World Heritage Convention

Impacts of Wind Energy Projects and their Assessment

This part of the Guidance provides heritage and impact assessment practitioners, site managers and heritage institutions an overview of the process for assessing the impacts of wind energy projects associated with World Heritage properties. The information is intended to assist actors responsible for commissioning and preparation such impact assessments and to support decision-makers.

The advice provided here includes overall provisions and requirements, nevertheless, it aims to complement the *Guidance and Toolkit for Impact Assessments in a World Heritage Context* as well as national and regional guidance documents related to the assessment of impacts on heritage values derived from wind energy projects. Therefore, readers are strongly encouraged to consult the 'Guidance and Toolkit' before conducting any World Heritage related impact assessments.

For the terminology used in this part of the Guidance, please refer to the 'Glossary' of the *Guidance and Toolkit for Impact Assessments in a World Heritage Context*.

Why is it important to assess the impacts of wind energy projects in a World Heritage context?

To ensure that the potential impact of a planned or proposed wind energy project is well understood both by the developers throughout the planning process and the decision-makers in the licensing process, an impact assessment needs to be undertaken. This is also a requirement under the *World Heritage Convention*. The impact assessment process should be used to understand the potential impact of a wind energy project before a decision is taken, ensuring also that its steps and results are used to improve the planning and design of wind energy projects and other developments. The main objective of the impact assessment process is to avoid any irreversible impact on the OUV of concerned World Heritage properties, which are considered unique and irreplaceable.

Impact assessment is a well-established process today worldwide that serves as a tool to show the potential consequences of proposed actions on the environment or on specific values, including on the OUV of World Heritage properties before irreversible decisions are made. Therefore, assessing impacts in a World Heritage context might be carried out as part of a wider environmental and social impact assessment that is being prepared for a wind energy project (see more details on Environmental and Social Impact Assessment below).

When there is no existing impact assessment system included in the governance framework, or when wind energy projects would not normally require impact assessment under existing legislation, the assessment of impacts are nevertheless needed for projects proposed in relation to World Heritage properties no matter if the project is planned within their boundaries, their buffer zones or in their wider setting (see in World Heritage Essentials for details about the spatial areas of World Heritage properties). In this case a stand-alone assessment of impacts of the proposed wind energy project is needed with regard to its effects on the OUV of one or more World Heritage properties (see Potential impacts of wind energy projects in Impacts of Wind Energy projects and their assessment).

In the World Heritage context, the assessment of impacts of wind energy installations is required to address specifically the potential impacts of the proposed project on the OUV of the concerned World Heritage property. For this reason, it is fundamental to ensure that the impact assessment is based on a thorough understanding of the attributes conveying the OUV and other relevant heritage values and that an appropriate methodology is followed throughout the assessment process (see the details about the OUV and attributes in World Heritage Essentials).

Please check the list of principles for conducting a World Heritage related impact assessment in this Guidance and for a more general World Heritage related approach, the principles included in the *Guidance and Toolkit for Impact Assessments in a World Heritage Context*.

Principles for conducting a World Heritage related impact assessment that concerns wind energy projects

In general terms, for changes that could affect World Heritage properties and their OUV, all impact assessments should follow the principles laid out in the *Guidance and Toolkit for Impact Assessment in a World Heritage Context*.

Principles for conducting a World Heritage related impact assessment that concerns wind energy projects

Principle 1: all wind energy project proposals that may adversely affect a World Heritage property must undergo a rigorous impact assessment (Environmental and Social Impact Assessment – ESIA), whether they are located within or outside its boundaries. This assessment should take place as early as possible in order to provide timely and effective input to decision-makers. Assessments that take place late in the decision-making process or after the decision has been made cannot adequately inform decision-makers.

Principle 2: Experts with knowledge about World Heritage in general and specifically about the World Heritage property/properties in question must be closely involved in the assessment process in order to identify the issues that will need to be assessed. These experts can also work together with project proponents and engineers to find alternative solutions to proposals that may adversely affect a World Heritage property's OUV.

Principle 3: The likely environmental and social impacts of the development proposal on the property's OUV must be assessed, including direct, indirect and cumulative effects. This assessment should consider the property's values, integrity and protection and management, as well as its connection to the wider landscape, and should be based on adequate information and data.

Principle 4: Reasonable alternatives to the project proposal must be identified and assessed with the aim of recommending the most sustainable option to decision-makers. The different options should be clearly communicated to decision-makers and those that are least damaging in relation to the site's OUV should be highlighted, including in some cases the 'no project' option. Very often, economically viable and feasible alternatives can be found to development proposals that may be damaging to a World Heritage property's OUV. A detailed and early consideration of alternatives can also help to ensure that resources are not wasted in developing proposals that are incompatible with World Heritage status.

Principle 5: Mitigation measures should be identified in line with the mitigation hierarchy, which requires first avoiding potential negative impacts and secondly minimising and reducing unavoidable residual impacts through mitigation measures.

In case any minor residual negative impacts on the OUV of a World Heritage property are identified and that cannot be avoided, the ESIA should outline how these will be mitigated and monitored through a budgeted Environmental Management Plan, indicating how the mitigation measures will be implemented, who will implement them within what

timeframe and what resources are secured for their implementation.

Principle 6: Special sections on World Heritage must be included in ESIAs that have a general scope. These sections should present clear conclusions to decision-makers on the potential impacts of the wind energy proposal on the World Heritage property's OUV as well as relevant recommendations/measures related to the impacts and should also be reflected in the Executive Summary of the impact assessment report.

Principle 7: Information from the assessment and the results must be publicly disclosed and subject to thorough public consultation at all relevant stages. All relevant right-holders, local communities and other stakeholders, including Indigenous Peoples when this is relevant, should be involved. Feedback from consultation should be fully reflected and documented in the assessment.

The relevant government agencies and non-governmental organizations should be involved and consulted early on and throughout the impact assessment process. They will need to have the possibility to review the resulting report.

Principle 8: Adequate follow-up measures need to be developed based on information and result of the impact assessment. This might include the need for proposing, implementing and independently auditing an Environmental Management Plan. The plan should detail operating, monitoring and other relevant conditions in relation to the property's OUV.

The developer must set aside funds from the outset to cover the costs of the follow-up actions, including the independent auditing of the implementation of the Environmental Management Plan at regular intervals.

Adapted from the IUCN World Heritage Advice Note: Environmental Assessment.

Providing information on proposed wind energy projects to the World Heritage Committee through UNESCO.

Elements of impact assessment

An impact assessment involves a series of steps. These steps are flexible and can be adapted to the type of action being proposed (and location or level of action).

Elements of the impact assessment process:

1 Screening
2 Scoping
3 Baseline
4 The proposed action and alternatives
5 Identifying and predicting impacts
6 Evaluating impacts
7 Mitigation and enhancement
8 Reporting
9 Reviewing the report
10 Decision-making
11 Follow-up

The 11-step process is explained in detail in the *Guidance and Toolkit for Impact Assessments in a World Heritage Context*.

As the preparation of impact assessments is a complex task, these are normally carried out by an independent team of specialists, who are commissioned to inform both the planning stages of the project (by the project proponent) and the decision making of the competent authorities (as to whether to authorise the proposed action).

Participation of rights-holders and other stakeholders in an impact assessment process

Impact assessments require the participation of all 'interested and affected parties' in a meaningful, transparent, and equitable manner.

Participation is a key process in the implementation of the *World Heritage Convention*, which provides for the involvement of rights-holders and other stakeholders in the identification, management, and protection of cultural and natural World Heritage. Article 5 of the *World Heritage Convention* calls States Parties to adopt a general policy to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes.

The participation of rights-holders, communities and other stakeholders is a key element not only in the management and protection of World Heritage properties but throughout the entire impact assessment process as well.

A participatory approach to impact assessment processes assists in:

- Facilitating the understanding of the potential impacts, benefits and challenges posed by the proposed project;
- Providing opportunities for rights-holders and other stakeholders to express their concerns and share their views in discussions throughout the impact assessment process, including in the identification and assessment of likely impacts, possible alternatives and, where appropriate, to take part in the development of mitigation and management measures (this should also extend to obtaining free, prior and informed consent from indigenous peoples where relevant);
- Enhancing the understanding of the OUV and of the other values of a property thanks to the considerations of rights-holders and stakeholders' sharing their values and concerns;
- Offering rights-holders and other stakeholders an understanding of key World Heritage processes and requirements.

Participation and engagement of rights-holders and other stakeholders may happen in different ways in line with existing national and/or regional legal frameworks or guidance. Awareness raising, consultation and participation campaigns are effective ways to best involve rights-holders and stakeholders, and to guarantee that their concerns are understood and integrated in the impact assessment processes.

➔ See also Note 3 for Identification of rights-holders and other stakeholders and potential engagement tools.

Engaging with rights-holders, communities and other stakeholders in protecting World Heritage.

The United Nations' and UNESCO's commitment to ensure the inclusion of Indigenous Peoples in plans, projects and programmes.

Case studies

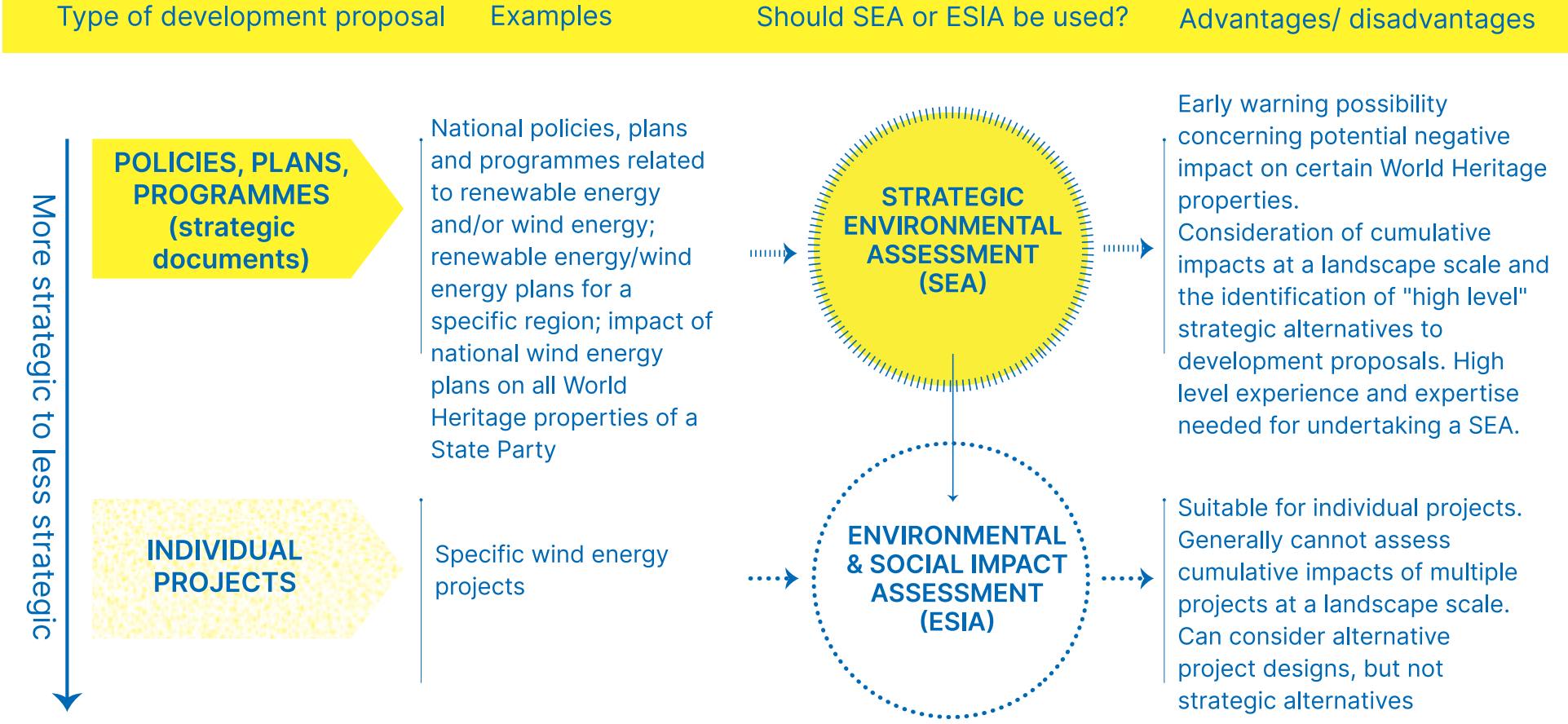
Types of impact assessments

Impact assessments can be carried out at different scales depending on the type of action being assessed. There are two main types of assessment of potential impacts on the OUV of World Heritage properties:

- a **Strategic Environmental Assessment** (SEA) is a higher-, more strategic level assessment from a development perspective that considers impacts of actions deriving from policies, plans and programmes on the environment (including natural and cultural elements), natural resources, social, cultural, and economic conditions, etc. It is also able to take into consideration the institutional environment in which decisions are made (for example, regional, or national renewable energy plans, national renewable energy policy but also regional and national land planning policies and acts);

- an **Environmental and Social Impact Assessment**, (ESIA; also known as Environmental Impact Assessment; EIA) is a project-level assessment focused on identifying and assessing the negative and positive environmental and social impacts of a specific proposed project (for example, a wind energy project with its ancillary facilities). An ESIA often assesses impacts on (cultural and natural) heritage values of a place and in this case is often referred to as a Heritage Impact Assessment (HIA). From a World Heritage perspective, an ESIA needs to focus on how the specific project will affect the OUV of a World Heritage property and the attributes that convey the OUV.

➔ See also *Guidance and Toolkit for Impact Assessments in a World Heritage Context* , **'Types of impact assessment'**.



Considerations related to SEAs and ESIAs
Source: *Guidance and Toolkit for Impact Assessments in a World Heritage Context*

What does ‘environmental’ mean in the context of impact assessments?

World Heritage Convention

Case studies

Strategic Environmental Assessments

A Strategic Environmental Assessment (SEA) considers impacts of actions deriving from policies, plans and programmes on the environment (including natural and cultural elements), natural resources, social, cultural and economic conditions, etc. The aim of the SEA process is to be proactive in providing support to better protect the environment (including natural and cultural heritage sites and obligations related to the implementation of the *World Heritage Convention*) before specific projects are proposed. It aims to ensure the sustainability of plans and policies by reviewing and shaping them and therefore, helps to improve decision-making, also when considering specific projects. The process of an SEA follows the general elements of an impact assessment.

SEAs have the potential to play a vital role in protecting cultural and natural heritage sites, including World Heritage properties, by ensuring that policymakers at the national, sub-national and local levels understand and integrate heritage considerations into the policies, plans and programmes that concern the renewable energy transition and wind energy, and can provide a context and framework for considering individual projects. An SEA could consider the values and attributes of specific World Heritage properties, and moreover allows consideration of (natural and cultural) heritage related issues as well as of the national obligations under the *World Heritage Convention*.

SEAs can also examine the impact of specific plans, policies instruments on the OUV of World Heritage properties (for example, for World Heritage properties on a large landscape level or for World Heritage properties in a region or in a country). In this case, the impact assessment considers the impact of actions on tangible and intangible attributes conveying the OUV. It then helps development planning agencies to enhance and improve understanding of World Heritage requirements and raise awareness of the need to ensure their protection during the development planning process.

While individual project proposals could profit from the findings of an SEA in general, these strategic level assessments are also particularly helpful in areas with already installed wind energy facilities, when planning for potential new wind energy development, as they are better suited to assess cumulative impacts (or in some cases even indirect impacts) of multiple projects. The two types of impact assessments are, therefore, complementary processes.

➔ See ‘**Identifying and predicting impacts**’ below and Note 6 for details about cumulative impacts.

Case Study

Environmental and Social Impact Assessments

An Environmental and Social Impact Assessment (ESIA; also known as Environmental Impact Assessment, EIA) is a project-level assessment focused on identifying and assessing the negative and positive environmental and social impacts of a specific proposed project (for example, a wind energy project with its ancillary facilities). As there are various legal

frameworks concerning impact assessments for States Parties, the name of these is not unified. Assessment of impacts on (cultural and natural) heritage values of a place is often called a Heritage Impact Assessment (HIA).

World Heritage Convention

From a World Heritage perspective, an ESIA needs to analyse how the specific project will affect a World Heritage property's OUV and the attributes that convey the OUV. The aim of this assessment is to provide both the project proponent and decision-makers with all the information necessary to enable them to avoid or, if possible, mitigate any potential negative impacts on a World Heritage property's OUV. The process includes the evaluation of the proposed project (and whether it is compatible with the protection and management needs of a World Heritage property) and proposes technically feasible and economically viable project alternatives, including, where appropriate, no-project scenarios.

An ESIA further guarantees that environmental, cultural, social, economic and health implications of proposed projects and policies are adequately taken into consideration before decisions are made.

This allows for:

- Better and improved planning and design of a wind energy project also considering alternative locations and design;
- Compliance with the *World Heritage Convention*, regional and national legislations, and other environmental and social standards, saving unnecessary costs for the wind energy industry as well as for States Parties and municipalities which might otherwise find themselves tied in legal proceedings to reverse binding decisions taken before the impact assessment process.

An impact assessment for a proposed wind energy project that relates to a specific World Heritage property should aim at:

- Providing analytical information to decision-makers on the potential impacts of the proposed wind energy project (including wind turbines, ancillary facilities, power grids, access roads, etc.) on the OUV of the World Heritage property in question;
- Ensuring the protection of the property's OUV through understanding of the values and comprehensive assessment of potential impacts on the attributes which convey the property's OUV and other values;
- Identifying potential negative impacts and providing procedures and methods for an iterative process that identifies mitigation, where possible and appropriate, and reassesses the revised project, with the objective of avoiding any negative impacts on the OUV;
- Providing opportunities to achieve positive impacts from a proposed project for the benefit of rights-holders and other stakeholders, which might also be to the benefit of the World Heritage property;
- Promoting transparent, equitable and inclusive participation in the decision-making process, also for right-holders (including indigenous peoples) and other stakeholders;
- Establishing follow-up methods (monitoring the long-term implementation of the project, including possible mitigation measures agreed during the planning process) in relevant project documentation and contracts, such as the licensing agreement and the Environmental and Social Management Plan;
- Contributing to improving the effectiveness of the management framework of the World Heritage property and related policies and other strategic documents;
- Contributing to sustainable development and promoting environmental protection and social justice.

When should project specific impact assessments be carried out?

Step-by-step guidance for the impact assessment process in the context of wind energy planning

World Heritage Convention

Although it is not usual for a wind energy project to be planned within a World Heritage property, even projects located in its buffer zone or wider setting can have an impact on its OUV.

Several steps can be distinguished in the impact assessment process, and referring to these steps, one by one, will assist those involved in carrying out an ESIA or any type of stand-alone assessment of the impacts of a proposed wind energy project in relation to a World Heritage property. Where appropriate, further information on the impact assessment process in a World Heritage context can be found in the *Guidance and Toolkit for Impact Assessment in a World Heritage Context*.

An overview of the key information needed to assess the potential impacts of wind energy projects is provided for each step of the ESIA, with specific reference to impacts on the OUV of a given World Heritage property. Whenever 'impact assessment' is mentioned in the step-by-step guidance, it refers to an ESIA, unlike in other parts of the Guidance, where this is used for impact assessment processes in general terms.

The elements of the process in relation to wind energy planning are explained in detail within this tool related to conducting an ESIA (please click on each item for further information):

1 **Screening**

2 **Scoping**

3 **Baseline assessment of the World Heritage property**

4 **The proposed wind energy project and alternatives**

5 **Identifying and predicting impacts**

6 **Evaluating impacts**

7 **Mitigation and enhancement**

8 **Reporting**

9 **Reviewing the report**

10 **Decision-making**

11 Follow-up
World Heritage Convention

The step-by-step guidance assists those involved in carrying out an ESIA or any type of stand-alone assessment of impacts of a wind energy project proposed in relation to a World Heritage property. Although it is less likely that a project will be planned within a property, even projects within the buffer zone or the wider setting of a World Heritage property may have an impact on its OUV. The step-by-step guidance focuses specifically on information needed for the assessment of wind energy projects and when indicated, it should be used in conjunction with the *Guidance and Toolkit for Impact Assessment in a World Heritage Context*.

For each step or element of the ESIA, this guidance tool offers an overview of the key information needed for the assessment of the potential impacts of wind energy projects with specific reference to impacts on the OUV of a concerned World Heritage property. Whenever 'impact assessment' is mentioned in the step-by-step guidance, it refers to an Environmental Social Impact Assessment (ESIA). If used in other places of the guidance, it refers to the impact assessment processes in general terms.

Adapted from: Guidance and Toolkit for Impact Assessment in a World Heritage Context.

Overview of the impact assessment process within the wind energy project cycle. The impact assessment needs to take place at an appropriate point in the lifecycle of the proposed project in order to efficiently influence the planning process and inform the decision-making. Other actions for the protection of the OUV of a property will also need to take place during the different lifecycles of a wind energy project (adapted from: *Guidance and Toolkit for impact Assessment in a World Heritage Context*).

As impact assessments are not linear processes but iterative processes, any changes to the proposed project or new information will need to be integrated into the process as they it becomes available. This may also result in the need to revise the process as it develops. The key purpose of the process is to inform developers and decision-makers of the impact the proposed project may have on a World Heritage property's OUV. To this end, a proactive problem-solving approach will need to take be adopted throughout the entire impact assessment process, as a one of the fundamental purposes of an impact assessment is to consider alternatives and mitigation measures to the impacts on the OUV of World Heritage properties concerned.

➔ See also in '**Mitigation and enhancement**' part of the Step-by-step guidance.

The findings and result of the ESIA are documented in an impact assessment report with clear recommendations for decision-makers and explanations of these proposed recommendations to all interested parties (including right-holders and other stakeholders). The report needs to highlight the potential negative and positive impacts of the project on the OUV of the concerned World Heritage property and provide recommendations on how to ensure the long-term protection and conservation of the property's values.

➔ See in detail the '**Reporting**' part of the Step-by-step guidance.

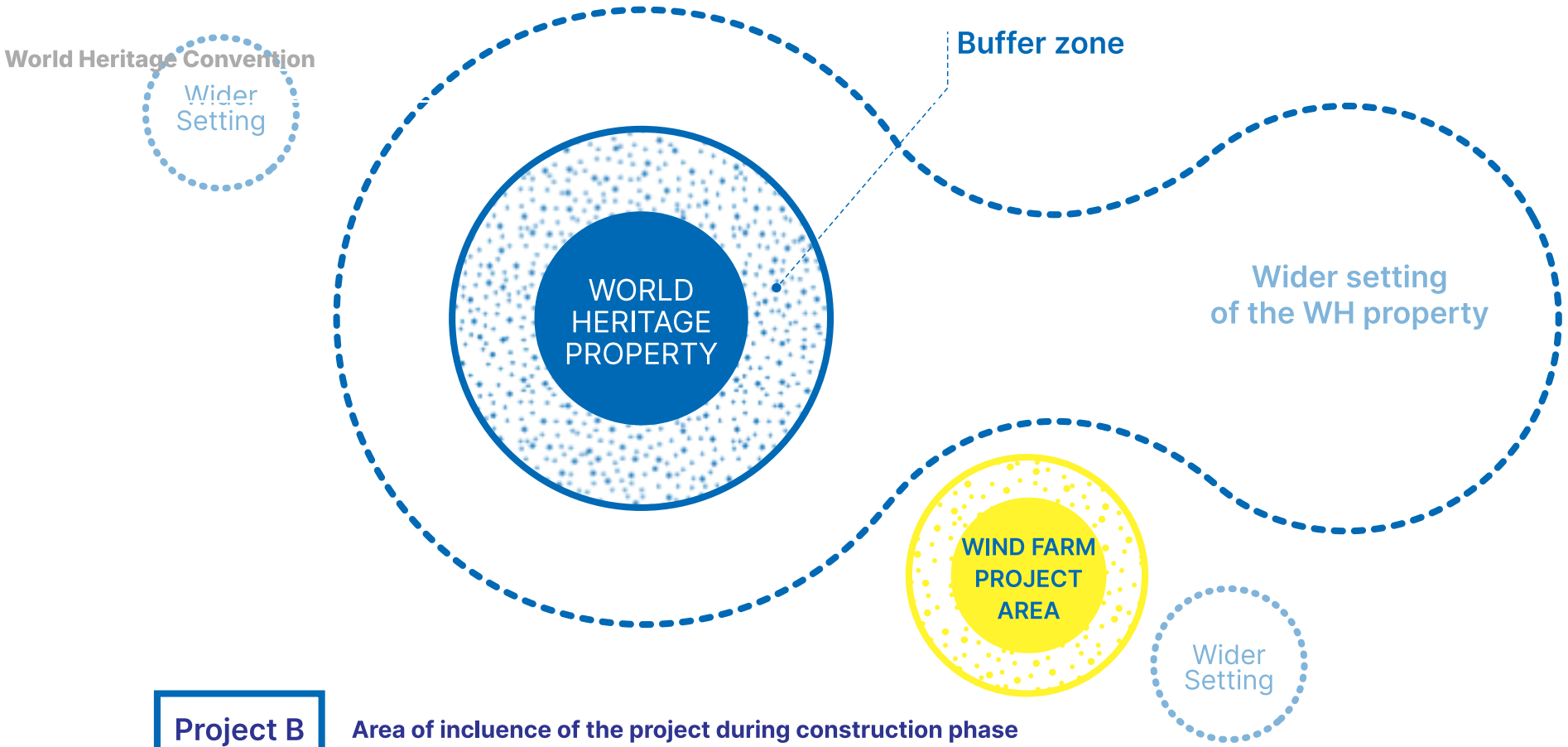
The findings of the ESIA will also allow project proponents to draw up an Environmental and Social Management Plan (ESMP) which describes how the project will be implemented and includes agreed mitigation measures and safeguards (also relevant for the protection of the World Heritage property's OUV). The development of an ESMP is regarded as a good practice that allows well-founded monitoring for all interested parties (including monitoring of the agreed mitigation measures and other safeguards).

➔ See in detail the '**Follow-up**' part of the Step-by-step guidance.

Case studies
World Heritage Convention

Potential impacts of wind energy projects

Wind energy projects can have multiple impacts on the attributes conveying the OUV that can be identified and categorized as direct, indirect, or cumulative impacts (see in detail '**Identifying and predicting impacts**' in the Step-by-step guidance). Impacts can also be both negative and positive and can arise from projects planned to be located within a World Heritage property, its buffer zone or its wider setting. Identifying and evaluating impacts in relation to the OUV of World Heritage properties is a complex task that requires considerable expertise and a thorough evaluation of all relevant information.



Schematic images illustrating the area of potential territorial impact area of different phases of a wind energy project related to a World Heritage property (the effects and impacts can be much more complex). Project A could be applied to any World Heritage property, Project B wishes to illustrate a natural World Heritage property, with values related to migratory birds that might have a resting place in the detached wider setting. Please note nevertheless, that these images only illustrate schematic potential territorial impact of a wind energy projects and do not provide insight into the complexity of effects and impacts.

The most evident impact that comes to mind when thinking about wind energy projects is usually their visual impact (see for details Note 5). However, impacts can be more than visual – inadequately planned wind farms, for example, can be located on migratory routes or within sensitive biodiversity areas, or disturb significant archaeological sites. When looking at the impact of wind energy projects, it is also important to bear in mind that a project may have different impacts over its lifecycle as well as several impacts at the same time. Such compound of impacts should not be analysed in isolation but considered cumulatively (an overview of cumulative impacts can be found in Note 6). Specific negative impacts of a proposed wind energy project need to be mitigated, if possible, according to their relationship to the property's OUV, and where this is not an option, project alternatives may be developed, or the project may be abandoned. At the same time, potential positive impacts can be developed and enhanced (for more detail, please consult the 'Evaluating impacts' and 'Mitigation and enhancement' parts of the step-by-step guidance).

Overview of potential impacts of wind energy projects on the OUV of World Heritage properties

Onshore wind farms and installations

Potential impacts	Examples of negative impact	Examples of positive impact
Cultural and Social (As a general and abstract concept)	• Erosion or loss of cultural significance of heritage places • Loss of identity and the connection (including cultural and social uses) between people and heritage sites (*e.g., loss in the quality of interactions which are also social drivers*) • Increase of crime cases and vandalism	• Access to clean energy • Enhancement of community's living standards through shares of economic income and benefits • A symbol for promoting a message of sustainability and green energy for future generations
Economic	• Impacts on the economic and productive relationships between people and their landscape • Loss of income and economic possibilities *(e.g., real estate prices)* • Loss of jobs (*e.g., tourism*)	• Generated income of the energy installations can benefit local communities (*e.g., locally or community-owned energy installations*) • Access to affordable clean energy • A fair transition strategy can create new economic opportunities
Environmental (also related to natural heritage values)	• Loss of biodiversity • Habitat and ecosystem fragmentation • Environmental degradation • Shadow flicker • Groundwater impacts • Noise pollution • Infrasound • Night lights	• Reduced carbon footprint • Contribute to the global climate emergency

Potential impacts	Examples of negative impact	Examples of positive impact
World Heritage Convention		
Physical (primarily related to physical aspects of cultural and natural heritage values)	• Physical disturbance of cultural and natural values/features • Ground current • Environmental exposure to high-frequency voltage transients (*e.g.,: foundation of wind turbines affecting archaeological remains; damage for historic/protected road infrastructure; degrading geological and hydrological elements and significant green areas, habitat loss, disturbance for species*)	
Health	• Noise pollution • Night lights	• Clean air • Long-term effects of CO2 reduction
Technological	• Electromagnetic fields and interference • Technology overload effect	• Promotion of technological progress through case studies and experimental
Visual	Disruption to visual character of landscape inside and surrounding the property: • Dominance of wind turbines over the landscape (height, design, colour); • Disturbance from night light and light signals; • Disturbance from rotor movement; • Loss of landscape scale; • Loss of relationships between values, attributes and communities; • Loss of landscape features and of the relationships between different landscape types and patterns; • Impacts on landscape dynamics; • Shadow flicker. (➔ see also Note 5)	

Offshore Wind Farms and Installations

Potential impacts	Examples of negative impact	Examples of positive impact
Cultural and social (As a general and abstract concept)	• Erosion or loss of cultural significance of heritage places • Loss of identity and the connection (including cultural and social uses) between people and heritage sites (*e.g., loss in the quality of interactions which are also social drivers*) • Increase of crime cases and vandalism	• Access to clean and affordable energy • A symbol for promoting a message of sustainability and green energy for future generations
Economic	• Impacts on the economic and productive relationships between people and their landscape/seascape • Impacts on the fishing industry • Loss of income and economic possibilities (*e.g., real estate prices)* • Loss of jobs (*e.g., tourism*)	• Locally or community-owned energy installations • Access to affordable clean energy • A fair transition strategy can create new economic opportunities
Environmental (Also related to natural heritage values)	• Loss of biodiversity • Loss of habitats and ecosystem fragmentation • Environmental degradation • Shadow flicker • Noise pollution • Infrasound • Night lights	• Reduced carbon footprint • Reduced dependency from fossil fuels and other non-renewable sources of energy • Artificial reef effect that might serve as new habitat
Physical (Primarily related to physical aspects of cultural and natural heritage values)	• Physical disturbance of cultural and natural values/ features • Ground current • Environmental exposure to high-frequency voltage transients (*e.g., foundation of wind turbines affecting underwater archaeological remains; degradation of geological elements and seabed, habitat loss, disturbance of species*)	

Potential impacts	Examples of negative impact	Examples of positive impact
Technological	• Electromagnetic fields and interference • Technology overload effect	• Promotion of technological progress through case studies and experimental
Visual	• Dominance of wind turbines over the landscape/seascape (height, design, colour) • Disturbance from night light and light signals • Disturbance from rotor movement • Loss of landscape/seascape scale • Loss of relationships between values, attributes and communities • Loss of relationships between landscape/seascape features • Loss of landscape/seascape features and patterns • Impacts on landscape/seascape dynamics	

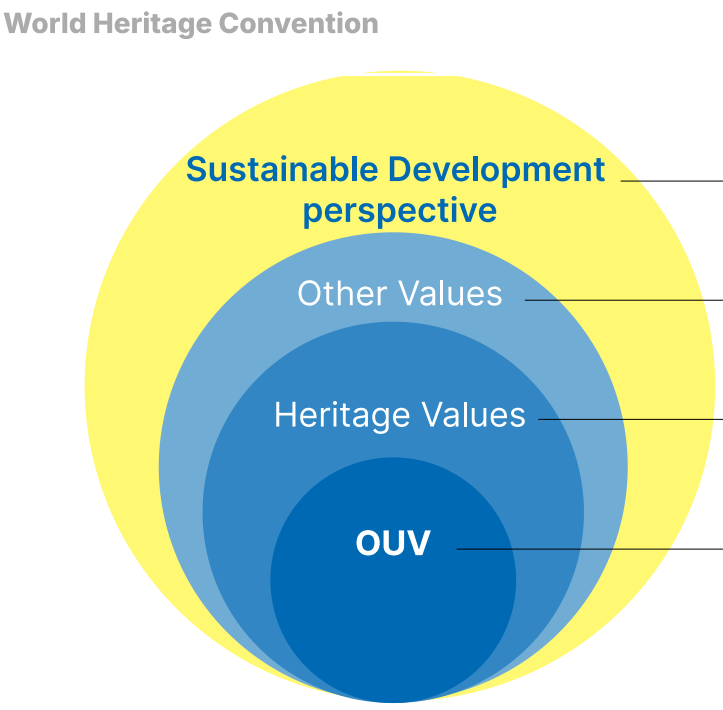
World Heritage Convention

Source: table adapted from IUCN (2021).
Please note that these lists are aimed only to provide examples and by no mean are they exhaustive).
See also Note 4

Case studies (related to impacts of wind energy projects)

What should be considered before beginning an ESIA?

A project specific ESIA should be based on a thorough understanding of the World Heritage property's OUV, its related attributes and other, and the proposed wind energy project (➔ See Checklist 1).



World Heritage properties are an integral part of the area they are situated at. In the planning and decision-making process for wind energy developments, an equitable sustainable development approach with the environmental, social and economic dimensions should be taken into account

A heritage place can be significant to its broader territory and contemporary society for other reasons too, including its economic and/or social values

Heritage values at any World Heritage property are not limited to its Outstanding Universal Value, and can include other natural or cultural assets (tangible and intangible) that are specific to that place

The World Heritage status of a property and all related processes are based on its Statement of Outstanding Universal Value, which expresses the reasons for which it was inscribed on the World Heritage List

Image adapted from Pilot Regional course (concept Note document) on Interpretive Planning at World Heritage properties completed its second module.

The multi-layered value characteristic of World Heritage properties should be taken into account during an impact assessment process, as national and local values are also conveyed by attributes that may contribute to protect the conditions of authenticity and integrity of World Heritage properties. The relationship between attributes and values is often complex – one attribute might convey several values, and one value might be conveyed by multiple attributes. For this reason, impact assessment should recognize that outstanding universal, national and local values and attributes together form an interconnected system and that a proposed action might impact elements of this interconnected system individually, but also the system as a whole.

In advance of an ESIA:

- Ensure that there is a comprehensive understanding of the World Heritage property for which the impact assessment process is being conducted as much as possible, using the readily available information and documents (SOUV, map and other relevant information on the UNESCO World Heritage Centre website, dedicated national websites, national inventories, Management Plan, etc.). This primarily includes a good grasp of the property's boundary, its OUV and other values and of the tangible and intangible attributes conveying them (see also **Note 1** and **Step 3: Baseline Assessment**). If available, an impact assessment should also refer to the results of the sensitivity mapping (see also **Note 2**);

- Obtain a clear picture of relevant legislative and policy framework existing at local, national and regional levels. The assessment should include a detailed description of the legal and institutional frameworks and reflect the property's territorial boundaries (including buffer zone(s) and the wider setting).
  ➔ See also in **World Heritage Essentials** and **Protecting World Heritage in the context of the renewable energy transition**;

- Consider already possible project alternatives before initiating the impact assessment process. This includes considering alternative locations, the outline and design of the proposed wind farm, alternative project specifications (size, height, colour, etc.), as well as a 'no-project' option;

- Envisage the involvement of relevant professionals in the impact assessment team, including impact assessment and wind energy experts as well as heritage practitioners with in-depth knowledge of the World Heritage property in question; these may be competent authorities, site managers, management teams or practitioners involved in conservation and management activities at the property. Particular impacts on specific attributes may require additional inputs from other specialists;

- Conduct an exercise to identify rights-holders and other stakeholders and ensure that mechanisms for their participation are in place throughout the impact assessment process (see also '**Participation of rights-holders and other stakeholders in an impact assessment process**').

Checklists

These checklists are linked with impacts of wind energy projects and their assessment and are referenced in the Guidance in relation to the impact assessment process.

- Checklist 1 – Key information needed for a World Heritage related Environmental Social Impact Assessment for wind energy projects
- Checklist 2 – Baseline assessment of a World Heritage property
- Checklist 3 – Description of a proposed wind energy project
- Checklist 4 – Items to be included in a World Heritage related impact assessment report for wind energy projects

Checklist 1

Key information needed for a World Heritage related Environmental Social Impact Assessment for wind energy projects

1.1 Information wind energy project proponents need for planning a project with potential impacts on a World Heritage property

This checklist includes an overview of information that wind energy project proponents should obtain at the early stages of the planning process from the bodies charged with the protection and conservation of World Heritage properties, such as the site manager or the specialized authority:

- Statement of Outstanding Universal Value (SOUV) of the property;
- Information on other relevant heritage values;
- List of all attributes conveying OUV and other relevant heritage values;
- Comprehensive maps of the property, including the property's boundaries and buffer zone(s);
- Documentation on key visual axis, panoramas and views that are important for the protection of the property's OUV. This may include visual impact assessments, and other visual and historical studies;
- Presence of sensitive species habitats and migratory routes;
- Overview of all relevant rights-holders, communities and stakeholders.

1.2 – Information for those in charge of the management and conservation of the World Heritage property

This checklist includes an indicative overview of information that representatives of heritage agencies, site managers and practitioners involved in the impact assessment process should obtain. When requesting this information, the 'Precautionary Principle' should be considered in reference to the best- and worst-case scenarios of a project proposal:

- Outline of the proposed wind energy project, including any planning document providing detailed information on the proposed project;
- Area proposed for the wind energy project;
- Scale of the proposed project;

- information concerning the proposed number, layout and location of the wind turbines and ancillary facilities;
- information concerning the design – including maximum height, colour and form – of the proposed wind turbines;
- Project lifecycle: commissioning and development timeframe, expected lifetime of the wind energy project, end-of-life and decommissioning strategies.

Checklist 2

Baseline assessment of a World Heritage property

This checklist includes an overview of information and data relevant for the baseline assessment in preparation of an impact assessment concerning a wind energy installation inside or nearby a World Heritage property.

Depending on the specific characteristics of a property, relevant information for a baseline study could be related to the following elements:

- Landscape and topography:
  - landscape typology and design
  - topography
  - geomorphology
  - landscape biography
  - landscape modelling
  - setting studies
  - vistas and panoramas
  - seasonal landscape patterns
  - landscape ecology
- Soil and geology:
  - geomorphology
  - geological features
  - quality of soil, including erosion patterns and acidity levels
- Water:
  - water quality and quantity
  - fluvial geomorphology
  - hydrologic characteristics
  - seasonal fluvial patterns
- Air:
  - air quality

    - climatic factors
    - atmospheric factors

- Climate and climate change
- Flora and fauna, biodiversity:
    - habitats
    - species
    - sites of special interest/ importance for the species in their life cycle or in a season
    - interdependencies
- Tangible and intangible heritage:
    - built heritage
    - buildings and monuments, including traditional and vernacular heritage
    - archaeological sites (including terrestrial and underwater)
    - traditional practices
    - associations and meanings
    - spiritual beliefs
    - traditional knowledge systems
- Use of the property:
    - Land use and landscape use (in the past and present)
    - ecosystem services
    - use of resources
    - access (including routes, connections, ritual paths, but also sightlines)
    - recreational use, including tourism
- Management systems
- Noise
- Population and demographics

Moreover, in the context of wind energy projects, data and information concerning the following elements are particularly relevant:

a) State of Conservation of the property:

- Desk based studies for the OUV, attributes and other values;
- Decisions of the World Heritage Committee;
- State of Conservation Reports (by the States Parties and the Secretariat);

- Result of onsite visits to assess current state of conservation either by the site managers, relevant national authorities or the World Heritage Centre/Advisory Bodies;

b) Environmental data and information:

- Environmental baseline studies;
- Biological mapping;
- Habitat mapping;
- Hydrodynamic studies;
- Landscape surveys;
- Landscape biographies;
- Measurement of ecosystem services;
- Soil health assessment;
- Water quality assessment.

c) Socio-cultural data and information:

- Mapping tangible and intangible cultural element and processes;
- Cultural heritage mapping and studies;
- Ethnographic studies;
- Establishment of visual baseline;
- Identification of key vistas and panorama;
- Culture related data collection from participation, consultation and engagement efforts (including interviews with rights-holders and local communities);
- Cultural tourism related studies and visitor statistics.

d) Economic data and information:

- Economic analysis of the proposed wind energy project (including cost-benefit analysis);
- Land evaluation especially related to agricultural use;
- Tourism related economic studies.

Checklist 3

Description of a proposed wind energy project

Clarification of the need and feasibility concerning the proposed project

- Justification of the need for the proposed wind energy project;

- Compliance with existing legal frameworks and/or with other local, national, regional or international policies and strategies related to the renewable energy and wind energy;

- Justification of the site selection for the proposed wind energy project;
- Anemometric data and energy efficiency of the proposed wind infrastructure;
- Studies clarifying the real potential of the site for wind energy exploitation.

Description of the proposed wind energy project

- Technical information concerning the proposed wind energy project:
  - Technical drawings and reports of the proposed wind energy project:
    - Proposed installed energy capacity,
    - Typology and layout of wind turbines,
    - Number of wind turbines,
    - Material used,
    - Ancillary facilities,
    - Access infrastructures,
    - Energy grid and distribution infrastructure.
- Technical characteristics of the proposed wind turbines:
  - Drawings: plan, elevation and section,
  - Visualizations from relevant perspectives,
  - Layout of the tower,
  - Colour (important not only for its possible visual impact but also for possible perception by animals),
  - Height of the wind turbine with and without the rotor,
  - Diameter and depth of foundations,
  - Diameter of the rotor,
  - Material of the turbines,
  - Amount of land to be cleared,
  - Expected lifetime,
  - Electrical output.
- Technical information of the rotor, rotor blade and the brake system;
- Overview of security plans and systems in place (lights, stabilization measures, ice protection systems);
- Description of the proposed lifecycle:
  - Proposed lifetime of the wind energy project,

- if available a Life Cycle Assessment,
- Description of the construction phase, including for example:
  - CO_2 emissions,
  - Information on infrastructural plans,
  - Energy and water resources needed,
  - Quantification of produced waste and sewage water,
  - Information concerning construction sites and logistics.
- Description of the operation phase, for example:
  - Noise,
  - Vibrations,
  - Nonionizing radiation,
  - Waste disposal,
  - Lights and security visual signals,
  - Maintenance plan,
  - Risk management plan,
  - Traffic previsions.
- Outline of the planned end of life options:
  - In case of repowering: possible repowering scenarios (considering that there might be technological advancements that might modify these scenarios),
  - In case of decommissioning: preview of models for a sustainable decommissioning scenario, dismantling of the wind energy infrastructure and requalification plan.

- Geographical information (including GIS coordinates) of the location of all the infrastructural components of the wind energy projects:
  - Wind turbines,
  - Access roads,
  - Sub-stations,
  - Transformers,
  - Power-grid lines,
  - Construction sites,
  - Area of influence of the project, for example, through shadow flickering.
- Cost plan with a detailed estimate of costs;
- Measures for environmental improvements;

- Visibility studies and visual modelling from different selected viewpoints, considering night and daytime.

Alternatives considered

- Outlining all proposed alternatives:
  - Alternative location,
  - Alternative type and layout of wind turbines,
  - No-go option;
- Assessment of the proposed alternative and comparison with other considered alternatives;
- Explanation and justification of the preferred alternative.

Checklist 4

Items to be included in a World Heritage related impact assessment report for wind energy projects

Chapter/Item	Content
Executive summary	A clearly written summary of the key findings, recommendations and conclusions (the summary should include the identification of the World Heritage property, its OUV and attributes and other values of the property, as well as the impacts of the proposed wind energy project on these). This summary, if possible, should be written in a language that makes it possible to understand by any reader. If this is not feasible, as the technical elements are important part of the report and need to be included in the 'Executive summary', an additional non-technical summary is advised to be provided for any reader with no technical background that includes key points related to World Heritage.

Contractual information and acknowledgements	• For transparency it is helpful to provide information on:
	  ○ Contractual references (who funded and commissioned the report);
	  ○ The role played by any institution or agency responsible for overseeing or reviewing the process;
	  ○ Who formed the team that carried out the impact assessment (key authors and other contributing specialists);
	  ○ Statement of the authors declaring no conflict of interest;
	  ○ Other key players in the process (an appendix on the consultation process can provide a list of independent reviewers and all those who participated in one way or another).

Chapter/Item	Content
Methodology	• A summary of the methodology used for the impact assessment; • The overall timeframe of the impact assessment and dates indicating when the different stages of the impact assessment were carried out; • Description on how rights-holders and stakeholders were involved and how their views were taken into account (when feasible, an annex could include a full list of all those who participated in various ways); • Any missing information, uncertainties or knowledge gaps relating to the baseline data, the proposed wind energy project and/or the impact identification and prediction; • An explanation of specific methodologies used for establishing the baseline study on the World Heritage property and for the prediction of impacts may be included in an annex.
Baseline for the World Heritage property	• Statement of Outstanding Universal Value; • Description of the World Heritage property and its wider setting, including the tangible and intangible attributes of the OUV, its authenticity (for cultural properties), integrity and other values; • Information on the current state of conservation of the attributes conveying the OUV of the property that is considered the baseline condition for the impact prediction; • Summary of other national/regional/local heritage values (cultural and natural) which have strong interdependencies with the OUV and/or may also be impacted by the proposal; • Relevant legal, regulatory and policy frameworks, including reference to the implementation of the *World Heritage Convention* on the national level; • Analysis of the governance and management system of the World Heritage property; • Relevant maps, plans and illustrations as annexes.
Outline of the proposed wind energy project and alternatives	• An explanation concerning the need for the development and objectives of the proposed wind energy project; • An outline of the proposed wind energy project; • An outline of the lifecycle of the proposed wind energy project: construction, operation, maintenance and end-of-life strategies. (Detailed information might be included in an annex)*;* • Maps, plans, technical drawings, visualizations and other illustrations in relation to the World Heritage property – sufficient to enable potential impacts to be clearly understood; • Alternatives that were considered, including the ‘no project’ option.

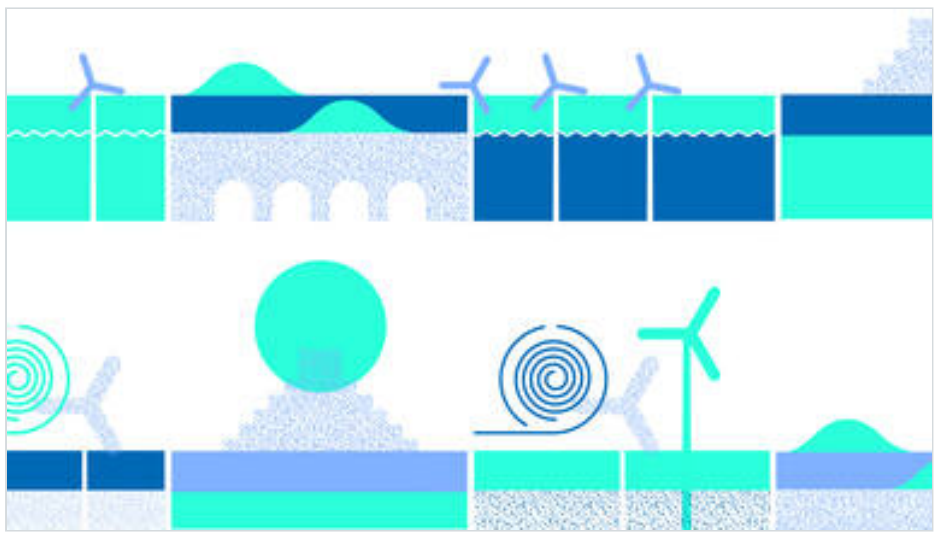
Chapter/Item	Content
World Heritage Convention	
Identification and evaluation of impacts	• Identification of the positive and negative impacts of the proposed wind energy project on the World Heritage property, including consideration of cumulative impacts; • Moreover, prediction of the characteristics of the positive and negative impacts, including disclosure of any uncertainty; • Evaluation of the significance of the impact of the proposed project on the OUV and attributes of the World Heritage property; • Determining whether these impacts are acceptable or not.
Mitigation measures	• Options for mitigation, including a proposal for detailed measures, and responsibilities (timeline, funding sources, etc.); • Description of any residual impacts after mitigation and anew appraisal of acceptability and degree of impacts.
Recommendations	• Recommendation for proceeding with the proposed wind energy project or a preferred alternative, or not proceeding with regard to impacts.
Follow-up	• Description of roles and responsibilities for the implementation of mitigation actions and their monitoring should the proposed project be approved and implemented; • If specific recommendations are needed and provided in relation to the protection of the OUV a World Heritage property and its attributes in the project implementation phases, these recommendations will need to be the object of adequate monitoring tools (this might include reporting to the World Heritage Committee in the form of a State of Conservation Report); • The preparation of a proposed Environmental Management Plan of the wind farm.

Chapter/Item	Content
World Heritage Convention	

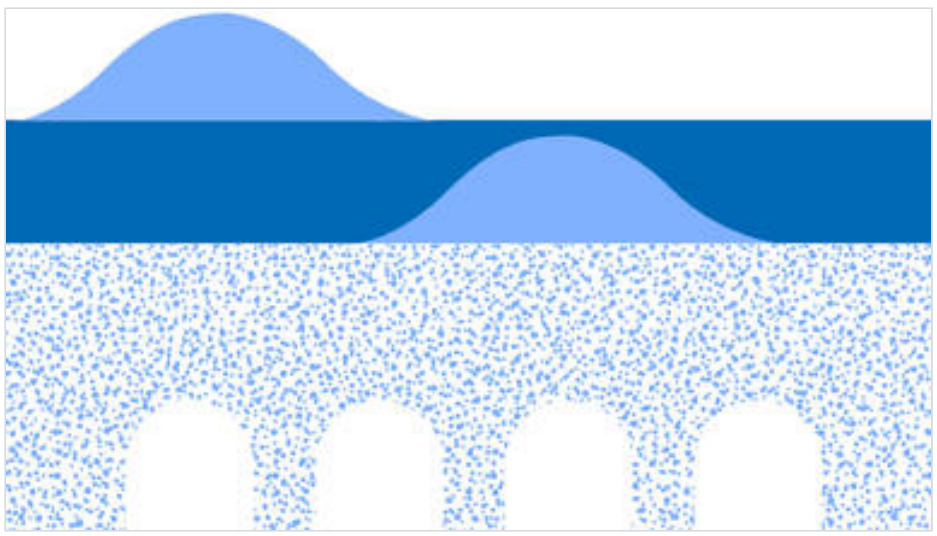
Annexes	• Terms of Reference;
	• Detailed information collected to describe the baseline of the World Heritage property (e.g., inventory of attributes that convey the OUV; information on other relevant national/regional/local heritage values; related surveys and scientific studies; relevant information gathered through the consultation process; illustrations and photographs, etc.);
	• Supporting technical information regarding the prediction of impacts:
	  ○ Project description and parameters,
	  ○ Detailed description of the project lifecycle, including end-of-life strategies,
	  ○ Technical drawings of the proposed wind energy project,
	  ○ Technical drawings of the wind turbines,
	  ○ Visualizations of the proposed project,
	  ○ Relevant location maps and design plans of the project,
	  ○ Technical assessments (noise, pollution, flickering).
	• The plan for mitigation and monitoring;
	• A proposed Environmental Management Plan of the wind farm if already available.

Adapted from the outline presented in the *Guidance and Toolkit for Impact Assessments in a World Heritage Context*.

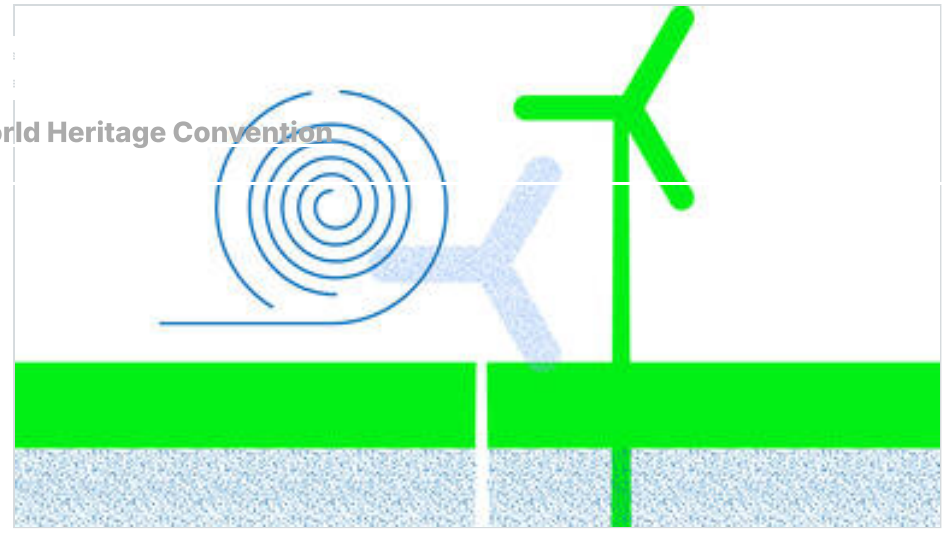
Other activities 4



Wind Energy



Guidance for Wind Energy Projects in a World Heritage Context



Wind Energy Essential

World Heritage and wind energy planning

Keywords 2

Wind Wind energy

Partners

Government of the Netherlands