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**SUPERGEN Wind Hub**

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# Economic impact of the proposed Neart Na Gaoithe offshore windfarm

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## Introduction

We have been asked by Mainstream Renewable Power Limited (MRP Ltd) to evaluate the economic impact on the Scottish economy of the proposed Neart Na Gaoithe offshore windfarm project. Specifically, we will focus on the GDP and employment effects of the anticipated size and profile of expenditure for this project.

There are different methodologies that can be employed to arrive at such estimates, and this note sets out one such approach and the key results that follow. As with all such analysis, these figures are estimates and should be viewed as such. In particular, we would note that the development is not currently in place and tendering for the different components has not yet been completed. Therefore, this analysis is based on detailed information on the anticipated supply chain for this project provided to us by MRP Ltd. These data identify anticipated spend in Scotland and in the rest of the UK, and were compiled for the Neart Na Gaoithe supply chain plan which was submitted to the UK Government.

This reflects the most up to date assessment of the expenditure related to this project that has been provided to us. In total,

- the CAPEX for this project could be up to £2bn, of which MRP Ltd anticipate around £510m will be spent in Scotland, this figure does not include development expenditure in Scotland to date.
- for OPEX, it is estimated that this will total around £1.7bn over the 25 year operational life of the development with around £610m of this spent in Scotland.

In what follows, we consider the capital expenditure (CAPEX) and operating expenditure (OPEX) separately, except where we consider the sectoral breakdown of these impacts when we consider the whole project impacts. In addition, we detail the direct, indirect and induced impacts of this spend in Scotland (explained further in the methodology note at the end of this document).

### Headline results:

- It is estimated that -over the lifetime of this project- it will support the equivalent of 0.6% of the total value of Scottish Onshore GDP in 2016
- 13,900 person years of employment will be supported by this project over its lifetime; with 8,000 person-years of employment in the CAPEX phase, and a further 5,900 during the OPEX phase.

## Results

The headline results are contained in the following table.

**Table 1: Economic impact of the NNG Windfarm, 2018 terms<sup>1</sup>**

	CAPEX	OPEX	Total
<i>£million</i>			
Direct GDP	£220.0	£190.2	£410.2
Indirect GDP	£84.7	£56.1	£140.8
Induced GDP <sup>2</sup>	£170.4	£105.9	£276.3
<b>Total</b>	<b>£475.2</b>	<b>£352.2</b>	<b>£827.4</b>
<i>Person-years<sup>3</sup></i>			
Direct Employment	3,700	3,000	6,700
Indirect Employment	1,450	1,150	2,600
Induced Employment	2,850	1,750	4,600
<b>Total</b>	<b>8,000</b>	<b>5,900</b>	<b>13,900</b>

Source: Fraser of Allander

This analysis suggests that the NNG Windfarm project will support around 8,000 person-years of employment in the CAPEX phase and a further 5,900 person-years of employment in the OPEX phase. On the CAPEX side, this is driven in large part by MRP's expectation that the majority of the Jackets and Piles will be procured within Scotland. On the OPEX side, this figure is predicated on around half of the maintenance on the site being procured within Scotland, as detailed in the MRP Ltd NNG Windfarm Supply Chain documentation.

In terms of a contribution to Scottish GDP, this is estimated to generate an additional £475m to the Scottish economy during the CAPEX phase of this project, with a further £352m being contributed to Scottish GDP over the OPEX period of 25 years. In total around half of the total impact on Scottish GDP (£410.2m) is driven by direct spend with the other half (£417.2m) coming through the supply chain and, as a result of additional household wage income, through supporting household consumption.

The impact on GDP in Table 1, further discounted back to 2016, is equivalent to 0.6% of total Scottish onshore<sup>4</sup> GDP in 2016 (with half of this impact occurring during the CAPEX phase of the project). Obviously, in practice, this impact on GDP will occur over the lifetime of the project, but by discounting these impacts back to 2016 terms, we can get an idea about the scale of this impact relative to the size of the Scottish economy in 2016.

**Table 2: GDP impact of the NNG Windfarm, by broad economic sector, 2018 terms<sup>5</sup>**

		Agriculture, forestry and fishing	Construction & Production	Service <sup>6</sup>	Total
<i>£million</i>					
GDP	Direct	£0.0	£294.7	£115.6	£410.2
	Indirect	£0.5	£56.1	£84.2	£140.8
	Induced	£4.5	£31.4	£240.4	£276.3
	<b>Total</b>	<b>£5.0</b>	<b>£382.2</b>	<b>£440.2</b>	<b>£827.4</b>
<i>Person-years<sup>7</sup></i>					
Employment	Direct	0	4,550	2,100	6,700
	Indirect	*	850	1,750	2,600
	Induced	100	400	4,050	4,600
	<b>Total</b>	<b>150</b>	<b>5,800</b>	<b>7,900</b>	<b>13,850</b>

*Source: Fraser of Allander*

By way of further comparison, a recently released report evaluated the economic impact on Scotland of another offshore windfarm project, the Beatrice<sup>8</sup> Offshore Wind Turbine (BOWL) project, although this analysis only considered the impact of CAPEX spending. It found a slightly higher impact on Scottish GDP of the CAPEX spending than we find here at £530m (in 2016 terms), relative to our estimate here of £475.2m (in 2018 terms). However, the jobs in the Scottish economy supported by this project are significantly higher than in the BOWL project evaluation. The CAPEX phase of this project is estimated to support around 8,000 person-years of employment compared to 5,800 in the BOWL project analysis. The differences in economic impact between the two projects stems from their distinct nature and pattern of spend.

The biggest GDP impact of this project (53% of the total) will be in the services sector, with an estimated £440.2m increase in GDP over the lifetime of this project. This project is also estimated to generate an additional £382.2m of GDP in the Construction and Production sector.

There is no direct employment in the 'Agriculture' sector as a result of this project. However, there are small employment impacts through sectoral supply chains. As might be expected, much of the induced effect of this project on GDP, driven by the additional wage income this project will support, is realised within the 'Services' sector while most of the impact of the direct project spend on this project is within the 'Construction & Production' sector.

The economic impacts outlined in this section are indicative of the scale of the impact on the Scottish economy as a result of the anticipated level and nature of spending on the NNG Windfarm project. Of course, until contracts are awarded the level and composition of spend may be subject to change, as may the geographic location of this spend. This analysis is predicated on the information supplied to us by MRP Ltd, which in turn is based on the supply chain plan that they submitted to the UK Government.

### **Methodology**

In this exercise, we use the most recent (2014) input-output tables for Scotland<sup>9</sup>.

Economic input-output tables provide a complete picture of the flows of goods and services (products) in the economy for a given year.

They detail the relationship between producers and consumers and track the interdependencies of industries. They are constructed directly from survey and other data sources and provide the most accurate and comprehensive picture of the national economy that is available.

Given the scale of resources that goes into compiling these tables, they are typically published with a slight lag. Hence, why the 2014 tables are the most recent.

Given that this anticipated spending takes place over the lifetime of this project, we need to take this into account through discounting. This adjusts future spend so that it has a lower 'value' than current spend. We do this using the UK Government Treasury Green Book discount rate of 3.5%<sup>10</sup>.

The detailed data provided to us for this analysis by Mainstream Renewable Power is consistent with the supply chain plan for this project submitted to the UK Government and available here: <https://www.gov.uk/government/publications/contracts-for-difference-supply-chain-plans-for-projects-over-300mw-which-secured-contracts>. Our estimates of the economic impact of the proposed Neart Na Gaoithe offshore windfarm are based on the data provided to us by Mainstream Renewable Power, who also provided a geographic breakdown of where in the UK the expenditure will take place. Our analysis of the impact of this project on the Scottish economy rests upon the accuracy of the spending data for the project provided to us by MRP Ltd.

We match each of the components of this anticipated spend to the sector of the economy where that spend is most likely to take place and using data published by the Scottish Government in their most recent input output tables for 2014, we evaluate the GDP, output and employment supported by that expenditure profile. All future impacts have been discounted and are reported in the same terms as the original anticipated spend (i.e. 2018 terms).

### **A note on different effects**

We can think of three different types of employment/GDP/Output supported by demand for the output of a sector. We explain each of these here in terms of the employment effects, but they parallel for output and GDP.

Firstly there is direct employment, that is, employment in that sector. This can be estimated by taking the number of people working in a particular sector, divided by the output of that sector. This gives an estimate of employment per £m of output of that sector.

Next, one can consider indirect employment supported by the output of that sector. That is, employment in other sectors which are in the supply chain. This is the key reason why we use the input-output data in our analysis as it can capture these sectoral interdependencies in the economy. Any product will be made using a variety of intermediate inputs. The production of these intermediate inputs requires people to work in the sector that produces these inputs supporting more jobs.

Finally, we have the induced employment effects. The production of the output of a sector requires the employment of workers in that sector and in the wider economy to produce inputs. These workers (households) receive income for this work, a portion of which they then, in turn, spend on goods and services across the economy as a whole. This increases demand in the economy and further stimulates employment. The increase in employment as a result of this spending is referred to as the induced effect.

For a discussion of these different effects, see [www.gov.scot/Resource/0048/00484660.pdf](http://www.gov.scot/Resource/0048/00484660.pdf)

In this note, we follow standard practice by referring to GVA as GDP. Technically, it is GVA data that is produced by the Scottish Government, although the two terms are treated as synonymous for most purposes at a sub-national level. GVA is technically GDP at basic prices. GDP at market prices only differs by including taxes and subsidies on products. When we refer to GDP in this note, it is GVA that we are using.

The purposes of this report is to analyse the economic impact of the investment, and while there are wider environmental and climate change issues associated with this project, these are beyond the scope of this work.

The analysis set out above has been conducted by the Fraser of Allander Institute (FAI) at the University of Strathclyde. The FAI is a leading independent academic research centre focussed on the Scottish economy. The report was commissioned by the Mainstream Renewable Power who determined the specific research question to be analysed:

"To assess the economic impact on the Scottish economy of the proposed Nearth na Gaoithe Offshore Windfarm project. This is to be done on the basis of the data in the supply chain plan submitted to DECC (now BEIS) and will focus on the impact in terms of GDP and employment. These impacts will be broken down by CAPEX and OPEX, and will quantify the direct, indirect and induced effects (for GDP, output and employment) of this spend."

The technical analysis, methodology and writing of the results was undertaken independently by the FAI.

The FAI is committed to informing and encouraging public debate through the provision of the highest quality analytical advice and analysis. We therefore are happy to respond to requests for factual advice and analysis. Any technical errors or omissions are those of the FAI.

1 Note totals may differ from the sum of the elements in the table due to rounding.

2 The different effects (direct/indirect/induced) are explained in more detail at the end of this note.

3 Numbers rounded to nearest 50.

4 i.e. excluding any activity in the UK Continental shelf.

5 Note totals may differ from the sum of the elements in the table due to rounding.

6 Within the Services sector the largest impacts are on the Financial & Insurance Activities; Real Estate Activities; Professional, Scientific, Administrative & Support Services.

7 Numbers rounded to nearest 50, this means that totals may not match exactly between Table 1 and Table

2. The entry marked with a \* is non-zero but less than 25 so is rounded down to zero.

8 [http://sse.com/media/475202/Beatrice-Socio-economic-impact-report-v2\\_BMF\\_FINAL\\_200717.pdf](http://sse.com/media/475202/Beatrice-Socio-economic-impact-report-v2_BMF_FINAL_200717.pdf)

9 <http://www.gov.scot/Topics/Statistics/Browse/Economy/Input-Output>

10 <https://www.gov.uk/government/publications/green-book-supplementary-guidance-discounting>