BARRIERS TO CLEAN ELECTRIFICATION SERIES
PLANNING AND PERMITTING

Solution Toolkit: Actions for wind and solar developers

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Energy Transitions Commission

Overview

This Solution Toolkit outlines the key actions that need to be taken by **wind and solar developers** to speed up slow planning, permitting and land acquisition processes associated with clean power generation whilst maintaining strong environmental and social standards. For wind and solar developers, there are three principal areas of action:

- Conducting effective **stakeholder engagement**
- Ensuring **biodiversity conscious renewables development**
- Improving **local support**

As discussed in the accompanying Insights Briefing, there are three major barriers for planning and permitting: regulatory barriers, administrative barriers, and societal support barriers. This Solution Toolkit maps key actions to the barriers that these help to address. Other Toolkits are available for Governments and policymakers and Local Authorities/Civil Society.

Planning and permitting processes and barriers differ vastly depending on the local political and spatial context. For each key action, the Solution Toolkit highlights where actions are of particular relevance to certain types of countries. Four different types of geographies are outlined:

1. **Centrally-led countries**
   e.g., China, Vietnam, UAE
2. **Countries with strong democratic processes**
   e.g., Europe, United States
3. **Highly land-restricted countries**
   e.g., Japan, South Korea
4. **Infrastructure-constrained countries**
   e.g., South Sudan, Burundi, Niger

Barriers to Clean Electrification Series

The ETC's *Barriers to Clean Electrification* series focuses on identifying the key challenges facing the transition to clean power systems globally and recommending a set of key actions to ensure the clean electricity scale-up is not derailed in the 2020s. This series of reports will develop a view on how to "risk manage" the transition – by anticipating the barriers that are likely to arise and outlining how to overcome them, providing counters to misleading claims, providing explainer content and key facts, and sharing recommendations that help manage risks.

An Insights Briefing will be developed for each barrier, covering the context and major challenges, and assessing the impact of deploying key solutions. These Insight Briefings will be accompanied by a series of Solution Toolkits, which lay out a set of key actions that need to be taken by the most important group of stakeholders (e.g., governments, renewables developers, grid operators, civil society) and outlines supporting case studies.

Key actions for for wind and solar developers:

Regulatory | Administrative | Societal support

Stakeholder engagement:

- Ensure effective stakeholder engagement

Biodiversity conscious development:

- Implement biodiversity-conscious approaches to siting and construction
- Implement company-level biodiversity positive strategies

Local support:

- Improve aesthetic design of renewable technology
- Ensure benefits sharing with local communities

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Ensure effective stakeholder engagement

Key actions

Every community is likely to have different priorities regarding new renewable energy infrastructure. Effective stakeholder engagement is critical to set the foundation for developers to roll out effective social and environmental impact management (e.g., via minimising potential negative impacts and sharing benefits with the local community). To set these foundations, developers should:

- **Map** out relevant stakeholders and create an engagement plan, outlining how and when stakeholders will be engaged – which **identifies** key issues, risks and opportunities.
- **Start** stakeholder engagement early and **maintain** an ongoing process throughout the development and construction phases.
- **Design** an action plan to overcome identified issues, and inform net-positive biodiversity strategies and benefits sharing arrangements. Action plans should include appropriate resourcing of departments within developer teams, e.g., for landholder liaison.

Implications

Fostering transparent and timely engagement with stakeholders will improve trust and understanding. This will also reduce the likelihood and severity of legal challenges.

Comprehensive consideration of social risks, impacts, and opportunities will strengthen business decision-making and support operation in complex operating environments, especially for developments in new jurisdictions.

Enhanced reputation of the project and company, as well as the renewables industry, will also enable a greater range and speed for site selection going forward.

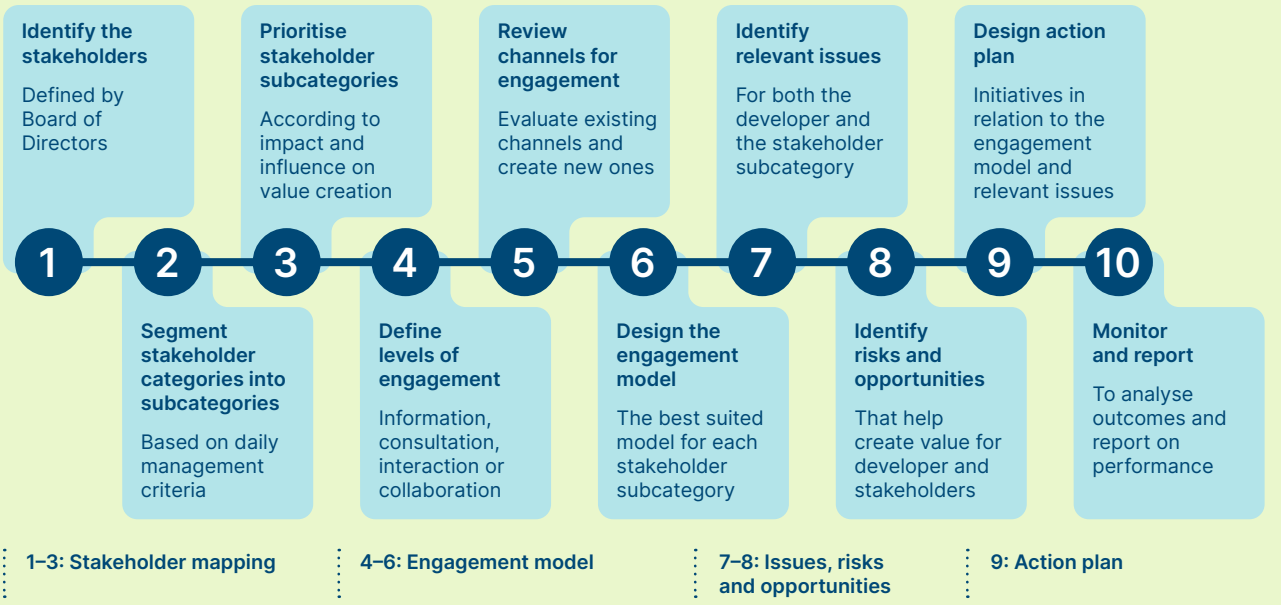
Key country groups

Democratic and land-constrained countries would benefit the most from thorough stakeholder engagement, as there tends to be a wider group of interested stakeholders in these regions, which also means that legal challenges tend to be a larger blocker.

Iberdrola's comprehensive stakeholder engagement model

The comprehensive stakeholder engagement model is designed to understand and cater to stakeholders' legitimate needs and interests. This model sets out a guide for the process:[1]

IBERDROLA



Implement biodiversity-conscious approaches to siting and construction

Biodiversity conscious development

Key actions

Some amount of disruption to biodiversity is inevitable with new large infrastructure projects. New wind and solar projects should be sited and constructed in ways which minimise biodiversity harm, and further negative impacts should be monitored and mitigated where necessary.

Developers should:

- **Utilise** effective land and marine spatial planning to identify the ecological and conservation priorities for districts and evaluate the best areas to place renewables. This could build on the government led country-level environmental mapping outlined in our Solution Toolkit for governments and policymakers.
- **Conduct** targeted environmental surverys to identify and reduce the potential for significant environmental effects arising from the construction, operation and decommissioning of development (e.g., to avoid or reduce deployment in areas which overlap with an area of high biodiversity value).
- **Construct** renewable plants in a manner that minimises impact on local ecosystems, taking steps to mitigate the damage of unavoidable impacts (e.g., constructed in a manner that allows continued grazing or use of farmland during construction and operation).
- **Monitor** all relevant impacts relating to the construction and use of the renewable energy plant and address potential issues that may arise (e.g., support recreation of affected habitats if these are found to be negatively affected by the development).

Implications

Using best practice siting, construction and monitoring is the best way to ensure that damage to local ecosystems is minimised. This should promote buy-in and reduce local opposition to projects on environmental grounds, resulting in a reduced scale and magnitude of legal challenges.

Key country groups

The ecosystems and biodiversity of all countries can benefit from using best practice siting, construction and monitoring. However, democratic and land-constrained countries tend to have legal systems which result in stronger challenges based on biodiversity impacts, so project development savings will be most prevalent in these regions.

Ørsted

Ørsted's best practice offshore wind biodiversity policy

Ørsted are one of the world's largest developers of offshore wind, with over 7.6 GW installed,[2] and one of the world leaders in sustainable offshore wind siting, construction and monitoring. They outline best practice in their offshore wind biodiversity policy:[3]

To ensure wind farms are appropriately and responsibly sited, Ørsted undertake extensive stakeholder dialogue to understand local considerations and sensitivities; detailed environmental impact assessments are conducted, and detailed planning and collaboration with authorities is undertaken to determine the specific location of wind turbines and cables to avoid unacceptable or significant impacts on the marine and coastal environment.

To minimise impacts on habitats, seabeds and coastal ecosytems during construction, surveys ensure strong consideration of natural habitats before and after installing cables, whilst potentially disturbing activities are limited by duration, intensity and extent where required, and unavoidable impacts are managed, monitored and mitigated to levels acceptable by local authorities (e.g., restricting construction activities to daylight hours if protected animals generally use the area at night).

To monitor impacts, a range of mandatory and voluntary environmental monitoring programmes are used. Where relevant, evidence is contributed to relevant stakeholders (e.g., whenever turbines are serviced, habitats of flora and fauna are monitored concurrently). If environmental monitoring reveals unforeseen negative impacts to biodiversity, these impacts are further substantiated and mitigated.

Implement company-level biodiversity positive strategies

Key actions

Wind and solar developers should aim to have a net-positive impact on biodiversity at a developer level – both by contributing positively to biodiversity when deploying new wind and solar sites and through additional restoration projects.

Developers should:

- **Set** net-positive biodiversity targets, with the goal of maintaining or improving biodiversity compared to the status quo (e.g., for the company to have a net-positive impact on biodiversity by 2030).
- **Deploy** wind and solar assets in a biodiversity positive manner, protecting existing species and where possible introducing new flora and fauna appropriate for local ecosystems (e.g., by enacting programmes to protect and conserve rare birds in the area or adding new pollinators such as bees to the development).
- **Restore** biodiversity in areas which have been negatively affected by man-made developments and climate change (e.g., reintroducing species to suitable habitats or creating new forests and artificial reefs).

Ørsted IBERDROLA

Net-positive biodiversity targets from leading renewables developers

Ørsted and Iberdrola have both set targets to have a net-positive biodiversity impact by 2030. Ørsted have committed that by 2030 all new commissioned projects will have a net-positive biodiversity impact,[4] whilst Iberdrola are also targeting a positive net impact on biodiversity in 2030.[5]

Biodiversity restoration in England

Ørsted have committed to restore biodiversity around the Humber, a large tidal estuary on the east coast of Northern England. The pioneering initiative will invest more than £2.5 million to restore seagrass and salt marsh and introduce half a million native oysters to improve the health and resilience of the estuary's ecosytems.[6]

Biodiveristy positive deployment in Spain

Iberdrola have installed 162 beehives at its Andévalo solar PV plant in Andalusia's Huelva province, with the aim of preserving biodiversity in the surroundings and demonstrating that introducing pollinators at renewable installations situated close to agricultural land can improve crop performance.[7]

These actions are part of the programme CONVIVE, which integrates all the initiatives and alliances that Iberdrola is carrying out for the integration of any renewable project with biodiversity conservation and contributions to social and economic development.[5]

Implications

Developers actively moving towards having a net-positive impact on biodiversity provides local stakeholders and interested non-governmental organisations a clear signal that these developers can be trusted to protect and nurture relevant flora and fauna.

This should result in considerably more support on biodiversity related grounds and could lead to a greater range and speed of site selection, increased pace of stakeholder consultations, accelerated permitting, and a reduction in legal challenges.

Key country groups

The ecosystems and biodiversity of all country groups can benefit from developers taking a net-positive approach to biodiversity; however, democratic and land constrained countries tend to have legal systems which result in greater challenges based on biodiversity impacts, so project development savings will be most prevalent in these regions.

Improve aesthetic design of renewable technology

Local Support

Key actions

Project design is a material consideration in the planning process, as good siting and design helps to produce developments which are more visually appropriate for the given landscape. Where possible, wind and solar farms should be designed in consultation with local stakeholders to minimise landscape and visual impacts.

In cases where this is possible and appropriate, developers:

- **Could agree** upon clear visual design objectives with local stakeholders and use these principles consistently when constructing solar panels and wind turbines.
- **Could utilise** site-specific design assessment and design the layout to preserve landscape character.
- **Could deploy** renewable energy plants alongside agricultural crops and livestock to preserve the natural aesthetic.

Best practice siting and design of wind farms in Scotland

Scottish Natural Heritage conducted extensive research for improving the siting and design of wind farms in the landscape. They found that best practice design decisions were generally based upon an "on-balance" judgement between differing design objectives including reduced visual impacts, camouflage, and integration with the local landscape.

General rules for onshore wind in rural Scotland were that a single colour of turbine is generally preferable, as aesthetic unity is viewed favourably. A light grey colour is thought to achieve the best balance between reducing the visual impact when seen against the backdrop of a landscape and when seen against the sky.

Different sites were found to have different "landscape character", comprised of distinct recognisable patterns of elements relating to underlying geology, landform, soils, vegetation, land-use, and settlement. Taken together, these qualities contribute to a regional distinctiveness and sense of place, which developers should seek to preserve when designing their renewable energy plant.[8]

Implications

Working with local communities to create more aesthetically pleasing wind and solar farms should help improve local acceptance and reduce the scale and magnitude of legal challenges.

Key country groups

Democratic and land-constrained countries would benefit the most from improving aesthetic designs as legal challenges tend to be a larger blocker in these regions.

Ensure benefits sharing with local communities

Local Support

Key actions

For local communities to be vested in the long-term sizeable presence and success of wind and solar projects, they need to see tangible and authentic benefit sharing (e.g., in the form of local jobs, revenue sharing and shared ownership, development of other local infrastructure, etc.). Investing and communicating early to create the right framework for local communities can better anticipate potential disputes.

As there is no single one-size-fits all approach to local benefit-sharing, the identification of appropriate measures should flow from engagement between the developer and community.

Developers could:

- **Create** opportunities for community ownership of renewable projects wherever possible, which can benefit the local community by reducing energy costs, ensuring access to clean energy, providing local jobs and a share in financial profits.
- **Contribute financially** to local communities through existing fiscal contributions (such as taxes) and if necessary, providing direct payments to citizens or funding local social services (e.g., nurseries, health services) or infrastructure (e.g., improving roads and public transportation).
- **Employ** local skilled labour and invest in workforce training programmes to create a pipeline of skilled renewable energy workers.

Benefits from community ownership of wind farms in Scotland

Analysis of Scottish wind farms suggests that community owned wind turbines bring in flows of £170,000 per installed MW per annum – 35 times more than the industry standard benefits payment of £5,000/MW currently offered by most commercial operators across Scotland.

Whilst the community does have to incur the cost of building the wind turbines, as an example a 0.9 MW turbine in Westbray is expected to produce revenues of £6.8m over it's 25-year lifespan, far surpassing costs of installation.[10]

Community payments from wind turbine operators in Germany

In 2021, new regulation was introduced allowing wind turbine operators to pass on up to €2 for each MWh of wind power generated to local municipalities at up to €25,000 per wind turbine per annum. Since implementation the sector has observed a material increase in municipalities looking for wind energy providers.[11,12]

Community ownership of wind farms in Denmark

Denmark has been a pioneer in community ownership of wind farms, in 2016 67% of onshore wind energy was generated by citizen-owned parks. This helped drive Denmark's share of clean electricity to more than 50% of consumption by 2019.[9]

Benefits to local communities from wind farms in the United States

Wind developers have committed to making payments to livestock farmers across rural America where wind turbines share the land with sheep and cattle. In rural parts of O'Neill, Nebraska, landowners collectively earn around $2 million per year in compensation for the use of land for 400 MW of turbines, while the project pays another $2 million in local property taxes each year, having created 25 permanent jobs for maintenance technicians.[13]

Building community infrastructure in Kenya

Lake Turkana Wind Power established the foundation Winds of Change to undertake sustainable community development projects, including building a 200 km road which transformed the transportation network in the area, significantly increasing local communities access to markets, health care and education.[14]

Implications

Whilst large-scale renewable energy deployment is necessary to meet climate goals, smaller community owned projects which are usually between 5 kW to 5 MW in size, could still play a significant role in ensuring buy-in to the energy transition.

Ensuring wider benefits to local communities from renewable development can ensure support for large-scale deployment, and support of the wider energy transition through giving local stakeholders a vested interest in the success of the project. This should expand the sites available for selection and reduce the scale and magnitude of legal challenges.

Key country groups

While renewables development should be compatible as much as possible with the needs of local communities worldwide, democratic and land-constrained countries with legal systems that provide avenues for greater local opposition would benefit most from a developer approach that takes into account strong benefits sharing. In many infrastructure-constrained countries, community-centric approaches would also help get projects off the ground due to synergies with local economic development goals.

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