Nuclear power stations: potential to contribute local economic benefits

Summary

In 2010 eight locations were selected by the UK Government in October 2010 as being potentially suitable for the development of new nuclear power stations. The purpose of this paper is to assess each of the shortlisted locations and identify the ones where a decision to build and operate a new power station has the greatest potential to make a contribution towards ‘levelling up’ local areas that are relatively disadvantaged in terms of economic and labour market performance.

The approach taken involves the use of 12 indicators of socio-economic performance using regularly updated data available at a local authority level from the Office for National Statistics. The indicators cover aspects such as demographic characteristics and change, availability of jobs, labour market activity, workforce characteristics, structure of the employment base, earnings, annual contributions to wealth generation and levels of new business formation.

The specific criteria chosen are as follows:

• Proportion of the population of working age	• Average annual rate of job growth since 2001
• Trend in working age population since	• Business start-up rate per capita
• Employment rate	• Proportion of employment in Construction
• Spare capacity in local labour force	• Proportion of employment in the Hospitality sector
• Proportion of workforce in relevant occupations	• Full time earnings of residents
• Job density	• Gross Value Added per capita

The reasons these criteria were chosen includes the following:

- they are widely used indicators of comparative economic and demographic competitiveness and performance
- they are available for all local authorities in Great Britain
- the datasets are updated regularly but also are available for the last 20 years or so, meaning that while they provide a good indication of current levels of performance it is also possible to obtain insights into cyclical and long-term trends.

An overall assessment of rankings by location can be obtained by aggregating the ranking for each individual indicator and generating an overall average score across all indicators.

The overall rankings across all 12 indicators are summarised in the table below, with Hartlepool (average score 2.75) emerging as the location that would potentially benefit the most from a decision to invest, followed by Wylfa on Anglesey (3.67).

On the other hand, Sizewell in East Suffolk (5.58) occupies the second lowest of the ranking positions.

Overall rankings

Site	Local authority area	Average score	Ranking
Hartlepool	Hartlepool	2.75	1
Wylfa	Anglesey	3.67	2
Heysham	Lancaster	3.75	3
Moorside	Copeland	3.83	4
Bradwell	Maldon	5.17	5
Oldbury	South Gloucestershire	5.33	6
Sizewell	East Suffolk	5.58	7
Hinkley Point	Somerset West & Taunton	5.75	8

Introduction

Eight locations were selected by the UK Government in October 2010 as potentially suitable as locations for the next generation of nuclear power stations.[1] Of these locations, development of a new power station is currently underway at one site: at Hinkley Point in West Somerset.

Large infrastructure projects have the potential to create significant levels of local and regional economic impacts, both directly and also indirectly through the stimulation of supply chains and through the spending power of people employed by the project, especially during the construction phase.

However, the ability of a large infrastructure project to contribute positively to the area that hosts it depends on a number of variables, such as:

- the ability to provide a local workforce without the need for extended commuting from other population centres;
- the size and structure of the local business base; and
- the presence of industries that could be either positively or adversely affected by the construction and/or operation of the proposed infrastructure project.

The purpose of this paper is to assess each of the shortlisted locations and identify the ones where a decision to build and operate a new power station has the greatest potential to make a contribution towards enhancing the economic performance of areas that are relatively disadvantaged in terms of economic and labour market performance.

Locations

In this paper we have examined the eight locations nominated by Government as being potentially suited to host a new nuclear power station. These locations are as follows:

Site Location	Local authority area	Region/country
Moorside	Copeland	North West
Heysham	Lancaster	North West
Hartlepool	Hartlepool	North East
Wylfa	Anglesey	Wales
Sizewell	East Suffolk	East of England
Bradwell	Maldon	East of England
Oldbury	South Gloucestershire	South West
Hinkley Point	Somerset West & Taunton	South West

Indicators

To assess these locations, we have identified 12 indicators of socio-economic performance that provide a basis of assessing the extent to which each host area could accommodate a development. The criteria are as follows:

Indicator	Explanation	Source
Proportion of resident population that is working age (2018)	The ONS continue to define working age population as 16-64. A higher proportion of population of working age is an indicator of potential workforce availability.	ONS Population estimates
Change in working age population (2001-2018)	As above. The long term (2001-2018) trend in working age population is an indicator of the availability of employment opportunity, with areas of restricted	ONS Population estimates

[1] https://www.bbc.co.uk/news/uk-politics-11564152

	opportunity tending to see out-migration of younger age groups.	
Employment rate (Jan-Dec 2019)	The employment rate is a measure of the proportion of the working age population either in employment or who are self-employed. A lower than average employment rate is an indicator of restricted economic opportunity.	ONS Annual population survey
Spare capacity in local labour force as a proportion of the working age population (2018)	This is the sum of two indicators as a proportion of the working age population: (1) the number of working age people who are unemployed (according to the International Labour Organisation definition, i.e. currently without a job but ready and available for work) plus (2) the number of currently economically inactive people (i.e. not in employment and not actively seeking work) who report via regular surveys say they would like a job.	ONS Annual population survey
Proportion of workforce in relevant occupations (2019)	The proportion of the resident population that are currently working in managerial, professional, associate professional, skilled trades or who are process/plant/machinery operatives.	ONS Annual population survey
Job density (2018)	The ratio of the total number of jobs (employees and self-employed) located in the area divided by the resident working age population (16-64) of the area.	ONS jobs density data series
Average annual rate of job growth, 2001-2018	The long term (2001-2018) annual change in the toal number of jobs located in the area (employee jobs plus self-employed jobs)	ONS jobs density data series
Business start-up rate (per 10,000 working age population) 2018	The latest annual number of new enterprises established in the area divided by the working age population of the area.	ONS Business demography data series
Proportion of employment in the Construction sector (2019)	The proportion of the jobs located in the area that are found in the Construction and Engineering sector. This is an indicator of the current importance of the sector to the local economy compared to the national average.	ONS Business register and employment survey
Proportion of employment in the Hospitality sector (2019)	The proportion of the jobs located in the area that are found in the Accommodation and Food & drink services sectors.	ONS Business register and employment survey
Full time earnings of residents as proportion of GB average (2019)	A measure of the business structure and levels of productivity in the local economy	ONS Annual survey of hours and earnings
Gross Value Added per capita (2015)	A measure of the annual value of economic activity in the area adjusted by the resident population of the area.	ONS GVA by local authority in the UK

Data for each of these indicators was gathered for each of the local authority areas within which the eight potential sites are located. In each case the most up-to-date data was used: in most cases the most recent available data is for either 2018 or 2019, but in the case of GVA the latest localised data currently is from 2015. Where long term trend data is used the starting point for the trend analysis is the earliest date for which comparable data is available for all authorities. In the event this date is either year 2000 or 2001: the result of local government structuring affecting two the areas (i.e. East Sussex and Somerset West & Taunton) has resulted in data pre-dating 2000/2001 not being readily available for all areas.

Ranking locations

The purpose of collecting data for the 12 indicators is to rank each of the eight potential site locations on the basis of that indicator. The majority of the indicators chosen operate on the demand side of the labour market and are essentially ‘needs-based’. For these, the rankings are undertaken from the perspective that locations that have the weakest level of outturn on any individual indicator will be ranked highly as a potential location. For example:

- Locations that possess a relatively low employment rate may suffer from restricted job opportunities compared to other area. The benefit of a large infrastructure investment in these areas would be to create additional employment opportunities – both directly and indirectly – during both the construction and operational phases of a scheme.
- Similarly, areas with low rates of new business formation are exhibiting restricted business and job opportunities. A major new investment in such an area would create new business and enterprise opportunities or compensate for the lack of local enterprise dynamism by creating replacement job opportunities that otherwise would be expected to originate from new business formation and early stage growth.

However, several of the indicators operate on the supply side of the labour market and assess the potential of the local labour market to supply sufficient quantities of appropriately skilled workers to the construction or operational stages of the project. For example, areas with a higher proportion of working age population or local residents with relevant skills would score more highly on these indicators than areas with relatively low levels of working age population or a lower proportion of the workforce with relevant skills or working in the most relevant occupations.

Results

The results of the assessment for the 12 indicators is described in the section that follows.

Working age population (2018)

Despite changes to both normal school-leaving age and state pension age, the ONS continues to use the 16-64 age range to define working age population in the UK's official labour market statistics. The table below provides details of the most recent data for working age population for each of the seven candidate locations plus Hinkley Point site currently under construction.

Working age population (2018), proportion of normally resident population

Site	Local authority area	Working age population (%)	Ranking
Heysham	Lancaster	63.3%	1
Oldbury	South Gloucestershire	62.6%	2
Hartlepool	Hartlepool	61.6%	3
Moorside	Copeland	60.8%	4
Bradwell	Maldon	58.7%	5
Hinkley Point	Somerset West & Taunton	57.4%	6
Wylfa	Anglesey	57.0%	7
Sizewell	East Suffolk	56.0%	8

Source: ONS Population estimates

Lancaster has the greatest proportion of its population being of working age (63.3%). This compares to a GB average of 62.7% (2018). On the other hand, East Suffolk has only 56.0% of its population being of working age, which is nearly six percentage points lower than the national average and is the lowest proportion of any of the eight locations considered here.

Trend in working age population since 2001

Nationally, there has been annual growth in the working age population of 0.6% per annum over the 2001-2018 period. Of the eight areas under consideration here, only South Gloucestershire can match the overall national rate of increase. The lowest growth has been in Copeland, where the average annual rate of change has been a decline of 0.4% per annum followed by Anglesey (-0.3% p.a.). East Suffolk is a mid-ranking performer in this respect with average annual growth of 0.2%.

A decline in working age population reflects changes in population age structure. In many rural or semi-urban areas with limited job opportunities there may be a drift of young people away from the area, usually linked to relatively limited education and/or employment opportunities. In the long term, areas with below average growth in working population may become less competitive due to a shortage of skills and increasing difficulties of employers to recruit and retain the labour they need.

The rankings in the table below reflect a needs-based assessment, with the areas suffering the lowest rate of increase judged to be most in need of additional stimulation from large scale infrastructure projects. Copeland is the highest ranked area on this basis, followed by Anglesey.

Annual change in working age population (2001-2018)

Site	Local authority area	Annual growth in working age population (%)	Ranking
Moorside	Copeland	-0.4%	1
Wylfa	Anglesey	-0.3%	2
Bradwell	Maldon	0.0%	3
Hartlepool	Hartlepool	0.1%	4
Sizewell	East Suffolk	0.2%	5
Hinkley Point	Somerset West & Taunton	0.3%	6
Heysham	Lancaster	0.4%	7
Oldbury	South Gloucestershire	0.6%	8

Source: ONS Population estimates

Employment rate

The employment rate is an internationally used statistic of labour market competitiveness. It reflects the number of people in employment (employees and self-employed) as a proportion of the working age population.

Nationally, the average employment rate between January and December 2019 was 75.8%. Across the eight areas considered here there is a very wide range of data for the same period, with the highest rate (85.9%) found in Maldon and the lowest (66.2%) found in Lancaster. The low rate for Lancaster partly reflects the presence there of a large university. The next lowest rate is the 67.6% found in Hartlepool. The employment rate for East Suffolk (78.7%) is the third highest among the eight locations assessed here.

Employment rate (January-December 2019)

Site	Local authority area	Employment rate (%)	Ranking
Heysham	Lancaster	66.2%	1
Hartlepool	Hartlepool	67.6%	2
Moorside	Copeland	70.7%	3
Wylfa	Anglesey	77.1%	4
Hinkley Point	Somerset West & Taunton	77.3%	5
Sizewell	East Suffolk	78.7%	6
Oldbury	South Gloucestershire	82.2%	7
Bradwell	Maldon	85.9%	8

Source: ONS Annual Population survey

Readily available labour pool

One measure of spare capacity in a local economy is the number of individuals who are unemployed – in the sense that they do not have a job but are actively seeking and are available for work. Another measure is the proportion of the economically inactive who say (via survey responses) that they would like a job if one was available. (The existence of people who are inactive but say they would take a job if one were available is explained by the so-called discouragement effect – people who stop seeking work because they consider that suitable jobs are not currently available).

Local data on the current extent of these two sources of spare capacity data in local labour markets was obtained from the ONS via the NOMIS data portal. The table below presents the sum of these measures as a proportion of the working age population of each area.

Model based unemployment plus Economically inactive seeking work (January-December 2019)

Site	Local authority area	Available Labour pool as a % of working age population	Ranking
Hartlepool	Hartlepool	10.28%	1
Heysham	Lancaster	8.00%	2
Wylfa	Anglesey	7.02%	3
Moorside	Copeland	6.97%	4
Oldbury	South Gloucestershire	6.61%	5
Sizewell	East Suffolk	6.40%	6
Hinkley Point	Somerset West & Taunton	6.11%	7
Bradwell	Maldon	4.87%	8

Source: ONS Annual Population survey

As can be seen, the largest available labour pool in proportionate terms is in Hartlepool, followed by Lancaster.

Proportion of workforce in relevant occupations

This indicator focuses on the proportion of the normally resident population of each area working in managerial, professional, associate professional, skilled trades or who are process/plant/machinery operatives.

The national (GB) average for this statistic is 63.8%. As can be seen in the table below, the highest proportion found amongst the eight areas that is the focus of this analysis is the 66.1% found in Copeland, followed by 64.8% found in South Gloucestershire. The lowest proportion is the 58.9% found in Lancaster. East Suffolk (64.2%) has the third highest proportion of the locations considered here.

Occupational structure (January-December 2019)

Site	Local authority area	Proportion of resident workforce in managerial, professional, skilled trades or who are plant/machinery operatives	Ranking
Moorside	Copeland	66.1%	1
Oldbury	South Gloucestershire	64.8%	2
Sizewell	East Suffolk	64.2%	3
Wylfa	Anglesey	62.2%	4
Bradwell	Maldon	60.4%	5
Hinkley Point	Somerset West & Taunton	59.6%	6
Hartlepool	Hartlepool	59.2%	7
Heysham	Lancaster	58.9%	8

Source: ONS Annual Population survey

Job density

The job density ratio reflects the number of jobs found in an area (employee jobs plus self-employed jobs) as a proportion of the working age population of an area. Nationally, the overall job-density ratio is 0.86. This reflects the fact that not all working age people are economically activity, but also that some people have more than one job. Areas with lower than average job density tend to see net outward flows of workers who commute to other nearby places to work.

Of the eight areas considered here, the place with the highest ratio is South Gloucestershire. This suggests that the local labour market is already quite intensively employed and that there are significant flows of workers from other areas. One the other hand, the ratio for Hartlepool is only 0.57, suggesting that significant numbers of residents of Hartlepool are commuting to other places to work. The ratio for East Suffolk is 0.83, slightly lower than the overall national total.

On this basis, there is likely to be more potential for reversing commuting flows in Hartlepool compared to South Gloucestershire, so from the point of view of investment location decision-making the Hartlepool location would be the best location on this criterion, with East Suffolk ranked fifth.

Job density ratio (2018)

Site	Local authority area	Ratio of jobs to working age population	Ranking
Hartlepool	Hartlepool	0.57	1
Wylfa	Anglesey	0.70	=2
Heysham	Lancaster	0.70	=2
Bradwell	Maldon	0.73	4
Sizewell	East Suffolk	0.83	5
Moorside	Copeland	0.92	6
Hinkley Point	Somerset West & Taunton	0.93	7
Oldbury	South Gloucestershire	0.95	8

Source: ONS Annual Population survey

Trend job growth (2000-2018)

Historic data used to estimate the jobs density ratio can also be used to estimate the long-term job growth trend for each area. Given re-organisations affecting some of the local authority areas, the furthest back that consistently defined data is available is the period 2000-2018.

For Great Britain as a whole, the average annual growth rate for workforce jobs over this period has been 0.9%. Among the eight areas we are focusing on here, the strongest growth has been found in South Gloucestershire where the average annual growth (1.7% p.a.) is nearly double the national average. By far the weakest performance is found in Hartlepool, where the annual growth rate over the same period is actually an average fall of 0.5% per annum.

For East Suffolk the average annual rate has been 1.2%, indicating that the area outperforms the national average when it comes to generating jobs.

The area that would be most in need of an employment boost from a major infrastructure project would therefore be Hartlepool, followed by West Somerset and Lancaster.

Workforce jobs trend (2000-2018)

Site	Local authority area	Annual growth in workforce jobs (2000-2018)	Ranking
Hartlepool	Hartlepool	-0.5%	1
Hinkley Point	Somerset West & Taunton	0.6%	2
Heysham	Lancaster	0.7%	3
Bradwell	Maldon	0.9%	4
Sizewell	East Suffolk	1.2%	5
Moorside	Copeland	1.3%	6
Wylfa	Anglesey	1.6%	7
Oldbury	South Gloucestershire	1.7%	8

Source: ONS Workforce Jobs

Entrepreneurship

A frequently used measure of local economic competitiveness is the annual rate of new enterprise formation as a proportion of the working age population. A widely used statistic measuring relative rates of enterprise formation is the annual number of new starts per 10,000 working age population.

Across Great Britain the overall average annual rate (for 2018) is 92.6 new enterprises created per 10,000 working age population. The national average is influenced by the very high levels of new business formation occurring in London.

Amongst the eight areas that is the focus of this report, the only area that exceeds the national average is Maldon (95.2). The other areas range from 78.1 (Somerset West & Taunton) to 50.1 (Anglesey). In the case of East Suffolk, the area has the third highest annual rate of new enterprise formation, suggesting relatively buoyant economic performance.

The area with the largest native entrepreneurial deficit that would be most in need of an employment boost from a major infrastructure project would therefore be Anglesey, followed by Hartlepool and Copeland.

Entrepreneurism (2018)

Site	Local authority area	Annual new business registrations per 10,000 working age population (2018)	Ranking
Wylfa	Anglesey	50.1	1
Hartlepool	Hartlepool	52.3	2
Moorside	Copeland	52.9	3
Heysham	Lancaster	57.5	4
Oldbury	South Gloucestershire	65.3	5
Sizewell	East Suffolk	66.6	6
Hinkley Point	Somerset West & Taunton	78.1	7
Bradwell	Maldon	95.2	8

Source: ONS Business demography datasets; ONS Population estimates

Proportion of employment in Construction and Civil Engineering

Another useful indicator is the proportion of the jobs located in the area that are found in the Construction and Engineering sector. This is an indicator of the current importance of the sector to the local economy compared to the national average, which in turn is a proxy for the capacity of the local economy to respond positively to the supply chain opportunities created during the extended construction phase of a major infrastructure project.

Nationally, the average proportion of the workforce accounted for by the Construction and Civil Engineering sector is 4.7% (2018). In the eight areas we are considering the proportion ranges from a low of 4.1% (Lancaster) to a maximum of 9.5% (Maldon). East Suffolk (4.5%) possesses the second lowest proportion, suggesting that the area is relatively weakly placed to benefit from supply side opportunities during the development phase of a large infrastructure project.

Relative importance of the Construction and Civil Engineering sector (2018)

Site	Local authority area	Proportion of employment accounted for by Construction and Civil Engineering (2018)	Ranking
Bradwell	Maldon	9.5%	1
Moorside	Copeland	6.8%	2
Oldbury	South Gloucestershire	6.6%	3
Hartlepool	Hartlepool	6.0%	=4
Wylfa	Anglesey	6.0%	=4
Hinkley Point	Somerset West & Taunton	5.1%	6
Sizewell	East Suffolk	4.5%	7
Heysham	Lancaster	4.1%	8

Source: ONS Business register and employment survey

Proportion of employment in the Hospitality sector

Another useful indicator is the proportion of the jobs located in the area that are found in the Accommodation and Food & drink services sectors. This is used as an indicator of the potential displacement of hospitality sector activity during the construction phase of the development. Across Great Britain, the overall average contribution to the workforce made by the Accommodation & food services sector is 7.6%. The proportions of employment accounted for by this sector in the eight areas considered here range from a low of 6.1% (Copeland) to a high of 14.3% (Anglesey). In the case of East Suffolk, the proportion is 10.1%, significantly higher than the national average and the third highest proportion in the group of areas considered here.

Relative importance of the Accommodation, Food & drinks services sector (2018)

Site	Local authority area	Proportion of employment accounted for by Accommodation + Food & drink services (2018)	Ranking
Moorside	Copeland	6.1%	1
Oldbury	South Gloucestershire	6.6%	2
Hartlepool	Hartlepool	7.8%	3
Heysham	Lancaster	8.2%	4
Bradwell	Maldon	9.5%	5
Sizewell	East Suffolk	10.1%	6
Hinkley Point	Somerset West & Taunton	10.3%	7
Wylfa	Anglesey	14.3%	8

Source: ONS Business register and employment survey

Average earnings of full-time workers (by place of residence)

Average earnings earned by residents reflects both the local employment and other income-generating opportunities available locally as well as those available within a commutable distance. The dataset used here covers gross weekly earnings for full time employees as a proportion of the national (GB) average.

From the perspective of 'levelling up', the strongest contribution to national wellbeing would be to create additional income generating opportunities in the areas with the lowest average weekly earnings. On this indicator Anglesey – where average earnings for full time workers is only 91.1% of the GB average – would be the best location for new investment whilst Copeland (116.9%) would be the least advantageous location.

Average weekly earnings (full time workers) (2018)

Site	Local authority area	Average weekly earnings by place of residence (as a proportion of the GB average)	Ranking
Wylfa	Anglesey	91.1%	1
Heysham	Lancaster	93.0%	2
Hartlepool	Hartlepool	93.1%	3
Hinkley Point	Somerset West & Taunton	93.5%	4
Sizewell	East Suffolk	96.1%	5
Oldbury	South Gloucestershire	102.0%	6
Bradwell	Maldon	115.0%	7
Moorside	Copeland	116.9%	8

Source: ONS Annual survey of hours and earnings

Gross Value Added per capita

Gross Value Added (GVA) is a widely used statistic reflecting the contribution that sub-national areas, specific industries and individual companies make towards Gross National Product. Areas with higher than average levels of GVA per capita are thereby the most prosperous areas of the country.

Data on levels of GVA per local authority area are produced by the ONS but lag the other statistics used in the report: the data used here is for year 2015.

On the basis that a frequently-stated Government objective is to facilitate economic 're-balancing' or 'levelling up' between areas with differing levels of prosperity, the best approach would be to facilitate the creation of additional wealth-generating activities in areas with lower than average levels of GVA per capita. On this indicator Anglesey would be the best location to encourage or facilitate new investment whilst South Gloucestershire would be the least advantageous location. With respect to GVA per capita East Suffolk lies in the middle of the table with the fourth highest proportion overall (84.5%).

GVA per capita (2015)

Site	Local authority area	GVA per capita (as a proportion of the GB average)	Ranking
Wylfa	Anglesey	52.4%	1
Hartlepool	Hartlepool	61.6%	2
Heysham	Lancaster	74.4%	3
Bradwell	Maldon	75.4%	4
Sizewell	East Suffolk	84.5%	5
Hinkley Point	Somerset West & Taunton	85.5%	6
Moorside	Copeland	95.6%	7
Oldbury	South Gloucestershire	123.7%	8

Source: ONS Regional Gross Value Added (Income Approach) by Local Authority in the UK

Conclusion: overall ranking of locations

An overall assessment of rankings by location can be obtained by aggregating the ranking for each individual indicator and generating an overall average score across all indicators. It would also be possible to create alternative rankings by attaching different weights to the indicators, but the approach taken here is to treat each indicator equally.

The overall rankings across all 12 indicators are summarised in the table below, with Hartlepool (average score 2.75) emerging as the location that would potentially benefit the most from a decision to invest in a major infrastructure project, followed by Wylfa on Anglesey. The third highest rank site is Heysham in Lancashire, followed by Moorside in Copeland.

Overall rankings

Site	Local authority area	Average score	Ranking
Hartlepool	Hartlepool	2.75	1
Wylfa	Anglesey	3.67	2
Heysham	Lancaster	3.75	3
Moorside	Copeland	3.83	4
Bradwell	Maldon	5.17	5
Oldbury	South Gloucestershire	5.33	6
Sizewell	East Suffolk	5.58	7
Hinkley Point	Somerset West & Taunton	5.75	8

On the other hand, East Suffolk occupies the second lowest of the ranking positions with only Somerset West & Taunton possessing a lower aggregate score.