Institution: Oxford Brookes University

Unit of Assessment: 13: Architecture, Built Environment and Planning

Title of case study: Building local socio-economic impacts into the assessment of major energy projects

Period when the underpinning research was undertaken: 2000–2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Prof John Glasson	Professor	[text removed for publication]
Dr Bridget Durning	Senior lecturer/researcher	
Prof Riki Therivel	Visiting Professor	
Prof Martin Broderick	Visiting Professor	
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Period when the claimed impact occurred: 1 August 2013–31 July 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Until recently, there has been little research into the, potentially significant, socio-economic impacts of the construction and operation of new energy facilities. This has hampered stakeholders' ability to mitigate negative impacts and ensure better outcomes for projects and local communities. The former Impact Assessment Unit (IAU), now part of the Smart Construction and Impact Assessment research group in the School of the Built Environment at Oxford Brookes University, has pioneered research into the local socio-economic impacts of major energy projects. These include:

- nuclear new build (NNB) at Sizewell C (SZC) in Suffolk and Wylfa in Anglesey;
- offshore wind farm (OWF) projects in the North Sea;
- early-stage monitoring of the construction of Hinkley Point C (HPC) in Somerset.

The IAU's research has provided methods for assessing and mitigating negative impacts, and enhancing future outcomes. A wide range of stakeholders (especially project developers, consultants and local authorities) are now using the work in impact studies to support their decision-making. This results in better outcomes both for the project and for local communities. For example, more use of local labour, less disruption to local transport, reduced impact on housing markets, and improved services such as health and policing.

2. Underpinning research

A secure energy supply is vital for the functioning of society. However, the construction and operation of new energy facilities can be controversial, especially in the area surrounding them. Power station facilities are large (covering hundreds of hectares), employ many construction workers (approximately 8,000 for peak years in the 10-year construction programme for a nuclear power station) and expensive (approximately GBP20 billion for a twin-reactor NNB, and approximately GBP6 billion for major OWFs).

Developers are becoming more aware of the need for a 'social licence to operate' from the community. Despite this, there has been little research into the local socio-economic impacts of such projects, and little coverage in the required Environmental Impact Assessments (EIAs) and the resultant Environmental Statements (ESs) for such major project assessments.

The IAU has undertaken research and consultancy on major UK energy projects over a period of 30 years. This has covered fossil fuel, nuclear and wind farm developments, as well as key stages

in the project life cycle (construction, operation and decommissioning). Since 2000, the IAU has had a continuous stream of funding from many branches of the energy industry and related agencies – including the Nuclear Decommissioning Authority (NDA), Electricité de France (EDF), Hitachi/Horizon Nuclear Power, the EU, Vattenfall and British Nuclear Fuels – for more than 20 projects, with a total value of over GBP1,500,000. Projects have included:

- socio-economic impact studies of the construction of onshore and offshore windfarms in England and Scotland
- the planning and assessment of EDF's HPC and SZC projects, and Hitachi/Horizon Nuclear Power's proposed Wylfa Newydd NNB in Anglesey
- monitoring the actual construction of HPC
- the decommissioning of several Magnox stations (e.g. Berkeley, Dungeness).

Taken together, this research has greatly increased the available evidence of actual socio-economic impacts to compare with predicted impacts.

Sizewell B

A particularly significant (approximately GBP1,000,000) research project was the monitoring study of the local socio-economic impacts of building Sizewell B (SZB). This is still the most recent completed nuclear power station built in the UK. The SZB and other IAU studies provide valuable empirical data for future developers and local decision-makers, and are the foundational studies for the current research **(R1)**. The research offers new approaches for enhancing the take-up of local employment on the projects, and mitigating the impacts of immigrant construction employees on local housing markets and health services.

Hinkley Point C

In 2018, the New Nuclear Local Authorities Group (NNLAG) awarded IAU the contract for monitoring and auditing the local impacts of the construction of HPC **(R2)**. This research provides an important contemporary insight to the actual local socio-economic and environmental impacts of building a new nuclear power station, in comparison with the predicted impacts.

Offshore wind farms

Further research includes an EU/Vattenfall-funded (GBP300,000) three-year project (2017–2020) to monitor and assess the actual local socio-economic impacts of the construction and operation of major North Sea OWFs, applying the techniques developed over several years. This research has produced a guidance document on how to assess such impacts, clarifying some often-overlooked local job impacts, such as those from the 25-year operational and maintenance stage **(R3)**.

International research

International research and consultancy contributions include an assessment by Glasson of the impacts of the first decommissioning of a nuclear power station for Canadian Nuclear Labs (2016–2017).The work highlighted the significance of involving local knowledge of indigenous communities in the assessment of impacts.

Research outcomes

- The research has clarified the range of relevant local and regional social and economic impacts, and enabled the development and application of approaches to explain and predict their nature (for example using multiplier and gravity models) and manage their impacts **(R4)**.
- The research has highlighted some previously under-assessed impacts, including impacts on crime **(R6)**, and the valuable role of Community Benefits Agreements for local communities **(R5)**.
- The research differentiates between impacts for different stages in the project life cycle, and between actual and perceived impacts. The identified range of impacts and assessment approaches have since been widely adopted to structure major project assessments, contributing to more informed decision-making for all key stakeholders – developers, local authorities/agencies and especially the host communities **(R7)**.

3. References to the research

R1. 2005 Glasson, J. 'Better monitoring for better impact management: the local socio-economic impacts of constructing Sizewell B nuclear power station', *Impact Assessment and Project Appraisal* (23.3), 215-226. DOI:10.3152/147154605781765535

R2. 2020 Glasson, J., Durning, B., Broderick, M., and Welch K. Monitoring and auditing the local socio-economic and environmental impacts of the early-stage construction of Hinkley Point C nuclear power station, UK. *Impact Assessment and Project Appraisal.*

DOI:abs/10.1080/14615517.2020.1838237

R3. 2020 IAU/ Vattenfall. *Guidance on assessing the local socio-economic impacts of Offshore Wind Farms.* IAU/Vattenfall. DOI:10.24384/ax1s-jr48

R4. 2018 Durning, B., and Broderick, M. Chapter 20: 'Environmental and Social Management Plans'; Glasson, J. Chapter 13: 'Socio-Economic Impacts 1: Overview and Economic Impacts', in Therivel R, Wood G, editors. *Methods of Environmental and Social Impact Assessment*, 4th edition. New York: Routledge. ISBN: 9781138647671 https://www.routledge.com/Methods-of-Environmental-and-Social-Impact-Assessment/Therivel-Wood/p/book/9781138647671

R5. 2017 Glasson, J. Large Energy Projects and Community Benefits Agreements—Some experience from the UK. *Environmental Impact Assessment Review* (65), 12-20. DOI:10.1016/j.eiar.2017.03.009

R6. 2011 Glasson, J and P. Cozens, 'Making communities safer from crime: an undervalued element in impact assessment', *Environmental Impact Assessment Review*, 31(1), 25-35. DOI:10.1016/j.eiar.2010.03.007

R7. 2019 Glasson, J and R. Therivel. *Introduction to Environmental Impact Assessment:* 5th edition. New York, Routledge. ISBN: 9781138600751 https://www.routledge.com/Introduction-To-Environmental-Impact-Assessment/Glasson-Therivel/p/book/9781138600751

4. Details of the impact

Key beneficiaries of the applied research:

- major energy project developers, e.g. EDF
- impact assessment practitioners, e.g. Jacobs consultancy
- local communities hosting developments, e.g. Somerset and Suffolk County Councils
- government agencies, e.g. Nuclear Decommissioning Authority, Department for Business, Energy and Industrial Strategy (BEIS).

Monitoring and auditing local socio-economic impacts

Research monitoring the actual local impacts of construction of HPC (2018–2019), and previously at SZB, has provided invaluable evidence for the English nuclear programme. The studies have also developed a research approach (identify/monitor/audit) using a colour-coding system, which has helped stakeholders understand the relative significance of impacts. The results of the HPC study were presented to a key stakeholder conference in June 2019 attended by BEIS, Somerset authorities and EDF, and this identified which predicted impacts are on target and which are not.

The outcome was an agreement in autumn 2019 between EDF and local authorities, led by the IAU, on new approaches to the monitoring and management of many local socio-economic impacts. This included a review of peak workforce numbers, local accommodation strategy and the scope of the impacts monitoring system.

The review of workforce numbers saw an increase from 6,000 jobs at peak to 8,000. The IAU has been contracted (since mid-2020) by the Somerset local authorities to advise on the implications of this increase for a wide range of local socio-economic impacts.

The HPC Planner for Somerset County Council noted the benefits of the research in this GBP20 billion HPC project: *'In particular, the research has helped to confirm in many areas the progress and impacts associated with the project … importantly [it] has identified areas where there are gaps in measurement and collective oversight.'* **(S1a).** Outcomes include revisions to the

monitoring systems used by the developer and the local authorities, including more systematic and detailed collection of impact data on employment, housing and environmental health issues.

More widely, the Corporate Affairs Director, Horizon/Hitachi, Wylfa, notes that the research insights from HPC will help facilitate research on the Wylfa NNB *'moving from the development phase into construction, monitoring and management, and mitigation of impacts, both anticipated and otherwise'*. **(S1b)** Similarly, the National Infrastructure Projects Association (NIPA) cites the importance of evidence from IAU's HPC research for major project construction stage monitoring in the UK **(S1c)**.

Improving the process of predicting and managing impacts

The development of impact modelling approaches, for example on the mix of local/non-local workforce, and the gravity modelling approach to estimate distribution of local labour market and housing market impacts, has helped stakeholders to better understand and anticipate potential socio-economic impacts. Local authority stakeholders and major consultancies acknowledge the importance of this research, and are using it in their own work:

The Sizewell C Adviser at Suffolk County Council said of the Sizewell C proposal in 2019: *'The consequence of this work [the previous HPC monitoring study] is that we are able to have more confidence in the forecasting methodologies being employed in some areas, and therefore are able to attach more weight to the impacts shown and the mitigation, which we will ask the developer to provide. In those areas where the study is showing a departure from the forecast outcomes, we are going back to the developer and seeking a more robust approach to the modelling and asking for greater contingency planning. Finally, in the areas identified in the study where the existing database and the proposals for continued data provision are inadequate, we will be seeking measures in the proposals to ensure that we do have the necessary information to check the forecast impacts and be able to hold the developer to account through the construction and operational period.'* **(S2a)**

The Principal Economist at Jacobs, a major engineering/environmental consultancy has also commented: *'The strong knowledge base that Oxford Brookes assembled around the local impacts of NNB provides an invaluable resource when considering the potential impacts of new projects, providing first-hand evidence of the impacts of similar projects.'* **(S2b).** Further acknowledgement of the importance of evidence on local expenditure impacts from NNB monitoring and other studies carried out by the IAU is provided in the 2018 Environmental Statement for the proposed Wylfa Newydd project **(S2c**).

Improving specific mitigation and enhancement policies for major energy projects

An example of effective mitigation of negative project impacts includes minimising the impact on local housing markets at SZB by the provision of a large site hostel, now adopted for HPC with two worker site campuses (for 1,500 people in total). In another example, the monitoring of crime coinciding with the building of SZB led to effective measures, now adopted at HPC – specifically the Worker Code of Conduct – and early planning with the local police. Monitoring evidence (2019) shows little or no increase in crime. The EDF Project Director for HPC and SZC notes of IAU research that: *'the local socio-economic impact of constructing Hinkley Point C power station was influential in shaping the economic strategy and DCO [Development Consent Order] commitments for that project – [it] has been very useful in helping to shape our future strategies at Sizewell C and in transferring valuable lessons and knowledge from Hinkley Point C'*. **(S3)**

Socio-economic impact enhancement policies include improving the skill base of the local population through training programmes, and developing local business supply-chain opportunities. This has been very effective for HPC (see R2, section 3). In addition, IAU advised on the successful introduction of a Community Benefits Scheme for the 20-year operational life of the Aberdeen OWF (2018–2019), allowing local communities to bid for funding from a pot of GBP150,000 per year to support community sustainability projects (see R3, section 3).

Other examples of reach and significance

Significant appointments of IAU researchers include appointment of Glasson, Therivel and Broderick to the small team of Examining Inspectors for major projects for the Planning Inspectorate. Glasson was lead Examining Inspector for Hornsea 2 OWF (2015–2016) – now the largest operational OWF in the world. He ensured that there was a requirement in the

Development Consent Order (DCO) for a developer commitment to the use of local employment and supply chains in the project construction, through a DCO requirement for an Employment and Skills Plan. This was the first time such a requirement had applied to OWFs in the UK, and it has been included in subsequent projects (for example the massive Hornsea 3 project), with locations such as Humberside now benefiting from increased use of local employment and firms by the OWF projects.

Glasson has also been the expert socio-economic impacts adviser to the NDA. The Environmental Assessment Manager, UK Nuclear Decommissioning Authority/ Radioactive Waste Management notes: *'Our approach to impact assessment for a proposed geological disposal facility (GDF) for the UK's higher-activity radioactive waste has drawn on the research from Oxford Brookes, both directly and through [its] membership of our Environmental Advisory Panel. Of particular interest has been the research on socio-economic impacts, which has been very useful in shaping our approach to both impact assessment and community engagement.'* **(S4a)**

In a further example of impact, BEIS' 2018 report, *Hinkley Point C Wider Benefits Realisation Plan*, recognises the importance of the IAU gravity model, which was used to develop the 90-minute commute zone to define home-based workers. Maximising the use of the local workforce, for the benefit of the community, is a key element of the plan. **(S4b)**

5. Sources to corroborate the impact

Monitoring and auditing local socio-economic impacts

S1a. Testimonial from senior local government official in an area hosting an energy project development - HPC Planner, Somerset County Council.

S1b. Testimonial from major energy project developer - Corporate Affairs Director, Horizon/Hitachi, Wylfa.

S1c. *Towards a Flexibility Toolkit,* report by National Infrastructure Projects Association (NIPA), May 2019, cites the significance of IAU's appointment (by the Local Government Association's New Nuclear Local Authorities Group) to monitor the environmental and socio-economic impacts of HPC, page 21.

Improving the process of predicting and managing impacts

S2a. Testimonial from senior local government official in an area hosting an energy project development - Sizewell C Adviser, Suffolk County Council.

S2b. Testimonial from an impact assessment practitioner - Principal Economist, Jacobs

S2c. *Wylfa Newydd Project, ES Volume 6.3.9 ES Volume C, 1-2 socio-economic technical appendix*, report by Horizon Nuclear Power, June 2018, acknowledges the importance of evidence on local expenditure impacts from NNB monitoring and other studies carried out by the IAU, pages 97 and 103.

Improving specific mitigation and enhancement policies for major energy projects

S3. Testimonial from a major energy project developer - EDF Project Director, HPC and SZC.

Other examples of reach and significance

S4a. Testimonial from government agency - Environmental Assessment Manager, UK Nuclear Decommissioning Authority/ Radioactive Waste Management.

S4b. *Hinkley Point C Wider Benefits Realisation Plan*, report by BEIS, July 2018, cites the IAU gravity model used to develop the 90-minute commute zone, pages 19-20.