

Keadby wind farm

Sustainability impact report



About SSE

SSE's core purpose is to provide the energy people need in a reliable and sustainable way.

SSE is the UK's broadest-based energy company, involved in the generation, transmission, distribution and supply of electricity; in the production, storage, distribution and supply of gas; and in other energy services. As the UK's largest producer of renewable energy and one of the largest developers, SSE has a responsibility to carry out renewable project construction, operation and maintenance in a sustainable way.

SSE works hard to make sure the lights stay on, energy costs are affordable, the best service is provided to customers, and that any negative environmental impacts are kept to a minimum. To achieve environmental, social and economic well-being for current and future generations, it is SSE's aim to always make decisions and choose actions which are ethical, responsible and balanced.

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Introduction

This report evaluates the economic, social and environmental impacts in the UK which result from constructing and operating England's largest onshore wind farm, Keadby.

The wind farm is located west of Scunthorpe in North Lincolnshire and became operational in summer 2014. It generates renewable energy from 34 turbines, with a total installed generation capacity of 68MW.

Enough energy to power
38,000
homes every year

Each year Keadby wind farm has the potential to provide enough electricity to power at least 38,000 homes¹. This means that each year Keadby wind farm can provide electricity for all the homes in nearby Scunthorpe.

£98.8m
Total project spend

Large construction projects can have significant sustainability impacts at local, regional and national levels. In order to maximise positive sustainability impacts whilst minimising any potential adverse outcomes, SSE seeks to make increasingly transparent the economic, social and environmental impacts that arise from its business activities. This Sustainability Impact Report for Keadby wind farm is one way in which impacts are reported to local and national stakeholders.



Environmental impacts

SSE aspires to be a responsible developer and a responsible operator, and this means aiming to protect the global and local environment.

Wind farm manufacture and construction has both positive and negative impacts on the local and global environment, but efforts taken to minimise environmental damage and reduce the volume of carbon emitted into the atmosphere should ensure that the maximum positive environmental impact is achieved.

CO₂ impact

Over its lifetime, Keadby wind farm will have a net positive impact on reducing the overall volume of carbon released into the atmosphere per kilowatt (kW) of electricity produced, therefore contributing to meeting the UK's carbon emission reduction targets.

A significant amount of energy is required to construct a wind farm. This includes, for example, the manufacture of turbines, the construction of the substations, the transportation of parts, the building of new tracks and the widening of roads. The renewable energy generated by Keadby therefore initially contributes to displacing the CO₂ that has been released during the manufacture and construction of the wind farm.

After this period, the energy produced by Keadby wind farm contributes to displacing the CO₂ that would otherwise be released from the production of energy using other forms of energy generation in the UK². Over the 25 year operational life of Keadby wind farm, the clean energy generated is expected to displace 718,800 equivalent tonnes of CO₂ from being emitted into the atmosphere in addition to offsetting the emissions from wind farm construction.

The wind farm is expected to displace

718,800^T

of CO₂ throughout its lifetime

²This is the current average volume of CO₂ used to generate each kW of energy in the UK, and incorporates relative proportions of high emitting sources such as power stations which burn fossil fuels, as well as other sources of energy generation such as nuclear, renewables and biomass, to calculate this final figure. For more information please refer to the Department for Environment, Food and Rural Affairs' online resources.



Local biodiversity

All wind farms built within the UK must undertake extensive environmental research and planning as part of the Environmental Impact Assessment. This is done to minimise any potential adverse environmental outcomes which may be caused by the construction and operation of the wind farm.

At all of SSE's wind farms, work on site is monitored by a qualified ecologist to ensure that best practice is implemented and disturbance for all wildlife is minimal.

During the construction of Keadby wind farm, several environmental and conservation issues arose and were subsequently managed by the Ecological Clerk of Works. For example, sand martins were found nesting in a sand stockpile and a pied wagtail was found nesting in a skip.

As a result, ecological exclusion zones were put in place and the nests were monitored regularly, with the exclusion zones only removed once the chicks had all fledged the nest. Additionally, to protect the water voles on site, a license from Natural England was obtained so that the animals could be moved from

construction areas before works started, and badger fences were also constructed to protect the local badger population.

As part of the Conservation Management Plan, a Marsh Harrier Enhancement Area was established. Ten hectares of land were taken out of agricultural production south of the main wind farm area. The area was turned into a habitat which would be more suitable for marsh harrier breeding and feeding: fields were planted with grass seed mix and new ditches were created and planted with reed beds. Two wildlife ponds were also constructed on site as part of the Conservation Management Plan. These were to provide habitat and benefits to amphibians, water voles and aquatic invertebrates, with secondary benefits for the species which prey on these animals.

Environmental monitoring also assessed the effect of wind farm construction on a wide range of other key environmental variables. The environmental and ecological impact of SSE's construction projects are always of the highest importance, and so these mitigation and monitoring efforts ensure that the negative impacts on each of these variables are as small as feasibly possible.

Keadby's Environmental Advisor continues to monitor the ecological impacts of the wind farm throughout the operational phase, ensuring that any potential negative environmental outcomes are minimised.

Economic impacts

A sustainable outcome is unlikely to be achieved without commitment to generating economic benefits, both in the long and short term.

As a responsible investor, operator and employer, SSE is committed to sharing economic impacts, where possible generating employment close to operational sites and always paying a fair share of taxes.



Calculating economic impacts

Jobs and wealth

To assess the impact of localised economic activity in different industrial sectors on the overall economy at either a regional or national level, it is standard within the public and private sectors in the UK to use the "Input-Output model".

The model generates economic impact indicators – the Gross Value Added (GVA) to the economy and the number of jobs supported within the economy. GVA measures the post-tax profit and wage contribution to the economy from an industry, business, or project at a national or regional level. The sum of GVA from all of these areas equates to the total economic output of a country: the country's Gross Domestic Product (GDP).

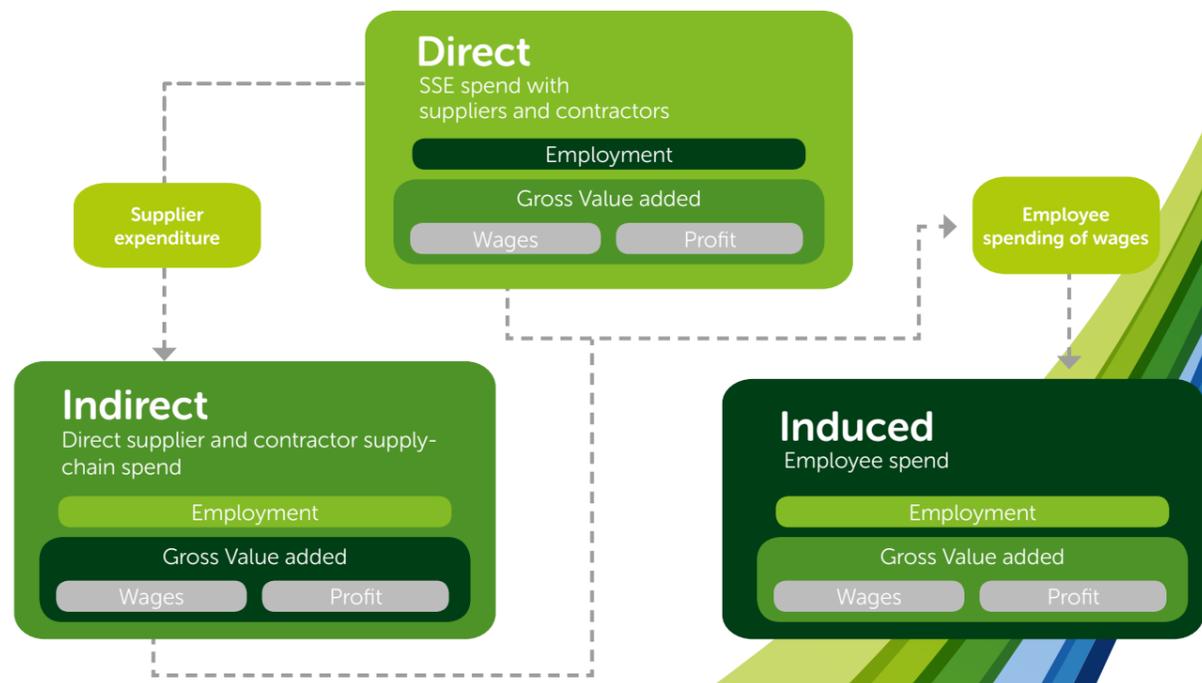
In this case GVA measures the contribution of Keadby wind farm to the UK economy. The total number of jobs supported is the sum of the employment generated at each impact level as a

result of direct Keadby expenditure. It is measured in the number of 'person-years' of employment. For example ten person-years equates to one person working for ten years or two people working for five years.

To measure the full scale of the economic impacts, the model generates results at a direct, indirect and induced level. Direct impacts measure the increased post-tax profit, wages and employment produced directly by project expenditure associated with direct contractors and suppliers; indirect impacts measure the increased post-tax profit, wages and employment created from employment

of sub-contractors and demand for goods and services from suppliers down the supply-chain; induced impacts measure the increased post-tax profit, wages and employment generated from greater demand and spending on goods and services such as accommodation, food and fuel by employees who are employed as a result of the direct and indirect impacts.

The sum of direct, indirect and induced impacts then equals the total GVA and jobs supported as a result of this economic activity.



£43.32m
Total contribution to UK GDP



723
Total person-years of employment in the UK*



SSE used the Input-Output model to calculate the contribution to the UK economy from constructing Keadby wind farm. In total, just under £100m was spent to complete this project. Of the 100 contractors and suppliers directly employed to carry out this work, only three were not based within the UK; however all were based within Europe.

At present, wind turbines cannot be manufactured in the UK. To ensure impacts were not overestimated, the total cost of turbines, which includes the cost of manufacturing, delivering and maintaining the wind turbines, was assumed to be non-UK expenditure and was therefore excluded from the economic impact analysis.

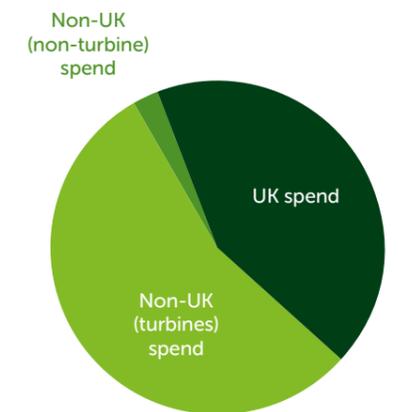
Inevitably a substantial proportion of this turbine expenditure will 'leak' into the UK economy in many different ways, for example from wage expenditure by

individuals employed to install the turbines or from the ongoing maintenance of the turbines over their 25 year life, but this proportion cannot currently be accurately estimated. The total cost of wind turbines accounted for approximately 96% of direct spend with non-UK suppliers and contractors.

This report therefore assesses the economic impact within the UK resulting from £42.2m of UK spend with 97 UK suppliers and contractors.

The results from the economic modelling concluded that over £43.3m of value was added and 723 jobs were supported in the UK economy because of the construction of Keadby wind farm. This means that for every £1m of UK expenditure, just over £1m of additional value was added back into the UK economy and for every one direct supplier or contractor employed by SSE, 1.7 further UK jobs were supported

throughout the supply chain and as a result of the spending of wages of employees connected to the project.



Total project spend
£98,755,000

Public finances contribution

In October 2014 SSE became the first FTSE 100 company to be accredited with the Fair Tax Mark.

This accreditation was awarded as a result of SSE's approach to tax: by actively adopting a policy of not taking an aggressive stance in interpreting tax legislation or using so-called 'tax havens' as a means of reducing its tax liability. Furthermore, the results of the PwC Total Tax Contribution survey of the largest UK companies conducted in 2013, where the SSE Group ranked as the 22nd highest company for taxes borne in the UK whilst being ranked 28th in the FTSE by market capitalisation in financial year 2013.



HM REVENUE &



Focus on the UK economy

While SSE operates within the context of a global supply chain, SSE aims for its major operations to benefit local communities and the local economy as much as possible.

As the only major energy company both headquartered in the UK and operating solely within the UK and Ireland, SSE seeks to maximise the impact of its operations and investments where possible, within these nations. This commitment is reflected in Keadby's expenditure data, which shows that 97% of suppliers and contractors were based within the UK, with almost 80% based within England. The UK-based construction firm Balfour Beatty won the main contract for construction, worth approximately £30m.

SSE actively aims to employ local suppliers, contractors and sub-contractors. Over 50 local businesses, for example, attended the 'Meet the Buyer and Jobs Fair' for Keadby wind farm at the local Forest Pines Hotel near Brigg.

Speaking about the event, Senior Project Manager of Balfour Beatty Civil Engineering Ian Rowell stated:

"It's encouraging to see so many local people interested in working on the wind farm project... We have made a commitment to using as much local labour as possible and are keen to see more local people add to the staff we already have on site who are from neighbouring communities."

As well as employing local businesses on site, the wages from individuals employed because of the wind farm construction and operation are spent in local shops, garages, restaurants, bars and hotels around Scunthorpe and the wider North Lincolnshire area, giving a further boost to the local economy while the wind farm is being built, and to a lesser extent during the relatively low labour-intensity operational phase.

Out of 100 direct suppliers and contractors, only three were not based in the UK

20

direct UK (non-English) suppliers and contractors

77

direct UK (English) suppliers and contractors



Social impacts

SSE aims to be a responsible community member by maximising positive social outcomes and minimising any negative impacts in the communities in which they live and work.

Greater economic prosperity can drive positive social change and benefits such as increased aspirations and greater security. As well as socio-economic growth, there are a number of additional measures that have been taken to have an overall positive social impact within the local area at Keadby.



New floors and lighting for the Crowle and Ealand Playing Field Association hall purchased using Keadby wind farm Community Benefit Funds.

Supporting community development

There are clear and significant economic benefits to local communities during the construction phase of a wind farm's life, with definite but smaller economic impacts during the operational phase.

As a responsible community member, SSE ensures that it continues to make a substantial positive impact in local communities after construction ends by providing community funds over the lifetime of every wind farm.

For over a decade SSE has established funds which have supported communities local to each wind farm development. These funds enable communities to develop sustainably through the funding of charitable and community initiatives and, consequently, benefit from the wind farm for the full duration of its lifetime.

As England's largest onshore wind farm, Keadby offers significant opportunities for nearby communities through the funding of local community projects. The communities surrounding the wind farm are entitled to funds of £5,000 per megawatt (MW) of installed capacity every year. This means that Keadby wind farm grants communities a total of £340,000 per year which is then split into two equally-sized pots: the Keadby Wind Farm Community Fund and the SSE North Lincolnshire Sustainable Development Fund.

£8.5m

will be granted to local communities over the 25 year lifetime of Keadby wind farm.

The Community Fund, worth £170,000 per year, delivers financial support to a diverse range of community projects near to Keadby wind farm. To coincide with the construction period the fund opened to applications in late 2013.

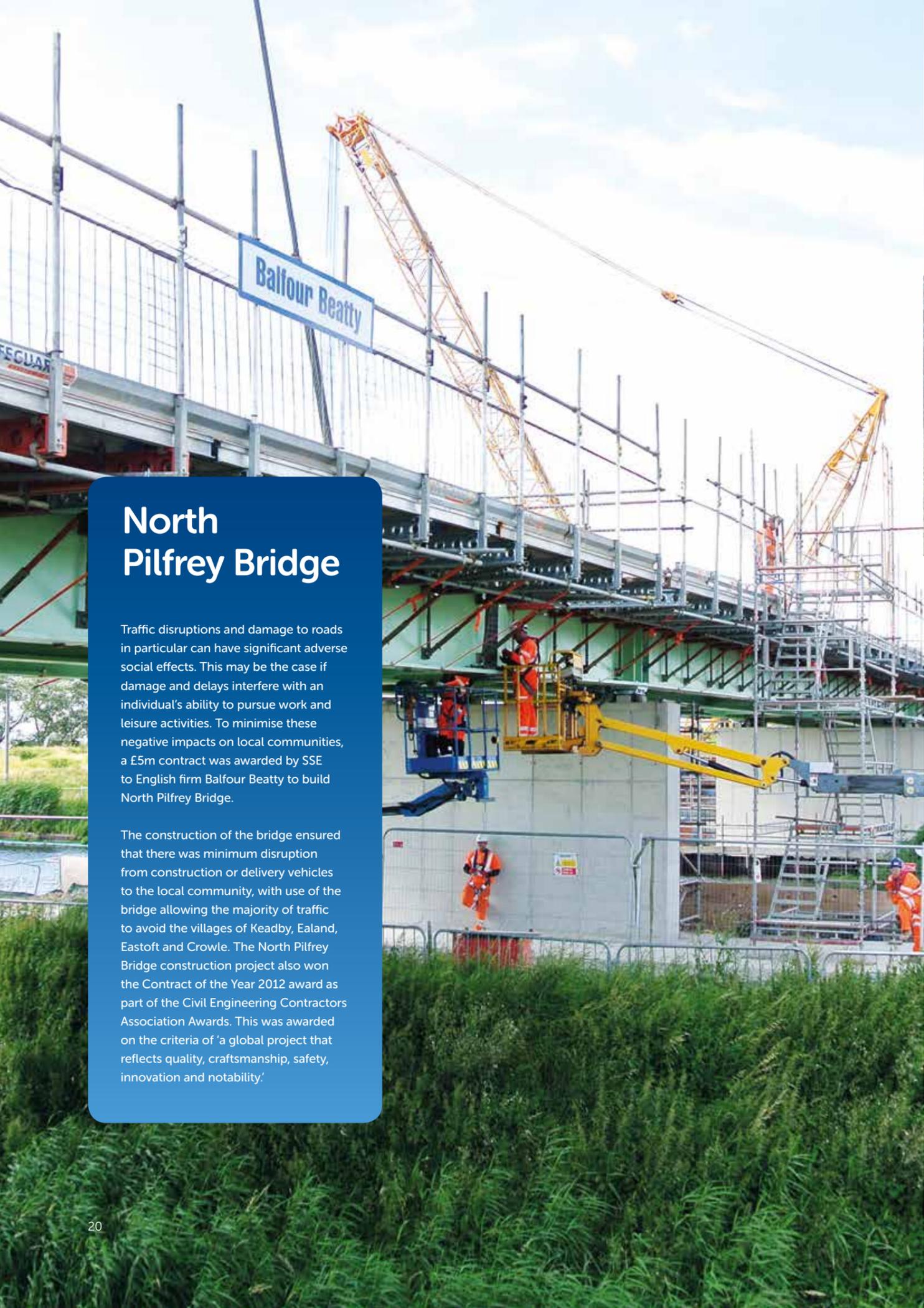
In the first year of the Keadby Wind Farm Community Fund, over £168,000 was granted to local communities:

-  **£80,000**
Community facilities and services
-  **£25,000**
Education and youth development
-  **£25,000**
Energy efficiency and environment
-  **£30,000**
Skills and employment opportunities
-  **£5,000**
Sports and cultural projects

The Sustainable Development Fund, which launched in early 2015, supports larger scale strategic projects that take a longer term view by delivering transformational social, economic and/or environmental changes in the community and develop sustainable ventures for the future. This regional fund is also worth £170,000 per year, and is open to not-for-profit groups from across the North Lincolnshire area

Councillor John Briggs, who chairs the advisory panel, said:

"The Keadby wind farm community fund has the potential to make significant and long lasting benefits to the people of Axholme North. I'm pleased to see it now up and running and delivering much needed support to community projects across the area."



North Piffrey Bridge

Traffic disruptions and damage to roads in particular can have significant adverse social effects. This may be the case if damage and delays interfere with an individual's ability to pursue work and leisure activities. To minimise these negative impacts on local communities, a £5m contract was awarded by SSE to English firm Balfour Beatty to build North Piffrey Bridge.

The construction of the bridge ensured that there was minimum disruption from construction or delivery vehicles to the local community, with use of the bridge allowing the majority of traffic to avoid the villages of Keadby, Ealand, Eastoft and Crowle. The North Piffrey Bridge construction project also won the Contract of the Year 2012 award as part of the Civil Engineering Contractors Association Awards. This was awarded on the criteria of 'a global project that reflects quality, craftsmanship, safety, innovation and notability.'



Minimising negative impacts

SSE aims to be a responsible community member by ensuring that any possible adverse outcomes from its operations are as small as possible.

SSE has a strong track record of working closely with local communities during wind farm planning, construction and operation. This relationship exists to maximise positive impacts such as economic opportunities whilst minimising any negative outcomes such as disruptions for residents and businesses. Negative social impacts may occur as a result of several factors, including the impact of increased traffic and increased noise.

As well as the construction of North Piffrey Bridge, further measures were taken to minimise traffic disruptions as part of the Traffic Management Plan.

For example, any Heavy Goods Vehicles that did need to go through the local communities did not do so at peak times (08:00 – 09:00 and 15:00-16:00). As well as limiting the times for deliveries, careful consideration and extensive planning for the route of vehicles was undertaken to ensure minimal local disruption.

The noise impacts of wind farms can also be a common concern of residents who live near wind farms. Consequently, there are strict governmental guidelines on wind turbines and noise emissions. The impact of noise from the Keadby wind farm has been fully assessed by experts in accordance with Government

procedures; both before construction and after operation began in summer 2014. The results show that the night noise limit of 43dB has been met at all residential properties.

The impact of the wind farm on residential and commercial properties, and on local people and businesses, are always of careful consideration during the planning process and continue to be monitored during operation. SSE complies with all legal requirements when carrying out operations and aims to go above and beyond legal obligations in order to minimise negative impacts from their activities.

Conclusion

As England's largest onshore wind farm, Keadby makes a significant and important contribution to the UK economy and society, and to the global environment.

The construction of Keadby will have a net positive CO2 impact over the wind farm's 25 year life, displacing 718,800 equivalent tonnes of CO2 from being released into the atmosphere in addition to offsetting the CO2 used during wind farm construction. Additionally, there are significant economic benefits from building large infrastructure projects, with Keadby contributing over £43m to UK GDP and supporting over 720 jobs within the UK. Keadby will also continue to generate positive social impacts through the SSE community benefit and sustainable development schemes, granting £8.5m to local communities over the lifetime of Keadby wind farm.

SSE is committed to being a responsible developer and operator, and this means considering environmental, economic and social impacts both immediately and in the long-term, and making decisions based on how to ensure there are beneficial outcomes in all three of these areas over time.



Produced in-house by SSE's Corporate Affairs Team.

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