SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Rialtas na hÉireann
Government of Ireland

Heat / Thermal Energy Storage

Manual of Consenting Procedures

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Disclaimer

Sustainable Energy Authority of Ireland

SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with the public, businesses, communities and the Government to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies.

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Abbreviations

Abbreviation	Meaning of Abbreviation
A	Amps
AA	Appropriate Assessment
AIMU	Assessment of Impact on the Maritime Usage
BCA	Building Control Authority
BCMS	Building Control Management System
CEG	Clean Export Guarantee
CEP	Clean Export Premium
CHP	Combined Heat and Power
CIÉ	Córas Iompair Éireann
CPA	Coastal Planning Authority
CRM	Certified Reference Materials
CRU	Commission for Regulation of Utilities
DAFM	Department of Agriculture, Food, and the Marine
DCCAE	Department of Communications, Climate Action, and Environment
DECC	Department of Environment, Climate and Communications
DMAP	Designated Marine Area Plan
DSO	Distribution System Operator
DUoS	Distribution Use of System Agreement
EC	European Commission
ECP	Enduring Connection Policy
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELS	Export Limiting Scheme
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
ETS	Emissions Trading Scheme
GWh	Gigawatt hours
IEL	Industrial Emissions Licence
IPC	Integrated Pollution Control
kVA	Kilo-volt-amperes
kW	Kilowatt (i.e., one thousand watts)
LV	Low Voltage
MEC	Maximum Export Capacity
MIC	Maximum Import Capacity

Abbreviation	Meaning of Abbreviation
MRL	Map Roadworks Licensing
MSS	Micro-Generation Support Scheme
MU	Maritime Usage
MV	Medium Voltage
MW	Megawatt (i.e., one million watts)
NC	New Connection (application form)
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
O&M	Operations and Maintenance
pSAC	proposed Special Area of Conservation
pSPA	proposed Special Protected Area
REFIT	Renewable Energy Feed-In Tariff
RESS	Renewable Energy Support Scheme
SAC	Special Area of Conservation
SEAI	Sustainable Energy Authority Ireland
SEM	Single Electricity Market
SI	Statutory Instrument
SID	Strategic Infrastructure Development
SPA	Special Protected Area
TES	Thermal Energy Storage
TSO	Transmission System Operator
TUoS	Transmission Use of System Agreement
V	Volts
W	Watt

1 Introduction

1.1 Purpose of Manual

This manual has been produced to accompany the *SEAI Single Point of Contact Renewable Energy* online tool. It provides a more detailed overview of specific technological, legislative, and regulatory information in relation to heat storage. This manual provides guidance and assists users in navigating which consents and licenses are required for the installation, operation, maintenance, and project end-of-life procedures of projects for heat/thermal energy storage.

1.2 An Introduction to Heat / Thermal Energy Storage

Heat storage or Thermal Energy Storage (TES) is a form of energy storage, whereby thermal energy is stored by heating or cooling a storage medium[1] such that the stored energy can be used at a later time for heating and cooling applications and power generation. The usage of TES enables excess renewable energy to be stored for use at a later stage and linking the gap between energy supply and demand. This method can be of particular use in industrial buildings and for large-scale industrial processes, or other applications such as district heating. TES can reduce peak demand pressure, energy consumption, CO_2 emissions and costs; while also increasing the overall efficiency of energy systems (Dincer and Rosen, 2010). TES can help to balance out the supply and demand of the electricity grid, when paired with thermal generators, by generating additional electricity to meet peak demand, having stored heat at times of lower demand, aiding in lowering wholesale energy costs, and reducing strain on the grid.

The basic principle is the same in all TES applications. What varies is the scale of the storage and the storage method used. The process of storing thermal energy can be described in three steps, referred to as a cycle. These are:

- Charging;
- Storing; and
- Discharging.

TES applications may use different material properties to achieve energy storage. According to the thermal mechanism used to store energy, TES can be classified in three types:

- Sensible TES (e.g., water tank, underground, packed-bed storage, and rock) occurs when the temperature of a material is raised or lowered;
- Latent TES (e.g., phase-change materials for use in solar heating/cooling of building using for example, heat-pump systems, and concentrating solar power plants water/ice and salt hydrates), occurs when the phase of a material is changed (solid to liquid or liquid to vapour) without a change in temperature; and
- Thermo-chemical reactions (e.g., chemical reactions and sorption processes), this takes place on the surface of a material as a chemical reaction or a sorption process.

The storage cycle applies to sensible, latent, and chemical storage. The differences between these methods are the material, the temperature of operation and a few other parameters. Water, for instance, is the more commonly used medium for sensible storage, but this varies depending on the application (Dincer and Rosen, 2010). Both sensible and latent storage can occur in the same material. In all cases, heat can be either absorbed or released from the material.

The most common type of storage used is in tanks or underground systems applications (sensible). These tanks are typically insulated steel tanks and can be pressurised to match pressure and temperature requirements from the heat transmission system. The tanks work by producing chilled or hot water (thermal energy) and distributing it to a facility/household for later distribution.

The increasing use of renewable energy sources during the last two decades has increased the importance of research and development of energy storage systems. Intermittent sources such as wind, solar or tidal do not always generate energy at a consistent rate and cannot be scaled up quickly to match the ebbs and flows of energy demand in the short term. The switch from a grid powered by fossil fuels, to one with significant of renewable sources, introduces potential load imbalances between supply and demand. Due to its wide range of benefits, TES can be used in parallel with many other applications as well, such as those found in CELSIUS demonstrators, to store heat in

[1] A heat storage medium is a material that absorbs, stores and releases heat, in a similar way that batteries work for electricity, but instead it stores heat.

homes and or commercial buildings, to couple waste heat and district heating systems, heat pumps, wood chips/straw, household waste, wind power and CHP generators in district heating networks.

TES is generally cheaper than electricity storage and it can integrate intermittent renewable energy sources such as wind and solar, into heating or cooling systems using heat pumps or electric boilers (e.g Sandia Energy Storages Systems).

Heat storage projects can vary in scale and output, and so there are many different scales of regulation relevant to a specific project. Larger commercial ventures will likely require more consents and licenses than smaller scale installations, however, it is important to ensure that any project regardless of its scale is compliant with relevant legislation and regulations. It is also important to note that a heat storage project is unlikely to be pursued as a standalone project and is usually accompanied by other infrastructure to produce/and or use the heat. Please consult other relevant SEAI Technology Specific Manuals for more information in relation to CHP, Solar Thermal, and Solar PV. Some heat storage equipment can be very small in scale, and be integrated within existing building envelopes, and may not require any consents (such as a domestic hot water tank, or other hot water storage in a building), however this manual considers more substantial projects, which may require consents.

1.3 Heat / Thermal Energy Storage Project Stages

The life cycle of a TES project can be divided into several phases.

During the feasibility phase, initial assessments are carried out to determine the viability of the project. This can also provide insight into which permits/licences will be required as these can vary based on project type and specific location. The planning and permitting phases as well as the pre-construction phase are where licences/permits and any relevant advance requirements are determined for the project. These phases can overlap and occur simultaneously. Successful construction of the project is followed by commissioning where final tests are conducted to determine successful installation of the turbines.

Licences or permits may be required during the operation of the project to ensure that continuous operations and maintenance are permitted to be carried out. Finally, the end phase of a project may also require licencing/permitting dependent on whether the project will be decommissioned, extended, or replaced.

The following sections of this manual will outline each phase of the life cycle and relevant permits, licences, regulatory requirements, and schemes relating to each.

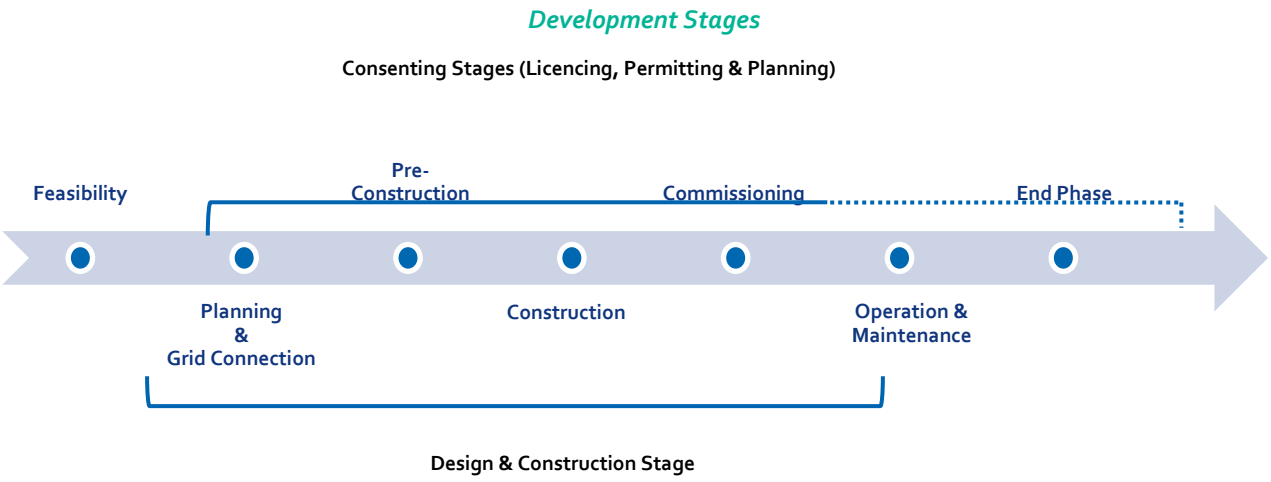

Figure 1-1: Projects Development Stage

2 Design and Construction Stage

During this step you will need to identify the relevant professional advisory team to support you in designing your project. Together you will need to consider the proposed site of the project, the technology you are interested in using, and the scale of your project and determine if the project you are proposing is feasible in that context. It is then important to develop a project plan that maps out all the stages needed to realise your project.

2.1 Feasibility and Design Phase

2.1.1 Commercial Feasibility

The feasibility of a TES project is vital, as this will determine if the project should be pursued or not, regardless of whether it is a commercial or community-based endeavour, based on financial viability. A potential site should be identified considering matters such as land ownership and local planning restrictions, details of which can be found in the relevant local Development Plan. Other high-level considerations such as the proximity to appropriate grid infrastructure, heat producers/consumers and site access can help to inform site location considerations. Often TES installations accompany another energy producing facility, such as a CHP plant, or a solar/wind farm.

Once a potentially suitable site has been identified, appropriate feasibility studies should be undertaken relating to the appropriateness to develop on this site, and the commercial/financial viability of the project. You will need to identify the relevant professional advisory team to support you in conducting feasibility studies.

The following items should be considered when examining the feasibility of an identified site:

- Site area;
- Available land and land ownership status;
- Ground conditions;
- Heat source availability;
- Heat demand;
- Existing and future grid infrastructure;
- Community acceptance and buy-in;
- Public Road Access; and
- Existing and planned energy storage projects in the area.

Local Authorities may also have published information on the construction of TES developments in the area, which may impact planning decisions or serve as helpful guidance. In other areas, there may also be resources available detailing heat demand, such as a heat demand study completed by Codema for the Dublin City area.

Generally, a multi-disciplined team will be best placed to guide feasibility studies, across fields such as (but not limited to) planning, engineering, financial consultants, developers, and environmental consultants.

2.1.2 Enabling Tasks

After a potential project and site passes feasibility screening, enabling tasks must be undertaken (often in conjunction with the planning phase) to transition toward the planning and pre-construction phases. These tasks include:

- Land lease options / Purchasing (only required where land is not already under the control of project developer);
- Options to access the site; and
- Community engagement.

It is important to consider the need to community engagement early in the process. New renewable energy developments, especially in proximity to residential dwellings, frequently encounter concerns from residents for a number of reasons, including concerns about impact on visual amenity, conservation, environmental considerations, etc. There may be valid concerns from residents that can then be addressed early in the process, which can help to avoid negative community interaction later in the process, as well as fostering community buy-in, including the community in the process before any statutory requirements. This early engagement has been shown to improve the acceptance of heat storage renewable energy developments in the surrounding area. Identifying key public stakeholders and community leaders is an important task to undertake as early as practicable.

2.1.3 Design

For larger scale projects, following the feasibility stage, you may look toward the design of the project. Depending on the scale you may need to undertake an Environmental Impact Assessment (EIA) which involves conducting a range

of environmental studies in order to inform the design of the project in line with relevant environmental regulations. Prior to undertaking these studies, you may need to apply for certain licences and permits based on the specifics of your chosen site and the project you are proposing, such as environmental derogation licences, ecological consents, archaeological excavation licences if near a national monument or detection device consents. The project is then designed by your technical team, following relevant planning regulations, and other environmental regulations, and you can then review the financial viability of the project based on that design, which will be more accurate than previous estimates.

2.2 Environmental Assessments

2.2.1 Environmental Baseline Surveys

Large scale TES projects may require a number of assessments to be carried out to support their statutory permit applications. The requirement for these assessments can be discussed with your design consultant. Environmental baseline surveys may need to be undertaken as part of the assessment process. Data gathered during surveys will allow computation modelling of impacts to be undertaken. These surveys provide vital information for the development of a project. This will need to be considered when planning your project. Environmental assessments are generally carried out in tandem with the design process. This allows for iteration of the design, such as locating of infrastructure to avoid more sensitive environments. The following sections give a summary of the assessment that may be required depending on the site and scale of the proposed development.

2.2.2 Environmental Impact Assessment (EIA)

2.2.2.1 Overview

In accordance with Directive 2011/92/EU, as amended by Directive 2014/52/EU projects that are likely to have significant effects on the environment by virtue of their nature, size, or location, must be subject to an EIA. The Environmental Impact Assessment Report (EIAR) is the principal document that the EIA process is based on, which is prepared by the developer.

The EIAR must identify, describe, and assess likely significant effects, both direct and indirect, of the project on the environment. It is important to note that the EIA is an iterative process and should be integrated into the design process. Through considered design and site selection it may be possible to avoid, prevent or reduce adverse impacts on the environment and this is a key requirement of the EIA process.

For a planning application, it is the responsibility of the Planning Authority to carry out an assessment of the information provided in the EIAR and come to a reasoned conclusion on the project impacts on the environment.

For further information in relation to EIAR, please refer to the following documents:

Guidelines on the information to be contained in Environmental Impact Assessment Reports May 2022

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)

Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects April 2017

2.2.2.2 EIA Screening - Mandatory EIA Thresholds

EIA Screening is the process of deciding whether a development requires an EIA to be carried out. The EIA Screening exercise first assesses the development to ascertain if it is subject to Mandatory EIA, using classifications defined in the EIA Directive (projects listed in Annex I of the EIA Directive are subject to an EIA). If the project is not listed in Annex I, and no mandatory EIA is required, the EIA Screening process progresses to consider projects listed under Annex II of the EIA Directive. Projects listed in Annex II of the EIA Directive are subject to an EIA if (i) they exceed certain thresholds (set out in Annex II and by each Member State); or (ii) if they do not meet or exceed the threshold, but where the project is deemed likely to have significant environmental effects, with regards to the project's scale, nature, location, and context.

An Environmental Impact Assessment may be required for TES project, however there is no specific entry for TES projects, however other triggers may mean an EIA is required. It is recommended to review the regulations and legislation to determine if this applies to your specific project.

2.2.2.3 EIA Screening - Sub-threshold EIA

Proposed TES energy developments below the mandatory thresholds but which may be likely to have significant effects on the environment may also require an EIA and should therefore be screened for EIA to determine whether the project is likely to have a significant effect on the environment. These projects may be referred to as **"sub-threshold"** projects. In the case of sub-threshold development, it is advisable that Developers consult with the planning authority regarding the possible need for an EIAR. Useful guidance can be found in the below document:

Environmental Impact Assessment (EIA) Guidance for Consent Authorities regarding Sub-threshold Development Aug 2003.

2.2.2.4 EIA Scoping

Scoping is an important stage that takes place early in the EIA process. It provides an opportunity for both Developers and the Competent Authority to determine those key environmental impacts and issues of concern that are likely to be of the utmost importance to the Project proposal's decision-making and eliminates those that are less of a concern. In other words, Scoping defines the EIA Report's content and ensures that the environmental assessment is focused on the project's most significant effects on the factors listed in Article 3 of the Directive, and that time and money are not spent on unnecessary examinations. It also reduces the likelihood that competent authorities will need to request additional information from the developer after the Environmental Impact Assessment Report has been prepared and submitted.

The Developer can request a written scoping opinion from the Planning Authority on the information to be contained in the EIAR in the event that an EIA is required. This is an opportunity for the Planning Authority, the Developer and the Developer's technical advisers to discuss the scope and level of detail of the environmental information to be submitted in the EIAR.

2.2.2.5 Public Consultation

Public consultation is a key consideration for development projects, and it is important that stakeholders are brought into the process at an early stage. Public concerns raised through the consultation process may be brought into the EIA scoping and be addressed in the EIAR as applicable. Public information events may be held, where the project team can present the plans and invite feedback from the local community. It will be necessary to set up a system to record such feedback or a website where key project documents may be viewed such as Scoping Reports, the EIAR, maps and application documents. As part of the EIA process, it is necessary to place public notices informing the public when an application and EIAR have been submitted to the competent authorities.

2.2.2.6 Consultation with Prescribed Bodies

Prior to the submission of a planning application there may be a requirement for the developer to notify a specified list of Prescribed Bodies about the proposal. Upon receipt of an application that is accompanied by an EIAR, there is a requirement for Competent Authorities to consult with authorities likely to be concerned by the project by reason of their specific environmental responsibilities or local and regional competencies and to give them an opportunity to make submissions and observations on the information supplied by the developer and on the request for development consent.

2.2.2.7 EIA Assessment and Determination

Once the EIAR has been completed and the application documentation prepared, the application is submitted to the Competent Authority for assessment and determination. The applicant and the Competent Authority must comply with relevant statutory provisions that may apply in relation to documentation, public notices, consultation, and processing of the application. If, during the assessment, the Competent Authority determines that the information presented in an EIAR is not sufficient for it to make a determination, then the developer may be asked to provide further information.

2.2.3 Appropriate Assessment (AA) under the Habitats and Birds Directives

The Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) seek to maintain, and where necessary, restore the favourable conservation status of designated natural habitats and species throughout member states. Designated Special Areas of Conservation (SAC), Special Protection Areas (SPA), candidate Special Areas of Conservation (cSAC) and proposed Special Protection Areas (pSPA) are collectively known as European Sites. The most important ecological sites are designated as European Sites under provisions of Irish legislation transposing

these Directives. Together, these sites form part of the Natura 2000 network of comparable sites throughout Ireland and other European Member States.

Article 6(3) of the Habitats Directive requires an AA of plans and projects that are likely to have significant effects on any European Site. A Competent Authority cannot agree to the plan or project until it has ascertained that it will not adversely affect the integrity of the site concerned.

2.2.3.1 Screening for Appropriate Assessment (Stage 1)

Under the Habitats Directive, it is the Competent Authority's responsibility to complete the Screening for AA and issue its determination whether an AA is required. To support this the applicant must submit a Screening for AA Report. The report should include all supporting information necessary for the Competent Authority to reach a 'Screening for AA Determination' including the applicant's own conclusion/determination in relation to screening.

The Report should be completed to meet the requirements of the Habitats Directive, EU and National guidance documents, transposing legislation, and relevant domestic and European case law. The Competent Authority will publish a Screening for AA Determination. Which will either inform the applicant that their application has been 'screened-in' for AA or it will inform the applicant that the application has been 'screened-out' and does not require and AA to be carried.

2.2.3.2 Appropriate Assessment (Stage 2)

If likely significant effects cannot be ruled out at the screening stage, the Competent Authority is required to carry out an AA. The Applicant will have to prepare a Natura Impact Statement (NIS) on foot of the Competent Authority's Determination. If the Applicant has already determined to their satisfaction that in all likelihood Stage 2 AA will be required and have prepared an NIS in anticipation of being requested to do so, they may submit it at initial application stage.

2.2.3.3 Public Consultation

As part of the assessment process, all applications and supporting documentation will be made available to the public consultation. The Applicant will be required to make the public aware, in a manner specified by the Competent Authority. The public will have a minimum of 30 days from the date of publication of the notice to make a submission to the Competent Authority. During this period, the Competent Authority may also consult with relevant public authorities which they believe might have appropriate observations to make on the application.

2.2.3.4 Imperative Reasons of Overriding Public Interest (IROPI)

In the event that the AA concludes that adverse impacts upon the integrity of a European Site cannot be ruled out, or that the integrity of such a European site will be adversely affected and where it has been demonstrated that there are no alternative solutions, Article 6(4) of the Habitats Directive allows for derogation for 'Imperative Reasons of Overriding Public Interest' (IROPI). There are limitations on the reasons applicable where priority habitats, as defined in the Directive, are affected.

IROPI is complex processes where it must be shown that public interest clearly outweighs the long-term conservation interests of the protected site. These have only been sought and granted in very rare instances in Ireland and are only considered as a very last resort. Where it is considered that IROPI applies to an infrastructural project, a statement of case is prepared by the competent authority and referred to the Minister for his/her consideration. The Minister will consider whether the compensatory measures proposed as part of the development are sufficient to ensure that the overall coherence of the Natura 2000 network is protected, and this may involve consultation with the European Commission. Once the Minister issues a notice to the competent authority with respect to whether compensatory measures are sufficient or not, the competent authority will then determine the planning application.

2.2.4 Risk Assessment for Annex IV Species

Under Article 12 of the Habitats Directive, Annex IV species are protected wherever they occur. If they occur within the Zone of Influence of the plan or project, a risk assessment of the effects of the project on the Annex IV species must be completed.

2.3 Planning Phase

There is no planning legislation or regulations that relate directly to Thermal Energy Storage (TES) development. This means that there are no exempted development regulations or criteria that would classify a TES project as a Strategic Infrastructure Development (SID), which would allow the project to be submitted directly to An Bord Pleanála.

Any proposal for a standalone TES development must be consented to by the relevant Local Authority. Many TES installations occur alongside other renewable energy projects and often form part of the same planning application.

Some small-scale TES installations in homes and businesses may not require planning consent if they do not substantially alter the structure or its use. However, this may not apply if the structure is a Protected Structure. If your structure is listed on the Record of Protected Structures, please consult with the relevant Local Authority before beginning any work.

If there are any doubts regarding the requirement for planning consent, clarity can be sought from the relevant Local Authority through a Section 5 declaration.

2.4 Grid Connection

TES projects generally co-locate with other renewable energy projects. If required for the energy generation project, licenses for a grid connection should be in place.

Before construction, a Grid Connection Offer must be obtained. This offer allows a generator to connect to the national grid and supply energy. It is important to note that to secure a grid connection offer, planning permission is required before submitting a Grid Connection Application, if planning permission is necessary for the project.

Depending on the scale of your project, one or more of the following Grid Connection Offers/Electrical Licenses may be required (see **Sections 2.4.1 - 2.4.10**). To determine if further licenses may be needed, it may be necessary to cross-reference with other renewable energy-specific projects.

It should also be noted that grid connection offers and licenses generally relate to projects that connect directly to the national electricity grid. Depending on the nature and application of your TES project, it may not export or import electricity from or to the grid, and therefore these licenses may not be required.

2.4.1 Micro-Generation Grid Connection Offer

All microgeneration systems (defined as systems with a capacity of less than 6kW/25Amps AC for single-phase connections and less than 11kW/16Amps for three-phase connections) must complete an NC6 notification form from ESB Networks. This form should be submitted by email (networkservicesbureau@esb.ie) or by post to ESB Networks in advance of installation.

Micro-Generation refers to the supply of electricity by equipment installed in homes or small businesses. Micro-Generation installations are defined as follows:

- Only **one customer** is involved;
- Only **one installation** is involved; and
- In cases where multiple customers are involved in the same housing scheme, such as planned greenfield developments, the installations must be designed to achieve a penetration level[2] expected to reach 40% of the capacity in kVA of the existing MV/LV substation that supplies the estate or scheme.

To participate in grid connection for Micro-Generation, customers are required to complete the Micro-Generation Installation Notification Form (Form: NC6), which is available at www.esbnetworks.ie.

Full conditions for Micro-Generation connection and operation are available from ESB Networks.

[2] "*Penetration level*" refers to the percentage of total energy demand that is supplied by a specific energy source, such as renewable energy. For instance, a penetration level of 40% indicates that 40% of the energy consumed in a given area is provided by that source, relative to the total capacity of the existing electrical infrastructure.

2.4.2 Mini-Generation Grid Connection Offer

Mini-Generation grid connections are designed for small-scale electricity generation and battery storage, primarily for self-consumption. This is defined as a source of inverter-connected electrical energy and all associated equipment, within the following ranges:

- Greater than 25 A up to and including 72 A at low voltage [230 V] (1), when the DSO network connection is single-phase.
- Greater than 16 A up to and including 72 A at low voltage [230 V/400 V] (2), when the DSO network connection is three-phase.

Where multiple generating sources (of the same or varied technologies) are located on the same site and share access to the same Distribution System Operator (DSO) network connection point, the aggregate rating shall not exceed:

- 72 A for single-phase connections at low voltage; and
- 72 A per phase for three-phase connections at low voltage.

The Mini-Generation process requires an application for connection to ESB Networks. Following this, a network study will be conducted locally by ESB Networks, and the conditions for connection will be outlined in the Connection Offer. For installations in existing premises, the customer must complete the Mini-Generation installation application form (Form: NC7) and provide a Type Test Certificate from a recognised laboratory confirming compliance with I.S. EN 50549-1 for the proposed Mini-Generator, as well as confirming that the appropriate Interface Protections have been applied (see Section 2.2 of ESB Networks conditions).

After receiving the application and application fee, ESB Networks will assess the network for the proposed connection and contact the customer regarding any associated connection limitations or costs (if requested). No work shall progress until the conditions in the Connection Offer have been met and any necessary ESB Networks construction work has been completed.

After installation, the installer must carry out any relevant on-site commissioning tests to ensure the satisfactory operation of the generator. Once confirmation of the installation has been received by ESB Networks (email to dsominigeneration@esb.ie), the connection on the DSO system can be completed. Until confirmation of the installation is received by ESB Networks, the offered Maximum Export Capacity (MEC) (and Export Limiting Scheme (ELS), if applicable) shall not become active. The period of validity of the Connection Offers shall be as stated in the Connection Offer.

2.4.3 Small Scale Grid Connection Offer

For Small Scale Generation connections, the Installed Generation Capacity is not permitted to be greater than the Maximum Import Capacity (MIC), and consequently the MEC cannot be greater than the MIC. If you wish for ESB Networks to assess the connection for the MEC level proposed, but where no reinforcements apply, please email: dsosmallscalegeneration@esb.ie. The MEC level proposed will be assessed and a quotation issued for the costs of any reinforcements proposed.

To secure a small scale Grid Connection, an application must be made to ESB networks completing an NC8 form for inverter connections. Once the forms are emailed to dsosmallscalegeneration@esb.ie along with all required documentation (ESB networks small scale information for further detail). This will be verified for completeness, accuracy and compliance, and an invoice will then be issued for the relevant application fee. Once the invoice is paid the application can be deemed complete.

ESB Networks will then need to carry out a full technical assessment of a connection point prior to issuing a connection offer in order to ensure connection capacity is not exceeded and that grid safety, stability and reliability are maintained and to establish the nature of any upgrade works required to the system to facilitate the connection. Currently due to a high demand the average period for the connection offer documents to issue is 3 to 6 months from payment of the application fee, however, for a small number of complex applications this stage may take longer.

2.4.4 ECP Cat A Grid Connection Offer

Enduring Connection Policy (ECP) process for grid connection applications is the current pathway for generators, storage, and other system services technology projects to connect to the electricity network.

ECP Category A is for generation, storage, and other system services technology projects (MEC >0.5 MW). Applications for this grid connection offer will occur in batches with application windows occurring at set times in the year (2-3 per annum).

An application fee applies for projects with MEC>500 kW (0.5 MW), which is €2,000. Successful applicants will be prioritised by largest renewable energy generation (first 25), then by planning permission grant date. Each batch application may set its' own generation priorities. A full list of all DSO (Distribution System Operator) ECP applicants is available from ESB networks.

To make a grid connection application Form NC5 should be used where an applicant has identified their specific generator manufacturer detail and would like their technical study processed using the specified data provided by the applicant. Form NC5A is a shortened version of this form and may be used where the specific generator manufacturer detail is unknown at time of application. Therefore, the technical study is completed using assumed data and the applicant is required to provide their specific data a year in advance of energisation. Fully completed application forms can be sent via email with all relevant documentation to DSOGenerators@esb.ie.

2.4.5 EirGrid Grid Connection Offer

Projects with total export capacity of under 40 MW at a single location should initially apply to ESB Networks for a Distribution Connection. Projects with over 40 MW total export capacity at a single location should initially apply to EirGrid for a Transmission Connection.

When submitting a new application to EirGrid as Transmission System Operator (TSO), the application must be accompanied by all supporting documentation as requested, including two signed copies of the EirGrid standard confidentiality agreement and the first instalment of €7,000 (inclusive of VAT) of the application fee. The total application fee is dependent on the size of the plant (taking into account the MEC and MIC values) and whether shallow connection works are involved in dealing with the capacity required.

For application forms for an EirGrid Enduring Connection Policy (ECP) and details of the application process, it is best to consult the EirGrid website and any queries can be directed to OPMO@eirgrid.com.

2.4.6 Licence to Supply

A Licence to Supply is a mandatory licence for anyone wishing to supply electricity to final customers (a final customer is defined as a customer purchasing electricity for their own use), it is applied for through the Commission for Regulation of Utilities (CRU), (Section 14(1)(b), (c) or (d) of Electricity Regulation Act 1999, as amended).

The CRU grants, revokes and enforces these licences. The current fee for the licence to supply is €254 and can be applied for through the CRU application form. An Electricity Supply Licence will be valid for 15 years.

For further information and details on supporting documentation please refer to the CRU Electricity Supply website: https://www.cru.ie/regulations-policy/licences/electricity-supply/

2.4.7 Wayleave Consent: Section 48 to Lay Electric Cables

Wayleave Consent: Section 48 refers to the power to lay electric cables (Section 48 of Electricity Regulation Act 1999, as amended) is granted to: lay electric cables across or under any street, road, railway or tramway, and the right to break up any street, road, railway, or tramway for that purpose. This licence is separate to other agreements such as the Road Opening Licence.

The Section 48 wayleave consent is applied for through the CRU, see Section 48 application form. At present there is no application fee. It should be noted that letters of consent from the landowners in addition to a copy of their connection offer are required as part of the application. If the land that is affected is a tramway or railway, consent will also be required from CIÉ. A photocopy of the route map is also required to be submitted along with the application.

Applications should be submitted at least two months prior to when the applicant intends to use the consent. The CRU will acknowledge only fully completed applications within 10 working days of receiving them. Once the CRU acknowledge an initial application the CRU will review it, contact will be made if the cru requires clarifications or additional information. For further information or queries related to Section 48 please contact the CRU at: consentapplication@cru.ie.

2.4.8 Wayleave Consent: Section 49 to Lay Electric Cables

Wayleave Consent: Section 49 refers to the power to lay electric lines (Section 49 of Electricity Regulation Act 1999, as amended), this is granted to lay lines across or under any land not being a street, road, railway, or tramway.

The Section 48 wayleave consent is applied for through the Commission for Regulation of Utilities (CRU), see Section 49 application form. At present, there is no application fee.

Should the electric lines be required to go through private land a yearly agreement has to be reached between the asset owner and the landowner for the duration of the project. It should be noted that letters of consent from the landowners in addition to a copy of their connection offer are required as part of the application. A photocopy of the route map is also required to be submitted along with the application.

Applications should be submitted at least two months prior to when the applicant intends to use the consent. The CRU will acknowledge only fully completed applications within 10 working days of receiving them. Once the CRU acknowledge an initial application, the CRU will review it, and contact will be made by the CRU if the CRU requires clarifications or additional information.

For further information or queries related to Section 49 please contact the CRU at: consentapplication@cru.ie.

2.4.9 Transmission Use of System (TUoS) Agreement

This is a mandatory agreement that is required to obtain access to TUoS and transport electricity to and/or from the generation plant through the transmission system. This is regulated under Section 14(1)(b), (c), (d) or (h) of Electricity Regulation Act 1999, as amended and Section 34 of Electricity Regulation Act 1999, as amended.

Suppliers and generators seeking to use the Transmission System will be required, prior to using the Transmission System, to enter into a TUoS with EirGrid Group. This agreement must be in place before a supplier or generator can participate in the Single Electricity Market (SEM).

2.4.10 Distribution Use of System (DUoS) Agreement

To obtain access to a distribution system and transport electricity to and/or from the generation plant through the distribution system an application must be made to ESB networks (Section 14(1)(b), (c), (d) or (h) of Electricity Regulation Act 1999, as amended and Section 34 of Electricity Regulation Act 1999, as amended). Following on from the connection application, an initial payment is required. A DUoS charge is a fee that ESB Networks charges your Electricity Supplier for use of the Electricity Distribution System. Details of Charges for Connection to the Distribution System, approved by the CRU, are available on the ESB Networks Website.

For further Information on the process for connection of demand customers to the distribution system please refer to: https://www.esbnetworks.ie/docs/default-source/publications/guide-to-the-process-for-connection-of-demand-customers-to-the-distribution-system.pdf?sfvrsn=9b4433f0_4.

2.5 Pre-Construction

2.5.1 Renewable Electricity Support Scheme

TES installations alone do not qualify to participate in the Renewable Electricity Support Scheme (RESS); however, they may be included as part of a larger renewable energy generation project that does qualify, such as a solar PV development.

2.5.2 Appointment of Construction Contractors

Pre-construction, contractors will need to be appointed to carry out the delivery of the development. There are two broad categories of contracting options:

1. Turnkey contracting, which sees a single company handling all TES equipment, electrical and civil engineering works; or
2. Separate contracting, where individual aspects are contracted out to specific companies.

Typically, if TES development follows the turnkey route, the equipment provider will lead, and sub-contract the electrical and civil engineering works to companies that would be deemed appropriate for the installation of their equipment.

Maintenance contracts are also usually agreed at this point, where required.

2.5.3 Planning Permission Amendments and Conditions

As the planning phases may take place over an extended period of time, there is a possibility that an amendment may be required to the consented development agreed with the Local Authority, due to alterations or technological improvements.

Pre-construction, some conditions within the planning permission applied by the Local Authority or An Bord Pleanála (the planning appeals board) must be sufficiently discharged, where required (formal applications process where requested details are required). This may include the likes of providing more specific details of design, or similar

details. Failure to discharge planning conditions as specified by condition of a planning permission may result in enforcement action.

2.5.4 Pre-Construction Licencing

The following licences are suggested pre-construction licences only. These will be updated in accordance with the approved guidance and legislation when it comes into force.

2.5.4.1 Road Opening / Closing Licence

At times, a temporary road closure is needed in conjunction with a road opening licence, or for other works. To comply with statutory requirements, **an application for a temporary road closure should be submitted eight weeks in advance** to the relevant Local Authority.

You need a 'Road Opening Licence' for any works in a public area, to dig up a public road, footpath, or grass verge, for works such as:

- Water/Sewer Connections;
- Lowering of footpaths;
- Footpath reconstruction; and
- Pipelaying.

Applications for Road Opening Licenses can be applied through the MRL website. You must register with Road Management Office; http://www.rmo.ie/non-registered-users.html online MRL System to apply for a Road Opening Licence.

Temporary Road Closures are on occasion required to facilitate road works. Completed **application forms must be submitted five weeks prior to the road closure** to the relevant Local Authority. Advertisement costs must be covered by the applicant.

In conjunction with the above licences the following licences should also be applied for where works take place on or near public roads or pathways: a Hoarding/Scaffolding Licence and a Signage licence. A hoarding/scaffolding licence is required to facilitate building works and to ensure safety for the public. Completed **application forms must be submitted three weeks prior to works commencing** to the relevant Local Authority. A Signage licence is also required to authorise the use of advertisement signs/structures on public roads, (including Directional Signs). Completed application forms must be submitted for assessment.

It will be necessary to check with the relevant Local Authority what the current fees are for the different permit applications.

2.5.4.2 Section 254 Licence (Items on Public Roads)

A Section 254 Licence applies to all appliances, cables, signs, street furniture or other items on public roads. You will need to apply to the relevant Local Planning Authority for this licence to place; on, under, over or along a public road numerous items or equipment, including the following which may be relevant to a Heat Storage project:

- A fence, scaffold or hoarding;
- A cable, wire, or pipeline;
- Over ground electronic communications infrastructure and any associated physical infrastructure such as A telephone pole or cabinet; or
- Any other appliance, apparatus or structure specified in regulations made by the Minister for Housing, Planning and Local Government or by an Act of the Oireachtas that requires a licence.

To apply for a Licence, you will need to complete an Application Form and submit that form to the Planning Authority along with:

- A Site Location Map - 1:2,500 scale;
- A Site Layout Plan showing location of proposed appliance(s)/apparatus(s)/structure(s);
- Drawing(s) to scale of proposed appliance(s)/apparatus(s)/structure(s);
- The appropriate licence fee;
- Copy of Insurance Confirmation indemnifying the relevant Local Authority against claims arising out of any accidents to persons or property;
- Written legal consent of the landowner; and
- A copy of the site notice.

2.5.4.3 Abnormal Loads Permit (Permit for Specialised Vehicles)

A special permit (often referred to as an Abnormal Load Permit) is required for any haulage vehicles which are considered to be either: Wide, Long or Heavy and travelling on the roads within the relevant Local Authority administrative area. These vehicles may be required when transporting larger components by road. **Completed application forms must be submitted seven days prior to commencement of the journey**.

It will be necessary to check with the relevant Local Authority what the current fees are for the different permit applications.

Some abnormal loads may not require an application to be submitted to the Local Authority, only requiring application to An Garda Síochána, however permits obtained through Local Authorities require the applicant to notify An Garda Síochána in all cases.

Table 2-1 outlines the specifications that determine which body issues the permit.

Table 2-1: Abnormal loads permit application thresholds

Dimensions	Vehicle and Load	Type of Permit Needed
Height	• Over 4.65 m	• Local Authority Permit
	• Over 4.65 m – agricultural baled* produce only	• No permit required
Length	• 27.4 m or less	• An Garda Síochána permit for designated routes only. Local Authority permit needed for non-designated routes.
	• Over 27.4 m	• Local Authority Permit
Width	• 4.3m or less	• An Garda Síochána permit for designated routes only. Local Authority permit needed for non-designated routes.
	• Over 4.3m	• Local Authority Permit
Weight	• Exceeds maximum weights outline in the regulations[3]	• Exceeds maximum weights outline in the regulations

*There is no height limit on agricultural baled produce e.g., hay, straw etc.

More information regarding the required permits for transporting abnormal loads can be found summarised on the RSA website.

2.5.4.4 Fire Safety Certificate

A Fire Safety Certificate is required where the applicant proposes a new building, a new building extension, material alterations to an existing building or a change of use of an existing building. The application is made through the Building Control Authority (BCA) in the Local Authority. If the building or works complies with the requirements of Part B of the Second Schedule of the Building Regulations 1997, the BCA will issue a Fire Safety Certificate.

A Fire Safety Certificate application should be made by a Fire Safety Consultant, Architect or Engineer who is familiar with the Building Regulations and the procedure for applying for a Fire Safety Certificate. The fees for the application vary based on the type of application required (normal, 7-day notice or regularisation application).

A valid Fire Safety Certificate application must include:

- A completed application form;
- Relevant fire safety drawings in duplicate;
- A fire safety report in duplicate;
- Site location maps in duplicate; and

[3] RSA Maximum Weight Guidelines: https://www.rsa.ie/docs/default-source/road-safety/r1.5-professional-drivers/weights-and-dimensions-leaflet---november-2023.pdf?sfvrsn=93f12248_11

- The appropriate fee.

Please refer to Part II of the Building Control Regulations for further information and exemptions.

2.5.4.5 Disability Access Certificate

To determine if your project requires a Disability Access Certificate (DAC), please refer to the Building Control (Amendment) Regulations 2018 Article 20D, Part 4.

It is best practice to apply for your DAC at the same time you are applying for your Fire Safety Certificate. If both applications are prepared at the same time by the same person, the drawings can be co-ordinated prior to submission. A DAC application should be made by an appropriate consultant, architect or engineer who is familiar with the Building Regulations and the procedure for applying for a DAC.

A valid DAC application must include:

- A completed application form;
- Relevant fire safety drawings in duplicate;
- A disability access report in duplicate;
- Site location maps in duplicate; and
- Providing the application is lodged at the same time as the Disability Access Certificate application a €500 fee applies, otherwise it is currently €800 per building.

To determine if your project may be exempt from the necessity of obtaining a DAC please refer to the Manual for the Reuse of Existing Buildings.

2.5.4.6 Certificate of Registration

A Certificate of Registration is granted by the relevant Local Authority in area the works will be carried out. The waste activities that require a Certificate of Registration are listed in Part II of the Third Schedule of the Waste Management (Facility Permit and Registration) Regulations 2007, (S.I. No. 821 of 2007) as amended. To aid in rapid determination, if the project or development requires a Certificate of Registration please refer to the following Decision Tree.

Applicants should contact the relevant Local Authority wherever they wish to apply for a Certificate of Registration.

2.5.4.7 Waste Disposal Licence/Permit

Waste disposal and recovery activities in Ireland require authorisation in accordance with the Waste Management Act 1996 as amended. To determine if the activity that is being carried out requires a waste licence please refer to the Environmental Protection Agency (EPA) services. A waste licence is a single licence which deals with emissions from an activity and the environmental management of the facility. Waste licences are issued through the EPA.

2.5.4.8 Water Abstraction Registration

By law, if you abstract 25 m^3 (25,000 litres) of water or more per day, you must register this abstraction with the EPA (e.g., used for dust suppression). Although not a licence (which is under development) failure to register can incur a Class A fine (a fine not exceeding €5,000). Requirements are set out in the European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018).

The development of a register of water abstractions is a requirement of EU law under the Water Framework Directive (2000/60/EC). New abstractions must be registered within one month of the start of the abstraction. If you reported your water abstraction to a public authority (such as your Local Authority) in the past, you must also register your water abstraction with the EPA.

Temporary abstraction of 25 m^3 (25,000 litres) of water or more per day must be registered, unless the abstraction is a one-off occurrence with a duration no more than 24 hours that is not going to be repeated at any regular or irregular interval. For all other temporary abstractions, a point of abstraction must be identified, and the maximum abstraction should be used when registering. When a one-off temporary abstraction ceases, it should be de-registered. This will be required for water abstraction to feed an industrial process or to dewater a groundwater body to facilitate a deep excavation during construction.

If you have any queries regarding this licence you can contact the EPA at edenabstractionsupport@epa.ie and licencing is administered by the EPA via the EDEN portal (https://www.edenireland.ie/).

2.5.4.9 Tree Felling Licence(s)

If as part of the project requirements an individual or project developer determines that there is a need for the felling of trees for the purposes of (not limited to) site clearance, safe cable installation or maintenance purposes, a Felling Licence may be required. This is granted by the Minister for Agriculture Food and the Marine provides authority under Section 7 of the Forestry Act 2014, as amended to fell, or otherwise remove a tree (singular) or trees (multiple) and to thin a forest. All those involved in tree felling must ensure that a felling licence has been issued before any felling is carried out, unless they are satisfied that the felling is exempted. It is the responsibility of the landowner and or the person felling the tree to ensure that an exemption applies. A tree felling licence once granted is valid for a period of ten years and can be extended up to five further years.

Exemptions apply to the following common scenarios:

- A tree in an urban area provided it is not under a protection order;
- A tree within 30 m of a building but excluding any building built after the trees were planted;
- A tree less than five years of age that came about through natural regeneration and removed from a field as part of the normal maintenance of agricultural land - but not where the tree is standing in a hedgerow;
- A tree uprooted in a nursery for transplantation;
- A tree of the willow or poplar species planted and maintained solely for fuel under a short rotation coppice;
- A tree outside a forest within 10 m of a public road and which, in the opinion of the owner is dangerous to persons using the public road because of its age or condition;
- A tree outside a forest of the hawthorn or blackthorn species;
- A tree outside a forest in a hedgerow and felled for the purposes of its trimming, provided that the tree does not exceed 20 cm in diameter when measured 1.3 m from the ground;
- A tree outside a forest the removal of which is specified in a grant of planning permission; and
- A tree outside a forest on an agricultural holding removed by the owner for use on that holding, provided:
  - it does not form part of a decorative avenue or ring of trees;
  - its volume does not exceed 3 m^3;
  - the removal of trees for use on the farm does not exceed 15 m^3 in any period of 12 months.

It should be noted that the three above exemptions do not apply in all circumstance, for example when trees are more than 150 years old or are close to certain protected structures, monuments, archaeological sites, specific environmentally sensitive areas. If you live in an urban area, you may need to contact your Local Authority to see if there is a preservation order on the tree. For further detail on these exemptions please refer to: Tree Felling Guidance Ireland.

Certain bodies are exempted from the requirement for a felling licence, these include but are not limited to:

- Bord Gáis (Section 27, Gas Act, 1976);
- Aer Rianta (Section 46, Air Navigation and Transport (Amendment) Act, 1998);
- CIÉ or any other railway undertaking (Section 49, Transport (Railway Infrastructure) Act, 2001);
- CIÉ (Section 15, Transport (Dublin Light Rail) Act, 1996);
- Any telephone/mobile network operator (Section 58, Communications Regulation Act, 2002);
- The ESB (Section 45, Electricity Regulation Act 1999, as amended);
- NPWS (Section 72, Wildlife (Amendment) Act, 2000);
- Minister for Defence (Section 7, Defence (Amendment) Act, 1987); and
- Inland Fisheries Act (Section 59, Inland Fisheries Act, 2010).

At present, each tree felling licence application costs €20.

Further information on tree felling can be found online at https://www.agriculture.gov.ie.

Where a project involves a large area of forestry and or felling of a number of trees, this often triggers the requirement for replacement trees of suitable species or mix thereof to be planted on "bare plantable lands" elsewhere via an Afforestation Licence (see **Section 3.1.1** for further information).

2.5.4.10 Licence to Interfere with or Destroy the Breeding Places of Any Wild Animals

If you are intending to develop in an area to be known for breeding places of any wild animals, a licence 'To Interfere with or Destroy the Breeding Places of Any Wild Animals' may be required to proceed. A licence may be required by the granting authority, National Parks and Wildlife Service (NPWS) (Section 23 (5) (d) of the Wildlife Act 1976 as amended), the legislation states that any person who wilfully interferes with or destroys the breeding place or resting place of any protected wild animal, shall be guilty of an offence.

See https://www.npws.ie/licences-disturb-or-interfere-protected-plant-and-animal-species for a further information.

The list of Annex IV species which occur in Ireland and its waters are set out in **Table 2.3**. The European Commission Guidance document on the strict protection of animal species of community interest under the Habitats Directive 92/43/EEC (October 2021) should also be consulted for further information.

If any Annex IV species is suspected/found to occur in an area to be developed, a derogation licence may be required. A derogation licence to disturb Annex IV species or their breeding or resting places may be required by the granting authority, NPWS, under European Commission (Birds and Natural Habitats) Regulations 2011-2021. For example, otters are listed on Annex IV of the EU Habitats Directive. The Irish law that implements this directive gives strict protection to individual otters and their breeding and resting places.

Even when planning permission is given, the wildlife legislation applies. Works which would capture or kill them, damage, or destroy their breeding or resting places, or disturb them at important parts of their life cycle cannot take place without obtaining a second derogation licence. This licence is issued when planning permission is given under Regulation 54 of the Regulations, and strict criteria must be met before such a licence can be approved.

See https://www.npws.ie/licensesandconsents/disturbance/application-for-derogation-licence for a further information.

2.5.4.11 Licence to Photograph or Film a Protected Wild Animal or Bird

In general, a licence is not required for photography/filming of protected wild animals or birds if there will be no risk of disturbance to the breeding place of any animal, a nest containing eggs or un-flown young of any bird. However, **if you intend to photograph a protected wild animal or bird on or near the breeding place of such an animal or bird, you should apply for this licence**.

For a person to take or make photographic, video, or other pictures of a protected wild animal of a species specified in the licence, on or near the breeding place of such an animal, a licence may be issued by the Minister (Under Section 23 (6)(b) of the Wildlife Act, 1976 (as amended)). Applications for permissions are made on a standard application form (Licence to Photograph/Film a Protected Wild Animal) and submitted to the wildlife licence unit of the National Parks and Wildlife service.

For a person to take or make photographic, video, or other pictures of a protected bird of a species specified in the licence, or a wild bird of a species specified in the licence on or near a nest containing eggs or unflown young, a licence may be issued by the Minister (Section 22 (9)(f) of the Wildlife Act, 1976 (as amended)). Applications for permissions are made on a standard application form (Licence to Photograph or Film a Protected Wild Bird) and submitted to the wildlife licence unit of the National Parks and Wildlife service.

Animal species protected under the Wildlife Act are listed in **Table 2-2** below.

Table 2-2: Current list of protected animal species in Ireland

Mammals			Amphibians	Reptiles	Fish	Invertebrates
All Bat Species	Otter	All Seal species	Natterjack Toad	Common Lizard	Basking Shark	Freshwater crayfish
Badger	Pine Marten	All Whale species	Common Frog	Leatherback turtle		Freshwater pearl mussel
All Deer Species	Red squirrel	All Dolphin Species	Common Newt			Kerry slug
All Hare Species	Pygmy Shrew	All Porpoise species				
Hedgehog	Stoat					

2.5.4.12 Licence for the Removal of Invasive Alien Species

Under the EC Birds and Natural Habitats Regulations 2001 SI 477 of 2011, it is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on Schedule 3 of the regulations without a Licence. The two regulations that deal specifically with this scheduled list of species are:

- **Regulation 49**: Prohibition of introduction and dispersal of certain listed species; and,
- **Regulation 50**: makes it an offence to or to intend to import, buy, sell, breed, transport and distribute listed animal or plant species or vector material; and
- **Regulation 74**: which sets out transitional provisions related to the commencement of Regulations 49 and 50

The following activities are expressly prohibited:

- Dumping invasive species cuttings in the countryside;
- Planting or otherwise causing to grow in the wild (hence the landowner should be careful not to cause further spread);
- Disposing of invasive species at a landfill site without first informing the landfill site that the waste contains invasive species material (this action requires an appropriate licence); and
- Moving soil which contains specific invasive species in the Republic of Ireland unless under a licence from National Parks and Wildlife Service (NPWS).

See: https://biodiversityireland.ie/top10/10-most-unwanted-species/, for the current list of invasive species (for flora and fauna) in Ireland.

At any stage of a project, where invasive alien plant species are encountered, a licence (applied for through the Wildlife Licence Unit of the NPWS) for the removal/movement of invasive species from the site is required. In the event that herbicides or pesticides have been used, the contaminated materials may be classed as a hazardous waste or non-hazardous waste and will be required to be appropriately disposed of at an appropriately licenced facility.

When submitting your application for a licence, it should include:

- Detailed methods of removal, transportation, and treatment of the species;
- Information on the bio-security measures;
- Management plan; and
- Timeframe for carrying out the work.

Refer to the NPWS outline invasive species management plan for further information.

2.5.4.13 Derogation Licence(s)

A Derogation Licence may be required when removing vegetation in preparation for tree felling/afforestation. Derogation licences are licences to disturb or interfere with protected plant and animal species. A number of plant and animal species are legally protected in Ireland. Some of these species are included in a system of Strict Protection pursuant to the requirements of Articles 12, 13 and 16 of the Habitats Directive (92/43/EEC) and are sometimes referred to as Annex IV species. The list of Annex IV species which occur in Ireland and its waters is set out in **Table 2-3**. The European Commission Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC (October 2021) should also be consulted for further information.

Table 2-3: Annex IV Species

Annex IV Species	
Animals	**Plants**
All bat species	Killarney Fern
Otter	Slender Naiad
Natterjack Toad	Marsh Saxifrage
Kerry Slug	
Dolphins and Porpoises	
Whales	
Marine Turtles	

2.5.4.13.1 Derogation Licence to Disturb Bats or their Breeding or Resting Places

At present there are nine confirmed resident bat species in Ireland. All bats are listed on Annex IV of the EU Habitats Directive. Under the Irish law that implements this directive, both the bats themselves and their roosts are protected, as such it is an offence to disturb or interfere with them without an appropriate licence. If any bat species is suspected to inhabit structure (e.g., trees, bat boxes, buildings, stone bridges etc.) in any area proposed for development, a derogation licence to disturb bats, their breeding or resting places may be required by the granting authority.

Even when planning permission is granted, the wildlife legislation applies. **Works which would capture or kill, damage, or destroy their roosts or disturb them at important parts of their life cycle cannot take place without obtaining a *second derogation licence***. This licence is issued when planning permission is given under Regulation 54 of the Regulations, and strict criteria must be met before such a licence can be approved. 'Bat Mitigation Guidelines for Ireland' should also be referred to when carrying out works which may disturb them.

2.5.4.14 Licence to Interfere with or Destroy the Breeding Places of Any Wild Animals

If you are intending to develop in an area to be known for breeding places of any wild animals, a licence 'To Interfere with or Destroy the Breeding Places of Any Wild Animals' may be required to proceed. A licence may be required by the granting authority, NPWS (Section 23 (5) (d) of the Wildlife Act 1976 as amended), the legislation states that any person who wilfully interferes with or destroys the breeding place or resting place of any protected wild animal, shall be guilty of an offence.

See https://www.npws.ie/licences-disturb-or-interfere-protected-plant-and-animal-species for further information.

2.5.4.15 Commencement Notice / 7-Day Notice

In accordance with the Building Control Regulations, you are obliged to submit a *Commencement Notice* or a *7-Day Notice Application Form* with a *Seven Day Statutory Declaration* prior to commencement of the development to Building Control Section of the Local Planning Authority, giving notice of the intention to start work.

A Commencement Notice must be received by the Building Control Authority not less than 14 days and not more than 28 days before you wish to commence.

Additional documentation may be required to be submitted with the completed Commencement Notice; and this should be completed on-line on the National Building Control Management System (BCMS). An online system (BCMS) for lodging commencement notices and 7 Day Notices and complying with the various new requirements is available at www.localgov.ie.

The fees relating to a 7-day notice are set out in **Table 2-4.**

Table 2-4: Breakdown of the current rates and fees for a 7-day Notice Application

Submission of a 7 Day Notice in Respect of:	Rates and Fees Applicable:
a) Work in connection with the construction or extension of a building	€250, or €5.80 for each square metre of floor area being provided, whichever is the greater
(b) Work in connection with -	
(i) the material alteration of the interior of a building	€250, or €5.80 for each square metre of relevant floor area, whichever is the greater
(ii) the material alteration of the external surfaces of a building	€250
(iii) a combination of (i) and (ii) above	€250, or €5.80 for each square metre of relevant floor area, whichever is the greater
(c) A building in which a material change of use takes place	€250, or €5.80 for each square metre of relevant floor area, whichever is the greater
(d) Works or a building, where the building concerned will be used as an agricultural building	€130, or €1.60 for each square metre in excess of 300 square metres of -
	(i) gross floor area being provided,
	Or
	(ii) relevant floor area

Submission of a 7 Day Notice in Respect of:	Rates and Fees Applicable:
	As the case may be, whichever is the greater

2.5.4.16 Industrial Emissions Licence (IE Licence)

The Industrial Emissions Directive is administered by the EPA and lays down rules on integrated prevention and control of pollution arising from industrial activities (see **Table 2-5** for list of typically licenced industries). An IE Licence is required for new activities, which is defined in the First schedule of the EPA Act 1992 as combustion of fuels in installations with a total rated thermal input of 50 MW or more. A licence must be obtained prior to commencement. Guidance on the application process is available from the EPA (https://www.epa.ie).

Table 2-5: Types of Industries that may require an Industrial Emissions Licence

Minerals and other materials	
Energy	Surface coatings
Metals	Intensive Agriculture (poultry and pigs)
Minerals Fibres and Glass	Food and Drink
Chemicals	Wood, paper textiles and leather
Waste	Fossil fuels
Other Activities (includes testing of engines, manufacture of printed circuit boards, production of lime, the manufacture of ceramic products, the capture of CO_2 streams and treatment of wastewater)	Cement, Lime, and Magnesium Oxide

Access to the EPA online application form is via the Environmental Data Exchange Network (EDEN) online portal (https://www.edenireland.ie/). The licence is required to refer to the complete environmental performance of the plant including emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents and restoration of the site upon closure. If unsure as to which type of authorisation is required, or to validate licence requirements, ***an applicant may request the EPA to determine appropriate licencing requirements***.

Industrial emissions licencing is typically required for of biogas and biomethane facilities and any facility proposing to accept an annual tonnage above 10,000 tonnes per annum of biowaste (any facility accepting up to 10,000 tonnes must have a Waste Facility Permit) must apply to the EPA for an IE Licence and guidelines on the process are available from the Composting and Anaerobic Digestion Association of Ireland (CRÉ) (http://www.cre.ie).

Where emergency generation equipment is used, if the total rated thermal input capacity of all combustion plant on site is 50 MW or more it is required to hold an IE Licence unless operations are limited to 50 MW input load or more for no more than 18 hours per annum. If emergency generation is required, it is advised to lodge an application for an IE Licence to allow for such operation and pre-application contact (at licensing@epa.ie) with the Agency is strongly advised to ensure the Agency's requirements are met.

An application for an Article 11 determination (waste disposal and recovery) must be made online using the EPA's website (EDEN) and will take 15 working days from submission to determination. However, the licencing process through the EPA takes eight weeks from application to determination, followed by 28 days allowed for objections, before a final decision can be made, which may then be subject to Judicial Review within eight weeks of the decision.

Any person conducting activity that is below an IE Licence threshold must ensure that they do not exceed that threshold without first obtaining an IE Licence and also must ensure that the activity is correctly authorised. It is an offence to carry out a licensable activity without a proper licence from the EPA and validation of licence requirements with the EPA is strongly advised.

EPA Licencing of generating facilities is currently carried out only for thermal plants. For all queries in relation to IE licencing and to arrange a pre-application meeting contact the EPA at licensing@epa.ie.

2.5.5 Pre-Construction Permits and Guidelines

For the purposes of safe construction and operation of TES additional conditions and permits may need to be applied for and strictly adhered to (**Sections 2.4.5.1 to 2.4.5.2**). In the case of the Seveso Directive this is not a licence so much as an international standard that must be adhered to if your activity involves the storage, use or potential release of dangerous substances.

2.5.5.1 Green House Gas Emissions Permit

The EPA is responsible for administering EU Emissions Trading Scheme (ETS) in Ireland for both stationary units and aircraft operators. The Green House Gas (GHG) Emissions Permit authorises the holder to undertake named activities (for further detail refer to the: Commission Implementing Regulation) which result in the emission of carbon dioxide and other greenhouse gases.

Installations from which greenhouse gasses are emitted, need to be monitored and controlled to ensure permitted emissions are not exceeded. It is an offence to carry on an activity listed in Annex 1 of the Directive without a GHG permit.

Information on activities can be found in the EU Guidance note on interpretation of Annex I of the EU ETS Directive (excluding aviation activities); this is helpful for determining if your installation is included in the EU ETS and if an emissions permit is required.

There is mandatory participation in the emissions permit for sectors and companies in the energy industry including:

- **Electricity and heat generation:** Combustion installations with a rated thermal input exceeding 20 MW Including power plants generating electricity and heat from fossil fuel such as: natural gas, coal, and oil as well as other high-emission technologies such as solid biomass fuel installations.

For more information on applicable sectors and greenhouse gases covered see Annex I and Annex II respectively of the EU ETS Directive.

Helpful guidance on activities that may require GHG permits can be obtained from the EPA website.

If you believe you fall into the descriptions under Annex I of the EU ETS Directive contact the EPA by email (ghgpermit@epa.ie) and they will advise on how to proceed. Useful information for ETS operators can be found under EU ETS Monitoring and Reporting guidelines.

Further information on GHG emissions trading can be found on the EPA website at:

- Emissions Trading System - Statutory Installations; and
- EU Emissions Trading Systems.

2.5.5.2 Seveso III Directive

The Seveso III Directive (hereafter the Seveso Directive) aims to control major accidents and or hazards involving dangerous substances, especially chemicals. They are a set of preventive measures and notifications in order to reduce the risk of hazardous activities and a put limitations on the consequences for human health and the environment, with a view to ensuring a high level of protection throughout the EU in a consistent and effective manner. This is not a licence so much as an international standard that must be adhered to if your activity involves the storage, use or potential release of dangerous substances.

The Seveso Directive does not apply to any of the following:

a) Military establishments, installations, or storage facilities;

b) Hazards created by ionising radiation originating from substances;

c) The transport of dangerous substances and directly related intermediate temporary storage by road, rail, internal waterways, sea, or air, outside the establishments covered by this Directive, including loading and unloading and transport to and from another means of transport at docks, wharves or marshalling yards;

d) The transport of dangerous substances in pipelines, including pumping stations, outside establishments covered by this Directive;

e) The exploitation, namely the exploration, extraction, and processing, of minerals in mines and quarries, including by means of boreholes;

f) The offshore exploration and exploitation of minerals, including hydrocarbons;

g) The storage of gas at underground offshore sites including both dedicated storage sites and sites where exploration and exploitation of minerals, including hydrocarbons are also carried out; and

h) Waste land-fill sites, including underground waste storage.

Notwithstanding points (e) and (h) of the first subparagraph, onshore underground gas storage in natural strata, aquifers, salt cavities and disused mines and chemical and thermal processing operations and storage related to those operations which involve dangerous substances, as well as operational tailings disposal facilities, including tailing ponds or dams, containing dangerous substances shall be included within the scope of this Directive.

Please refer to: Seveso III Directive – Seveso III On the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (Text with EEA relevance), Annex I for a list of Dangerous Substances considered under the Seveso Directive.

2.6 Construction

2.6.1 Planning Permission Conditions

Upon a grant of permission, there will almost certainly be planning conditions imposed by the Local Authority, which may cover a range of matters. There will likely be conditions that will cover matters during construction, such as working hours, which specifies the acceptable window of time when construction may take place, or other conditions in relation to noise from construction, dust generated, wheel washing, etc. These conditions must be strictly adhered to, as if a project is found to be in breach of conditions, a Local Authority may initiate enforcement proceedings.

The Local Authority may also deploy Site Inspectors to ensure compliance with planning conditions, and other site matters under which the Local Authority has jurisdiction.

2.6.2 Outline of Construction

Once construction is ready to commence, if required, site clearance is the first stage, preparing the site for construction. Access roads will be put in place allowing construction vehicles to access the site.

In parallel, two aspects of the project will usually start construction – the TES facility to support the project, and the substation(s) required. These can be viewed as separate projects by their nature, but of course they form part of the same project. The substation(s) will need to be ready for connection when the generator is ready to be connected to the grid.

2.6.3 Commissioning

Once planning permission is obtained and construction is complete, commissioning of the heat storage system takes place. Commissioning typically involves electrical testing, mechanical testing, performance evaluations and corrections reporting. The purpose is to ensure the equipment has been correctly installed and will operate safely and efficiently.

Provided a project passes the commissioning stage, it will then enter its operational stage and begin to store energy for consumption or sale at a later stage.

3 Operating and Maintenance Stage

Some licences and consents may not have a duration that covers the entire lifespan of a heat storage project, thus may require further attention from the owner/operator. This may be as a result of the legislative basis for the consents, or as a change of legal circumstance, or an environmental change over time.

3.1 Licences

3.1.1 Afforestation Licence (Technical Approval)

An Afforestation Licence "*provides the permission to plant all or part of the areas specified, and the areas planted meet scheme requirements*"[4]. This is necessary for all afforestation projects where the area involved is greater than 0.1 hectare (approx. 0.25 acres). Afforestation is defined in the Forestry Act 2014 as, "*the conversion of land to a forest with a minimum area of 0.1 hectares and tree crown cover of more than 20 per cent of the total area, or the potential to achieve this cover at maturity*". Forest land is defined as land under trees with a minimum area of 0.1 hectare and tree crown cover of more than 20% of the total area (or the potential to achieve this cover at maturity).

This permit is necessary when a developer seeks to replant trees which were felled during a site development. For the proposed afforestation of alternative lands, approval must be obtained before the associated felling licence can be granted. Proposed alternative land should be submitted for afforestation approval as early as possible, ideally at the same time as the felling licence application is submitted. Afforestation approval must be applied for using the Afforestation Pre-Approval Form.

All afforestation projects (whether availing of a grant or not) must obtain prior written approval from the Department of Agriculture, Food and the Marine (DAFM) termed 'Technical Approval'. A technical approval confirms that the proposed forest detailed in the application complies with the silvicultural (control of the growth, quality and needs of the forest, of particular importance for timber production) and environmental requirements. This approval provides permission to plant all, or part of the areas specified in the application. Grant aided projects require a supplementary 'Financial approval' in conjunction with technical approval. This financial approval' must be obtained before work can commence.

Further information on tree felling can be found online at https://www.agriculture.gov.ie.

3.1.2 Derogation Licence

Over the course of operation, there may be a need to interfere with a protected species, if they happen to be interrupting safe and efficient operation of the TES installation. As such, a Derogation Licence would be required.

Please refer to **Section 2.5.4.13** for further information about Derogation Licences.

3.1.3 Waste Disposal Licence / Permit

Waste disposal and recovery activities in Ireland require authorisation in accordance with the Waste Management Act 1996, as amended. To determine if the activity that is being carried out requires a waste licence please refer to the EPA services. A waste licence is a single licence which deals with emissions from an activity and the environmental management of the facility. Waste licences are issued through the EPA.

3.1.4 Water Abstraction

During the course of normal operations, it may be necessary to apply for a temporary water abstraction licence depending on project/maintenance requirements. For further information on water abstractions please refer to **Section 2.5.4.8**.

[4] Technical Approval is granted by the Minister for Agriculture, Food and the Marine provides authority (under Section 7 of the Forestry Act 2014, as amended)

4 Project End Stage

4.1 Decommissioning

Decommissioning refers to the cessation of energy production and the dismantling and removal of associated equipment and infrastructure.

4.1.1 Planning

Typically projects that have been constructed following the procurement of planning permission from a Local Authority, will deal with decommissioning by condition. This means that within the conditions attached to the planning permission, it will directly set out how to carry out decommissioning and restoration of the site to its original condition. This is typically ordered after a set period of operation, and thus the decommissioning of the installation does not require further consent, as it has been provided for under the original application. If, however, you wish to conduct works not specified within the condition, planning consent will be required for those works.

Please note that there may be other conditions specified regarding the end of a project's lifespan, so please review relevant permissions carefully. If there is no condition dealing with decommissioning, you may require planning permission.

4.1.2 Licences

The decommissioning phase of a project may require reapplication for licences applied for during the pre-construction phase along with additional licences.

Licences which may apply such as abnormal load or road closures if the site is to be fully decommissioned – these licences will be subject to the conditions laid out under planning.

4.2 Lifespan Extension

Renewable energy technology, as with any other infrastructure, has a lifespan which has been determined to be the maximum allowable period of operation for the equipment. This is generally advised by the manufacturer of the equipment, however, a lifespan may also be determined through planning permission, by condition. It is recommended to operate TES equipment according to the manufacturer's instructions to maintain safe operations.

4.2.1 Planning

Regarding TES installations that required planning permission for construction, there may be a condition attached in relation to the lifespan of the installation. If there is, this must be complied with, however, if not, the applicant may leave the installation in place according to their own wishes, while ensuring it remains safe.

Regarding larger scale projects it is more likely that lifespan extension will be dealt with by condition, meaning that within the conditions attached to the original planning permission, it will directly set out how to carry out a lifespan extension. Typically, this will specify that further planning consent is required. If there is no specific condition, you may not require planning permission. If you have any doubts whether planning permission is required, you may contact your Local Authority and request a Section 5 Declaration, in which it will be determined if your works are exempted development.

4.2.2 Licences

As project extension by nature is determined by the equipment being used it may be necessary to reapply (due to timescales/permits/conditions involved) for various licences. Please refer back to **Section 3** (operation and maintenance stage) for more information in relation to potential licences that might be required.

4.3 Re-Powering

Re-powering means retrofitting and upgrading existing renewable energy installations with better equipment and technology, to improve the efficiency of the installation, while also allowing for an extended lifespan (given the newer infrastructure installed). This may also necessitate the upgrading of associated ancillary equipment.

4.3.1 Planning

From a planning perspective, it is best to approach re-powering considering it like a new project, and so it would be useful to utilise the *SEAI Single Point of Contact Renewable Energy* online tool for guidance, in addition to complying with the regulations.

The original planning permission may contain a condition specifying that any further works on the site requires further planning permission to be obtained. If there is no such condition, you may still require further planning permission, as the works required may be substantial.

In addition to complying with the regulations, it is recommended that you consult with the Local Authority regarding re-powering, and potentially seek a Section 5 Declaration. It is likely that permission will be required, as re-powering may be classed as 'land use intensification'.

4.3.2 Licences

With the exception of certificates that will not be required for renewal (e.g., Disability Access Certificate), it is likely that the remaining licences will require renewal or reapplication. It is recommended that you consult with the various granting authorities regarding repowering of your project and seek advice as to whether renewal/reapplication is required.

5 Other Useful Resources

Dincer, Ibrahim and Rosen, Marc. (2010). Thermal Energy Storage: Systems and Applications, Second Edition. 10.1002/9780470970751.

International Energy Agency (2013) https://www.iea.org/reports/world-energy-outlook-2013.

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