion GVA/year for the Scottish economy and supporting around 8,375 jobs. If a new harbour is developed at Nigg Bay then it is expected that the future impact of Aberdeen Harbour would be around £1.4 billion GVA/year and that it could support around 11,395 jobs.

This suggests that if a new harbour is developed at Nigg Bay then in 20 years time it could be generating in an additional economic impact of £383 million GVA/year for the Scottish economy and supporting an additional 3,020 jobs. The impact in Aberdeen City and Shire was estimated at £354 million GVA/year and 2,470 jobs.

If the development of the new harbour is complemented by additional public investment in the surrounding roads infrastructure then this impact could be even greater. If this were to occur then it is estimated that in 20 years time Aberdeen Harbour could be contributing £2.0 billion GVA/year to the Scottish economy and supporting around 15,540 jobs.

This suggests that if a new harbour is developed at Nigg Bay and complementary investment is made in the surrounding roads infrastructure then in 20 years time it could be generating in an additional economic impact of £897 million GVA/year for the Scottish economy and supporting an additional 7,165 jobs. The impact in Aberdeen City and Shire was estimated at £794 million GVA/year and 5,555 jobs.

This implies that the investment stimulated by transport infrastructure investment could be generating £514 million additional GVA for the Scottish economy in 20 years time and supporting 4,145 additional jobs. In Aberdeen City and Shire this impact could amount to £440 million GVA and 3,085 jobs. These impacts are summarised in Table 8-1.

Table 8-1 – net additional operational economic impact of Aberdeen Harbour in year 20

Impact	Aberdeen C&S		Scotland	
	Jobs	GVA (millions)	Jobs	GVA (millions)
Reference case	6,800	£972	8,375	£1,054
Basic development scenario	9,270	£1,326	11,395	£1,438
Enhanced development scenario	12,355	£1,766	15,540	£1,952
Net additional impact of Nigg Harbour expansion	2,470	£354	3,020	£383
Net additional impact of infrastructure investment	3,085	£440	4,145	£514
Net additional impact of enhanced development scenario	5,555	£794	7,165	£897

Source: BiGGAR Economics economic impact model

Using these numbers it was estimated that:

- over 20 years of operations the new harbour could generate £5.3 billion additional GVA for the Scottish economy of which £5.0 billion could be retained within Aberdeen City and Shire; and
- if the new harbour stimulates complementary investment in surrounding infrastructure then over 20 years of operations the development stimulated by this investment could generate a further £8.2 billion GVA for the Scottish economy, of which around £7.0 billion could be retained in Aberdeen City and Shire.

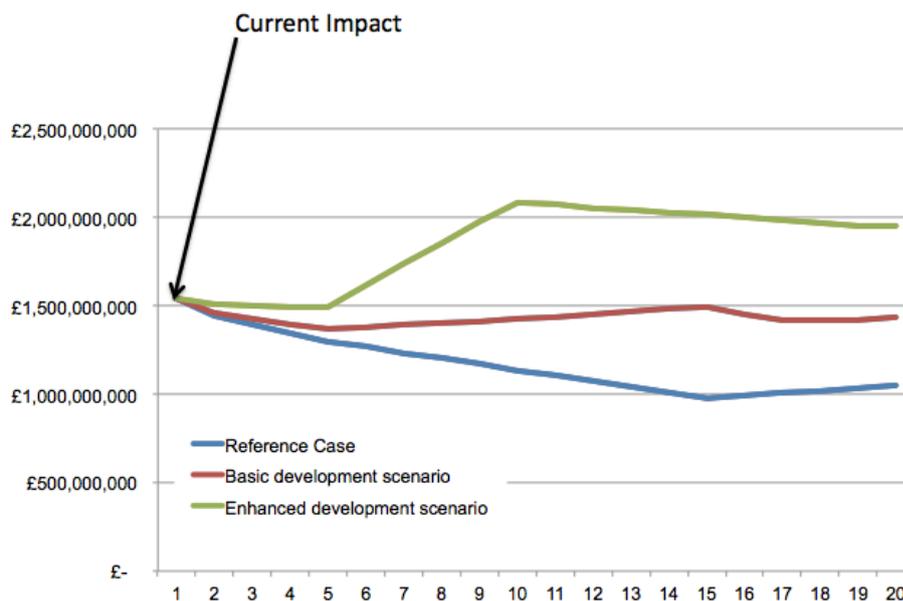
This implies that the total potential additional operational impact of the new harbour could amount to £13.5 billion GVA for the Scottish economy over 20 years, of which around £12.0 billion could be retained in Aberdeen City and Shire.

Importantly the results of a sensitivity analysis confirm that even if expectations about future levels of activity within the oil and gas sector turn out to be much lower than expected over the full 20 year development period the new harbour could still contribute a total of £4.6 billion additional GVA (in today's prices) to the Scottish economy (£4.3 billion in Aberdeen City and Shire).

The difference between the three scenarios is illustrated by the graph below. The blue line in this graph represents the reference case, where the impact of Aberdeen Harbour declines over the next 20 years from its current level, highlighted on the left hand axis. The red line illustrates what the impact of the Harbour would be if a new harbour is created but no improvements are made to the surrounding roads infrastructure. The space between the blue and red lines represents the additional impact that would be generated by this basic development scenario.

The green line illustrates the enhanced development scenario, where a new harbour is developed but the surrounding infrastructure is also improved. The space between the green and blue lines represents the additional impact that would be created by this development scenario.

Figure 8-1 - GVA of Aberdeen Harbour over time – alternative development scenarios



In addition to these operational impacts it was also estimated that the development of Nigg Bay could generate a further £74 million GVA for the Scottish economy and support 1,215 years of construction related employment. It was estimated that £11 million of this GVA and 175 years of the construction related employment would be retained within Aberdeen City and Shire.

If complementary investment is made in surrounding transport infrastructure then this could generate a further £5.0 million GVA for the Scottish economy and support 80 years of construction related employment. It was estimated that £1 million of this GVA and 10 years of the construction related employment would be retained within Aberdeen City and Shire.

9 ACKNOWLEDGEMENTS

The original study upon which this report is based involved an in-depth consultation programme with the individuals listed in Table 9-1.

Table 9-1 - List of consultees

Name	Company
James Argo	Aberdeen City Council
James Bell & Ken Reilly	Aberdeen Harbour Board
Gary Florence	BP Exploration Operating Company Ltd
Fiona Haley	Chevron
Innes Cameron	Clarkson Enship
Tracy Morrison	ConocoPhillips
Michel Milne	Dales Properties (Scotland) Ltd
Dan Taylor	Enviroco
Mike Packer	Euroline Shipping Company Ltd
Michael Henderson & John Goodchild	GAC Shipping (UK) Ltd
Ron Tomal	GB Oils Ltd (Caledonian Oils)
Ian Jack	MI Drilling Fluids UK Ltd
Johan Pretorius	NOV Brandt
Ken Cruickshank	Oil and Gas UK
Mike Porter	Peterson Ltd
Hugh Chisholm	Petrofac Training Services
David Rennie	Scottish Enterprise
Stuart Garret	Serco Northlink Ltd
Jackie Alexander	Shell
Neil Gordon	Subsea UK
Chris Coull	TAQA
Tim Varley	Total