



# Wind Development Process

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Shared Ownership Projects 10013

LOCAL ENERGY SCOTLAND



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## **1.1. Glossary/Abbreviations**

|       |                                            |
|-------|--------------------------------------------|
| AGL   | Above Ground Level                         |
| BCE   | Budget Cost Estimate                       |
| BESS  | Battery Energy Storage System              |
| CARES | Community And Renewable Energy Scheme      |
| CBF   | Community Benefit Fund                     |
| CFD   | Contracts For Difference                   |
| COD   | Commercial Operation Date                  |
| CPI   | Consumer Price Index.                      |
| DNO   | Distribution Network Operator              |
| ECU   | Energy Consents Unit                       |
| EIA   | Environmental Impact Assessment            |
| FC    | Financial Close                            |
| FCA   | Financial Conduct Authority                |
| FID   | Final Investment Decision                  |
| FPA   | First Pass Assessment                      |
| FSMA  | Financial Services And Markets Act         |
| GIS   | Geographical Information Systems           |
| GW    | Gigawatt                                   |
| HoT   | Heads of Terms                             |
| IM    | Information Memorandum                     |
| JV    | Joint Venture                              |
| LCCC  | Low Carbon Contracts Company               |
| LES   | Local Energy Scotland                      |
| LIDAR | Light Detection And Ranging                |
| LPA   | Local Planning Authority                   |
| LVIA  | Landscape And Visual Impact Assessment     |
| MOU   | Memorandum Of Understanding                |
| MW    | Megawatt                                   |
| NDA   | Non-Disclosure Agreement                   |
| PPA   | Power Purchase Agreement                   |
| SHEPD | Scottish Hydro Electric Power Distribution |
| SO    | Shared Ownership                           |

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SODAR   Sound Detection And Ranging

SPEN                Scottish Power Energy Networks

SPV                 Special Purpose Vehicle

SSE                 Scottish and Southern Electricity

TO                  Transmission Operator

## 2. Introduction

### 2.1. Background

Local Energy Scotland (LES, the Client) has been actively supporting community groups and individuals to develop locally owned renewable energy projects across Scotland for many years. With the removal of subsidies commercial onshore wind projects have required to grow in size (both MW capacity installed and dimensions of turbines) to ensure that they can secure suitably significant economies of scale and achieve strong commercial returns. This has led to increased development complexity and risk as well as also requiring significant development cost at risk. These factors have meant a reduction in the number of wholly community-owned wind projects taken forward in Scotland since 2015.

Shared ownership is set out further in Section 3 but in simple terms it can allow interested community organisations to share in the potential upside of a development whilst having reduced or no exposure to the development costs and potentially reduced risks associated with development. Typically the greater the risk taken on by the community organisations the greater the associated upside should be on the basis that the project is successful.

### 2.2. Aim of works

The aim of this document is to clearly set out the current onshore wind development process in Scotland using a summary flowchart and supporting background information. The purpose of the document is to highlight where developers may find difficulties, such that any community organisation looking to enter into a shared ownership project is aware of development risks. Depending on the extent of community involvement, and the stage at which they join the project, this report may provide more detail than required.

The scale of the projects being considered is >10MW in capacity which reflects what would typically be a minimal viable scale of new development where generation is being sold back to the grid.

Within this document Locogen will also highlight key shared ownership considerations so that interested parties can identify the key points at which shared ownership is being discussed and the works, and associated risks, needed to achieve a viable project.

This overview of the development process will ultimately be shared on the Local Energy Scotland website for use by CARES applicants, the Local Energy Scotland team and other stakeholders. The works will help them to understand how shared ownership fits into the development process to ensure a better overall understanding of the potential opportunities that are available. The document has been designed to be relatively high-level with a focus on common key risks and potential causes for delay when considering getting involved in a shared ownership project.

This guidance document has also been presented to Local Energy Scotland and other interested parties in the form of a Webinar.

### 2.3. Report structure

The remainder of this report comprises the following sections:

3. **Overview of shared ownership:** Provides an overview of what shared ownership is and how it typically works.
4. **Wind development flowchart:** This summary graphic sets out the 6 identified project phases and then breaks down the required works by the five interdependent categories.
5. **Summary of development works:** Sets out further detail on the key categories associated with wind development. Section includes a summary of the key risks associated with each category and relevant factors when considering Shared Ownership.
6. **Development stages:** Provides further detail on the 6 identified project phases that a project must go through to be successfully developed.

## 3. Overview of shared ownership

### 3.1. What is shared ownership?

Local Energy Scotland provide a detailed narrative of shared ownership on their website<sup>1</sup>. In summary, community organisations can be empowered by sharing in the ownership renewable projects, rather than solely receiving voluntary payments from developers (as currently is the status-quo for most large commercial wind projects). Rather, by sharing ownership in a project, the community organisation (which invests in the project) will have the potential for increased income with, typically, a greater level of control for the community group. This should enable the group to achieve more meaningful revenue streams and build a greater level of resilience.

Most shared ownership projects begin with the developer, with some community engagement in the consenting process. The opportunity for community investment is most often realised when financing the project, towards financial close. However, further benefits can be realised (as discussed subsequently) with an element of community ownership from the beginning.

On a wider scale, it is the Scottish Government's ambition "to encourage the renewables industry to consider, explore and offer shared ownership opportunities as standard on all new renewable energy projects including repowering and extensions to existing projects". In 2019, the Scottish government originally set targets of 1 GW of community and locally owned energy by 2020 and 2 GW by 2030. This demonstrates the importance of community empowerment nationally, and the role of renewable energy developments in strengthening communities (and vice versa).

### 3.2. Benefits of shared ownership

In projects where there is solely a community benefit fund, the income to the community is essentially 'capped' whereas the income from a shared ownership project has the potential for increased earnings if the project performs well (though also carries a risk of lower earnings if project performs below expectations). Furthermore, a shared ownership income would be unrestricted, whereas a CBF will likely have some precedents set by the developer, such as a requirement to spend the fund on a yearly basis (which would not allow the community to save up for a larger project, or to invest in something bigger e.g. property).

From the developer's perspective, a shared ownership project demonstrates excellence in community engagement and could ultimately lead to a more valuable project overall due to the project being potentially eligible for business rates relief. Depending on when the community becomes involved in the project, it may also be considered more attractive to those parties making a planning decision, residents within the vicinity of the proposed project and potentially investors. Further benefits to the developer may include access to investment, rates relieve and local influence.

### 3.3. Structuring shared ownership

There are several structures used for shared ownership. Further details are available on the Local Energy Scotland hub. There are three models recognised in the Shared Ownership good practice principles, namely:

- **Joint venture (JV)/Special Purpose Vehicle (SPV)** – The developer and community work in partnership to develop, own, and manage a project. The JV should be set up at an early stage, and as such, the risks and rewards will be fully shared between parties.

Community's financial contribution may be funded by a government grant or repayable loan. Alternatively, a community could buy in to a project after development has started by contributing a share of the costs to date.

- **Shared revenue** – The developer agrees to provide a share of project revenues or profit. The community has a financial stake but does not own any asset. In this case, the community invests in the project at the start of the construction stage, or shortly after commissioning, and the investment price is a proportion of development and construction costs. The community then earns a percentage of revenue determined by its investment share.



- **Split ownership** – The developer and community own separate, distinct entities (for example, the community owns one turbine within the wind farm), essentially dividing the project into distinct elements. This option is more legally and technically complex in terms of development and ownership. Whilst it does present a clear delineation of control it can carry higher risk than other options (e.g. what happens if that turbine underperforms relative to the wider project) and as such is not as common as the other two options.

The choice of structure depends on the level of risk that the community group wishes to take on, their potential to access development spend (if willing to become involved pre-financial close) and the views of the existing incumbent developer.

### 3.4. What are the general risks in SO context?

In addition to project development risks (as discussed throughout Section 5 of this report, and summarised in Appendix A), the community group will take on additional risk by being an (assumed) minority stakeholder in the project.

These risks include the following:

- **Control** – the majority owner will retain overall control/decision making for the project and any minority shareholder is typically ‘dragged’ along in their direction of travel.
- **Subordination** – Community funding/borrowing will likely be ranked behind the senior lender and therefore in the event of insufficient funds being available this repayment may be delayed.
- **Security** – A senior lender will be able to take control if project significantly underperforms and this may include taking ownership of the community’s share.
- **Volatility** – repayment of senior debt will be fixed, therefore reduced revenues will typically impact the community repayment first which means extra volatility in cashflows to the community.

Examples of key operational shocks to the project that may impact upon returns include the following:

- General project underperformance due to poor technical availability of the turbines;
- Significant grid risk (curtailment) that reduces the project’s ability to generate;
- Price fluctuations when selling the generation; and
- Step changes in risk at the end of the turbine’s maintenance contract.

## 4. Wind development flowchart

| Phase 1: Initial feasibility (6-9 months)                                                                                                                                                          |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"><li>Confirm land boundaries</li><li>Exclusivity agreement</li></ul>                                                                              | <b>Grid</b> <ul style="list-style-type: none"><li>Initial discussions with DNO</li><li>Request Budget Cost Estimates</li><li>Submit grid application</li></ul>                                                                   | <b>Consenting</b> <ul style="list-style-type: none"><li>FPA planning constraints</li><li>Initial pre-app discussions with LPA</li></ul>                                                                                                                                 | <b>Technical</b> <ul style="list-style-type: none"><li>FPA technical constraints</li></ul>                                                                                                                                          | <b>Financial</b> <ul style="list-style-type: none"><li>Initial outline financial model</li></ul>                                                                                                                                                                                    | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Potential initial discussions (only if some over-riding reason, e.g. community-initiated project, or local property involvement, etc.)</li></ul>                                                                                                                       |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Exclusivity agreement with landowner; Budget cost estimate for grid; FPA demonstrating technical & planning risks                                                                                                |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| Phase 2: Detailed feasibility (9-18 months)                                                                                                                                                        |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| <b>Property</b> <ul style="list-style-type: none"><li>Title checks</li><li>Secure lease Option for wind farm site</li><li>Identify all grid and access landowners and enter negotiations</li></ul> | <b>Grid</b> <ul style="list-style-type: none"><li>Grid connection offer and acceptance</li><li>Transmission contract or grid impact process (if distribution connected)</li></ul>                                                | <b>Consenting</b> <ul style="list-style-type: none"><li>Complete Screening &amp; Scoping</li><li>Specialist environmental consultant feedback on key risks (if applicable)</li><li>Initial stakeholder engagement</li></ul>                                             | <b>Technical</b> <ul style="list-style-type: none"><li>Initial yield works complete</li><li>Layout plan sufficient for planning/grid</li><li>Confirm technical feasibility</li><li>Initiate wind monitoring</li></ul>               | <b>Financial</b> <ul style="list-style-type: none"><li>Establish Special Purpose Vehicle (SPV)/ Joint Venture (JV)/ project company</li><li>Ongoing review of financial model</li></ul>                                                                                             | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Seek LES/CARES legal &amp; financial support</li><li>Conduct initial discussions between parties in accordance with FCA &amp; FSMA rules</li><li>Sign any NDA and commence MoU discussions</li></ul>                                                                   |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Lease option signed; SPV established; Grid connection offers (distribution and transmission); Detailed technical and environmental feasibility; Scoping results; Phase 2 report                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| Phase 3: Permitting (2-5 years)                                                                                                                                                                    |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| <b>Property</b> <ul style="list-style-type: none"><li>Secure agreements for all off-site land (access and grid)</li></ul>                                                                          | <b>Grid</b> <ul style="list-style-type: none"><li>All contracts secured and costs/timescales known</li><li>Pay pre-trigger securities &amp; liabilities</li></ul>                                                                | <b>Consenting</b> <ul style="list-style-type: none"><li>Submit EIA/Planning Application</li><li>Detailed stakeholder engagement</li><li>Appeal/Public Enquiry (if necessary)</li></ul>                                                                                  | <b>Technical</b> <ul style="list-style-type: none"><li>Finalise planning layout</li><li>Wind monitoring (contd)</li><li>Resource assessment</li></ul>                                                                               | <b>Financial</b> <ul style="list-style-type: none"><li>Review and update financial model</li></ul>                                                                                                                                                                                  | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Seek LES/CARES legal &amp; financial support</li><li>Engage community to ensure sufficient support</li><li>Discuss and agree optimal structure</li><li>Sign MoU</li></ul>                                                                                              |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Planning submission for finalised layout; Grid contract secured, and any ongoing grid liabilities and securities paid; Planning decision; Appeal submission and decision (if necessary),                         |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| Phase 4: Design, procurement & financial close (12-18 months)                                                                                                                                      |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| <b>Property</b> <ul style="list-style-type: none"><li>Amend draft lease to satisfy Lenders</li></ul>                                                                                               | <b>Grid</b> <ul style="list-style-type: none"><li>Pay post trigger date securities &amp; liabilities</li><li>Confirm final connection date</li><li>Pay major connections costs</li></ul>                                         | <b>Consenting</b> <ul style="list-style-type: none"><li>Discharge pre-commencement conditions</li><li>Amend consent (site layout, turbine model, etc.) if required</li></ul>                                                                                            | <b>Technical</b> <ul style="list-style-type: none"><li>Complete all construction surveys</li><li>Procurement of turbine &amp; contractors</li><li>Civil and electrical design</li><li>Pre-construction energy yield works</li></ul> | <b>Financial</b> <ul style="list-style-type: none"><li>Secure PPA/CfD</li><li>Legal and technical due diligence undertaken by Lender's advisors</li><li>Secure finance (reach 'Financial Close')</li></ul>                                                                          | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Seek LES/CARES legal &amp; financial support</li><li>Discuss and agree IM/sign HoT</li><li>Secure community funds/debt</li><li>Establish new community investment body (if required)</li></ul>                                                                         |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Clean Planning consent; Design complete; Contractors procured; Finance secured                                                                                                                                   |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| Phase 5: Construction (12-24 months)                                                                                                                                                               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| <b>Property</b> <ul style="list-style-type: none"><li>Enter into lease</li></ul>                                                                                                                   | <b>Grid</b> <ul style="list-style-type: none"><li>Install and commission required grid infrastructure</li><li>Ongoing security &amp; liability payments</li><li>Energisation of site</li></ul>                                   | <b>Consenting</b> <ul style="list-style-type: none"><li>Discharge pre-operational conditions</li><li>On-site presence during construction for ecological, archaeological, etc. surveys</li><li>Planning Monitoring Officer</li></ul>                                    | <b>Technical</b> <ul style="list-style-type: none"><li>Off-site construction (access)</li><li>Civil and electrical build</li><li>Turbine installation</li><li>Site commissioning</li></ul>                                          | <b>Financial</b> <ul style="list-style-type: none"><li>Draw down funds from lender</li><li>Ongoing project monitoring for Lender</li><li>Management of project budget and cashflow</li></ul>                                                                                        | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Seek LES/CARES legal &amp; financial support</li><li>Draw down of funds from lender (if community have invested pre-construction)</li><li>Make investment in wind farm (if investing pre-construction, arrangement may require investment once operational).</li></ul> |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Built and operational site which has met all obligations associated with planning and financing during the construction phase.                                                                                   |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| Phase 6: Operation (25+ years)                                                                                                                                                                     |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
| <b>Property</b> <ul style="list-style-type: none"><li>Ongoing payment of lease and other agreements</li><li>Consider repowering at later stage in operation (e.g. lease extension)</li></ul>       | <b>Grid</b> <ul style="list-style-type: none"><li>Manage connection incl. outages</li><li>Manage connection payments (if required)</li><li>Consider repowering at later stage in operation (e.g. additional capacity?)</li></ul> | <b>Consenting</b> <ul style="list-style-type: none"><li>Operational surveys and monitoring</li><li>Ongoing ecological management works</li><li>Addressing complaints (if required)</li><li>Consider repowering at later stage in operation (e.g. new consent)</li></ul> | <b>Technical</b> <ul style="list-style-type: none"><li>Check performance against expectations</li><li>Ongoing management of project</li><li>Consider repowering at later stage in operation (e.g. new turbine layout)</li></ul>     | <b>Financial</b> <ul style="list-style-type: none"><li>Repay loan (typically 15-18 years)</li><li>Ongoing financial reporting</li><li>Negotiate and renew contracts (as required)</li><li>Consider repowering at later stage in operation (e.g. baseline commercial case)</li></ul> | <b>Shared ownership</b> <ul style="list-style-type: none"><li>Manage community investment</li><li>Spend received moneys</li><li>Discuss potential extension and repowering shared ownership</li></ul>                                                                                                                                |
| ê                                                                                                                                                                                                  | <b>OUTPUTS:</b> Ongoing works to ensure consent and grid are managed pro-actively whilst maximising yield and returns achieved. From years 15-20 consideration of repowering opportunities.                                      |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |

## 5. Summary of development works

The differing works required to successfully develop an onshore wind project can be broadly broken down into the following five interdependent categories:

1. Property
2. Grid
3. Consenting
4. Technical
5. Financial

A commentary on the shared ownership considerations at each phase is also included. These are considered separately below to include a summary overview of the works entailed, any specific considerations in relation to shared ownership and identification of the key risks to be considered.

In the wind development process flowchart set out in Section 4, it is clear that many of these works will span several of the defined development stages.

### 5.1. Property

#### 5.1.1. Brief outline of works

Property works essentially refer to the agreements made between the developer and relevant landowner(s) which are required to allow the project to be developed, constructed and operated. This not only requires landowner(s) agreement where the wind farm will be located, but also includes any landowners which may be required to host grid connection infrastructure (e.g. underground or overhead cables, substations, communications equipment, etc.) or which will be impacted by required transport/access improvements relating to the development works (e.g. where dedicated access tracks cross their land, or where the large turbine components oversail or overrun the land they own that is adjacent to public roads).

The main agreements that are entered into between developers and landowners for the wind farm site is set out as follows:

1. **Access and exclusivity** – This is typically a concise informal document that lasts for 1-2 years when the project is in the earliest stages of development. It typically states that the landowner and developer will work together to agree terms for a more formal document (the Option) and that the landowner will not talk to other parties whilst the developer is assessing the feasibility of the site.
2. **Option** – This document provides the developer with an Option to enter into a Lease within a defined period (the 'Option period') from its signing. Crucially this is a formal document that is lodged against the title deeds of the land and therefore provides significant additional protection for the developer. The Option agreement is typically agreed with a draft lease appended to it so that there is a clear understanding of the commercial agreement.
3. **Lease** – This is a formal lease agreement that is entered into by both parties ahead of construction and lasts for the duration of the project (typically with clear rights to extend) and sets out in details the obligations and rights of both the developer (as tenant) and the landowner (as landlord).

Agreements required for sustained access (e.g. main access route) will typically follow a similar process as set out above. Agreements that permit short term access works and/or grid permissions typically utilise simpler agreements in the form of Wayleaves or Servitudes. Wayleaves are favoured by Scottish Hydro Electric Power Distribution (SHEPD, DNO for northern half of Scotland) but are considered more informal than Servitudes which, similar to Option and Lease agreements, are also formally registered on the Title Deeds. Servitudes take significantly longer to put in place but are favoured by Scottish Power Energy Networks (SPEN, DNO for southern half of Scotland) as they have more legal protection.

Historically property issues have been the key area that is consistently overlooked in the early development stages of an onshore wind project. Drawn out negotiations among parties, and their respective solicitors and agents, in finalising legal agreements have also typically been the main source of delay in progressing projects.

Over the last 10 years the typical size of commercial wind turbines has increased significantly which has led to a dramatic increase in the off-site works (and third-party permissions) required transport these much larger components to site. This has also coincided with new projects now being in more marginal areas with respect to the availability of grid infrastructure. This in turn has meant that typical project grid connection infrastructure routes are generally over longer distances in order to reach a suitable point on the network to connect. Both of these considerations mean that property works are even more crucial to ensuring a project can proceed.

### **5.1.2. How does Shared Ownership apply in this context?**

Local ownership in a proposed commercial project may be able to positively influence landowners to act reasonably on behalf of the community's interests during discussions, especially if the landowner is a beneficiary. Conversely, landowners may feel 'ganged up on' in decision making if pressure is applied by the community for them to compromise on, for example, rental payments. This relationship will need carefully considered.

### **5.1.3. Key risks/dependencies**

Some key risks and considerations are detailed below when looking to secure property rights:

- **Insufficient time** – There are several things that slow down legal discussions. The long communication chains (developer to their solicitor, developer's solicitor to landowner's solicitor, landowner's solicitor to landowner, etc) can mean negotiations can take years, not months. This can be exacerbated in the event that banks also need to sign off on agreements due to existing securities on land (e.g. through mortgages) and/or the inputs of land agents.
- **Starting discussions too late** – It is always advisable to approach any required landowners early on in the project to initially understand their level of interest, if any, in the project. On a simple level this minimises any subsequent changes in design, but early engagement also reduces the potential of landowners seeing the project as having significant value (if developed to a stage where consented, have secured grid, etc.) which may increase their financial demands.
- **Not formalising agreements early enough** – Informal agreements such as exclusivity documents are useful early in a project but ideally formal Option agreements and/or servitudes should be entered into prior to planning submission to minimise risk and avoid the potential for key terms changing during further negotiations.
- **Not securing enough space** – When negotiating for areas of land needed for construction, access and/or operation it makes sense to include contingency areas to future proof the area secured in case larger turbines are available and/or required when it comes to construction. This will avoid the need to re-negotiate at a later stage which is generally expensive and time consuming.
- **Alternative land value** – It is important to consider the landowner's alternative use for the land in understanding the opportunity cost of agreeing to get involved with the project. For example, a landowner considering an access track crossing their land may not have an alternative use for the land other than grazing and may consider a reasonable sum, however if the field(s) are deemed suitable for another development (e.g. housing) then the opportunity cost, and associated value put on it by the landowner, will be much higher.
- **Costs** – There are potentially significant costs incurred in negotiating and securing property agreements and often the fees demanded by the landowner's solicitors and/or agents can be as much, or in some cases more, than the amounts paid to the landowner.
- **Change of ownership** – This is most commonly an issue if the landowner changes part way through discussions before agreements are formalised and officially registered. However it can also be a risk if an informal agreement has been secured and then the landowner changes.

- **'Lender proofing' documents** – Prospective lenders to the project, and their advisors, will have set ideas on the form that these documents take. A lot of time can be wasted renegotiating agreements to get them in a form that is acceptable to lenders. Early consideration of what possible lenders will want to see can reduce this time.

## 5.2. Grid

### 5.2.1. Brief outline of works

Securing a cost effective and timely grid connection is currently the biggest challenge facing onshore wind developments. An early understanding of the potential export capacity for the site, and the timelines for securing this capacity, is crucial to minimise risk for the project and grid discussions should therefore be initiated at the earliest stage in development.

Projects <50MW in capacity are likely to be classed as 'embedded projects' as they would generally be connected onto the distribution network (so contract with the DNO for this connection). Projects >50MW in capacity will typically be 'transmission connected' so will connect directly onto the transmission network (and therefore contract with the TO). Table 1 below sets out the connection process by differing capacities and the expected cost for projects. SSE provide a useful guide<sup>2</sup> for generation applications, outlining the type of transmission impact assessments relevant to different project scales across different regions.

**Table 1: Connection process and payments by capacity bands**

| Type of connection                    | 'Small embedded'              | 'Large embedded'                      | Transmission        |
|---------------------------------------|-------------------------------|---------------------------------------|---------------------|
| Capacity                              | <10MW (SHEPD)<br><30MW (SPEN) | 10-c.50MW (SHEPD)<br>30-c.50MW (SPEN) | Generally >c.50MW   |
| Distribution connection application?  | Yes                           | Yes                                   | No                  |
| Transmission assessment undertaken?   | Yes                           | Yes                                   | Yes                 |
| Transmission agreement? <sup>3</sup>  | No                            | Yes                                   | No                  |
| Transmission connection application?  | No                            | No                                    | Yes                 |
| Connection costs pre-operation?       | Yes                           | Yes                                   | Yes (lesser amount) |
| Connection payments during operation? | No                            | No                                    | Yes                 |

As shown above all embedded projects will also be assessed for their potential impacts on the transmission network and, given the nationwide requirement for transmission reinforcement, this can lead to significant delays in connection dates and additional connection costs.

In recent years, the timelines associated with obtaining a grid connection have been pushed out to, in some cases, as far out as 2037. This is ultimately due to transmission network constraints, which unfortunately are not confirmed until the transmission impact assessment process has been completed.

During the construction works there is the option for most embedded projects not to rely on the DNO to build out the project. Independent Connection Providers (ICPs) are available that can be contracted to undertake the majority of the works not associated with the DNO's existing network. This offers an opportunity to secure more

cost-effective rates but can also significantly reduce the timescales for completion of the works as the ICPs are typically able to work to a faster programme. The main downside from using ICPs is the additional complexity in managing the interface between the two parties and increased potential for works being missed.

### **5.2.2. How does Shared Ownership apply in this context?**

There is no preferential treatment during the grid connection process for projects with an element of community ownership (with regards to, for example, making capacity available/queue-jumping). However, if there are unnecessary delays caused by the DNO or TO there is the potential that there may be some increased traction in the press for a project which has an element of community ownership.

### **5.2.3. Key risks/dependencies**

Some key risks and considerations for a developer when looking to secure a grid connection are detailed below:

- **Timelines for grid applications being processed** – Distribution connection applications are generally processing within standard timescales (c.3 months). However the recent high volume of transmission applications has meant that projects progressing through transmission assessment can be waiting >12 months to receive the results of their transmission impact assessment. As potential mitigation it is advised to pro-actively chase the progress with the submission to National Grid and discuss the likely connection works with them at the earliest opportunity.
- **Timelines for grid connection** – Timelines for grid connections (from acceptance to construction) are currently extending as far as 10-15 years into the future due to significant regional constraints on the transmission network. This is not always clear even at the stage where the distribution offer is received, as distribution works are considered independent of the transmission works (and usually have shorter timescales for completion of typically c. 2-5 years).
- **Distribution and/or transmission capacity** – The technical impacts of the proposed export can impact the distribution and transmission networks, which are highly constrained nationally. Both operating bodies (the DNO and the TO) are highly regulated and have defined, inflexible connections processes that must be followed. Due to the requirement for TO involvement at any scale over 1MW (and in some regions, as low as 50kW), it is highly likely both will be involved in any projects going forward, adding complexity, time and cost risks to the project.
- **Liabilities and securities** – Due to the requirement for the TO to invest in upgrades to the national transmission network, cancellations of projects by developers exposes other developers (and ultimately, consumers) to increased costs. Essentially, they would be obligated to cover the apportion of costs that would be lost when a project is cancelled. Therefore, commitment arrangements are required which essentially apply liabilities on generators that have triggered an investment in the network in order to financially secure the investment being undertaken on their behalf.
- **Costs** – Connection costs can vary significantly depending on the type of connection; length of connection route; and (perhaps most significantly) reinforcements required at both the distribution and/or transmission level. Costs are not easy to predict and can change significantly throughout the pre-construction phases of development as more studies are carried out. Furthermore, as often new connections are constructed several years after the original quote, the cost of materials and labour is also likely to change throughout the project development phases.
- **Limited design flexibility** – securing a grid connection requires decisions to be made on the scale of the project and technologies used. To change technology (for example, adding a battery) an entirely new grid application (or significant, material modification) would be required. Therefore, once a grid connection offer is accepted, there is limited flexibility with regards to the project's location, scale and technology.



## **5.3. Consenting**

### **5.3.1. Brief outline of works**

In the early stages, the 'consenting' workstream includes processes to de-risk the project and ensure the project is feasible under current planning legislation. This would initially take the form of a 'First Pass Assessment' or initial feasibility works that are design to identify the key planning risks associated with the proposed development.

In terms of communication with the planning authorities<sup>4</sup>, all projects will initially seek pre-application advice from the local planning authority. This would ideally look to better understand the key project risks and try and garner a clear understanding of the potential concerns of the planning authority. Following a pre-app meeting, a request for Screening opinion would be submitted, and the response will ultimately determine whether the project would need to adhere to the Environmental Impact Assessment (EIA) process (would be typical for projects >10MW in scale). For projects which are required to follow the EIA process a Scoping study would then be the next step and this will look to clarify the extent of necessary studies and surveys prior to submission of a formal application. It may be that the developer push forward any initial studies that are deemed to be potential 'showstoppers' to minimise spend at risk.

Once suitably de-risked, and if still considered technically and commercially viable, the 'permitting' stage will involve submission of a full planning application to the appropriate authorities. This will likely require detailed survey works in several areas, and studies to address site-specific planning challenges. Key planning application studies for wind farms include:

- Landscape & Visual Impact Assessment (LVIA);
- Ornithology studies;
- Aviation consultation and assessment;
- Transport and access assessment;
- Geology, peat, hydrology and hydrogeology;
- Noise assessment;
- Ecology studies; and
- Archaeology and cultural heritage assessment(s).

These will be submitted alongside the other relevant reports and technical documents to the LPA or ECU. If not successful with the initial planning decision, it may be necessary to go down the appeal process and this can take a further 18-24 months.

Once approved, there will be a range of additional consenting works required to discharge the planning conditions. These will mainly be required during the pre-construction phase of the project although additional works will be required during construction and throughout the operation of the site.

### **5.3.2. How does Shared Ownership apply in this context?**

It should be noted that the provision of community benefits is not considered to be a 'material consideration' when it comes to authorities making a planning decision. However, LPAs and the ECU are supportive of projects where local economic, environmental and/or social benefits are maximised. Scottish Government guidance also clearly sets out aspirations for community ownership. As such, the benefits of clear community involvement consenting can be substantial. Therefore any support that can be achieved, either through individuals writing in to provide support or community bodies (such as local councils or community groups) can help a project to secure consent.

Statutory pre-application consultation applies to planning applications for all major developments over 20MW in capacity. This process includes the following requirements:

- Pre-application consultation with community councils in whose area the proposal is situated or with neighbouring community councils;
- A public event where members of the public may make comments to the prospective applicant (with a local newspaper notice publicising the event);
- A public notice indicating both where information on the proposals can be obtained and written comments can be sent to the prospective applicant; and
- prepare and submit a pre-application consultation report with any subsequent application outlining the approaches taken in engagement.

Further consultation requirements can also be set out by the planning authority on top of the above.

For developer-led projects, there are community consultation standards that developers should follow throughout the consenting process. For Scottish projects, these are detailed in the Scottish Government's publication: *Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments*. This details considerations for the developer throughout the community engagement process.

Community consultation for renewable projects is generally moving away from a single engagement event (either directly before or after formal submission of the planning application) to developers undertaking engagement at multiple points through the development process. Key to this increased engagement is to facilitate the identification concerns and address these through design changes, where possible, during the detailed feasibility and early permitting stages. Sustained and pro-active consultation can also avoid the perception that a developer is just going through the engagement process to 'tick a box'.

In a shared ownership project, the community organisation should be better placed than a developer to achieve positive engagement with the wider community as it should be clearer what the benefits of the project would be and there is likely to be a greater level of trust.

### **5.3.3. Key risks/dependencies**

Some key risks and considerations for the developer when looking to secure a planning consent are detailed below:

- **Timeline** – Some of the studies required for planning applications are time-constrained and/or can only be carried out at certain times of the year. For example, ecology works are generally seasonally dependent as some wildlife species are only active at certain times of the year.
- **Limited design flexibility** – The design used in planning should consider the future landscape of wind development. Generally, smaller scale turbines (i.e. <150m height to blade tip) are no longer being manufactured and, as such, planning consents from 3-4 years ago are becoming redundant or needing resubmitted for larger turbine heights of 180m+ tip heights (if the developer is not comfortable utilising refurbished/reconditioned turbines). Additionally, as the design evolves to accommodate findings from pre-construction surveys, the design must stay within the remits of the planning application. It is therefore advised to use a 'futureproofed' design in planning where appropriate that provides the widest possible planning envelope.
- **Community engagement** – Community engagement is crucial to a successful application in planning. The developer should be able to demonstrate that the community were consulted on an ongoing throughout the application process, and that feedback has been considered in the design evolution.
- **Importance of peat** – Recent changes to peat legislation has considerably increased the level of protection on higher quality peat habitats. This has led to several projects that would have previously been developed ending up being abandoned where they were located in deep peat with minimal opportunity for mitigation.
- **Permanent lighting if >150m tip height** – Current guidance means that if a turbine is >150m in tip height then the turbines would require constant visible lighting as an aviation safeguarding measure. This complicates the LVIA works as there is a need to present dawn/dusk montages that demonstrate the



light pollution. In addition many local residents are concerned about the impact on their amenity from these lights. However, as set out above, any decision to go for <150m tip height turbines need to be carefully considered against potential future procurement issues.

- **Decommissioning and restoration** – It is typical for all modern developments to have a requirement to fully decommission and restore the site to its previous appearance at the end of the operational stage of the project. Most planning authorities will require a bond or other financial payment to be put in place to ensure that funds are available to complete the works should the developer no longer be around. Historically the amount to be put aside were relatively low but this has increased to £150,000-£250,000 per turbine which presents a significant additional cost for projects. These bonds typically sit separately from the project capital costs and will likely require an annual payment to the bank or other institution that is guaranteeing this amount. It is important that any party looking to invest clearly understands the position around decommissioning. In the event that a developer left a project without decommissioning then the liability would then fall to the landowner and then ultimately sit with the local authority.

## 5.4. Technical

### 5.4.1. Brief outline of works

Technical works broadly relate to the scale of development, project layout and crucially the resulting energy yield of the site, which ultimately impacts upon the achieved revenue and financial viability of the project.

In the initial stages of development, there will be a high-level technical First Pass Assessment (FPA) that will consider key parameters including available access (which may limit turbine scale), complexity of terrain and available wind resource. These works will be undertaken in tandem with the planning FPA and a key output is the creation of an initial layout that ideally looks to achieve a balance between the known planning site constraints and maximising the achieved generation. This includes applying appropriate turbine-to-turbine setbacks to ensure internal wake losses within the site are kept suitably low. This initial layout will inform the consenting processes, as well as the grid application. It may be that several layouts (representing ambitious and conservative project scales) are created and used for different dependent processes.

As the project progresses, the technical works will refine this layout through iterative ongoing site design and confirming the energy yield. The former will be informed by more detailed planning and technical surveys with specific design freezes in the run up to planning submission. After a certain point the wind resource and energy yield will only be further de-risked through the completion of a wind monitoring programme.

It is typical for wind monitoring to be undertaken for at least 12 months to ensure a seasonally balanced monitoring period. Historically, tall, guyed masts were used for the purposes of accurately monitoring the available wind resource at various heights above ground level. Masts have a limited achievable height of c.80m (tilt up mast) or ~110m (for a semi-permanent lattice structure mast). Given that turbines are often now being proposed with 130-150m hub heights many developers are utilising SODAR or LIDAR technologies which are able to measure wind speeds up to 200m AGL or more. The higher cost of SODAR/LIDAR equipment is at least partially offset by the improved ease of install (no need for planning, smaller footprint so less issues with land use, lower key with regards to visibility compared to a mast). It is highly recommended that a completed period of on-site monitoring be used to refine and optimise a final planning layout as significant changes in layout post consent can be limited by typical micro-siting allowances within the consent (e.g. no more than 50m movement from initial location and can't be any higher up, etc.).

Once the project is consented there are significant pre-construction technical works which are required to confirm the capital cost of the project and enable the project to reach financial close. These works include:

- **Pre-construction surveys** – This includes the completion of topographical surveys (to accurately set out terrain height for purposes of the civil design) and ground investigation surveys to allow turbine foundations and other civil infrastructure to be designed).
- **Procurement for all necessary construction contractors** – The developer's project manager would be responsible for the procurement of the turbine supplier alongside the civil and electrical contractors. In

addition there may be a requirement to procure an ICP (as discussed in Section 5.2.1) as well as manage the DNO/TO that will be delivering at least a portion of the grid connection works.

- **Civil and electrical design** – The completion of the design works can either be undertaken by separate designers or undertaken by the contractors (if they are procured on a design and build basis). Key project risks here is the potential requirement for piled turbine foundations that can be more than double the cost of a traditional gravity foundation.

The above works will be utilised to set out the required cost to build the project. Technical project managers and/or owners engineers will then be tasked with progressing the construction and commissioning of the projects.

#### **5.4.2. How does Shared Ownership apply in this context?**

The impact of shared ownership is limited on a technical level as the community group will typically be dependent on the developer for managing the delivery of these works. The ability for the community to benefit from the developer's expertise and resources in this regard is a key benefit of a SO structure as this removes the pressure on the community group to have a detailed understanding of these complex works and associated contracts.

#### **5.4.3. Key risks/dependencies**

Some key risks and considerations for the developer when looking to progress the technical works associated with development are set out below:

- **Low energy yield** – A lower-than-expected yield will ultimately result in a loss in revenue. It is therefore important to understand the realistic P50 and P90 yields prior to a substantial financial commitment. Key areas where energy yield works have been subsequently shown to be significantly incorrect primarily relates to utilising high-level wind resource models for an extended period through development. Whilst these models may have a place early on in development a developer would typically look for more 'real life' figures from other operational sites in the area. If there is a high level of uncertainty in the available wind resource, then early detailed wind monitoring should be prioritised. Additional sources of reduced performance come from complex terrain on, or around, the site which can significantly impact on the available wind resource as well as through underestimating the potential for grid downtime and/or curtailment that is inherent within a number of modern grid connection offers.
- **Limited design flexibility** – As noted in both the Consenting and Grid works, any changes in design will likely have knock-on effects on other elements of the project. It is therefore strongly advised (where possible) to design in some contingency to the scale of the project to allow for design changes further down the line.
- **Changing technology** – With grid connection dates often significantly pushing out the It is likely that by the procurement stage, technology will have progressed such that the models of turbines which were commercially available at the start of the project are no longer readily available. Therefore, it may be necessary to redesign the site for larger turbines.

## **5.5. Financial**

### **5.5.1. Brief outline of works**

An initial financial model would be developed at the very start of the project to understand the potential commercial viability of the project. This model will be iteratively updated throughout the development process with inputs and assumptions informed by various other ongoing works.

Typically the project will look to set up as a Special Purpose Vehicle (SPV) ahead of formally entering into any formal property agreements (to minimise potential for complexity around assignment) and potentially ahead of accepting grid offers.

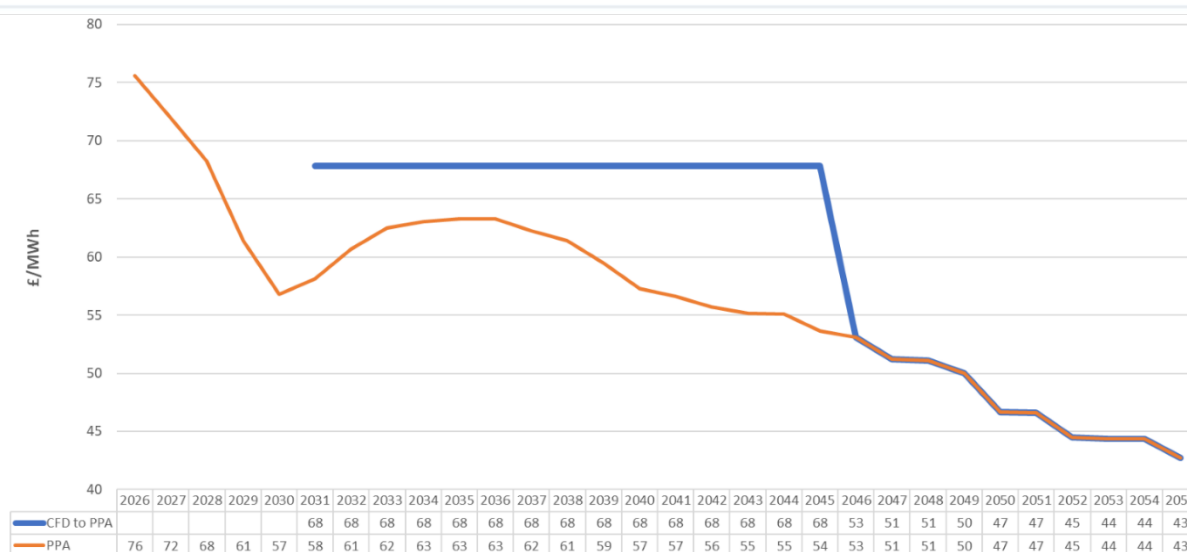
The financial works will significantly ramp up once the project is consented, connection dates are confirmed, and the project costs have been fully understood through the procurement and design phase. At this point there is the opportunity to source project finance that will allow the project to be built out where the lender would have the project itself as a security (like with a mortgage). For this to be successful the lender must have a clear understanding of the value of the project, and they utilise technical and legal advisors to undertake detailed due diligence works.

Once the project is consented it may be possible for the project to secure a defined value for the generation. On the basis that 100% of the project's generation will be exported to the grid the achieved revenue from sale of the project's generation has been assumed to be through two differing routes:

1. **Merchant Power Purchase Agreement (PPA)** – This would entail the sale of electricity to a supplier under standard market rates. This assumes that the project can secure 1–3-year merchant PPA agreements with suppliers on a rolling basis and therefore achieves a reasonably competitive rate over the project life. The alternative option that may be required by the Lender is for the project to secure a PPA that covers the length of the repayment period which may leave the project more open to day-to-day variations in pricing (as would typically agree a value at c.95% of a suitable energy price index).
2. **Contract for Difference (CfD)** – Generation based renewable incentives for >5MW onshore wind projects were removed in 2015. The Contract for Difference (CfD) was established to provide increased revenue certainty for developers to achieve a suitable investment case in the face of merchant PPA price uncertainty. Renewable generators that meet the eligibility requirements can apply for a CfD by submitting a sealed bid into one of the auction rounds. There have been 6 auctions, or 'allocation rounds', to date, which have seen a number of different renewable technologies competing directly against each other for a CfD offer. Successful parties then enter a contract with the Low Carbon Contracts Company (LCCC), a government-owned company, at a set rate ('strike price') for the electricity they generate over a 15-year period. If the market rate achieved by operational sites is below the strike price, then the UK government will top up the revenue, so the secured rate is as per the strike price. If the project secures a market rate above the strike price, then the additional revenue is passed back to the UK Government. In the last allocation round, AR5, the secured strike price was £52.29. This strike price is based on 2012 prices for which inflation (Consumer Price Index) is then applied to.

Locogen has collated indicative merchant PPA pricing based on wider industry feedback with the baseline assumption that, in the long-term, electricity prices will reduce to something similar to the previously seen base wholesale price of c.5p/kWh.

A graph showing the pre-inflation estimated wind power wholesale price curve and the assumed 15-year CfD price curve option (subsequently reverting to the merchant PPA price curve at the end of the 15 years) is shown in Figure 1 below. This graph shows that the CfD rates secured in recent allocation rounds is expected to be above this assumed merchant PPA rate. As set out in the next section there is significant uncertainty as to this level.



**Figure 1: Estimated PPA and CfD wind pricing (pre-inflation)**

### 5.5.2. How does Shared Ownership apply in this context?

Community projects looking at shared ownership can play a significant role in the financial stage of the project.

Initially community groups could potentially have access to grants which could be used to improve the financial case of the project early on development when overall development risk is high. Developers may be more interested in sharing this risk with the community, especially if this was potentially seen as a way to mitigate other identified risks. It is likely that the developer would have their own financial modelling in place by the end of the initial feasibility works but this information is often deemed to be confidential in nature and it may take some time before this was shared.

It is typically the decision of the developer if and when they want to engage on potential shared ownership. Some landowners such as Forestry and Land Scotland have stipulated that developers provide opportunities for investment at key stages pre-construction (at Final investment Decision, FID) and post construction (Commercial Operation Date, COD).

The LES website has good information on what can be achieved at the point of securing finance for a project<sup>5</sup>. This information demonstrates that the potential shared ownership structure will have a big impact on the form of loan that can be secured. As the community groups are unlikely to have significant assets, they would most likely need to secure a loan against the project itself on a non-recourse basis. This may only be achievable if they have bone-fide shareholding in the project (as opposed to just rights to income).

As mentioned before a key benefit of shared ownership may be the ability for the project to be eligible for 100% business rates relief. Depending on the scale of the project and it's point of connection (distribution projects having lower operational costs than transmission projects) business rates can typically make up 3-6% of the total annual operational cost. To put this in context a 30MW wind farm may have annual rates payable of £120,000-140,000. This is a significant upside for a commercial project, but 100% relief is only secured if a community organisation is receiving >15% of the annual profit.

### 5.5.3. Key risks/dependencies

Some key risks and considerations are detailed below when looking to progress the financial works associated with a wind project:

- **PPA pricing** - There is a significant amount of uncertainty as to what effect future large-scale development of additional onshore and offshore wind capacity could have on long term pricing during high wind periods (e.g. pricing may be depressed if supply exceeds demand on a regular basis), and how the summer/winter pricing evolves alongside the expected significant increase in electricity demand

across the UK due to the electrification of heat and transport. It is therefore very difficult to have long-term certainty on PPA prices and lenders typically will utilise conservative models which in turn may make projects less attractive.

- **Interest rates** – These have increased rapidly in recent years, and this has led to a significant increase in the cost of borrowing. Fully understanding the impact of this on investment hurdle rates is crucial to understanding the extent to which a project may be able to accept this and still present a reasonable financial return to the borrower.
- **Significant cost increases** – Alongside the increase in interest rates there has been a spike in key prices associated with a wind development. For example wind turbines and electrical equipment cost increases were well above inflation. This has put increasing pressure on projects.
- **General investment risk:** The return derived from investment in a renewable project can go down as well as up. Additionally, the entire investment made could be lost due to project specific issues or through a significant shock (or changes) in general economic conditions and/or legislation.

## 6. Wind development process stages

### 6.1. Initial feasibility

The Initial feasibility stage is an opportunity to assess the site at a high-level to determine its suitability for a wind project. Essentially, this stage should allow all potential risks to be identified, and therefore for an early view of the project viability to be concluded.

**Table 2: Activities in Initial Feasibility stage**

| Phase 1: Initial feasibility (6-9 months)                                                                                                                                |                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>• Confirm land boundaries</li> <li>• Exclusivity agreement</li> </ul>                                             | <b>Technical</b> <ul style="list-style-type: none"> <li>• FPA technical constraints</li> </ul>                                                 |
| <b>Grid</b> <ul style="list-style-type: none"> <li>• Initial discussions with DNO</li> <li>• Request Budget Cost Estimates</li> <li>• Submit grid application</li> </ul> | <b>Financial</b> <ul style="list-style-type: none"> <li>• Initial financial model</li> </ul>                                                   |
|                                                                                                                                                                          | <b>Consenting</b> <ul style="list-style-type: none"> <li>• FPA planning constraints</li> <li>• Initial pre-app discussions with LPA</li> </ul> |
| ê                                                                                                                                                                        | <b>OUTPUTS:</b><br>Exclusivity agreement with landowner; Budget cost estimate for grid; FPA demonstrating technical & planning risks           |

The most significant works at this stage are with regards to property. Prior to any grid application, a landowner must give permission to the developer to make enquiries to the DNO. Furthermore, the landowner will ideally be willing to sign off an 'exclusivity' with the developer, which essentially ensures that they only utilise the agreed land area for the Developer to develop wind projects.

The Letter of Authority provided by the landowner is used to request a Budget Cost Estimate from the DNO, which usually is the easiest way to secure some time with the DNO to discuss the project and potential connection options. The formal grid connection offer will be submitted in this stage, and crucially must include all intended technologies (wind, solar, BESS). In cases where the site capacity might not yet be fully confirmed (due to planning stage or lack of direction from the DNO), the grid application should broadly assume success in planning as ultimately it will be easier to decrease capacity than to increase it.

In parallel, the development team (or consultants) will conduct a high-level FPA of the site. This work may come under a different title but the main works are to examine a suite of planning and technical constraints, utilising a dedicated GIS database supplemented by open data from stakeholders and the local planning authority, where available. This process should indicate any risks to the project from a planning/technical perspective, and highlight key focus areas for de-risking the project. Concurrently, the initial financial model can be populated with estimates and accounting for some mitigation of the identified risk. This will require a high-level energy yield to estimate the potential project revenue and returns. This model should be used iteratively throughout the project to ensure it is worth considering the next phase of works.

The process for obtaining pre-application advice varies between local planning authorities. Generally, the developer will provide a detailed FPA to the local authority, and attend a call to discuss the project with a representative from the LPA. This will be a crucial opportunity to understand the LPA's initial stance on the project. Throughout the detailed feasibility stage, the processes of Screening and Scoping will also be completed where applicable.

### 6.1.1. Outputs

The initial feasibility works should ideally culminate in the following key outputs:

- Exclusivity agreement with landowner;
- Budget cost estimate for grid;
- FPA demonstrating technical & planning risks;
- Initial financial model highlighting likely viability of the project.

### 6.1.2. Timeline

The timeline for this stage is indicated at 6-9 months. Timescales relevant to each workstream are detailed in Appendix B and summarised below.

- Property: The timelines for this stage is driven almost entirely by the landowner engagement, assumed to take 4-6 months to the stage of obtaining an initial 1-2 year access and exclusivity agreement and grid Letter of Authority.
- Grid: The timeline for obtaining a BCE from the DNO is 4 weeks from request, with an additional 2-4 weeks for scheduling a follow-up discussion and clarifications. However, this is fundamentally only possible following receipt of the landowner's Letter of Authority.
- Consenting: These initial works will take 3-4 months to complete.
- Technical: This work will only require 1-2 months to complete.
- Financial: An initial financial model should only take 1 month to complete from the point of having all necessary outline information on layouts etc. to complete the document.

## 6.2. Detailed feasibility

The detailed feasibility stage substantially builds upon the initial feasibility works. Further investigation into planning and technical constraints should aid in developing an initial layout for the site, sufficient for obtaining initial planning feedback and compiling a grid application.

**Table 3: Activities in Detailed Feasibility stage**

| Phase 2: Detailed feasibility (9-18 months)                                                                                                                                                                  |                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>• Title checks</li> <li>• Secure lease Option for wind farm site</li> <li>• Identify all grid and access landowners and enter negotiations</li> </ul> | <b>Technical</b> <ul style="list-style-type: none"> <li>• Detailed yield assessment complete</li> <li>• Layout plan sufficient for planning/grid</li> <li>• Confirm technical feasibility</li> <li>• Initiate wind monitoring</li> </ul> |

|                                                                                                                                                                                                                                       |                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Grid</b> <ul style="list-style-type: none"> <li>• Grid connection offer and acceptance</li> <li>• Transmission grid impact process (if distribution connected)</li> </ul>                                                          | <b>Financial</b> <ul style="list-style-type: none"> <li>• Establish Special Purpose Vehicle (SPV)/Joint Venture (JV) project company</li> <li>• Review financial model</li> </ul>                    |
| <b>Consenting</b> <ul style="list-style-type: none"> <li>• Complete Screening &amp; Scoping</li> <li>• Specialist environmental consultant feedback on key risks (if applicable)</li> <li>• Initial stakeholder engagement</li> </ul> |                                                                                                                                                                                                      |
| <b>ê</b>                                                                                                                                                                                                                              | <b>OUTPUTS:</b><br>Lease option signed; SPV established; Grid connection offers (distribution and transmission); Scoping results; Detailed technical and environmental feasibility (Phase 2 report). |

A key deliverable of this stage will be securing the Option to lease the main project development site. Other than these works this stage is essentially an opportunity to further assess any risks identified in the Initial Feasibility stage, confirm the magnitude of these risks, and explore options for mitigation through the completion of Screening, Scoping and initial stakeholder engagement works. By then end of this stage, the project should be suitably de-risked to attract investors and demonstrate that the project has a reasonable opportunity to secure planning consent.

### 6.2.1. Outputs

The detailed feasibility works should ideally culminate in the following key outputs:

- Option signed;
- SPV established;
- Grid connection offer received;
- Screening and Scoping results; and
- Detailed technical and environmental feasibility works.

### 6.2.2.

The timeline for this stage of work is estimated at 9-18 months. Timescales relevant to each workstream are detailed in Appendix B and summarised below.

- **Property:** The timelines for this stage is again led by the landowner discussions around the agreement of the Option due in part to the communication chains being lengthy with the relevant solicitors and possibly agents. In the event that property drags on beyond the completion of other tasks it may be advisable to take a view on progressing with planning whilst the Option is finalised.
- **Grid:** The initial distribution/transmission offer will be received over this period and usually has three months' validity (if not interactive). During the offer validity period it is vital to fully review and discuss the project with the issuing party and others as well as identifying potential property requirements from the grid connection route. The transmission assessment/application process would need to be at least initiated over this process as it may be challenging to proceed with full planning costs without all grid cost and timescales available.



- Consenting: Screening and Scoping a project would typically take 9 months. At the end of this period it may be advisable (depending on progress to initiate stakeholder engagement to understand specific concerns and this may include initial community engagement which could take 3-4 months.
- Technical: The ongoing technical works will fit in alongside the relevant consenting works, the key output is to initiate wind monitoring works which may entail securing planning (if installing a mast) that could take 3-4 months and then procuring installation of the equipment.
- Financial: Setting up a project SPV does not take significant time during this process.

### 6.3. Permitting

The primary focus of the permitting stage is to secure the planning consent and around this there is the requirement to secure all necessary grid contract documents and outstanding property agreements.

**Table 4: Activities in Permitting stage**

| Phase 3: Permitting (2-5 years)                                                                                                                                                                  |                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>• Secure agreement for all off-site land</li> </ul>                                                                                       | <b>Technical</b> <ul style="list-style-type: none"> <li>• Finalise planning layout</li> <li>• Resource assessment</li> </ul>                                                                            |
| <b>Grid</b> <ul style="list-style-type: none"> <li>• All contracts secured and costs &amp; timescales known</li> <li>• Pay pre-trigger securities &amp; liabilities</li> </ul>                   | <b>Financial</b> <ul style="list-style-type: none"> <li>• Review and update financial model</li> </ul>                                                                                                  |
| <b>Consenting</b> <ul style="list-style-type: none"> <li>• Submit EIA/Planning Application</li> <li>• Detailed stakeholder engagement</li> <li>• Appeal/Public Enquiry (if necessary)</li> </ul> |                                                                                                                                                                                                         |
| ê                                                                                                                                                                                                | <b>OUTPUTS:</b> Grid contract secured and any ongoing grid liabilities and securities paid; Planning submission for finalised layout; Planning decision; Appeal submission and decision (if necessary), |

The wide range of timescales set out for this section present a best and generally worst-case scenario for reaching a planning decision (including the potential need for an appeal). The longest lead time survey works (typically ornithology at potentially 1-3 years of surveys) can be kicked off at the detailed feasibility stage to shorten timeframes for planning submission but from submission an initial decision can be 6-12 months.

Prior to securing planning decision it is highly recommended that all off-site property agreements are secured as the payments requested can increase significantly if the project is known to be consented. As previously discussed, these agreements can take significant time even where the proposed works are relatively minor due to delays from the landowners solicitors and/or agents.

### 6.3.1. Outputs

The permitting phase typically culminates in the following key outputs:

- All required main grid contracts secured, costs and connection timescales understood, and any ongoing grid liabilities and securities paid;
- Agreements secured for all off-site land required to develop the project;
- Planning submission for finalised layout and receipt of planning decision; and
- Completion of wind monitoring works.

### 6.3.2. Timeline

The timeline for this stage of works is estimated at 2-5 years. Timescales relevant to each workstream are detailed in Appendix B and are summarised below.

- **Property:** securing off-site agreements can take a number of years, especially in Scottish Power area where the more formal grid route agreement (servitude) may lead to extended timeframes.
- **Grid:** Any outstanding grid contractual documents would have been requested at the previous stage. The trigger date for payment of grid liabilities and securities is just over 3 years from the date of connection which would typically land around the receipt of consent (given the potentially large sums involved it is advisable to aim to have consent before the trigger date).
- **Consenting:** As stated, the main rate determining step for this phase is the planning consent and this will often depend on the length of pre-submission works required, time take for decision and requirement for appeal.
- **Technical:** The technical works only require completion of the wind monitoring works to allow a 2-3 month detailed resource and yield assessment to be completed. This will therefore sit comfortably alongside the property and consenting works.
- **Financial:** Limited works required at this stage other than keeping an eye on the financial model and updating with any further grid cost or yield feedback.

## 6.4. Design, procurement and financial close

The key deliverable of this stage is to reach a point where the project is ready to build and has, if required, secured the necessary funding to build out the project.

**Table 5: Activities in Design, Procurement & Financial Close stage**

| Phase 4: Design, procurement & financial close (12-18 months)                                                                                           |                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>• Amend draft lease to satisfy Lenders</li> </ul>                                                | <b>Technical</b> <ul style="list-style-type: none"> <li>• Complete all construction surveys</li> <li>• Civil and electrical design</li> <li>• Tendering &amp; procurement of turbine</li> <li>• Tendering &amp; procurement of contractors</li> <li>• Pre-construction energy yield works</li> </ul> |
| <b>Grid</b> <ul style="list-style-type: none"> <li>• Post trigger date securities &amp; liabilities</li> <li>• Confirm final connection date</li> </ul> |                                                                                                                                                                                                                                                                                                      |

|                                                                                                                                                                                       |                                                                                                                    |                                                                                                                                                                                                |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <ul style="list-style-type: none"><li>Pay major connections cost</li></ul>                                                                                                            |                                                                                                                    |                                                                                                                                                                                                |  |
| <b>Consenting</b> <ul style="list-style-type: none"><li>Discharge pre-commencement planning conditions</li><li>Amend consent (site layout, turbine model, etc.) if required</li></ul> |                                                                                                                    | <b>Financial</b> <ul style="list-style-type: none"><li>Secure PPA/CfD</li><li>Legal and technical due diligence by Lender's advisor</li><li>Secure finance (reach 'Financial Close')</li></ul> |  |
| ê                                                                                                                                                                                     | <b>OUTPUTS:</b><br><br>PPA secured; Clean Planning consent; Design complete; Contractors procured; Finance secured |                                                                                                                                                                                                |  |

Reaching financial close is a key landmark for a project as it demonstrates that a prospective lender has deemed the project to be suitably de-risked to allow funds to be realised to build it out. The rate limiting steps are the procurement and design works (typically 6-9 months) and then the due diligence and lender works to reach this point (typically a further 4-6 months).

At this time it is also advisable to consider routes to market for the generation and any decision to bid for CfDs may be time limited as auction rounds are typically only open once a year (based on previous rounds) so this may potentially delay the project if the required information (consent and grid) is not available to meet one of these deadlines.

#### 6.4.1. Outputs

The design, procurement and financial close phase typically culminates in the following key outputs:

- Clean Planning consent;
- Contractors procured;
- Design complete;
- PPA/CfD secured;
- Capital costs confirmed; and
- Finance secured.

#### 6.4.2. Timeline

The timeline for this stage of works is estimated at 12-18 months. Timescales relevant to each workstream are detailed in Appendix B and summarised below.

- Property: Any amendments to satisfy a potential lender should be straight forward but could require 3-4 months.
- Grid: This stage will require the project to typical start paying significant amounts towards the construction costs as well as paying increasing grid securities & liabilities. Delaying these payments until the project reaches Financial Close may have a knock-on impact on the resulting connection date.
- Consenting: Discharging the pre-commencement conditions typically requires 6-9 months and can be run alongside the procurement and design works.
- Technical: These works can be a rate limiting factor at this stage as without confirmations on final contractors and turbine suppliers the project may be delayed from completing due diligence works.
- Financial: Lenders will typically initiate due diligence works ahead of all required documents & contracts being in a final reviewable form so as to minimise delay. Many projects will propose short due diligence

windows of 4-8 weeks but these timeframes typically drag out due to project complexities and lenders advisors flagging issues needing resolution.

## 6.5. Construction

This stage is focused on the building out of the project as set out below.

**Table 6: Activities in Construction stage**

| Phase 5: Construction (12-24 months)                                                                                                                                                                                                                                               |                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>Enter into lease</li> </ul>                                                                                                                                                                                                 | <b>Technical</b> <ul style="list-style-type: none"> <li>Off-site construction (access)</li> <li>Civil and electrical build</li> <li>Turbine installation</li> <li>Site commissioning</li> </ul>           |
| <b>Grid</b> <ul style="list-style-type: none"> <li>Install and commission required grid infrastructure</li> <li>Ongoing security &amp; liability payments</li> <li>Energisation of site</li> </ul>                                                                                 | <b>Financial</b> <ul style="list-style-type: none"> <li>Draw down funds from lender</li> <li>Ongoing project monitoring on behalf of Lender</li> <li>Management of project budget and cashflow</li> </ul> |
| <b>Consenting</b> <ul style="list-style-type: none"> <li>Discharge pre-operational planning conditions</li> <li>Likely on-site presence during construction for ecological, archaeological, etc. surveys</li> <li>Potential requirement for Planning monitoring officer</li> </ul> |                                                                                                                                                                                                           |
| ê                                                                                                                                                                                                                                                                                  | <b>OUTPUTS:</b><br>Built and operational site which has met all obligations associated with planning and financing during the construction phase.                                                         |

The construction phase is dependent on a number of variables but works will typically be set out around meeting the grid connection date. Depending on the size and complexity of the project the on-site construction and turbine installation may take the full 12-24 months proposed, whilst at other times the construction works may be only 6-9 months but because of the grid connection date the timing of the works is delayed to avoid equipment to be left out un-energised for a significant amount of time.

The other factor that may be relevant is that typical turbine lead times from order to delivery are generally 10-12 months. Therefore this is another potential rate limiting step. Any off-site works typically need to be completed ahead of the turbine delivery works as the movement of abnormal loads is the main driver for the off-site improvements.

A final consideration for construction is the time of year that works would be undertaken, generally the main civil and electrical works are preferably undertaken in the summer months when there is reduced scope for wet ground conditions and longer daylight hours. Whilst turbine installation is generally preferred in the lower wind speed summer months it is not unusual for turbine erection to take place in the autumn or winter months which increases the potential for wind delay compensation to the manufacturer.

### 6.5.1. Outputs

The construction phase typically culminates in the following key outputs:

- Project constructed and energised
- Ongoing payments for grid (incl. securities and liabilities)

### 6.5.2. Timeline

The timeline for this stage of works is estimated at 12-24 months. Timescales relevant to each workstream are detailed in Appendix B and summarised below.

- Property: Works to enter into the Lease are relatively quick ahead of construction starting.
- Grid: Ongoing payments required to ensure connection works progress and that grid liabilities and securities are covered (moneys are refunded post energisation).
- Consenting: These works sit alongside the construction programme.
- Technical: As discussed above these works will dictate the completion of the phase and may require the full 12-24 months. A key timeline risk for projects is now potentially very long lead times for electrical equipment such as transformers and switchgear which may take >2 years to come from order.
- Financial: Again any works will sit alongside the ongoing construction.

## 6.6. Operation

This phase is relatively self-explanatory based on the below activities.

**Table 7: Activities in Operational stage**

| Phase 6: Operation (25+ years)                                                                                                                                                                      |                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b> <ul style="list-style-type: none"> <li>• Ongoing payment of lease and other agreements</li> <li>• Consider repowering at later stage in operation (e.g. lease extension)</li> </ul> | <b>Technical</b> <ul style="list-style-type: none"> <li>• Check performance against expectations</li> <li>• Ongoing management of project</li> <li>• Consider repowering at later stage in operation (e.g. new turbine layout)</li> </ul> |
| <b>Grid</b> <ul style="list-style-type: none"> <li>• Manage connection incl. dealing with outages and any issues</li> <li>• Manage any ongoing repayments for connection</li> </ul>                 | <b>Financial</b> <ul style="list-style-type: none"> <li>• Repay loan (typically 15-18 years)</li> <li>• Ongoing financial reporting</li> <li>• Negotiate and renew contracts (as required)</li> </ul>                                     |

|                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Consider repowering at later stage in operation (e.g. explore if additional capacity)</li> </ul>                                                                                                                                                  | <ul style="list-style-type: none"> <li>Consider repowering at later stage in operation (e.g. baseline commercial case for renewed investment)</li> </ul>                                                                                                                             |
| <b>Consenting</b> <ul style="list-style-type: none"> <li>Operational surveys and monitoring</li> <li>Ongoing habitat and ecological management works</li> <li>Addressing complaints (if required)</li> <li>Consider repowering at later stage in operation (e.g. new consent)</li> </ul> |                                                                                                                                                                                                                                                                                      |
| ê                                                                                                                                                                                                                                                                                        | <b>OUTPUTS:</b><br><br>Operational site with ongoing works to ensure consent and grid are managed pro-actively whilst maximising yield and associated returns achieved by the operational site. From years 15-20 would expect there to be consideration of repowering opportunities. |

The main works here are around the ongoing management of the site to ensure best returns are achieved and that, at a suitable point in operation, there is consideration of potential repowering opportunities. Repowering would generally require a new planning permission to be submitted (if looking to use turbines that are outwith the dimensions in the existing consent or timeframes go beyond the original time limitation of 20-35 years). Therefore community engagement would be undertaken again as part of this planning process. Depending on the agreed SO structure there may not be a right for the community to invest in any repowering project and this should be considered within the discussions on the original project.

Typically the key period of unsettled performance is during the initial 1-2 years if the turbines have ongoing post-commissioning issues and/or there are teething issues with the project. Assuming project availability is met then longer term underperformance can be linked to overestimation of the wind resource at the energy yield phase and/or additional downtime from unexpected or extended grid outages or curtailment.

#### 6.6.1. Outputs

The operational stage will ultimately prove the success of the project. The activities listed above will contribute to financial success, ensuring the best value for exported energy is achieved, and maximizing the value of the project through extending its life and/or repowering the site if possible.

#### 6.6.2. Timeline

A wind project is expected to be operational for c. 25 years. Contracts, such as PPAs (if taken merchant route) will typically be reviewed and re-negotiated every 1-3 years alongside other operational contracts, and this will typically be administered by the asset manager. Repowering investigations, if sought, would begin approximately 10 years before the planning consent ends.

### 6.7. When to get involved in a project?

The developer is essentially investing time, money and resource into the project from its inception. While the community group may invest time and resource prior to any agreement, full commitment by the community group will ultimately be when the group begins co-funding the project.

At the **Initial Feasibility** and **Detailed Feasibility** stages, the community can register their interest in sharing ownership of the project with the developer. Community involvement from the start will give the greatest opportunity for the community group to influence the project design and development process (albeit within the limitations of ensuring what is developed is still commercially viable). From the developer's perspective, the

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'soft' benefits associated with having strong community engagement and involvement from the start will be of considerable value.

However, usually if considering a shared ownership option, the developer will begin approaching community groups in the **Permitting** phase of their project, pre-consent.

Broadly, the earlier on the community group is financially involved in a project, the more significant the upside as they will have likely shared in the risk prior to the project achieving a significant uplift in value at the end of the permitting stage.

Unless terms are agreed in advance of the project being consented any investment post planning would present a less attractive upside (albeit for lower risk overall). As set out in the document above the design, procurement and financial close phase presents the most obvious time for informed investment given the availability of financial information.

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## Appendix A. Risk matrix

See separate document.

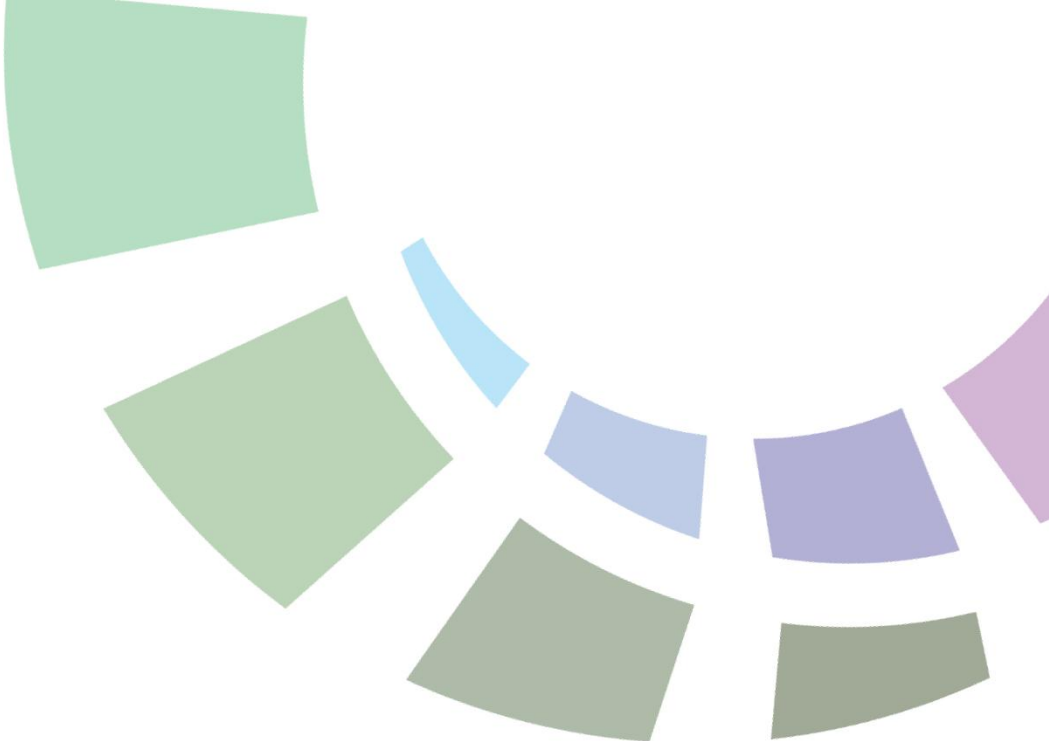


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## Appendix B. Typical timeline

See separate document.





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