The evolving approach to the assessment of the local socio-economic impacts of major energy projects – with particular reference to UK new nuclear and offshore wind projects

John Glasson

REPORT (Volume 1 of 2)

Submitted for the Degree of Doctor of Philosophy by Published Work

Lancaster Environment Centre
Lancaster University

October 2024

The evolving approach to the assessment of the local socio-economic impacts of major energy projects – with particular reference to UK new nuclear and offshore wind projects

John Glasson

Abstract

Socio-economic impacts are the 'people impacts' of development actions/projects. Socio-economic impact assessment (SEIA) seeks to identify and assess such impacts in project planning and decision-making. The focus of this research is primarily on the impacts of building major energy projects in the UK. A secure energy supply is vital for the functioning of society, yet the construction and operation of new energy facilities can be controversial, especially for the host locality. The aim of the research programme has been to research, document, analyse and advance the assessment of the socio-economic impacts of large and very large UK energy projects, especially on their local and regional host areas. The more detailed objectives were to advance the profile of socio-economic impacts and their assessment in the environmental impact assessment (EIA) process; develop SEIA process and methodology; examine the roles and changing relationships among stakeholders in the process; and particularly to assess the effectiveness of SEIA, learning from experience and follow-up (monitoring and auditing of impacts).

Fourteen publications are submitted as part of the PhD by Published Work, including four book chapters especially on SEIA evolution, methodology and follow-up, and ten journal articles covering the scope of socio-economic impacts, SEIA methods, major project monitoring and auditing studies and community benefits agreements.

The report begins with an introduction including the origins of the research, followed by a section setting out the researcher's overall research programme, objectives and methodologies employed. The core sections of the report then examine in greater depth the main themes of the research and the original contributions to knowledge represented by the works, especially relating to the case studies of UK new nuclear power stations and offshore wind farms. They review the researcher's work on advancing the socio-economic impacts of major energy projects and their assessment in the context of EIA and contributions to the evolving SEIA process and methodologies. The case studies examine key participants involved in the process and the role of community benefits agreements, and especially the importance of follow–up (monitoring and auditing) and adaptive assessment and management.

The final section draws some overall conclusions on the development of SEIA in light of the documented research, summarises the original contributions to knowledge, influence on policy and practice, and proposes some future research directions for this field. Contributions include documentation of the need for SEIA, developments in process and methods, coverage of the emerging community benefits approaches, and especially of the importance of follow-up and learning from experience. Examples of future research directions include covering impacts over the full life cycle (including decommissioning), assessing impacts of emerging energy technologies such as small modular reactors and floating wind farms, cumulative socio-economic impacts assessment, comparative community benefits approaches,

and approaches to the more effective resourcing of the essential impact monitoring and auditing activities.

Researcher: John Glasson, FAcSS, Hons BSc (Econ), MA, MRTPI, FRSA, is Professor Emeritus in Planning and Impact Assessment at Oxford Brookes University, where he was Head of the School of Planning, Research Pro-Vice Chancellor, and Director of the Oxford Institute for Sustainable Development (OISD) and Impacts Assessment Unit (IAU). He has also been an Examining Inspector for English National Infrastructure projects at the Planning Inspectorate (PINS).

Declaration: This is my own work and has not been submitted for the award of a higher degree elsewhere.

Acknowledgements*:* I am most grateful to Professor Nigel Watson for his guidance in the writing of this report and to Professor Elizabete Carmo-Silva for her support through the Lancaster University application process.

Structure of the Report

1. Introduction to the research

1.1 Introduction

Since the 1980s – the early days of socio-economic impact assessment (SEIA) of major projects -- the author has sought to research, document, analyse and advance the assessment of the socio-economic impacts of large and very large UK energy projects, especially on their local and regional host areas. The research stretches over several decades and has two main sources. The first was an academic interest in the new area of Environmental Impact Assessment (EIA) in the early 1980s and the start of a train of publications on its potential, brought together in a substantial way with the production of the first edition of *An Introduction to Environmental Impact Assessment (EIA)* (Glasson et al 1994). The second was a research/consultancy role assessing the local impact of current and new UK power station projects. Developers, initially Central Electricity Generating Board (CEGB), later Nuclear Electric (NE), then Electricite de France (EDF) and others, knew something about their local landscape and other physical environmental impacts, but little about their local socio-economic impacts. A key applied research study was the pioneering researcher led eight-year longitudinal study of the local socio-economic impacts of constructing Sizewell B (SZB) nuclear power station (Glasson and Chadwick 1988-1995). The author has been involved in assessing the impact of many other such projects, in the UK and overseas, culminating most recently in monitoring and auditing studies of Hinkley Point C new nuclear project, and several major offshore wind farms. He has also been an Examining Inspector for the English Planning Inspectorate (PINS National Infrastructure Division) of North Sea offshore wind farms.

Building on such projects and on his wider research on impact assessment, the author has advanced the development of the socio-economic dimension to the assessment of major energy projects. This has involved exploration and documentation of the nature of and interlinkages among socio-economic impacts especially during the construction stage of the lifecycle of major projects, and approaches to their mitigation and enhancement. In addition, there has been a particular focus - through monitoring and auditing of actual impacts - on the generation of research evidence regarding the accuracy or otherwise of predictions on socio-economic impacts. The work shows that such evidence regarding differences between predicted and actual impacts can provide the basis for a more adaptive assessment and management approach to the construction and operation of major energy projects, with lessons for large projects more widely.

A secure energy supply is vital for the functioning of society. Yet the construction and operation of new energy facilities can be controversial, especially for the host locality. Power station

facilities are large (100s of hectares), employ many construction workers (c10500 for peak years in the 10-12 year construction programme for a nuclear station) and are expensive (c£30bn for a twin-reactor nuclear stations and c£6-8bn for a major offshore wind farm). However, until relatively recently, there has been little knowledge about 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 projects. Furthermore, the projects are often perceived and valued in different ways by relevant stakeholders – developers, central and local government, various agencies, and local communities. For example, they can be seen, on the one hand, as essential elements in a national transition from fossil fuels to renewable energy but, on the other hand, as major disruptors to life in host areas (national gain, local pain). It is vitally important therefore to identify, assess and manage such socio-economic impacts in the planning and decision-making process to help to ensure, as much as possible, a fair allocation of benefits and costs across society. This has been the primary focus and motivation for my research since the 1980s.

This research has evolved over time according to the key themes covered in this report:

- advancing and improving the evaluation of socio-economic impacts in an EIA context;
- developing the scope, process and methodology of SEIA;
- involving key participants in the assessment process; and especially
- advancing the importance of follow-up (monitoring and auditing) of predicted impacts and an adaptive assessment and management approach.

Across all four themes, the research has generated valuable evidence and new insights regarding socio-economic impacts in practice. Such work is increasingly important because stakeholders are becoming much more aware of and sensitive towards a variety of primary, secondary and tertiary impacts. For example, developers are becoming aware of the importance of having a 'social licence to operate' from the community (Boutillier 2017). Communities are recognising some of the possible trade-offs for taking on such projects in the national interest, including the role of Community Benefits Agreements.

In addition to academic and professional practice publications, the work has also been disseminated through training courses, webinars, and advice given to governments, developers, consultancies and various agencies in the UK and overseas (for example on decommissioning a nuclear project in Canada, and developing a gas field in W. Australia). There has also been complementary work on the local socio-economic impacts of tourism, of high–tech industry (especially in Oxfordshire) and of universities; see for example Glasson

(with Wood) 2006; Glasson (with Lawton-Smith and Chadwick) 2005; and Glasson (2003). However, the focus here in this report is on energy projects, in particular on new nuclear power stations (NNPs) and offshore wind farms (OWFs).

1.2 List of publications

The research programme is set out and demonstrated through the publications listed below as part of a submission for PhD by Published Work at Lancaster University. Copies of the articles and chapters are included in a separate volume.

Evolution of SEIA: nature, process, scope, methodology and participants
(IF= Impact Factor of Journal 2023)

Glasson, J (1984), 'Local Impacts of Power Station Developments', in D. R. Cope, P. Hills and P. James (eds.), Energy Policy and Land Use Planning: An International Perspective, Pergamon Press, Oxford, 123-147.

Glasson, J and D, Heaney (1993), 'Socio-Economic Impacts: the Poor Relations in British EISs', Journal of Environmental Planning and Management, 36(3) 335-343 (IF: 4.4).

Glasson, J, (2018), `Socio-Economic Impacts1: Overview and Economic Impacts', in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition), 475-514.

Chadwick, A and J, Glasson (2018) `Social Impacts' (with A. Chadwick): in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition), 515-545.

Glasson, J, Barrett, B and M. Van der Wee, (1988) `A Local Income and Employment Multiplier Analysis of a Proposed Nuclear Power Station Development at Hinkley Point in Somerset', Urban Studies, 248-261 (IF: 4.2).

Glasson, J and P. Cozens, (2011) 'Making communities safer from crime: an undervalued element in impact assessment', EIA Review (EIAR), 31, 25-35 (IF: 9.8)

Glasson J, (2017) 'Large Energy Projects and Community Benefits Agreements - some experience from the UK, EIAR, 65, 12-20 (IF: 9.8).

Glasson J, (2022) 'Follow-up: post-decision learning in EIA', in Fonseca, A (ed), Handbook of Environmental Impact Assessment, Elgar: Cheltenham, 198 -218.

Case studies: major UK energy projects – new nuclear and offshore wind

Glasson, J, 2005 'Better monitoring for better impact management: the local socio-economic impacts of constructing Sizewell B nuclear power station', Impact Assessment and Project Appraisal (IAPA), July (05) 215-226 (IF: 1.8).

Glasson J, Durning B, Broderick M, Welch K, (2021), 'Monitoring and auditing the local socio-economic and environmental impacts of the early stage construction of Hinkley Point C Nuclear Power Station, UK,' IAPA, 39 (2), 84-95 (IF: 1.8).

Chadwick, A. and J. Glasson, (1999), 'Auditing the Social and Economic Impacts of a Major Construction Project: the Case of Sizewell B Nuclear Power Station', Journal of Environmental Planning and Management, 42 (6), 811-836 (IF: 4.4).

Glasson, J and A. Chadwick, 'Life after Sizewell B', (1997), Town Planning Review, Vol. 68, (3) 325-345 (IF: 1.6).

Glasson J, Durning B, Welch K, Olorundami T, (2022), 'The local socio-economic impacts of offshore wind farms', EIAR, 95, 1-11 (IF: 9.8).

Glasson J, (2021), 'Community Benefits and UK Offshore Wind Farms: Evolving Convergence in a Divergent Practice', Journal of Environmental Assessment Policy and Management, 22, 1-28 (IF: 4.25).

1.3 Summary role of publications submitted

The publications in s1.2 are set out broadly in two groups, although there are overlaps between the groups. The first covers various aspects of the evolving nature of SEIA. This includes the growing importance and recognition of socio-economic impacts in the assessment of the impacts of projects, especially major projects, on local communities. The 1984 book chapter and the 1993 article provide an early highlighting of the then low profile of such impacts in EIA. The next two book chapters are the latest (fourth edition) versions developing the scope of economic and social impacts and approaches to their assessment; they are in the key edited text on methods of impact assessment (Therivel and Wood, 2018). As background, the fifth edition of the book on EIA by Glasson and Therivel (2019) also sets out such assessment as part of the wider and evolving approach to impacts assessment worldwide. The 1988 and 2011 articles cover more the changing scope and assessment methods used in socio-economic impact assessment. The 1988 article on economic multipliers provides an example of a detailed and uniquely disaggregated approach to economic impact assessment, with direct and indirect impacts, over the key construction and operational stages of major project life cycles using the example of the then proposed Hinkley Point C. The 2011 article promotes a widening scope to social impacts with a coverage of potential crime impacts associated with major projects. The 2017 article on community benefits examines the changing role of participants in the assessment process as exemplified in the growing significance and critical issues associated with Community Benefits Agreements for large energy projects. The recently commissioned book chapter (2022) in the Research Handbook on EIA (Fonseca 2022) sets out the case for and best practice on EIA follow–up and the vital importance of monitoring and auditing to provide an evidence base for

a more rigorous assessment. This latter topic is a key one in the case study work on major nuclear and offshore wind farm projects

The publications in the second group report on pioneering research on the local socio-economic impacts of the construction of the UK's two most recent nuclear power stations at Sizewell B (SZB) in Suffolk in the 1990s and Hinkley Point C (HPC) in the 2010s/2020s. They cover the survey, monitoring and auditing methodologies, the range of socio-economic impacts and the role of an adaptive approach to manage better such impacts. The 2005 article brings together the findings from the major longtitudinal research programme on the construction of SZB. The 2021 article similarly brings together the findings from a shorter research programme assessing the local impacts of the more recent and current HPC construction project. This group of case study publications also include articles on the local socio-economic impacts of offshore wind farms. These 2021 and 2022 articles bring together significant research findings on the socio-economic impacts of a set of major North Sea OWF projects – Aberdeen, Beatrice and Hornsea -- and on offshore wind projects more broadly.

1.4 Structure of the report

Section 2 sets out the researcher's overall programme of research, its objectives and methodologies employed. Sections 3 to 6 examine in greater depth the main themes of the research and highlight the original contributions to knowledge represented by the works. They roughly follow the listing of the publications as set out above but with several overlaps and references to particular articles and chapters across various sections, especially relating to the central role in the research of the new nuclear and offshore wind farm case studies.

Section 3 reviews the researcher's work on advancing the socio-economic impacts of major energy projects and their assessment in the context of EIA more generally; Section 4 focuses on the contributions of the research to the evolving socio-economic impact assessment process and methodologies. Sections 5 and 6 draw on the case studies, examining key participants involved in socio-economic impact assessment for major projects, and the importance of follow–up (monitoring and auditing) and adaptive management. The final section 7 draws some overall conclusions on the development of SEIA in light of the research documented, summarises original contributions to knowledge, influence on policy and practice, and proposes some future research directions for this field.

2. Research programme objectives and methodologies employed

2.1 Overview of research programme objectives

Unlike traditional doctoral research, which has a tight and coherent programme over a few years only, a doctoral programme by published work evolves over time and includes a retrospective assessment of the programme. This research dates back several decades as noted in the Introduction (s1.1). Over this extended research programme, a number of key themes have taken shape, summed up in the following primary and secondary objectives (with section references). The primary objectives are:

- To advance the profile of socio-economic impacts and their assessment in the EIA process (s3).
- To develop the SEIA process and methodology, especially for major energy projects (s4&s6).
- To examine the roles and changing relationships among stakeholders, including the growing significance of community benefits agreements (s5).
- To assess the effectiveness of SEIA, learning from experience/follow-up, and adaptive assessment and management (s6).

Secondary objectives include:

- To examine how socio-economic impacts vary over a project's life cycle, especially variations between project construction and operational stages (s4, 5 & 6).
- To assess how the consideration of socio-economic impacts has changed over time, using for example the research programme case studies and to consider what we can learn about impacts from crossovers between different types of energy projects (s4).
- To examine and advance approaches to monitoring and auditing of socio-economic impacts (s6)

2.2 Research methodologies developed over the life of the research programme

The publications have employed a wide range of research methodologies. However, of central importance has been a case study approach examining the local socio-economic impacts over the lifecycle of major energy projects, with a focus particularly on the construction stage that can be very disruptive to local communities. Early studies in the 1980s included retrospective analysis of a wide range of UK nuclear, gas and coal-fired stations (Glasson 1984). These were followed by the major longitudinal research study for the socio-economic impacts of SZB, funded by Nuclear Electric over the period 1988 to 1995 (publications here of 1997, 1999, 2005 and 2021), and which was led throughout by the researcher. It involved detailed monitoring of socio-economic impact indicators such as local and non-local employment take-

up, wider economic impacts in the community, housing of workforce, crimes in the community and many other socio-economic impacts. There were also biennial surveys of the workforce (approx 20% sample) and of various groups in the local community (e.g businesses, schools, accommodation establishments and residents), and interviews with key stakeholders. Impact findings were published in Annual Monitoring reports (1988-1995). The later studies (2018/19) of the early stage construction of HPC and the current studies (2023/24) of the peak construction stage, partly supported by funding from the Local Government Association (New Nuclear Group), have focused on the monitoring and auditing of publicly available impacts data.

Research on the offshore wind farm (OWF) impacts has built on a 3-year research study (2017-2020) which was part of a Vattenfall/EU scientific research programme for the European Offshore Wind Deployment Centre (EOWDC) to understand the environmental impacts of offshore wind projects. Believed to be the largest offshore wind research programme of its kind, it has supported in-depth scientific impacts research and monitoring in a real-time environment on four biophysical topics, plus the socio-economic topic. The researcher led the Oxford Brookes socio-economic impacts component of this programme. The methodology used case studies of the Aberdeen and Beatrice projects in Scotland, and the much larger Hornsea projects off the Yorkshire coast. Research methodology included detailed examination of project contracts with local and non-local businesses, surveys of local community perceptions over part of the project life cycle, and workshops and interviews with key participants. The researcher's approach also gained from his previous (2012-2015) participant role as an Examining Inspector for the National Infrastructure Planning Division of the Planning Inspectorate (PINS) for the Hornsea 1 and 2 OWFs.

In summary, the range of detailed methods includes literature reviews, surveys of and workshops with key stakeholders involved in the socio-economic impacts process for major projects, monitoring and auditing of impact data from ongoing major projects and reviews of evolving government policies and developer practices. The case studies have provided the opportunity for detailed examinations of impacts and their management in practice, set in the wider context of evolving EIA and SEIA theory and practice. A few reflections on the evolving case study methodology are noted here, with further consideration later in the report, especially in s 4.4. All the cases have included longtitudinal studies covering key stages and phases of project lifecycles; this is very important as impacts, actual and perceived, can vary considerably over time. Methods and models of impact interactions from early studies have proved useful in later studies, and there has also been learning across cases in impact enhancement measures (especially in encouraging local employment), and mitigation measures, especially for housing and transport impacts. Issues of health, safety and

community benefits have come more to the fore in recent studies. The case study approach has also highlighted some of the ongoing constraints on assessing socio-economic impacts in practice; it can be resource intensive, needs good monitoring data and some measure of independent auditing to counter any lack of developer openness. The Sizewell B study exemplified some of the advantages of a well-resourced case, especially in the ability to undertake primary data collection. However, the researcher's approach to the more thinly resourced Hinkley Point case shows that much can be achieved using publicly available data in a light touch approach, and with clear communication of findings. For example, the colour coding of the relative accuracy of HPC predictions certainly focused the consideration of the findings for key stakeholders (Glasson et al 2021).

In addition to publications, the researcher has presented findings at major conferences, including the Annual Conferences of the International Association for Impact Assessment (IAIA), on various webinars for key research agencies, consultancies and governments. He has also been an expert participant on reviews and advisory panels for many government bodies. These include for new nuclear proposals for the Canadian and Dutch Governments, and for the future rad-waste deep–mined geological facility for the UK Nuclear Decommissioning Authority (NDA) (over period 2011-2017). Very recent activities have been for socio-economic impact assessment methodology for OWF projects for the Scottish Government (2020-2023) and for community benefits policies for electricity transmission lines for the UK Department of Energy Security and Net Zero (2023-2024).

3. Advancing the evaluation of socio-economic impacts of major projects in context

3.1 The nature and importance of socio-economic impact assessment (SEIA)

SEIA initially developed in the 1970s/80s mainly in relation to the assessment of the impacts of major resource development projects, such as hydroelectric schemes in Canada, nuclear power stations in the USA and the UK's North Sea oil- and gas-related developments (Clark et al 1981). Early texts included, for example, those by Wolf (1974) and Finsterbusch (1985). Another early publication by Bronfman (1991) succinctly saw SEIA as providing the essential 'human elements' complement to the often narrow biophysical focus of many EIAs ... "*from the perspective of the social impact agenda, this meant: valuing people 'as much as fish'...*" (p69). Socio-economic impacts are the 'people impacts' of development actions. SEIA seeks to identify impacts on people, including who benefits and who loses; it can help to ensure the inclusion of the voices of diverse communities in project planning and decision-making. Over

time, as discussed in later sections of the report (especially s4.1 and 4.3), the impacts included in SEIA covered a widening range, especially of social impacts, than those normally covered in these early energy project impact studies.

The researcher's work on the evolution and nature of SEIA has sought to highlight the growing importance of socio-economic impacts, especially for major projects. It drew initially on research on the local impacts of power station developments (Glasson 1984) which noted that in contrast with research on the physical impacts on amenity and landscape, there was little work on local economic and social impacts, especially on the significant employment impacts. It highlighted and provided evidence for the distinctions between anticipated, demonstrated and perceived impacts, and the key determinants of impacts. The early research chapter (Glasson 1984) concluded -'*During the proposals stage, questions are raised about many aspects of power station development and frequently questions about economic and social effects are inadequately answered because of the paucity of information available*. *Estimates may be made which are often, at best, wide of the mark and sometimes completely misleading. Yet, in parallel with national trends, it seems likely that local debate about the effects of such massive developments will intensify. The growing interest in EIA suggests that in future local authorities and other interested parties are likely to be seeking more precise and detailed answers to their points from the developer. An improvement in the quality of information on the local effects of power stations requires a better understanding of the processes at work when such a development is introduced into a locality, plus a more systematic approach to the prediction and monitoring of effects'* (p143). The researcher's work on developing processes (s4), involving stakeholders (s5), and advancing prediction and monitoring (s6) seeks to address the issues raised here.

3.2 The evolution of SEIA in an EIA context

The wider contextual field of EIA has developed apace since its birth under the US National Environmental Policy Act (NEPA 1970); an act which saw EIA as a systematic and interdisciplinary approach to ensure that social, natural and environmental sciences are used in planning and decision-making. From this holistic approach has arisen a growing family of assessment tools, and the socio-economic/social dimension has been at the forefront of this growth in the last twenty years (Vanclay 2015). Terms include Social Impact Assessment (SIA), Socio-Economic Impact Assessment (SEIA), Health Impact Assessment (HIA), Equality Impact Assessment (EqIA), Human Rights Impact Assessment (HRIA) to mention just a few. SIA and SEIA are the more generic of these terms. Some authors see this assessment as an integral element of EIA, with the environment including biophysical and socio-economic dimensions; others see SIA in particular as a separate field of study with its own process. This

researcher has always advocated the importance of an integrated approach to EIA, with socio-economic impact assessment as an element, often a key element, in a holistic project assessment. The author's focus on socio-economic aspects stems from the close interrelationship between economic and social impacts, with for example many social impacts arising from the direct and indirect economic impacts of projects. This focus was advanced in particular through the widely cited (c2500) five editions of *Introduction to EIA* (Glasson and Therivel 1994-2019), and Glasson chapters (Glasson, Chadwick and Glasson 2018) on Socio-Economic impacts in the four editions of *Methods in EIA* (ed. Therivel and Wood 1995-2018).

Studies by the United Nations Economic Commission for Europe (UNECE 1991) on EIA practice in various countries noted the need for greater emphasis on socio-economic impacts and for better integration with biophysical factors. The author's work on the socio-economic content of UK ESs led by the researcher, with Heaney (JEPM 1993) further clarified this need. The research reviewed the socio-economic coverage of a randomly chosen set of over 100 UK project ESs. The assessment found that less than half had addressed any social or economic impacts, and the quality was generally poor. The content in power station ESs was better than the average, but the techniques used were largely unjustified with no indications provided of methods underpinning forecasts. The article concluded—*'Socio-economic impacts continue to be the poor relations, five years after the introduction of regulations and guidance for EIA in Britain'* (p342)*.* Subsequent reviews of international literature and best practice are integral to the regular updated editions of *Introduction to EIA,* and chapters in *Methods in EIA*. The latter promotes the importance of socio-economic impacts and provides important sources of guidance for both academia and practice. The nuclear project case studies, and those on offshore wind farms, provide further guidance to stakeholders on the importance and scope of SEIA for major energy projects. The research advanced SEIA by, for example, incorporating a wider scope of interlinked impacts; improving prediction methods; addressing the need for community engagement; and developed approaches for positive impact enhancement as well as mitigation. The research also contributed to advances in the complex and challenging area of impacts monitoring and auditing. All are discussed further in the following sections.

Over time, there has been complementary international work. For example, the IAIA provided some international guidance on social impacts assessment (Vanclay et al 2015) as did the International Finance Corporation (IFC 2012). Coverage in national EIA legislation, in the EU for example (EU 2014, 2017), has improved over time although it is still partial. However, in 2023 the EC introduced its European Sustainability Reporting Standards (EC 2023) which

modernise and strengthen the rules concerning social and environmental information that companies have to report.

It is also pleasing, given my research contributions, to see the growing consideration of socio-economic impacts in the assessment of Nationally Significant Infrastructure Projects (NSIPs) in England (e.g. See DESNZ, National Policy Statement (NPS) Energy (EN-1) 2024). EN-1 notes – *'13.9 The Secretary of State should have regard to the potential socio-economic impacts of new energy infrastructure identified by the applicant and from any other sources that the Secretary of State considers to be both relevant and important to its decision'*. Drawing on his research, the author has worked to increase the coverage of such impacts in the assessment of major projects by the Planning Inspectorate, especially and recently for offshore wind projects. As noted by Buchan (2024): '*There is a comprehensive body of research being developed by the European Offshore Wind Deployment Centre (EOWDC) connected with Vattenfall's Aberdeen offshore windfarm and Oxford Brookes University. This programme of research and monitoring, funded by Vattenfall, is leading advances in socio-economic impact assessment within the EIA framework. The programme has produced a guide to assessing offshore wind socio-economic impacts'* (p59).

4. The evolving socio-economic impact assessment process and methodologies

4.1 The SEIA process

The socio-economic impact assessment process is an element within the wider EIA process or in some cases a parallel process, and includes, as documented by this researcher (1994-2019, 2018) and other authors over time (e.g. Canter 1996 and Morrison-Saunders 2018) the following steps:

- Screening: is an assessment necessary for the project?
- Scoping: what socio-economic impacts need examination?
- Prediction: what is the size and extent of the impacts?
- Evaluation: are the impacts significant?
- Mitigation and enhancement: what scope for reversing adverse and enhancing beneficial impacts?
- Review: is the assessment adequate?
- Decision: should the project be authorised?
- Follow-up: how accurate were the predictions?

Whilst these steps are the now familiar ones for EIA, the socio-economic element has its own characteristics; see for example methods documentation in Rodriguez-Bachiller with Glasson – Socio-economics chapter 8 (2004), Esteves and Barclay (2011) and in Glasson (2018). What are the types of socio-economic impacts to consider? How can we predict them? Socio-economic prediction is an inexact exercise drawing on some models and interlinkages, especially for economic impacts, but in general, it can be characterised as more soft-modelled in comparison to more hard–modelled impact sectors such as noise and air pollution (Rodriguez-Bachiller and Glasson Chapter 8: Socio-economics 2004). There are often no easily applicable 'state of the community' standards for assessing the significance of predicted impacts. The nature and distribution of socio-economic costs and benefits, such as the local labour content in a project and potential local impacts on crime and health are sensitive issues for communities. Assessment based on follow-up evidence using monitoring and auditing still tends to be weak, despite considerable work by academics on advancing methodology (see Pinto et al 2019, Glasson 2022 covered further in s6 of this report). Buchan (2024) again, in her research for the Crown Estate, highlights this researcher's work for the European Offshore Wind Deployment Centre (EOWDC) programme on advancing a dominant socio-economic framing and set of impact types: the research "*distinguishes between economic and social impacts and provides an overview of the challenges in assessment of these, together with methodologies and techniques for assessment. It is aimed at technical practitioners and stakeholders engaged in impact assessment. Here, the issue of offshore development being seen as removed from onshore social impact is challenged and stakeholders are encouraged to consider community issues such as community cohesion and place attachment and identities" (p59)*.

The author's work has contributed to efforts to address these important challenges. For example, Table 1 sets out the types of socio-economic impacts identified and advocated for assessment by the author (Glasson 2018). These include a wider range, especially of social impacts, than those normally covered in early energy project impact studies. Whilst this table indicates discrete categories of impacts, they are very much interlinked. For example, the direct and indirect economic impacts, and especially the core issue of the mix of local and non-local employment, can have very significant impacts on local housing markets and on other local services, and in terms of community relations. The impacts of a project with a high number of non-local employees, many bringing families with them, can greatly affect health, education and other local services if not well predicted and managed. A report on UK new build nuclear power research (Tyndall Centre 2013) notes the researcher's emphasis of the importance of the source of the workforce …'*Glasson (2005) highlights the significance of*

providing local and UK jobs in relation to migrant jobs in determining economic benefits' (p47). The researcher has sought to highlight and model such interlinkages as a guide to better prediction; see Figures 1a and 1b for versions of simple flow modelling of socio-economic impacts for power station construction and operation. Recent UK power station EIA predictions have built on the logic of such modelling. For example, the socio-economic impact predictions for the current HPC project focus on the key distinction between non-home based and home-based workers, with the distribution of the latter within the construction commuting zone employing gravity model formulations advocated by the author.

Table 1: Types of socio-economic impacts (Source: Glasson 2018)

1. **Direct economic:** • local – non-local employment; • characteristics of employment (e.g. skill group); • labour supply and training; • wage levels. 2. **Indirect/wider economic/expenditure:** • employees' retail expenditure; • linked supply chain to main development; • labour market pressures; • wider multiplier effects; • effects on development potential of area 3. **Demographic:** • changes in population size; temporary and permanent; • changes in other population characteristics (e.g. family size, income levels, socio-economic groups); • settlement patterns 4. **Housing:** • various housing tenure types; • public and private; • house prices and rent / accommodation costs; homelessness and other housing problems; and personal and property rights, displacement and resettlement	5. **Other local services:** • public and private sector; • educational services; • health services; social support; • others (e.g. police, fire, recreation, transport); • local authority finances 6. **Socio-cultural:** • lifestyles/quality of life; • gender issues; family structure; • social problems (e.g. crime, ill-health, deprivation); • community stress and conflict; integration, cohesion and alienation; • community character or image 7. **Distributional effects:** • effects on specific groups in society (eg: by virtue of gender, age, religion, language, ethnicity and location)

Figure 1a: Socio-economic impact model for power station construction and operation -- as the interaction between the development and the local community (Glasson 1984)

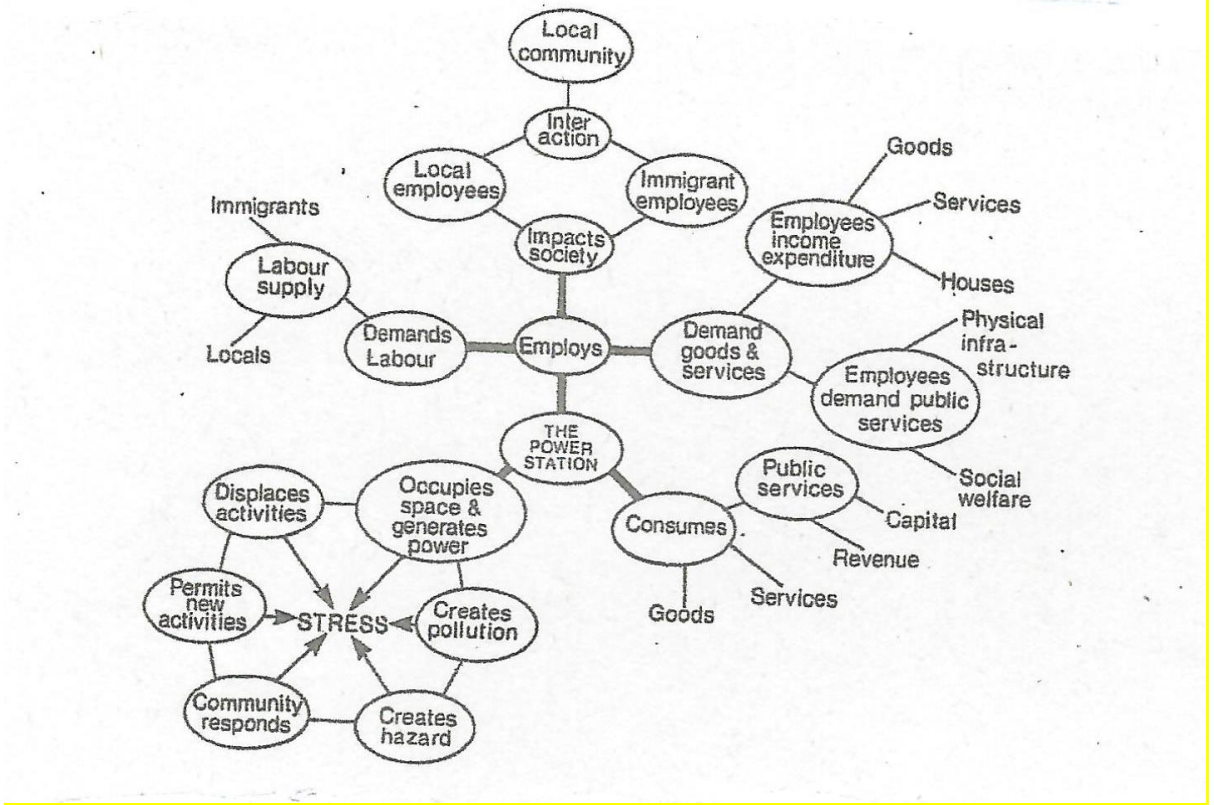
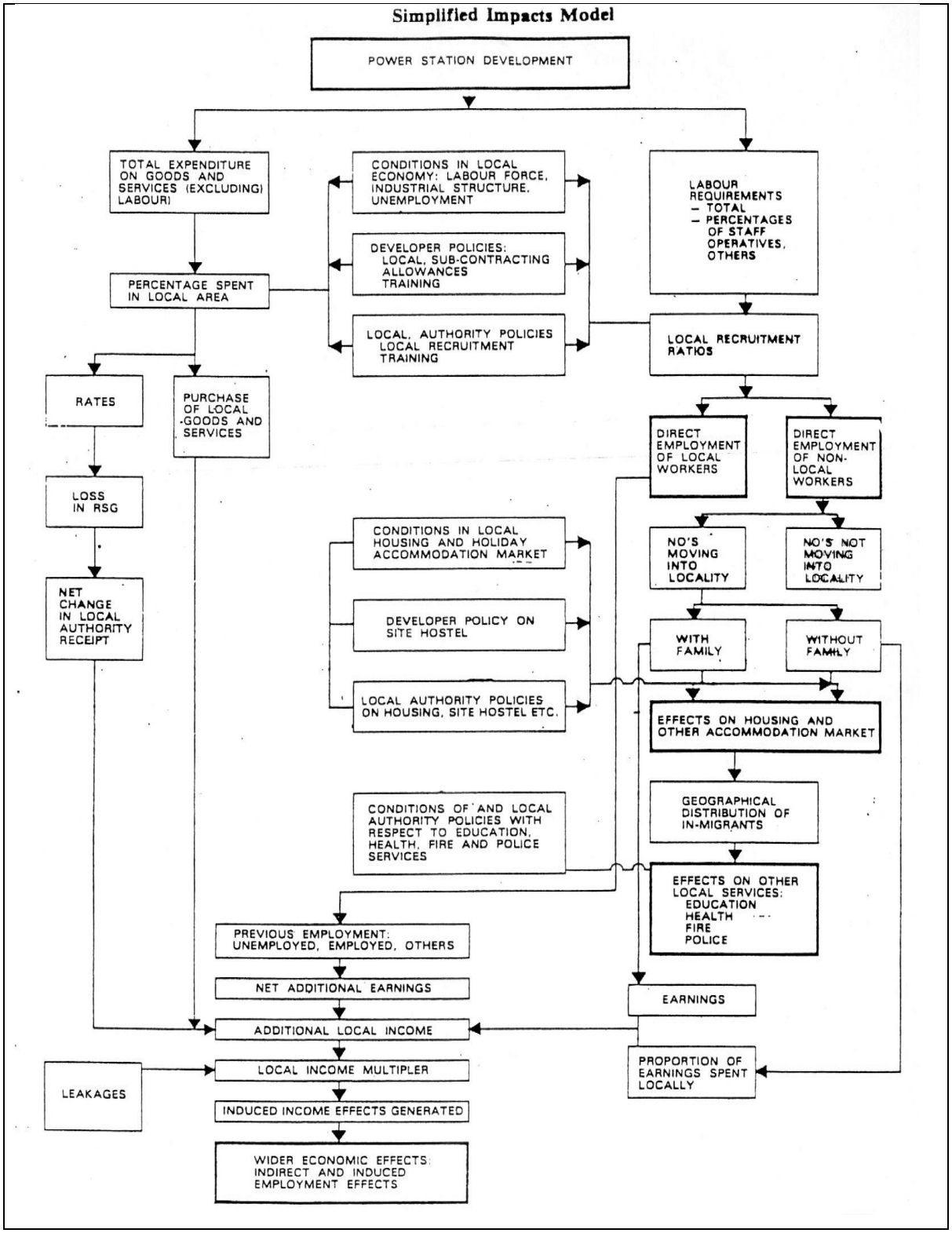


Figure 1b: Further development as simple cause-effect diagram for the local socio-economic impacts of Hinkley Point C power station proposal (Glasson 2018) – highlighting different impacts of local and non-local workers



4.2 An economic impacts multiplier model

The researcher's work also includes detailed specific aspects of methodology. An early study (1988, led by the researcher with Van der Wee and Barrett) drew on research for a previous incarnation of HPC to develop an economic impacts multiplier model, based on the Keynesian

multiplier model. The study focused on the direct and indirect local economic impacts of the proposed development across both the construction and operational stages for the local area of Somerset. The study differed from other multiplier studies (e.g. Brownrigg 1980) with its emphasis on the prediction of the incremental changes in annual income and employment effects of a nuclear power station throughout the construction period and into the early years of full operation. A key feature of this new approach was the disaggregation of the total workforce to account for the significant impact variations associated with in-migrant workers in comparison with local recruits, and those with families compared with those without families. The findings showed that unaccompanied in-migrants provided the largest direct income injection, despite the leakage of a substantial proportion of earnings spent outside Somerset. However, per worker, the highest local income injection was from in-migrants with families. The analysis also highlighted the great variations in impacts over time with full operation direct income injections only about 10% of peak construction, although these are long term permanent jobs.

4.3 Crime as an example of the widening scope of social impacts

The multiplier study provides an example of the detailed assessment of economic impacts and the SEIA of major projects has generally covered economic impacts better than social impacts (Glasson and Heaney 1993). However, over time there has been a growing recognition of social impacts, especially of impacts on housing and local services (Chadwick and Glasson 2018). Socio-cultural issues have been less well covered, but issues of quality of life, wellbeing, deprivation, crime and community stress and conflict are important and can be associated with the development of major projects. The Glasson and Cozens article (2011) is an example of the researchers' work helping to widen the scope to social impact with a coverage of potential crime impacts linked to major projects. The article also highlighted the importance of the fear of crime, linking back to the significance of perceived effects noted in s3. Some of the author's research has shown how crime and safety issues can vary considerably across project stages and project types. For major infrastructure projects, the construction stage can be particularly significant when workforces of several thousand move into often remote and rural communities to build the project over several years. Power station projects with a large and predominantly young male in-migrant workforce are likely to present an issue for crime and other behavioural problems in the host locality, and this was initially the case for the SZB project (Glasson, 2005). The 2011 article sets out some key issues for better managing potential crime issues, including better understanding of the project and local area baselines which may affect crime, using meaningful data on crime and fear of crime, and adopting appropriate mitigation measures. Section 6 of this report covers further the nature of

such problems at SZB and other case studies, and the development of approaches to their monitoring and management.

4.4 Comparing the scope of assessment of socio-economic impacts of major projects over time.

The programme of research has also made it possible to compare how the scope of socio-economic impact assessment has changed over time. Examples include comparisons between SZB in the 1980s/90s and the current HPC project and between types of energy projects, new nuclear and offshore wind (2005, 2020, 2021 and 2022 publications). Although this is a limited sample, there are useful findings. Socio-economic impacts were very significant in the construction of SZB and perhaps even more so for HPC, given the massive scale of the construction stage workforce, especially over the peak years (10,500+ at HPC over at least 4 years compared with a peak of about 5,000 at SZB). Both project assessments focused on the construction stage of the lifecycle, and for both the range of socio-economic impact topics was similar. Maximising the local employment benefit and wider supply chain benefits, minimising the impacts of the in-migrant workforce on housing and local services, especially health and education, and managing the traffic implications of the total workforce, were key topics across both projects. In both, some crime issues emerged to raise the profile of actual and perceived crime and safety issues. Positively, the research has shown how there was some learning across projects, using the Sizewell study in the assessment for Hinkley Point. For example, in addition to the scope of impact types, there was/is also the spatial scope of impacts. The researcher introduced the concept of the construction daily commuting zone (CDCZ) for SZB. An employee was 'local' if he/she had a home address within daily commuting distance of the construction site immediately before recruitment to the project. Employees recruited from outside this zone were defined as non-local. The CDCZ extended to about 35-40 miles for Sizewell, including all of Suffolk, plus parts of Norfolk and Essex. For HPC, the CDCZ is defined by a commuting time of 90 minutes, which, with the M5 running through SW England, results in a zone extending up to 45 miles from the site.

Predictably, socio-economic issues have had and currently have a much higher profile for new nuclear than for the major offshore wind farms (OWFs). Indeed, there can be scepticism about the importance of such impacts on host communities, especially when the OWF may be many miles off the coast – 'out of sight, out of mind'. However, some OWFs are near the coast, and all have onshore components, especially substations, cabling and power lines, and have impacts on harbours and other local infrastructure and businesses. Glasson et al (2022) explores the nature of the assessment of these impacts across project lifecycles. For example, a contents assessment of the socio-economic coverage of 22 UK ESs for OWF projects of

50+MW from 2010 onwards showed considerable variation in length of coverage, with much more coverage of economic than social impacts, in a ratio of about 5:1. In fact, some recent large OWFs have scoped out many social impacts from their assessments. There was a clear focus on the offshore construction stage, which is unfortunate for, as shown by the researcher, onshore activities can have important local impacts, for example in terms of supply chain contracts, local jobs direct and indirect, community benefits agreements and changing perceptions of impacts (Glasson et al 2022). However, the research on the case study projects, especially the Aberdeen OWF, also showed a very high level of leakage of economic benefits out of the local community, and indeed out of Scotland and the UK, of the offshore work. Only when a location gains hub status, a concept promoted by the researcher, as a base for several large OWFs, does it begin to reap some substantial economic benefit. Hull and Grimsby provide examples, developing as centres for OWF servicing and/or associated manufacturing (e.g. OWF blades and cabling). Key factors clarified by the researcher behind some of the variations in impacts include the nature of the OWF project and local communities, developer policies and management measures, local agency policies and activities, and the relevant legislative and regulatory context behind the decision making process. In remote rural communities, and in coastal areas that have lost many of their previous staple industries, impacts can be of considerable socio-economic significance. Overall, and certainly in the UK, the examination of recent projects by the Planning Inspectorate now involves much more emphasis on socio-economic impacts than was the case for OWF projects from 10 years or so ago, and the issue of local impacts and content is becoming a much more significant factor for developers to plan for (see Note 1).

5. Involving key participants in SEIA for major projects

The research programme has involved key participants in the process, both directly and indirectly, using a range of approaches. The SZB study involved the most primary research, with major surveys of workforce impacts and of community perceptions of impacts across the project lifecycle; there were also targeted local sector group studies, for example surveys of local retailers and their interaction with the project. The OWF studies also involved community surveys across the project lifecycle. Both also involved media surveys. In contrast, the HPC research used largely secondary data, but evolving community views were gained from developer-community fora, and other sources such as parish council minutes. The findings from all the research provided valuable and neutral sets of published information for developer and local authority discussions and new outcomes on mitigation and enhancement measures.

5.1 Key stakeholders and power relationships in SEIA for major projects

Most SEIA projects involve a configuration of broadly four groups of interests with associated strategies and perspectives: regulators/consenting authorities; developers; various intermediaries, including consultants, advocates and advisers; and those directly or indirectly affected by a project. Regulators can include various levels of government/government agencies. In England for example, the Planning Inspectorate National Infrastructure Division has the role of examining assessments of what are termed Nationally Significant Infrastructure Projects (NSIPs), including major energy projects. Local authorities also have a significant role. Developers are many and varied. They may be public sector or private sector. They may have a programme of major projects, or they may be undertaking SEIA for a 'one-off' development. For the latter, SEIA may be less familiar, requiring quick learning and good advice. Major developers may have strong in-house teams, whereas single developers may rely very much on external consultancy support. Consultants and other facilitators perform important roles in SEIA. They range from large international firms covering all aspects of the wider EIA to specialist and often-smaller firms focusing on specific impact types (e.g socio-economics). Those directly or indirectly affected by a project also cover a wide spectrum of parties-- statutory and advisory, international agencies to the local area public — with varying power in the process. The stakeholder power relationships for major energy projects may be very unbalanced, with the developer having the resources in contrast to the financially hard-pressed local authority and local interest groups. However, local authorities are important gatekeepers in the process and local community groups can be significant in terms of protest and politics, especially where they see a potentially unfair distribution of costs and benefits emanating from a development. This is particularly so in the evolving business environment which places more and more weight on the importance of Corporate Social Responsibility and the business pursuit of a Social Licence to Operate, in terms of gaining the support and co-operation of host communities (Boutillier 2017). Also, and more recently, the concept of environmental justice has come to the fore in terms of seeking a just energy transition from fossil-fuel systems to more renewables (Scottish Government 2023).

5.2 The example of Community Benefits

The evolving role of Community Benefits Agreements (CBA), sometimes termed Community Benefit Schemes, provides an example of the changing interrelationship of key stakeholders over time and an important research focus for the author (Glasson 2017, 2021). Such agreements between the various project participants, in particular between developer and

host community, can provide a range of benefits, including financial incentives, infrastructure, and community empowerment measures. In terms of justification for such agreements, there are a range of views '*between the extremes of the altruistic where developer philanthropy meets community interests to the cynical and highly sceptical of CBAs as developer bribes to effectively buy a planning consen*t' (Glasson 2021). In practice, arguments include being a good neighbour, paying compensation for impacts, especially for disturbance to local amenity not easily mitigated in the assessment /planning process and distributive justice in recognition of a community's participation in a project perceived as being in the national interest. The researcher identified early examples of community benefits for energy projects in the UK as ad hoc and small. For new nuclear, the Sizewell B 'amelioration programme' was about £600,000. In contrast the HPC projects has a substantial £128mn CBA package, and the proposed UK radioactive waste disposal facility (GDF) will have a very significant additional 'community investment' to help to maximize the benefits associated with hosting such an NSIP. However, the focus here is on the evolving CBAs associated with the many OWFs that are in various stages of development around the UK coast (Glasson 2021).

The UK *onshore* wind farm industry has established a clear and structured approach to community benefits led by Scottish practice where projects currently pay £5000 per installed MW pa, index-linked over the 20-25 years operation and management (O&M) stage of development. In contrast, for *offshore* wind farms, the CBA approach has been more laissez-faire. This approach has support from some commentators (e.g Rudolf et al 2017) who argue that because of the challenges of defining relevant communities, as well as the offshore distance of many projects, there should not be restrictive guidance for this relatively new and technologically evolving sector. A study by Kerr (2017) found that only seven of 24 UK wind farms operational in 2016 had CBAs. A more recent examination by this researcher of the incidence of community benefits in another set of 24 more recent OWF projects, much larger and further offshore, identified double the number of CBAs (Glasson 2021). The growth in the community benefits approach is noted also by the Crown Estate (2019) in its *Offshore Wind Operational Report –'Community benefits schemes are now well established as an integral part of offshore wind energy development – signifying the positive relationship being built between operators and the local communities within which they operate'*. Yet, whilst there is growing acceptance of annual community benefits funding for OWF projects, the level of funding, as calculated per project MW pa, does not appear to have increased and is still very variable. For example, the near shore Aberdeen project has funding of £1500 per MW pa. Other near shore projects have lower funding ranging from £500-£1000 per MW pa, and many larger and mostly more distant offshore projects have even lower rates. This may reflect the negotiating position of key stakeholders in an industry moving further offshore; but all projects

must come ashore and larger projects have greater onshore ancillary equipment and site works.

The researcher has identified some evolving good practice in the distribution of community benefits, in terms of identifying relevant communities, management and focus of schemes (for both socio-economic and environmental local projects). In general, benefit funding from offshore projects tends to have a wider geographical spread when compared with the more locally focused funding for onshore projects, but a much smaller per MW pa payment. However, in terms of the provision of CBAs for offshore wind projects, Glasson (2021) shows there is some evidence of a move from the laissez-faire approach towards a more structured approach, with a widening adoption of an annual community benefits approach. Local communities are reasonably pressing for higher levels of funding support per MW pa (for example see Highlands Council in Glasson 2021, p18-19), and overall there may be some shift in the balance of power relationships between the main stakeholders.

5.3 Working with participants

The Aberdeen OWF research (Glasson et al 2022) highlighted the importance of a positive working relationship between key stakeholders and the empowerment of the local community, as advocated by researchers such as O'Faircheallaigh (2010) and Glucker et al (2013). For example, following from the previous CBA discussion, the researcher worked with the project local community liaison officer on a process to involve the community in developing the Aberdeen community benefits scheme. The Aberdeen research also involved a series of workshops and surveys, at key stages over three years of the project lifecycle, to assess local community perceptions of the project as a whole (Glasson et al 2022). Such key stage studies of major energy projects are sparse, but invaluable (Buchan 2024). Early views during the consenting and pre-construction period included some elements of 'resistance' due to uncertainty about the nature of the project although others sought to get 'on board'. Later views at project completion were generally very positive, with pride in a renewable energy project, although surprise by some on the size of the turbines and their closeness to the shore. The research also uniquely analysed the role of the media over the project lifecycle and narratives formed around press reports, newspaper articles, social media comments and public consultation for the project. There was a major influence at pre-consent by an orchestrated campaign against the project, because of its proximity to a Trump Organisation golf course. However, there was a clear shift from negative to more positive themes (e.g. carbon reduction, job creation) as the project developed (Glasson et al 2022).

Working with the local community and local agencies has also been integral to the research on new nuclear projects (Glasson 2005). For example, the longitudinal Sizewell B research

had several primary data sources including two-yearly surveys of major samples of the construction workforce, to provide snapshots of worker characteristics (expenditure patterns, use of local facilities etc), and of the host Leiston population, involving local A-level students as surveyors, to provide snapshots of the changing local perceptions on project impacts. There were also targeted surveys of potentially impacted local sectors including housing and retailing, and the construction workforce and their next steps at the end of contracts (Glasson and Chadwick 1997) (see s6). In contrast, the shorter and less resourced HPC research largely focused on publicly available but still very useful information, much of which came from the developer, EDF energy (Glasson et al 2022). This did include regular reports from developer-community site and transport liaison committees. When taken together with other sources, including for example local authority and parish council minutes, this provided a useful window into impact issues from a community perspective, such as the level of local job take-up, pressure on the housing rental market, and fear of crime. Overall, the research on both OWF and new nuclear has highlighted and provided new insights regarding the importance of early and continuing engagement with and empowerment of the community at large and for sub-groups of that community. The growing importance of CBAs is one facet and vehicle for developer-community interaction.

6. Advancing the importance of follow–up (monitoring and auditing) and adaptive assessment and management

6.1 Importance and role of follow–up in SEIA

A key element in the researcher's publications is advancing the importance of monitoring and auditing of socio-economic impacts. As in most aspects of life, we should learn from follow-up experience. This is particularly so when we are dealing with the assessment of the impacts of major projects where uncertainty and complexity are key features. A 2019 report by the UK National Infrastructure Projects Association (NIPA 2019) stressed the need for better follow-up activity for UK national infrastructure for better decision-making and project implementation, and highlighted the Oxford Brookes work led by the author. Follow-up can provide evidence on the accuracy of predictions, the implementation of conditions, and indeed the utility of particular monitoring and auditing processes, which in turn can help to improve the management of projects through their lifecycle and provide evidence-based learning for future projects (as the work on HPC is currently providing for SZC). Yet, for many years, this obvious follow-up activity has been the Achilles heel of project impact assessment (Jones and Fischer 2016). In the international *Handbook of EIA* Glasson (2022) identifies key structural and procedural barriers to effective follow-up. Structural barriers include for example, the lack

of mandatory legislation/regulations, resource implications and the absence of independent auditing. Some of the procedural barriers include the difficulty of detailing key impact indicators, then accessing good monitoring data and applying clear auditing criteria. All of this can be set in the context of an adaptive approach, as advocated by Holling (1978), who recommended periodic reviews of the assessment through a project's lifecycle, with a *'predict, monitor and manage'* approach. The case studies led by the researcher have provided leading examples of approaches to monitoring and auditing of major energy projects, advancing processes and methods for adaptive assessment and management as set out in the following sections 6.2 and 6.3.

6.2 Evidence-based approaches to SEIA follow-up and an adaptive approach for new nuclear

The SZB study provided a valuable research opportunity to comprehensively monitor and audit the local socio-economic impacts of a construction project over a long period, as summarised in Glasson 2005. It has been widely used in subsequent UK new nuclear power station impact assessments. The detailed findings were published in independent annual monitoring reports, with a consolidated report in 1995 (Glasson and Chadwick 1995). They provide evidence on the accuracy of predictions and examples of adaptive assessment and management using the research findings. The article by Chadwick and Glasson (1999) presents the findings of a post-auditing study comparing the Sizewell B socio-economic predictions with actual impacts. Out of a total of 69 socio-economic and traffic predictions identified in the inquiry inspector's report, 60% were either within predicted ranges or accurate to within 20% of predicted values, but 14% had errors of more than 50%. Some explanations of predictive inaccuracies included project modifications, length of project authorisation and inadequacies in predictive techniques, assumptions and baseline studies.

A major modification to the SZB project, with the addition of a 1200m perimeter wall for hydraulic protection, necessitated the use of a larger workforce later in construction with many implications and impacts. For example, research monitoring revealed increasing pressure on the local housing market. A key management response was to increase by 50% the capacity of the purpose built site worker accommodation. The extra workforce demand also threatened to undermine the commitment to 50% local recruitment; an accelerated training programme, complemented by a skills audit of the local labour market, helped to maintain quite high levels of local recruitment throughout the project. As noted in s4, major projects can also have crime issues. At SZB, there was an early and locally sensitive issue of worker drink driving offences in the local community. Monitoring quickly identified the issue and management steps followed, including the provision of minibus transport to the local pubs in Leiston, the (interesting) provision of a bar on site, and loss of job if prosecuted. Subsequent monitoring

showed that these measures were very effective with numbers of arrests falling off fast at the same time that the workforce numbers were increasing rapidly towards peak. Another looser assumption about the project was that there could be a dangerous local 'boom-bust scenario' at the end of project construction and into a much lower operational employment regime, flowing from the level of local recruitment. The study by Glasson and Chadwick (1997) explored this with a survey of the destinations of around 500 local ex-SZB employees. Findings Indicated that, even in a rural location in a period of recession, two thirds of respondents were back in employment again within 12 months, mainly in East Anglia. The study also explored locally perceived impacts via various barometers of local opinion. As noted in s5 for offshore wind, these included local press coverage, local liaison arrangements, complaints procedures and direct survey of local residents. Sample surveys of approximately 250 local residents per survey at two stages in the project life indicated a learning to live with the project, perhaps partly reflecting its inevitability and adjustment to impacts, but perhaps also the better management of its impacts in the community.

The HPC project (Glasson et al 2021) provides evidence from a more recent research study and indeed current research with a second study of peak construction impacts still ongoing. This article refers to findings from the first study of early construction. Unlike Sizewell, it is an example of a more tightly resourced 'follow-up light' approach relying primarily on publicly available information, supplemented by interviews with key participants. The research covered six socio-economic and biophysical impact sectors: economic development, transport, social and community, accommodation, environmental health, and the biophysical environment. For each, the research involved three main steps – identifying key impact indicators, establishing impact findings and monitoring trends, and auditing those findings and trends against predictions. The research used a simple colour coding system to present the audited findings (e.g. green – predictions very accurate with actuals; fully compliant with conditions/obligations). This approach has proved very useful in conveying findings to key participants and more widely. The findings showed some good performance against predictions in many areas, such as local employment content, apprenticeships, and local supply chain content, use of organised coach travel to site, and limited impact on crime and health services locally. These partly built on learning from SZB, including internalising health impacts via an on-site medical campus, and a worker code of conduct for interaction with the local community. The research also identified some significant gaps between predicted and actual impacts. For example, in-migrant workers were much more concentrated in the town of Bridgwater than predicted and much more in the private rented sector, causing much local concern. The monitoring also revealed some surprise and unpredicted issues. One, in particular, workforce flyparking in residential areas in villages close to the site has caused

most of the local complaints and a concerted response by the developer to manage better its workers.

The HPC research, as for SZB, helped to clarify factors behind both the positive and the more negative findings. For example, the Bridgwater accommodation issue was partly due to the late completion of purpose built accommodation campuses. Similarly, the late completion of a temporary jetty into the Severn Estuary meant more heavy goods traffic by road to the site. The research also identified some weaknesses in the organisation and resourcing of the monitoring and auditing activities for the project between the developer and the local authorities. Highlighting problems especially in monitoring accommodation and environmental impacts led to re-organisation of the accommodation monitoring group and establishment of an environmental monitoring group. The research also drew out some wider recommendations for future new nuclear developments and other NSIPs. In particular, there are major pointers for impacts and impact monitoring and management for the future SZC project, which is a duplicate of the HPC project. Wider lessons relate to the better clarification of monitoring indicators and organisation in the ES and their securing in the Development Consent Order (DCO) (Note 1), clear timings on the delivery of key associated projects such as accommodation campuses, and the production of clearly structured and publicly available monitoring and auditing reports throughout the project lifecycle.

6.3 Evidence-based approaches to SEIA follow-up and an adaptive approach for offshore wind

Offshore wind farm research (Glasson et al 2022) included a broad survey of the coverage of socio-economic impacts in ESs for recent large OWF projects in the UK and in various EU states (see s5). In addition, there were detailed case studies of the Aberdeen project, in particular, and the Beatrice project off the NE coast of Scotland and the major Hornsea array (1-4) off the Yorkshire coast. Some of the findings are briefly set out in s4.4. The focus here is on the relationship between predicted and actual impacts. The emphasis in the ESs reviewed is on construction stage employment especially on supply chain and Gross Value Added (GVA) impacts. Developers use a high/medium/low scenario approach claiming this is because of uncertainty of port location, supply chain sourcing and evolving OWF technology limiting predictions. As such, there is a certain vagueness in predictions, but generally the ESs assess local construction stage economic impacts as positive but of medium/minor significance, and for the O&M stage as almost always positive but minor.

The detailed Aberdeen study monitored offshore and onshore construction and O&M stage employment and contracts expenditure. The project ES predicted c150 pa local construction

over a two year period and c25-30 pa local over the 25 years O&M stage. In practice, the research showed that from the 200pa actual offshore construction workforce around 80% came from other European countries (mainly Netherlands), living on installation vessels, and only about 10% were British, with a very small Scottish contingent. In contrast, about 60% of the onshore construction staff, working on sub-stations etc, were local as were those working on the O&M stage. A caveat is the small, 98MW, size of this project and the short construction period, relying on established contracted personnel. Yet overall, there was over-prediction in the ES for offshore local construction, and under-prediction for O&M.

In contrast, the Hornsea array that, once fully developed, will be one of the largest OWF clusters worldwide at 7GW, displays some of the advantages of scale economies and hub status. The cumulative impacts of overlapping Hornsea projects, with predicted c1000 local construction jobs each, and around 300 O&M local jobs each, have encouraged the development of various levels of local training programmes to support local jobs, an O&M supply base at Grimsby, and auxiliary supply chain firms on Humberside (e.g. Siemens blade factory). The PINS examination of Hornsea 2 led by the researcher also resulted in the addition of a requirement for a local Skills and Employment Plan in the DCO[1] (PINS 2015), as a management measure to increase local employment. The social impacts of OWFs receive only limited consideration in ESs, yet local perceptions can be important considerations for developers and local authorities in the planning and management of a project. The Aberdeen approach, involving considerable developer engagement with the community and the evolving perceptions over the project, has been referred to in s5.

In summary, the monitoring and auditing of the actual socio-economic impacts of the implementation of major projects, in comparison with the predicted impacts, has been the Achilles heel of impact assessment. The author has explored the structural and procedural barriers to effective monitoring and auditing; his case study research has provided an important evidence base of actual impacts across the construction stage and into operation for major nuclear new build and offshore wind farms, with explanations of key determinants of the findings. The research has involved the implementation of both in depth and light touch innovative research approaches, reflecting a major influence on such activity – the availability of resources. The findings have provided evidence to support changes in practice to impact mitigation and enhancement measures, as part of an adaptive assessment and management approach.

7. Overall conclusions and recommendations on future research directions

7.1 Critical reflections

The research that underlies the set of publications has used a range of methodologies including literature reviews, surveys of participant groups, surveys of practice (especially the content of ESs), key case studies of a set of new nuclear and offshore wind energy projects, and personal experience in carrying out SEIA studies and officially examining proposed developments. However, it is important to recognise some limitations of the research.

Whilst the literature context is set widely, the researcher's case studies are mostly UK based, although the offshore wind farm research did include a set of projects from several EU Member States. The new nuclear studies are also a very small set, but that reflects where we are at with new UK nuclear power station projects that have moved from prediction to implementation over the last 30 years. The offshore wind farm cases used in the research are more numerous, reflecting the UK leading role in this renewable energy technology over the last 15 years (Wind Europe 2023).

The research has also focused on energy projects. There are of course a lot more types of NSIPs where, for example, the socio-economic impacts may have a different configuration; for example, major leisure and retail projects, with smaller construction stage impacts but much larger and more wide-ranging operational stage impacts. The research has sought to identify the impacts on various population groups affected by projects, but there is scope for a much more disaggregated population assessment.

Despite these limitations, the research provides significant and original contributions to knowledge as presented in s7.2.

7.2 Overall conclusions and summary of the original contributions to knowledge, and influence on policy and practice, of the works

The researcher has documented and sought to advance, over several decades, *the need for SEIA* as an essential contribution to a more holistic approach to EIA that raises the profile of impacts of major projects on people in their local communities. The need is particularly marked when the projects are large and controversial, such as major energy projects. The research is a response to the position noted in Glasson 1984 where 'd*uring the proposals stage, questions are raised about many aspects of power station development and frequently questions about economic and social effects are inadequately answered because of the paucity of information available*. *Estimates may be made which are often, at best, wide of the mark and sometimes completely misleading'.*

In response to those criticisms and gaps, the researcher has analysed, developed and documented *approaches to the SEIA process and methodology*, particularly drawing on applications in the energy project case studies. This work has included the development and application of a detailed economic impact methodology, coupled with a widening of the scope of coverage with work on aspects of socio-cultural impacts. The researcher has sought to identify and model interlinkages between economic and social impacts as a guide to better prediction, highlighting the central importance of the local and non-local worker mix in the construction workforce. The research has explored important variations in impacts between, and indeed within, the construction and operational stages in project lifecycles, the importance of considering both actual and perceived impacts, and key determinants of impacts.

The researcher's work has also focused on exploring the involvement of *key stakeholders and the power relationships in SEIA for major projects.* The importance of and a range of methods for working with key stakeholders, including the developer, the local community and local agencies, have been developed through the case studies. The particular case of the evolution of approaches to Community Benefits Agreements, especially for OWFs, has provided an example of some shift in the power relationship between the participants. Developers are becoming more aware of the need for a social licence to operate, and SEIA can be an important vehicle in providing key impact indicators and evidence for all participants.

The researcher's work has in particular *raised the profile of the vital follow-up step in the SEIA process.* The lack of implementation evidence has been an Achilles heel in the process. The researcher has provided evidence on actual and perceived impacts to audit predictions. This has involved the development and application of a range of full and light touch monitoring and auditing approaches derived from case study applications and examination of international best practice. Finally, the research has promoted and provided findings on the importance of an adaptive *'predict, monitor and manage' approach* to SEIA and to EIA more generally.

This generation of new knowledge regarding SEIA by the author has also led to a contribution to practice. *A wide range of stakeholders (especially project developers, consultants and local authorities)* working on major energy projects are using the researcher's work in impact studies and for more informed decision making, which results in better outcomes both for the project and for local communities. Buchan (2024) sees –'*The EOWDC programme as a strong example of how academia and industry can work together to develop the evidence base on social impact'* (p82). The researcher continues to be an active contributor to practice workshops and conferences, most recently in May 2024 to the DLUHC NSIP Centre of Excellence Conference, presenting on *Assessing the Effectiveness of NSIP EIA Predictions in Practice,*

The researcher's work has been an Impact Case Study in the last two Research Excellence Framework (REF) exercises. Some examples of practice comments from the most recent REF include:

- John Pitchford, former Chief Planner, Suffolk CC (re SZC project): '*The consequence of this work* (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.*
- Julia Pyke (EDF Energy Project Director, HPC and SZC) *: 'The local Socio Economic Impacts assessment of constructing Hinkley Point C Power Station 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'*

7.3 Recommendations for future research.

The research demonstrates the importance of socio-economic impact assessment, especially in relation to major energy projects, and provides a foundation for some recommendations for further research activities -- divided here into project and process foci.

Project focus

The research demonstrates the critical importance of assessing variations in impacts over the project lifecycle. Yet, there is need for further research of other stages of the project lifecycle, especially decommissioning, and on the rapid expansion of the UK transmission grid over the next 20 years. The researcher has already undertaken some research on the socio-economic impacts of the decommisioning of nuclear and non-nuclear power stations, but not of OWFs. The latter will become more numerous as early projects come to the end of their 20-25 year lives and there will be need for decisions on repowering, rescaling or removal options (Wind Europe 2023).

The researched energy sectors may be subject to considerable change in the next few years and beyond. If UK government plans materialise, Sizewell C may be another major new nuclear project. However, what comes after that – will there be more large nuclear projects and/or small modular reactors? Similarly, and already happening, technological change in offshore wind may be significant, with a shift to a greater role for floating offshore wind farms

to take advantage of deeper-water locations. What might be the socio-economic effects of such evolving technologies?

The focus of the research has been in the UK. There is further scope for some new nuclear comparative work across countries. The scope is probably greater for offshore wind, with a rapid build-up, not only in Europe, but also now in countries such as the USA and Australia, and especially China (although likely research access issues there).

Research and practice in SEIA is advancing probably faster in the energy sector than in many other sectors. Another research topic is an examination of the transferability of approaches, methods and findings between sectors, including for example to conventional major projects: transport, water and waste, housing, retail and leisure; but also to newer big projects such as big data services/complexes and laboratories, electric battery giga factories; desalination plants etc.

Process, methodology and policy focus.

There is scope for researching and developing a more disaggregated approach to community impacts exploring for example the socio-economic impacts of major project development for different groups e.g. age, gender, socio-economic status and interest groups. What factors influence how different groups experience and perceive impacts, including the evolving role of media? Can technology improve stakeholder participation, for example through more digital systems and data visualisation (Fonseca 2022)?

As the number of OWFs grow in particular locations, so do the cumulative impacts. What is the nature of cumulative socio-economic impacts and the scope for management in the best interests of coastal communities? In addition, how might OWF developments contribute to a just transition in areas suffering from a decline in other energy sectors (e.g oil and gas in Scotland, and other coastal industries more widely) (Scottish Government 2023).

The research has shown how Community Benefits Agreements are becoming important in the energy sectors, partly to offset the perception of major energy projects bringing national gain but local pain. However, there is concern about variations in practice, potential overlapping schemes (e.g between energy generation and transmission projects), and perhaps a need for a more common approach. Further research on evolving practice would be useful.

Finally, the research has highlighted the importance of systematic monitoring and auditing for an adaptive SEIA and management, but has also identified related structural and procedural challenges and potential barriers, in particular additional financial and human resource

requirements. The UK government is currently considering ways to improve monitoring, as set out in the *Levelling Up and Regeneration Act* (DLUHC 2023). The HPC study provides one example of a light touch, yet relatively efficient and independent, SEIA monitoring and auditing system. Further research on monitoring and auditing systems in different sectors and in different countries could help in the further development of follow-up systems for major projects.

As a last note, with a change in UK government (July 2024), it is timely to consider some possible messages for the new government, for developers and for assessment and planning practitioners more generally. With a clear government focus on economic growth, partly driven through support for energy transition via major infrastructure projects, including offshore wind and new nuclear, SEIA can make ever more important contributions. The author has already addressed the Council of the National Infrastructure Projects Association in late July 2024 on such potential contributions. A rigorous evidenced based SEIA drawing on for example some of the author's research findings, can contribute to a more holistic appraisal of project impacts. Such appraisal needs to recognise the interlinkages between economic and social impacts, and the significant role of key determinants -- for example the significance of percentage of local employment in determining construction stage impacts. NPS EN-1 (2024) in the note below (2) shows some recognition of such interlinkages for the appraisal of impacts of major energy project. By anticipating potential socio-economic issues over the project lifecycle, project adaptations through mitigation and enhancement measures, exemplified in this research, can help to minimise project delays. Such adaptations for example include to worker accommodation, travel mode, medical support and codes of conduct for project-community interactions. The more systematic inclusion of community benefits can also lead to a fairer distribution of costs and benefits in the host communities, and help to offset, at least in part, any 'local pain' from the 'national gain' of such projects. Finally, as noted in the previous paragraph in relation to future research, better monitoring and auditing of actual impacts is essential and the research illustrates some of the potential of different approaches.

Notes

1. Development Consent Order (DCO) is the term used under the 2008 Planning Act in England for the 'planning permission' associated with Nationally Significant Infrastructure Projects (NSIPs), such as energy, transport, water and waste projects.

2. NPS EN-1 (2024) - The applicant's assessment should consider all relevant socio-economic impacts, which may include:

- the creation of jobs and training opportunities. Applicants may wish to provide information on the sustainability of the jobs created, including where they will help to develop the skills needed for the UK's transition to Net Zero

- the contribution to the development of low-carbon industries at the local and regional level as well as nationally
- the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities
- any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains
- effects (positive and negative) on tourism and other users of the area impacted
- the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development.

.

References

Boutillier, R (2017), A measure of the social license to operate for infrastructure and extractive projects, Simon Fraser University, Centre for Sustainable Development.

Bronfman, L, M (1991), Setting the social impact agenda: an organisational perspective. Environmental Impact Assessment Review (EIAR), 11, 69–79.

Brownrigg, M (1980), 'Industrial contraction and the regional multiplier effect', Town Planning Review (TPR), 51, 195-210.

Buchan, P (2024), The Social Impacts of Marine Developments: A Report for the Crown Estate. The Crown Estate/University of Exeter.

Canter, L (1996), Environmental impact assessment: 2nd edition. London: McGraw-Hill

Chadwick, A. and J. Glasson, (1999), 'Auditing the Social and Economic Impacts of a Major Construction Project: the Case of Sizewell B Nuclear Power Station', Journal of Environmental Planning and Management (JEPM), 42 (6) 811-836

Chadwick, A and J, Glasson (2018), `Social Impacts' (with A. Chadwick): in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition). 515-545.

Clark, B et al (1981), A manual for the assessment of major development proposals. London: HMSO

Crown Estate (2019), Offshore Wind Operational Report 2018. London: Crown Estate

Department for Energy Security and Net Zero (DESNZ) (2024), National Policy Statement (NPS) Energy (EN-1), London: HMG

Department for Land Use Housing and Communities (DLUHC) (2023), Levelling Up and Regeneration Act. London: HMG

EC (2023), European Sustainability Reporting Standards. Brussels: EC

EU (2014), Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and

private projects on the environment**.** Brussels: *Official Journal of the European Union*, L 124, 25 April 2014.

EU (2017), Guidelines on the preparation of the EIA Report*.* Brussels*:* EU.

Finsterbusch, K (1985), 'State of the art in social impact assessment'. Environment and Behaviour 17(2), 193–221

Fonseca, A (2022), 'The benefits and perils of digital and automated technologies: impact assessment in the fourth industrial revolution' in Fonseca, A (ed) (2022), Handbook of Environmental Impact Assessment, Elgar: Cheltenham

Fonseca, A (ed), (2022), Handbook of Environmental Impact Assessment, Elgar: Cheltenham

Glasson, J (1984), 'Local Impacts of Power Station Developments', in D. R. Cope, P. Hills and P. James (eds.), Energy Policy and Land Use Planning: An International Perspective, Pergamon Press, Oxford, 123-147.

Glasson, J, Barrett, B and M. Van der Wee (1988), `A Local Income and Employment Multiplier Analysis of a Proposed Nuclear Power Station Development at Hinkley Point in Somerset', Urban Studies, 248-261.

Glasson, J and D, Heaney (1993), 'Socio-Economic Impacts: the Poor Relations in British EISs', JEPM, 36(3) 335-343.

Glasson, J, Therivel, R and A, Chadwick (1994), Introduction to Environmental Impact Assessment, UCL Press: London (first Edition).

Glasson, J and A, Chadwick (1995), The local socio-economic impacts of the Sizewell B PWR power station construction project 1987-1995: summary report, IAU: Oxford Brookes University.

Glasson, J and A. Chadwick, 'Life after Sizewell B', (1997), TPR, Vol. 68, (3) 325-345.

Glasson, J (2003), 'The widening local and regional development impacts of the modern universities – UK North-South perspectives', in Local Economy, 18(1), 21-37.

Glasson, J, (2005), 'Better monitoring for better impact management: the local socio-economic impacts of constructing Sizewell B nuclear power station', IAPA, July (05) 215-226.

Glasson, J and P. Cozens, (2011), 'Making communities safer from crime: an undervalued element in impact assessment', EIAR, 31, 25-35.

Glasson J, (2017), 'Large Energy Projects and Community Benefits Agreements - some experience from the UK', EIAR, 65, 12-20.

Glasson, J, (2018), `Socio-Economic Impacts1: Overview and Economic Impacts', in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition) 475-514.

Glasson, J and R. Therivel (2019), Introduction to Environmental Impact Assessment, Routledge: London (5th Edition).

Glasson J, (2021), 'Community Benefits and UK Offshore Wind Farms: Evolving Convergence in a Divergent Practice', Journal of Environmental Assessment Policy and Management (JEAPM), 22, 1-28.

Glasson J, Durning B, Broderick M, Welch K (2021), 'Monitoring and auditing the local socio-economic and environmental impacts of the early stage construction of Hinkley Point C Nuclear Power Station, UK', IAPA, 39 (2) (2020) 84-95.

Glasson J, (2022), 'Follow-up: post-decision learning in EIA', in Fonseca, A (ed), Handbook of Environmental Impact Assessment, Elgar: Cheltenham, 198 -218.

Glasson J, Durning B, Welch K, Olorundami T (2022),'The local socio-economic impacts of offshore wind farms, EIAR, 95.

Glucker, A, N, Driessen, P, Kolhoff, H and Runhaar, H (2013). 'Public participation in EIA: why, who and how?' EIAR, 43, 104-111.

Holling, C, S (ed) (1978), Adaptive environmental assessment and management. New York: Wiley.

IFC (International Finance Corporation) (2012), Performance Standards on Environmental and Social Sustainability. Washington: IFC, World Bank Group

Jones, R and Fischer, T (2016),'EIA follow-up in the UK: A 2015 update'. JEAPM, 18(1), 1-22.

Kerr, S, Johnson, K and Weir, S (2017), 'Understanding community benefits payments from renewable energy developments'. Energy Policy, 105, 202-211.

Lawton-Smith, H, Glasson, J and A, Chadwick (2005), 'The Geography of Talent: Entrepreneurship and Local Economic Development in Oxfordshire', Entrepreneurship and Regional Development, 17 (6), 449-478.

Morrison-Saunders, A (2018), Advanced Introduction to EIA. Cheltenham: Elgar.

NEPA (National Environmental Policy Act) (1970).42 USC4321-4347,1 Jan as amended.

National Infrastructure Projects Association (NIPA) (2019), Towards a Flexibility Toolkit: Supporting the Delivery of Better National Infrastructure Projects. London: NIPA Insights Project Board.

O'Faircheallaigh, C (2010), 'Public participation and EIA: purposes, implications and lessons for policy making.' EIAR 30, 19-27

Pinto, E, Morrison-Saunders, A, Bond, A, Pope, J and Retief, F (2019), Distilling and applying criteria for best practice EIA follow-up'. JEAPM, 21(02).

Rodriguez-Bachiller, A with J, Glasson (2004), Expert systems and geographical information systems for impact assessment. London: Taylor and Francis.

Rudolf, D, Haggett, C and Aitken, M (2017), 'Community benefits from offshore renewables: the relationship between different understandings of impact, community and benefit.' Environment and Planning C: Politics and Space, 36(1)

Scottish Government (2018), Good practice principles for community benefits from offshore renewable energy developments. Edinburgh: Scottish Government.

Scottish Government (2023), Draft Energy Strategy and Just Transition Plan. Edinburgh: Scottish Government.

Therivel, R and G. Wood, (eds.) (2018), Methods of Environmental and Social Impact Assessment, London: Routledge.

Tyndall Centre (2013). A review of research relevant to new build nuclear power plants in the UK. Tyndall Manchester and Tyndall Centre Sussex.

UNECE (United Nations Economic Commission for Europe) (1991), Policies and systems of environmental impact assessment. Geneva: UNECE

Vanclay, F (2015), 'Changes in the impact assessment family 2003-2014: implications for considering achievements, gaps and future directions'. JEAPM 17(1).

Vanclay, F et al (2015), Social Impact Assessment: Guidance for assessing and managing the social impacts of projects. Fargo, USA: IAIA

Wind Europe (2023), Wind energy in Europe: 2023 Statistics and the outlook for 2024-2030. Brussels: Wind Europe.

Wolf, C, P (ed.) (1974). Social impact assessment. Washington, DC: Environmental Design Research Association.

Wood, D and J. Glasson (2006), 'Giving the Environment a Voice: the Transformational Potential of Valuing Tourism in Sensitive Natural Environments-the Case of the Ningaloo Coastal Region, Western Australia'. Planning Practice and Research, 20(4), 391-407.

World Bank (2017). Environmental and Social Framework. Washington DC: World Bank.

The evolving approach to the assessment of the local socio-economic impacts of major energy projects – with particular reference to UK new nuclear and offshore wind projects

John Glasson

PUBLICATIONS (Volume 2 of 2)

Submitted for the Degree of Doctor of Philosophy by Published Work

Lancaster Environment Centre
Lancaster University

October 2024

List of publications

The research programme is set out and demonstrated through the publications listed below as part of a submission for PhD by Published Work at Lancaster University. E-links to copies of the articles and chapters are set out in the order of the listing below.

Evolution of SEIA: nature, process, scope, methodology and participants
(IF= Impact Factor of Journal)

Glasson, J (1984), 'Local Impacts of Power Station Developments', in D. R. Cope, P. Hills and P. James (eds.), Energy Policy and Land Use Planning: An International Perspective, Pergamon Press, Oxford, 123-147 (Citations :5).

Glasson, J and D, Heaney (1993), 'Socio-Economic Impacts: the Poor Relations in British EISs', Journal of Environmental Planning and Management, 36(3) 335-343 (IF: 4.4; Citations: 85)

Glasson, J, (2018), `Socio-Economic Impacts1: Overview and Economic Impacts', in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition), 475-514 (Citations: 89)

Chadwick, A and J, Glasson (2018) `Social Impacts' (with A. Chadwick): in R. Therivel and G. Wood, (eds.), Methods of Environmental and Social Impact Assessment, Routledge, London (4th edition), 515-545 (Citations: 6)

Glasson, J, Barrett, B and M. Van der Wee, (1988) `A Local Income and Employment Multiplier Analysis of a Proposed Nuclear Power Station Development at Hinkley Point in Somerset', Urban Studies, 248-261 (IF: 4.2; Citations: 31)

Glasson, J and P. Cozens, (2011) 'Making communities safer from crime: an undervalued element in impact assessment', EIA Review (EIAR), 31, 25-35 (IF: 7.9; Citations: 62)

Glasson J, (2017) 'Large Energy Projects and Community Benefits Agreements - some experience from the UK, EIAR, 65, 12-20 (IF: 7.9; Citations: 24)

Glasson J, (2022) 'Follow-up: post-decision learning in EIA', in Fonseca, A (ed), Handbook of Environmental Impact Assessment, Elgar: Cheltenham, 198 -218 (Citations: 7)

Case studies: major UK energy projects – new nuclear and offshore wind

Glasson, J, 2005 ‘Better monitoring for better impact management: the local socio-economic impacts of constructing Sizewell B nuclear power station’, Impact Assessment and Project Appraisal (IAPA), July (05) 215-226 (IF: 1.8; Citations: 46)

Glasson J, Durning B, Broderick M, Welch K, (2021), 'Monitoring and auditing the local socio-economic and environmental impacts of the early stage construction of Hinkley Point C Nuclear Power Station, UK, ' IAPA, 39 (2), 84-95 (IF: 1.8; Citations:5)

Chadwick, A. and J. Glasson, (1999), Auditing the Social Economic Impacts of a Major Construction Project: the Case of Sizewell B Nuclear Power Station, Journal of Environmental Planning and Management, 42 (6), 811-836 (IF: 3.371: Citations: 20)

Glasson, J and A. Chadwick, Life after Sizewell B, (1997), Town Planning Review, Vol. 68, (3) 325-345 (IF: 1.6; Citations:3)

Glasson J, Durning B, Welch K, Olorundami T, (2022), 'The local socio-economic impacts of offshore wind farms, EIAR, 95, 1-11 (IF: 7.9: Citations: 33)

Glasson J, (2021), 'Community Benefits and UK Offshore Wind Farms: Evolving Convergence in a Divergent Practice’, Journal of Environmental Assessment Policy and Management, 22, 1-28 (IF: 1.29: Citations: 8)

Evolution of SEIA: nature, process, scope, methodology and participants


scan_20240710112116 --Local Impacts of I


Socio economic impacts the poor rela


13 Economic final (1).docx


14 Social final (4).docx


HP--1988 Multipier article.docx


EIR5659 Crime and EIA.pdf


1-s2.0-S0195925516303092-main Large En


scan_20240710131154 --Glasson 2022 --EIA

Case studies: major UK energy projects—new nuclear and offshore wind


Better monitoring for better impact manage


scan_20241016164927.pdf


scan_20240710125355 Chadwick and Glass


Monitoring and auditing the local soci


1-s2.0-S0195925522000049X-main OWFS So


S1464333221500010 (7) --Community Bene