Historic England

Commercial Renewable Energy Development and the Historic Environment

Historic England Advice Note 15

Summary

This Historic England Advice Note describes the potential impacts on the historic environment of commercial renewable energy proposals, which could occupy large areas of land or sea. It is written for all of those involved in commercial renewable energy development, helping them to give appropriate consideration to heritage issues.

Technologies covered include large-scale development proposals for wind power, solar photovoltaics (PV) and biomass and energy from waste (EfW). Not all biomass and EfW is renewable; however, at least a proportion of the energy generated by some facilities that burn biomass and waste is considered renewable, depending on the design of the facility and the characteristics of its fuel supply.

The Advice Note includes consideration of Nationally Significant Infrastructure Projects (NSIPs). Also it covers other large-scale proposals that do not meet the criteria for inclusion in the NSIP regime, but which require assessment under Environmental Impact Assessment (EIA) regulations to determine what harm might be caused, including to cultural heritage, and whether this can be avoided or reduced.

Section 1 gives an overview of the renewable energy market trends and key drivers, and outlines relevant decision-making processes. Section 2 describes the main historic environment considerations associated with commercial renewable energy development. Section 3 describes the different types of commercial renewable power generation schemes onshore and offshore, including further consideration of links that occur between offshore and onshore environments.

This document has been prepared by Guy Robinson informed and supported by a range of colleagues within Historic England.
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Front cover: Construction of Westermost Rough Offshore Wind Farm, off the Yorkshire coast, in May 2015
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1 Context.

Introduction to this Advice Note

1. Commercial renewable development can occupy large areas of land or sea and be proposed in locations where the impacts of the proposal and its relationship with the historic environment merit careful consideration.

2. This Advice Note is written for planning officers, local and national heritage professionals, planning consultants, those in the renewable energy industry, community groups (including neighbourhood planning groups) and other interested parties. Its purpose is to explain how the historic environment is taken fully into account during the planning and delivery of commercial renewable energy developments.

3. The Advice Note covers historic environment issues relating to different types of commercial renewable energy development proposals, including:

- wind power (onshore and offshore)
- solar photovoltaics (PV)
- biomass and energy from waste (EfW), noting that not all biomass and EfW is renewable; however, at least a proportion of the energy generated by some facilities that burn biomass and waste is considered renewable, depending on the design of the facility and the characteristics of its fuel supply

4. The Advice Note does not cover small-scale domestic projects or other microgeneration projects, for which other advice exists including Energy Efficiency and Historic Buildings: Solar Electric (Photovoltaics) and Heat Pumps: Energy Efficiency in Historic Buildings. It also does not cover wave and tidal development, the issues from which are considered in Tidal Range Developments: Considerations for the Historic Environment published in March 2018, which is in part informed by an earlier publication entitled Historic Environment Guidance for Wave and Tidal Energy. Both of these references and others are included in section 4 on references and further reading.

5. This Advice Note is intended to support the implementation of historic environment legislation, national policy and related guidance. It can usefully be read in conjunction with relevant Good Practice Advice and other Historic England Advice Notes. Alternative approaches may be acceptable, provided they are demonstrably compliant with legislation and national policy.

Renewable energy and climate change

6. In 2019 there was a continuation of the switch in the main sources of electricity generation away from coal and gas to renewables. Renewables' share of power generation reached a record high level of 37.1% in 2019 [BEIS, 2020]. Increasing the pace of decarbonisation is crucial to international and national agreements to tackle climate change, as outlined in Box 1.

7. Contributing to this switch away from coal and gas is a reduction in the cost of renewable energy technology, which in turn is increasing the number of proposals coming forward. For more information on technology costs and associated trends, refer to the government's Clean Growth Strategy.

BOX 1: Renewable energy development and climate change

Renewable energy development makes an important contribution to measures that reduce carbon emissions and help to tackle climate change.

Internationally, the Paris Agreement was adopted by parties to the United Nations Framework Convention on Climate Change in 2015 and ratified the following year. Implementing guidelines for the Paris Agreement were agreed in Poland in late 2018.

In the UK the Climate Change Act 2008 committed the UK to reducing greenhouse gas emissions by at least 80 per cent by 2050 when compared to 1990 levels. In 2019 the government signed legislation committing the UK to a legally binding target of net zero emissions by 2050. This is to be delivered by setting carbon budgets, which are five year caps on greenhouse gas emissions.

In its 2020 Progress Report to Parliament, the UK's Committee on Climate Change noted that the UK's domestic emissions have fallen consistently since the Climate Change Act was passed in 2008, and continue to fall, though progress towards future carbon budgets remains off track.

Set in this context, there are clear drivers for further action to meet the net zero target, and for further work on the priority risk areas that have been identified in the UK Climate Change Risk Assessment.

This Advice Note is written with the expectation of an increase in the number of commercial renewable energy development proposals coming forward, and forms part of Historic England's response to the issues arising from climate change and its support for sustainable development.

National policy

8. National policy for renewable energy development is set out in a range of different documents, including:

- National Policy Statements (NPSs), covering proposals for Nationally Significant Infrastructure Projects (NSIPs). The National Policy Statement for Renewable Energy Infrastructure, 2011 (EN-3), taken together with the Overarching National Policy Statement on Energy (EN-1), provides the main framework for decisions on renewable energy NSIPs. The National Policy Statement for Electricity Networks Infrastructure (EN-5) is also relevant for related development; for example, the routeing of new overhead lines and the approach taken with underground power lines

- National Planning Policy Framework (NPPF), setting out government's planning policies for England and how these are expected to be applied. The NPPF provides a framework within which locally-prepared plans for housing and other development can be produced, and is supported by Planning Practice Guidance (PPG)

- National Planning Policy for Waste (NPPW), noting that waste can be used as a fuel to generate energy. The NPPW sets out national waste planning policies and should be read in conjunction with the NPPF, the Waste Management Plan for England and National Policy Statements for Waste Water and Hazardous Waste, or any successor documents. The NPPW is also supported by relevant PPG

- UK Marine Policy Statement, providing the framework for preparing Marine Plans and taking decisions affecting the marine environment

Nationally Significant Infrastructure Projects (NSIPs)

9. Many energy proposals are considered under the regime that deals with NSIPs. When a proposed development meets the relevant threshold as a NSIP (see EN-1), it is submitted to the Planning Inspectorate who will then examine the application and provide a recommendation to the Secretary of State for the Department for Business, Energy and Industrial Strategy (SoS BEIS).

10. Recommendations to SoS BEIS must be in accordance with the relevant NPSs, except in specified circumstances including where the adverse impacts of a proposed development would outweigh its benefits (see section 104 of the Planning Act 2008 for further information). Other matters that are relevant will also inform the process, such as the NPPF (see paragraph 5 of the NPPF). In the marine environment, due regard must be given to the Marine Plans (published or draft) which are produced with reference to the UK Marine Policy Statement.

Proposals that require planning permission and other consents

11. For energy projects that are not considered under the NSIP regime, the decision-maker is usually the local planning authority or waste planning authority, depending on the type of development proposed. Such applications for planning permission are determined in accordance with the Development Plan unless material considerations (such as the NPPF or NPPW) indicate otherwise.

12. For onshore wind farms, including facilities above 50MW generating capacity, planning permission will be determined by the relevant local planning authority in accordance with the Town and Country Planning Act 1990. This amends the previous approach outlined under the Planning Act 2008 which did classify wind farm infrastructure over 50Mw as NSIPs.

13. The NPPF states that when determining planning applications for (non-NSIP) renewable and low carbon development projects, local planning authorities '*should approve the application if its impacts are (or can be made) acceptable*' (paragraph 154). Specific requirements associated with renewable energy proposals in the Green Belt are stated in paragraph 147 of the NPPF and for wind turbines in footnote 49.

14. Further consents required for development in the marine environment include a Marine Licence and a seabed lease. In consideration of operational requirements commercial offshore wind farm projects will qualify as NSIPs. In such circumstances if the permission is granted, the resulting Development Consent Order (DCO) will contain a deemed Marine Licence. However, a specific seabed lease will also be required, which is sourced from The Crown Estate. For more information refer to The Crown Estate's website.

15. Scheduled monuments may be located on land, within the intertidal area or on the seabed within the English Inshore Marine Planning Area (as defined by the Marine and Coastal Access Act 2009). If a scheme has a potential impact on a scheduled monument Scheduled Monument Consent (SMC) may be required and consulting Historic England at an early stage is strongly recommended (also if the scheme may impact on the setting of a scheduled monument). This includes informal discussion with Historic England at the pre-application stage. Historic England has published notes for applicants for SMC setting out its advisory role to the Secretary of State for Digital, Culture, Media and Sport with regard to applications for SMC. SMC is not required where an NSIP proposal impacts on the monument, where these proposals are considered via an Examination in Public of the NSIP.

16. Listed Building Consent (LBC) is needed for works to demolish listed buildings, or for works of alteration or extension which affect their character. In the event that a development proposal for commercial renewable energy development is likely to result in works affecting a listed building, formal pre-application discussion with the local planning authority is recommended to provide the applicant with greater certainty about the requirements for LBC.

17. Within the English inshore marine planning area other designated heritage assets may be encountered including historic shipwrecks designated under the Protection of Wrecks Act 1973. Activities that may impact any site designated under the 1973 Act will require separate licensing to any DCO held; for further information about the licensing system to access historic shipwrecks designated under the 1973 Act, please see Historic England's website. More information about regulatory matters for wrecks as might be encountered within the UK marine area is available from the Maritime and Coastguard Agency.

18. Furthermore, some military shipwrecks can be afforded protection under the Protection of Military Remains Act 1986, but all crashed combat aircraft (whether on land or lost at sea) are automatically designated as 'protected places' under the 1986 Act, which is administered by the Ministry of Defence (also see Box 5 in section 3).

Box 2: Cooperating across administrative boundaries

Some development proposals will be strategic in nature and thus the Duty to Cooperate will apply to the applicants. For more information on the Duty to Cooperate refer to the government's guidance on plan-making and The Historic Environment in Local Plans [Historic England, 2015a]. In cases where onshore development is proposed near the border with England, or an offshore wind development is proposed on the edges of English marine planning areas (as defined by the UK Marine and Coastal Access Act 2009), discussions on relevant transboundary issues with neighbouring authorities may be appropriate.

Environmental assessment of policy

19. Environmental assessment of policy is needed to help plan-makers consider different policy options and allow the environmental, economic and social impacts of proposals to be taken into account. It is done with the help of Sustainability Appraisals (SA) and Strategic Environmental Assessments (SEA). SA provides a mechanism to assess the extent to which an emerging plan will promote sustainable development. SEA is an assessment of the impact that certain plans and programmes may

have on the environment and can in certain circumstances be required in isolation from SA. Advice on SA and SEA and the consideration of heritage issues is included in Sustainability Appraisal and Strategic Environmental Assessment [Historic England, 2016].

20. The environmental implications of offshore energy plans and programmes are considered at a strategic level via the UK Offshore Energy Strategic Environmental Assessment (OESEA3). This exercise includes possible future seaward Leasing/Licensing for offshore renewable energy and carbon dioxide storage. OESEA3 objectives include consideration of how assessment exercises may contribute to our understanding of marine archaeology and prehistoric environmental change. It is also acknowledged that heritage assets are likely to be identified through site specific surveys conducted in support of energy development proposals, with any necessary mitigation and monitoring measures implemented in accordance with the DCO.

Environmental assessment of proposals

21. Proposals for large-scale renewable energy power generation are likely to require an Environmental Impact Assessment (EIA). This requires a developer to identify and consider the likely impacts of the proposed development enabling the decision-maker to take into account the likely significant effects of a proposed development when considering an application for consent.

22. The EIA Regulations 2017 require EIAs to identify, describe and assess in an appropriate manner the direct and indirect significant effects of the proposed development. It is vital that the impacts of a proposal on significance (in terms of heritage policy) are properly understood; section 2 gives advice on how this is done. Historic England encourages early engagement to discuss the potential effects of a new proposal.

BOX 3: Dealing with uncertainty: the 'Rochdale Envelope'

For large-scale energy infrastructure development projects there are some design aspects which the applicant may want to finalise post-consent, such as height, massing and materials (e.g. the number, size and power configuration of turbines within a proposed offshore array), and the transmission system (i.e. High Voltage Direct Current or High Voltage Alternating Current to the onshore substation). As a result, when preparing an application, the developer may wish to include sufficient flexibility to address design uncertainties by using a 'Rochdale Envelope' approach under the Planning Act 2008, which can be used to scope the different environmental worst-case impacts of the scheme at the point of making an application. Further advice on this approach is available from the Planning Inspectorate.

2 Advice on heritage assets and their assessment

Assessing significance and harm in plan-making

23. The NPPF requires locally-prepared plans to set out a positive strategy for the conservation and enjoyment of the historic environment. This requires an understanding of the local historic environment, informed by expert advice as appropriate, including liaison with relevant archaeological and building conservation advisers.

24. Sites proposed for development need to be informed by an assessment of the impact which their development might have on the historic environment, underpinned by appropriate evidence, consultation with local authority heritage advisers, and with reference to existing desk-based sources of heritage data; for example, the National Heritage List for England (NHLE), local Historic Environment Records (HERs), historic landscape characterisation and other surveys including LIDAR (light detection and ranging) surveys. Advice on site allocations on land is available from The Historic Environment and Site Allocations in Local Plans [Historic England, 2015b].

25. When preparing policies and maps that identify areas suitable for commercial renewable energy development, it is important also to identify the presence and location of heritage assets in the plan area and consider how a proposal for development may impact on the significance of those assets including their settings. Such consideration is supported at the plan-making stage by including policies that refer to the historic environment, potentially including specific heritage criteria. Statements of Heritage Significance [Historic England, 2019] provides relevant advice at the application stage and sets the legislative and policy background for this in paragraph 28.

26. Relevant expert advice (e.g. from the local authority's archaeological advisers) can help to identify potential areas of archaeological interest, which may usefully inform new proposals for development. Furthermore, studies such as historic landscape characterisation and Conservation Area Appraisals or Conservation Area Management Plans can help in understanding potential impacts on historic landscapes, the character of a Conservation Area, or the setting of a heritage asset.

27. Use of a standard distance to create a buffer zone around identified heritage assets is not recommended, as impacts within setting which can affect significance vary according to topography and the characteristics of the asset and its surroundings; refer to the section headed 'the extent of setting' in The Setting of Heritage Assets [Historic England, 2017b] for further advice on this issue.

Consideration of the historic environment when making an application

28. Prior to the determination of an application, the applicant is encouraged to seek pre-application advice from the determining authority (including its relevant heritage advisers as appropriate) and also from Historic England. Historic England offers free initial pre-application advice to prospective applicants in certain circumstances such as proposals affecting designated heritage assets (including EIA development and National Infrastructure Projects). Historic England's website provides more information on pre-application advice and on when it is consulted.

29. When determining a proposal, decisions are made with reference to the Development Plan (and any other material considerations) and decision-makers must consider the impacts of that proposal on the significance of designated and non-designated heritage assets. Further information on assessing and understanding significance can be found in Managing Significance in Decision-Taking in the Historic Environment [Historic England, 2015c], The Setting of Heritage Assets [Historic England, 2017b], Statements of Heritage Significance [Historic England, 2019] and Ships and Boats: Prehistory to Present [Historic England, 2017c].

30. Development proposals that affect the historic environment are much more likely to gain the necessary permissions and create successful places if their design is informed by an understanding of the significance of the heritage assets they may affect and the impact of the proposal on that significance.

31. A key first step is to fully understand the historic environment during site selection. This is done by consulting relevant data sources (such as the NHLE and the local HER) and liaising with the determining authority (including its relevant heritage advisers as appropriate) and Historic England at an early stage in project planning.

32. Once a site has been chosen, it may be necessary to undertake further archaeological assessment, including field evaluation, to identify as yet unknown heritage assets when considering the options for detailed site development, which may also include ancillary matters, such as those described in EN-1.

33. Proposals for new works such as cabling, electricity substations, battery storage facilities and other associated works also need to be assessed for their potential impact on the significance of designated and non-designated

heritage assets, including from a development within their setting. Options for alternative locations and for mitigating any harm also need to be considered; this assessment will need to be informed by national and local planning policy, the HER and other relevant sources of heritage data.

34. A key consideration associated with facilities that generate electricity is the identification by National Grid Electricity Transmission of where the electricity generated will join the transmission network. For offshore wind farms there are relatively few such locations that have this capacity and they may be a considerable distance away (more than 50km) from where the cables make landfall. The locations of the cable landfall and substation determine the general route of onshore cabling. The historic environment needs to be considered at an early stage in the cable route selection process, if impacts on heritage assets are to be avoided or reduced, and can feed into the subsequent route refinement process as appropriate.

35. National policy states the criteria to use when considering proposals that harm the significance of designated heritage assets (see in particular paragraphs 193-202 in the NPPF, 2.6.6.8 in the UK MPS, and 5.8.11 – 5.8.18 in the EN-1) and these must be used by applicants when developing their proposals. National policy supports the conservation of designated heritage assets.

36. Any harmful impact on the significance of a designated heritage asset requires a clear and convincing justification, detailing the benefits of the proposal and enabling them to be weighed against any harm that would be caused to the historic environment. In this regard, EN-3 notes the positive role that large-scale renewable projects play in the mitigation of climate change, the delivery of energy security and the urgency of meeting the national targets for renewable energy supply and emissions reductions. Determining the balance between harm and benefits is done on a case by case basis, informed by evidence and assessment (as described in national policy) and taking account of a range of factors and relevant policy and guidance (including other relevant advice in this advice note).

37. Some nationally important archaeological sites are not designated as scheduled monuments, but are demonstrably of equivalent significance. National policy states that in such cases the heritage asset should be subject to the same policy considerations as those that apply to designated heritage assets (as explained in paragraphs 5.8.4-5.8.5 in EN-1, footnote 63 in the NPPF, and paragraph 2.6.6.5 in the UK MPS).

38. In considering non-NSIP applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset (NPPF, paragraph 197; UK MPS, paragraph 2.6.6.8). For NSIP applications, EN-1 requires the determining authority to consider the impacts on other non-designated heritage assets on the basis of clear evidence that the assets have a heritage significance that merits consideration in its decisions, even though those assets are of lesser value than designated heritage assets.

Physical impacts

39. Commercial renewable energy development has the potential to result in direct and indirect physical impacts on the historic environment which can impact on its significance. Direct physical impacts include impacts on surface features or buried archaeological remains; indirect physical impacts include those which occur offsite, such as impacts to groundwater levels.

40. Some archaeological sites and other heritage assets are of such significance or sensitivity that they may need to remain undeveloped to avoid harm to their archaeological remains, historic fabric or settings. Preserving archaeological remains in this way may occur in land parcels within a development site such as a solar park, assuming the impacts on the setting of those remains are acceptable. In such cases, the future management and maintenance of the heritage asset(s) may benefit from being set out by the applicant in a Heritage Management Plan and agreed by the local planning authority and, where a scheduled monument is involved, Historic England.

41. Buried archaeological remains on land, on the coast or on/within the seabed can be damaged or even destroyed by operations such as:

- intrusive ground investigation
- engineering operations to prepare the site for construction, temporary works, excavation, foundation and buried service installation
- landscaping (earth movement and planting of trees for screening)
- planting and harvesting of biomass crops
- connection(s) to the national power grid (if appropriate)
- connection(s) to a local heat network (if appropriate e.g. for biomass or energy from waste facilities)
- connection(s) to the national gas transmission network (if appropriate e.g. for biomass or energy from waste facilities)
- off-site works, such as those related to highways
- post-construction intrusive operations relating to the repair, maintenance and improvement of the site
- decommissioning

As a result, an iterative, evidence-based approach is needed to consider the archaeological interest of a development proposal on a site-by-site basis.

42. Assessing the impact of a scheme in areas of potential archaeological interest entails a staged approach, each stage informing the next, starting with a desk-based assessment, and then if necessary progressing to non-intrusive field investigation (usually including a geophysical survey) and intrusive trial-trench excavations.

43. Where a development site might include heritage assets with an archaeological interest, it is essential that early consultation takes place with the determining authority's heritage advisers and Historic England where appropriate. The first step is usually a Desk-Based Assessment (DBA). More information on DBAs is available from the Chartered Institute for Archaeologists [CIfA, 2014] and from relevant advice and guidance from Historic England.

44. Informed by a DBA, a further programme of evaluation may be needed prior to determination to inform the decision in accordance with national policy The results of any pre-determination evaluation can be used to inform the design of the scheme (also see Preserving Archaeological Remains) and related archaeological planning conditions, informed by related discussions between the applicant and the relevant authorities or other interested parties.

45. The methodology for archaeological assessment is set out in a programme of works, known as a Written Scheme of Investigation (WSI), which would normally be agreed with the determining authority in response to their brief and where appropriate with Historic England. Managing Significance in Decision-Taking in the Historic Environment [Historic England, 2015c] includes a section on WSIs and an example planning condition that supports a phased approach; as stated in that publication: "*WSIs are used to set out proposals for assessment and evaluation, as well as post-permission investigation and recording*". Where an archaeological consultant is acting on behalf of the developer they would need to be suitably experienced (refer to The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, section 18(5a-b)).

46. For NSIPs which span land and sea, such as offshore wind farm proposals, two outline or draft WSIs are prepared and submitted as part of the Development Consent application to inform the examination and subsequent decision-making process. These will address separately:

- any area subject to terrestrial planning controls (e.g. the corridor for electricity transmission cables to any new Convertor Station and any new National Grid sub-station connection point)
- any area subject to the marine licence consent (e.g. the offshore turbine array area and cable corridor route to the coastal landfall location, including any installation across or under the foreshore).

In these cases it is important to ensure the two documents are complementary and work together to ensure compatibility.

47. If a DCO is secured, it will specify conditions and a timeframe within which project-specific archaeological mitigation measures e.g. production of an archaeological WSI should be prepared (i.e. as informed by the any outline WSI submitted as part of the DCO application). For Offshore Wind Farms, post-consent, a marine WSI should be produced in consultation with Historic England and the relevant local authority if foreshore works are proposed and then formally agreed with the Marine Management Organisation. These WSIs need to be in place within a stipulated timeframe to inform survey investigation programmes which are commissioned by the Consent Holder as necessary to inform the detailed design planning and construction of the development. The primary lead for agreeing any onshore WSI will be the relevant local authority.

Impacts within setting that can affect significance

48. When assessing the likely impacts of a proposal on the historic environment, it is important to consider not only the direct physical impacts of the development, but also any impacts on the contribution setting makes to the significance of identified heritage assets; setting can contribute to the significance of a heritage asset and it can allow that significance to be appreciated. This entails identifying the contribution that the setting of any heritage assets makes to the significance of those assets and any impact the proposed development would have on that significance. The assessment also needs to explore potential measures that avoid or reduce the level of harm. It is informed by technical analyses and supported by a narrative that sets out what matters and why. The Setting of Heritage Assets [Historic England, 2017b] provides detailed advice on setting and its assessment.

49. Setting impacts may be temporary as a consequence of construction activities or longer-term, resulting from the period of use (i.e. for the duration of the development). In some cases there may be residual impacts which continue after the infrastructure is removed.

50. A range of techniques may be used when considering impacts of commercial renewable energy development on the setting of heritage assets. Appropriate visualisations are essential to help to illustrate the potential visual impact of a scheme and how mitigation measures might reduce potential harm to the historic character of an area or to significant views of or from heritage assets (also see Box 4).

BOX 4: The use of photomontages to inform assessments

Photomontages can be a valuable tool when assessing the potential impacts of a development proposal on the setting of a heritage asset.

For commercial renewable energy developments, Historic England's experience highlights the importance of selecting an appropriate focal length for the image, as this affects the impression of scale and distance in a photomontage, and has a significant effect on our impression of the visual impact of a new development. For further information refer to the Landscape Institute's Technical Guidance Note on the Visual Representation of Development Proposals.

Preparing photomontages can also require a degree of innovative thinking when assessing whether or not a proposed development would become a new skyline feature; for example, using a crane to consider the relative height of the chimney and main waste building for an energy from waste development proposal.

51. Landscape and visual impact assessment (LVIA) of large-scale development proposals is carried out as part of an EIA or as a contribution to the appraisal of development proposals and planning applications. Assessments of landscape impacts usually follow the guidelines published by the Landscape Institute. The responsibility for more general matters associated with landscape sensitivity rest with Natural England (who have published related guidance) and the local planning authority.

52. LVIA differs from the assessment of setting impacts because, while the impact of development in views under LVIA is on the viewer, as receptor, the impact of development in terms of the setting of heritage assets and associated views is on the significance of the heritage asset itself. Therefore, while LVIAs are usually based on publically accessible viewpoints, the contribution that setting makes to the significance of the heritage asset does not depend on there being public rights or an ability to access or experience that setting. On large-scale projects where LVIAs and heritage setting impact assessments may be carried out by different consultants, it is recommended that the two assessments are completed in parallel and inform each other.

53. When informed by relevant assessments, the design of a scheme can help to mitigate the visual impact of a proposal, for example through the use of landscape bunds or tree planting. This is likely to be particularly important in areas known and valued for their historic character, such as conservation areas, registered parks and gardens or registered battlefields. However, such measures need very careful consideration as they are not appropriate in all situations. Bunds, for instance, can themselves be intrusive features in the setting of a heritage asset. Any proposed landscape mitigation needs to be appropriately visualised and presented

in the visual impact assessment. The Setting of Heritage Assets [Historic England, 2017b] includes further advice on measures to mitigate the negative impacts of a development proposal.

54. In considering the potential impact on the significance of a scheme within a conservation area, applicants and planning officers are encouraged to refer to relevant Conservation Area Appraisals or Management Plans if available, alongside other relevant sources of heritage data.

55. When discussing a proposal that is subsequently amended, it is important to revisit the information supporting an application, as minor changes can affect the acceptability of proposals and their harm on the setting of heritage assets. An iterative approach is to be welcomed if it results in reduced environmental impacts.

Cumulative impacts

56. Whether development proposals are on land or offshore, it is important to consider the potential cumulative impacts of the proposal on the significance of a historic landscape or the setting of heritage assets when considered in conjunction with other past or proposed developments.

57. Cumulative heritage impacts are frequently linked with setting, but they can also apply to physical impacts that ultimately may result in a change to the significance of a heritage asset; for example, a development may have hydrological impacts that cause changes to the groundwater level which in turn affects the preservation of waterlogged archaeological remains.

58. When considering cumulative impacts for offshore wind proposals, these commonly relate not only to consideration of the multiple turbines but also to other development such as other offshore or coastal energy infrastructure.

59. The Planning Inspectorate has published advice on undertaking cumulative effects assessment (CEA) relevant to NSIPs, noting that the scale and complexity of an NSIP may result in a complex CEA process. It puts forward a four-stage approach to CEA which applicants may wish to adopt and it strongly advises applicants to take advantage of pre-application consultation with the consultation bodies including the relevant local planning authority(ies) and other interested organisations, to ensure that the shortlist of 'other existing development and/or approved development' identified for CEA is comprehensive and accurate.

60. Historic landscape and seascape character assessment can help the decision-maker to review cumulative impacts and the degree to which a proposed development will become a significant or defining characteristic of the landscape or seascape. Discussion between the decision-maker, the applicant and consultation bodies (including Historic England) will help to ensure that historic environment issues are properly addressed.

Transport impacts

61. As stated in EN-1: "*The transport of materials, goods and personnel to and from a development during all project phases can have a variety of impacts on the surrounding transport infrastructure and potentially on connecting transport networks, for example through increased congestion. Impacts may include economic, social and environmental effects.*" For many developments, such impacts are most concentrated during the construction phase and are assessed prior to determination in accordance with national and local policy.

62. For a biomass or EfW facility transport impacts also arise throughout the operational life of the development and from a heritage perspective this has the potential to have a significant impact on local amenity and the appreciation of heritage assets. The impact of frequent HGVs carrying biomass or waste materials may be especially noticeable in areas known for their historic character such as conservation areas.

The duration of development and its decommissioning

63. The duration of the development and its associated impacts are often key points that affect the settings of heritage assets. The intended engineering life of many renewable energy developments is such that the change they will bring to their site and locality will last for 25-30 years, effectively a generation and potentially not perceived by local residents as temporary.

64. Even if it is eventually possible to return the area to its former use or appearance, the direct impacts of a development on some elements of the historic environment (for example archaeological remains) will be irreversible. Factors such as these affect the level of harm that a development will cause to a heritage asset and the kind of mitigation or offsetting that might be provided as part of the planning balancing exercise.

65. Once an installation has reached the end of its life, it might have its operating life extended by being 'repowered', for example by introducing new blades and other items in a wind farm. The re-use of the existing foundations, towers or cabling could avoid new impacts, although issues to do with setting that can affect significance would persist.

66. If its operational life is not extended, renewable energy development such as a solar park or wind farm is usually decommissioned in accordance with its consent. Care is needed to consider what the potential impact that the decommissioning activities may have on the historic environment and to avoid or mitigate any harm arising; for example, through the routing of vehicles (where possible avoiding areas known for their historic character), adherence to an agreed approach on activities that generate noise (which can impact on the appreciation of heritage assets nearby) or the avoidance of any archaeological remains preserved below ground during construction.

3 Commercial renewable energy developments

Solar parks

67. Most solar parks range from 0.5MW to 15MW in scale, and developers and installers typically require about 2 hectares of land (5 acres) per MW of power, with most solar parks being up to 30 hectares. Larger projects (30-50MW) have also come forward over recent years and in late 2018 an application for a DCO was submitted to the Planning Inspectorate for the first solar park that would be considered as an NSIP as it would exceed 50MW installed capacity.

68. Assessment of potential heritage impacts of a solar park will typically cover groundworks, such as those from the supports for the solar panels, cable trenches and hard-standings for access or equipment. Mitigation may be possible; for example, the use of concrete bases for the panels, which entail less ground disturbance. Planning guidance published by BRE supported by Cornwall Council notes that: "*Where possible Solar PV arrays should be installed using 'pile' driven or screw foundations, or pre-moulded concrete blocks (shoes), and capable of easy removal. The use of shoes may be required for archaeological sensitive areas.*" The vehicles and equipment used during construction can also damage archaeological remains.

69. In cases where solar parks are proposed on previously developed land, it should not be assumed that such sites are devoid of heritage interest. For example, former airfields may contain heritage assets which are not readily apparent or previously recorded, and it is important that assessment of these sites in relation to the historic environment is as rigorous as it would be for other land use types. Further conservation advice on airfields is available from Historic England.

70. Harmful visual impacts on the settings of heritage assets can be avoided or reduced through sensitive design and layout, and mitigation measures such as tree and hedge planting to screen the development. However, care needs to be taken that these measures do not themselves have an adverse impact on the heritage setting or landscape character (also see paragraph 53).

Biomass and energy from waste (EfW) developments

71. Biomass can be burned in suitably adapted traditional coal-fired power stations or in specialised biomass facilities designed for the production of electricity, heat, or combined heat and power.

72. Although planning consent is not needed for farming operations, it is helpful if biomass plant applications are informed by a desk-based resource assessment within the plant's catchment area, which includes consideration of the area's landscape character and archaeological potential. This exercise is helpful not only because of the potentially significant landscape and archaeological impacts of large-scale energy crop cultivation, but also because of the 'knock-on' effects which any major constraints that are identified could have on travel patterns associated with fuel supply.

73. Large-scale energy crop plantations also have the potential to harm the setting of historic sites and compromise the visual amenity of the wider landscape, detracting from historic character and sense of place.

74. When assessing potential impacts of a biomass or EfW proposal on the historic environment, it is important to consider all aspects of the proposal, following the principles outlined in section 2.

75. The need for a stack for flue-gas treatment and the overall size and massing of facilities present significant challenges in sensitive locations, noting that such facilities can cause considerable harm to the significance of designated heritage assets. Effective visualisations of the proposed development are needed to allow the impact of a proposal to be assessed.

76. Although the harmful visual impact of a facility will often be due essentially to its siting and scale in relation to the designated heritage asset(s) affected, in some cases good design may mitigate such an impact. Fundamental to achieving high quality design will be a sound understanding of the significance of any heritage assets affected, whether at the scale of individual buildings and sites or more extensive historic areas and landscapes.

Onshore wind farms

77. A modern onshore turbine can be over 150m tall and individually generate 5MW. However, constraints such as visual impacts on the landscape tend to limit the size of onshore wind farm when compared with

what is achievable offshore. The PPG highlights the importance of careful consideration regarding the impact on heritage assets, including their setting (also see section 2 of this Advice Note).

78. Community support plays an especially important role in onshore wind development. According to the government'a PPG a planning application should not be approved unless the proposed development site is an area identified as suitable for wind energy development in a Local or Neighbourhood Plan (also see paragraphs 25-27 above).

79. In 2020 the government proposed updating its 2014 best-practice guidance for England on community benefits and engagement guidance for onshore wind, at the same time as putting forward a set of proposals to amend the Contracts for Difference (CfD) scheme, which is the government's main mechanism for supporting new, low carbon electricity generation projects. The next allocation round is expected in 2021 and the government is proposing to include onshore wind proposals (>5MW) in this allocation, potentially resulting in a new phase of growth for onshore wind power.

Offshore wind farms and onshore National Grid connection

80. The UK has the largest installed offshore wind capacity in the world, as stated in the government's Clean Growth Strategy. The Offshore Wind Sector Deal, published in March 2019, set out a pathway to 30GW of offshore wind by 2030, which the government increased in October 2019 to 40GW by 2030. It has also been announced that a new target of 1GW of floating offshore wind is to be delivered by 2030.

81. The electricity generation capacity of offshore wind farms means that commercial developments are NSIPs and the entire development from the offshore turbine array to the onshore connection facilities represent one project and therefore one DCO application. However, given the different regulatory regimes that govern activities on land and at sea, the DCO application will be prepared within a project management structure that ensures the request skills and expertise are applied to addressing environmental issues as might be found within either the onshore or offshore proposed development areas. Heritage assets can be found offshore and within the intertidal areas (the area between high tide and low tide marks) and may be directly impacted by the development and indirectly by physical changes within the coastal and marine environment. The range of heritage assets encountered may include human remains, evidence of ceremonial or military activity, wreck sites for ships, boats and aircraft, and other features of historic maritime importance. They may also include evidence of former landscapes and river and estuarine systems which are now submerged and buried within and beneath today's seabed and which may include artefacts and remains of human activity. Box 5 provides more information on the protection of heritage assets in the marine environment.

82. Intertidal and seabed sedimentary deposits of organic material, such as peat, help to preserve biological evidence of prehistoric environmental conditions and so provide an important means to understand changes that have occurred. As a result such sedimentary deposits may be identifiable as heritage assets that require consideration within the EIA exercise, to determine how mitigation measures may be identified and implemented as part of a DCO; in this way the information such deposits may contain on past landscapes, climates and human interaction with those environments is analysed, reported, archived and published to increase our knowledge and promote public understanding. For example along sections of the north Norfolk coast it is possible to encounter sedimentary sequences such as the 0.5-2 million years old Cromer Forest Bed formation, which comprises layers of sediment, fossils and stone tools which are thought to relate to the course of a prehistoric river, now buried within today's coastline.

83. During the production of an Environmental Statement, an applicant will commission geophysical and geotechnical data acquisition programmes to inform the design of the proposed development. It is therefore of immediate interest to the applicant to ascertain how the proposed seabed infrastructure can be positioned with greatest operational efficiency and in full consideration of how other environmental receptors might be impacted, inclusive of cultural heritage. Through the archaeological interpretation of those data it is possible to identify seabed (and sub-seabed) anomalies, which could be of archaeological interest and that should be avoided or investigated further if likely to be impacted by construction plans.

84. Whilst it might be possible for a development project to avoid known heritage assets (such as shipwrecks that are already charted by the UK Hydrographic Office e.g. as navigation hazards), the knowledge currently available about the historic environment in the inshore and offshore areas is poorly defined. For example, the record for shipwreck sites is biased towards those from the post-Medieval period when more detailed record keeping was introduced. However, while some seabed features might be readily identifiable through geophysical survey as a shipwreck due to their iron and then steel construction, it cannot be assumed that the identity of a vessel (i.e. its name) is known with any certainty or its historic or archaeological importance.

85. A key requirement is to determine how any known heritage assets might best be avoided. The applicant will be expected to conduct all necessary examination and assessment exercises using a variety of survey techniques to plan the development so as to optimise opportunities for avoidance. The mechanism which Historic England recommends is that the applicant employs specialist, accredited and experienced archaeological consultants to work with the project engineers and survey contractors. It is important that access is given to data for archaeological analysis and interpretation which, when used in conjunction with available desk-based sources of information, is assessed and included within the Environmental Statement.

86. In terms of direct impacts from construction, avoiding heritage assets, including archaeological sites and historic wrecks, is the most effective form of protection. One way this can be achieved, as outlined in EN-3, is through the implementation of Archaeological Exclusion Zones (AEZs) which preclude seabed-impacting activities within their boundaries. The archaeological consultant employed by the applicant will also describe within the Environment Statement how an avoidance strategy (for example, based on the use of AEZs) will be used in reference to the placement of the proposed infrastructure e.g. turbines and electricity transmission cables both within the array and along the export cable corridor to the selected landfall location.

87. For archaeological assessment conducted within terrestrial planning jurisdiction, the primary point of contact will be the relevant local authority, as described in paragraph 23. In situations when an applicant uses the 'Rochdale Envelope' when preparing a DCO submission (as explained in Box 3), it is likely that detailed survey campaigns will be required post-consent to assist selection of the optimum engineering design. It is therefore important that an archaeological WSI is also prepared in outline as part of the DCO submission with a commitment included in the DCO for a project-specific WSI to be produced post-consent in consultation with Historic England (as described in paragraph 47).

88. It is acknowledged that considerable uncertainty exists in our knowledge of the historic environment including prehistoric environmental evidence that can now be found on, within and beneath today's seabed. The use of WSIs onshore and offshore provide an important means for agreeing investigation methodologies and techniques that assist archaeological interpretation and analysis. WSIs will also provide the methodological basis for the excavation of sites of known or possible interest that might be incompatible with the final design and installation of infrastructure where exclusion and thereby avoidance of impact might not be possible. Furthermore, it might be that case that other survey investigations, for example the use of video to examine seabed anomalies to determine the presence of Unexploded Ordnance (UXO) might also confirm the presence of archaeological materials. It is therefore important that a report mechanism is agreed and in place, as part of the DCO, to assist the effective reporting of discoveries of possible archaeological interest and thereby support informed and timely decision-making. To support this approach the Consent Holder may wish to secure the services of a 'retained' archaeology service as a component part of post-consent project management and delivery.

89. Within the application there are different aspects of historic character which need to be considered to take account of the offshore environment; for example, how heritage assets may draw part or all of their significance from their coastal location and relationship with the sea, or how the perception of offshore historic character may change due to the type of development proposed. The setting of heritage assets on land may be affected by off-shore development, particularly where heritage assets are grouped together and therefore lead to cumulative impact.

90. When assessing the concept of 'seascape', Historic England's programme of Historic Seascape Characterisation helps to assess character (for example, how a particular area might have had an association with a specific industrial or commercial activity) and how far this character can accommodate the change that would be introduced by new development. The sources of data used to produce seascape characterisation include charts and other documentary and artistic references. Identifiable archaeological material found on the coast or beneath the seabed contributes to the characterisation process which also incorporates consideration of the activities that produced those remains. For example, the accounts of historic naval battles, former maritime trade routes and ports which dominated commerce centuries ago and even the recent infrastructure of the offshore oil and gas industry.

91. Once constructed, offshore wind farms require Operation and Maintenance (O&M) bases to support boat-based servicing of turbines as well as hosting office facilities to monitor power output. The O&M bases are subject to separate planning applications and are built within existing ports and harbours, so there could be opportunities for advice to be provided to support investment and design decisions that recognise the historic fabric of such places.

Box 5: The protection of heritage assets in the marine environment

Statutory designation of heritage assets due to their significance helps to ensure that they are protected and conserved for the benefit of this and future generations. In the English inshore marine planning area designated heritage assets include:

- restricted areas designated under the Protection of Wrecks Act 1973
- scheduled monuments designated under the Ancient Monuments and Archaeological Areas Act 1979
- named military vessels protected under the Protection of Military Remains Act 1986

If a proposed development, either on land or at sea (including any intertidal area that might be crossed), encounters crashed military aircraft remains, such sites are automatically afforded statutory designation as 'protected places' under the Protection of Military Remains Act 1986 which is administered by the Joint Casualty and Compassionate Centre, an executive agency of the Ministry of Defence.

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Contact Historic England

East of England
Brooklands
24 Brooklands Avenue
Cambridge CB2 8BU
Tel: 01223 582749
Email: eastofengland@HistoricEngland.org.uk

Fort Cumberland
Fort Cumberland Road
Eastney
Portsmouth PO4 9LD
Tel: 023 9285 6704
Email: fort.cumberland@HistoricEngland.org.uk

London and South East
4th Floor
Cannon Bridge House
25 Dowgate Hill
London EC4R 2YA
Tel: 020 7973 3700
Email: londonseast@HistoricEngland.org.uk

Midlands
The Axis
10 Holliday Street
Birmingham B1 1TG
Tel: 0121 625 6888
Email: midlands@HistoricEngland.org.uk

North East and Yorkshire
Bessie Surtees House
41-44 Sandhill
Newcastle Upon Tyne NE1 3JF
Tel: 0191 269 1255
Email: northeast@HistoricEngland.org.uk

37 Tanner Row
York YO1 6WP
Tel: 01904 601948
Email: yorkshire@HistoricEngland.org.uk

North West
3rd Floor,
Canada House
3 Chepstow Street
Manchester M1 5FW
Tel: 0161 242 1416
Email: northwest@HistoricEngland.org.uk

South West
1st Floor
Fermentation North
Finzels Reach
Hawkins Lane
Bristol BS1 6JQ
Tel: 0117 975 1308
Email: southwest@HistoricEngland.org.uk

Swindon
The Engine House
Fire Fly Avenue
Swindon SN2 2EH
Tel: 01793 445050
Email: swindon@HistoricEngland.org.uk

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