Capital Project 1021

CP1021 Proposed Project Overview Report

April 2022

EirGrid

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Contents

Glossary and Abbreviations

Abbreviations	
ACA	Architectural Conservation Areas
AAP	Areas of Archaeological Potential
AEOS	Agri Environmental Options Scheme
AIS	Air insulated
ASI	Archaeological Survey of Ireland
CAFE	Cleaner Air for Europe
CFRAM	Catchment Flood Risk Assessment and Management
CPD	County Development Plan
CSO	Central Statistics Office
EHV	Extra High Voltage
EPA	Environmental Protection Agency
GIS	Geographic Information System
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
IGHS	Irish Geological Heritage Sites
i-WeBS	Irish Wetland Bird Survey
LCA	Landscape Character Area
MVAr	Mega Volt Amps (reactive)
MCA	Multi-Criteria Analysis
NIAH	National Inventory of Architectural Heritage
NHA/ pNHA	Natural Heritage Area/ Proposed Natural Heritage Area
NPWS	National Parks and Wildlife Services
OHL	Overhead Line
OPW	Office of Public Works
PWS	Public Water Supply
RMP	Record of Monuments and Places
RPS	Records of Protected Structures
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, designated under the EU Habitats Directive
SI	Statutory Instrument
SMR	Sites and Monuments Record
SPA	Special Protection Area, designated under the EU Birds Directive
TPC	Total Project Cost
TSO	Transmission System Operator
TSSPS	Transmission System Security and Planning Standards
UGC	Underground cable
WFD	Water Framework Directive
XLPE	Cross-linked polyethylene

1. Introduction

1.1 What is Capital Project 1021?

Capital Project 1021 (CP1021) is a proposed project to reinforce the electricity network between East Meath and North Dublin. Reinforcement of this part of the network is needed to continue to ensure the security of the network feeding the east of Meath and the north of Dublin, between Woodland, Clonee, Corduff, Finglas and Belcamp substations. The proposed project will help meet the growing demand for electricity in the east of the country due to the increased economic activity in recent years while also facilitating increasing amounts of renewable electricity that is generated by windfarms in the west and south of the country and transported for use in the east.

The Climate Action Plan (2021) has a target to increase the proportion of renewable electricity to up to 80% by 2030. The Plan sets out that additional electricity generation and transmission infrastructure will be a critical enabler to achieve the renewable energy and emissions targets.

In Ireland, total electricity demand over the next ten years is forecast to grow between 19% and 50%, largely driven by new large energy users. This presents a challenge to Ireland's emissions targets and to Ireland's security of supply. Included in the targets for the electricity sector is to 'Expand and reinforce the grid through the addition of lines, substations and new technologies'.

Currently, electricity power generated in the south-west of the country is mainly transported cross-country on two 400 kV (kilovolt) power lines from Moneypoint substation to the Dunstown substation and Woodland substation in the east of the country.

The need in this case, involves a strengthening of the network in the east of Meath and the north of the Dublin region to facilitate the transfer of power across the existing 220 kV transmission network from the Woodland 400 kV substation to the East Meath and North Dublin area. This will help to facilitate the increased demand in East Meath and North Dublin and variability in generation output in Dublin.

To investigate this further, a number of technical feasibility and constraints reports have been prepared.

- CP1021 Cable Route Feasibility Report (321084AJ-REP-002);
- CP1021 OHL Feasibility Report (321084AJ-REP-003);
- CP1021 Environmental Constraints Report (321084AJ-REP-004)
- CP1021 Strategic Social Impact Assessment Scoping Report (321084AJ-REP-005); and
- CP1021 Substation Feasibility Reports (321084AJ-REP-006 to 008).

This report, the Proposed Project Overview Report (321084AJ-REP-001) sets out the need for the project, explains EirGrid's approach to Grid development and introduces the Multi-criteria assessment which will inform the decision, to be made by EirGrid, on the best way to achieve the need set out above.

1.2 Framework for Grid Development Explained

EirGrid follow a six-step approach when they develop and implement the best performing solution option to any identified transmission network problem. This six-step approach is described in the document 'Have Your Say' published on EirGrid's website[1]. The six steps are shown on a high-level in Figure 1.1. Each step has a distinct

[1] http://www.eirgridgroup.com/the-grid/have-your-say/

purpose with defined deliverables and represents a lifecycle of a development from conception through to implementation and energisation.

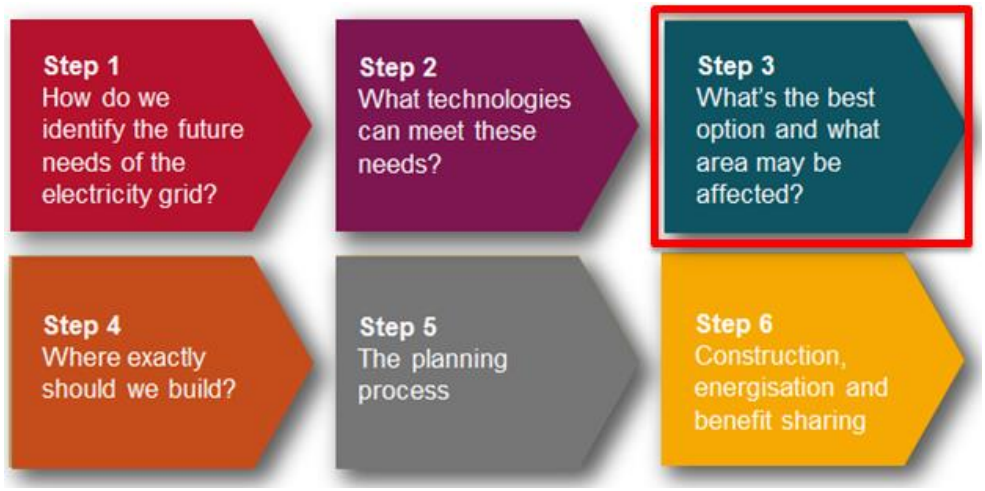

Figure 1.1 EirGrid's Six-Step Framework for Grid Development

The aim of Step 3 (the stage of this assessment) is to identify a best performing solution option to the need identified. The assessment of the options in Step 3, for linear projects, will be based on a study area and it should be made clear that any required routes will be developed in Step 4. CP1021 has entered Step 3 and there are four solution options which will resolve the need. The four solution options proposed for CP1021 are all technically feasible and options involve transmission network reinforcements centered on strengthening the network between existing Woodland 400 kV station in County Meath and either Belcamp 220kV or Finglas 220kV station in North Dublin. The substations at both ends of the new circuit will require new 400kV infrastructure. There are some common requirements for all options, and for the 400 kV underground cable (UGC) option, there may be additional reinforcements required.

1.3 Multi-Criteria Assessment

As part of Step 3, these solution options will be further investigated based on five main criteria, namely:

- Technical performance;
- Economic performance;
- Environmental aspects;
- Deliverability aspects; and
- Socio-economic aspects.

Each of these criteria will be broken down further into sub-criteria and a multi-criteria evaluation matrix will be used to identify the best performing option that will be brought forward to Step 4. It shall be noted that the overall assessment is carried out by EirGrid, but certain aspects are investigated and assessed by various consultants and their assessment will feed into the overall assessment.

Each of the feasibility and constraints reports considers the technological and geographical options to strengthen the transmission network in East Meath, North Dublin.

The OHL and UGC feasibility reports consider the technical, economic (financial) and deliverability of each option. The environmental constraints report uses a range of environmental topics to determine the environmental performance of each option (UGC or OHL to Finglas or Belcamp); the Social Impact Assessment Scoping report uses a range of topics relating to people and communities to determine the performance of each option (UGC or OHL to Finglas or Belcamp). The Substation feasibility reports are focused on the options for connections at the

substations and whether it is feasible to connect to Finglas or Belcamp, given existing and future (known) constraints and include an assessment all five criteria within them.

1.3.1 Scale Used to Assess Each Criterion

The effect on each criterion parameter is presented along a range from “more significant”/ ”more difficult”/“more risk” to “less significant”/”less difficult”/“less risk”.

The following scale is used to illustrate each criterion parameter:

More Significant/ Difficult/ Risk **Less Significant/ Difficult / Risk**

This risk scale is clarified by text, as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

2. The Project

2.1 Solution Options Being Considered

- Solution Option 1: New Finglas – Woodland 400 kV OHL:
    - Construction of a new 400 kV OHL linking Woodland 400 kV station to Finglas 220 kV station.
- Solution Option 2: New Finglas – Woodland 400 kV UGC:
    - Construction of a new 400 kV UGC linking Woodland 400 kV station to Finglas 220 kV station, including:
        - Option 2A: One 400kV circuit standard cable type (2.5m^2 Cu XLPE installed in flat formation in a 1.7m wide trench);
        - Option 2B: One 400kV circuit alternative cable type (3m^2 Cu XLPE installed in flat formation in a 2.1m wide trench);and
        - Option 2C: Two 400kV circuits consisting of one 2.5m^2 Al XLPE cable per phase, installed as two circuits in trefoil formation in a single 1700 mm wide trench.
- Solution Option 3: New Belcamp – Woodland 400 kV OHL:
    - Construction of a new 400 kV OHL linking Woodland 400 kV station to Belcamp 220 kV station.
- Solution Option 4: New Belcamp – Woodland 400 kV UGC:
    - Construction of a new 400 kV UGC linking Woodland 400 kV station to Belcamp 220 kV station, including:
        - Option 4A: One 400kV circuit standard cable type (2.5m^2 Cu XLPE installed in flat formation in a 1.7m wide trench);
        - Option 4B: One 400kV circuit alternative cable type (3m^2 Cu XLPE installed in flat formation in a 2.1m wide trench);and
        - Option 4C: Two 400kV circuits consisting of one 2.5m^2 Al XLPE cable per phase, installed as two circuits in trefoil formation in a single 1700 mm wide trench.

Solution Connection requirements for each option:

- Connection at Woodland 400kV station;
- New 400kV station infrastructure at remote end station (Finglas or Belcamp); and
- The thermal rating of the underground cable options should match the standard 400 kV overhead line rating as far as practicable (i.e. a winter rating of 2963 A and summer rating of 2506 A).

2.2 Project Study Area

The Project Study Area is defined as the area investigated for the possible installation of the technologies identified and shortlisted in Step 2.

2.2.1 Development of the Project Study Area

The Project Study Area identified in Step 2 was used as a basis of the development of a Project Study Area for Step 3. See Figure 2.1

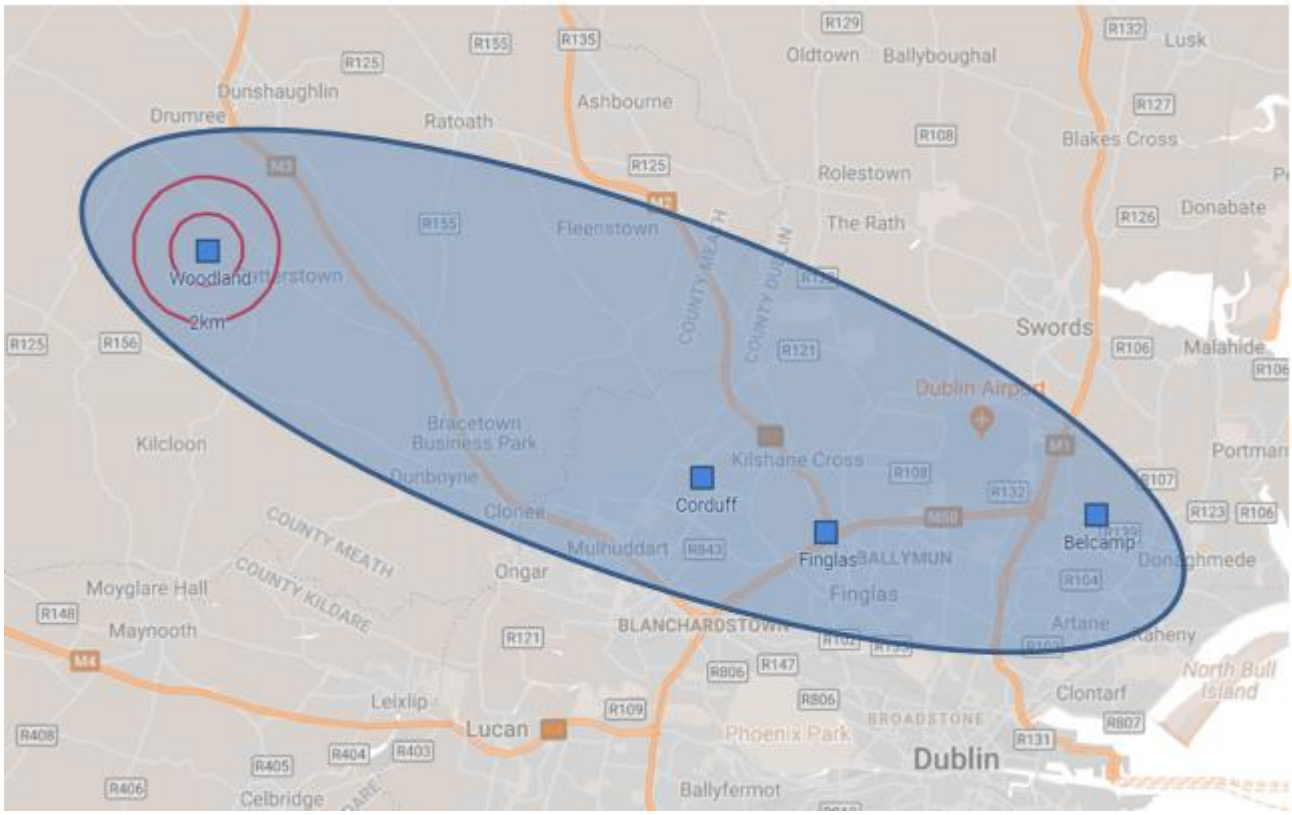

Figure 2.1 Step 2b Study Area (Ref. Social Impact Assessment report Social Area of Influence).

During Step 2, a long list of 21 options to six (Step 2a); this was further refined to four (Step 2b) to take forwards into Step 3.

As part of this Step of the project (Step 3), the Project Study Area has been further refined by considering a wide variety of factors. These included technical requirements of the Proposed Project and the presence of the road network, settlements, existing electrical utilities, and other physical constraints (e.g. river or rail crossings as well as other environmental constraints).

Of particular note in defining the Project Study Area, were: the M50 corridor and the highly urban and built up area south of it; Dublin International Airport; significant towns and settlements such as Dunboyne, Blanchardstown, Swords and Malahide; environmental constraints such as Malahide Estuary; and the need to take the shortest and straightest routes possible for OHLs and to stay within the public road network for the UGC.

The current Project Study Area (see **Figure 2.2**) is slightly larger than, and a different shape to, the Step 2 Study Area. South of the M50 has been removed, as this is not considered to be feasible for either OHL or UGC for a variety of reasons, including the proliferation of existing utilities residential and industrial buildings and the significant disruption that would be brought to the area. Similarly, south of the N2 as it gets closer to the M50 has also been removed for the same reasons. To the north, potentially significant constraint on feasible routes, for an OHL in particular to Belcamp, are posed by Dublin Airport. As a result, the Project Study Area from Step 2 was extended north above Swords, and to the east towards Malahide, so that the feasibility of bringing an OHL between Swords and Malahide could be investigated.

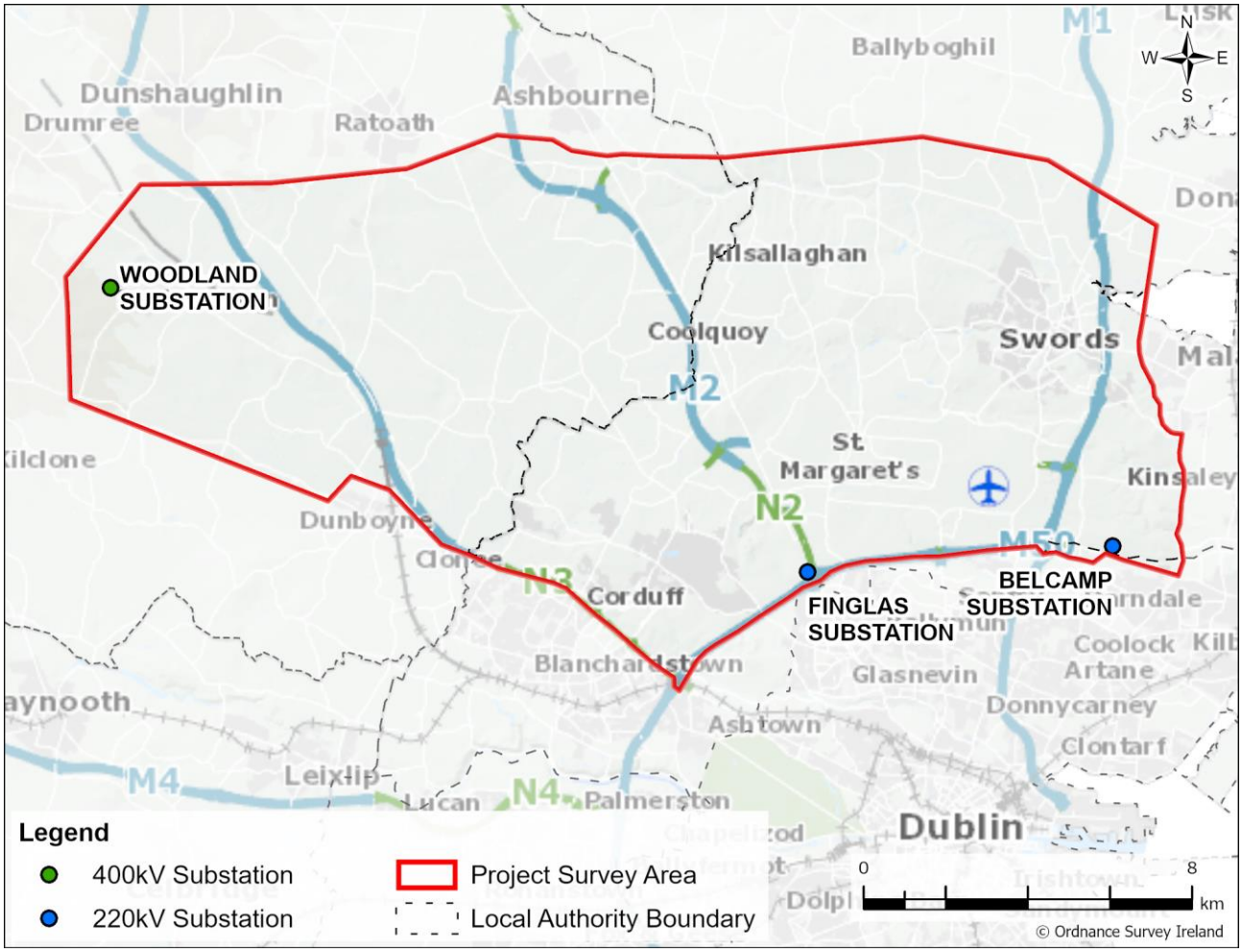

Figure 2.2: CP 1021 Project Study Area at Step 3

In addition to this, the UGC and OHL feasibility reports each have a number of smaller sub-study areas defined, which present particular constraints to that technology. These are presented and described in those reports.

The Environmental Constraints report and Social Impact Assessment Scoping Report identify a sub study area for technology options to Finglas Substation which would generally not involve constraints to the north and east Dublin Airport. The study area for Belcamp in these reports is the same as the Project Study Area. These are presented and described in those reports.